PARRAMATTA NORTH URBAN RENEWAL INFRASTRUCTURE AND FLOODING REZONING APPLICATION

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URBANGROWTH NSW

PARRAMATTA NORTH URBAN RENEWAL

Infrastructure and Flooding

Rezoning Application

Author	David Stone	
Checker	Greg Ives	
Approver	Greg Ives	
Report No	AA002976-58-001	
Date	17 October 2014	
Revision	1	

REVISIONS

Revision	Date	Description	Prepared By	Approved By
0	26 Sept. 2014	Final	DS	GI
1	17 Oct. 2014	Updated Rezoning Boundary	DS	GI

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APPENDICES

EXECUTIVE SUMMARY

Hyder Consulting Pty Ltd (Hyder) has been engaged by UrbanGrowth NSW to investigate the provision of services and stormwater management infrastructure as well as identify flooding constraints to the proposed development of the Parramatta North Urban Renewal (PNUR) area.

The key objective of this report is to inform a Rezoning Application for the PNUR area.

Services Infrastructure

The existing capacity and upgrades required to service the proposed level of development have been investigated for the following key services:

- Potable water and wastewater
- Power
- Natural gas
- Telecommunications

Potable Water and Wastewater

Potable water and wastewater services in the area are currently provided by Sydney Water Corporation (SWC). Existing services in or near the site include a DN250 water main running generally along the eastern boundary and a DN225/300 sewer main running centrally through the site from north to south. Consultation with SWC is ongoing, however preliminary investigations by SWC suggest for the proposed level of development it is likely that lead-in mains will need to be upgraded. SWC is in the process of undertaking modelling to determine the extent of upgrades required.

Alternative options for potable water and wastewater services include the establishment of a privately operated system. The viability of a private system is dependent on a number of factors. A private system should be considered in future planning for the development. The establishment of private systems are typically supported by SWC.

Power

Endeavour Energy is the state owned corporation responsible for electricity distribution in Western Sydney. Consultation with Endeavour Energy for this Study has determined that current supply to the site is from a combination of Northmead Zone Substation (NZS) and North Parramatta Zone Substation (NPZS) and the existing diversified demand of approximately 1.1 MVA is able be reallocated for use elsewhere on the site.

The diversified demand for the proposed development is estimated to be 24.7 MVA. The NPZS will have sufficient capacity to supply the development up until the end of Endeavour Energy's current forecasting period up to 2024. Endeavour Energy will continue to monitor zone substation capacity beyond 2024 and will augment zone substation capacity as the need arises.

The development is required to fund lead in works (up to 5 x 11kV feeders) from the NPZS to the site (approx. 1.2 km) and, if required, any relocation/demolition of existing assets within the site.

Natural Gas

Jemena are the service authority responsible for the gas distribution network in this area. An existing 1050 kPa secondary gas main runs generally along the eastern boundary of the site.

Preliminary consultation with Jemena has identified that if upgrades are required to the existing gas network to service the development, a commercial decision would be made by Jemena on whether to undertake

these upgrades. Any upgrades would be made at no cost to the development. However, the development would be required to meet the cost of trenching to install network mains within the site.

Telecommunications

It is anticipated that fibre to the premises (FTTP) will be the technology selected by NBN Co for provision of telecommunications services to this development. The development would be required to meet the cost of installing fibre-ready pit and pipe infrastructure and then transfer ownership of these assets to NBN Co when fibre is installed by NBN Co.

Stormwater Management

Parramatta Development Control Plan 2011 (PDCP), Section 3.3.6, provides general guidelines and standards for stormwater management within the Parramatta LGA. This includes consideration of on-site detention (OSD) and water sensitive urban design (WSUD). It is considered appropriate for the provisions in the PDCP to be applied to the PNUR site.

There is also a series of small catchments to the east of the site which have pit and pipe networks currently capturing and conveying stormwater flows both to and through the PNUR site. Overland flows generated from the upstream catchments would need to be managed through the site. Upgrades to the pit and pipe network through the PNUR site could be considered to limit overland flows.

Flooding

Regional Flooding

The PNUR site is located within the Parramatta River catchment and is largely within the Parramatta River floodplain. The *Upper Parramatta River Catchment Floodplain Risk Management Study* (Bewsher, 2003) is the most recent published study documenting flood behaviour at the site. This study shows that while the 1% Annual Exceedance Probability (AEP) event is largely contained within the river banks at this location, the Probable Maximum Flood (PMF) extent encompasses most of the site.

Under Parramatta City Council's *Local Floodplain Risk Management Policy* (LFRM Policy)(PCC, 2006), the site is almost entirely classified as a 'Low Flood Risk Precinct', this generally being the area between the 1% AEP and PMF flood extents. It is identified in the LFRM Policy that most land uses would be permitted and that the risk of flood damages can be minimised by applying appropriate planning and building controls.

Local Overland Flooding

In addition to stormwater flows generated from the site itself, there are a number of small upstream catchments which would generate overland flows and discharge through the PNUR site. Given the relatively old age of development in the area it is expected that the existing drainage system would have limited capacity and/or in poor condition. Overland flows would therefore be expected in relatively frequent storm events.

There are a number of small sub-catchments which discharge through the PNUR site. At each of these locations allowance needs to be made for the safe conveyance of overland flows through the site. Further investigations should be undertaken to quantify overland flows and design safe overland flow paths following rezoning of the site.

Conclusion

Overall, it is concluded that the proposed development is able to be serviced with upgrades to services infrastructure as identified and that stormwater and flooding constraints are able to be managed through the application of development controls.

1 INTRODUCTION

Hyder Consulting Pty Ltd (Hyder) has been engaged by UrbanGrowth NSW to investigate the provision of services and stormwater management infrastructure as well as identify flooding constraints to the proposed development of the Parramatta North Urban Renewal (PNUR) area.

The key objective of this report is to inform a Rezoning Application for the PNUR area.

1.1 BACKGROUND

Parramatta North Urban Renewal area is located to the west and north-west of the Parramatta CBD (refer **Figure 1**), Sydney's second CBD. Parramatta is located in the geographical heart of Sydney and plays a significant role as the most important centre in Western Sydney. The PNUR is located to the immediate east of the Westmead Health campus, separated by the Parramatta River.

Figure 1 - Location Plan

The PNUR is a 146 Ha area and has been divided into four distinct Precincts comprising (refer **Figure 2**):

- The Cumberland Precinct (40 Ha)
- Sport and Leisure Precinct (21 Ha)
- Old Kings School Precinct (4 Ha), and
- Parramatta Park Precinct (81 Ha).

