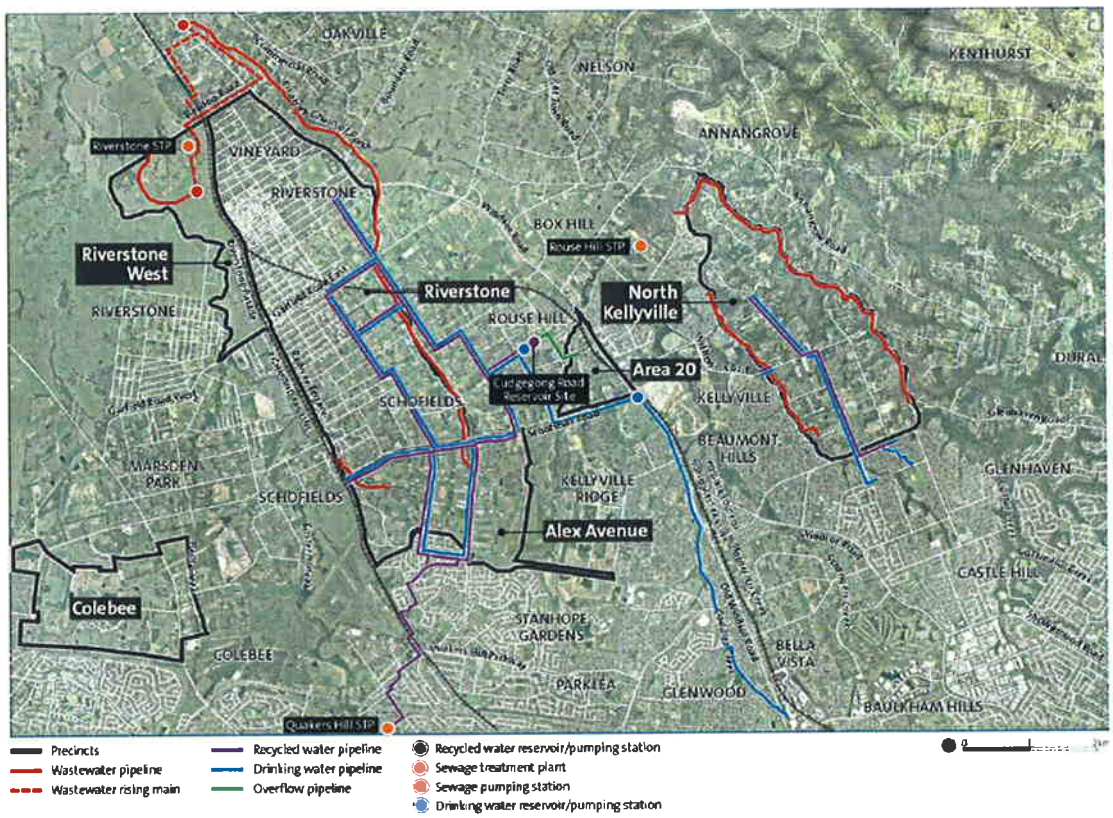
NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT
Water Related Services for the North West Growth Centre
Sydney Water Corporation



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

November 2008

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EXECUTIVE SUMMARY

Sydney Water Corporation (the Proponent) has lodged a major project application and Environmental Assessment to construct and operate the water-related services for the North West Growth Centre First Release Precincts, in the Baulkham Hills, Blacktown and Hawkesbury local government areas.

The project includes the installation of pipelines for potable water, recycled water and sewage. The project would also include the upgrade of two existing sewage treatment plants, and the construction of a water reservoir facility. The Proponent estimates the capital investment value of the project at $278 million.

The proposed water-related services would play a major role in satisfying the expected growth in demand for these services in the North West Growth Centre over the coming decade. In addition, the project would ensure that the North West Growth Centre First Release Precincts have access to recycled water supplies, which is an aim of the *State Environmental Panning Policy (Sydney Region Growth Centres) 2006*.

The Department has assessed the Environmental Assessment, Statement of Commitments, Preferred Project Report and the 11 submissions received from the exhibition of the proposal. The main issues that were raised in submissions and through the Department's assessment of the project were impacts related to odour, ecology, water quality, and indigenous heritage.

The Proponent's assessment indicated that odour emissions above levels considered offensive in residential areas would occur in the area around the proposed Riverstone Sewage Treatment Plant expansion. However, in consultation with DECC and the Growth Centres Commission, the Department established that residential uses are not planned for the affected areas, and that the industrial and commercial uses proposed would not be adversely affected by the predicted odour levels.

The project would result in the loss of 17.17 hectares of vegetation, however the recommended conditions of approval require the Proponent to offset all of the vegetation loss not already accounted for in the North West Growth Centre Biodiversity Conservation Order (December 2007). The Proponent has identified an appropriate offset package. In terms of water quality, although the project involves increased sewage capacity, it also involves increased capacity for water recycling. As a result, the project (together with the Replacement Flows Project) will actually improve water quality in the surrounding creek system.

Several areas of Indigenous archaeological value may be impacted by the construction of the project. The Proponent has proposed work exclusion zones and underboring construction methods in the vicinity of known sites. A portion of one particularly significant site is likely to be affected, and the recommended conditions of approval require the Proponent to undertake detailed investigation into the feasibility of relocating pipelines in the vicinity of this site. Unless this report provides sufficient justification for maintaining the pipeline in its proposed location, the Department will require the Proponent to avoid the archaeological site altogether.

The Department is satisfied that the impacts of the project can be mitigated and/or managed to ensure an acceptable level of environmental performance, subject to the recommended conditions of approval. Based on its assessment, the Department is satisfied that the project is necessary to ensure that the NSW Government's plans for the North West Growth Centre are met and that water-related services are supplied to the First Release Precincts in an efficient and environmentally acceptable manner.

CONTENTS

1. BACKGROUND

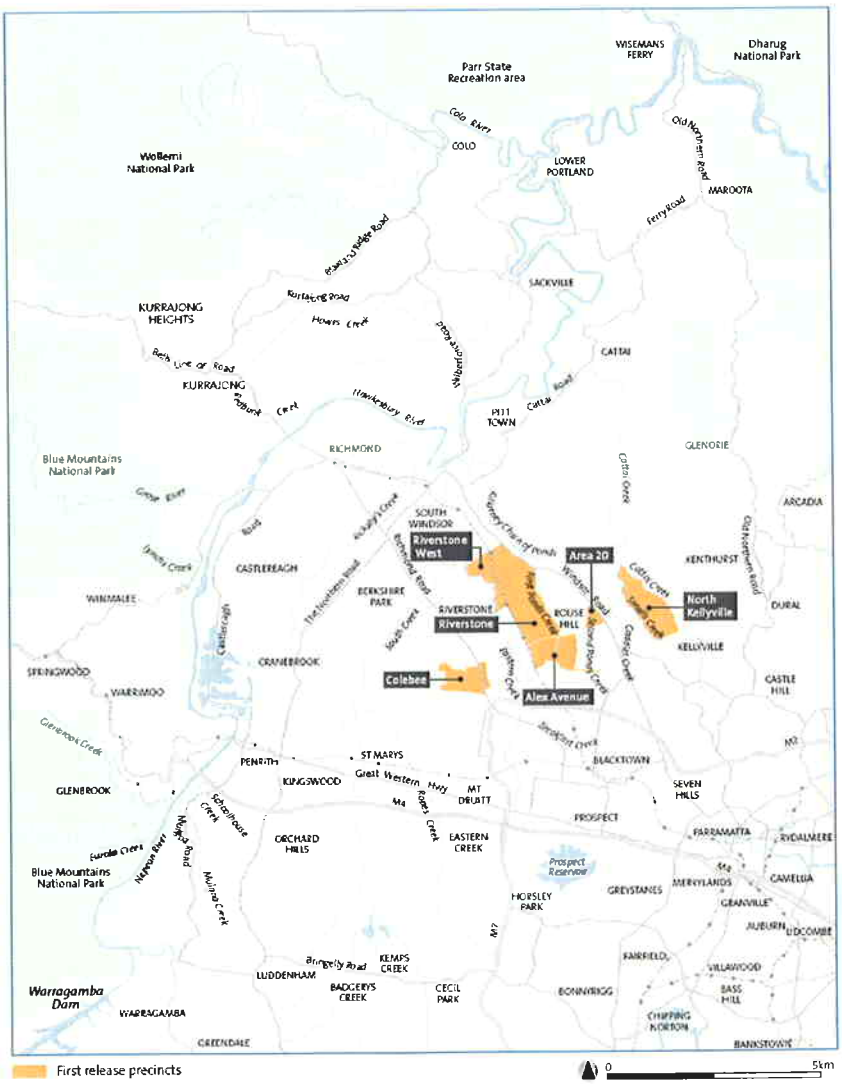
Sydney Water Corporation (the Proponent) proposes to construct and operate water-related services for the North West Growth Centre First Release Precincts within the Baulkham Hills, Blacktown and Hawkesbury local government areas.

