Before the Hearings Panel
At Waimakariri District Council

Under	the Resource Management Act 1991
In the matter of	the Proposed Waimakariri District Plan

Joint Witness Statement – Stream 12C/12D Stormwater Expert Conferencing

Date: 04 September 2024

INTRODUCTION:

1 This Joint Witness Statement (JWS) relates to expert conferencing on groundwater resurgence and stormwater.

2 The following participants were involved in this conferencing and authored this JWS:

(a) John Aramowicz;

(b) David Delagarza;

(c) James Hopkins;

(d) Nick Keenan;

(e) Daniel McMullan;

(f) Eoghan O'Neill

(g) Colin Roxburgh;

(h) Ben Throssell;

(i) Bas Veendrick;

3 A meeting between the participants was held on 4 September 2024 at Waimakariri District Council Chambers. This JWS has resulted from the meeting and finalisation of the written statements over email.

4 In preparing this statement, the experts have read and understand the Code of Conduct for Expert Witnesses as included in the Environment Court of New Zealand Practice Note 2023[1].

PURPOSE AND SCOPE OF CONFERENCING:

5 The conferencing was focused on matters identified in Minute 33, dated 29 July 2024 in relation to groundwater resurgence and stormwater.

6 The experts discussed the request contained in Minute 33, which stated:

[1] https://www.environmentcourt.govt.nz/assets/Practice-Note-2023-.pdf

"Expert conferencing is required on the cumulative effects of all the requested rezonings, including the Ohoka rezoning addressed in Hearing Stream 12D.

1. *Can groundwater resurgence be managed on-site in a manner that is not going to result in cumulative effects "downstream"?*

2. *If it is identified that there would be adverse cumulative effects, what might the triggers be for upgrades or new infrastructure to be provided, how could these be reflected in district plan provisions for each rezoning request."*

7 Commissioners requested Mr Aramowicz, Mr Veendrick, Mr Hopkins, Mr Delagarza, Mr Sookdev, Mr McLeod, Mr Mars and Mr McMullan attend the conferencing. Mr Mars and Mr Sookdev excused themselves as they had not submitted evidence on stormwater or groundwater resurgence matters for submissions in the Ohoka area. Mr Keenan, Mr Throssel, Mr O'Neill and Mr Roxburgh were invited to attend by the other participants as they had all given evidence on groundwater and/or stormwater matters in Stream 12D. Mr McLeod was unable to attend.

MATTERS THAT THE EXPERTS AGREE and DISAGREE ON:

7 Please refer to the attached table which sets out the agreed positions, and remaining areas of disagreement.

Signatories

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John Aramowicz

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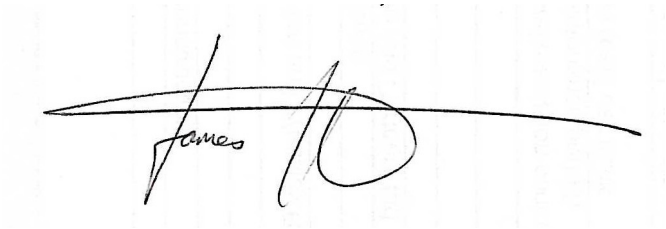
David Delagarza