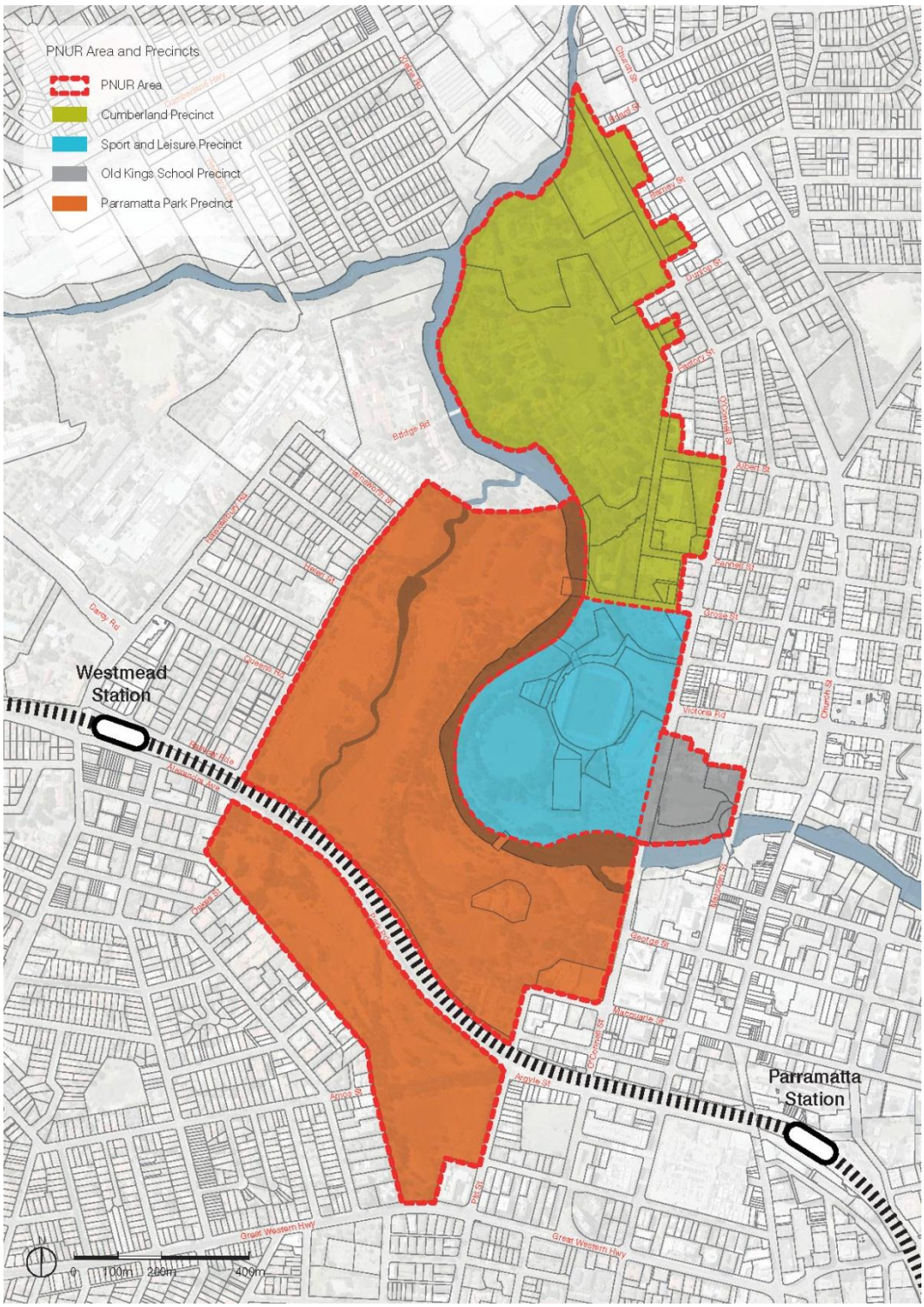

Figure 2 - Precinct Diagram

This Study has been prepared in order to identify how best to plan for the urban renewal of the Cumberland Precinct and the Sports and Leisure Precinct only. The recommended planning controls have been prepared recognising the locational advantages of the PNUR to the Parramatta CBD, the Westmead Health Precinct, the Rydalmere Education Precinct, and transport options.

1.2 EXISTING SITE DESCRIPTION

Land uses and facilities currently located within the SLP include Parramatta Stadium and associated facilities, Parramatta public pool, Parramatta Leagues Club, open space parkland and venue car parking. These built facilities and associated structures occupy predominantly the north eastern two thirds of the precinct. The balance of the precinct, nestled inside the meander of the Parramatta River, is predominantly landscaped open space with some incursion of at grade car parking.

Land uses within the Cumberland Precinct include the Cumberland Hospital, the NSW Linen Service, allied health related uses and NGOs and the former Parramatta Gaol. The precinct contains buildings of State and local heritage significance as well as potential Aboriginal archaeological sites. Buildings are dispersed thought the precinct serviced by an irregular access network and broadly surrounding a central oval. These clusters of buildings are interspersed with vegetation and are framed by an almost continuous band of vegetation framing the eastern bank of the Parramatta River.

1.3 PROPOSED DEVELOPMENT

The Study has been undertaken to prepare an appropriate suite of planning controls to guide the urban renewal of the area and future development. This has led to an Indicative Layout Plan (ILP) (refer **Appendix 1**) guiding future open space, transport links and building footprints, as well as zoning and height of building controls, which are to be implemented in conjunction with site specific Development Control Plan (DCP) provisions to guide the fine grain development of the area.

This suite of controls has had regard to the site's heritage, environmental values and physical constraints.

The ILP envisages the creation of a mixed use area within the Cumberland Precinct that accommodates new development for housing, employment, cultural and community uses in new buildings and through the adaptation of existing heritage buildings. For the Sports and Leisure Precinct, the ILP envisages the strengthening of the current role of the area as a major sports venue and the introduction of allied retail and commercial uses to support the role of Parramatta Stadium as a major sport and entertainment venue for Parramatta and greater western Sydney. The Sports and Leisure Precinct may also accommodate ancillary retail to support the resident and employee population to be accommodated in the PNUR.

