

# Utility Services Review

## Calderwood Urban Development Project Yield Review

8201819401



Prepared for  
Lendlease

9 August 2018



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# 1 Introduction

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This Utility Services Review accompanies an Environmental Assessment Report (EAR) for a proposed S75W Modification Application to the Calderwood Concept Plan Approval (MP09\_0082) (Approved Concept Plan) for the Calderwood Urban Development Project (CUDP).

A modification is sought to the Approved Concept Plan to allow for increased and more diverse housing supply at Calderwood. The increase in housing supply is proposed to ensure that the existing area of urban zoned land at Calderwood is efficiently used for the continued supply of a range of housing types and sizes that both meet market demand and will assist in addressing housing affordability pressures in the Illawarra region.

## 1.1 Site Description

The CUDP site is located within the Calderwood Valley in the Illawarra Region. It is approximately 700 hectares in area with approximately 107 hectares of land in the Wollongong LGA (15%) and the balance in the Shellharbour LGA (85%). An aerial photograph of the site is provided at **Figure 1-1**.

Calderwood Valley is bound to the north by Marshall Mount Creek (which forms the boundary between the Shellharbour and Wollongong LGAs), to the south by the Macquarie Rivulet, to the south-west by Johnston's Spur and to the west by the Illawarra Escarpment. Beyond Johnston's Spur to the south is the adjoining Macquarie Rivulet Valley within the locality of North Macquarie. The CUDP site extends south from the intersection of North Marshall Mount Road and Marshall Mount Road to the Illawarra Highway.



Figure 1-1 The site  
Source: Nearmap, December 2017

## 1.2 Background

Lendlease is the proponent of the CUDP. On 8 December 2010 the Minister for Planning determined (with modifications) the Approved Concept Plan. Following approval of the Concept Plan, on 14 January 2011 Schedule 3 of State Environmental Planning Policy (Major Development) 2005 (now the State Significant Precincts SEPP) was amended to establish zoning and other planning controls for the CUDP.

The Approved Concept Plan comprises the plans, drawings and documents cited by the proponent in its Environmental Assessment, Preferred Project Report and Statement of Commitments, subject to the modifications and further assessment requirements set out in Schedule 2 of the Concept Plan notice of determination. A Consolidated Concept Plan was prepared in March 2011 that includes the approved Concept Plan documentation.

Together, the planning controls at Schedule 3 of the State Significant Precincts SEPP and the Approved Concept Plan establish the statutory planning regime for the development of the CUDP.

The Approved Concept Plan provides for the development of a total of approximately 700 hectares of land. Relevantly, Condition A1(1) of Schedule 2 of the Concept Plan determination states that approval is granted to the carrying out of development of approximately 4,800 residential dwellings and 50ha of mixed use employment land, open space and protection of environmentally significant lands, internal roads, service infrastructure and community facilities (including three schools).

The approved Calderwood Concept Plan is at **Figure 1-2**.

The utility servicing strategies originally proposed for the CUDP were addressed within the Utility Services Study for Concept Plan Application prepared by Cardno in February 2010. Specific utility servicing strategies for sewer, water, electricity, natural gas and telecommunications are addressed within this document. The study was included within Appendix M of the approved Consolidated Concept Plan prepared by JBA Planning dated March 2011.

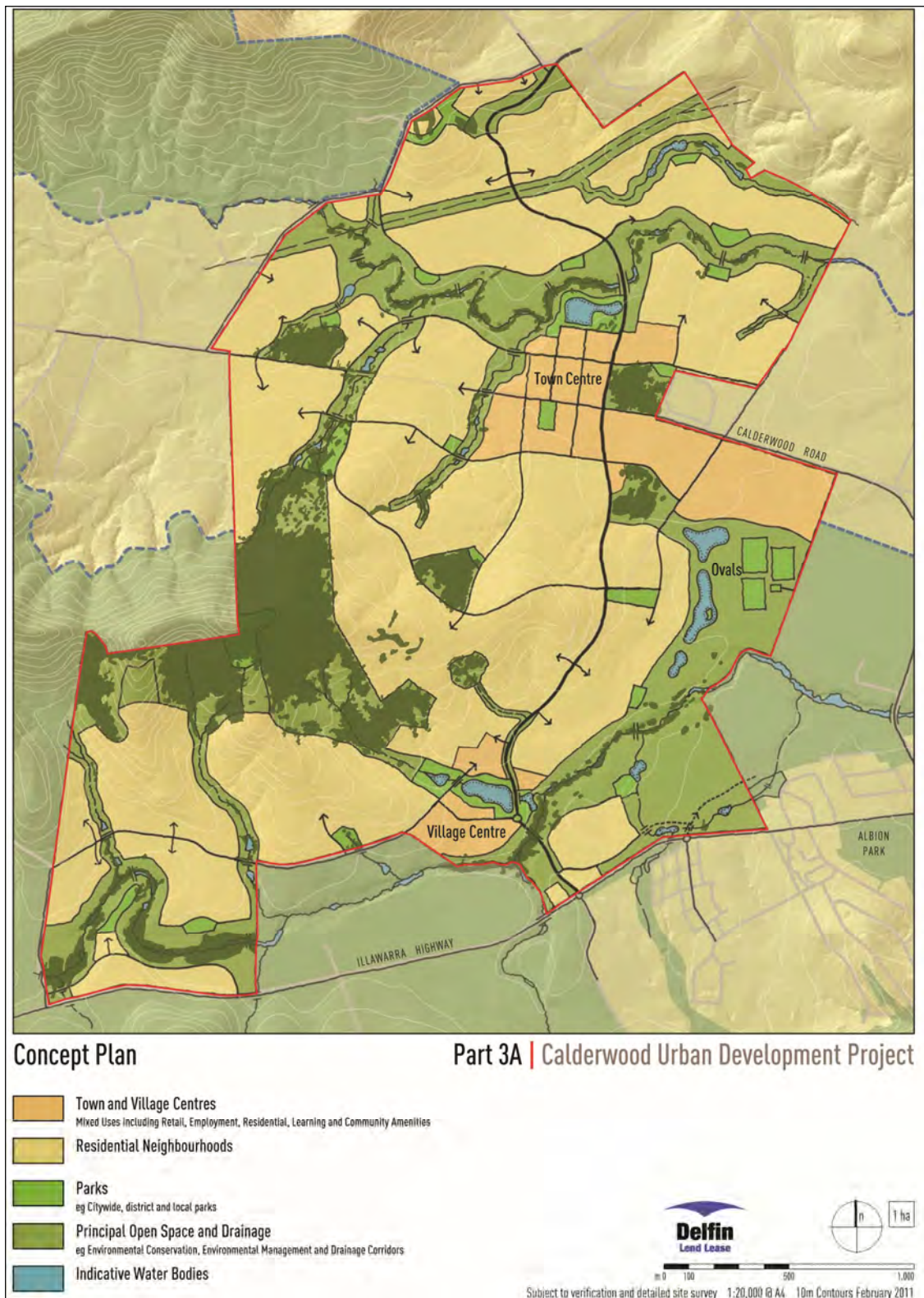


Figure 1-2 Approved Calderwood Concept Plan

Source: Lendlease Communities

Lendlease is the developer of the majority of the CUDP (i.e. it is the developer of approximately 600 ha of the overall 700 ha site). The component of the overall CUDP owned / controlled by Lendlease and to be developed by Lendlease in accordance with the Approved Concept Plan is illustrated at **Figure 1-3** below. Other areas of land within the boundaries of the Approved Concept Plan are owned by and to be developed by separate entities.

Lendlease has commenced the development of its component of the overall CUDP, and will continue to develop the project in stages over an approximately 15+year period. To date Lendlease has obtained development consents for some 1,200 dwellings within Stages 1, 2a, 2b and 2c and 3a, and lodged development applications for another 650 dwellings in Staged 3b south and 3c of the overall project. Other developers have also lodged development applications for a further 369 lots on land within the Concept Plan boundary that Lendlease does not own or control. **Figure 1-3** illustrates the indicative subdivision plan for the project.

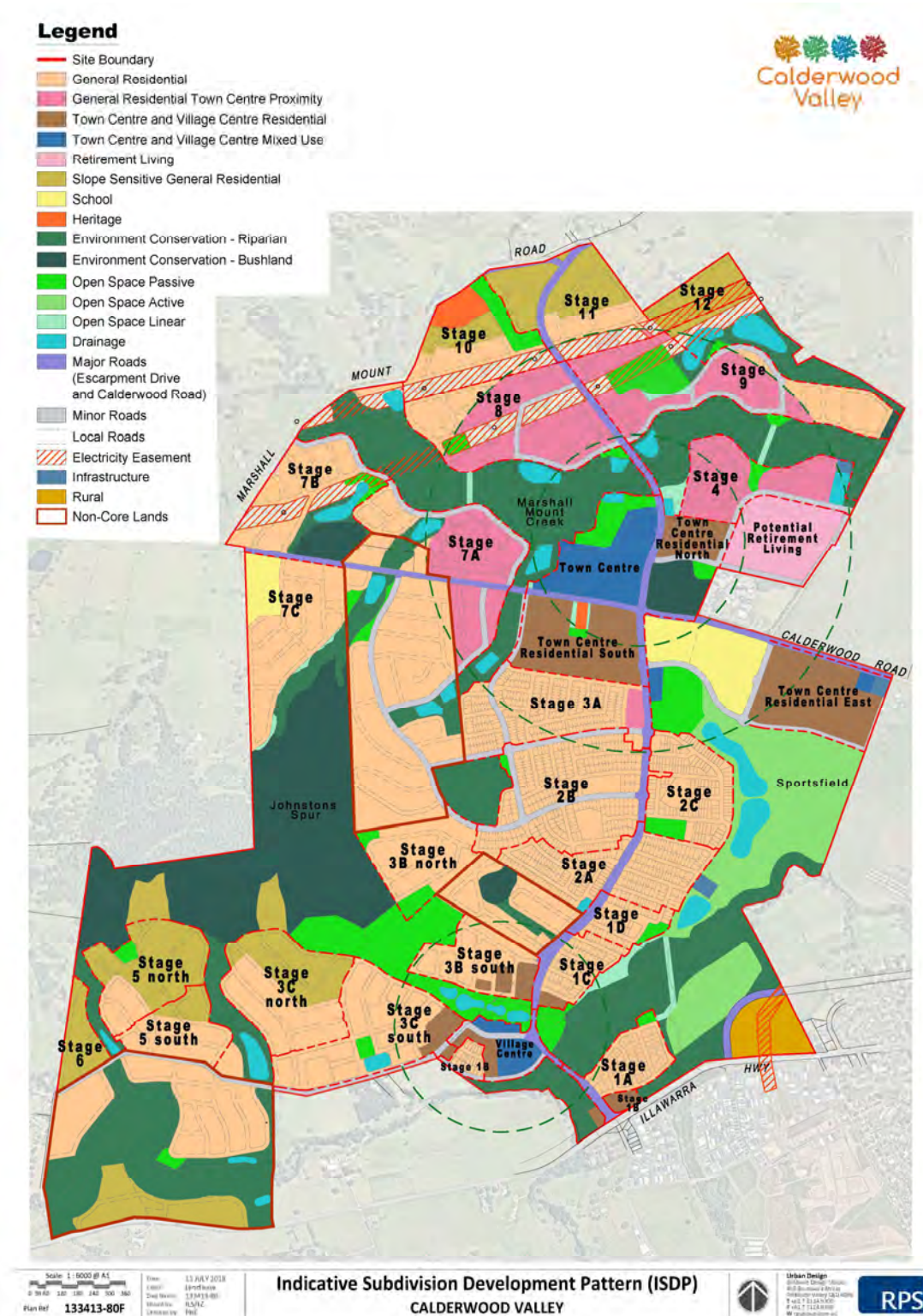


Figure 1-3 Indicative subdivision plan  
Source: Lendlease Communities

### 1.3 Proposed Concept Plan Modification

The proposed modification to the Approved Concept Plan seeks to increase the total provision of housing (approximate number of dwellings) within the overall CUDP to respond to market demand for the provision of smaller housing types / lot sizes at affordable price points and to ensure the efficient use of urban zoned land within this context for the supply of housing.

It is proposed to increase the overall number of dwellings to be delivered within the existing area of land zoned R1 General Residential and B4 Mixed Use and also approved for urban development as shown on the Approved Concept Plan from approximately 4,800 to approximately 6,500 dwellings.

Allowing for increased housing supply will support the delivery of more integrated housing product in appropriate locations within the CUDP, including greater diversity in housing product.

The increase in housing supply for the CUDP is proposed without any expansion of the footprint of urban zoned land (residential and mixed use zoned land) and without any change to the minimum lot sizes permitted under State Environmental Planning Policy (State Significant Precincts) 2005 (State Significant Precincts SEPP) It is also proposed without any change to the areas of land already approved for residential and other urban development under the existing Concept Plan Approval.

There is no substantive change between the proposed modified development and that envisaged by the Approved Concept Plan in respect of approved land uses, the urban structure of the development, the road and pedestrian network within the site, nor the scope of environmental protection outcomes for the land including the quantum and configuration of riparian and environmental corridor and environmental reserve lands.

Within the Approved Concept Plan framework, the proposed increased dwelling yield will be achieved via the delivery of a greater diversity of dwelling types and lot sizes within the R1 General Residential and B4 Mixed Use zones generally as follows:

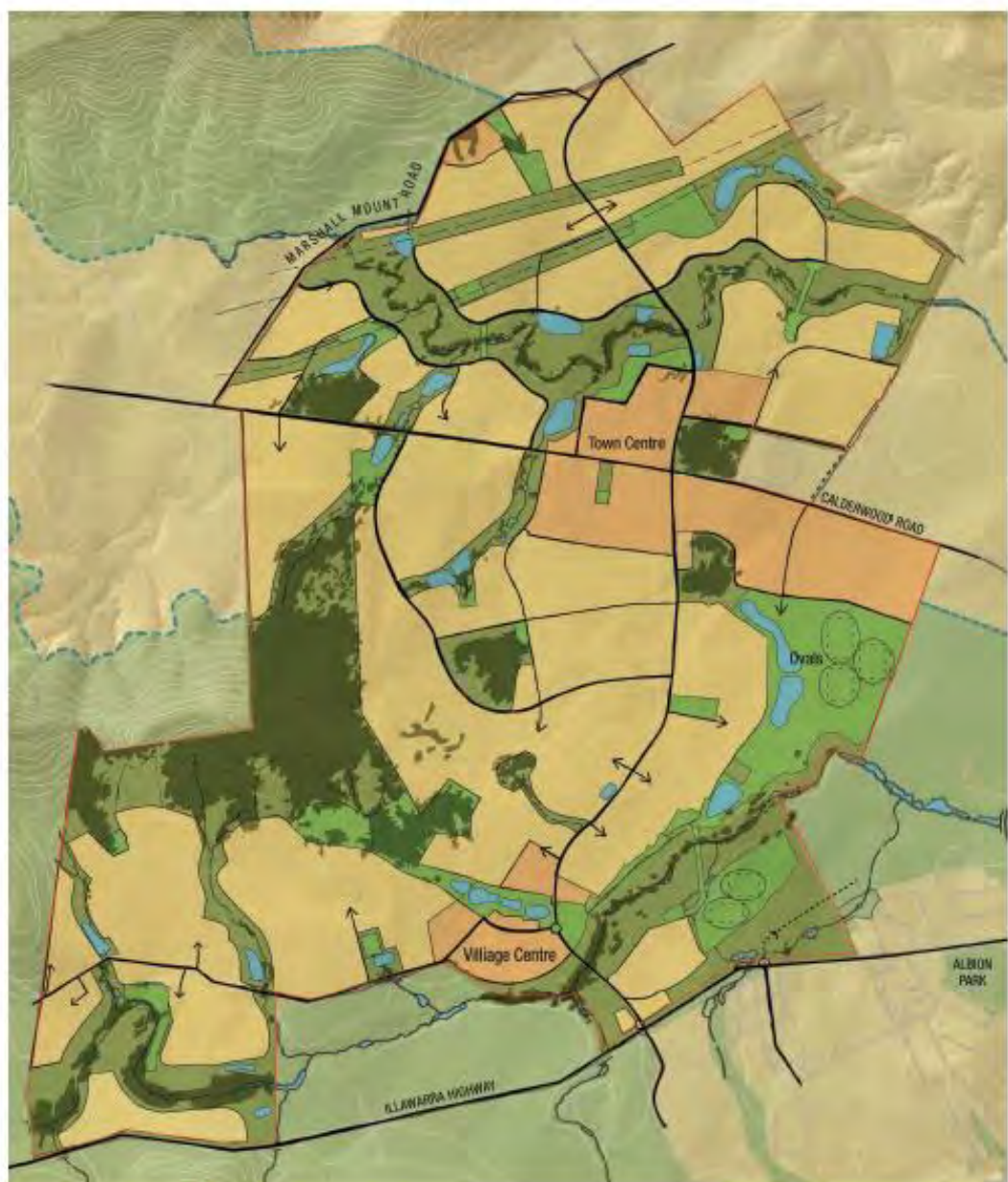
- > Within the R1 General Residential zone, additional yields will be achieved through the delivery of a more diverse range of housing types such as seniors housing and integrated housing and also by a different mix of lot sizes than was anticipated at the time of the Approved Concept Plan in 2010 (including a greater number of smaller lots) to respond to the changing and more diverse market expectations and housing affordability pressures;
- > Within the B4 Mixed Use zone, the number of dwellings to be provided will be increased through the provision of a combination of more shop top housing, mixed use development and stand-alone residential development.