1.1 Location

The project site covers the North West Growth Centre First Release Precincts of Riverstone West, Riverstone, Alex Avenue, Area 20 and North Kellyville, approximately 35 km north west of the Sydney central business district and 10 km north west of Parramatta. Colebee is not included in the project application as water-related services will be supplied by the Precinct developer.

The location of the North West Growth Centre First Release Precincts is shown in Figure 1.

Figure 1: North West Growth Centre First Release Precincts



Source: Figure 1 of Proponent's EA (Sydney Water Corporation, 2008)

1.2 Surrounding Land Use

The existing land use in the North West Growth Centre is predominantly rural residential, with a few areas of intensive agriculture and industry. Urban residential areas are located around the train stations at Riverstone and Schofields. Sydney Water's existing sewage treatment plants at Riverstone, Rouse Hill and Quakers Hill service current residents. The NSW Growth Centres Commission has planned for 22,500 new residential dwellings, as well as 65 ha of new industrial land in the First Release Precincts.

2. PROPOSED DEVELOPMENT

2.1 Project Description

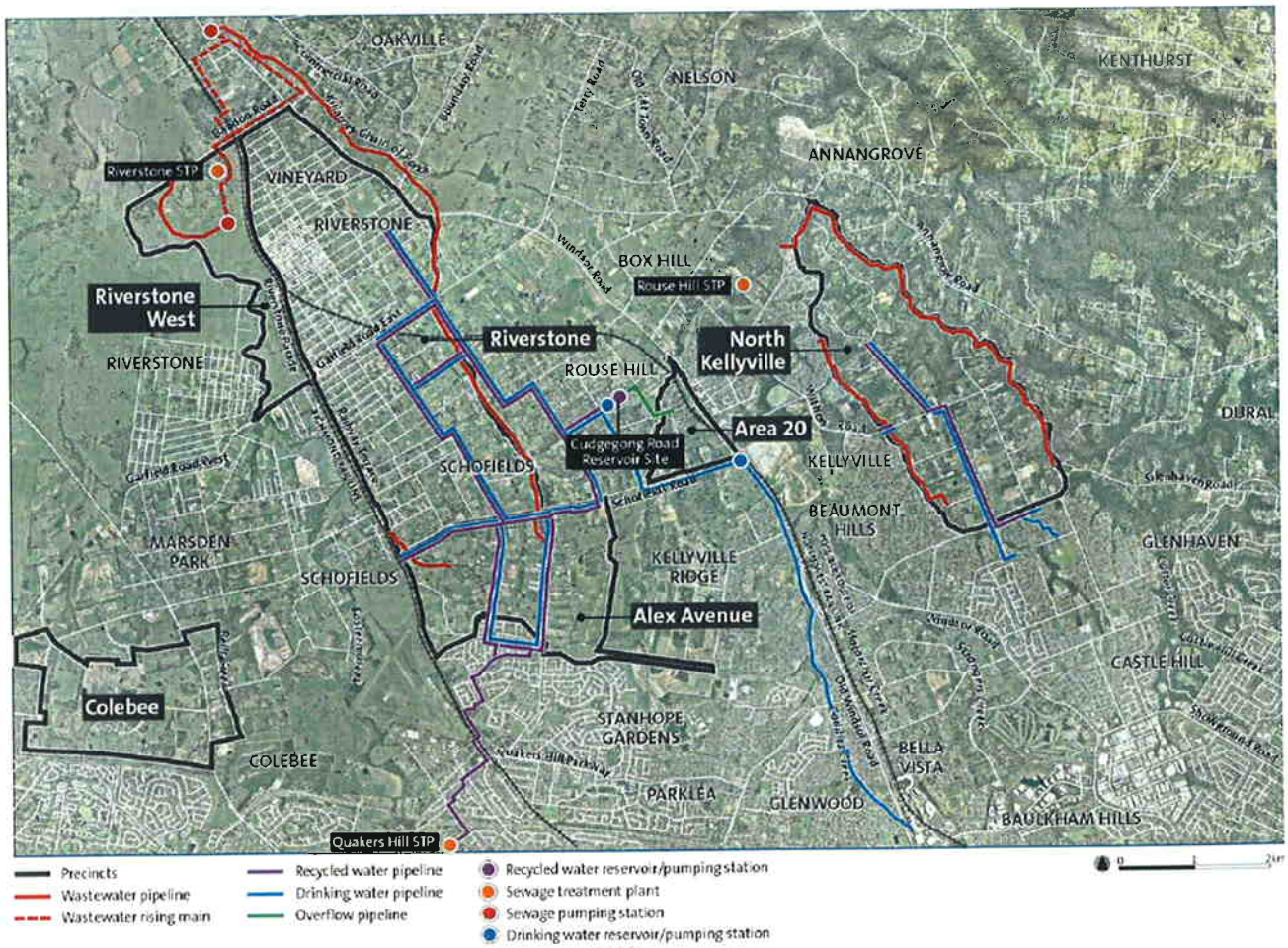
The Proponent proposes to construct and operate water-related services for the North West Growth Centre First Release Precincts. The proposal would comprise the following elements as outlined in Figures 2-5:

- approximately 30 kilometres of drinking water pipelines, 30 kilometres of recycled water pipelines, and 30 kilometres of wastewater pipelines;
- three drinking water storage reservoirs and three recycled water storage reservoirs;
- three drinking water pumping stations, three recycled water pumping stations, and one sewage pumping station;
- one chlorine dosing facility;
- one recycled water plant;
- upgrade of one existing sewage pumping station; and
- upgrade of one sewage treatment plant.

Construction of the project would occur in three phases over five years, but would be dependent on the rate of lot development in the Precincts. The project would employ 130 people during construction and 2 people during operation. The capital investment value of the project is $278 million.

The location of the proposed services is shown in Figure 2. The drinking and recycled water pipelines would follow existing road verges, paths and drainage reserves. The wastewater pipelines would generally follow drainage lines and creek lines to utilise gravity, although rising mains would follow road reserves. Pipelines would be constructed through a combination of trenching and boring.

Figure 2: Pipeline and Plant Locations



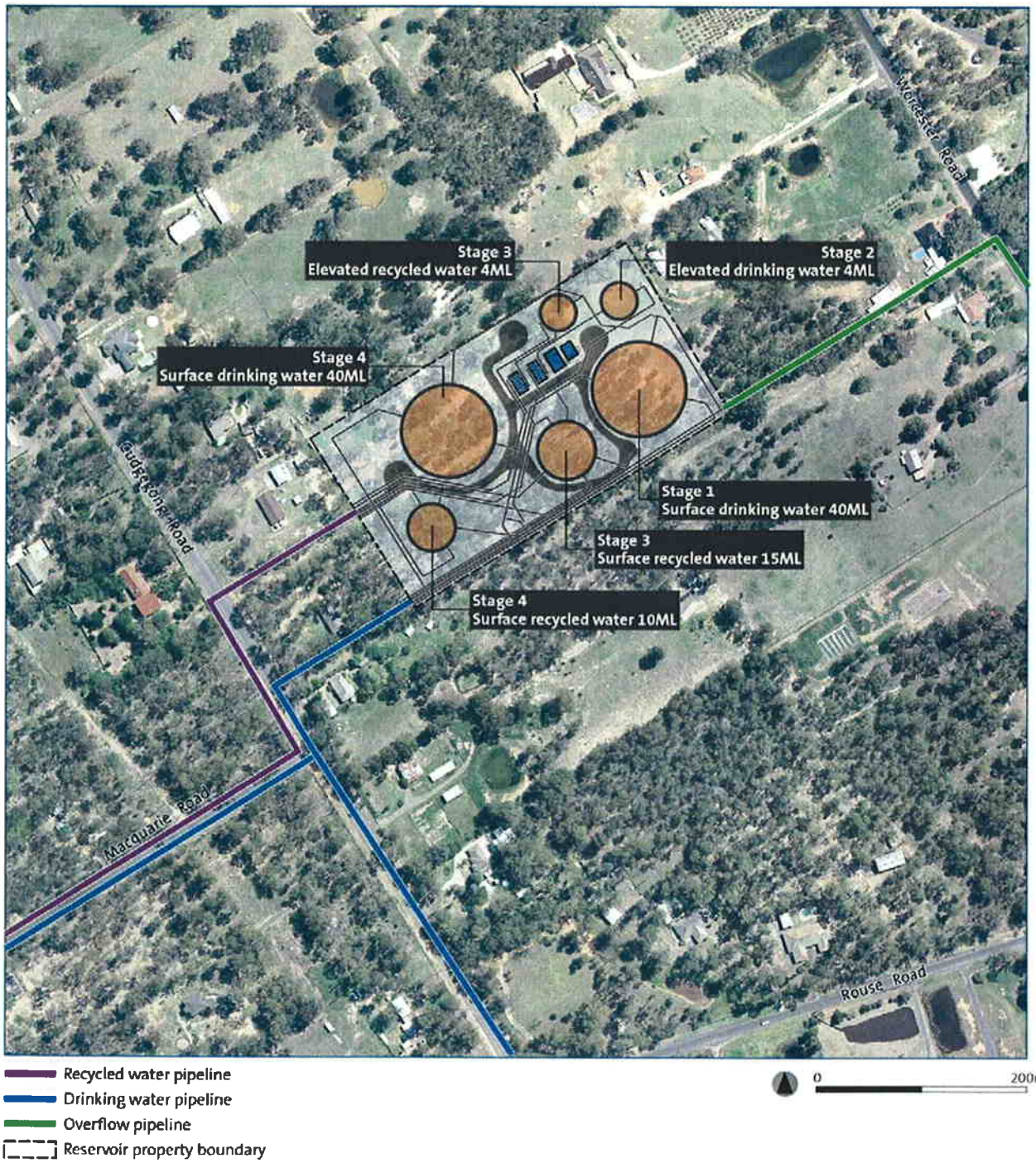
Source: Figure 3.1 of Proponent's EA (Sydney Water Corporation, 2008)