1.3.1 DEVELOPMENT YIELDS

The study proposes amendments to the planning framework, including revisions to the development controls, that will facilitate a mixed use residential redevelopment of the area to be rezoned (refer **Figure 3**). The proposed amended planning framework will facilitate the lodgement of future development applications for the land in the study area which are anticipated to achieve the following development yields:

Cumberland Precinct

- Approximately 4,100 dwellings
- Approximately 28,000 m2 GFA of adaptive reuse of retained heritage buildings
- Up to 4,000 m2 GFA of retail space

Sports and Leisure Precinct

- Approximately 34,000 m2 GFA of mixed-use (likely to be predominantly commercial)

For the purposes of this assessment of potential infrastructure servicing requirements, a higher development yield has been assumed to reflect the outcome of a future redevelopment of land not included as part of the overall study into the amendment of the planning framework. For the purpose of infrastructure servicing requirements the development has assumed a yield potential of:

Cumberland Precinct

- Approximately 5,600 dwellings
- Approximately 35,000 m2 GFA of adaptive reuse of retained heritage buildings
- Up to 4,000 m2 GFA of retail space

Sports and Leisure Precinct

- Approximately 46,000 m2 GFA of mixed-use (likely to be predominantly commercial)

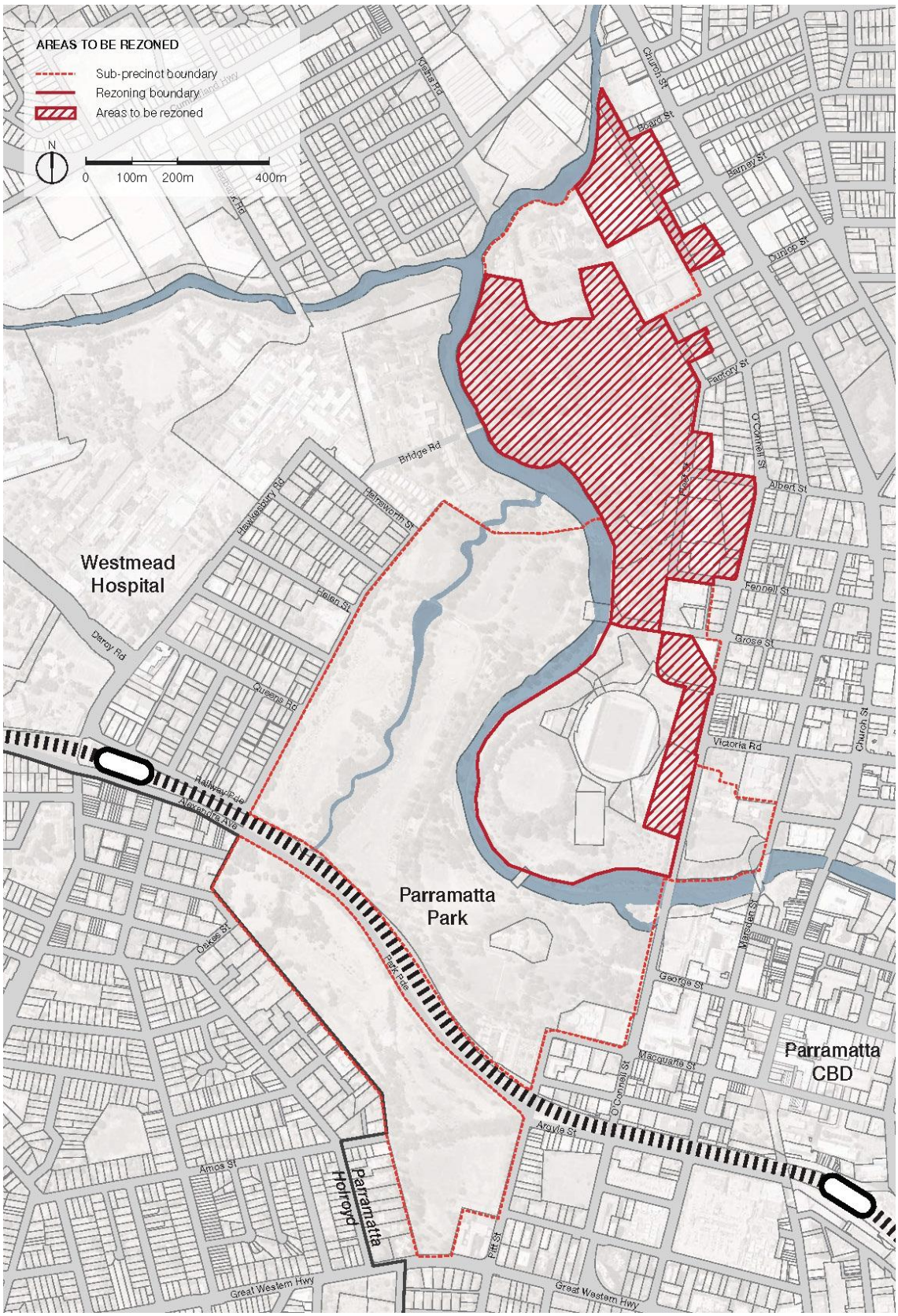

Figure 3 - Rezoning Boundary

2 SERVICES INFRASTRUCTURE

As part of the *Draft Parramatta North Study Requirements* it is necessary to demonstrate that the proposed level of development can be accommodated by utilising existing services infrastructure or through the provision of infrastructure upgrades. The following key services have been investigated:

- Potable water and wastewater
- Power
- Natural gas
- Telecommunications

2.1 POTABLE WATER AND WASTEWATER

Sydney Water Corporation (SWC) is the state owned corporation responsible for potable water supply and wastewater management in the Sydney region. Consultation with SWC has determined that (refer **Appendix 2** for correspondence records):

- SWC has no objections to servicing the proposed development.
- Existing infrastructure servicing the site includes a DN225/300 sewer main running centrally through the site from north to south and a DN250 water main along the eastern boundary.
- Demands for the proposed development and required trunk upgrades are currently being investigated by SWC. This report will be updated when further information becomes available.
- SWC's policy is that all infrastructure, with the exception of minimum reticulation, will either be funded by SWC directly or financed by the developer and reimbursed by SWC.
- Indicative costs for the trunk upgrades and site reticulation are provided in **Appendix 3**.

Further to the provision of potable water and wastewater services by SWC, under the *Water Industry Competition Act 2006* (WICA) alternative delivery models for the provision of these services are able to be employed. Whether or not it is financially viable for a private operator to provide the required infrastructure to service the development depends on a number of factors (eg; capacity of existing infrastructure, distance to existing infrastructure). A current rule of thumb suggests that a minimum of 2,000 dwellings is required to make a privately operated system viable. Given that the proposed PNUR development is well in excess of this value then this may be a viable alternative to the traditional approach.

Private operators may also choose to provide recycled water to the development. Potential demands for recycled water include both internal (laundry and toilet flushing) and external (irrigation) uses. Given that there is a significant open space area within the development it is expected that there could be significant irrigation demands which may assist in making the provision of recycled water a viable option.

Existing recycled water schemes, such as at Camellia, and/or the establishment of a new stormwater harvesting scheme may also be considered as sources of recycled water.