A range of new provisions are proposed to be incorporated into the Development Control Strategy to allow for the broader range of housing typologies, lot sizes and affordable housing options that are proposed to meet current market demand.

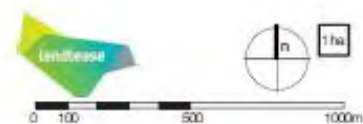
Related changes to the Approved Concept Plan are proposed to ensure the Calderwood development meets the needs of residents, namely:

- > an increase in the area of land required for open space within the site,
- > an increase in the provision of retail floor space within the new town centre; and
- > delivery of more capacity in local community and other infrastructure including the planned community centre and transport requirements.

The proposed modified Concept Plan is shown at **Figure 1-4**.



Concept Plan (MOD 4)



Subject to verification and detailed site survey 1:20,000 © A4 10m Contours July 2018

Figure 1-4 Proposed modified Concept Plan  
Source: Lendlease Communities

## 1.4 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs) for the proposed modification to the Approved Concept Plan were issued by the NSW Department of Planning and Environment. SEARs that relate to engineering infrastructure and utility services are shown in **Table 1-1** below.

Table 1-1 Secretary's Environmental Assessment Requirements Relating to Engineering Infrastructure and Utility Services

| Secretary's Environmental Assessment Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Sections of Report where this is Addressed |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| <b>Key Issues – 20. Utilities</b> <ul style="list-style-type: none"> <li>&gt; In consultation with relevant agencies, address the existing capacity and requirements of the development for the provision of utilities and services, including staging of infrastructure works.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sections 2 – 5, Appendix A and C           |
| <b>Consultation</b> <p>During the preparation of the EA, you are required to consult with the relevant local, State or Commonwealth Government authorities, service providers and other landholders within the Concept Plan land, including:</p> <ul style="list-style-type: none"> <li>&gt; Wollongong City Council;</li> <li>&gt; Shellharbour City Council;</li> <li>&gt; Office of Environment and Heritage;</li> <li>&gt; Environment Protection Authority;</li> <li>&gt; Transport for NSW;</li> <li>&gt; Roads and Maritime Services;</li> <li>&gt; Department of Primary Industry;</li> <li>&gt; Rural Fire Service; and</li> <li>&gt; Department of Education.</li> </ul> <p>The modification request must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to those issues. Where amendments have not been made to address an issue, a short explanation should be provided.</p> | Section 2 and Appendix A                   |

## 1.5 Overall Approach and Study Objectives

Albion Park, the suburb adjoining the CUDP to the east is fully serviced with sewerage, potable water, electricity, telecommunications and gas available. Existing utility service infrastructure available within this area has previously been noted as inadequate to service the CUDP. Therefore a range of utility services have been proposed in the past to meet the demand resulting from the CUDP. Several stages of the CUDP have currently been sold and settled, other stages are either under construction, with development applications lodged or in the planning stages. Considering the modification to the Approved Concept Plan seeks to increase the total provision of housing within the CUDP, the capacity of the proposed utility services will need to be addressed.

The following objectives have been established for this utility services study:

- > Notify the relevant utilities agencies of the modification to the Approved Concept Plan.
- > Address the existing capacity and requirements of the development for the provision of utilities and services, including staging of infrastructure works.
- > Address the utility services required to meet the demands of the proposed modification to the Approved Concept Plan based upon consultation with the relevant utility agencies.

## 1.6 Scope of this Report

Mindful of the above objectives, this report investigates the availability of existing utility services and the possibility of servicing the CUDP based upon the proposed development yield increase. The scope of the report includes:

- > Consultation with relevant stakeholders involved in the CUDP.
- > A review of the existing utility services currently proposed and delivered to service the CUDP based upon the original Approved Concept Plan.
- > An assessment of the upgrades required to the originally proposed utility services in order to meet the demands of the CUDP yield increase.

## 1.7 Structure of this Report

The report is organised as follows:

- > **Section 2** – describes the objectives, methodology and results of consultation with relevant stakeholders.
- > **Section 3** – provides a review of the utility services currently proposed to service the CUDP based upon the original Approved Concept Plan and the relevant appendices to the approved Concept Plan including the Utility Services Study at Appendix M.
- > **Section 4** – provides a review of the utility services which have already been delivered to service the CUDP, considering several development stages have currently been sold, settled or are under construction.
- > **Section 5** – demonstrates, in a strategic planning sense, how the site can be serviced to meet the proposed development yield increase.
- > **Section 6** – provides recommendations and conclusions.

## 2 Stakeholder Consultation

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### 2.1 Objectives

The consultation undertaken for this project has been carried out in accordance with the following objectives. Details of the consultation are included as **Appendix A** of this report.

1. *To identify key stakeholders in relation to the CUDP project*
2. *To provide key stakeholders an understanding of the proposed modification to the Approved Concept Plan for the CUDP and information suitable to their area of expertise or interest*
3. *To provide key stakeholders with an opportunity to provide suitable comments on the proposed modification to the Approved Concept Plan for the CUDP at an early stage so that they can be considered in the infrastructure and servicing strategies for the concept design and development application process.*

In accordance with the SEARs, the following service providers were consulted as part of this Utility Services Study.

### 2.2 Sydney Water

Sydney Water are the stakeholders responsible for the delivery of sewer and water reticulation services within the CUDP. Lendlease has maintained consistent and extensive consultation with Sydney Water as part of the CUDP since the project's inception in 2003. Representatives from Lendlease and Cardno met with representatives from Sydney Water (Ensure) in April 2018 to discuss the proposed modification to the Approved Concept Plan for the CUDP.

At the meeting Lendlease provided Sydney Water (Ensure) with an overview on the project status to date including the number of lots sold and the number of lots which currently have Development Applications either approved or submitted. Details of the proposed modification to the Approved Concept Plan for the CUDP were provided including the following:

- > The increase in the overall number of dwellings to be delivered from approximately 4,800 to approximately 6,500.
- > The potential location of where a yield increase is likely to occur.

The "non-core" landholders were identified, who are other private developers at Calderwood Valley. Lendlease confirmed the anticipated number of dwellings in the overall development contained the expected lot yield from the three non-core landowners and Lendlease, therefore the entire CUDP site.

Sydney Water (Ensure) provided a brief update on the Package 1, 2 and 3 works during the meeting. Package 3 was noted to have been brought forward by Sydney Water due to the information Lendlease had provided on forecast lot numbers per year.

Sydney Water (Ensure) agreed to undertake a detailed planning report which will consider the revised 6,500 dwellings for the CUDP rather than the original 4,800 for the next package of work. Sydney Water (Ensure) have advised that this package of work will likely be completed by September 2018.

Lendlease and Cardno have provided the following information as requested by Sydney Water (Ensure) to assist in preparation of their detailed planning:

- > Growth intelligence spreadsheet noting information relative to the CUDP including anticipated dwelling delivery timeframes.
- > Contact details of non-core landholders in order to allow initial contact to be made.

In addition to the information noted above, Lendlease and Cardno are able to provide the following additional information when required and as requested by Sydney Water (Ensure):

- > Already approved Sydney Water plans (water and sewer WSC plans)
- > DWG file of preliminary designs that have been completed across the site.

## 2.3 Endeavour Energy

Endeavour Energy are the stakeholders responsible for the delivery of electrical services within the CUDP. Lendlease has demonstrated consistent consultation with Endeavour Energy over the lifetime of the CUDP. Cardno notified Endeavour Energy of the proposed modification to the Approved Concept Plan for the CUDP over the months of April and May 2018, noting the following:

- > The increase in the overall number of dwellings to be delivered from approximately 4,800 to approximately 6,500.
- > The potential location of where a yield increase is likely to occur.

A response was received from a representative of Endeavour Energy noting the future zone substation can be designed to accommodate the increase in density to 6,500 dwellings size based upon the standard transformer sizes for a 33kV substation. It was noted that there will be no need to change the size of the site designated for the substation due to the proposed yield increase. Endeavour Energy advised that approximately two additional 11kV feeders will need to be established to meet the electricity servicing demands arising from the yield increase. These feeders would be delivered as part of a typical subdivision design through Accredited Service Provider's (ASP).

Cardno has provided the following information on behalf of Lendlease as requested by Endeavour Energy to assist in forecasting the timing for electrical infrastructure:

- > Growth intelligence spreadsheet noting information relative to the CUDP including anticipated dwelling types and delivery timeframes.
- > Yield analysis plan showing the layout of the proposed modification to the Approved Concept Plan for the CUDP, highlighting the anticipated number of dwellings per stage.

## 2.4 Telecommunications (OptiComm)

OptiComm is the stakeholders responsible for the delivery of telecommunications services within the CUDP. Lendlease have been in consultation with OptiComm throughout the planning and development phases of the CUDP, with several stages of telecommunications infrastructure already delivered. Cardno notified OptiComm of the proposed modification to the Approved Concept Plan for the CUDP in May 2018, noting the following:

- > The increase in the overall number of dwellings to be delivered from approximately 4,800 to approximately 6,500.
- > The potential location of where a yield increase is likely to occur.

A response was received from OptiComm noting that there is no issue in supporting the proposed modification to the Approved Concept Plan for the CUDP.

## 2.5 Jemena

Jemena is the stakeholders responsible for the delivery of gas services within the CUDP. Lendlease have demonstrated consistent consultation with Jemena over the lifetime of the CUDP, with Jemena having delivered several stages of gas infrastructure to the already completed stages of the CUDP. Cardno notified Jemena of the proposed modification to the Approved Concept Plan for the CUDP over the months of April and May 2018, noting the following:

- > The increase in the overall number of dwellings to be delivered from approximately 4,800 to approximately 6,500.
- > The potential location of where a yield increase is likely to occur.

A response was received from a representative of Jemena noting the need for a secondary steel gas main had been identified for the CUDP in order to ensure sufficient capacity for later stages of the development. Jemena noted that the increase in dwellings proposed as part of the modification to the Approved Concept Plan for the CUDP may require delivery of the secondary steel gas main to be brought forward. Jemena advised that once the secondary steel gas main had been provided there would not be any issues associated with supplying the CUDP due to the proposed increase in loads associated with the increase in density.

Cardno has provided the following information on behalf of Lendlease to assist in forecasting the timing for gas infrastructure:

- > Growth intelligence spreadsheet noting information relative to the CUDP including anticipated dwelling types and delivery timeframes.
- > Yield analysis plan showing the layout of the proposed modification to the Approved Concept Plan for the CUDP, highlighting the anticipated number of dwellings per stage.

## 2.6 Staging of Infrastructure Works

The proposed staging of infrastructure works was addressed by providing key stakeholders involved in the CUDP with a growth intelligence spreadsheet. This spreadsheet noted the forecasted development information relative to delivery of the CUDP (considering the proposed increase in dwellings) including the anticipated delivery timeframes and the associated number of dwellings to be provided for each stage of the development. **Table 2-1** below summarises the information provided to the key stakeholders relating to the anticipated delivery timeframes and number of dwellings anticipated to be delivered for each stage. The provision of this information will allow key stakeholders to consider the staging of works within the CUDP as it highlights the timeframe for when essential utility services infrastructure will be required. It should be noted that the anticipated dwelling delivery timeframes for each stage are subject to change depending upon future planning and delivery of stages and market conditions.

Table 2-1 Anticipated CUDP Stage Dwelling Delivery Timeframe

| Anticipated Delivery Period | Complete                      | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | 2028-2029 | 2029-2030 | 2030-2031 | 2031-2032 | 2032-2033 | Total |
|-----------------------------|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| Stage 1                     | 260                           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           | 260   |
| Stage 2                     | 666                           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           | 666   |
| Stage 3                     | 381                           | 156       | 400       | 96        |           |           |           |           |           |           |           |           |           |           |           |           | 1033  |
| Stage 4                     |                               |           |           |           | 200       | 200       | 57        |           |           |           |           |           |           |           |           |           | 457   |
| Stage 5                     |                               |           |           |           |           |           | 65        | 200       | 117       |           |           |           |           |           |           |           | 382   |
| Stage 6                     |                               |           |           |           |           |           | 13        |           |           |           |           |           |           |           |           |           | 13    |
| Stage 7                     |                               |           |           |           | 200       | 200       | 265       |           |           |           |           |           |           |           |           |           | 665   |
| Stage 8                     |                               |           |           |           |           |           |           | 217       |           |           |           |           |           |           |           |           | 217   |
| Stage 9                     |                               |           |           |           |           |           |           |           | 251       |           |           |           |           |           |           |           | 251   |
| Stage 10                    |                               |           |           |           |           |           |           |           |           | 65        |           |           |           |           |           |           | 65    |
| Stage 11                    |                               |           |           |           |           |           |           |           |           | 124       |           |           |           |           |           |           | 124   |
| Stage 12                    |                               |           |           |           |           |           |           |           |           | 12        |           |           |           |           |           |           | 12    |
| Town Centre                 |                               |           |           |           |           |           |           |           |           | 200       | 400       | 238       |           |           | 150       | 150       | 1138  |
| Village Centre              |                               |           |           | 91        |           |           |           |           |           |           |           |           |           |           |           |           | 91    |
| Non-Core                    | TBC with non-core landholders |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           | 1165  |
| Total                       | 1307                          | 156       | 400       | 187       | 400       | 400       | 400       | 417       | 368       | 401       | 400       | 238       | 0         | 0         | 150       | 150       | 6539  |

## 3 Utility Services Currently Proposed

### 3.1 Introduction and Background

The Approved Concept Plan provided for the CUDP included an infrastructure servicing strategy proposal for the development. Section 3.12 of the previously approved Consolidated Concept Plan prepared by JBA Planning dated March 2011 specifically refers to the overall utility services strategy for the entire CUDP. A summary of the utility services strategies proposed for sewer, water, electricity, natural gas and telecommunications are provided within the Approved Concept Plan. Figures 17, 18 and 19 highlight the proposed servicing strategy for all utility services infrastructure, sewer infrastructure and potable water infrastructure for the entire CUDP, respectively. These figures have been included within **Appendix B** for reference. More detailed information regarding the utility servicing strategies for the proposed CUDP was prepared in the form of the Utility Services Study for Concept Plan Application prepared by Cardno in February 2010 and is included within Appendix M of the Approved Concept Plan.

Development of the CUDP has progressed since approval of the Consolidated Concept Plan and a review of the utility services currently proposed to service the CUDP will be provided within the following sections of the report.

### 3.2 Water and Sewer

During the initial CUDP investigation works carried out by Sydney Water an array of master plans were produced by Sydney Water to service the rezoned development area. The purpose of the master plans was to guide the future designs of reticulation and trunk lead-in services. The master plans were prepared for a total development yield of 4,800 lots within the CUDP and a further 2,900 lots within the greater Calderwood investigation area which lies outside the current rezoned CUDP. Major infrastructure that was proposed for the CUDP included two new sewage pump stations (SPS) SPS1192 and SPS1193, three new water boosting pump stations (WPS) and trunk water and waste water lead-ins bringing the Sydney Water network to the CUDP.

SPS1192 is currently under construction to service the initial staging of the CUDP. Provisions have been allowed for the SPS to be upgraded in the future to cater for the full CUDP development, including the 2,900 lots located outside the CUDP that will eventually drain to this SPS. SPS1193 has commenced the detailed planning phase and Sydney Water have advised the increased lot yield of 6,500 lots will be used to determine the sizing and staging of the SPS and associated infrastructure.

The detailed planning currently being completed by Sydney Water will cater for the proposed 6,500 lots and outline the proposed staging and delivery timeframes of the required infrastructure. Due to time constraints this information will not be available to include within this report. An indicative layout of the proposed water and sewer utility services is provided within **Appendix C**. It should be noted that the water and sewer layouts shown are based on the latest detailed planning reports available at the time this report was prepared. They are currently under review and the alignments are subject to change.

### 3.3 Electricity

The entire CUDP is currently proposed to be serviced by a new 132/ 11kV zone substation within a dedicated parcel of land on the eastern side of the site, in the north eastern corner of the Town Centre East Stage. There currently exists a power distribution station located along Russell Street in Albion Park located approximately 2.5 km from the CUDP. This power distribution station provides electricity to the Albion Park area and has inadequate capacity to support the overall CUDP as proposed. Therefore the new zone substation was proposed to service the CUDP area.

Cardno have been advised by Endeavour Energy that the new zone substation is expected to be completed by the time the anticipated demand requires it. This proposed substation is expected to be supplied from three 132kV feeders at the following locations:

- > Feeder 1: Established between the proposed new zone substation and Transgrid's Dapto Bulk Supply Point located in Yallah Road, Yallah (within a 25m 132kV easement or public road reserve).
- > Feeders 2 and 3: Established between the proposed new zone substation and connected into the existing 132kV feeder 988(Dapto Bulk Supply Point to Fairfax Lane Transmission Substation) located adjacent to Mellows Road (within a 25m 132kV easement or public road reserve).

