

PROJECT NO: ISC00168

MEADOW VIEWS

144 CALDERWOOD ROAD, CALDERWOOD

UTILITIES INVESTIGATION REPORT

February 2021

Prepared For:

ILLAWARRA LAND CORP PTY LTD





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1 INTRODUCTION

Illawarra Land Corp Pty Ltd has engaged Maker ENG Pty Ltd (Maker) to provide professional services to support the rezoning process with Shellharbour City Council for the rezoning of rural land to residential for the purpose of future development at 144 Calderwood Road, Calderwood (Lot 2 DP651377).

An important consideration during the preliminary stage of the project involves determining the ability of the site to be serviced by utility services. The report will assist in informing the suitability of the site for development and assess both current and proposed services in its vicinity.

1.1 SITE DESCRIPTION

The Meadow Views Development (subject site) is located on the northern side of Calderwood Road, approximately 2.5km from Albion Park and has an area of 91.25 hectares. Bisected by Marshall Mount Creek, the site contains two farm dams and one dwelling. Neighbouring the subject site is LendLease's Calderwood Valley project and the broader Calderwood Urban Development Program (CUDP), with the proposed LendLease Town Centre East development located immediately south of the site and the Calderwood Christian school to the immediate west of the site. **Figure 1-1** highlights the location of the site relative to its surroundings.

The northern side of the site sits within the Wollongong City Council Local Government Area and immediately adjacent to the West Dapto Stage 5 Release Area – Yallah Marshall Mount.

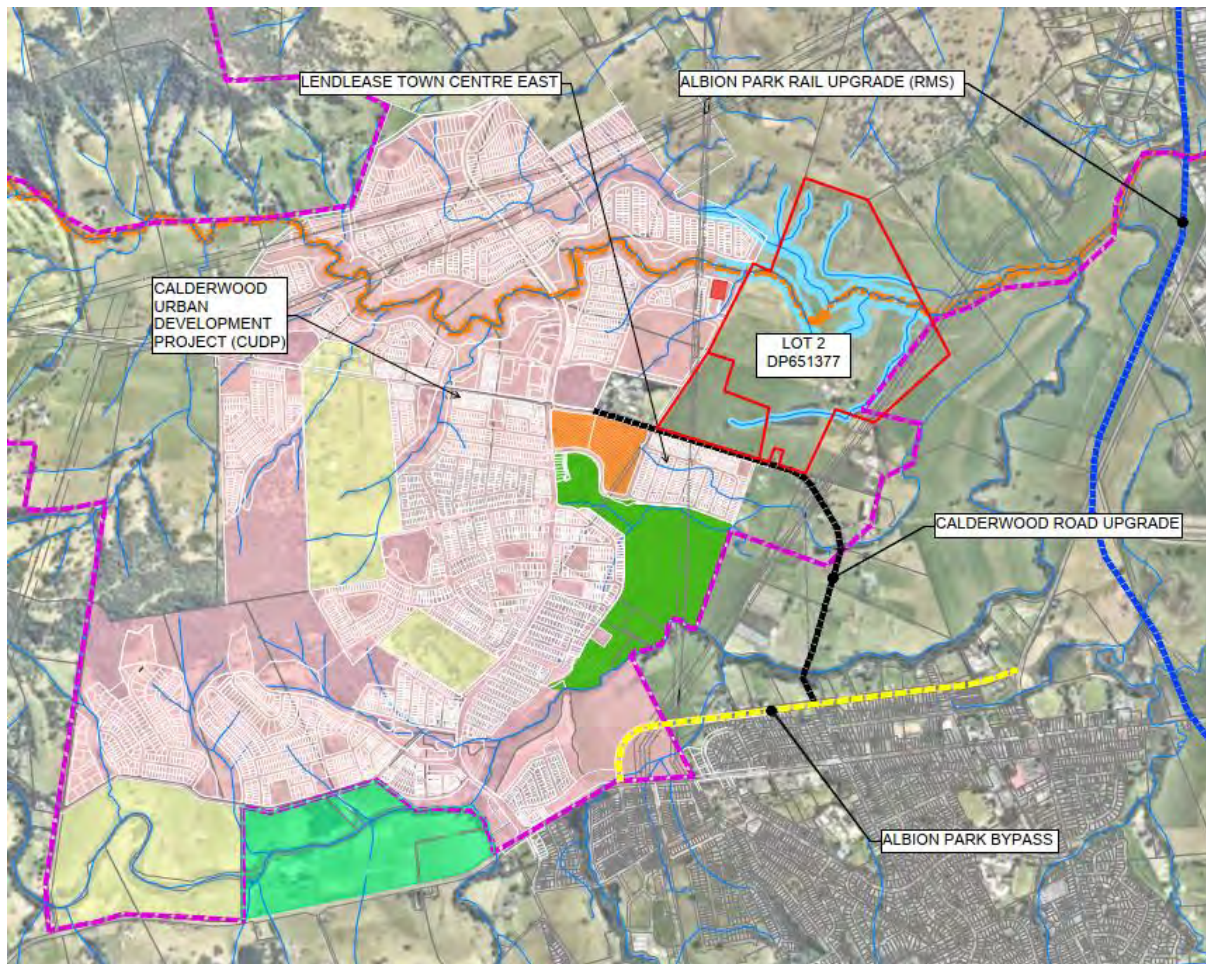


Figure 1-1 Site locality in context to Calderwood Valley.