The reservoirs, pumping stations and other facilities would be located at three sites within the First-Release Precincts (refer to Figure 2):

- Cudgegong Road;
- Quakers Hill Sewage Treatment Plant; and
- Riverstone Sewage Treatment Plant.

The layout of the proposed reservoir site at Cudgegong Road is shown in Figure 3. The site would include three drinking water reservoirs and three recycled water reservoirs, as well as a chlorine dosing facility, a switchroom and supply pipelines. The reservoirs would be constructed in three stages over five years as demand dictates. An overflow pipeline would discharge drinking and recycled water overflow into Second Ponds Creek. A water pumping station would be located nearby, south of Schofields Road.

Figure 3: Cudgegong Road Reservoir Site



Source: Figure 3.4 of Proponent's EA (Sydney Water Corporation, 2008)

The layout of the proposed additions to the existing Quakers Hill Sewage Treatment Plant is shown in Figure 4. The additions would include a recycled water plant with a capacity of 10ML/day. This recycled water plant would supply demand in the First Release Precincts until another recycled water plant is built at Riverstone Sewage Treatment Plant, after which it would play a subordinate supply role. The recycled water plant at Riverstone does not form part of this project application.

A sodium hypochlorite storage tank with a capacity of 15ML, a 10ML recycled water storage reservoir and a pump station would also be added to the Quakers Hill site. All additions would be added in the final two years of the five-year construction schedule for the project.

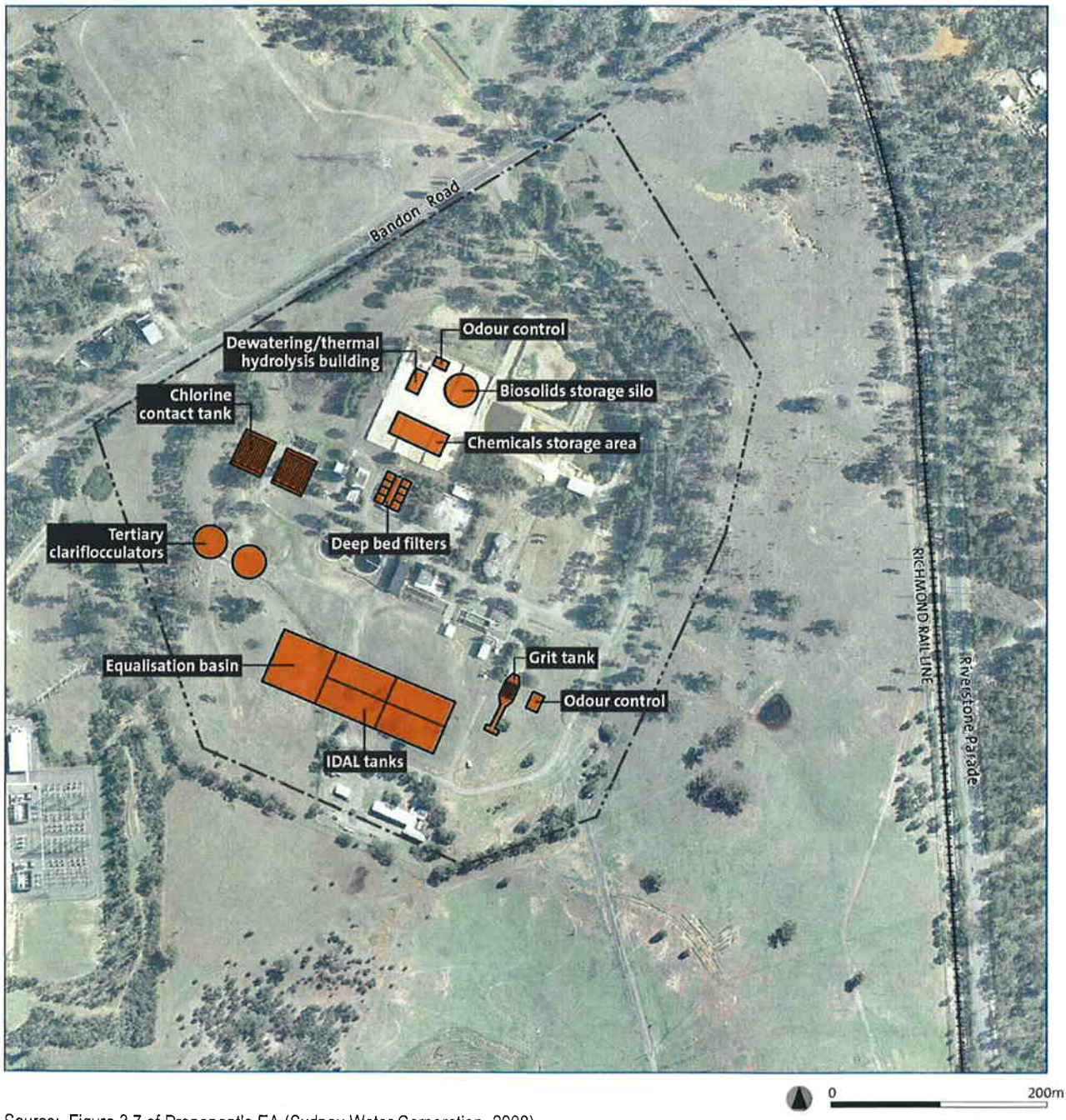
Figure 4: Quakers Hill Recycled Water Plant Site

Source: Figure 3.7 of Proponent's EA (Sydney Water Corporation, 2008)

The layout of the proposed additions to the existing Riverstone Sewage Treatment Plant is shown in Figure 5. The Plant's capacity would increase from 2ML/day to 14.2ML/day to accommodate development in the First Release Precincts. Ultimately, with full development of the North West Growth Centre, it is envisioned that the Plant would eventually be upgraded to a capacity of 35ML/day. However, this ultimate capacity does not form part of the current project application and would be the subject of further assessment.

The proposed additions would include various treatment buildings, collection tanks and storage tanks. All of these facilities would be covered, except for the aeration lagoon tanks, which would be exposed to the air. The upgrades to the Riverstone Sewage Treatment Plant would occur in the final two years of the five-year construction schedule.

Figure 5: Riverstone Sewage Treatment Plant Site



Source: Figure 3.7 of Proponent's EA (Sydney Water Corporation, 2008)

2.2 Project Need

The NSW Government's *Metropolitan Strategy* (2005) identifies the North West Growth Centre as an area that will accommodate 66,000 new dwellings over the next 30 years. In June 2006, the Minister for Planning identified the North Kellyville, Riverstone, Riverstone West, Alex Avenue, Area 20 and Colebee areas as the First Release Precincts. Lot development in the First Release Precincts is scheduled to begin in 2009.