Endeavour Energy are expected to fund the proposed zone substation within the CUDP and the three proposed 132kV feeders which will be supplying the substation. Lendlease will provide the parcel of land for location of the proposed new substation through an agreement with Endeavour Energy.

An 11kV distribution network has been proposed to be established from the new zone substation to service the CUDP area. Padmount substations will be included within the proposed network, strategically positioned to reduce the electricity load down to acceptable levels for residential and commercial usage. An indicative layout of the proposed electricity utility services is provided within **Appendix C**.

Endeavour Energy have accepted a proposal to replace the existing 33kV overhead line (feeder 7041) which currently runs through the proposed sports field and town centre east precincts on the eastern side of the CUDP area. Relocation of this existing overhead line in the form of an underground cable will allow for development to occur within this area. Details of this proposed relocation are outlined within the Project Definition T-1824 prepared by Endeavour Energy dated 27 June 2018.

### 3.4 Telecommunications

The CUDP is currently proposed to be serviced by a network of underground fibre cables located within designated telecommunication conduits that are supplied by a telecommunications satellite compound located within Stage 1A of the CUDP which has been backhauled from a connection point on Broughton Avenue located south east of the CUDP. Telecommunication conduits and associated fibre cables will be located within a shared trench arrangement with gas and electricity services. Telecommunication conduits will be included within service trenches along Escarpment Drive to allow for future stages of the development to be serviced by the telecommunications satellite compound. Fibre cables will be fed into these existing telecommunication conduits as later stages of the development progress, enabling the telecommunications reticulation systems of each stage to be supplied. An indicative layout of the proposed telecommunications utility services is provided within **Appendix C**.

### 3.5 Natural Gas

Jemena has investigated the provision of providing natural gas to the CUDP progressively in stages, as the gas supply is required to developed areas. Jemena take a whole of network approach when extending their gas assets into new developments such as the CUDP. Initial stages of the development are proposed to be serviced by a gas main running along Escarpment Drive within the CUDP, reticulated to the development from an established connection point available on Yellow Rock Road. This connection sources natural gas from the Albion Park 'black box' located on the corner of Taylor Road and the Illawarra Highway intersection approximately 1.7km east of the CUDP site. As part of their investigations, Jemena identified the need for a secondary steel gas main to ensure sufficient natural gas capacity for later stages of the CUDP. An indicative layout of the proposed natural gas utility services is provided within **Appendix C**.

### 3.6 Alternative Technologies Previously Considered

The Utility Services Study for Concept Plan Application prepared by Cardno in February 2010 which was included as part of the Approved Concept Plan noted the potential application of alternative electricity technologies within the CUDP. Such technologies included the following:

- > Electricity co-generation (the efficient and simultaneous conversion of energy from gas to electricity and heat) and trigeneration (the simultaneous conversion of electricity, heat and cooling).
- > A Solar farm introduced to supplement electricity supply.

The potential for electricity co-generation and trigeneration in the CUDP was noted to exist within the town centre and employment precinct. As the CUDP has progressed Lendlease has monitored the potential for the application of these alternative electricity applications. Energy sustainability has been addressed through the efficient design of urban form for stages of the CUDP which have currently been delivered. Furthermore, the demand for utilities has been mitigated through the application of BASIX requirements for dwelling design. Future stages of the CUDP will continue to address energy sustainability and mitigate the demand for utilities through the application of these design measures, therefore ruling out the need for electricity co-generation and trigeneration technologies within the development.

Lendlease are considerate of the development of emerging alternative technologies for application in developments such as the CUDP where they can be practically applied. Technologies which aim to lower carbon emissions and achieve renewable energy targets will continue to be monitored by Lendlease as development of the CUDP progresses. Emerging developments in solar panel technologies have lead Lendlease to consider the potential use of solar panels on the roofs of buildings within the town centre. The

inclusion of such technology would allow energy generation to be supplemented and carbon emissions to be reduced whilst meeting the market demand for the provision of housing in the area. The application of such technologies would prevent the need for the application of infrastructure such as a solar farm which would require a relatively large allocation of land.

The proposed servicing strategy for stages of the development which have currently been delivered has been consistent with the Utility Services Study for Concept Plan Application (Cardno, February 2010) in terms of sustainability and efficiency in infrastructure. Water mains have been aligned along the side of the road reserve that serves the most properties and minimises the length of property services required. This ensures material use is minimised and results in an associated reduction in energy usage. Sustainable design has also been implemented through the layout of sewer reticulation throughout the CUDP. The sewer system has been designed to conform to the natural topography of the land, allowing gravity drainage to be possible, therefore reducing the infrastructure and energy demands in comparison with less efficient designs which require pressure sewer applications. Lendlease will continue to ensure sustainable and efficient infrastructure is implemented in future stages of the development where the application is practical.

## 4 Utility Services Currently Delivered

### 4.1 Water and Sewer

Stage 1 and 2 are currently being serviced by water and waste water, except for Stage 2C which is awaiting Construction Certificate (CC) to commence subdivision works. In order to supply the current stages of the development a new SPS is being constructed in Stage 1 by Sydney Water.

All the sewer in Stage 1 and 2 drains to the SPS and will be pumped (currently an Interim Operating Procedure (IOP) is in operation) to the Sydney Water network in Albion Park Rail. There is a trunk sewer main currently under construction that will drain to the SPS. All future stages will either drain or be pumped to this trunk main. This trunk main has been sized for the full development yield within the CUDP and the expected pump rates from the future SPS (SPS1193). There was another trunk main which was delivered south of the SPS, but there are no lot yield increases expected in this catchment.

A new DN250 water main was extended from Tullimbar to the CUDP. This water main is currently servicing all approved stages and occupied lots. An indicative layout of the existing water and sewer utility services is provided within **Appendix D**.

### 4.2 Electricity

Stages of the development which have currently been sold and settled (including land from Stages 1, 2 and 3) are currently being serviced by electricity supplied from the existing power distribution station located along Russell Street in Albion Park. In order to supply the current stages of the development an 11kV underground feeder was established to the site from the existing power distribution station in Albion Park, reticulated to the development from an established substation located on Wingello Crescent south east of the site. A lead-in 11kV underground feeder was then run along Escarpment Drive within a shared trench arrangement with gas and telecommunications services to service the current stages of the development. Padmount substations have been strategically positioned throughout the currently completed stages of the CUDP in order to reduce the electricity load down to acceptable residential and commercial usage levels.

It is anticipated that all future electrical reticulation for the entire CUDP will be supplied (or back fed) from the proposed new zone substation to be located on a dedicated parcel of land in the north eastern corner of the Town Centre East Stage. Spare underground ducts have been provided throughout the currently completed stages of the development in order to allow for future electrical cables to be connected to the new zone substation upon its completion. This will ensure the currently completed stages of the development will be capable of being serviced by the new zone substation with minimal disturbance to the existing infrastructure provided. An indicative layout of the existing electrical utility services is provided within **Appendix D**.

### 4.3 Telecommunications

Telecommunications services for stages of the development which have already been sold and settled (including land from Stages 1, 2 and 3 of the CUDP) are currently being supplied by the telecommunications satellite compound established on the southern side of Stage 1A which has been backhauled from a connection point on Broughton Avenue located south east of the CUDP. Telecommunication conduits originating from the satellite compound have been provided within the underground shared services trench running along Escarpment Drive to allow telecommunication lead-ins to be provided at later stages of the development. An indicative layout of the existing telecommunications utility services is provided within **Appendix D**.

### 4.4 Natural Gas

Stages of the development which have currently been sold and settled (including land from Stages 1, 2 and 3) are currently being serviced by gas supplied from the existing Albion Park 'black box' located at the intersection of Taylor Road and the Illawarra Highway (approximately 1.7km east of the CUDP site). A gas main has been provided along the Illawarra Highway which supplies the CUDP with natural gas from Jemena at Albion Park. Upon commencing early stages of the development an established gas connection point to the main gas line was available on Yellow Rock Road south of the CUDP site. This gas main runs along Escarpment Drive and is connected to a gas reticulation system within the currently completed stages of the CUDP. The gas reticulation system is located underground in a shared trench arrangement with electricity and telecommunication services. An indicative layout of the existing natural gas utility services is provided within **Appendix D**.

## 5 Utility Services Requirements to Meet Yield Increase

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### 5.1 Water and Sewer

SPS1192 currently under construction has been designed to allow for the full CUDP and the investigation area which lies outside the CUDP. The staged upgrades of SPS1192 will be dependent on the projections provided by Lendlease on lot take up rates and expected development timeframes for each stage. The future SPS, SPS1193 is currently being reviewed through a detailed planning report by Sydney Water which will be designed to the revised lot yield of 6,500 for the CUDP.

The potable water services will also be reviewed during the same detailed planning report. This will allow Sydney Water to project when future trunk mains and reservoirs will be required to keep up with demand. It is not expected upsizing of existing infrastructure will be required to service the lots currently being serviced in Stage 1 and 2.

### 5.2 Electricity

The future zone substation proposed to service the CUDP will be located within a dedicated parcel of land in the north eastern corner of the Town Centre East precinct. Endeavour Energy has confirmed that the future zone substation can be designed to meet the capacity increase resulting from the proposed modification to the Approved Concept Plan. This is based on the standard transformer sizes available for a 33kV substation. Endeavour Energy have noted that there will be no need to change the size of land which has been dedicated for the substation.

Endeavour Energy have noted that approximately two additional 11kV feeders will require to be established for the increased dwelling yield proposed as part of the modification to the Approved Concept Plan.

### 5.3 Telecommunications

OptiComm have noted that there is no issue in supporting the proposed modification to the Approved Concept Plan for the CUDP and have advised that they can easily cope with the increased density. No specific requirements for telecommunications utility services were noted to meet the yield increase as proposed.

### 5.4 Natural Gas

The need for a secondary steel gas main had been identified previously by Jemena to ensure sufficient natural gas capacity for later stages of the CUDP. The proposed modification to the Approved Concept Plan for the CUDP which includes an anticipated increase in the number of dwellings may require the secondary steel gas main to be delivered sooner than originally expected. Jemena have advised that once the secondary steel gas main has been provided there would be no issues associated with supplying the CUDP with natural gas, considering the proposed increase in loads associated with the proposed yield increase.

## 6 Conclusion

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This Utility Services Review has been prepared by Cardno to accompany an EAR for a proposed S75W Modification Application to the Approved Concept Plan for the CUDP. The proposed modification seeks to increase the total provision of housing within the CUDP to respond to the market demand for the provision of smaller housing types and lot sizes at affordable prices. The overall number of dwellings delivered within the Approved Concept Plan is expected to increase from approximately 4,800 to approximately 6,500 dwellings as part of this modification.

Due to the proposed increase in dwellings, the availability of existing services and the possibility of servicing the CUDP was investigated. Relevant stakeholders involved in the CUDP including Sydney Water (water and sewer services), Endeavour Energy (electricity services), OptiComm (telecommunications services) and Jemena (natural gas services) were consulted, allowing them the opportunity to provide suitable comments on the proposed modification to the Approved Concept Plan for the CUDP at an early stage.

The existing capacity and requirements of the development for the provision of utilities and services, including staging of infrastructure works was reviewed within this study with the following key findings noted:

- > Major sewer and water infrastructure included two new SPS - SPS1192 and SPS1193, three new water boosting pump stations (WPS) and trunk water and waste water lead-ins bringing the Sydney Water network to the entire CUDP. SPS1192 is currently under construction to service the initial staging of the CUDP.
- > Major electrical infrastructure included a new 132/ 11kV zone substation within a dedicated parcel of land on the eastern side of the site, in the north eastern corner of the Town Centre East Stage which will service the entire CUDP. Endeavour Energy have advised that the new zone substation will be completed when required by the development and will service all current and futures stages of the development.
- > Major telecommunications infrastructure included a telecommunications satellite compound located within Stage 1A of the CUDP which will service the entire CUDP. This telecommunications satellite compound has already been established with future stages being supplied by lead-ins from this compound.
- > Major natural gas infrastructure included the provision of a gas main running along Escarpment Drive within the CUDP for initial stages of the development, reticulated to the development from an established connection point available on Yellow Rock Road. This connection sources natural gas from the Albion Park 'black box' located on the corner of Taylor Road and the Illawarra Highway intersection approximately 1.7km east of the CUDP site. Jemena identified the need for a secondary steel gas main to ensure sufficient natural gas capacity for later stages of the CUDP.

The utility services required to meet the demands of the proposed modification to the Approved Concept Plan were addressed based upon consultation with the relevant utility agencies. The following key findings are noted:

- > The future SPS, SPS1193 and the potable water services are currently being reviewed through a detailed planning report by Sydney Water which will be designed to the revised lot yield of 6,500 for the CUDP.
- > Endeavour Energy has confirmed that the future zone substation can be designed to meet the capacity increase resulting from the proposed modification to the Approved Concept Plan. They also noted that there will be no need to change the size which has been dedicated for the substation.
- > OptiComm did not note any specific requirements for telecommunications utility services to meet the yield increase associated with the proposed modification to the Approved Concept Plan. OptiComm advised there is no issue in supporting the proposed modification.
- > Jemena have advised that provision of a secondary steel gas main would ensure there is adequate capacity to supply the CUDP with natural gas, considering the proposed increase in loads associated with the yield increase.

# APPENDIX

# A

CORRESPONDENCE WITH SERVICE  
AUTHORITIES

**Calderwood Urban Development Project Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**Summary Record of Agency Consultations**

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |       |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|
| <b>Date</b>                        | 18 April 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |       |
| <b>Project team member / firm</b>  | Sarah Kelly (Lendlease)<br>Peter Moy (Cardno)<br>Adam Clarke (Cardno)<br>Nuno Moreira (Cardno)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |       |
| <b>Organisation</b>                | Sydney Water (Ensure)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |       |
| <b>Name of contact</b>             | Helal Morshedi (Sydney Water – Senior Growth Planner)<br>Suhanti Thirunavukarasu (Sydney Water – Growth Planner)<br>Alicia Ferrier (EnSure- Project Manager)<br>Sujit Pandey (EnSure – Network Modeller)<br>Mel Tadhunter (EnSure – Communications)<br>Li-Anne Tung (AAJV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |       |
| <b>Position in organisation</b>    | See above                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |       |
| <b>Contact details</b>             | Alicia Ferrier 02 9032 1739                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |       |
| <b>Form of Consultation</b>        | Face to face      X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Phone call | Email |
| <b>Issues discussed / outcomes</b> | <p>Lendlease provided an overview of the following:</p> <ul style="list-style-type: none"> <li>• Project status to date including number of lots sold, number of lots as per DA's approved and submitted</li> <li>• Details on the proposed modification including yield increase from approximately 4,800 dwellings to approximately 6,500 dwellings</li> <li>• Potential location of where yield increase is likely to occur</li> <li>• Identified non-core landholders and confirmed that the number of dwellings in the overall development contained expected lot yield from the 3 non-core landowners (~1,000 dwellings with 2 of 3 landowners have submitted DAs)</li> </ul> <p>Sydney Water (Ensure) provided the following:</p> <ul style="list-style-type: none"> <li>• Brief update on Package 1, 2 and 3 works. Noted that Packaged 3 (now entering detailed planning) had been brought forward by Sydney Water as Lendlease provided information around forecast lots numbers per year.</li> </ul> |            |       |
| <b>Actions arising</b>             | Sydney Water (EnSure) <ul style="list-style-type: none"> <li>• Undertake detailed planning for 6,500 dwellings rather than 4,800. Expected completion of this package of work is September 2018</li> </ul> Lendlease (Cardno)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |       |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Complete Growth Intelligence Spreadsheet and issue to Sydney Water as soon as possible. This is required to assist with detailed planning.</li> <li>• Provide already approved Sydney Water plans (water and sewer WSC plans). TBC with Lendlease prior to issue</li> <li>• DWG file of preliminary designs that have been completed across the site. TBC with Lendlease prior to issue.</li> <li>• Contact details of non-core landholders to allow initial contact to be made</li> </ul> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Briefing Note  
for  
Sydney Water (Jacobs)**

**CUDP Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**18 April 2018**

**ITEMS FOR DISCUSSION**

**Project Overview and Status Summary  
Briefing on Number/Location of Density Increase  
Existing Sewer and Water Capacity  
Future Stages Network Modelling**

## PROJECT OVERVIEW AND STATUS SUMMARY

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### Key Facts:

