

To	Keith Seghers, WWCC	From	John Sutcliffe, Cardno
CC	Tim Murphy, Cardno	Date	20, April 2022
Project	Duke of Kent Development - 50522025	Location/Time	
Subject	Stormwater Management Plan for Spring St and North Pde Developments		
Action Required	In Principle Support	Attachments	Spring St_On site detention calculator Spring St_Manning Calculations North Pde_On site detention calculator North Pde_Manning Calculations

18-22 Spring St

Overview

Cardno, now Stantec have been engaged by the NSW Land and Housing Corporation to develop two a new social housing development at 18-22 Spring St. The proposed development will see the three existing blocks consolidated into one, and a new 12-unit complex constructed. Below is a summary of the stormwater management strategy proposed to be implemented as part of this development.

Flooding and Overland Flows

Wagga Wagga City Council Intramaps indicate that the site is not affected by Riverine Flooding.

A review of data from the Major Overland Flow Flood Study (MOFFS) has identified that the 1 in 100-year flood height over the blocks is AHD 178.14. As per Council's Engineering Guidelines for Subdivisions and Development Standards, the minimum Finished Floor Level (FFL) of the dwelling should be AHD 178.44, 300mm above the above the OSD storage's maximum design water surface level.

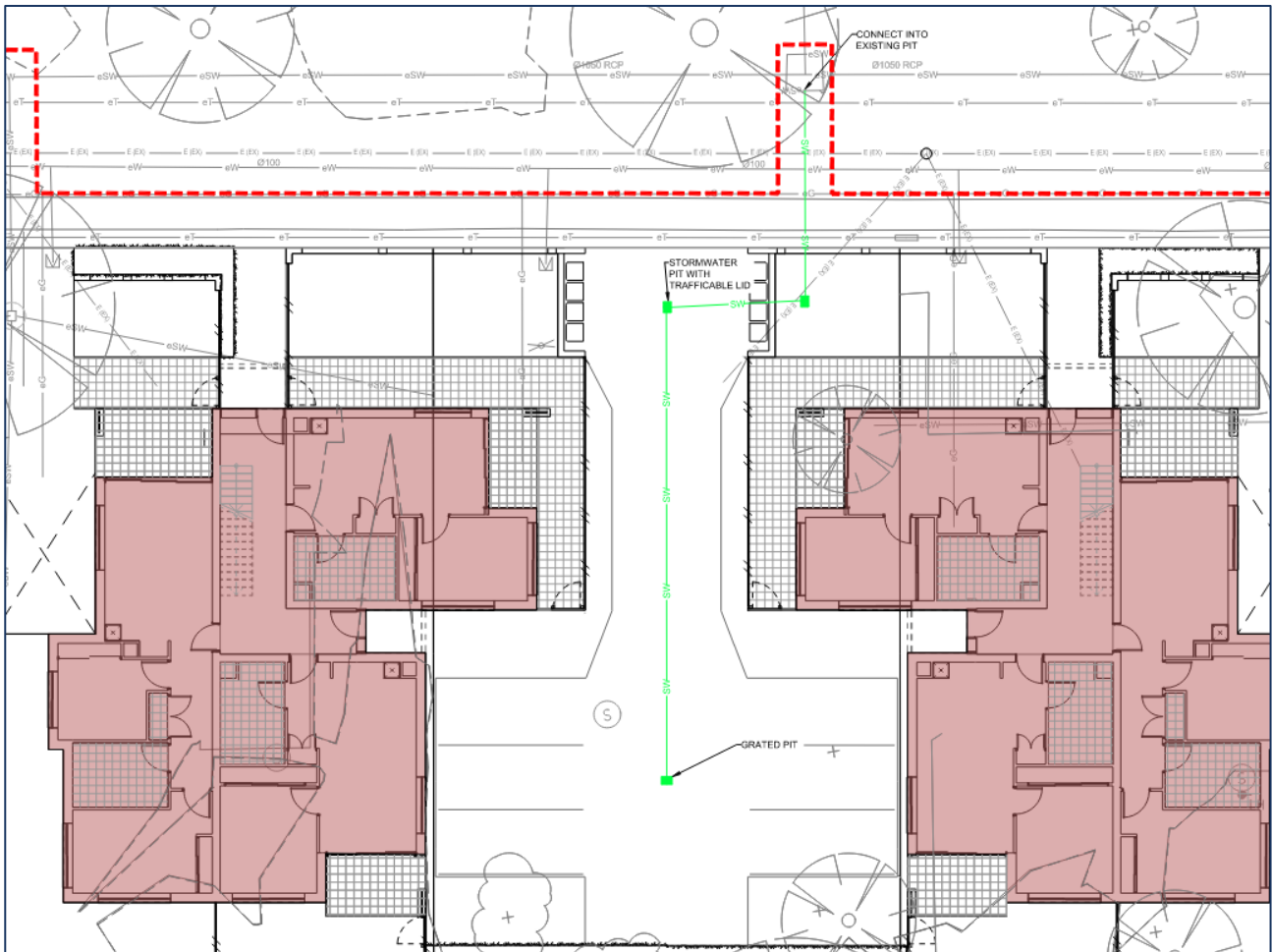