The future layout of the subject site is likely to consist of approximately 400 residential lots with sizes ranging between 240m² and 700m². The concept plan attached in **Appendix A** displays the potential lot layout for the development. Maker has been involved in the development of the neighbouring CUDP and has conducted several



previous utility investigations. Many of the utilities required to service the subject site are expected to lead-in from the adjacent development.

A utility Services Review completed by Cardno on 9 August 2018 details the servicing plan for the CUDP. The report indicated Lendlease's amendment to servicing requirements due to an increased lot yield from 4,800 lots to 6,500 lots, which subsequently resulted in the design and staging of utilities to service this increased lot yield. Lendlease has since amended the CUDP development to seek only 6,000 lots, indicating potential to service an additional 500 lots. This report aims to investigate the effects of the decreased lot yield and the resulting effects on available capacity to service the subject site.

2 WATER AND SEWER SERVICES

Sydney Water is the utility service authority responsible for the management and delivery of water and sewer reticulation services in the Calderwood precinct. Maker has confirmed that potable water and sewer infrastructure exists in the immediate vicinity of the subject site and has been recently, or are planned to be, constructed to service the neighbouring CUDP development. Connection to potable water and wastewater services planned to service the CUDP are anticipated to provide viable connection and capacity for the subject site.

2.1 WATER

Existing potable water services in the vicinity of the subject site consist of a 200mm watermain along Escarpment Drive, within the CUDP. To service the later stages of the CUDP, a 300mm trunk water main is proposed to run along Calderwood Road, along with Water Booster Pump Stations (WPS) throughout the network as required.

Sydney Water advised Cardno the increased lot yield of 6,500 lots was used to determine the sizing and staging of the infrastructure at the time of the report. The recent amendment to the lot yield within CUDP of 6,000 lots indicates it would be feasible to service the 400 lots within the subject site with the remaining capacity.



Figure 2-2 Proposed potable water connection point.

Whilst engagement with Sydney Water has indicated that no consideration has been given to the servicing requirements of any potential developments outside of the CUDP, Sydney Water's Growth Servicing Plan (**Figure 2-1**) highlights the subject site to be within the Strategic Planning stage of planned future growth. It was also implied that major lead in works would not be required for the development.



Illawarra Region

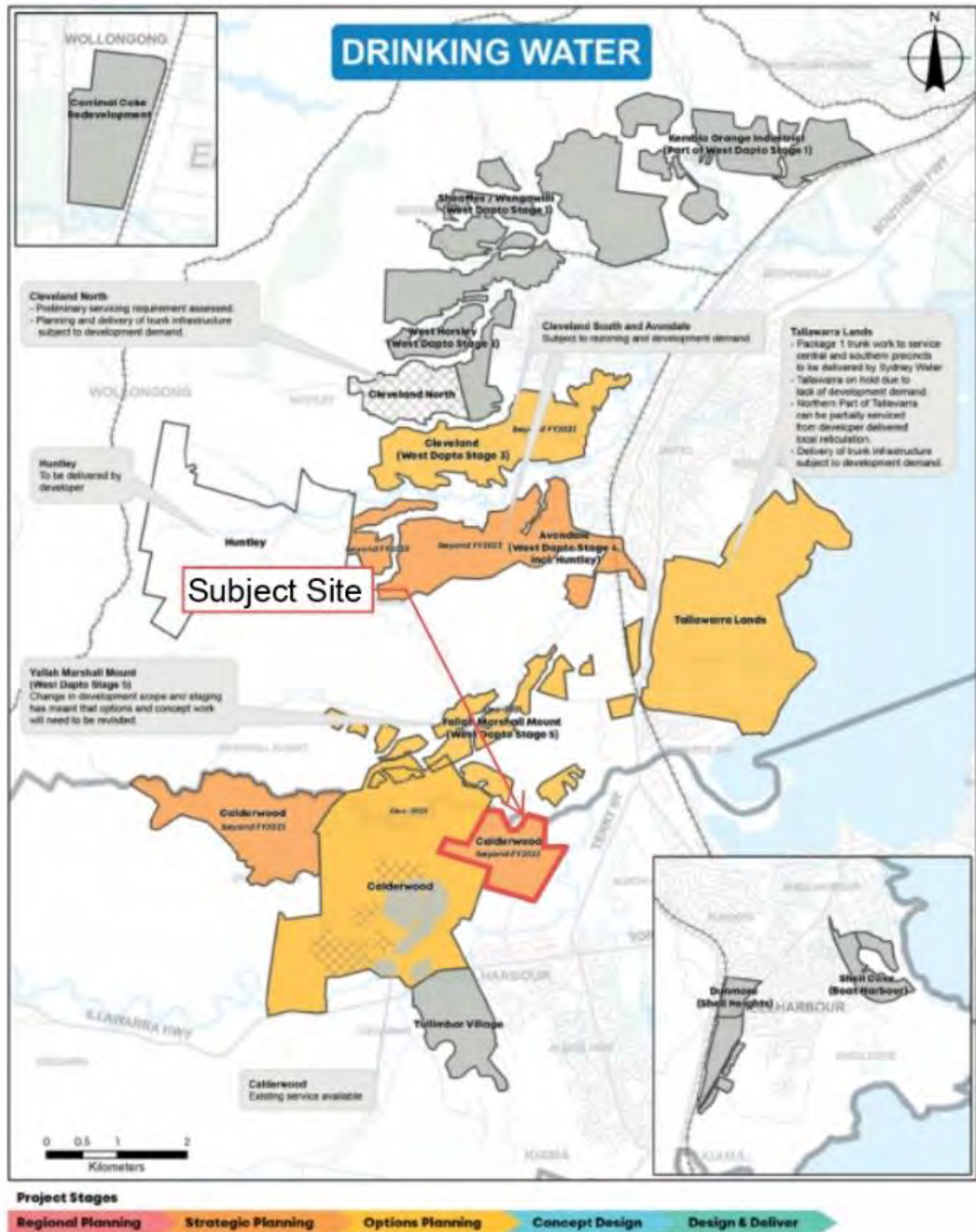


Figure 2-1 Sydney Water Growth Servicing Plans.