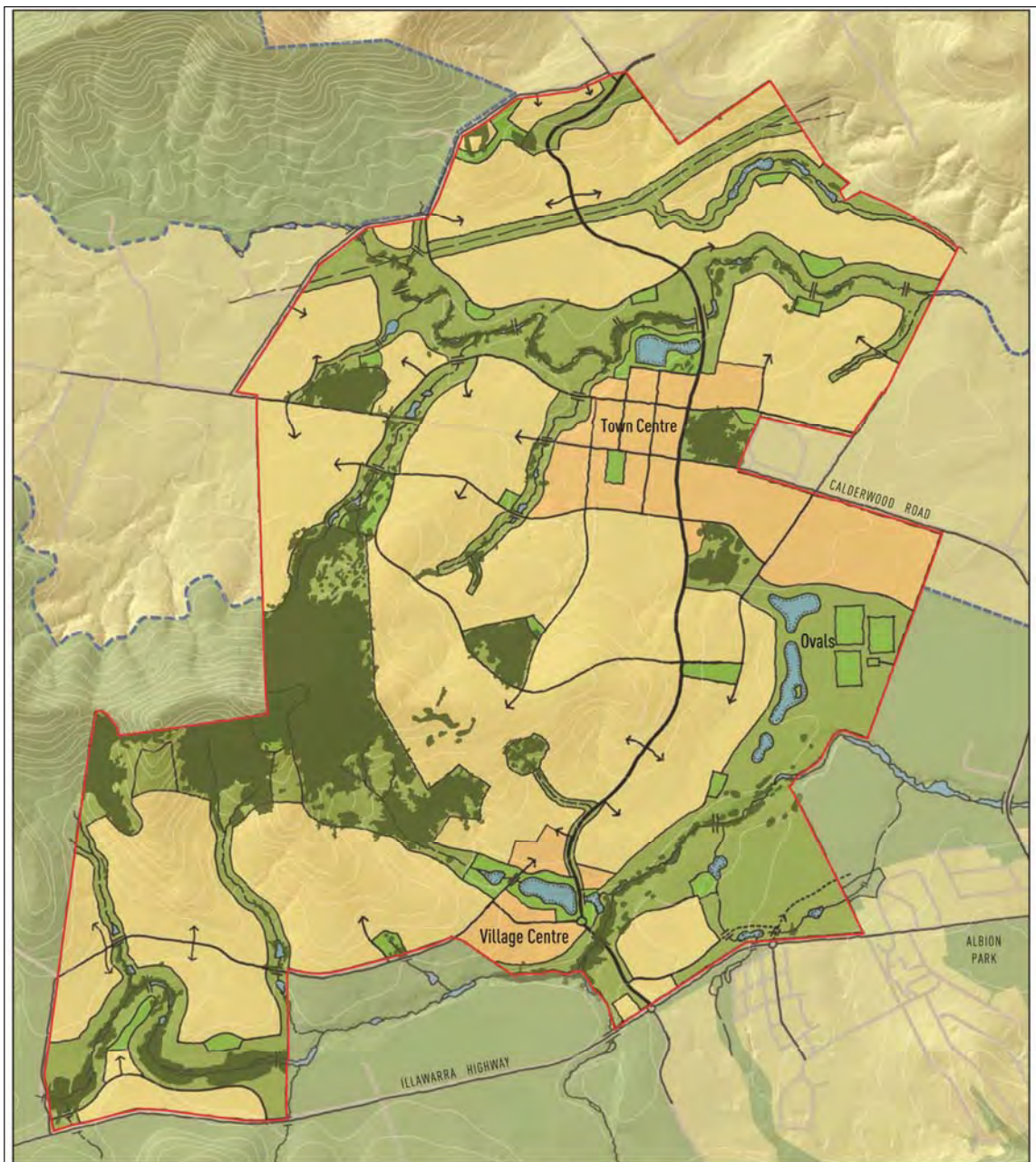
|                     |                                                                                                                                 |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Size:               | 700 hectares - 593ha (85%) in Shellharbour & 107ha in Wollongong (15%)<br>Lendlease controls 609ha (87%)                        |
| Timeframe:          | Approximately 15 years remaining on the project                                                                                 |
| Approved Dwellings: | 4,800 / Approximately 12,500 residents                                                                                          |
| Approved Non urban: | 50ha Employment, Retail, Community, Education, Mixed Use                                                                        |
| Open Space:         | 13 local parks, 5 District parks, 3 City parks and 15.84ha of sports fields                                                     |
| Community:          | 2 public primary schools, 1 public high school, existing Illawarra Christian School and community facilities (community centre) |
| Other:              | Conservation, Riparian, Water Quality, Environmental reserves                                                                   |
| Affordable Housing  | Land prices starting at approximately \$250,000 for a 300sqm lot (at December 2017)                                             |

### Project Status and Public Interest

- Since the project launch in March 2015, Lendlease has sold approximately 1,100 lots (as at March 2018).
- DAs for Stage 3B south (102 lots) and Stage 3C (410 lots) have been lodged with Shellharbour City Council, yielding 650 dwellings.
- Public interest remains strong with some 240 leads per month. Buyers are mainly locally based owner occupiers (predominately young families and young couples) with a small percentage of investors.
- Lendlease held 40% market share as at December 2017 - when stock available.
- Demand continues to outstrip supply
- 37 home display village now open – largest in the Illawarra region.
- Two local parks now complete and the first district park (2.85ha) under construction.
- 250+ residents now living on site.
- 500 homes due for settlement by 30 June 2018.

### Planning Status

- 8 December 2010 the Minister for Planning determined (with modifications) the CUDP Concept Plan.
- 14 January 2011 Schedule 3 of State Environmental Planning Policy (Major Development) 2005 (now the State Significant Precincts SEPP) was amended to establish zoning and other planning controls for the CUDP.
- A Consolidated Concept Plan was prepared in March 2011 that includes the approved Concept Plan documentation.
  - Together, the planning controls at Schedule 3 of the State Significant Precincts SEPP and the Approved Concept Plan establish the statutory planning regime for the development of the CUDP.
  - A request to modify the Approved Concept Plan was submitted to DPE in November 2017 (Mod 4) and the Secretary's Environmental Assessment Requirements (SEARs) were issued on 1 February 2018.



## Concept Plan

## Part 3A | Calderwood Urban Development Project

- Town and Village Centres**  
Mixed Uses including Retail, Employment, Residential, Learning and Community Amenities
- Residential Neighbourhoods**
- Parks**  
eg Citywide, district and local parks
- Principal Open Space and Drainage**  
eg Environmental Conservation, Environmental Management and Drainage Corridors
- Indicative Water Bodies**



m 0 100 500 1,000

Subject to verification and detailed site survey 1:20,000 (A4) 10m Contours February 2011

Consolidated Concept Plan, Calderwood Urban Development Project (JBA March 2011)

## THE PROPOSED MODIFICATION

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### The Proposed S75W Modification (Mod 4)

The proposed modification to the Approved Concept Plan seeks to increase the total provision of housing to respond to market demand for smaller housing types / lot sizes at affordable price points and to ensure the efficient use of urban zoned land within this context for the supply of housing.

It is proposed to increase the overall number of dwellings to be delivered within the existing area of land zoned R1 General Residential and B4 Mixed Use approved for urban development as shown on the Approved Concept Plan from approximately 4,800 to approximately 6,500 dwellings. There is also a modest increase in retail floor space in the town centre from 20,000sqm to 25,000sqm.

The increase in housing supply is proposed without any expansion of the urban footprint (residential and mixed use zoned land) and without any change to the minimum lot sizes permitted under State Environmental Planning Policy (State Significant Precincts) 2005 (State Significant Precincts SEPP)

There is no substantive change between the proposed modified development and that envisaged by the Approved Concept Plan in respect of approved land uses, the urban structure of the development, the road and pedestrian network within the site, the overall range of minimum lot sizes/dwelling types/lot types to be provided, nor the scope of environmental protection outcomes for the land including the quantum and configuration of riparian and environmental corridor and environmental reserve lands.

The proposed increased dwelling yield will be achieved via the delivery of a greater diversity of dwelling types and lot sizes within the R1 General Residential and B4 Mixed Use zones generally as follows:

- o Within the R1 General Residential zone, additional yields will be achieved through the delivery of a more diverse range of housing types such as seniors housing and integrated housing and also by a different mix of lot sizes than was anticipated at the time of the Approved Concept Plan in 2010 (including a greater number of smaller lots) with the average lot size across the project decreasing from 450sqm to 420sqm; and
- o Within the B4 Mixed Use zone, the number of dwellings to be provided will be increased through the provision of a combination of more shop top housing, mixed use development and stand-alone residential development.

A range of new provisions are proposed to be incorporated into the Development Control Strategy to allow for the broader range of housing typologies, lot sizes and affordable housing options that are proposed to meet current market demand.

Related changes to the Approved Concept Plan are proposed to ensure the Calderwood development meets the needs of residents, namely:

- o an increase in the area of land required for open space within the site,
- o an increase in the provision of retail floor space within the new town centre;
- o a review of servicing requirements;
- o a review of local and regional transport infrastructure, and
- o delivery of more capacity in local community infrastructure including the planned community centre.

### Next Steps

- Prepare the Environmental Assessment report (EAR) including a range of specialist sub-consultant reports consistent with the SEARs.
- Consult with Councils, agencies and existing landholders as required by the SEARs.
- Lodge EAR by 30 June 2018.
- DPE exhibit and assess.
- Determination.

## THE PROGRAM

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### Programme

An overview of the Project Programme follows:

| Key Step                                        | When                      |
|-------------------------------------------------|---------------------------|
| Meeting with DPE and lodgement of SEARs request | November 2017             |
| SEARs issued                                    | 1 February 2018           |
| Environmental Assessment supporting studies     | February – May 2018       |
| Authority and Agency Consultation               | April – May 2018          |
| Meetings and consultation with DPE              | April – May 2018          |
| Community Consultation and Information          | May 2018                  |
| Review and refinement                           | May – June 2018           |
| Reports finalised                               | June 2018                 |
| Documentation lodged                            | 30 June 2018              |
| Exhibition                                      | August – September 2018   |
| Response to submissions                         | September – November 2018 |
| Assessment and decision                         | November – December 2018  |
| Determination                                   | 2019                      |

# Calderwood Valley Master Plan



## CALDERWOOD VALLEY

1. Sales & Information Centre
2. Display Village



## RETAIL

3. Proposed Village Centre
4. Proposed Town Centre



## TRANSPORT

5. Proposed Albion Park road bypass
6. Albion Park train station
7. Bus stop for route 75 (future bus stop locations to be determined)



## EDUCATION

8. Calderwood Christian School K-12
9. Proposed Government primary school
10. Proposed Government primary school
11. Proposed Government high school



## COMMUNITY

12. Sprout Hub temporary community centre & café



## RECREATION

13. Flame Tree Park
14. Fig Tree Park
15. Pine Tree Park
16. Proposed Recreation Precinct
17. Calderwood Valley Golf Course
18. 2ha heritage parkland and curtilage around Marshall Mount Homestead
19. Proposed park



## NATURE

20. Conservation land



Private Lands



Potential Retirement Living Precinct



Infrastructure



Medium Density Residential

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**Calderwood Urban Development Project Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**Summary Record of Agency Consultations**

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |         |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|
| <b>Date</b>                        | 17 April 2018 and 18 May 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |         |
| <b>Project team member / firm</b>  | Peter Moy (Cardno)<br>Adam Clarke (Cardno)<br>Nuno Moreira (Cardno)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |         |
| <b>Organisation</b>                | Endeavour Energy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |         |
| <b>Name of contact</b>             | Jason Lu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |         |
| <b>Position in organisation</b>    | Capacity Planning Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |         |
| <b>Contact details</b>             | T: 02 9853 5003 E: <a href="mailto:jason.lu@endeavourenergy.com.au">jason.lu@endeavourenergy.com.au</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |         |
| <b>Form of Consultation</b>        | Face to face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Phone call | Email X |
| <b>Issues discussed / outcomes</b> | <p>Email sent to Jason Lu outlining the proposed increase in yield as part of the SEAR's documentation.</p> <ul style="list-style-type: none"> <li>Identified the proposed increase from 4,800 dwellings to 6,500 dwellings</li> <li>Identified the proposed location of the yield increased as the town centre along with some minor adjustments elsewhere.</li> </ul> <p>Response received from Jason Lu noted the following:</p> <ul style="list-style-type: none"> <li>Zone substation can be designed to accommodate an increase in density to 6,500 dwellings based on standard transformer sizes.</li> <li>Site of zone substation already allocated does not need to change</li> <li>Approximately 2 additional 11kV feeders would need to be established. This would be delivered as part of typical subdivision design work through the ASP's</li> </ul> |            |         |
| <b>Actions arising</b>             | <p>Endeavour have requested the following information:</p> <ul style="list-style-type: none"> <li>Confirmation on the type of density increase i.e. apartments/townhouses , smaller lots or combination</li> <li>Revised forecast for development timeframes</li> </ul> <p>Cardno to prepare spreadsheet and issue to Endeavour Energy.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |         |

**Briefing Note  
for  
Endeavour Energy**

**CUDP Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**17 May 2018**

**ITEMS FOR DISCUSSION**

**Project Overview and Status Summary  
Briefing on Number/Location of Density Increase  
Substation Capacity**

## PROJECT OVERVIEW AND STATUS SUMMARY

---

### Key Facts:

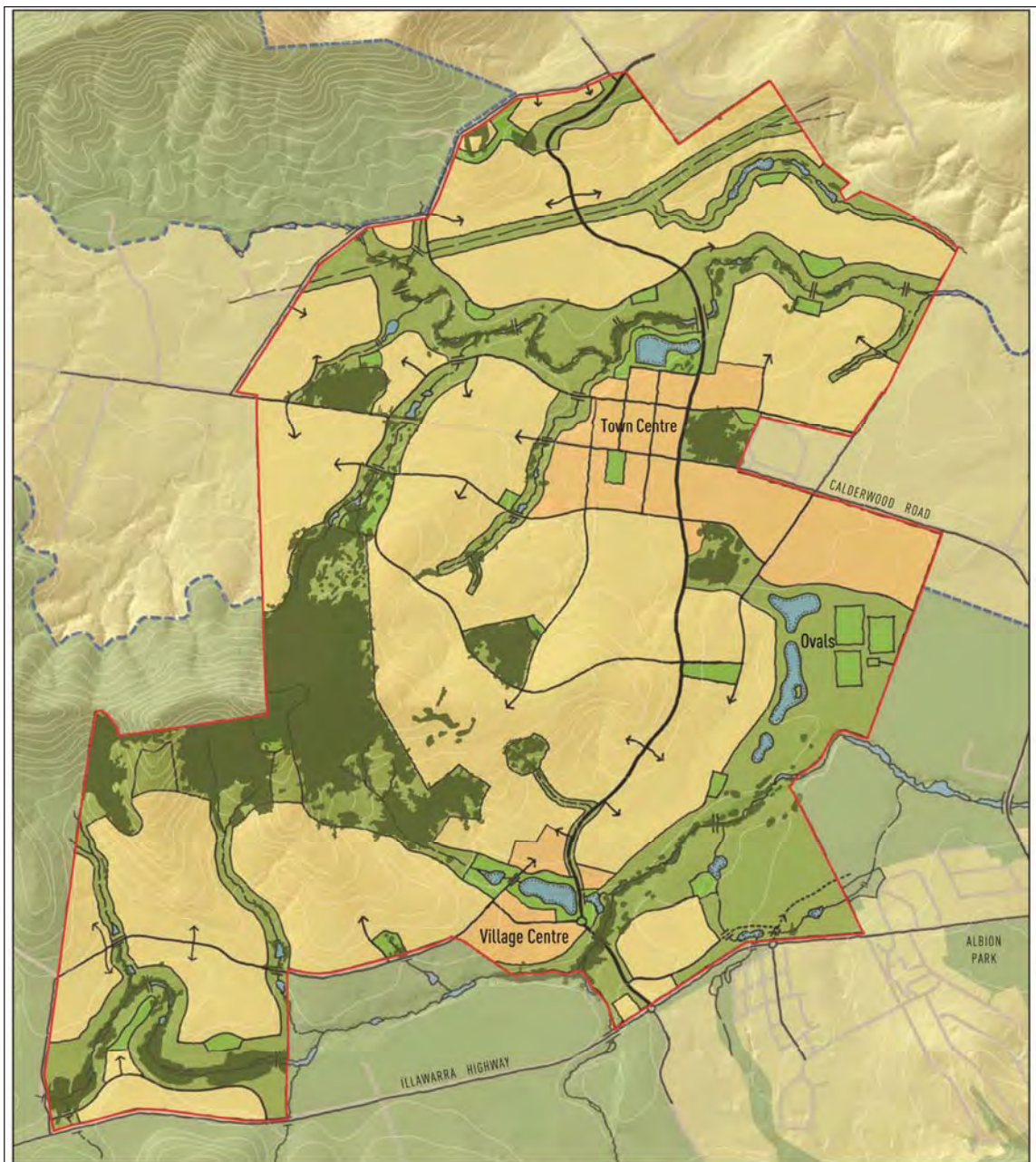
|                     |                                                                                                                                 |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Size:               | 700 hectares - 593ha (85%) in Shellharbour & 107ha in Wollongong (15%)<br>Lendlease controls 609ha (87%)                        |
| Timeframe:          | Approximately 15 years remaining on the project                                                                                 |
| Approved Dwellings: | 4,800 / Approximately 12,500 residents                                                                                          |
| Approved Non urban: | 50ha Employment, Retail, Community, Education, Mixed Use                                                                        |
| Open Space:         | 13 local parks, 5 District parks, 3 City parks and 15.84ha of sports fields                                                     |
| Community:          | 2 public primary schools, 1 public high school, existing Illawarra Christian School and community facilities (community centre) |
| Other:              | Conservation, Riparian, Water Quality, Environmental reserves                                                                   |
| Affordable Housing  | Land prices starting at approximately \$250,000 for a 300sqm lot (at December 2017)                                             |

### Project Status and Public Interest

- Since the project launch in March 2015, Lendlease has sold approximately 1,100 lots (as at March 2018).
- DAs for Stage 3B south (102 lots) and Stage 3C (410 lots) have been lodged with Shellharbour City Council, yielding 650 dwellings.
- Public interest remains strong with some 240 leads per month. Buyers are mainly locally based owner occupiers (predominately young families and young couples) with a small percentage of investors.
- Lendlease held 40% market share as at December 2017 - when stock available -
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- 37 home display village now open – largest in the Illawarra region.
- Two local parks now complete and the first district park (2.85ha) under construction.
- 250+ residents now living on site.
- 500 homes due for settlement by 30 June 2018.