The primary objective of the project is to ensure that the predicted water and sewage supply needs for future residents and businesses in the First Release Precincts are met. The project also aims to meet the requirement of *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* that all new developments be provided with water for non-drinking uses in areas that are or will be serviced by a recycled water plant.

2.3 Consideration of Alternatives

The "do nothing" option was not considered by the Proponent because the area is subject to the NSW Government's plans for development, and water-related services form an integral part of these plans. The Department recognises the need for water-related services in the North West Growth Centre and does not support a "do nothing" option.

The Proponent did, however, consider alternative route and supply source options for the various components of the project. The consideration concluded that the proposed routes and supply sources represent the most efficient and cost-effective method for servicing the First Release Precincts and would be most compatible with the projected future growth in demand for water-related services throughout the North West Growth Centre.

2.4 Department's Position

The Department considers that the project is consistent with the service obligations of Sydney Water for the North West Growth Centre, and that the proposed sites and pipelines routes are the most appropriate in terms of efficiency and minimising adverse impacts on the community and the environment. The majority of above-ground infrastructure would be located within existing Sydney Water sites. The Department considers that the project would provide important infrastructure to accommodate sustainable urban and industrial growth in the North West Growth Centre.

3. STATUTORY CONTEXT

3.1 Major Project

The project is a development to which Part 3A of the *Environmental Planning and Assessment Act 1979* (the Act) applies by virtue of an Order made by the Minister for Planning under section 75B of the Act on 29 July 2005.

3.2 Director-General's Requirements and Adequacy of Environmental Assessment

The Director-General's requirements for the preparation of an Environmental Assessment for the project were issued on 17 October 2007. For the purpose of section 75I(2)(g) of the *Environmental Planning and Assessment Act 1979*, the Environmental Assessment for the project complied with the Director-General's requirements and the Proponent was notified of this compliance on 18 January 2008.

3.3 Environmental Planning Instruments

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 substantially governs the carrying out of the project. The aims of this policy are:

- to coordinate the release of land for residential, employment and other urban development in the North West and South West growth centres of the Sydney Region;
- to enable the Minister from time to time to designate land in those growth centres as ready for release for development;
- to provide for comprehensive planning for those growth centres;
- to enable the establishment of vibrant, sustainable and liveable neighbourhoods that provide for community well-being and high quality local amenity;
- to provide controls for the sustainability of land in those growth centres that has conservation value;
- to provide for the orderly and economic provision of infrastructure in and to those growth centres;
- to provide development controls in order to protect the health of the waterways in those growth centres;
- to protect and enhance land with natural and cultural heritage value; and
- to provide land use and development controls that will contribute to the conservation of biodiversity.

The Department is satisfied that the project is consistent with these aims. Clause 18A of the SEPP states that development for public utility undertakings other than electricity generating works and water recycling facilities may be carried out without consent on land to which the SEPP applies.

The *Baulkham Hills Local Environmental Plan 2005*, *Blacktown Local Environmental Plan 1988*, and *Hawkesbury Local Environmental Plan 1989* apply to the project sites. These LEPs adopt the *Environmental Planning and Assessment Model Provisions 1980*, which makes the proposed public utility undertakings permissible without consent. Nevertheless, the project is consistent with the objectives of all of the zones applying to the project sites.

3.4 Exhibition and Notification

The project application and Environmental Assessment were placed on public exhibition from Wednesday 27 February to Wednesday 2 April 2008 and submissions invited in accordance with section 75H of the Act. Exhibition locations were as follows:

- Department of Planning's head office in Sydney;
- Nature Conservation Council of NSW;
- Blacktown City Council;
- Baulkham Hills Shire Council; and
- Hawkesbury City Council.

The Environmental Assessment was also available for download on the Department's internet site. Notification of the exhibition period was made through two separate advertisements in the *Sydney Morning Herald*, the *Daily Telegraph*, the *Hornsby Upper North Shore Advocate* and the *Hills News/Northern News* on 27 February 2008 and again on 19, 19, 20 and 25 March 2008 respectively.

4. CONSULTATION AND ISSUES RAISED

The application for the project and accompanying Environmental Assessment were publicly exhibited from Wednesday 27 February 2008 to Wednesday 2 April 2008. During the exhibition period 11 submissions were received. Submissions were received from State and local government agencies, one special interest group and one member of the local community. Of the submissions received, one objected to the project. The remaining 10 submissions either supported the project, provided comments for consideration as part of the assessment or stated that they had no objection to the project proceeding.

4.1 Submissions from State and Local Government

Submissions were received from 7 State government agencies and from Blacktown City and Baulkham Hills Shire Councils:

- NSW Department of Environment and Climate Change (DECC) – **raised no objection to the project** however raised concerns regarding the Proponent's odour assessment for the Riverstone Sewage Treatment Plant , the lack of data on vegetation clearing during construction, and the need for a Construction Noise Management Plan for the project. The DECC outlined specific conditions with respect to noise management and noise limits for the project and these have been incorporated as part of the recommended conditions of approval for the project.
- NSW Department of Primary Industries (DPI) – **raised no objection to the project** but noted the potential impact of recycled water on salinity in the area.
- NSW Health – **raised no objection to the project.**
- NSW Department of Water and Energy (DWE) – **raised no objection to the project** however noted that pipeline intrusion into riparian corridors should be minimised, that salt discharges into creeks should be monitored, and that the pumping of groundwater will require a separate licence from DWE.
- NSW Transport Infrastructure Development Corporation (TIDC) – **raised no objection to the project** however highlighted potential conflicts between the proposed pipelines and the proposed North West Metro. TIDC suggested alternate pipeline routes near their infrastructure and requested ongoing consultation with the Proponent.
- NSW Growth Centres Commission (GCC) – **supported the project** however noted the need to liaise further with the Proponent to manage odour impacts from the Riverstone Sewage Treatment Plant.
- Landcom – **supported the project.**
- Blacktown City Council – **raised no objection to the project** however expressed concerns regarding the erosion effects of pipeline outlets, the offset requirements for vegetation clearing, the impact of pipeline construction on indigenous cultural heritage, and potential construction noise impacts.
- Baulkham Hills Shire Council – **raised no objection to the project** however commented on a number of issues, including access to creek lines during pipeline construction, erosion management during pipeline construction, and the alignment and restoration of trenches affecting Council road reserves.

4.2 Submissions from Special Interest Groups and Individuals

A submission was received from the Nature Conservation Council of NSW objecting to the proposal based on impacts on flora, fauna and aquatic health. The submission identified a number of flora, fauna and aquatic species that would be adversely impacted by the loss of vegetation in the North West Growth Centre. A submission was also received from a member of the community who raised no objection to the project but expressed concern about the impact of pipeline construction in Jocelyn Boulevard, a route used by local children on bicycles.

4.3 Preferred Project Report

Following consideration of the submissions, the Proponent submitted a Preferred Project Report on 16 July 2008 which proposed six amendments to the project as follows:

- Revised drinking water pipeline routes – the pipeline route from Parklea to the Cudgegong Road Reservoir site would follow the drainage reserve along Caddies Creek, run along Old Windsor Road, Windsor Road, Schofields Road and finally Cudgegong Road. This route would avoid impacting on the proposed North West Metro rail link.
- Revised recycled water pipeline routes – the pipeline route would be slightly altered to avoid conflict at crossings of the M7 Motorway, the Richmond rail line and the access corridor at the Cudgegong Road Reservoir site.

- Revised waste water pipeline routes – two pipelines were originally proposed to cross the Richmond rail line at Bandon Road, but the pipeline sizes mean that one pipeline was relocated to cross at St James Road.
- Relocation of the Rouse Road water pumping station – the revised drinking water pipeline route means the water pumping station would be moved to south of Schofields Road.
- Expansion of the Cudgegong Road Reservoir site – an additional hectare of private property will be acquired to accommodate repositioning of access roads, servicing units and pipeline spacings.
- Addition of the Cudgegong Road Reservoir overflow pipeline – this pipeline would discharge drinking and recycled water overflow into Second Ponds Creek.

It is considered that these amendments are acceptable and that they do not significantly change the nature and scope of the original proposal, nor will they result in additional adverse impacts. Nevertheless, comment was sought from the DECC on the proposed changes.

On 15 August 2008, the DECC provided comments on the proposed changes relating to the Proponent's obligations under the legislation administered by the DECC, and the need for consultation with the DECC in relation to any post-approval management plans for the project.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

Key issues raised in the submissions in response to the public exhibition of the project and/or identified during the Department's assessment included:

- odour impacts;
- ecological impacts;
- water quality impacts; and
- Indigenous heritage impacts.