Pre and Post-Development Site Outflows

The Rational Method was used to calculate the pre and post-development stormwater runoff volumes for the site during a 1 in 10-year storm event and 1 in 100-year storm event. The pre-development site results in 39.05 L/s of stormwater discharge, while the post-development site results in 45.10 L/s of discharge during the 10-year event. For the 1 in 100-year event, the pre-development site results in 66.80 L/s of discharge while the post-development site results in 74.02 L/s of discharge. Refer to attached **Spring St_On site detention calculator** for calculations.

Stormwater Pipe Sizing

The internal stormwater network for the development has been sized based on the 1 in 10-year site outflows and calculated using the Manning Equation. In order to carry the 46.97 L/s of stormwater, a DN225 PE pipe at 1% grade will be required (Refer to **Spring St_Manning Calculations** for calculations). In order to carry the internal stormwater into the DN1050 main within the southern verge of Spring St, it is proposed the DN225 internal pipe will connect into the rear of the existing Stormwater Pit in the southern road reserve of Spring St in front of the site. Refer to **Figure 1-1** below.

Figure 1-1 Proposed Stormwater Connection



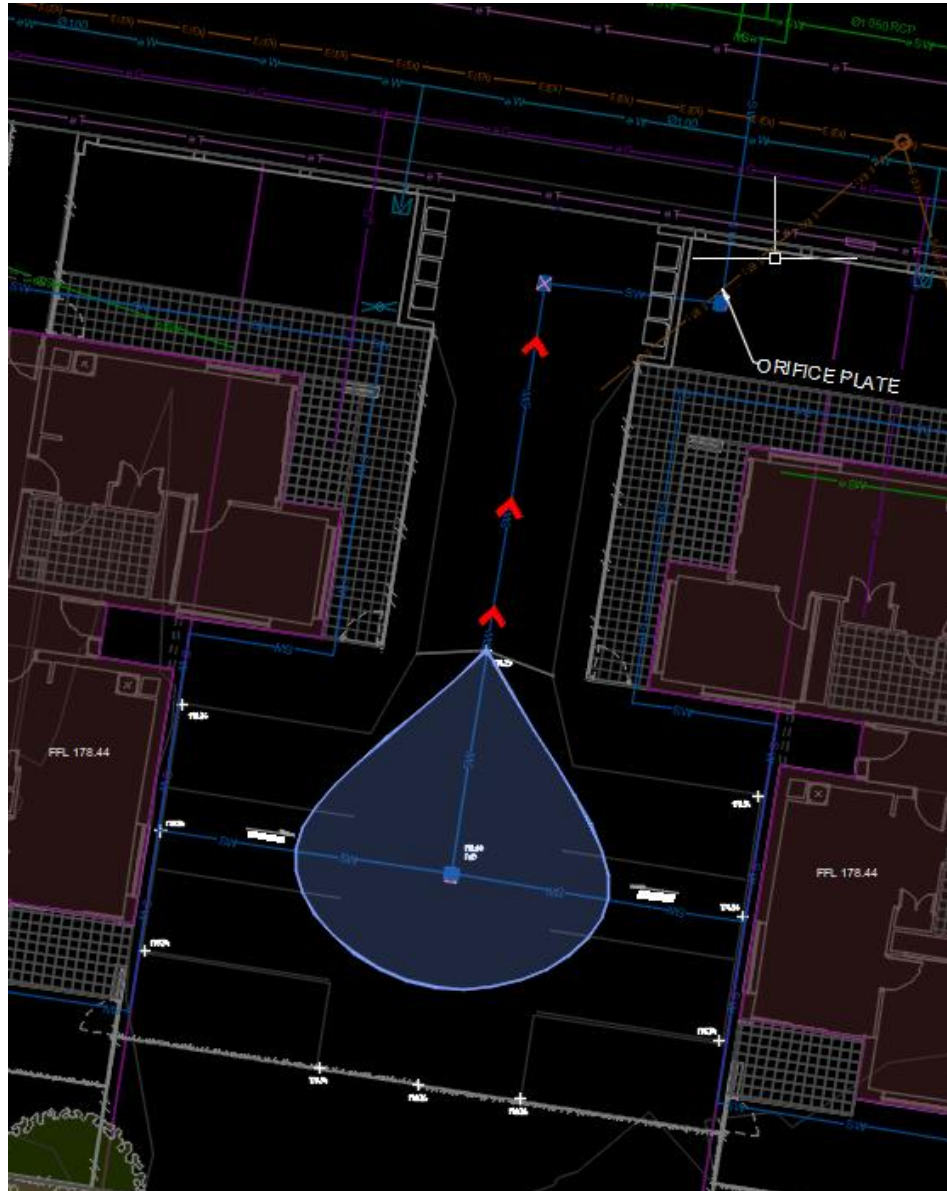
On Site Detention (OSD)