### Planning Status

- 8 December 2010 the Minister for Planning determined (with modifications) the CUDP Concept Plan.
- 14 January 2011 Schedule 3 of State Environmental Planning Policy (Major Development) 2005 (now the State Significant Precincts SEPP) was amended to establish zoning and other planning controls for the CUDP.
- A Consolidated Concept Plan was prepared in March 2011 that includes the approved Concept Plan documentation.
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- A request to modify the Approved Concept Plan was submitted to DPE in November 2017 (Mod 4) and the Secretary's Environmental Assessment Requirements (SEARs) were issued on 1 February 2018.



## Concept Plan

## Part 3A | Calderwood Urban Development Project

- Town and Village Centres**  
Mixed Uses including Retail, Employment, Residential, Learning and Community Amenities
- Residential Neighbourhoods**
- Parks**  
eg Citywide, district and local parks
- Principal Open Space and Drainage**  
eg Environmental Conservation, Environmental Management and Drainage Corridors
- Indicative Water Bodies**



Subject to verification and detailed site survey 1:20,000 (A4) 10m Contours February 2011

Consolidated Concept Plan, Calderwood Urban Development Project (JBA March 2011)

## PROJECT OVERVIEW AND STATUS SUMMARY

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It is proposed to increase the overall number of dwellings to be delivered within the existing area of land zoned R1 General Residential and B4 Mixed Use approved for urban development as shown on the Approved Concept Plan from approximately 4,800 to approximately 6,500 dwellings. There is also a modest increase in retail floor space in the town centre from 20,000sqm to 25,000sqm.

The increase in housing supply is proposed without any expansion of the urban footprint (residential and mixed use zoned land) and without any change to the minimum lot sizes permitted under State Environmental Planning Policy (State Significant Precincts) 2005 (State Significant Precincts SEPP)

There is no substantive change between the proposed modified development and that envisaged by the Approved Concept Plan in respect of approved land uses, the urban structure of the development, the road and pedestrian network within the site, the overall range of minimum lot sizes/dwelling types/lot types to be provided, nor the scope of environmental protection outcomes for the land including the quantum and configuration of riparian and environmental corridor and environmental reserve lands.

The proposed increased dwelling yield will be achieved via the delivery of a greater diversity of dwelling types and lot sizes within the R1 General Residential and B4 Mixed Use zones generally as follows:

- o Within the R1 General Residential zone, additional yields will be achieved through the delivery of a more diverse range of housing types such as seniors housing and integrated housing and also by a different mix of lot sizes than was anticipated at the time of the Approved Concept Plan in 2010 (including a greater number of smaller lots) with the average lot size across the project decreasing from 450sqm to 420sqm; and
- o Within the B4 Mixed Use zone, the number of dwellings to be provided will be increased through the provision of a combination of more shop top housing, mixed use development and stand-alone residential development.

A range of new provisions are proposed to be incorporated into the Development Control Strategy to allow for the broader range of housing typologies, lot sizes and affordable housing options that are proposed to meet current market demand.

Related changes to the Approved Concept Plan are proposed to ensure the Calderwood development meets the needs of residents, namely:

- o an increase in the area of land required for open space within the site,
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### Next Steps

- Prepare the Environmental Assessment report (EAR) including a range of specialist sub-consultant reports consistent with the SEARs.
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- Transport and access;
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- Social and Community including local open space and riparian lands;
- Planning Agreements (potential for revised contributions toward services and infrastructure required as a result of the modification to the development of Calderwood).
- Future approvals:
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# Calderwood Valley Master Plan



## CALDERWOOD VALLEY

1. Sales & Information Centre
2. Display Village



## RETAIL

3. Proposed Village Centre
4. Proposed Town Centre



## TRANSPORT

5. Proposed Albion Park road bypass
6. Albion Park train station
7. Bus stop for route 75 (future bus stop locations to be determined)



## EDUCATION

8. Calderwood Christian School K-12
9. Proposed Government primary school
10. Proposed Government primary school
11. Proposed Government high school



## COMMUNITY

12. Sprout Hub temporary community centre & café



## RECREATION

13. Flame Tree Park
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15. Pine Tree Park
16. Proposed Recreation Precinct
17. Calderwood Valley Golf Course
18. 2ha heritage parkland and curtilage around Marshall Mount Homestead
19. Proposed park



## NATURE

20. Conservation land



- Private Lands
- Potential Retirement Living Precinct
- Infrastructure
- Medium Density Residential

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**Calderwood Urban Development Project Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**Summary Record of Agency Consultations**

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |         |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|
| <b>Date</b>                        | 18 May 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |         |
| <b>Project team member / firm</b>  | Adam Clarke (Cardno)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |         |
| <b>Organisation</b>                | OptiComm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |         |
| <b>Name of contact</b>             | Robert Carrick (OptiComm)<br>Darren Kelly (OptiComm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |         |
| <b>Position in organisation</b>    | Sales Manager – NSW and ACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |         |
| <b>Contact details</b>             | Robert Carrick :<br>M: 0421 058 734 P: (02) 8252 3604 E: <a href="mailto:rcarrick@opticomm.net.au">rcarrick@opticomm.net.au</a>                                                                                                                                                                                                                                                                                                                                                                                                                         |            |         |
| <b>Form of Consultation</b>        | Face to face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Phone call | Email X |
| <b>Issues discussed / outcomes</b> | <p>Email sent to Darren Kelly outlining the proposed increase in yield as part of the SEAR's documentation.</p> <ul style="list-style-type: none"> <li>Identified the proposed increase from 4,800 dwellings to 6,500 dwellings</li> <li>Identified the proposed location of the yield increased as the town centre along with some minor adjustments elsewhere.</li> </ul> <p>Darren responded and advised Robert Carrick could assist however it was conveyed that OptiComm would have no issue in being able to cope with the increased density.</p> |            |         |
| <b>Actions arising</b>             | Cardno to provide consultation summary to OptiComm.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |         |

**Briefing Note**

**for**

**Opticomm**

**CUDP Concept Plan Approval (MP09\_0082)**

**S75W Modification Application (Mod 4)**

**18 May 2018**

**ITEMS FOR DISCUSSION**

**Project Overview and Status Summary**

**Briefing on Number/Location of Density Increase**

## PROJECT OVERVIEW AND STATUS SUMMARY

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### Key Facts:

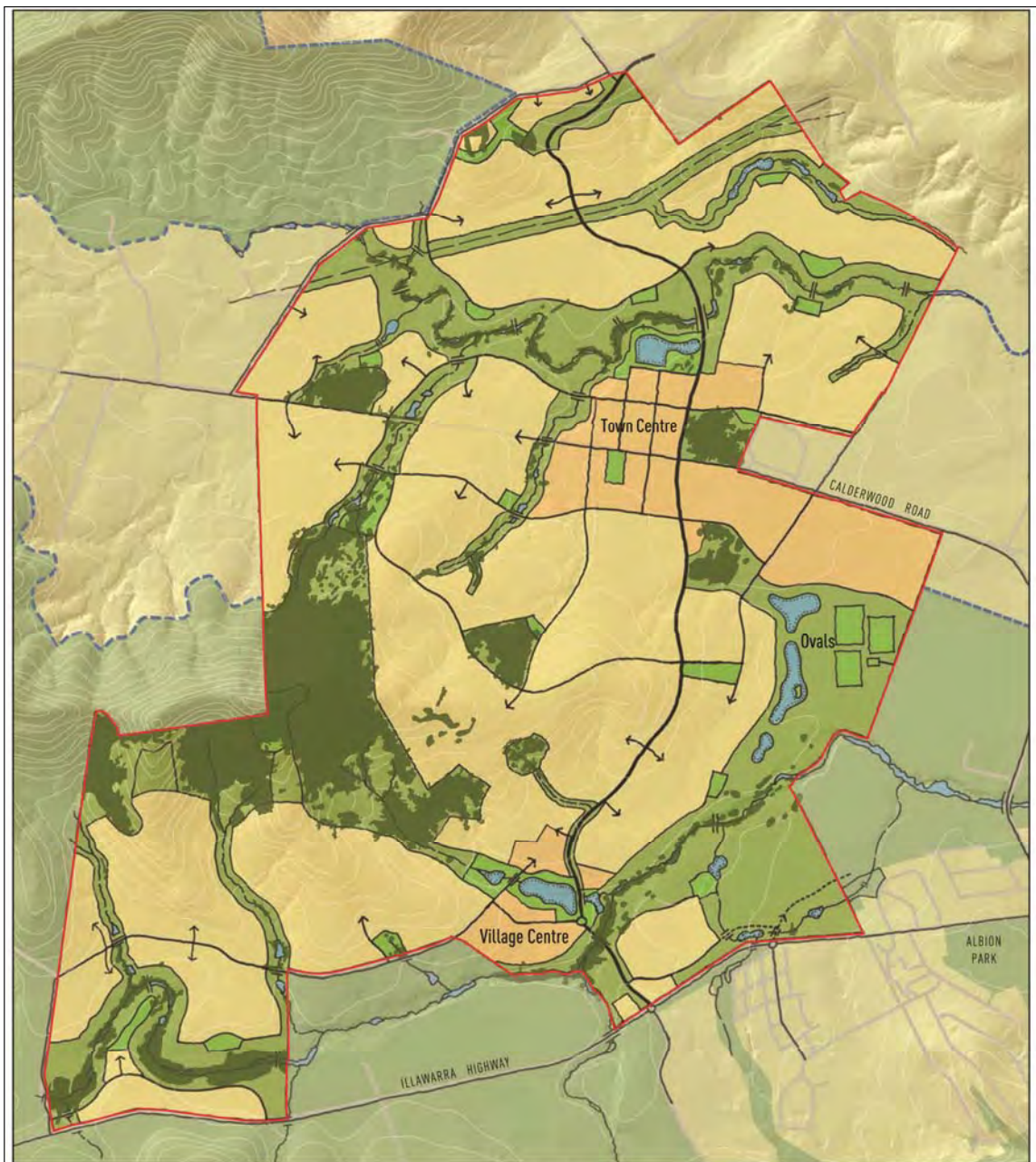
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m 0 100 500 1,000

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20. Conservation land



Private Lands



Potential Retirement Living Precinct



Infrastructure



Medium Density Residential

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**Calderwood Urban Development Project Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**Summary Record of Agency Consultations**

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |         |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|
| <b>Date</b>                        | 17 April 2018 and 24 May 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |         |
| <b>Project team member / firm</b>  | Adam Clarke (Cardno)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |         |
| <b>Organisation</b>                | Jemena                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |         |
| <b>Name of contact</b>             | Greg Knight                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |         |
| <b>Position in organisation</b>    | Network Development Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |         |
| <b>Contact details</b>             | T: 0402 060 241 E: <a href="mailto:Gregory.Knight@jemena.com.au">Gregory.Knight@jemena.com.au</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |         |
| <b>Form of Consultation</b>        | Face to face                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Phone call | Email X |
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| <b>Actions arising</b>             | <ul style="list-style-type: none"> <li>Nil</li> </ul> <p>For information Cardno has prepared a spreadsheet showing increase yield areas along with timings to Jemena.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |         |

**Briefing Note  
for  
Endeavour Energy**

**CUDP Concept Plan Approval (MP09\_0082)  
S75W Modification Application (Mod 4)**

**24 May 2018**

**ITEMS FOR DISCUSSION**

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Briefing on Number/Location of Density Increase  
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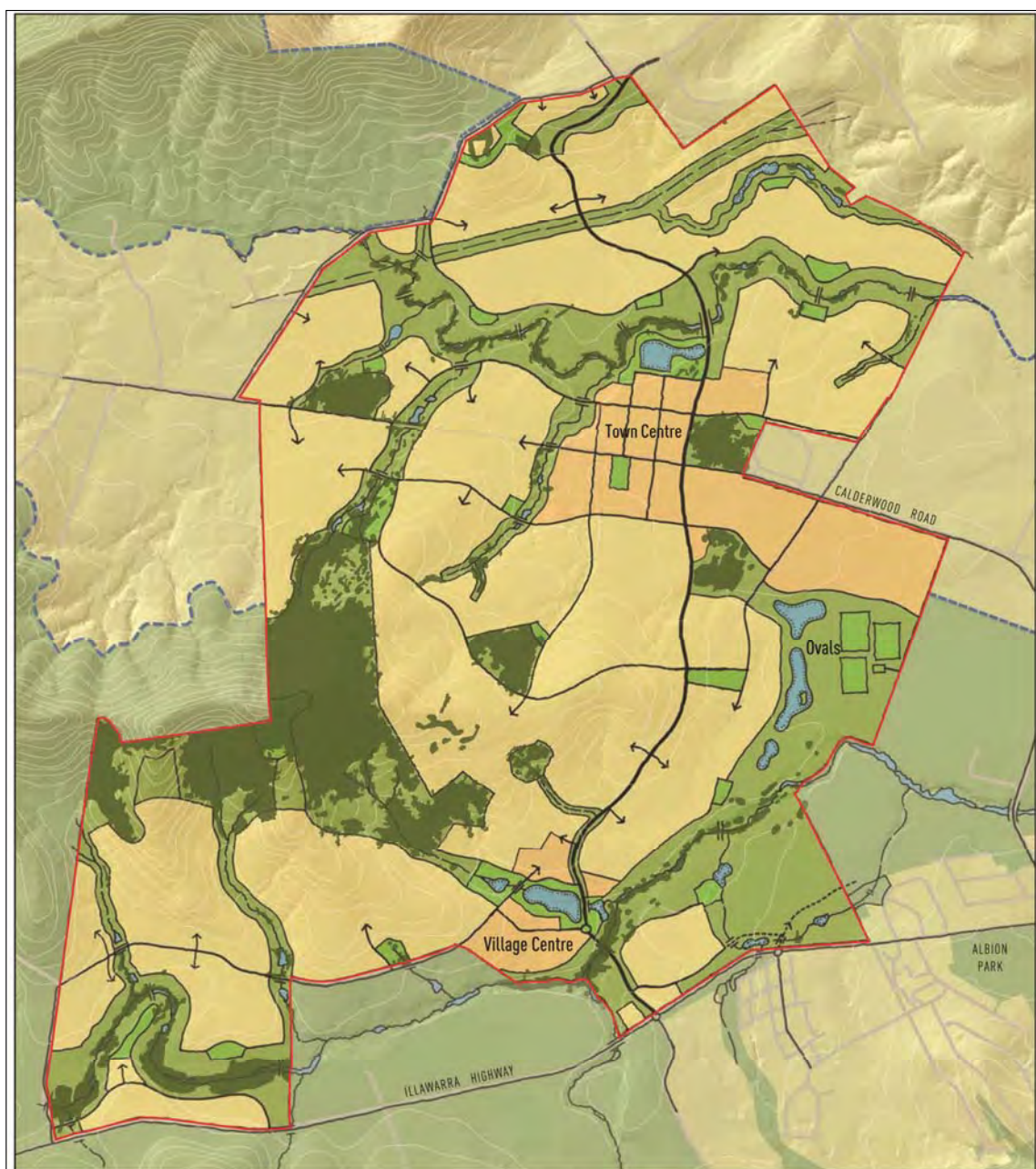
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It is proposed to increase the overall number of dwellings to be delivered within the existing area of land zoned R1 General Residential and B4 Mixed Use approved for urban development as shown on the Approved Concept Plan from approximately 4,800 to approximately 6,500 dwellings. There is also a modest increase in retail floor space in the town centre from 20,000sqm to 25,000sqm.

The increase in housing supply is proposed without any expansion of the urban footprint (residential and mixed use zoned land) and without any change to the minimum lot sizes permitted under State Environmental Planning Policy (State Significant Precincts) 2005 (State Significant Precincts SEPP)

There is no substantive change between the proposed modified development and that envisaged by the Approved Concept Plan in respect of approved land uses, the urban structure of the development, the road and pedestrian network within the site, the overall range of minimum lot sizes/dwelling types/lot types to be provided, nor the scope of environmental protection outcomes for the land including the quantum and configuration of riparian and environmental corridor and environmental reserve lands.