All other issues raised in submissions are considered to be minor or have been addressed as part of the Proponent's Preferred Project Report.

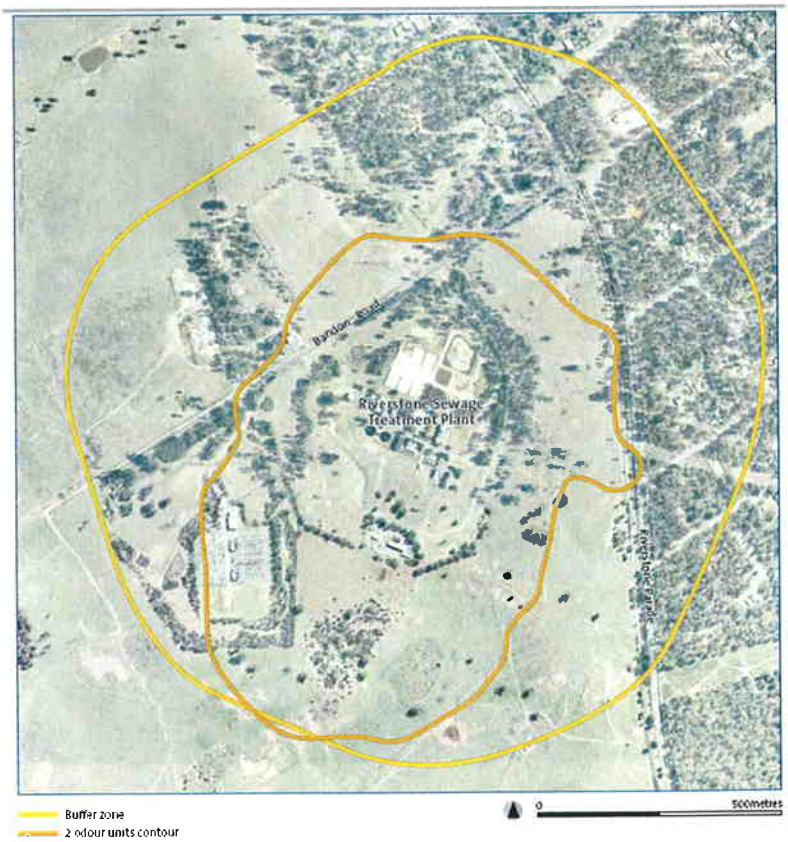
5.1 Odour Impacts

Issue

The construction and operation of the majority of the proposed facilities would not emit odours, as they process and handle drinking and recycled water products which are largely odourless. However, the operation of the proposed waste water facilities at Riverstone Sewage Treatment Plant would emit odours. Although most of the sewage processing facilities on the site would be fully enclosed, the aeration lagoon tanks are exposed to air in order to maximise treatment efficiencies. Odour will therefore be emitted from these tanks.

An assessment of potential odour impacts from the additions to the Riverstone Sewage Treatment Plant was undertaken as part of the Environmental Assessment. The results are shown in Figure 6. The results clearly show that the proposed expansion of the sewage treatment plant would generate odour emissions above 2 odour units (the level at which odour is generally considered offensive in residential areas) beyond the boundary of the site. The Proponent justified these emissions by stating that odour levels at all existing or future planned residential areas would be less than 2 odour units, which is considered an acceptable level of odour impact.

Figure 6: Odour Impact Assessment for the Riverstone Sewage Treatment Plant (Ultimate Capacity)



Source: Figure 6.11 of Proponent's EA (Sydney Water Corporation, 2008)

Submissions

In its submission on the project, the DECC questioned the validity of the Proponent's odour assessment, stating that the modelling did not reflect worst case scenarios at the plant, and did not provide details of all key operational assumptions upon which the modelling was based. The results provided by the Proponent were likely to be an underestimation of the actual odour impacts from the plant operating at 35ML/day.

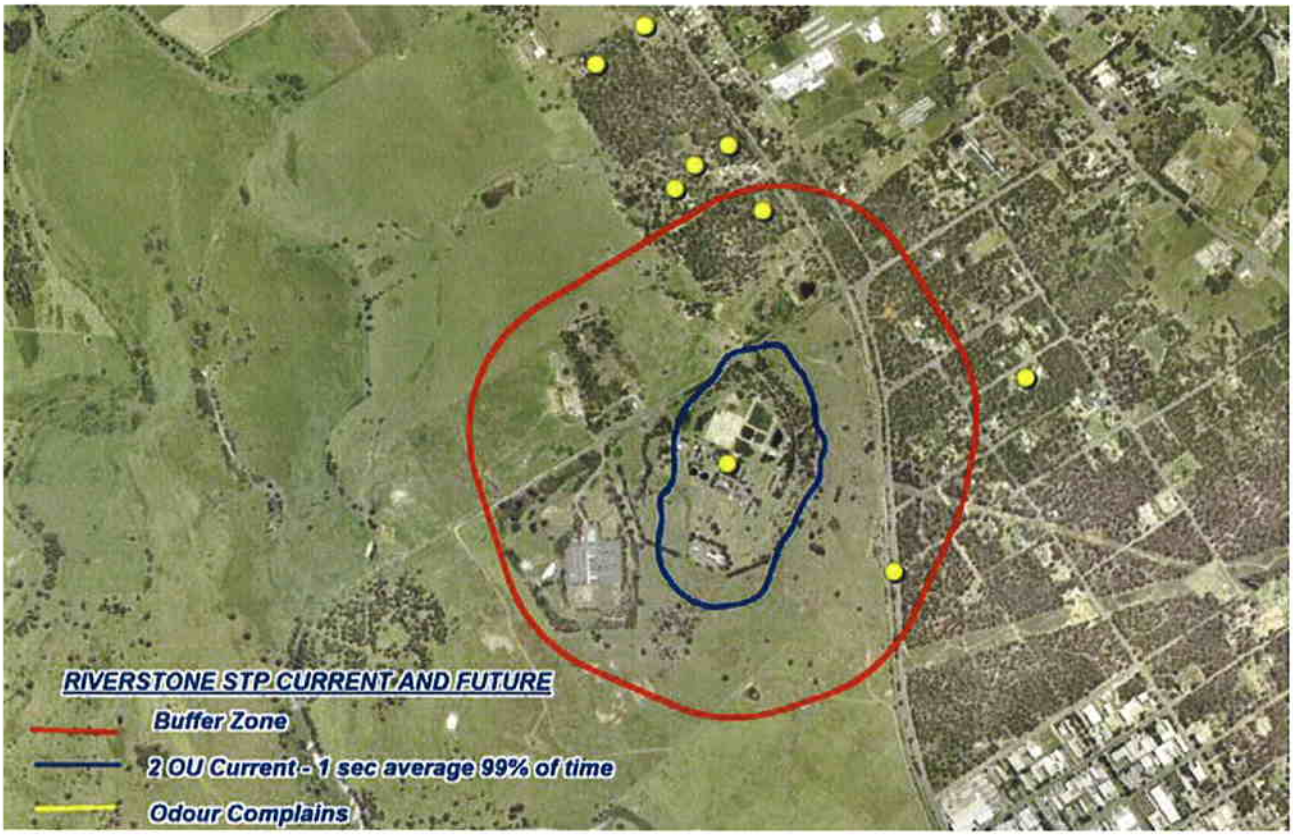
The Growth Centres Commission acknowledged the critical importance of providing water related services to the North West Growth Centre in a timely and sustainable manner, but raised concerns regarding the impact of the Riverstone Sewage Treatment Plant expansion on surrounding lands. The Plant is located within 300 metres of the proposed Riverstone railway station. The Growth Centres Commission plans for this area focus on high density residential and commercial uses to capitalise on the proximity of the station. The Commission noted that land uses in the vicinity of the Plant would need to be carefully managed to minimise odour impacts.

Consideration

The Proponent's original odour impact assessment for the Riverstone Sewage Treatment Plant was problematic. Firstly, the assessment was based on the plant operating at a capacity of 35ML/day, even though the capacity for which the Proponent is applying under the current project application is only 14.2ML/day. Secondly, although the assessment clearly indicates that odour levels beyond the boundary of the site would significantly exceed levels considered offensive in residential areas (2 odour units), the Environmental Assessment remained silent on any management or mitigation issues to address this impact. Finally, the DECC found significant methodological flaws with the assessment, and questioned the validity of the results.