2.2 POWER

Endeavour Energy is the state owned corporation responsible for electricity distribution in Western Sydney. Consultation with Endeavour Energy for this Study has determined that (refer **Appendix 2** for correspondence records):

- Endeavour Energy has no objections to servicing the proposed development.
- Existing uses on the site (hospital, gaol and laundry) have a total load of 2.7 MVA and a diversified demand of approximately 1.1 MVA at 6pm. These demands could be reallocated for use elsewhere on the site. Current supply is from a combination of Northmead Zone Substation (NZS) and North Parramatta Zone Substation (NPZS).
- Diversified demand for the proposed development is estimated to be 24.7 MVA at 6pm in summer.
- At the proposed rate of development (ie. approx. 350 dwellings / year and evenly distributed commercial and adaptive reuse) the NPZS will have sufficient capacity to supply the development up until the end of Endeavour Energy's current forecasting period up to 2024.
- Endeavour Energy will continue to monitor zone substation capacity beyond 2024 and will augment zone substation capacity as the need arises.
- The developer is to fund lead in works (11kV feeders) from the NPZS to the site (approx. 1.2 km) and, if required, any relocation/demolition of existing assets within the site.
- Up to five 11kV feeders will be required to service the development from NPZS

Indicative costs for the trunk upgrades and site reticulation are provided in **Appendix 3**.

2.3 NATURAL GAS

Jemena are the service authority responsible for the gas distribution network in this area. An existing 1050 kPa secondary gas main runs generally along the eastern boundary of the site.

Preliminary consultation with Jemena has identified that if upgrades are required to the existing gas network to service the development, a commercial decision would be made by Jemena on whether to undertake these upgrades. Any upgrades would be made at no cost to the development. However, the development would be required to meet the cost of trenching to install network mains within the site.

2.4 TELECOMMUNICATIONS

Under the previous Australian Government's Fibre in New Development (FIND) Policy (22 June 2011), NBN Co is identified as the telecommunications 'wholesale provider of last resort' for developments of greater than 100 dwellings and will meet the cost of providing the necessary trunk infrastructure. While this still applies, the more recent 'Statement of Expectations' (8 April 2014) issued by the current Australian Government requires NBN Co to select a technology that meets minimum download data rates while also taking into account financial considerations.

While it is anticipated that fibre to the premises (FTTP) will be the technology selected for this development, this will not be known until NBN Co has undertaken its assessment following an application by the developer. If FTTP is selected, the development would be required to meet the cost of installing fibre-ready pit and pipe infrastructure and then transfer ownership of these assets to NBN Co when fibre is installed by NBN Co.

3 STORMWATER MANAGEMENT

Parramatta Development Control Plan 2011 (PDCP), Section 3.3.6, provides general guidelines and standards for stormwater management within the Parramatta LGA. It is considered appropriate for the provisions in the PDCP to be applied to the PNUR site. A summary of key principles of the PDCP and how they apply to the PNUR site is provided below.

3.1 EXTERNAL CATCHMENTS

There are a series of small catchments to the east of the site which have pit and pipe networks currently capturing and conveying stormwater flows both to and through the PNUR site. Given that development in this area of Parramatta is relatively old, the inlet and pipe capacity within these catchments could be expected to be less than typically provided in newly developed areas (the inlet and pipe capacity of Council's existing piped drainage system has not been assessed as part of this study).

Overland flows generated from the upstream catchments would need to be managed through the site. Upgrades to the pit and pipe network through the PNUR site could be considered to limit overland flows.

3.2 SITE STORMWATER MANAGEMENT

3.2.1 PIPED AND OVERLAND FLOW SYSTEMS

Stormwater flows generated within the site will need to be collected and conveyed in accordance with PCC's '*Design and Development Guidelines*'. The piped drainage system would connect to PCC's existing system (refer **Appendix 4** for Council's stormwater drainage plan) and discharge through the existing outlets to the Parramatta River. If insufficient capacity is available in the existing system, upgrade of the existing system including outlets would be required (preference would be for no new outlets to be constructed).

Stormwater flows entering the site, both piped and overland, from external catchments will need to be managed in accordance with Council's '*Design and Development Guidelines*'.

Future stages of planning for the site will require:

- Detailed survey of Council's existing drainage system; and
- Analysis of the existing drainage system and overland flow paths.

3.2.2 ON-SITE DETENTION

On-site detention (OSD) is required to be provided in accordance with the Upper Parramatta River Catchment Trust's (UPRCT) *On-Site Detention Handbook, Fourth Edition* (UPRCT, December 2005).

It is expected that OSD would largely be provided within the building footprints rather than in public open spaces. These would likely be incorporated into an overall water sensitive urban design (WSUD) strategy which may include elements such as rainwater tanks and rain gardens.

3.2.3 WATER SENSITIVE URBAN DESIGN

Stormwater treatment targets for the development would be as per Table 3.30 of PDCP. In summary, this gives stormwater pollution reduction targets, relative to the same development without any treatment, of:

- Gross Pollutants (GP): 90%
- Total Suspended Solids (TSS): 85%
- Total Phosphorus (TP): 60%
- Total Nitrogen (TN): 45%

These targets are proposed to be met using an at-source approach, rather than providing larger scale treatment measures along the downstream boundary of the site. Using this approach it is expected that buildings would largely be required to meet these targets through the collection of roof runoff in rainwater tanks for uses such as irrigation and other non-potable uses. Runoff from other surfaces within the lot boundaries may require lot-scale rain gardens or other WSUD elements to be provided.

Public spaces, including roads, would likely require WSUD elements such as rain gardens or tree pits to meet the treatment targets.

Future stages of planning and development will require the use of MUSIC software, or equivalent, to demonstrate compliance with the stormwater treatment targets.

4 FLOODING

4.1 REGIONAL FLOODING

The PNUR site is located within the Parramatta River catchment and is largely within the Parramatta River floodplain. The *Upper Parramatta River Catchment Floodplain Risk Management Study* (Bewsher, 2003) is the most recent published study documenting flood behaviour at the site. This study shows that while the 1% Annual Exceedance Probability (AEP) event is largely contained within the river banks at this location, the Probable Maximum Flood (PMF) extent encompasses most of the site (refer **Appendix 5**).

Under Council's *Local Floodplain Risk Management Policy* (LFRM Policy)(PCC, 2006), the site is almost entirely classified as a 'Low Flood Risk Precinct', this generally being the area between the 1% AEP and PMF flood extents. It is identified in the LFRM Policy that most land uses would be permitted and that the risk of flood damages can be minimised by applying appropriate planning and building controls.

It should be noted that an updated flood study for the entire Parramatta River catchment is currently being prepared. However, from discussions with PCC, it is understood the updated study is currently only in the data collection phase and may take a number of years to complete. As updated flooding information becomes available in coming years, which will likely include consideration of climate change scenarios, it should be reviewed in the context of the PNUR site and the planning controls updated where appropriate to reflect the best available information.