The proposed increased dwelling yield will be achieved via the delivery of a greater diversity of dwelling types and lot sizes within the R1 General Residential and B4 Mixed Use zones generally as follows:

- o Within the R1 General Residential zone, additional yields will be achieved through the delivery of a more diverse range of housing types such as seniors housing and integrated housing and also by a different mix of lot sizes than was anticipated at the time of the Approved Concept Plan in 2010 (including a greater number of smaller lots) with the average lot size across the project decreasing from 450sqm to 420sqm; and
- o Within the B4 Mixed Use zone, the number of dwellings to be provided will be increased through the provision of a combination of more shop top housing, mixed use development and stand-alone residential development.

A range of new provisions are proposed to be incorporated into the Development Control Strategy to allow for the broader range of housing typologies, lot sizes and affordable housing options that are proposed to meet current market demand.

Related changes to the Approved Concept Plan are proposed to ensure the Calderwood development meets the needs of residents, namely:

- o an increase in the area of land required for open space within the site,
- o an increase in the provision of retail floor space within the new town centre;
- o a review of servicing requirements;
- o a review of local and regional transport infrastructure, and
- o delivery of more capacity in local community infrastructure including the planned community centre.

### Next Steps

- Prepare the Environmental Assessment report (EAR) including a range of specialist sub-consultant reports consistent with the SEARs.
- Consult with Councils, agencies and existing landholders as required by the SEARs.
- Lodge EAR by 30 June 2018.
- DPE exhibit and assess.
- Determination.

## PROJECT OVERVIEW AND STATUS SUMMARY

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### Programme

An overview of the Project Programme follows:

| Key Step                                        | When                      |
|-------------------------------------------------|---------------------------|
| Meeting with DPE and lodgement of SEARs request | November 2017             |
| SEARs issued                                    | 1 February 2018           |
| Environmental Assessment supporting studies     | February – May 2018       |
| Authority and Agency Consultation               | April – May 2018          |
| Meetings and consultation with DPE              | April – May 2018          |
| Community Consultation and Information          | May 2018                  |
| Review and refinement                           | May – June 2018           |
| Reports finalised                               | June 2018                 |
| Documentation lodged                            | 30 June 2018              |
| Exhibition                                      | August – September 2018   |
| Response to submissions                         | September – November 2018 |
| Assessment and decision                         | November – December 2018  |
| Determination                                   | 2019                      |

### Consultation with WCC on issues impacting the WCC LGA

- Transport and access;
- Water cycle management;
- Utilities and Infrastructure;
- Social and Community including local open space and riparian lands;
- Planning Agreements (potential for revised contributions toward services and infrastructure required as a result of the modification to the development of Calderwood).
- Future approvals:
  - o No change. DA's lodged with local council/relevant authority on a stage by stage basis.

# Calderwood Valley Master Plan



## CALDERWOOD VALLEY

1. Sales & Information Centre
2. Display Village



## RETAIL

3. Proposed Village Centre
4. Proposed Town Centre



## TRANSPORT

5. Proposed Albion Park road bypass
6. Albion Park train station
7. Bus stop for route 75 (future bus stop locations to be determined)



## EDUCATION

8. Calderwood Christian School K-12
9. Proposed Government primary school
10. Proposed Government primary school
11. Proposed Government high school



## COMMUNITY

12. Sprout Hub temporary community centre & café



## RECREATION

13. Flame Tree Park
14. Fig Tree Park
15. Pine Tree Park
16. Proposed Recreation Precinct
17. Calderwood Valley Golf Course
18. 2ha heritage parkland and curtilage around Marshall Mount Homestead
19. Proposed park



## NATURE

20. Conservation land



- Private Lands
- Potential Retirement Living Precinct
- Infrastructure
- Medium Density Residential

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## APPENDIX

# B

UTILITY SERVICES PLANS PROVIDED WITHIN  
THE PREVIOUSLY APPROVED CONSOLIDATED  
CONCEPT PLAN

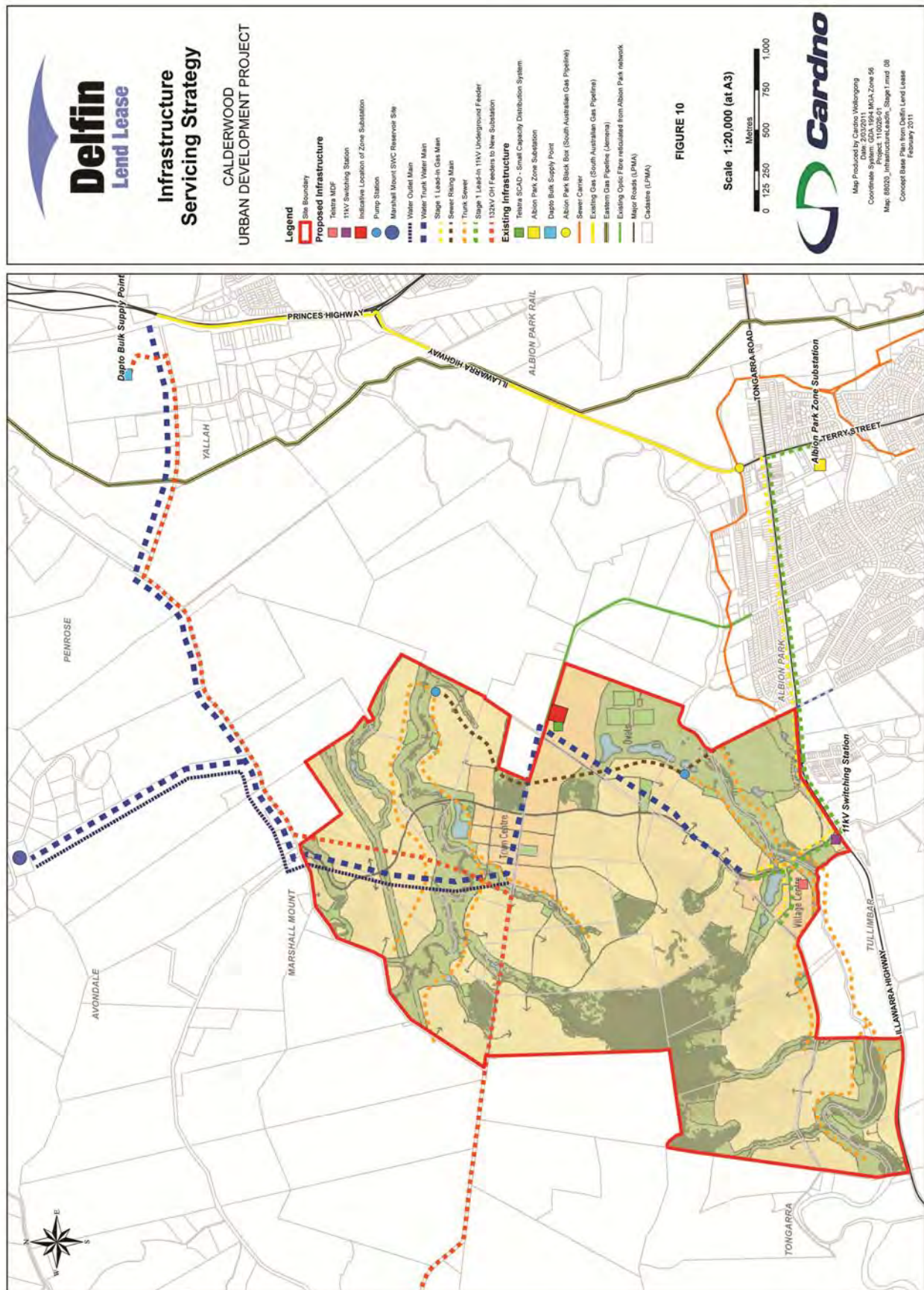


Figure 17 – Infrastructure servicing strategy (Source: Cardno, 2010)

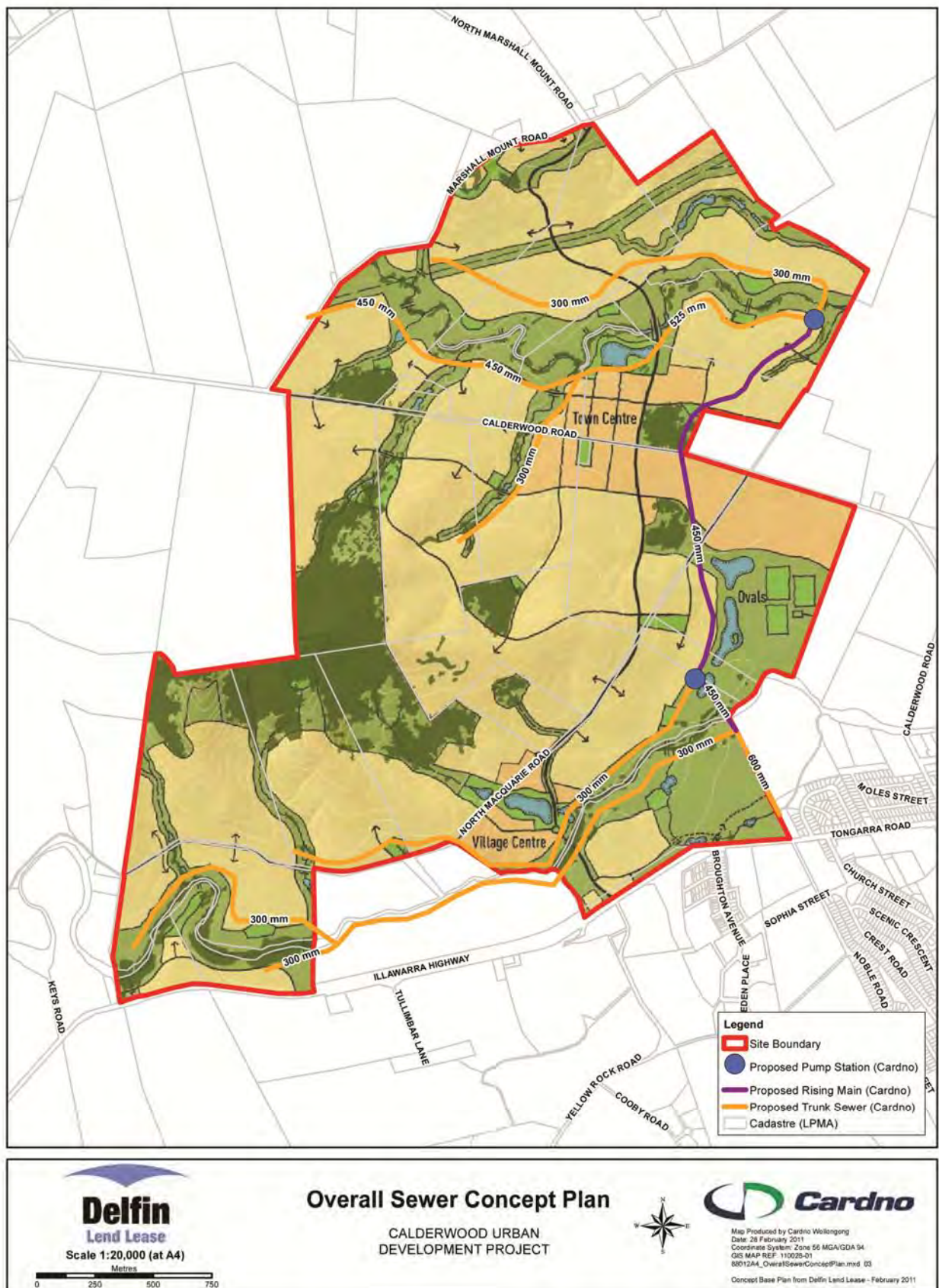


Figure 18 – Overall Sewer Concept Plan (Source: Cardno 2010)

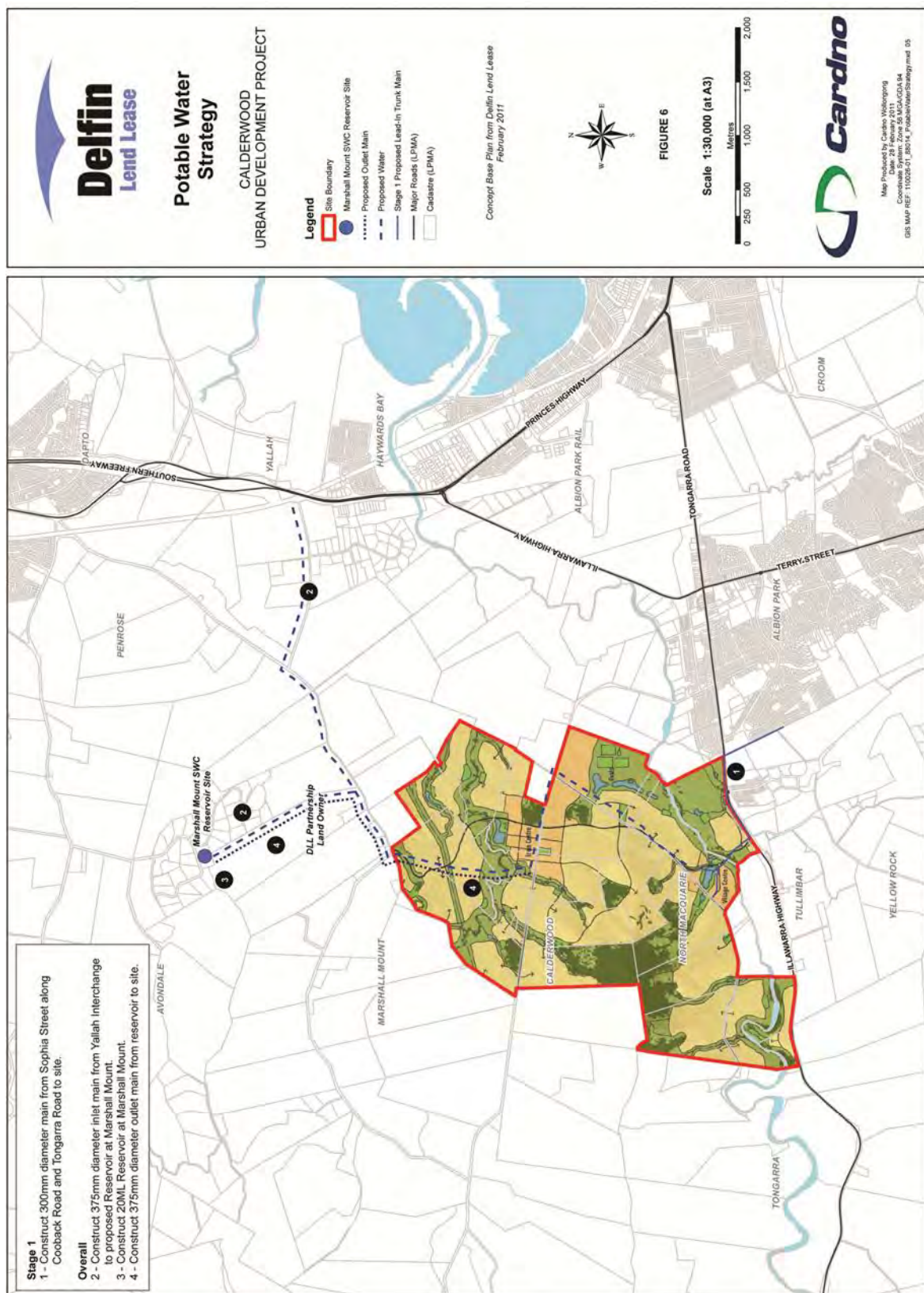


Figure 19 – Concept Plan Potable Water Strategy (Source: Cardno, 2010)

# APPENDIX

# C

PROPOSED UTILITY SERVICES MAPS



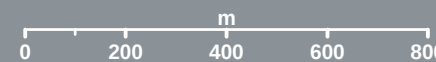
# Utility Services Future / Proposed (Water)