Further information regarding the capacity of the network and lead-in connection to the subject site will be provided by Sydney Water once the planning proposal has progressed. Summary of the phone call shared between Maker and Helal Morshedi (Sydney Water representative) has been summarised in **Appendix B**.



2.2 SEWER

Maker is aware of major sewerage infrastructure currently being constructed to service the CUDP development including two sewerage pumping stations (SPS). Currently, a singular SPS services the initial stages of the CUDP (SPS1192). To meet the capacity requirements of the later stages of the CUDP, a second SPS (SPS1193), pictured in **Figure 2-3**, will be constructed to the immediate west of this site, with plans to install a 400mm sewerage line through the subject site.

Sydney Water has informed Cardno that the sizing and staging of sewerage infrastructure will be determined based on the increased lot yield of 6,500 lots. Subsequently, the reduced lot yield of 6,000 lots within the CUDP indicates it would be feasible for the future connection to the sewerage pump station to the immediate west of the site (SPS1193).

Maker is aware that provisions have been allowed for the future upgrade of SPS1192 to service the entirety of the CUDP, in addition to 2,900 lots that surround the CUDP. Upgrade works of SPS1192 are anticipated to increase capacity availability within the Sewerage Pump Station neighbouring the subject site (SPS1193). Based on the proposed location of the SPS and its proximity to the subject site, it is reasonably envisaged that connection will be straightforward.

A formal application is required to confirm the time of construction of the SPS and whether adequate capacity is available. An informal implication received from Sydney Water indicating no major lead-in connection works are required also suggest that the newly constructed network has considered the future growth of the network. Summary of the phone call shared between Maker and Helal Morshedi (Sydney Water representative) has been summarised in **Appendix B**.

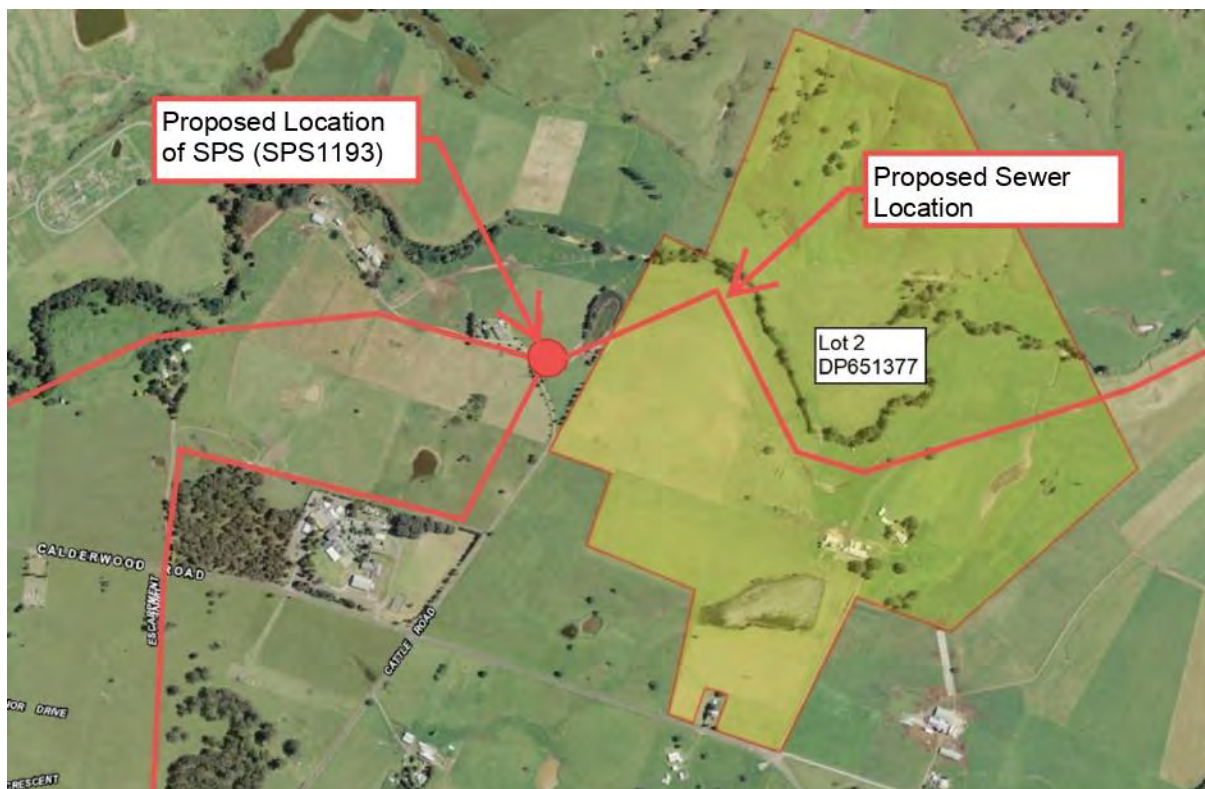


Figure 2-3 Proposed sewerage pump station and connection point.