James Hopkins

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Daniel McMullan

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Eoghan O'Neill

Signatories

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James Hopkins

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Colin Roxburgh

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Ben Throssell

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Bas Veendrick

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Colin Roxburgh

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Ben Throssell

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Bas Veendrick

Nick Keenan

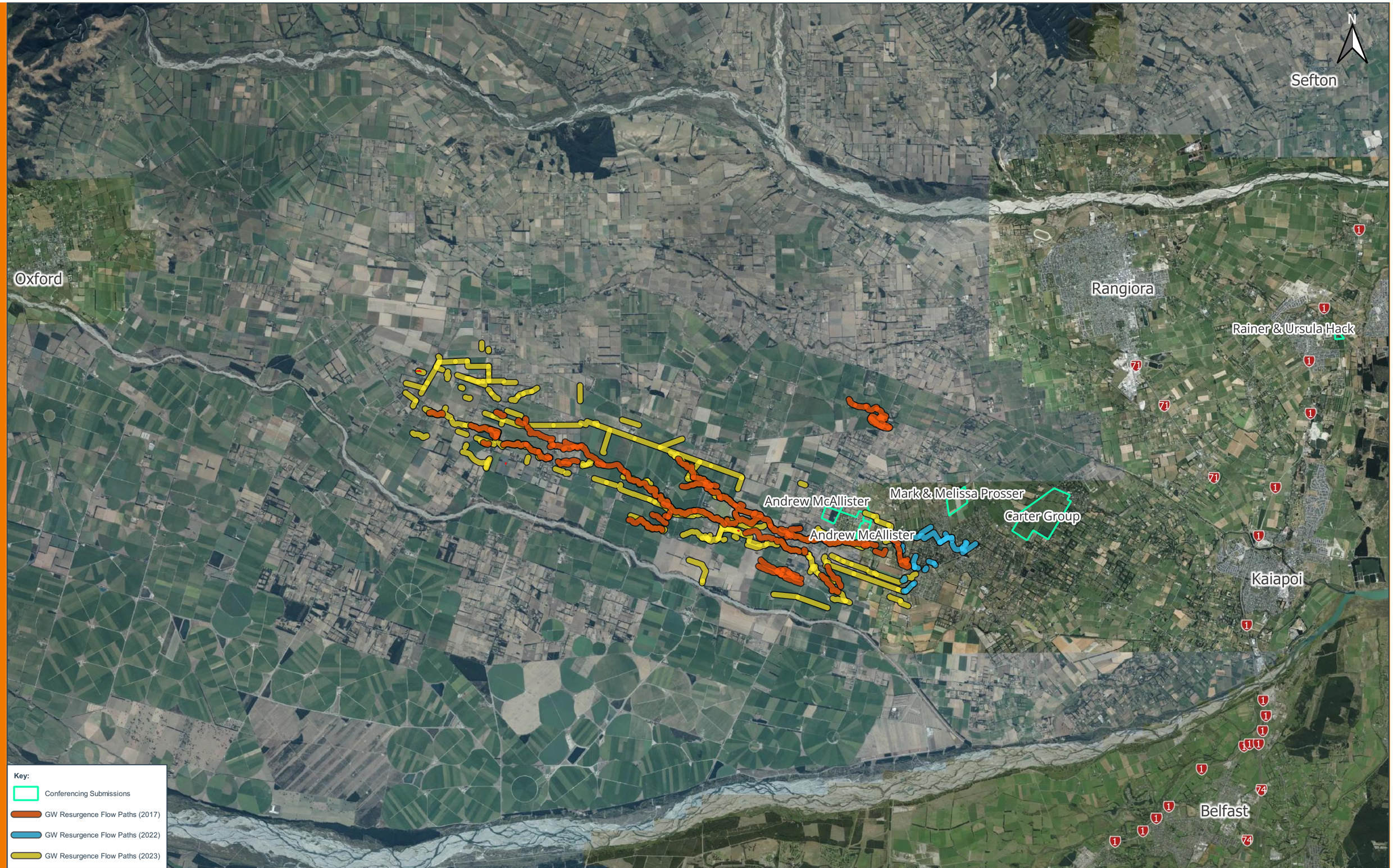
EXPERT CONFERENCING STREAM 12C: STORMWATER

Issue	Commissioner's Question	Agreed Positions	Remaining Disagreements
Expert conferencing is required on the cumulative effects of all the requested rezonings, including the Ohoka rezoning addressed in Hearing Stream 12D.			
Stormwater	Can groundwater resurgence be managed on-site in a manner that is not going to result in cumulative effects "downstream"?	<u>Regional effects</u> The groundwater catchment area is large compared to the area of proposed development, therefore the regional/catchment wide groundwater levels/resurgent flow is unlikely to be changed by development. There is potential for effects to occur immediately downstream of a development site, if resurgent groundwater is not adequately managed on site. Agreed methods to manage groundwater effects on site for areas susceptible to resurgence: - Avoid reliance on discharge to ground via rapid infiltration or similar; - Maintaining historic flow patterns across the site; - Use of storage to attenuate flows; - Design to include conservative assumptions regarding groundwater and avoid intercepting permeable gravels (and maintain the low permeability silt cap where present).	<u>Downstream effects</u> CR, JA, NK are of the view that while there are steps that can be taken to reduce the risk of groundwater resurgence causing effects either on-site or downstream, there is still some residual risk associated with development in areas that are susceptible to groundwater resurgence. Groundwater resurgence can be unpredictable and is not well understood, both in terms of where the resurgence may occur, and at what flowrate. It is also hard to predict how changes to a site may change groundwater resurgence both within and around the site. This carries some risk of negative effects to downstream and adjacent properties even if/when the design approaches suggested are followed. Other Experts agree to the following (DD, BV, EO, BT): Implementing the controls defined in the 'Agreed Positions' section (Agreed methods to manage groundwater effects on site for areas susceptible to resurgence) utilising conservative values around groundwater levels