In order to attenuate the post-development flows to pre-development rates, an orifice plate and OSD storage is intended to be incorporated into the internal stormwater network of the development.

The orifice plate will be used to control the peak flows discharging from the site to the existing downstream drainage network, for all events up to and including the 1 in 100-year storm to the pre-development peak flow. The orifice plate will be installed on the outlet of the pit prior to stormwater leaving the site.. The **Spring St On site detention calculator** calculates the maximum diameter of the orifice plate as 145mm.

In order to meet the pre-development peak flows for 1 in 100 years ARI storm event, a minimum of 3m³ of OSD is required. The OSD will be provided via grading of the carpark area to create surface detention ponding over the grated pit in the carpark. The grading of the carpark will provide a maximum ponding depth of 0.16m over an area of 58m² for approximately 3.1m³ of storage space. When the volume of water exceeds the storage space, stormwater will overflow to the north onto the driveway where it will be directed towards Spring St. Refer to **Figure 1-2** below for the OSD storage and overflow path.

Figure 1-2 Spring St OSD details



21-25 North Pde

Overview

Cardno, now Stantec have been engaged by the NSW Land and Housing Corporation to develop two a new social housing development at 21-25 North Pde. The proposed development will see the three existing blocks consolidated into one, and a new 12-unit complex constructed. Below is a summary of the stormwater management strategy proposed to be implemented as part of this development.

Flooding and Overland Flows

Wagga Wagga City Council Intramaps indicate that the site is not affected by Riverine Flooding, but is affected by the 1 in 100-year Major Overland Flow, which is at a maximum level of AHD 178.15 across the site. Due to this, the minimum FFL of the dwelling will be AHD 178.45, 300mm above the Major Overland Flow level.