3 ELECTRICAL SERVICES

Endeavour Energy is the utility service authority responsible for the management and delivery of electrical services in the core Calderwood precinct neighbouring the subject site. The initial stages of the CUDP are currently serviced by an existing power distribution station on Russell Street in Albion Park located approximately 2.5km from the CUDP. However, this network currently provides electricity to the Albion Park area and has



insufficient capacity to service the entire CUDP extents, therefore implementation of a new zone substation is currently underway.

The entire CUDP is proposed to be serviced by a 132/ 11kV substation within a designated site immediately south of the subject site as seen in **Figure 3-1**. Maker has been advised by Endeavour Energy that it is likely that additional capacity may be available to service the subject site once the Calderwood Zone Substation is commissioned around mid-2022. Endeavour Energy is expected to fund the proposed zone substation and the accompanying three 132kV feeders which will be supplying the substation.



Figure 3-1 Proposed zone substation and electrical connection point.

A response from Endeavour Energy received in May 2020 indicated it is likely two additional developer funded 11kV feeders may be required to meet the electricity servicing demands of the subject site. This response, however, is subject to change as a formal application is required for capacity reservation. Correspondence between Maker and Endeavour Energy can be seen in **Appendix C**.

4 GAS SERVICES

Zinfra is the utility service authority responsible for the management and delivery of gas services in the vicinity of the subject site. The initial stages of the neighbouring CUDP are currently serviced by a gas main running along Escarpment Drive within the CUDP. Zinfra has previously identified the need for a secondary steel gas main to ensure sufficient capacity is available to service later stages of the CUDP.

Maker has engaged Zinfra to receive high level advice in March 2020. Their response indicated that Zinfra is aware of the development of the subject site. It can be assumed that the subject site has likely been considered in the expansion of the natural gas network as it takes a whole of network approach when extending its gas assets into new developments such as the CUDP and subject site. It can therefore be reasonably envisaged the installation of the secondary gas main will provide adequate capacity to service the subject site.

The proposed natural gas network to service the later stages of the CUDP can be seen in **Figure 4-1** to extend east along Calderwood Road from the intersection with Escarpment Drive. Should sufficient capacity be provided by the proposed secondary steel gas main, connection to the gas main along Calderwood Road would present a viable connection point with minimal lead-in works required.



Figure 4-1 Proposed natural gas connection point.

Zinfra has indicated the extent of connection and lead-in works is heavily subject to the timing of the development works. Based on historical gas pressure, Zinfra has identified the potential for the extension of the existing 210kPa network, approx. 1km from the site at the intersection of Calderwood Road and Taylors Road. However, connection to this point is subject to the timely upgrade of Calderwood Road. Correspondence between Maker and Zinfra can be seen in **Appendix D**.

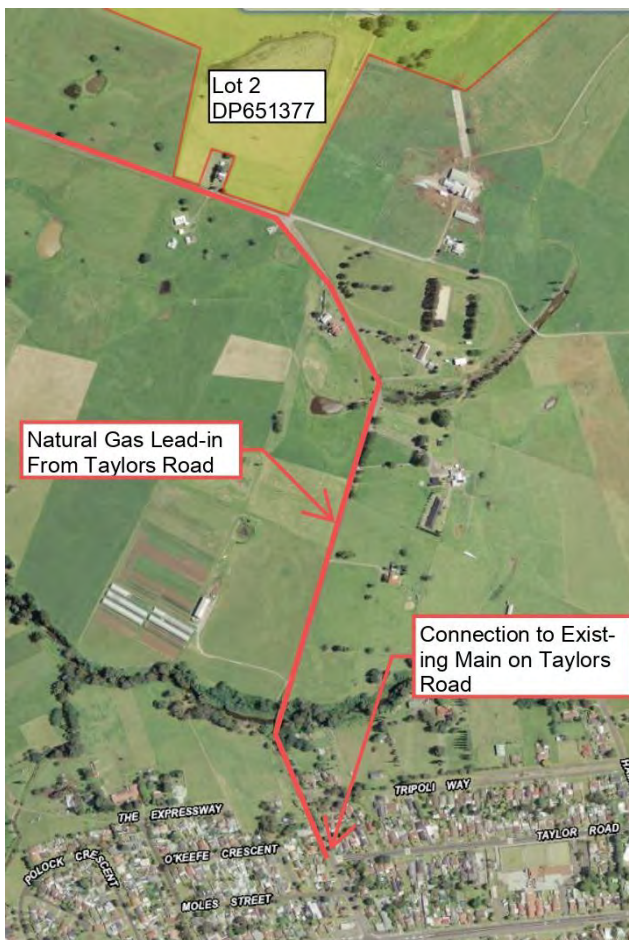


Figure 4-2 Potential alternative natural gas connection point.



5 TELECOMMUNICATIONS

Telecommunications services are within the vicinity of the subject site and are available via the adjacent CUDP development. Opticom private network currently services the initial stages of the CUDP via a telecommunications satellite compound located within Stage 1 of the CUDP. Fibre cables currently extend along escarpment drive in telecommunication conduits and are located within a shared trench arrangement with gas and electricity services. It can be expected the shared trench arrangement will continue throughout the CUDP and allow for telecommunication network connection at the proposed connection point to natural gas services, as highlighted in **Figure 4-1**.