4.1.1 FLOOD LEVELS

Based on a flood enquiry information provided by PCC, flood levels at the site for the 100 year ARI event range from approximately 13.0 mAHD at the northern end of the Cumberland Precinct (on Darling Mills Creek) to 8.0 mAHD at the southern end of the Sports Precinct (on the Parramatta River). For the PMF event, flood levels range from 17.9 mAHD to 13.0 m AHD at the same locations.

More detailed information on flood levels should be obtained from Council at subsequent planning stages.

4.2 LOCAL OVERLAND FLOODING

In addition to stormwater flows generated from the site itself, there are a number of small upstream catchments which would generate overland flows and discharge through the PNUR site. Flows from small, frequent storm events would be collected and conveyed in PCC's traditional pit and pipe drainage system to the Parramatta River. Flows in excess of the drainage system capacity would be conveyed overland through the PNUR site. Given the relatively old age of development in the area it is expected that the existing drainage system would be of limited capacity and/or in poor condition. Overland flows would therefore be expected in relatively frequent storm events.

There are a number of small sub-catchments which discharge through the PNUR site. At each of these locations allowance needs to be made for the safe conveyance of overland flows through the site. Overland flows are typically designed to be contained within road reserves, however they may also be incorporated into public open spaces where appropriate. Further investigations should be undertaken to quantify overland flows and design safe overland flow paths following rezoning of the site.

5 DEVELOPMENT CONTROLS

The Parramatta Development Control Plan 2011 (PDCP) provides development controls which are applied across the Parramatta local government area. A number of sections within PDCP are considered applicable to the PNUR site, particularly in relation to stormwater management and flooding.

The following sections of the PDCP are considered applicable:

- Section 2.4.2 Water Management; and
- Section 3.3.6 Water Sensitive Urban Design.

6 CONCLUSION

Hyder has investigated the provision of services and stormwater management infrastructure as well as identified flooding constraints for the proposed development of the PNUR site.

To facilitate the proposed development, significant infrastructure upgrades have been identified for potable water, wastewater and power services and indicative cost estimates provided. Any necessary upgrades to natural gas and telecommunications trunk infrastructure would be undertaken by the service providers at no cost to the development. Internal reticulation of all services would be required to be provided by the development.

Development controls as detailed in the PDCP which address stormwater management and flooding are considered appropriate to apply to this development.

Overall, it is concluded that the proposed development is able to be serviced with upgrades to services infrastructure as identified and that stormwater and flooding constraints are able to be managed through the application of development controls.

7 REFERENCES

- Bewsher, 2003 – *Upper Parramatta River Catchment Floodplain Risk Management Study*, Bewsher Consulting Pty Ltd, October 2003
- PCC, 2014 – *Parramatta Development Control Plan 2011*, Parramatta City Council, 2 April 2014

APPENDIX 1

INDICATIVE LAYOUT PLAN

LEGEND

- STUDY AREA
- AREA TO BE REZONED
- SIGNIFICANT BUILDING TO BE RETAINED
- EXISTING BUILDING TO BE REMOVED
- PUBLIC OPEN SPACE
- PROPOSED DEVELOPMENT
- OPEN SPACE (PRIVATE OWNERSHIP)
- ROAD RESERVE
- FORESHORE CONNECTION
- POTENTIAL FUTURE CONNECTION
- PODIUM LEVEL RETAIL
- RIVER
- EXISTING VEGETATION - TO BE RETAINED
- EXISTING VEGETATION - RETAIN IF PRACTICABLE

CUMBERLAND AND SPORTS AND LEISURE PRECINCTS
INDICATIVE LAYOUT PLAN

PARRAMATTA NORTH URBAN RENEWAL

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14/10/2014

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N NORTH

APPENDIX 2

SERVICE PROVIDERS CORRESPONDENCE

ENDEAVOUR ENERGY

From: Jason Lu [mailto:Jason.Lu@endeavourenergy.com.au]
Sent: 5 September 2014 10:02 AM
To: David Stone
Cc: Deepak Sahay; John Phillips
Subject: RE: Parramatta North Urban Renewal - Power Supply

David

I think 5 would be the upper end of what you might need, so for budgeting purposes might be good to consider this.

4 feeders is a reasonable estimate even with the higher apartment numbers as the original allowance of 4kVA per dwelling is on the upper end of potential load.

The ultimate number of feeders will be confirmed as development proceeds and we get a clearer idea of power demand of the new apartments.

Thanks

Jason

Jason Lu
Capacity Planning Manager

Asset and Network Planning

Endeavour Energy

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www.endeavourenergy.com.au

From: David Stone [mailto:David.Stone@hyderconsulting.com]
Sent: Friday, 5 September 2014 9:51 AM
To: Jason Lu
Cc: Deepak Sahay; John Phillips
Subject: RE: Parramatta North Urban Renewal - Power Supply

Thanks Jason. I appreciate the quick response.

In regards to the number of 11kV feeders we will need, would this increase from 4 to 5 to cater for the increased load?

Regards

David Stone

Drainage Team Leader

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From: Jason Lu [mailto:Jason.Lu@endeavourenergy.com.au]
Sent: 5 September 2014 9:25 AM
To: David Stone
Cc: Deepak Sahay; John Phillips
Subject: FW: Parramatta North Urban Renewal - Power Supply

Hi David

Our original advice still stands

Thanks

Jason

Jason Lu
Capacity Planning Manager

Asset and Network Planning

Endeavour Energy

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From: John Phillips
Sent: Friday, 5 September 2014 7:34 AM
To: Jason Lu
Cc: Deepak Sahay
Subject: RE: Parramatta North Urban Renewal - Power Supply

Hi Jason,

The advice will still stand, the supply details now after the forecast period will have to be looked at closer to that date if other applications arrive in the meantime such as urban acceleration.

Regards

John.

From: Jason Lu
Sent: Thursday, 4 September 2014 5:05 PM
To: Deepak Sahay; John Phillips
Subject: RE: Parramatta North Urban Renewal - Power Supply

John/Deepak

I think our advice still stands

Can you confirm

Thanks

Jason

From: David Stone [mailto:David.Stone@hyderconsulting.com]
Sent: Wednesday, 3 September 2014 5:17 PM
To: Jason Lu
Cc: John Phillips; Ryan Beelitz; David Riddell; Paul Irwin (pirwin@urbangrowth.nsw.gov.au); Greg Ives; Deepak Sahay
Subject: RE: Parramatta North Urban Renewal - Power Supply

Jason

Thanks for sending through the initial information.