To address these concerns, the Department convened a meeting between the Proponent, the DECC and the Growth Centres Commission. The Proponent was required to provide revised modelling results which addressed the methodological requirements of the DECC and that reflected the capacity of 14.2ML/day sought under the current project application. The Proponent provided these results in the Preferred Project Report and they are shown in Figure 7.

Figure 7: Revised Odour Impact Assessment for the Riverstone Sewage Treatment Plant (14.2ML/day Capacity)



Source: Figure 3.1 of Proponent's PPR (Sydney Water Corporation, 2008)

These results indicate that, under worst-case conditions, some areas beyond the site would be affected by odour levels above 2 odour units, but that the majority of the odour impacts would be contained within the site. The DECC indicated that the methodology behind these revised results is acceptable.

The Growth Centres Commission has indicated an acceptance of some odour impacts on its lands in the vicinity of the site, given the need for a sewage treatment plant in this area into the future. The Commission has also noted that residential uses are unlikely to be permitted in the areas potentially affected by odour levels above 2 odour units, and that business, industrial and recreational uses would be more appropriate in those locations.

The Department notes that these types of uses are less likely to find odour levels above 2 odour units offensive, since their frequency of use is much lower than residential areas and the exposure of any individual to odours is likely to be brief. Given the fact that the Growth Centres Commission is aware of the odour emissions associated with the plant, the Department is confident that landuse in the area surrounding the plant will be appropriately managed.

Furthermore, the above results reflect worst-case scenarios, and the Proponent has indicated that emissions above 2 odour units outside of the site are highly unlikely when the capacity of the plant is only 14.2ML/day. Therefore, the recommended conditions of approval require the Proponent to comply with section 129 of the *Protection of the Environment Operations Act 1997,* which prohibits the emission of offensive odours beyond the boundary of the site.

It is noted that the Proponent is only seeking approval for the first stage of the expansion of the Riverstone Sewage Plant (to 14.2ML/day) in order to accommodate demand only within the First Release precincts. Subsequent precinct releases within the North West Growth Centre will require further expansion of the plant, up to an ultimate capacity of 35ML/day. Given the modelling for the ultimate capacity of the plant shown in Figure 6 (which is likely to somewhat underestimate the impact) it is clear that the potential for odour emissions from the final plant is significant. The Proponent will need to consider further odour mitigation measures when it seeks approval for the ultimate capacity plant, including fully enclosing the sewage treatment process.

However, the Proponent's modelling also suggests that odour emissions above 2 odour units are unlikely to affect future residential areas, even at full capacity. While DECC questioned the validity of the modelling, discussions between the Proponent and DECC suggested that any additional impacts beyond the modelled area would most likely occur in the south, and not in the areas of future residential development to the east. Again, the Department is confident that the Proponent will be able to resolve odour impacts associated with the ultimate capacity plant in consultation with DECC and the Growth Centres Commission.

5.2 Ecological Impacts

Issue

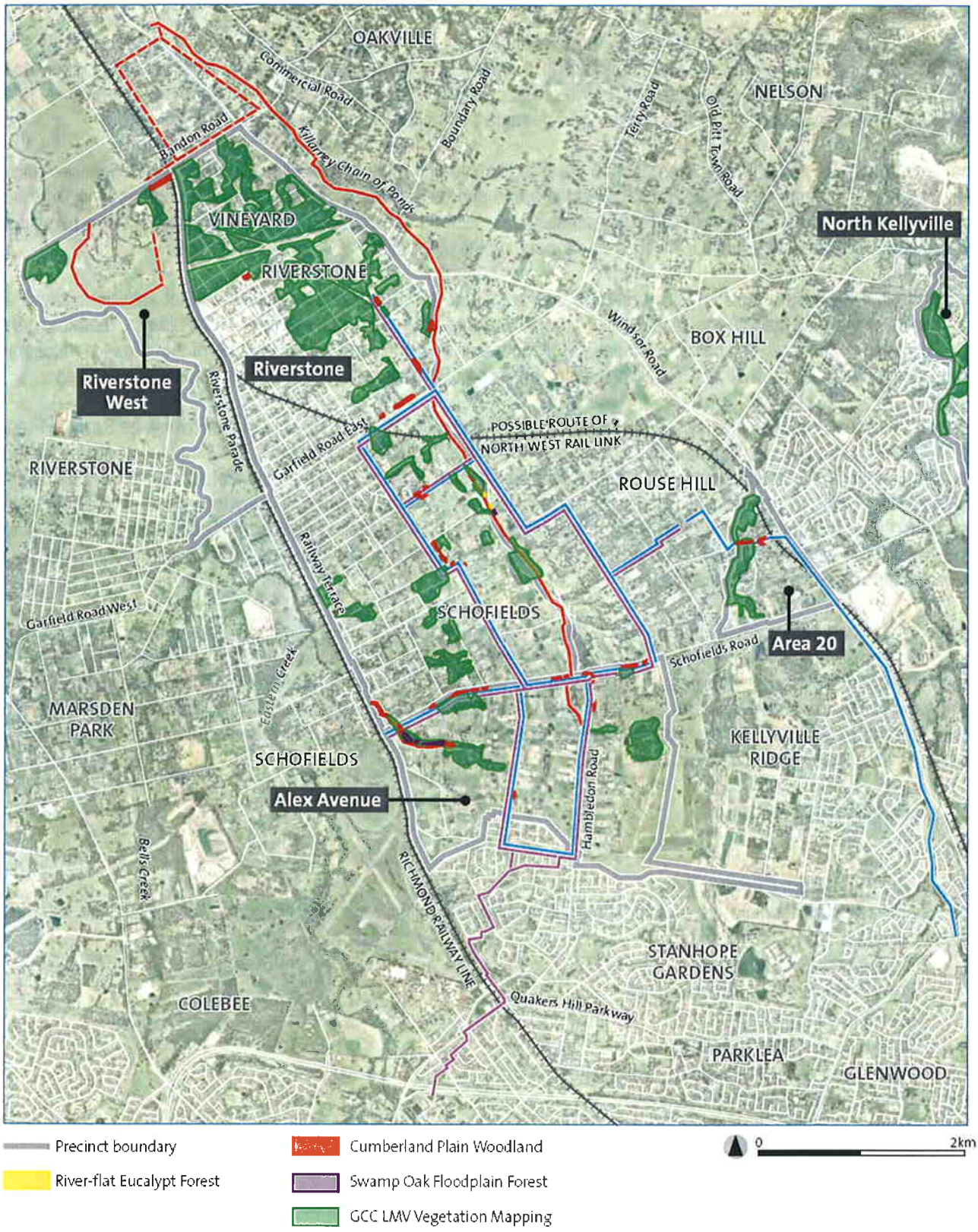
Threatened Vegetation Communities

The pipelines associated with the project would be constructed within vegetation corridors that include the following communities (refer to Figures 8 and 9):

- Cumberland Plain Woodland;
- Shale Sandstone Transitional Forest;
- River-flat Eucalypt Forest;
- Sandstone Ridgetop Woodland;
- Upper Georges River Sandstone Woodland;
- Western Sandstone Gully Forest;
- Shale Gravel Transition Forest; and
- Swamp Oak Floodplain Forest.