Opticom has noted that there is no issue in meeting the increased capacity demands of the CUDP and have advised it can easily cope with the increased lot yield within the CUDP. It is expected capacity is available to service the subject site.

6 CONCLUSION

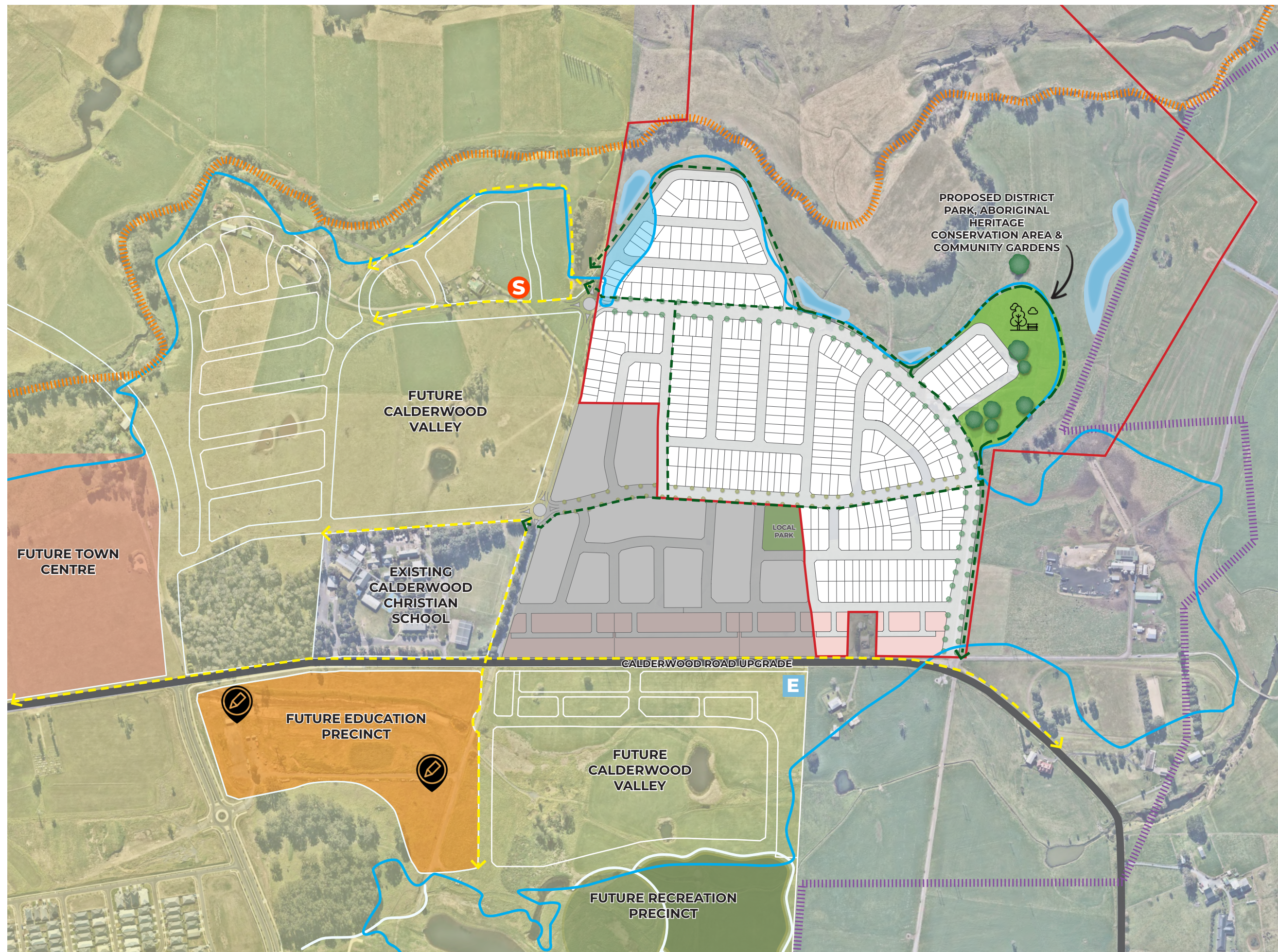
Advice has been provided regarding the utility service infrastructure requirements for the site, informed through consultation with relevant service authorities. Water, sewer, electricity, telecommunications, and gas can all be provided to service the proposed development.

All required utilities for the servicing of the subject site are within the immediate vicinity, with additional infrastructure proposed to meet the increasing capacities of the Calderwood area. It is assumed the future extension of all utility services will provide adequate capacity to service the subject site with minimal lead-in costs.

All utility capacities mentioned in this report are indicative of the utility capacities at the time of enquiry. Confirmation of the capacity to service the site with all utilities mentioned in this report requires a formal supply offer for the request of services from respective service authorities.