The forecast yield for the site has just been finalised (for the purposes of our study) and now includes the following:

- 5,620 dwellings
- 56,000 m2 of commercial/retail
- 26,000 m2 of adaptive reuse Mixed-Use (retained historic buildings)

The rate of development has also been revised to be 300 – 400 dwellings / year so we are assuming an average of 350 at this point.

I've updated the spreadsheet you sent previously to include these numbers (refer attached). Can you/John please have a look at this and also let me know if this changes any of your comments below? My thoughts are that we are still within the capacity of the North Parramatta ZS up to the end of your forecasting period (2024) so it shouldn't change anything significantly. Although the number of 11kV feeders might increase? Can you please confirm.

I'd appreciate a response by Friday (or tomorrow!) if possible. We are required to submit our reports early next week.

Regards

David Stone

Principal Engineer/Drainage Team Leader

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From: Jason Lu [mailto:Jason.Lu@endeavourenergy.com.au]
Sent: 8 August 2014 2:45 PM
To: David Stone
Cc: John Phillips; Ryan Beelitz; David Riddell; Paul Irwin (pirwin@urbangrowth.nsw.gov.au); Greg Ives; Deepak Sahay
Subject: RE: Parramatta North Urban Renewal - Power Supply

David

John Phillips has prepared a response which I have reviewed below.

Also attached is an excel spreadsheet showing further detail of the method used to arrive at the loading figures for this proposed development.

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1. *Confirm that they have no objections to servicing the proposed development*

Endeavour Energy has no objection to servicing the proposed development. The hospital site has 4 substations and 11kV underground cable around the site protected by easements. The 11kV cable is located in internal roads and also across vacant lands. Some of these 11kV cables were recently upgraded and newly installed and could be used to supply portions of the new development.

The relevant Endeavour Company Policies will apply at the time of load application or asset relocation.

2. *Review Hyder's demand calculations*

(a)The Hyder's demand calculations for new residential development is accepted at 4kVA, but this could be lower if there is a mixture of small 1 bedroom apartments across the development.

Hyder's demand calculation for new commercial and adaptive reuse is not accepted at 1kVA/m2 (1000VA/m2) This planning value is in the range of 90 – 110 VA/m2. For the purposes of this calculation the value of 100VA/m2 will be used for new commercial and adaptive reuse.

(b) As a result of the Endeavour Energy demand calculations and using a diversified time of day multiplier across the load categories it was found that the maximum loading of the proposed development was 20.32 MVA at 6pm in summer.

(c)There is approximately 1.1 MVA of diversified demand that is currently supplying the hospital, gaol and laundry at this time of 6 pm, therefore the additional new load of the site would equate to 19.2 MVA at 6pm if the 1.1 MVA diversified load is used elsewhere on the site.

(d) The use of alternate energy systems by the developer has been limited to the site being supplied by gas appliances ie hot water, ovens etc. The use of solar energy has been ruled out by Hyder at the present time.

3. *Provide us with Endeavour Energy's data on existing use demands*

The following substations are located within the redevelopment study area apart from the substations on the Parramatta Stadium site. The values for Load kVA are the actual substation load maximum readings for 2013 and are not diversified. There are currently no readings for 2014 available presently. North Parramatta ZS presently supplies all substations on the Hospital site. The Gaol and the laundry are presently supplied from the Northmead ZS.

Sub No.	Site	Rating kVA	Load kVA	Zone Sub
904	Hospital	500	240	N Parra
26024	Hospital	1000	687	N Parra
20041	Hospital	500	372	N Parra
26270	Hospital	500	225	N Parra
9634	NP centre	750	180	N Parra
7786	Gaol	750	126	Northmead
6299	Laundry	1000	870	Northmead

4. *Confirm that there is available capacity in the NPZS to supply the development*

(a)North Parramatta ZS is a 132/11kV ZS with a firm capacity of 52 MVA. The loading of North Parramatta ZS forecast for summer 2015 is 28.9 MVA and 33.5 MVA for summer 2024.

Present indications would suggest that the proposed Parramatta North Urban Renewal site could be supplied from North Parramatta ZS up to the end of the existing forecast period in 2024. This is based on an additional 1.202 MVA (300 dwellings and evenly distributed commercial and adaptive reuse) being supplied across the entire development every year up until the end of 2024, at which time the load on North Parramatta ZS is calculated to be 45.5 MVA with the addition of 12.02 MVA of the Urban renewal site. Past this point in time, there appears to be capacity at North Parramatta ZS, however it is likely that other developments will emerge in the area which will also take capacity. No commitment from North Parramatta

ZS is given past the forecast time, however this can be reviewed on a yearly basis as to whether capacity will available past 2024. There would still be 7.22 MVA of capacity needed to complete the North Parramatta Urban Renewal site after 2024 if the 16 year timetable is adopted (5000 lots @ 300 year). Endeavour will manage zone substation capacity and any required augmentation when the need arises. In summary we plan to cater for Urban Renewal project from existing zone substations and do not require land for a zone substation site within the Urban Renewal development site.

(b) For an additional 19.24 MVA of capacity to be developed to the Parramatta North Urban Renewal site, at least four (4) new 11kV feeders will need to be developed exclusively for this site and associated cross feeder ties.

5. Review the proposed staging plan and identify any issues with the rate of development

The rate of development will determine when new 11kV feeders have to be installed from a ZS to the Urban Renewal site. Presently there is little capacity left in the existing 11kV feeder from North Parramatta ZS to the hospital site. It is likely that a new feeder would be required very early on in this developments timeframe to proceed as planned (say 2017).

Our understanding is that the dates shown on the Indicative Staging Maps are starting dates and not completion dates as the latest date shown is 2023 and well within a 16 year development time.

6. Confirm Endeavour Energy's current policy on lead in costs to be borne by the developer

Under existing policy the developer is to fund lead works (11kV feeders) from the zone substation to the site.

If Endeavour Energy's existing assets on the Parramatta North Urban Renewal site (ie substations, 11kV cables etc) have to be moved,relocated or abolished then the developer is to fully fund this work.

Regards

Jason Lu
Capacity Planning Manager

Asset and Network Planning

Endeavour Energy

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From: David Stone [mailto:David.Stone@hyderconsulting.com]
Sent: Friday, 1 August 2014 1:21 PM
To: Jason Lu
Cc: John Phillips; Ryan Beelitz; David Riddell; Paul Irwin (pirwin@urbangrowth.nsw.gov.au); Greg Ives
Subject: Parramatta North Urban Renewal - Power Supply

Hi Jason

Thanks for meeting with us earlier this week.