CALDERWOOD YIELD REVIEW

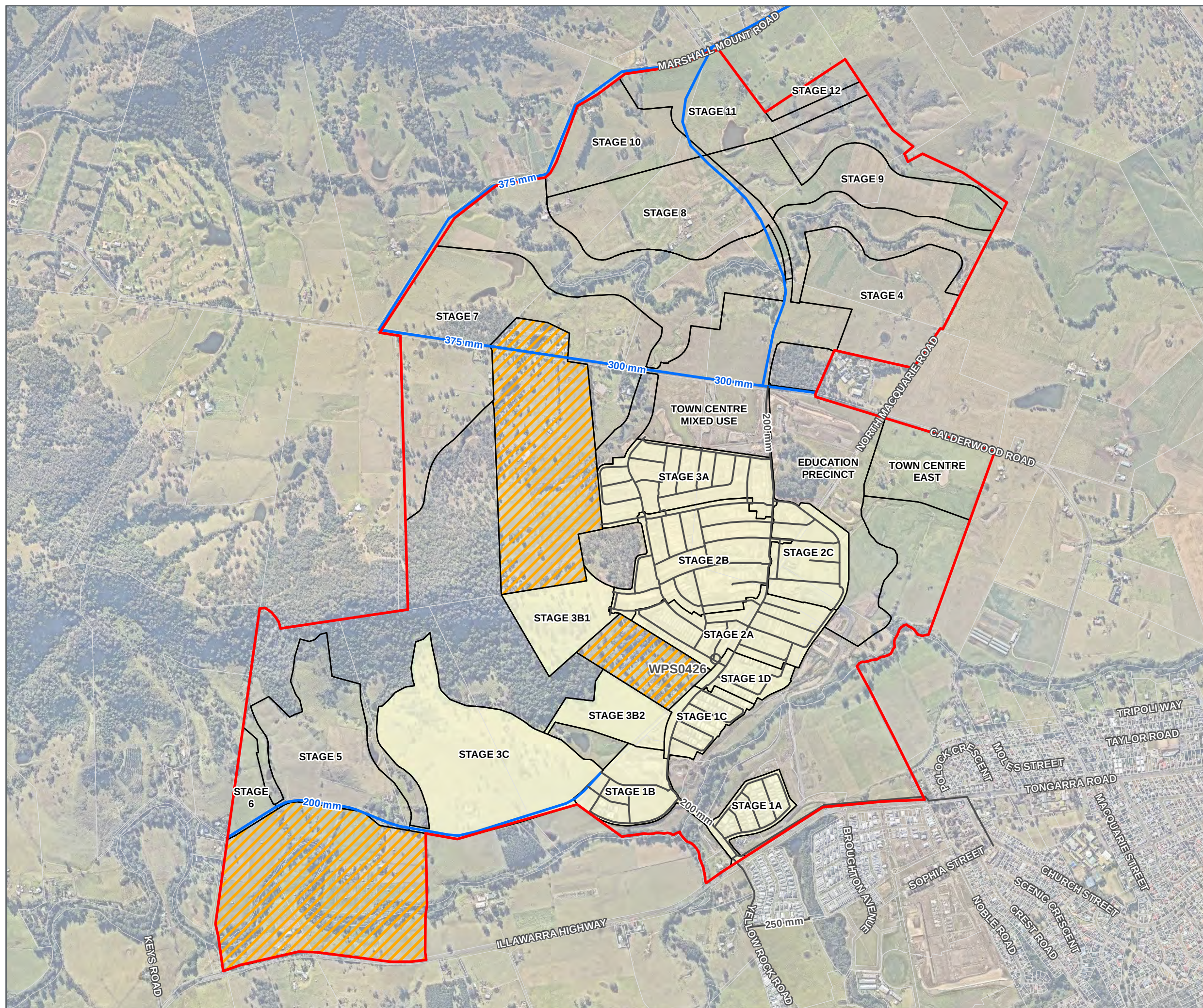
## Legend

- Study Area
- Stage Boundaries
- Future Water Mains
- Existing/Approved Water Main
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2018-07-12 | Project: 82018194-01  
Coordinate System: GDA 1994 MGA Zone 56  
Map: 82018194-GS-012\_ProposedUtilities\_Water\_Yield.mxd 03  
Aerial imagery supplied by nearmap (May, 2018)





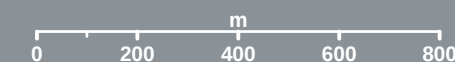
# Utility Services Future / Proposed (Sewer)

CALDERWOOD YIELD REVIEW

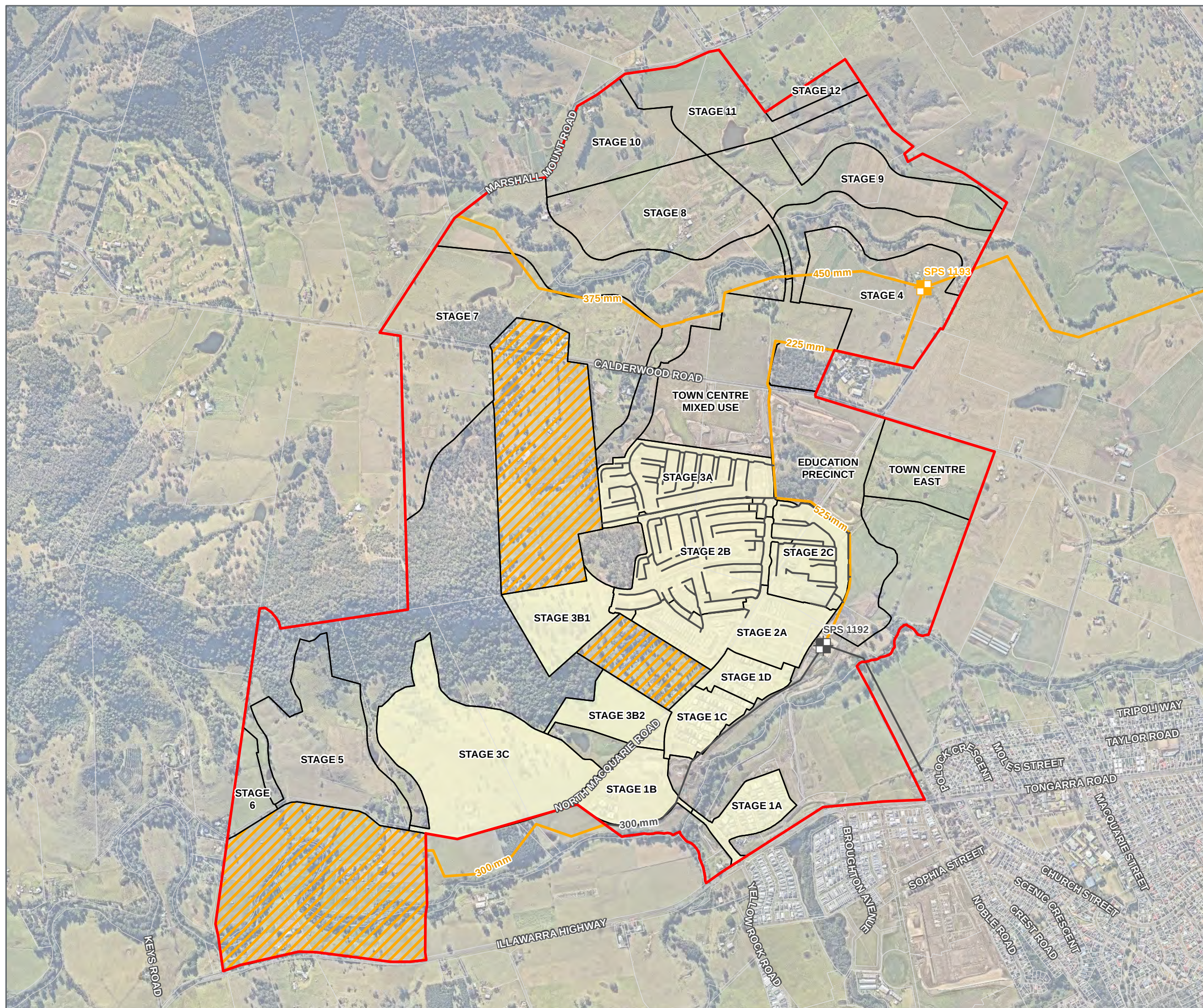
## Legend

- Study Area
- Stage Boundaries
- Future Pump Station
- Existing Pump Station
- Future Sewer Mains
- Existing/Approved Sewer Main
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
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Map: 82018194-GS-016\_ProposedUtilities\_Sewer\_Yield.mxd 03  
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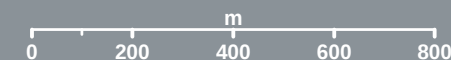
# Utility Services Future / Proposed (Electrical)

CALDERWOOD YIELD REVIEW

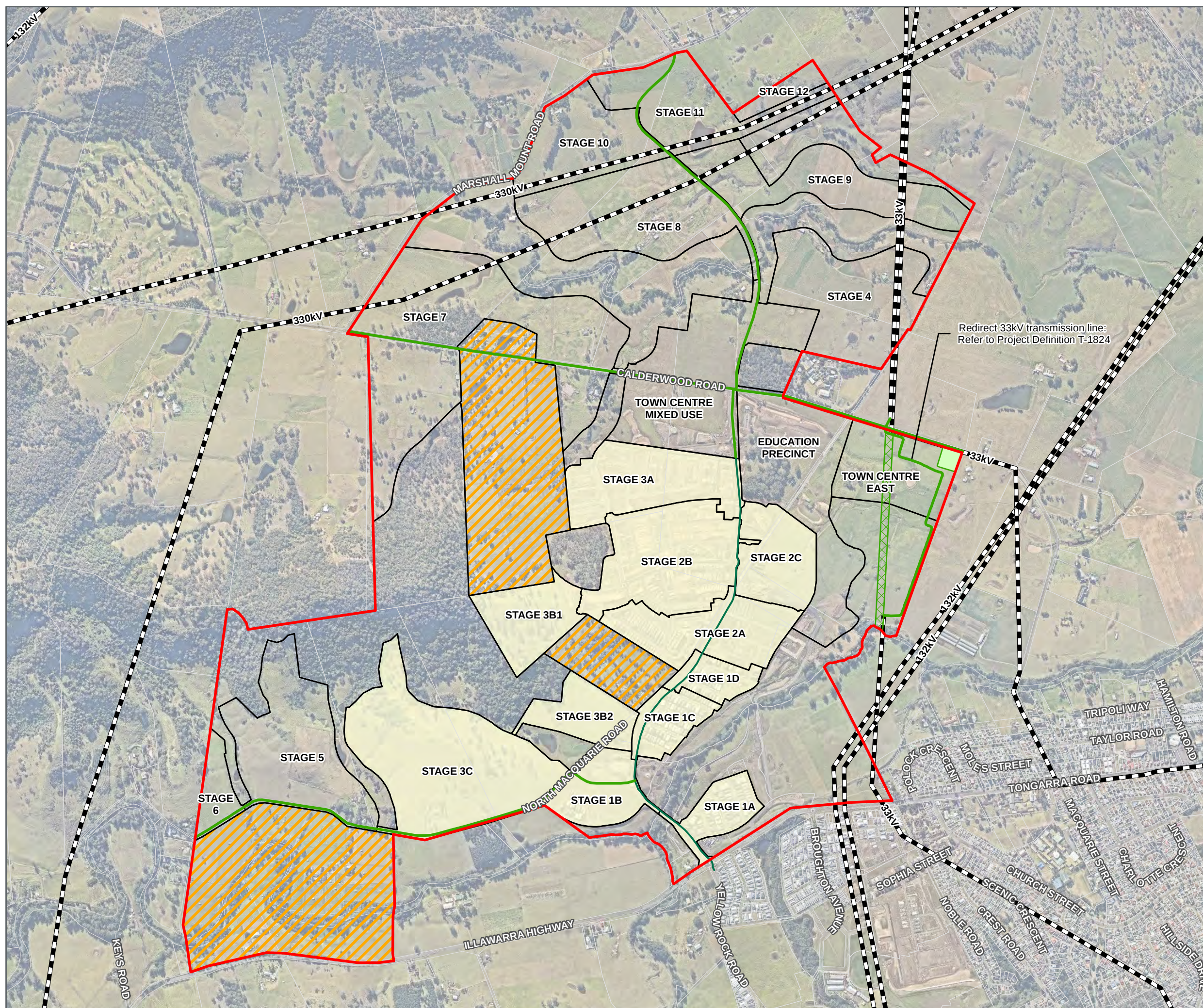
## Legend

- Study Area
- Stage Boundaries
- Existing Electrical Lead-in
- Proposed Electrical Lead-in
- Electricity Transmission Line (LPI)
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)
- Existing Electrical Easement
- Proposed Electrical Substation

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2018-07-12 | Project: 82018194-01  
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Map: 82018194-GS-011\_ProposedUtilities\_Elec\_Yield.mxd 02  
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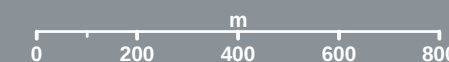
# Utility Services Future / Proposed (Telecommunications)

CALDERWOOD YIELD REVIEW

## Legend

- Study Area
- Stage Boundaries
- Existing Satellite Compound
- Existing Mains Connection Point
- Existing Telecommunications
- Proposed Telecommunications
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2018-07-12 | Project: 82018194-01  
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Map: 82018194-GS-009\_ProposedUtilities\_Telco\_Yield.mxd 02  
Aerial imagery supplied by nearmap (May, 2018)



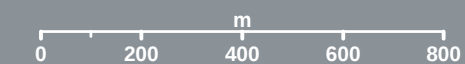
# Utility Services Future / Proposed (Gas)

CALDERWOOD YIELD REVIEW

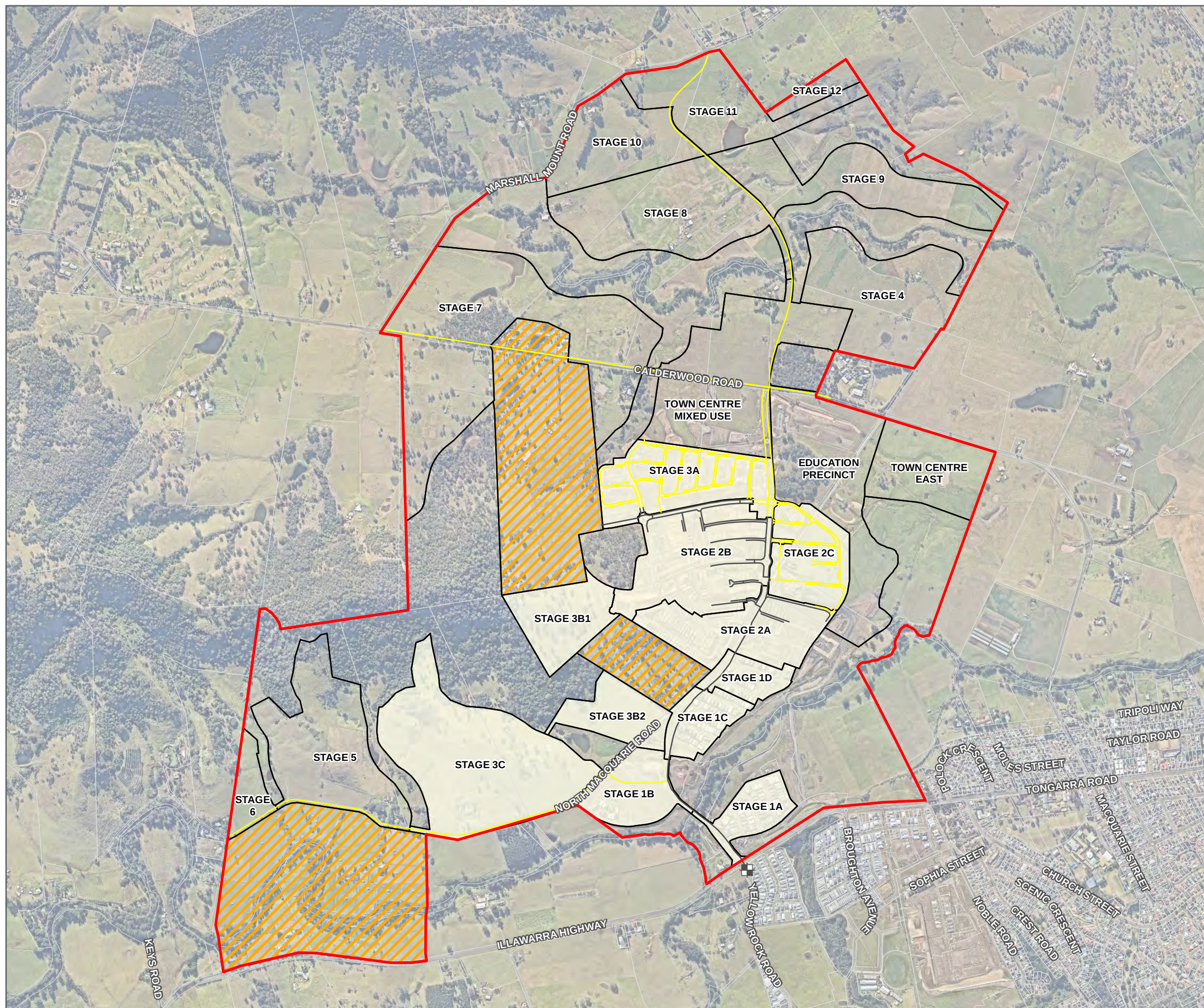
## Legend

- Study Area
- Stage Boundaries
- Existing Mains Connection Point
- Existing Gas
- Proposed Gas
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2018-07-12 | Project: 82018194-01  
Coordinate System: GDA 1994 MGA Zone 56  
Map: 82018194-GS-004\_ProposedUtilities\_Gas\_Yield.mxd 02  
Aerial imagery supplied by nearmap (May, 2018)



# APPENDIX

# D

EXISTING UTILITY SERVICES MAPS



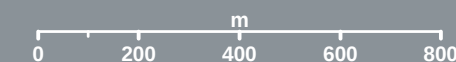
# Utility Services Currently Approved / Delivered (Water)