APPENDIX **A**

Subject Site Lot Layout



LEGEND

- SITE BOUNDARY
- ||||| WOLLONGONG / SHELLHARBOUR LGA BOUNDARY
- ||||| REGIONAL SIGNIFICANT GROWTH AREA
- APPROX 100YR FLOOD (POST DEV.J.W.P.)
- PROPOSED PARKLAND LOCATION
- PROPOSED MEDIUM DENSITY
- FUTURE POTENTIAL ZONING
- MINOR FILL EXTENTS TO RENDER SITE FLOOD FREE
- MAJOR COLLECTOR (22m)
- MINOR COLLECTOR (20m)
- CONCEPTUAL WATER QUALITY DEVICE
- EXISTING FIG TREES TO BE RETAINED
- ←--- PROPOSED SHARED PATHWAY
- ←--- PROPOSED SHARED PATHWAY BY LENDLEASE
- E PROPOSED ELECTRICAL ZONE SUB-STATION (BY ENDEAVOUR ENERGY)
- S PROPOSED SEWER PUMP STATION 1193 (BY SYDNEY WATER)

APPENDIX **B**

Sydney Water Correspondence

From: Patrick McCann
Sent: Friday, 20 November 2020 9:46 AM
To: Tim Pollock
Cc: Ryhan Thomson
Subject: FW: Servicing Investigation 144 Calderwood Road
Attachments: ISC00168-00 SK01 (Adjoining Information Sketch - 11.02.20).pdf

Pat McCann
B.Eng (Civil) (Hons)
Civil Engineer
0427 888 400
patrick.mccann@makereng.com.au
www.makereng.com.au



From: Patrick McCann
Sent: Wednesday, 18 March 2020 2:39 PM
To: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: FW: Servicing Investigation 144 Calderwood Road

Hi Ryhan,

As discussed please see below a summary of the conversation I had with Helal this morning. He indicated he would not reply to my email given the informality of the advice given.

No consideration has been given to the servicing requirements of any potential developments outside of the Calderwood core precinct;
It appears that he is aware of some other potential development sites around the core precinct and reiterated the above comment;
No indication can be given whether the SPS can be connected to – or if it has sufficient capacity to cater for the development;
An indication that no major lead in works would be required for a development on the proposed site – perhaps an indication that the system has been built to cater for future growth;
Helal notes that consideration of the network would be given once the planning proposal has been progressed;
He notes that previous considerations and advice given (West Dapto) were due to the developments being at a later stage of planning;
Helal also informally notes a relatively large time frame before being able to consider the development – noting that West Dapto is of priority at the moment.

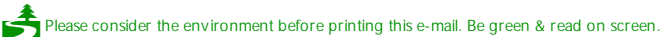
Regards,

Pat McCann
Graduate Civil Engineer
P: 0427 888 400



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From: Patrick McCann
Sent: Wednesday, 18 March 2020 10:28 AM
To: 'HELAL.MORSHEDI@sydneywater.com.au' <HELAL.MORSHEDI@sydneywater.com.au>
Cc: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: Servicing Investigation 144 Calderwood Road

Hi Helal,

I am working alongside Ryhan Thomson to conduct a servicing investigation for a property next to the Calderwood precinct. This servicing investigation is being conducted in order to have the land rezoned and then developed.

Please see attached proposed rezoning extents and some mark ups for clarity . Preliminary investigations indicate that Lot 2 DP651377 can be subdivided in to

400 lots. The smaller parcel of purple land (see attached mark up) will also be rezoned and potentially acquired. A preliminary investigations indicate a potential of 200 lots in this parcel

The rezoning of the land would potentially allow for an additional 600 dwellings. Some of the advice that I am hoping you can assist with are as follows

- Sydney Water to confirm adequate capacity of the PW and WW network to cater for the development;
- The location of the SPS located in stage 4;
- A rough time frame for the delivery of the above SPS;
- The invert level for connection to this SPS (to ensure the feasibility to drain to SPS).

Any advice you are able to provide on the above matters would be greatly appreciated.

Please don't hesitate to contact me if I can clarify further or if I can send through any further details to assist.

Kind regards,

Pat McCann
Graduate Civil Engineer
P: 0427 888 400



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APPENDIX **C**

Endeavour Energy Correspondence

From: Patrick McCann
Sent: Friday, 20 November 2020 10:26 AM
To: Tim Pollock
Subject: FW: Servicing Investigation 144 Calderwood Road
Attachments: RE: 2514 Illawarra Highway, Tullimbar - Electrical Supply Requirements

Pat McCann
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From: Deepak Sahay <Deepak.Sahay@endeavourenergy.com.au>
Sent: Wednesday, 18 March 2020 1:14 PM
To: Patrick McCann <Patrick.McCann@indesco.com.au>
Cc: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: RE: Servicing Investigation 144 Calderwood Road

Hi Patrick,

We provided some preliminary high level advice to one of your colleagues in relation to a development within the same general area. Much of the advice (attached) is essentially the same. Some indication of timing or staging of your development would have been helpful. It is likely that up to two additional developer funded 11kV feeders could be required. This advice is only informal and subject to change at any time and does not mean you will have capacity at the time you make your application.