A summary of key points from our meeting:

- UrbanGrowth provided a summary of the proposed development and indicated that it is currently preparing a rezoning application for the site.
- Endeavour Energy indicated it has no objections to servicing the proposed development.
- Following the imminent commissioning of the Parramatta West Zone Substation (PWZS) there will likely be sufficient capacity in the North Parramatta Zone Substation (NPZS) to service the proposed development.
- Additional feeders may be required from the NPZS to the development. It is unknown at this point whether existing conduits are available or whether they would need to be constructed to service the development.
- Some recent upgrade works (conduits, feeders?) have been undertaken within the development area itself. It is assumed these were undertaken within the existing road network.
- Current Endeavour Energy policy is to fund all lead in works to the zone substation level. The developer is to fund lead in works from the zone substation to the site (ie. HV feeders).
- Hyder Consulting will provide preliminary calculations of the proposed development demands
- Endeavour Energy will determine the existing use demands from their available data
- UrbanGrowth will provide preliminary staging information.

Further Information from Hyder and UrbanGrowth

- Following our discussions, Hyder has prepared some preliminary calculations of the demands for the proposed development as summarised in the table below.

Land Use	**Number or Area**	**Assumed Demand**	**Total Demand**
New Dwellings	5,000	4 kVA / dwelling	20 MVA
New Commercial	6,500 m2	1 kVA/m2	6.5 MVA
Adaptive Reuse	1,500 m2	1 kVA/m2	1.5 MVA
			28 MVA

We note that a portion of this demand would be supplied from existing demands which will be removed from the site (eg; linen service, hospital and gaol)

- UrbanGrowth has provided the attached staging plan (Please note this is both **PRELIMINARY AND CONFIDENTIAL**). In summary, it is assumed that development will occur at the rate of 300-400 dwellings per year over a 20 year period and commercial development will also be evenly distributed across this period.

Further Information Required from Endeavour Energy

At this point we request that Endeavour Energy undertake the following:

1. Confirm that they have no objections to servicing the proposed development
2. Review Hyder's demand calculations
3. Provide us with Endeavour Energy's data on existing use demands
4. Confirm that there is available capacity in the NPZS to supply the development
5. Review the proposed staging plan and identify any issues with the rate of development
6. Confirm Endeavour Energy's current policy on lead in costs to be borne by the developer.

If you have any questions regarding the above please do not hesitate to call/email me.

Regards

David Stone

Principal Engineer/Drainage Team Leader

SYDNEY WATER

From: JOBLIN, GREGORY [mailto:GREGORY.JOBLIN@sydneywater.com.au]
Sent: 10 September 2014 1:30 PM
To: David Stone
Subject: Parramatta North

Hi David

Based on initial investigation of water and wastewater network needs to service proposed 6000 dwelling development known as Parramatta North Urban Renewal. The initial investigation has identified that it appears we have available spare capacity with the existing trunk water and wastewater mains near the boundary of the development. Wastewater flows from this development will drain to SPS67 and then onto the North Head trunk system and North Head WWTP for treatment and effluent management. Water for this area will be from the Ryde Gravity Supply zone.

However both the water and wastewater lead-ins mains to service the full development are undersized. Analysis on the impacts on the existing system performance with other known growth is to be undertaken. What level of development can be serviced with the existing infrastructure will be undertaken as part of the detailed planning project now in progress. Detailed planning is targeted to be completed late October 2015.

Thanks

Greg Joblin | A/Manager Growth Strategy
Urban Growth Strategy | Sydney Water
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PO Box 399 Parramatta NSW 2124
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E gregory.joblin@sydneywater.com.au
sydneywater.com.au

APPENDIX 3

COST ESTIMATES

Parramatta North Urban Renewal

Rezoning Application

Report Number: AA002976-58-001 Rev0
Revision: A
Date: 26-Sep-14

Project Number: AA002976-53

Completed: D. STONE

Hyder Consulting Pty Ltd
ABN 76 104 485 289
Level 5, 141 Walker Street, North Sydney NSW 2060, Australia
Tel: +61 2 8907 9000 Fax: +61 2 8907 9001 www.hyderconsulting.com

Notes	
Note No.	**Description**
0.1	Rates are based on published cost data and tender prices from similar projects.
0.2	All costs are exclusive of GST.
0.3	Costs are inclusive of 15% contingency
0.4	No allowance for the acquisition of land.
0.5	All lengths and areas are indactive only based on masterplan documentation.
0.6	Now allowance made for temporary works required to enable staging
0.7	Assume reticulation works to be undertaken as part of overall site works. No allowance has been made for site establishment, sediment and erosion control, etc.
0.7	External works are for upgrades to existing service infrastructure external to the site and are based on limited information provided by service authorities.

Disclaimer

Hyder Consulting Pty Ltd ('Hyder Consulting') has acted in its capacity as professional engineers in preparing this estimate of the PNUR site. UrbanGrowth NSW acknowledges that it should seek the advice of a registered Quantity Surveyor prior to assessing the accuracy of this estimate. Hyder Consulting cannot accept any responsibility for use or reliance on this estimate by UrbanGrowthNSW or third parties. In preparing this estimate, cost rates based on published data and recent similar projects have been adopted. Such cost rates are dependent on current market conditions and therefore the accuracy and reliance of this estimate cannot be guaranteed.

Drawings referenced for quantities		
Drawing Name	**From**	**Dated**
Masterplan	AJ+C Architects	3-Sep-14

Site/Reticulation Servicing Works

				PNUR	
Item No.	Description of Work	Unit	Unit Cost	Quantity	Cost
1	**Service Trenching**				
1.1	**Shared Trench**				
1.1.1	Trench, Sand, Coverguard & Backfill - Electricity, NBN & Gas	cu.m	$ 80	6250	$ 500,000
				Subtotal	***$ 500,000***
2	**Electrical & Comms**				
2.1	**Street Lighting**				
2.1.1	Lighting Column - incl. footing	each	$ 4,500	125	$ 562,500.00
2.2	**Electrical Reticulation**				
2.2.1	HV feeders in shared trench	m	$ 1,000	2500	$ 2,500,000.00
2.2.2	LV in shared trench	m	$ 350	3750	$ 1,312,500.00
2.2.3	Kiosk substations in public domain (excludes kiosks for new buildings)	each	$ 100,000	10	$ 1,000,000.00
2.3	**NBN Reticulation**				
2.3.1	NBNCo pit & pipes in shared trench	m	$ 100	3750	$ 375,000.00
				Subtotal	***$ 5,750,000***
4	**Sewer**				
4.1	**Sewer Reticulation**				
4.1.1	Supply, bed, lay, joint				
4.1.1.1	DN300 reticulation	m	$ 340	1800	$ 612,000
4.1.1.2	DN600 trunk main	m	$ 860	1480	$ 1,272,800
4.1.2	Trench Excavation and Backfill				$ -
4.1.2.1	DN300 reticulation	cu.m	$ 70	2160	$ 151,200
4.1.2.2	DN600 trunk mian	cu.m	$ 80	5400	$ 432,000
4.1.3	Connections	each	$ 3,000	15	$ 45,000
4.1.4	Disconnection and grouting of existing sewer	m	$ 250	1250	$ 312,500
4.1.5	Concrete Encasing	m	$ 130	330	$ 42,900
4.1.6	QA testing, reports, connection fees and charges	item	$ 16,500	3	$ 49,500
4.1.7	Break and connect into existing	each	$ 2,200	2	$ 4,400
				Subtotal	***$ 2,922,300***
5	**Water**				
5.1	**Potable Water Reticulation**				
5.1.1	Supply, bed, lay, joint and backfill DN200 Service Main	m	$ 400	1600	$ 640,000
5.1.2	Supply, bed, lay, joint and backfill DN300 Loop Main	m	$ 600	1300	$ 780,000
5.1.3	Supply and install fittings	item	25% of service	1	$ 361,250
5.1.4	Connections	each	$ 5,000	5	$ 25,000
				Subtotal	***$ 1,806,250***
			Total Site Works		**$ 10,978,550**