Pre and Post-Development Site Outflows

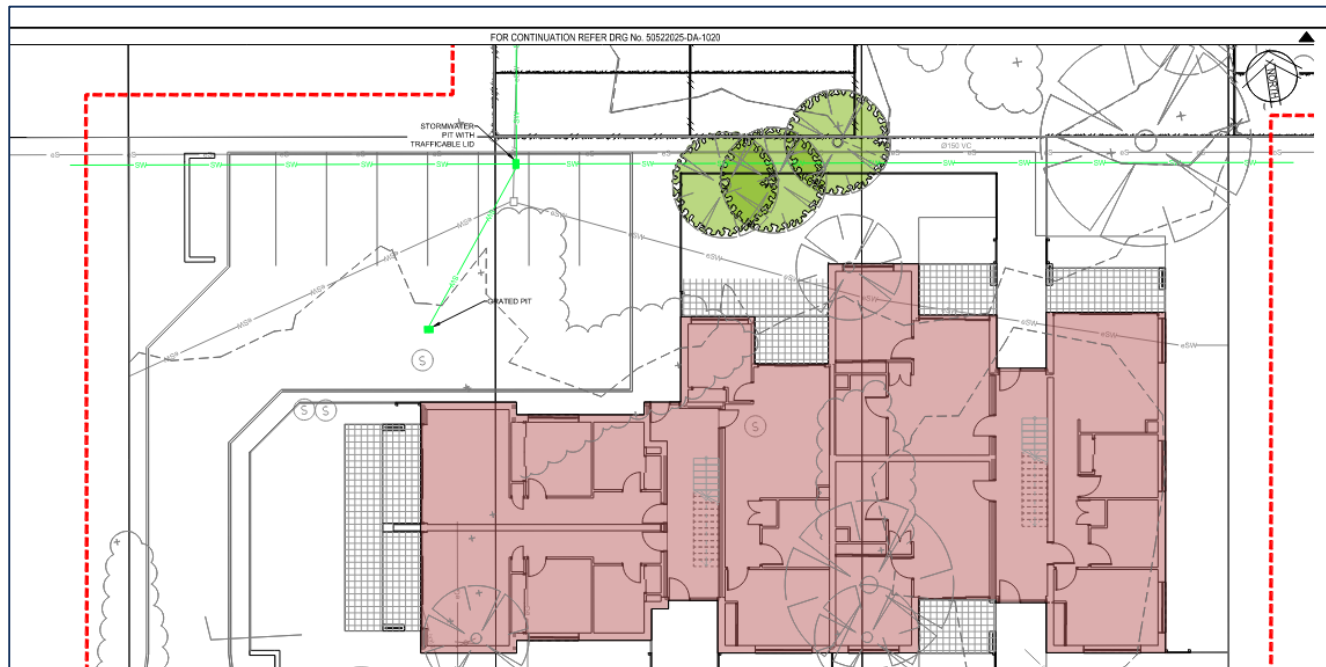
The Rational Method was used to calculate the pre and post-development stormwater runoff volumes for the site during a 1 in 10-year storm event and 1 in 100-year storm event. The pre-development site results in 38.31 L/s of stormwater discharge, while the post-development site results in 46.61 L/s of discharge during the 10-year event. For the 1 in 100-year event, the pre-development site results in 65.83 L/s of discharge while the post-development site results in 75.83 L/s of discharge. Refer to attached **North Pde_On site detention calculator** for calculations.

Stormwater Pipe Sizing

The internal stormwater network for the development has been sized based on the 1 in 10-year site outflows and calculated using the Manning Equation. In order to carry the 46.92 L/s of stormwater, a DN225 PE pipe at 1% grade will be required (Refer to **North Pde_Manning Calculations** for calculations). In order to carry the internal stormwater into the DN1050 main within the southern verge of Spring St, it is proposed the existing pit in the rear of Lot 57 and the pipe between it and the DN1050 in the southern verge of Spring St will be decommissioned and replaced with a new stormwater pit and DN225 pipe, creating a new 2m wide drainage easement along the western boundary of 22 Spring St. The new DN225 internal pipe of the development will connect into this new Pit and subsequently into the DN1050 in the southern road reserve of Spring St in front of the site. Refer to **Figure 1-3** below.

The existing drainage lines within the site, servicing the adjacent blocks, will be relocated to the rear of the block, alongside the existing sewer line and a new 2.5m wide drainage and sewer easement will be created.