If you are going to take this any further, I'd strongly suggest that you make a formal enquiry with our network connections team – please see the link below or contact cwadmin@endeavourenergy.com.au. Our planners can then make a more detailed assessment and advise accordingly.

http://www.endeavourenergy.com.au/wps/portal/ee/!ut/p/a1/pVHLbslwEPwVOOQY7CRAQm9RRYugPIQhBPEF2c4mMU1sYxto_74OVU8traruYaVdzY5mZhFBG0QkPYqaOqEkbfuZTLLeJYvrsfR7Gm2mON8fnO7mmbjaPmMPaDwAHyhcvtb_RoRRLh02jWoANiegFnhIMCN6nw3YEUJ0gnaDqgsB-xghQRrAyzBnZR5GXAIJfBeru2pNK2h9Ee1PE9clKilpynnacbcBNMyHMcThrlotCmghoxH1aSKOPsQ8rOVO0TqVrFzLEUuWZLVBiowIAZHYxfN87pqwAHWEhngJc4AqAH O-KqC_BJe9laGUfbT3t9_46sUdahzVeShit2-z3JfWhKOnj1sP-mVvgXppd_IKDIH6PU3arLdpXO3pL2eF89PuTD4TvtKe3l/dl5/d5/L2dBISEvZ0FBIS9nQSEh/

I hope this assists.

Regards,

 **Deepak Sahay**
Senior Network Planning Engineer

T 61 2 9853 6265

51 Huntingwood Drive
Huntingwood NSW 2148
endeavourenergy.com.au



From: Patrick McCann <Patrick.McCann@indesco.com.au>
Sent: Wednesday, 18 March 2020 10:29 AM
To: Deepak Sahay <Deepak.Sahay@endeavourenergy.com.au>
Cc: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: Servicing Investigation 144 Calderwood Road

Hi Deepak,

I am working alongside Ryhan Thomson to conduct a servicing investigation for a property next to the Calderwood precinct. This servicing investigation is being conducted in order to have the land rezoned and then developed.

Please see attached proposed rezoning extents and some mark ups for clarity .

The rezoning of the land would potentially allow for an additional 600 dwellings. Some of the advice that I am hoping you can assist with are as follows

- Ability for the proposed development to be serviced by the existing/ proposed Endeavour Energy electrical network (assuming a development yield of approximately 600 lots);
- Endeavour Energy's estimated delivery timeframe for the Calderwood zone substation expected to be located along Calderwood Road (assuming the proposed development will be serviced by the new zone substation);
- Anticipated high voltage feeders required to service the proposed development and associated funding arrangement with Endeavour Energy.

Any advice you are able to provide on the above matters would be greatly appreciated.

Please don't hesitate to contact me if I can clarify further or if I can send through any further details to assist.

Kind regards,

Pat McCann
Graduate Civil Engineer
P: 0427 888 400



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APPENDIX **D**

Zinfra Gas Email Correspondence

From: Patrick McCann
Sent: Friday, 20 November 2020 9:47 AM
To: Tim Pollock
Cc: Ryhan Thomson
Subject: FW: Servicing Investigation 144 Calderwood Road

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From: Neale Hilton <Neale.Hilton@jemena.com.au>
Sent: Friday, 20 March 2020 12:39 PM
To: Patrick McCann <Patrick.McCann@indesco.com.au>
Cc: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: RE: Servicing Investigation 144 Calderwood Road

Pat
Thank you for contacting Jemena regarding the potential capacity of the Natural Gas network for this site. Based on historical gas loads Jemena has identified that the existing medium pressure 210kPa network on Calderwood Rd cnr Taylor Rd could be extended further along Calderwood Rd to supply this site.
Extending our network is dependent on commercial viability and final assessment would require field testing and environmental impact study as two water courses are evident. Additionally, should Calderwood rd be upgraded this will be taken into account. Regards.

Neale Hilton
Network Development Specialist
Jemena
Level 14, 99 Walker Street, North Sydney, NSW 2060
M0402 060 151
neale.hilton@jemena.com.au | www.jemena.com.au



From: Gas Mains_New Estates <GasMains.NewEstates@zinfra.com.au>
Sent: Wednesday, 18 March 2020 11:35 AM
To: Patrick McCann <Patrick.McCann@indesco.com.au>; Stephen Angel <Stephen.Angel@jemena.com.au>; Neale Hilton <Neale.Hilton@jemena.com.au>
Cc: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: RE: Servicing Investigation 144 Calderwood Road