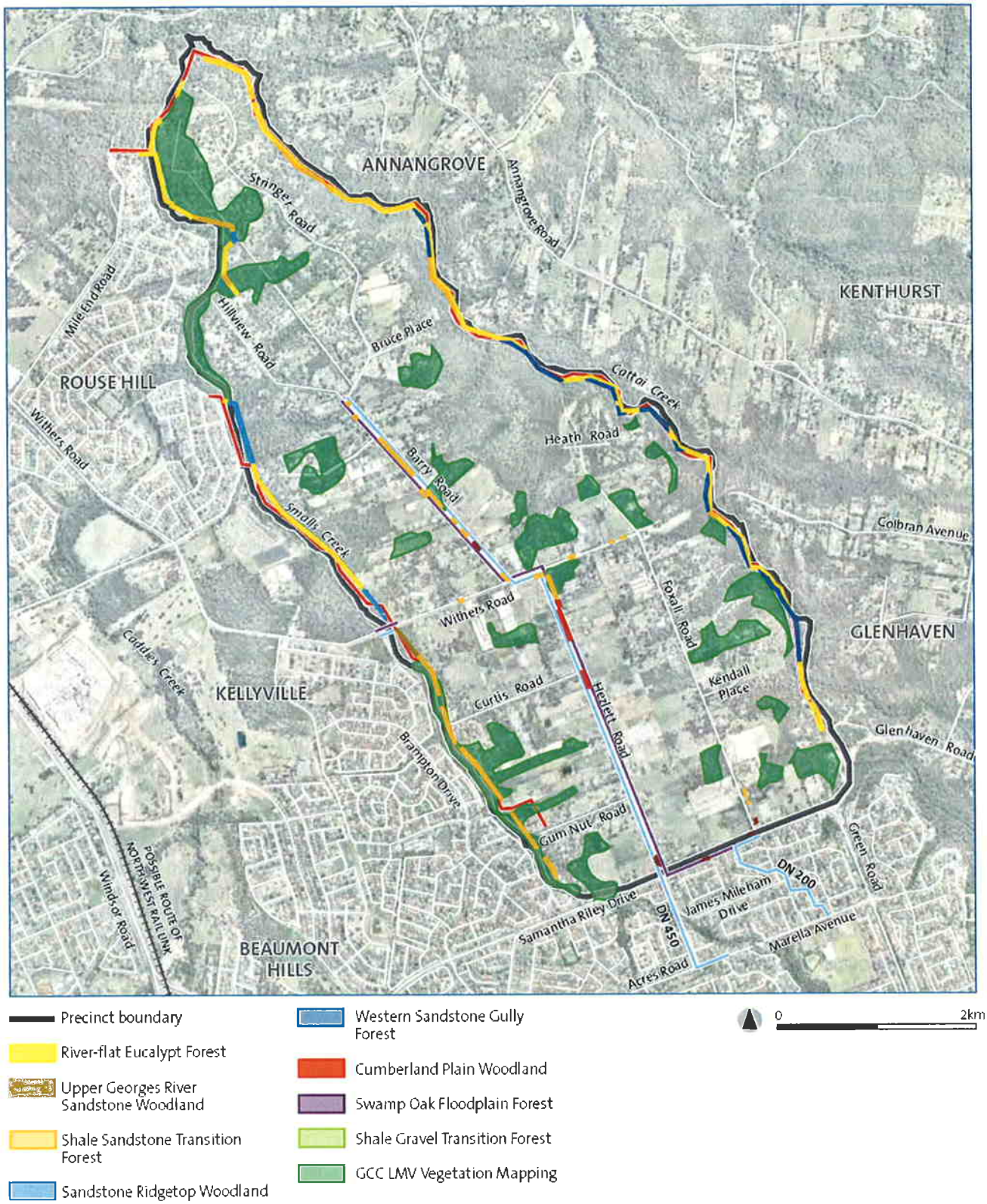
Cumberland Plain Woodland and Shale Sandstone Transition Forest are listed as endangered ecological communities under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These two communities are also listed as endangered ecological communities under the NSW *Threatened Species Conservation Act 1995* (TSC Acf), together with the River-flat Eucalypt Forest, Shale Gravel Transition Forest and Swamp Oak Floodplain Forest. To protect these vegetation communities from construction impacts, the Proponent proposes a number of general mitigation measures, including restricting the width of the pipeline construction corridor to 10 metres, boring under creek lines, weed control, exclusion fencing and the minimisation of soil disturbance.

Figure 8: Vegetation Communities in Riverstone West, Riverstone, Alex Avenue and Area 20



Source: Figure 6.6 of Proponent's PPR (Sydney Water Corporation, 2008)

Figure 9: Vegetation Communities in North Kellyville



Source: Figure 6.5 of Proponent's PPR (Sydney Water Corporation, 2008)

The Proponent estimates that a total of 17.17 hectares of vegetation would be lost as a result of the project. However, the majority of this vegetation is certified under the North West Growth Centre Biodiversity Conservation Order (December 2007), which means that offset issues for this vegetation have already been addressed. Only 2.58 hectares of the vegetation to be lost is within areas of the North West Growth Centre which are not certified under the Order. These 2.58 hectares consist mainly of endangered ecological communities such as Shale Sandstone Transition Forest (0.97ha), River-flat Eucalypt Forest (0.9ha) and Cumberland Plain Woodland (0.43ha). The Proponent proposes to provide up to 3.6 hectares in offsets for the loss of these 2.58 hectares on land owned by the Proponent in the Riverstone West Precinct. The offset area includes endangered ecological communities.

The Environmental Assessment also identified two species listed as 'vulnerable' under the TSC Act: *Epacris purpurascens var. purpurascens* (one location in North Kellyville) and *Grevillea juniperina ssp. juniperina* (three locations in Riverstone and Riverstone West). In order to protect these species, the Proponent proposes to prohibit construction works within five metres of the species, erect exclusion fencing during construction, and undertake manual digging in the vicinity of the species. The Environmental Assessment concluded that, given these measures, the project would be consistent with the provisions for these species under the TSC Act.

Threatened Fauna

The Environmental Assessment identified fifteen threatened fauna species listed under the EPBC Act and TSC Act as using or potentially using the project area for foraging and roosting/nesting activities. The fauna assessments in the Environmental Assessment found that the project would not adversely affect these species, except for the following threatened species which may be affected by construction of the Cudgegong Road Reservoir site:

- Cumberland Plain Land Snail;
- Eastern Freetail-bat;
- Yellow-bellied Sheathtail-bat;
- Eastern False Pipistrelle; and
- Little Bentwing-bat.

To protect these species from construction impacts at the Cudgegong Road Reservoir site, the Proponent proposes a number of general mitigation measures, including retaining hollow bearing trees, timing construction to ensure clearing is not undertaken in breeding, roosting and torpor time for the bats, and translocating individual Cumberland Plain Land Snails to appropriate habitat.

Submissions

Four of the eleven submissions provided comments related to the impact of construction on flora and fauna. These submissions were from the DECC, DWE, Blacktown City Council and Nature Conservation Council of NSW. The Nature Conservation Council objected to the project on the basis of the impacts on the threatened species identified above, in the context of the general expansion of Sydney into vegetated areas. DWE requested that construction in riparian corridors be avoided wherever possible.

The submissions from Blacktown City Council and the DECC highlighted the lack of certainty in the Proponent's commitment to vegetation offsets. In light of this, the DECC requested that further detail be provided regarding the offsets proposed. In the Preferred Project Report, the Proponent identified the 3.6 hectares of vegetation offsets on their land in the Riverstone West Precinct referred to above.

Consideration

Threatened Vegetation Communities

The concerns raised by the Nature Conservation Council relate to the loss of vegetation across Sydney due to urban expansion. Whilst the project would result in the loss of 17.17 hectares of vegetation, offset provisions have been made for all of this vegetation, either through the North West Growth Centre Biodiversity Conservation Order, or through the additional offsets proposed by the Proponent. The Department considers that these offsets are appropriate, since they include endangered ecological communities which account for the communities to be lost. The recommended conditions of approval require the Proponent to establish a formal offset arrangement in consultation with the DECC prior to the commencement of construction.

With regard to individual threatened species, the Department considers that the mitigation measures proposed by the Proponent, including exclusion zones and manual digging arrangements in the vicinity of threatened species, are appropriate. Nevertheless, the recommended conditions also require the Proponent to prepare a Flora and Fauna Management Plan as part of a Construction Environmental Management Plan, to specifically address the impacts pipeline construction on vegetation, and to provide for post-construction rehabilitation where necessary.

Threatened Fauna

The Department notes the impact that the construction of the Cudgegong Road Reservoir site will have on five threatened fauna species. However, the Department also considers that the Proponent has demonstrated that the reservoir site can not be moved, due to site elevation requirements, the central location of the site, energy efficiency considerations and distance to sensitive noise receivers.

In order to address this issue, the recommended conditions of approval require the Proponent to prepare a Flora and Fauna Management Plan as part of the Construction Environmental Management Plan. This Plan must specifically address the management of construction impacts on the five threatened fauna species identified in the Environmental Assessment.

5.3 Water Quality Impacts

Issue

Erosion and Sedimentation during Construction

The construction of pipelines within creek lines and across rivers has the potential to cause erosion of soils and sedimentation within watercourses. The Environmental assessment identified the waste water pipelines as having particularly high risk of soil erosion and sedimentation, since they would be generally located in the lowest part of the catchment immediately adjacent to creeks and drainage lines.

To manage this risk, the Proponent proposes to implement appropriate standard erosion and sedimentation mitigation measures in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). At creek crossings, the Proponent also proposes to underbore all pipelines, or attach pipelines to bridges or other existing structures to avoid damaging creek banks and causing sedimentation.