CALDERWOOD YIELD REVIEW

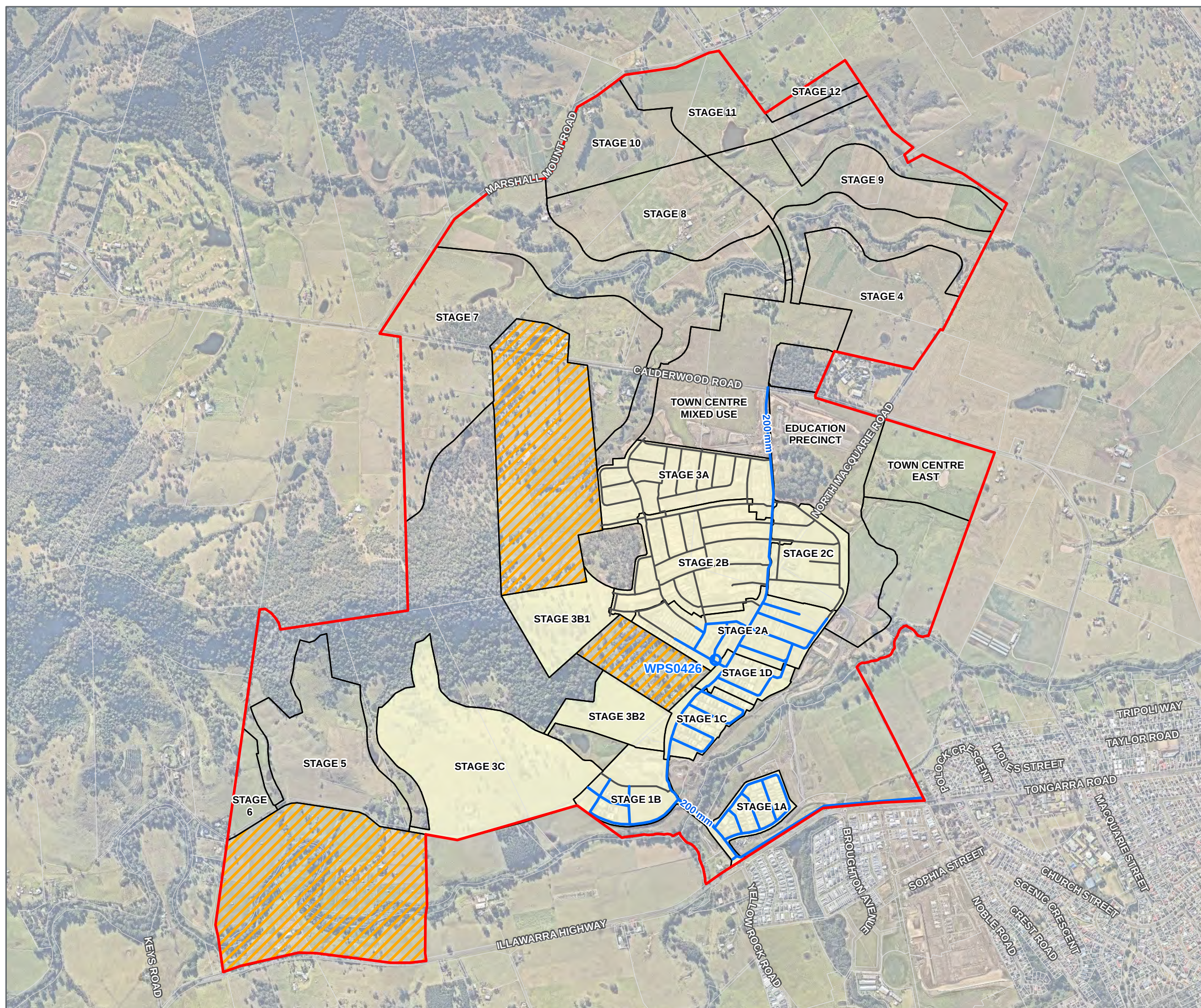
## Legend

- Study Area
- Stage Boundaries
- Existing Water Main
- Approved / Constructed Water Main
- Non Core Lands
- Approved Stages
- Cadastre (DFS-I-SS, 2017)

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2018-07-12 | Project: 82018194-01  
Coordinate System: GDA 1994 MGA Zone 56  
Map: 82018194-GS-020\_ExistingUtilities\_Water\_Yield.mxd 03  
Aerial imagery supplied by nearmap (May, 2018)



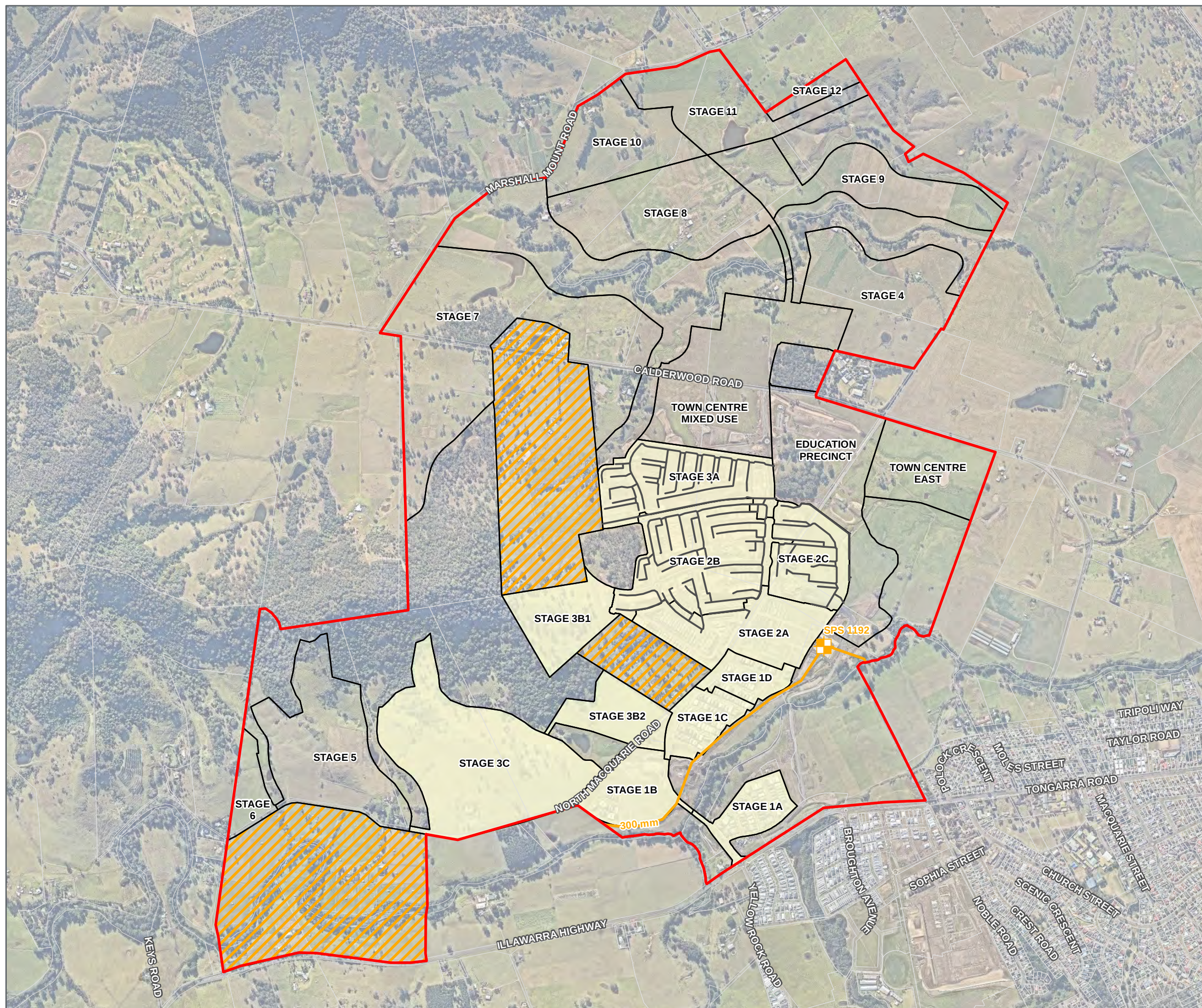


# Utility Services Currently Approved / Delivered (Sewer)

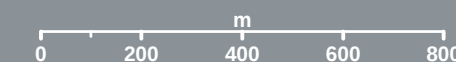
CALDERWOOD YIELD REVIEW

## Legend

- Study Area
- Stage Boundaries
- Existing Pump Station
- Existing Sewer Main
- Approved / Constructed Sewer
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)



1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
Date: 2018-07-12 | Project: 82018194-01  
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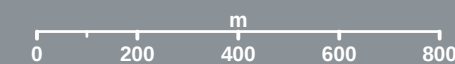
# Utility Services Currently Approved / Delivered (Electrical)

CALDERWOOD YIELD REVIEW

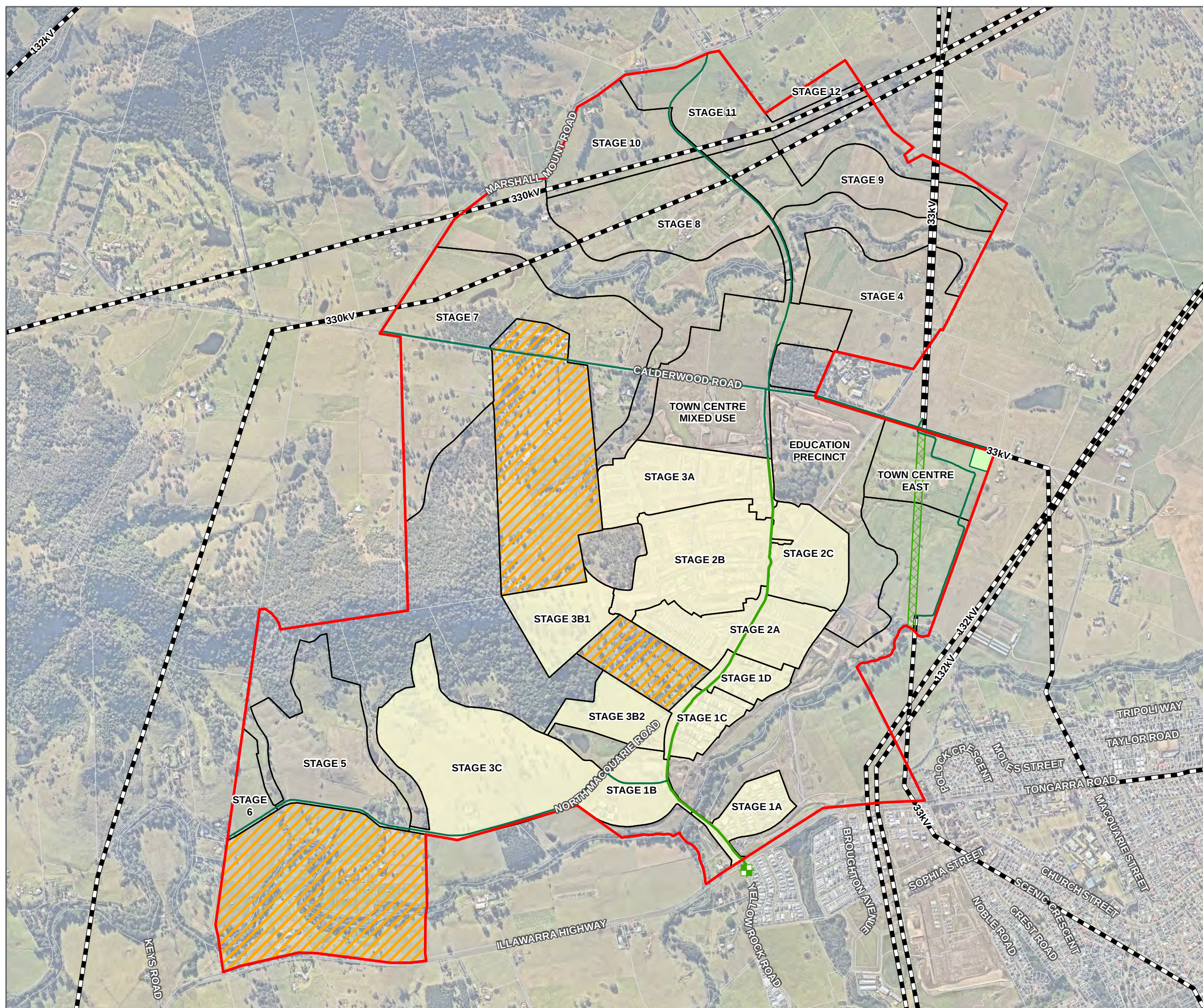
## Legend

- Study Area
- Stage Boundaries
- Existing Mains Connection Point
- Existing Electrical Lead-in
- Proposed Electrical Lead-in
- Electricity Transmission Line (LPI)
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)
- Existing Electrical Easement
- Proposed Electrical Substation

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
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Aerial imagery supplied by nearmap (May, 2018)





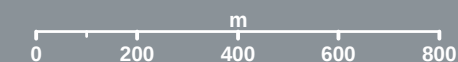
# Utility Services Currently Approved / Delivered (Telecommunications)

CALDERWOOD YIELD REVIEW

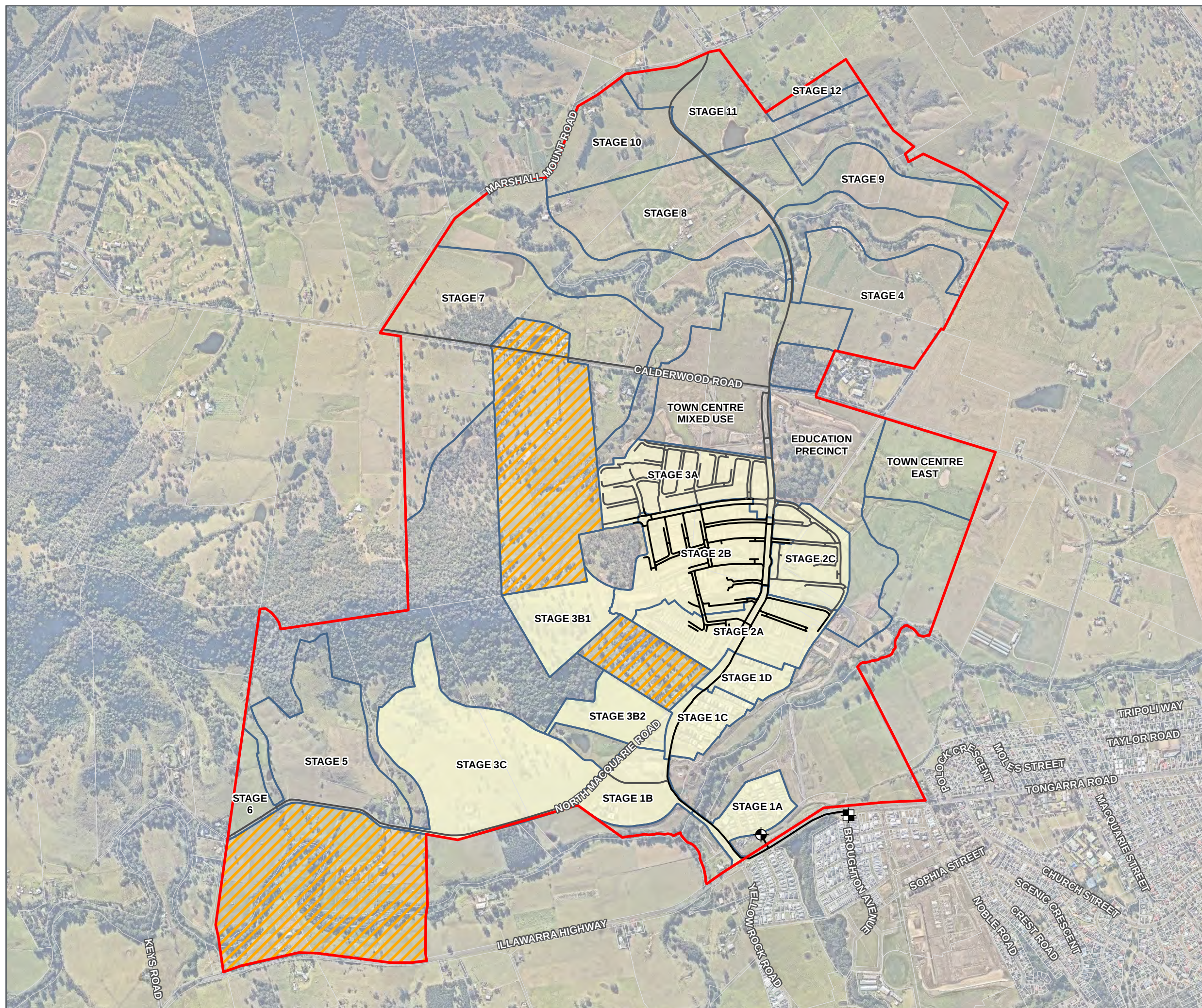
## Legend

- Study Area
- Stage Boundaries
- Existing Satellite Compound
- Existing Mains Connection Point
- Existing Telecommunications
- Proposed Telecommunications
- Non Core Lands
- Approved Stages
- Cadastre (DFSI-SS, 2017)

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
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Coordinate System: GDA 1994 MGA Zone 56  
Map: 82018194-GS-018\_ExistingUtilities\_Telco\_Yield.mxd 02  
Aerial imagery supplied by nearmap (May, 2018)





-  Study Area
-  Stage Boundaries
-  Existing Mains Connection Point
-  Existing Gas
-  Proposed Gas
-  Non Core Lands
-  Approved Stages
-  Cadastre (DFSI-SS, 2017)



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)  
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