External Servicing Works

				PNUR	
Item No.	Description of Work	Unit	Unit Cost	Quantity	Cost
1	**Sydney Water**				
1.1	Potable Water Upgrades (nominal 30% markup on NPC cost estimate)	each	$ 1,127,000.00	1.3	$ 1,465,100
1.2	Wastewater Upgrades (nominal 30% markup on NPC cost estimate)	each	$ 3,457,000.00	1.3	$ 4,494,100
				Subtotal	***$ 5,959,200***
2	**Endeavour Energy**				
2.1	5 x 11kV Feeders from North Parramatta ZS (approx. 1.2km)	each	$ 1,800,000.00	5	$ 9,000,000
				Subtotal	***$ 9,000,000***
			Total External Works		**$ 14,959,200**

APPENDIX 4

COUNCIL DRAINAGE PLAN

Parramatta City Council Stormwater Drainage Map 1:8,000

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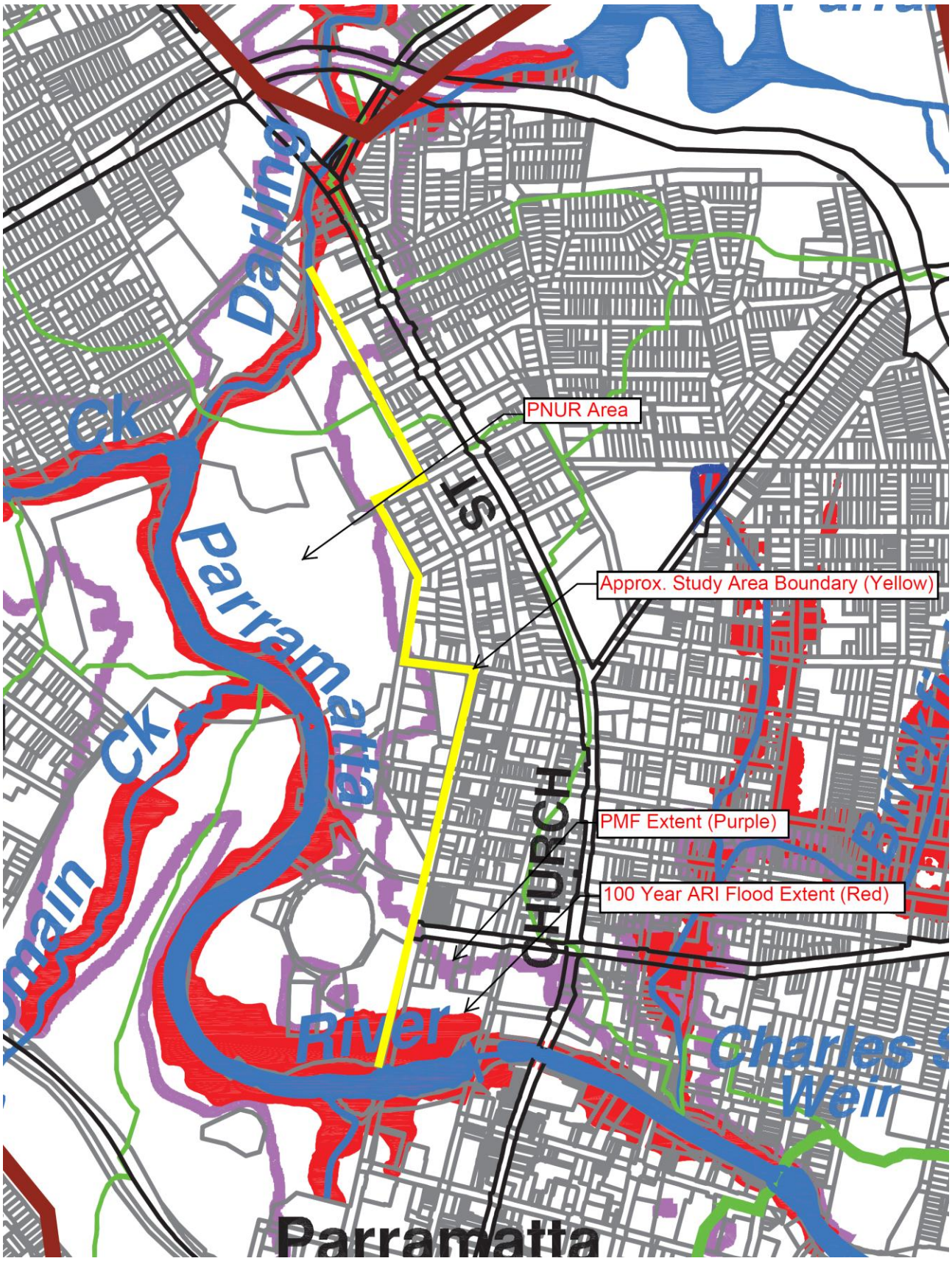
Printed 31/07/2014

DISCLAIMER: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this Information. Any pipe sizes and location of pits and pipe lines should be confirmed by site investigation.
The flood levels provided are only an approximate guide and have been derived using the current computer simulated model.
The information provided on this document is presented in good faith. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
Parramatta City Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

APPENDIX 5

FLOOD EXTENTS MAP (BEWESHER, 2003)


PNUR Area
Approx. Study Area Boundary (Yellow)
PMF Extent (Purple)
100 Year ARI Flood Extent (Red)
Parramatta River
Charles Weir
Parramatta