		Where there are existing issues associated with resurgent groundwater, development design was not undertaken in accordance with the methods described above (e.g. soakage basin used, swales intercepting groundwater). Attached to this statement is a map showing where groundwater resurgence has been observed in 2017, 2022 and 2023. The geographical scope and purpose of the surveys was different in each year, and they cannot be directly compared. The main focus of the surveys was in the general Mandeville area where the main groundwater resurgence occurred/was reported. However, it is noted that within this general area, if an area is shown as clear of groundwater resurgence, it doesn't mean resurgence was not occurring – the area could simply be outside the scope of the survey. All experts agree there are unlikely to be cumulative effects on the wider area related to groundwater resurgence. Any potential effects of groundwater resurgence are likely to be more localised to the proposed developments and the immediate downstream area as discussed above. <u>Sites outside of groundwater resurgence area</u> Woodend has not experienced the groundwater resurgence issues which have arisen in the Mandeville area.	and flow rates would mitigate the risk of adverse effects from groundwater resurgence resulting from the development and any resulting impacts would likely be negligible. BT, EO and BV note that there is no evidence available to suggest groundwater resurgence has occurred in Ohoka or on the proposed development at 535 Mill Road (Carter Group). The resurgence issues identified in Mandeville have arisen because the soakage to ground based stormwater systems are ineffective when groundwater levels are high, resulting in extended durations of ponding in channels and low areas. We understand that Ohoka currently does not rely on soakage to ground for stormwater disposal and none is proposed for 535 Mill Road. Ohoka utilises open channels for stormwater drainage. Therefore, in the unlikely event that groundwater resurgence did occur, effects will be adequately mitigated through the proposed stormwater design for the site which discharges to surface water rather than to ground. We (BV, EO, BT) direct the commissioners to the JWS for hearing stream 12D (item 5 of JWS – Engineering, dated 6 August 2024) for further details on the proposed 535 Mill Road development. <u>Design criteria</u>

			DM has the view that interception of permeable gravels should be acceptable if groundwater resurgence effects can be appropriately mitigated by suitable methodologies subject to approval by WDC. NK notes in addition to the design mitigations listed, new developments have the additional mitigation strategy of raising finished floor levels and providing secondary overland flowpaths.
Stormwater	If it is identified that there would be adverse cumulative effects, what might the triggers be for upgrades or new infrastructure to be provided, how could these be reflected in district plan provisions for each rezoning request.	Refer above regarding cumulative groundwater effect. Experts have interpreted the two questions as related to groundwater resurgence only. However, consideration was also given to how the cumulative effects of stormwater runoff could be assessed and managed. The cumulative effects of the proposed developments have not been assessed or modelled from a stormwater perspective. Modelling the cumulative effects is a lengthy, complex and expensive exercise which has not been undertaken. At plan change stage developers typically do not undertake an assessment of cumulative effects as the other land areas are outside of their control. The following methods are used in other regions and are considered a pragmatic way to assess and manage possible cumulative effects:	

		1) Developments could be required to run a stormwater model which includes an assumption that all rezoned land within the catchment is developed and considers the impact on the downstream network to demonstrate effects are less than minor, or 2) Introduce a requirement to manage the stormwater runoff for the site so run-off is lower than pre-development, as opposed to Council's current requirement to achieve hydraulic neutrality, to ensure effects are less than minor. For example, Auckland Council and Hawkes Bay require new development to manage stormwater flows to 80% of pre-development levels; this is intended to ensure each development is not contributing additional flows post-development. The assessment would be undertaken at subdivision consent stage. These requirements could be included in Council's Code of Practice.	