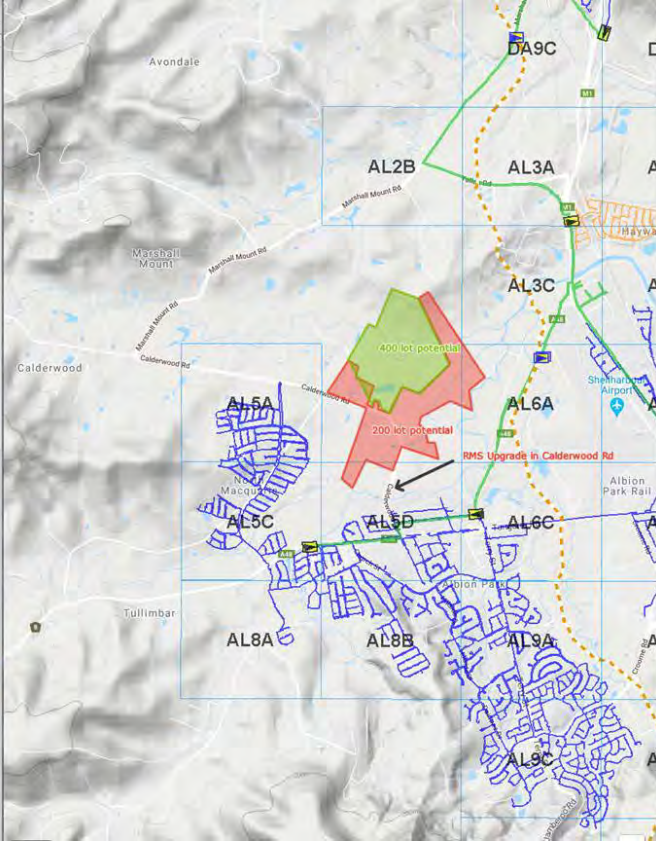
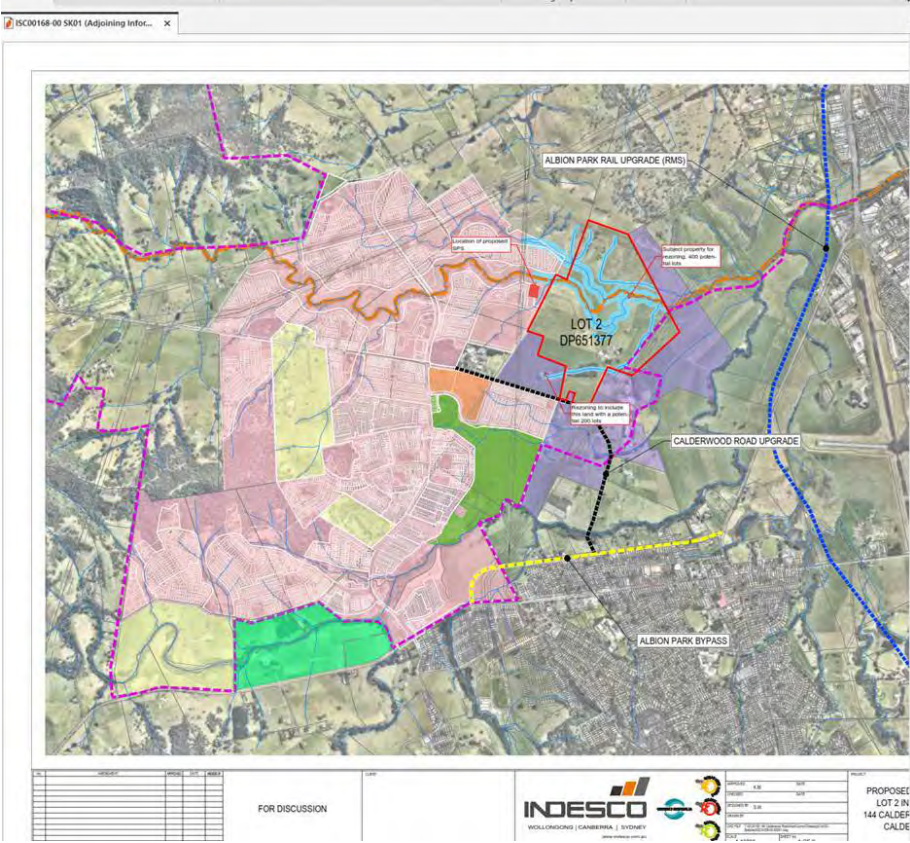
Hi Patrick
Thank you very much for reaching out to us in advance.

From a very high level view, there is gas available nearby (approx. 1km) with the following constraints:
Macquarie Rivulet on the southern side
Waterways throughout your subject property
RMS? Or Council upgrade of Calderwood Rd

Expansion of the Core Precinct sounds like it's already something in our sight, and would continue to naturally grow the gas network as each application comes through and crosses to the north side of Calderwood Rd (reference box AL5A). This would inevitably need to connect back into the gas network in AL5D to ensure supply continuity and backup.

I will defer you over to the Network Development team for the appropriate response or discussion. Timeframes will be critical to understand, and also an interface with RMS or Council on the Calderwood Upgrade to ensure they leave an allocation for gas in their designs.

@Neale Hilton and @Stephen Angel, can you please take a look at Patricks email below, with his attached overview of the Calderwood Valley/North Macquarie Master Planning document.
For ease, I've highlighted the immediate subject site in green on our GIS.



From: Patrick McCann <Patrick.McCann@indesco.com.au>
Sent: Wednesday, 18 March 2020 10:44 AM
To: Gas Mains_New Estates <GasMains.NewEstates@zinfra.com.au>
Cc: Ryhan Thomson <Ryhan.Thomson@indesco.com.au>
Subject: Servicing Investigation 144 Calderwood Road

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Hi Ottillie,

I am working alongside Ryhan Thomson to conduct a servicing investigation for a property next to the Calderwood precinct. This servicing investigation is being conducted in order to have the land rezoned and then developed.

I have tried to email Greg Knight from Jemena Gas regarding the below – however the email was unable to send. I am hoping you may be able to assist with my enquiry.

Please see attached proposed rezoning extents and some mark ups for clarity .

The rezoning of the land would potentially allow for an additional 600 dwellings. I am hoping you are able to provide some advice on the ability for the proposed development to be serviced by the existing/ proposed Jemena gas network (assuming a development yield of approximately 600 lots).

Any advice you are able to provide on the above matters would be greatly appreciated.

Please don't hesitate to contact me if I can clarify further or if I can send through any further details to assist.

Kind regards,

Pat McCann
Graduate Civil Engineer
P: 0427 888 400



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P: 02 4288 4401

www.makereng.com.au

Management Systems

Quality and safety are extremely important to Maker Eng and as such we are certified to the following Australian Standards:

- ISO 9001:2015 Quality Management Systems
- ISO 45001:2018 Occupational Health and Safety Management Systems
- ISO 14001:2015 Environmental Management Systems