Figure 1-3 Proposed Stormwater Connection

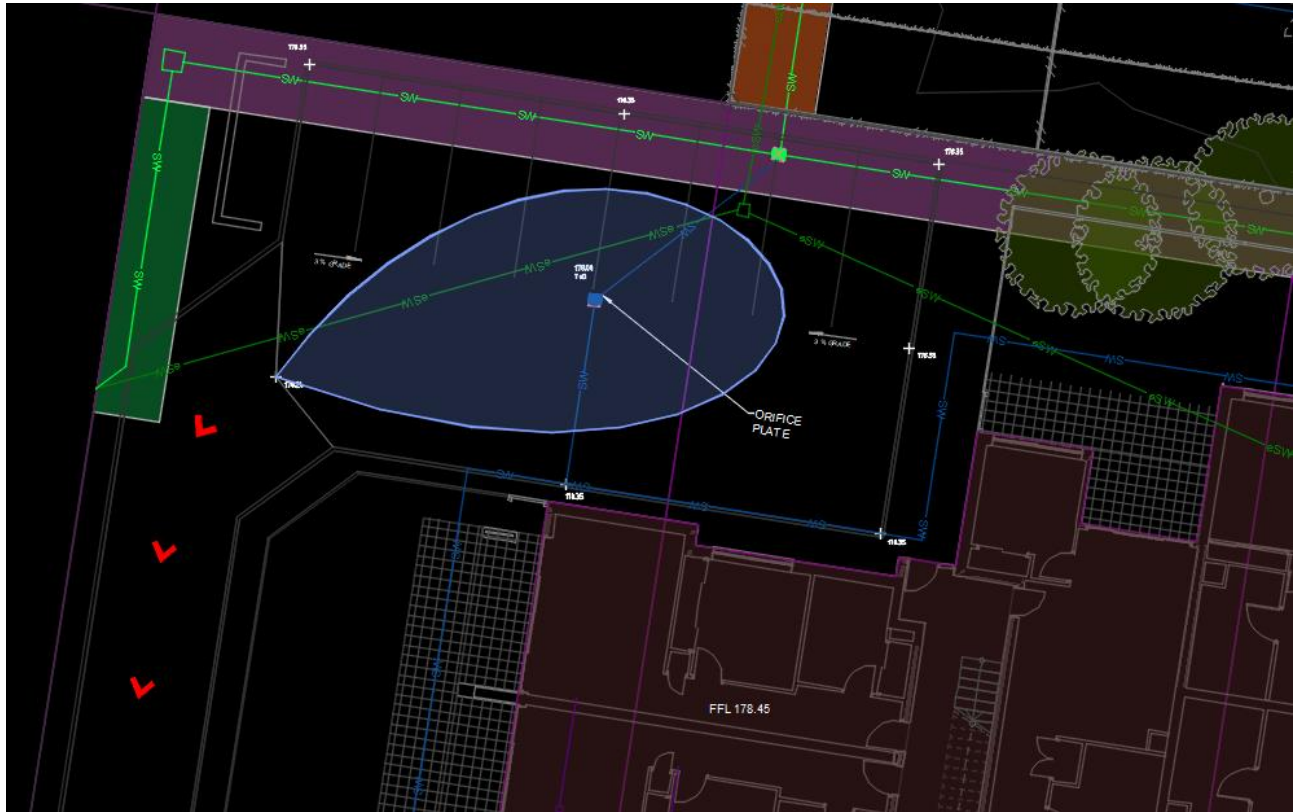


On Site Detention (OSD)

In order to attenuate the post-development flows to pre-development rates, an orifice plate and OSD storage is intended to be incorporated into the internal stormwater network of the development. The orifice plate will be used to control the peak flows discharging from the site to the existing downstream drainage network, for all events up to and including the 1 in 100-year storm to the pre-development peak flow. The orifice plate will be installed on the outlet of the pit prior to stormwater leaving the site. The **North Pde_On site detention calculator** calculates the maximum diameter of the orifice plate as 145mm.

In order to meet the pre-development peak flows for a 1 in 100-year ARI storm event, a minimum of 3m³ of OSD is required, which will be provided via grading of the carpark area to create surface detention ponding over the grated pit in the carpark. The grading of the carpark will provide a maximum ponding depth of 0.16m over an area of 77m² for approximately 4.1m³ of storage space. When the volume of water exceeds the storage space, stormwater will overflow to the north onto the driveway where it will be directed towards Spring St. Refer to **Figure 4-2** below for the OSD storage and overflow path.

Figure 1-4 North Pde OSD Details



John Sutcliffe

From: Seghers, Keith <Seghers.Keith@wagga.nsw.gov.au>
Sent: Thursday, 26 May 2022 3:41 PM
To: John Sutcliffe
Cc: Tim Murphy
Subject: RE: Spring St and North Pde - Stormwater Proposal
Attachments: North Pde_Manning Calculations.xlsm; North Pde_On site detention calculator.xlsx; Spring St_Manning Calculations.xlsm; Spring St_On site detention calculator.xlsx; DOK Development Sites - Stormwater Management Memo - REV01.pdf

Hi John,

I can confirm in-principle support for the proposed stormwater strategy for the Spring St & North Parade sites.
Thanks.

Regards,
Keith

Keith Seghers

Development & Subdivisions Engineer Coordinator

1300 292 442

d: +61 2 6926 9542 | **e:** segthers.Keith@wagga.nsw.gov.au

[Wagga Wagga City Council](#) · 243 Baylis Street (PO Box 20) · Wagga Wagga NSW 2650

Committed to a thriving, innovative, connected and inclusive city

Wagga Wagga City Council acknowledges the traditional custodians of the land, the Wiradjuri people, and pays respect to Elders past, present and future and extends our respect to all First Nations Peoples in Wagga Wagga. We recognise and respect their cultural heritage, beliefs and continuing connection with the land and rivers. We also recognise the resilience, strength and pride of the Wiradjuri and First Nations communities.