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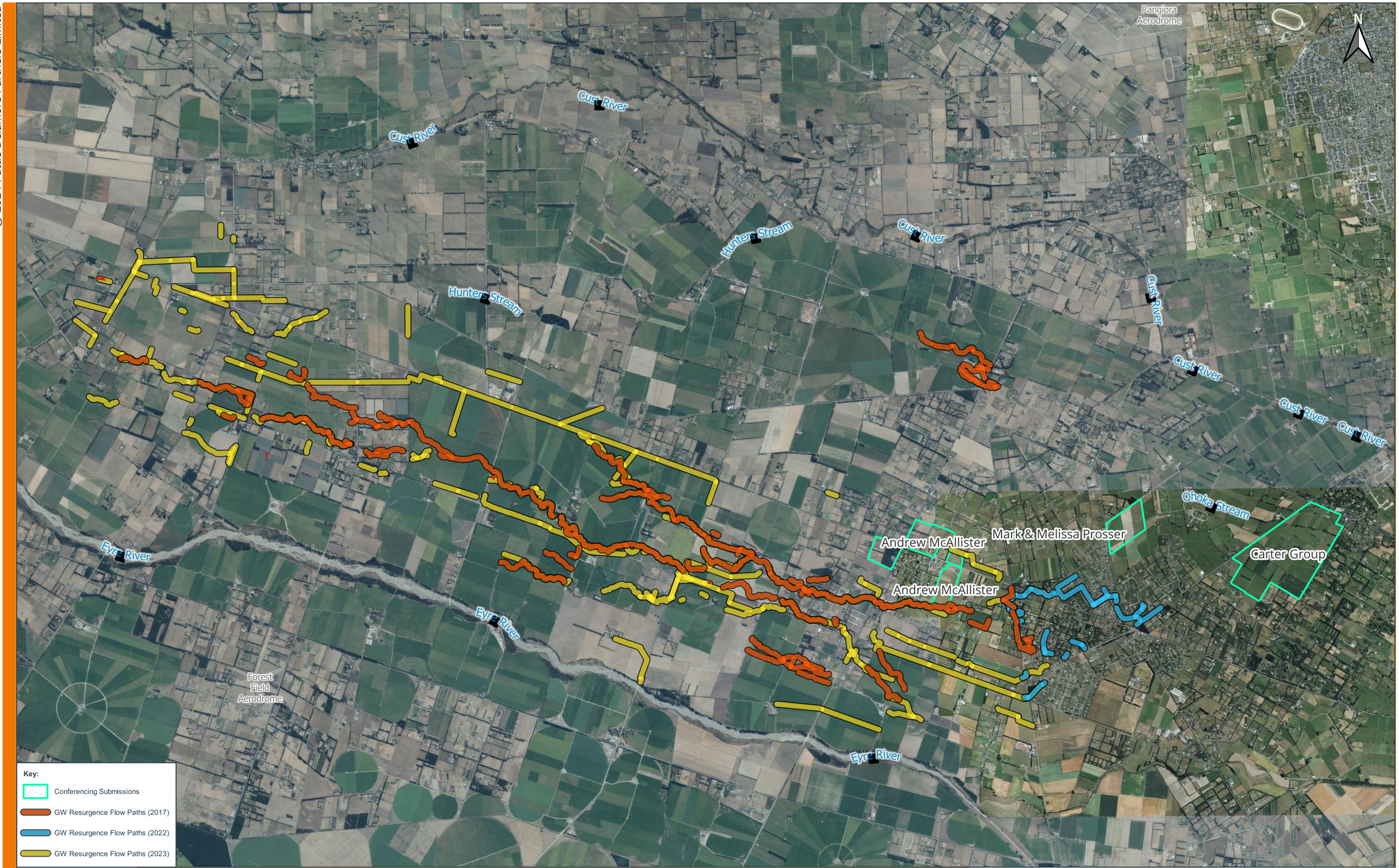
SCALE : 1:105,000

NO.	REVISION	DATE	BY
A	Draft	SEP 24	SP

NOTES

1. AERIAL IMAGERY SOURCED FROM THE LINZ DATA SERVICE [https://data.linz.govt.nz] AND LICENCED BY LINZ FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENCE.