Discharges during Operation

The operation of the project would result in the following changes to discharge regimes in the North West Growth Centre:

- increased discharge of tertiary treated effluent from the Riverstone Sewage Treatment Plant to South Creek;
- increased discharge of tertiary treated effluent from the Rouse Hill Recycled Water Plant (reviewed in an REF for this plant in 2005);
- overflows from wastewater pipelines and pumping stations to Cattai, Eastern and South Creeks;
- overflows of drinking and recycled water from the Cudgegong Road Reservoir site to Second Ponds Creek; and
- decreased discharge of tertiary treated effluent from Quakers Hill Sewage Treatment Plant to Eastern and South Creeks.

Increased discharges could potentially elevate nutrient levels in waterways, leading to algal blooms and the growth of aquatic weeds. However, the water quality monitoring undertaken in the Environmental Assessment indicated that the project would not significantly elevate total nitrogen and phosphorous concentrations in the Hawkesbury-Nepean River. This is due to the increased use of recycled water within the North West Growth Centre as a result of the project.

Furthermore, once the Replacement Flows Project becomes operational in 2009-10, the volume of tertiary treated effluent discharged into the South Creek system would be reduced to only 50% of current levels. Phosphorous discharge volumes are predicted to decrease from 1,215 kg/year at present to 622 kg/year in 2020. This is significantly lower than the current licence limit of 2,300 kg/year. Similarly, nitrogen discharge volumes are predicted to decrease from 124,465 kg/year at present to 62,233 kg/year in 2020. Again, this is significantly less than the licence limit of 222,000 kg/year.

Submissions

DWE stated that all works other than environmental protection works and pipeline crossings should be excluded from riparian corridors, in order to minimise the risk of erosion and sedimentation. DWE also requested that the Proponent

prepare a management plan to ensure that riparian corridors are protected and rehabilitated following construction of the project.

Blacktown City Council expressed concern that the discharge outlets would result in scouring of creek banks. Baulkham Hills Shire Council warned that the waste water pipeline route following Cattai Creek is located in an area of very steep slopes. Both Councils asked that erosion and sedimentation issues be carefully considered during construction of the project.

Consideration

Erosion and Sedimentation during Construction

The Department notes that the design constraints on gravity-fed pipelines means that much of the waste water pipeline infrastructure is necessarily located within drainage lines and creek lines. The Proponent has demonstrated a commitment to avoiding erosion risks at river crossings and discharge outlets by using appropriate construction methods such as underboring. Nevertheless, the Proponent must ensure that best practice management is implemented during construction to prevent soil erosion and sedimentation. The recommended conditions of approval require the Proponent to prepare a Soil and Water Management Plan in consultation with relevant authorities, in order to manage construction impacts. The rehabilitation of riparian areas after construction must also be addressed in the Flora and Fauna Management Plan for the project.

Discharges during Operation

The Proponent has demonstrated that the increased capacity for water recycling in the North West Growth Centre as a result of the project and the Replacement Flows Project will actually improve nutrient levels in discharges to the local creek system. Furthermore, the improved waste water treatment technology proposed for the Riverstone Sewage Treatment Plant will further reduce nutrient levels in discharges. The Department is therefore satisfied that the impact of discharges from the project on water quality is acceptable.

The Department also notes that the waste water infrastructure associated with the project is a scheduled activity under the *Protection of the Environment Operations Act 1997* (POEO Act). As such, the Proponent will be required to obtain one or more environment protection licences under this legislation. The licences will specify stringent criteria in relation to water quality. Since discharges from drinking and recycled water facilities do not require licences, the recommended conditions of approval require the Proponent to comply with section 120 of the POEO Act, which prohibits the pollution of waters.

5.4 Indigenous Heritage Impacts

Issue

The Environmental Assessment identified a total of 28 Indigenous heritage sites, as well as several potential archaeological deposits, which may be impacted by the construction of the project. These sites are primarily located within the creek lines along which pipelines are proposed to run. Of these sites, fifteen were identified as having low archaeological significance, seven as having moderate significance, and six as having high significance. One site, known as 'A7', was singled out as having particularly high significance due to the volume, type, integrity and rarity of the artefacts found there. The Department has decided not to make the exact location of these sites publicly available for cultural sensitivity reasons.

The proponent proposes to exclude construction work around known objects. Where impacts on items of low significance are unavoidable, the Proponent would collect the artefacts of low significance in conjunction with Indigenous stakeholders. Sites of medium to high significance would be excavated to identify, assess, record and salvage any artefacts, in consultation with Indigenous stakeholders. The Proponent has committed to using boring rather than trenching in areas of medium to high significance, and considering pipeline relocation in areas where these boring techniques would still have an adverse impact. With regard to the 'A7' site, pipelines would be installed along the creekline which bisects the site, and the Proponent has attempted to locate these pipelines to avoid the significant known heritage items at the site. Boring, rather than trenching, would also be used in the vicinity of the 'A7' site.

Submissions

Blacktown City Council raised concerns regarding the impact of construction on the 'A7' site, which is identified as having particularly high archaeological significance. Council requested that the Proponent consider relocating the

pipeline route 200 metres east or west of the complex. Council also made similar requests relating to the level crossing pipelines in the vicinity of other identified archaeological sites.

Consideration

The Department is satisfied that the majority of the identified sites are of low to moderate significance, and that most of these sites are unlikely to be directly impacted by construction activities given the mitigation measures proposed. The Department also notes that the topographic requirements for gravity-fed pipelines mean that it would be difficult to relocate the pipelines affecting most Indigenous heritage sites, and that alternative construction methods such as underboring are appropriate mitigation measures.

Nevertheless, the Department notes the findings of the Aboriginal Heritage Assessment prepared as part of the Environmental Assessment, and the objections of Blacktown City Council, and agrees with both these statements that the 'A7' site should be protected from adverse impacts from the project. Whilst noting that the Proponent has located the pipelines within the 'A7' site so as to avoid the significant known artefacts, the Department also notes that the Preferred Project Report acknowledges that relocating pipelines in the vicinity of the 'A7' site is possible.

In order to address this issue, the recommended conditions of approval require the Proponent to prepare a report into relocation options for pipelines in the vicinity of the 'A7' site, in consultation with the DECC. Condition 1.3 of the recommended conditions of approval requires the Proponent to comply with the Director-General's requirements arising from the Department's assessment of this report. Unless the report provides sufficient evidence that the cost of relocating pipelines would outweigh the value of the archaeological heritage that would be affected by construction, the Department will require the Proponent to avoid the site altogether.

In the event that sufficient justification is provided for locating the pipelines as originally proposed (i.e. with potential impacts on a portion of the 'A7' site), the Proponent has committed to undertaking test excavations along this section of the pipeline, constructing the pipeline by boring rather than trenching, and engaging an Environmental Representative to monitor construction and implement stop work measures in the event an archaeological find is made. The Department believes that, provided that the proponent sufficiently justifies being unable to relocate the pipeline, these measures would appropriately mitigate impacts on the 'A7' site.

6. CONCLUSIONS AND RECOMMENDATIONS

The Department has assessed the EA, Statement of Commitments, Preferred Project Report and submissions received during the exhibition period and is satisfied that the impacts of the project can be mitigated and/or managed to ensure an acceptable level of environmental performance. The Department recommends that the Minister approve the project, subject to conditions.

The construction and operation of water-related services will allow the development of the North West Growth Centre to proceed in a timely and sustainable manner. It will also fulfil some of the objectives of the *State Environmental Panning Policy (Sydney Region Growth Centres) 2006.* The Proponent has demonstrated that the ecological, heritage, odour, water quality, and all other impacts associated with the project can be mitigated and managed. Where necessary, the Department has included additional measures as part of its recommended conditions of approval to further mitigate potential impacts to the surrounding environment.

The Department recommends that specific conditions of approval be imposed on the Proponent to address the key issues raised in the assessment process, as follows:

- Odour impacts – offensive odour must not be emitted from the Riverstone Sewage Treatment Plant beyond the boundary of the site, in order to protect future residents of the Growth Centre;
- Ecological impacts – the Proponent must offset an appropriate area to compensate for the loss of important vegetation, and must manage threatened species affected by the project in accordance with the requirements of the DECC;
- Water quality impacts – the proponent must prepare a Soil and Water Management Plan to ensure that soil and waterways are adequately protected during construction of the project; and
- Indigenous Heritage impacts – the Proponent must further investigate options to avoid construction of pipelines within a significant archaeological site.

On balance, the Department considers that the project can be undertaken in an ecologically sustainable manner and would provide benefits to NSW by encouraging the efficient management of drinking, recycled and waste water across a large area of Sydney.