From: John Sutcliffe <john.sutcliffe@cardno.com.au>
Sent: Thursday, 26 May 2022 9:59 AM
To: Seghers, Keith <Seghers.Keith@wagga.nsw.gov.au>
Cc: Tim Murphy <tim.murphy@cardno.com.au>
Subject: FW: Spring St and North Pde - Stormwater Proposal

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe. If you know this is a phishing email please forward to servicedesk@wagga.nsw.gov.au.

Morning Keith,

Just following up on the email below we discussed earlier in the week, are you able to review and let me know if you are happy with the proposal?

Cheers,

John Sutcliffe

SENIOR PROJECT MANAGER
CARDNO



Phone +61 2 6112 4507 Direct +61 2 6112 4507 Mobile 0403 221 730
Address Eastern Core, Level 4, 2 Constitution Ave, Canberra, Australian Capital Territory 2601 Australia

Email john.sutcliffe@cardno.com.au Web www.cardno.com

CONNECT WITH CARDNO    



Cardno acknowledges the Traditional Owners of the land upon which we live and work and pay our respects to their Elders past, present and emerging - [learn more](#).

Cardno's management systems are certified to ISO9001 (quality) and AS/NZS4801/OHSAS18001 (occupational health and safety)

This email and its attachments may contain confidential and/or privileged information for the sole use of the intended recipient(s). All electronically supplied data must be checked against an applicable hardcopy version which shall be the only document which Cardno warrants accuracy. If you are not the intended recipient, any use, distribution or copying of the information contained in this email and its attachments is strictly prohibited. If you have received this email in error, please email the sender by replying to this message and immediately delete and destroy any copies of this email and any attachments. The views or opinions expressed are the author's own and may not reflect the views or opinions of Cardno.

From: John Sutcliffe
Sent: Friday, 22 April 2022 12:10 PM
To: Seghers, Keith <Seghers.Keith@wagga.nsw.gov.au>; Collins, Cameron <Collins.Cameron@wagga.nsw.gov.au>
Cc: Tim Murphy <tim.murphy@cardno.com.au>; Adam Bower <Adam.Bower@facs.nsw.gov.au>
Subject: Spring St and North Pde - Stormwater Proposal

Afternoon Keith,

Following our recent meeting on the LAHC Duke of Kent Development sites, we have developed our stormwater masterplan for Spring St and North Pde and have summarised the proposed service methodology in the attached memo. Are you able to review and advise whether council is able to support the proposal in principle?

The final design documentation will be formally submitted to council (like by a Design and Construct contractor) following the Part 5 approval process.

If you require any additional information please let me know.

Cheers,

John Sutcliffe
SENIOR PROJECT MANAGER
CARDNO



Phone +61 2 6112 4507 Direct +61 2 6112 4507 Mobile 0403 221 730
Address Eastern Core, Level 4, 2 Constitution Ave, Canberra, Australian Capital Territory 2601 Australia

Email john.sutcliffe@cardno.com.au Web www.cardno.com

CONNECT WITH CARDNO    



Cardno acknowledges the Traditional Owners of the land upon which we live and work and pay our respects to their Elders past, present and emerging - [learn more](#).

Cardno's management systems are certified to ISO9001 (quality) and AS/NZS4801/OHSAS18001 (occupational health and safety)

This email and its attachments may contain confidential and/or privileged information for the sole use of the intended recipient(s). All electronically supplied data must be checked against an applicable hardcopy version which shall be the only document which Cardno warrants accuracy. If you are not the intended recipient, any use, distribution or copying of the information contained in this email and its attachments is strictly prohibited. If you have received this email in error, please email the sender by replying to this message and immediately delete and destroy any copies of this email and any attachments. The views or opinions expressed are the author's own and may not reflect the views or opinions of Cardno.

Attention:

The information contained in this e-mail message and any attached files are intended only for the use of the individual or entity named. It may contain information which is confidential or the subject of legal privilege. If you are not the intended recipient, any use, dissemination, disclosure or copying of this e-mail is strictly prohibited. If you have received this e-mail in error, please notify Wagga Wagga City Council immediately by reply e-mail and delete the original.

Think before you print - help save our environment