Groundwater Resurgence Areas



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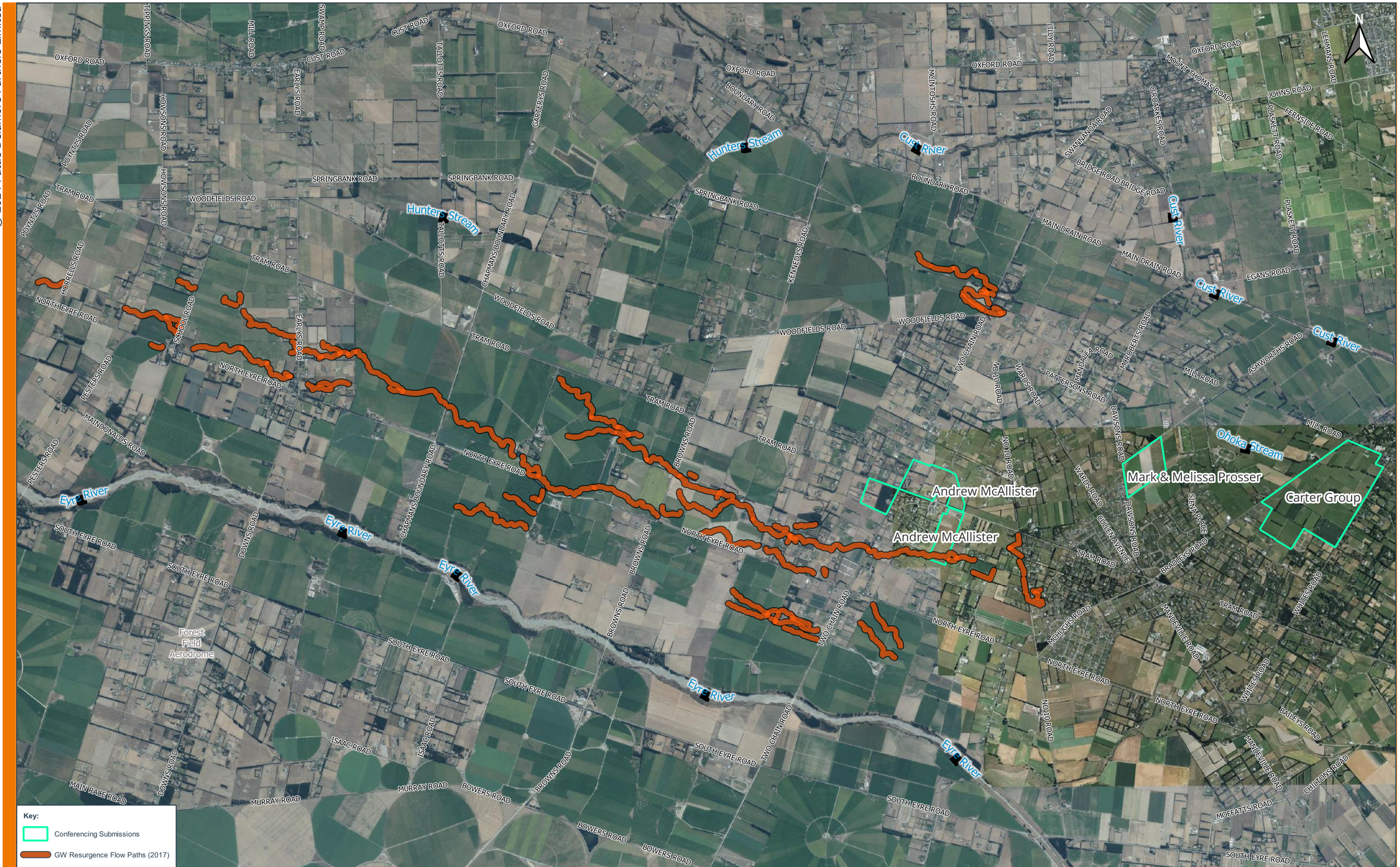
Groundwater Resurgence Areas



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Groundwater Resurgence Areas - 2017 Survey

Key:

- Conferencing Submissions
- GW Resurgence Flow Paths (2022)
- GW Resurgence Flooded Areas (2022)

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SCALE : 1:18,000

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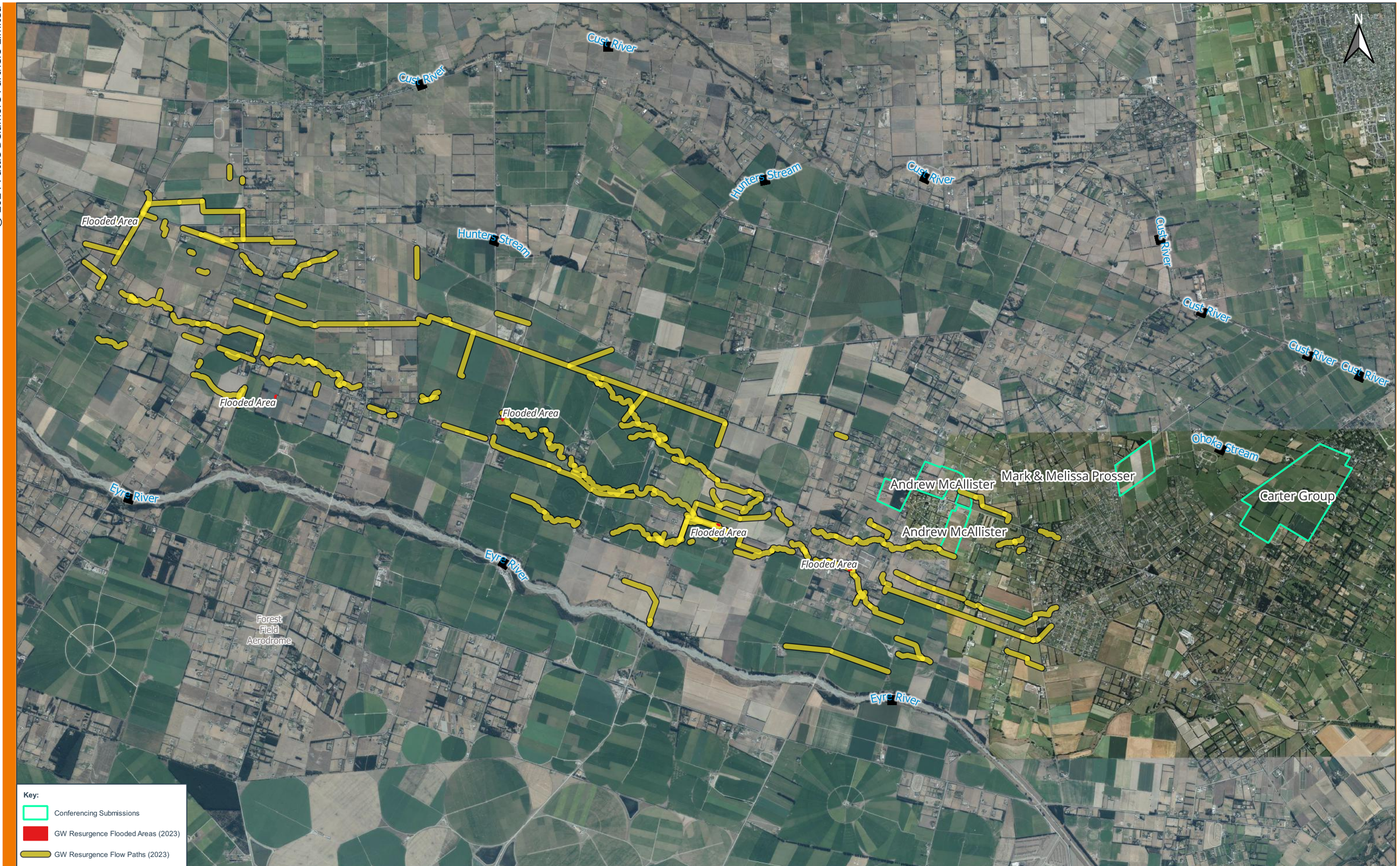
Groundwater Resurgence Areas - 2022 Survey



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KILOMETRES (A3)
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Groundwater Resurgence Areas - 2023 Survey