Appendix 9 – Evidence of Kevin Kemp on the Flood Assessment Overlay

BEFORE THE **TIMARU DISTRICT COUNCIL HEARING COMMITTEE**

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the Proposed Timaru District Plan

STATEMENT OF EVIDENCE BY KEVIN THOMAS KEMP

Introduction

1 My name is Kevin Kemp. I hold qualifications of a Masters of Applied Geography in Resource and Environmental Studies from Texas State University – San Marcos and am currently studying towards a New Zealand Diploma in Civil Engineering from the New Zealand Institute of Highway Technology.

2 I am currently the Stormwater Team Leader at Timaru District Council (TDC). Prior to my current role I have held the roles of Infrastructure Planner and Subdivision and Compliance Officer at TDC. I have provided technical assistance on behalf of the Infrastructure Group at TDC to Mr Andrew Willis in his role as a s42A author as it relates to addressing submissions on the Energy and Infrastructure and Drinking Water Protection Chapters of the Proposed Timaru District Plan (PTDP).

3 I confirm I have read the Code of Conduct for expert witnesses contained in the Environment Court New Zealand Practice Note 2023 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Background

4 I have been asked by Mr Willis to provide comment on recommended changes to the Notified Timaru District Plan Flood Assessment Area Overlay for the Urban Area of Timaru and respond to submissions seeking amendments to the Flood Assessment Area Overlay in these areas.

5 TDC has worked closely with WSP (formerly Opus) on modelling our Three Waters Networks to assess the capacity of our networks as well as identify the potential impact of climate change on Council's water service networks.

6 TDC's Stormwater Modelling is intended to identify excessive surcharge, spills from manholes and overflow structures and ponding that occurs in various rain events which will assist with the development of broad scale flood hazard maps and identify secondary overland flowpaths.

7 The Notified Timaru District Plan Flood Assessment Area Overlay is a product of Council's preliminary rain on grid modelling which helps identify at risk sites from a series of rain events without consideration of Council' drainage system.

8 The rain on grid modelling used High Intensity Rainfall Design for Timaru District which includes an allowance for the effect of climate change to 2090 as well as set Coastal Boundary conditions for an RCP 8.5 scenario for the year 2090.

9 The flood assessment area is intended to identify those parcels of land with a flooding risk in a 0.5% Annual Exceedance Probability (AEP) flood event as well as possible high hazard flood areas triggered in a 0.2% AEP flood event. Timaru District Council has an existing service for issuing Flood Risk Certificates in its urban areas, where the predominant flood risk is from urban stormwater. These identify flood risk and required habitable floor levels for developments, as well as details of High Hazard Flooding if relevant. Timaru District Council currently charges $650 to prepare and issue a flood risk certificate. Environment Canterbury (ECAN) provides a similar service for rural and small urban areas who's predominant flood risk is from river catchments rather than urban stormwater.

10 0.5% AEP is inversely related to a 200 year Annual Recurrence Interval (ARI), which helps provide an indication of the probability of a specific rain event occurring in a given year. Therefore a 200-year ARI means there is a 0.5% probability of a rain event of that scale impacting an area within a given year. For a 0.2% AEP event, this is inversely related to a 500 year ARI event.

General Reason for Change of Urban Flood Assessment Areas

11 In the absence of a map in ECAN submission we worked with ECAN to understand the changes sought to the Flood Assessment Overlay, and reassessed the Overlay for urban areas as part of that exercise and in light of

the updated modelling that the Council has since received for the Timaru township.

12 Following the initial rain on grid modelling to identify surface water flow, detailed network modelling has progressed since 2021. The detailed network modelling has resulted in improved accuracy to flooding areas, particularly around the Timaru Urban Area.

13 TDC has completed model builds for the Te Ahi Tarakihi, Waimataitai, Whales Creek and George Street Catchments of Timaru Urban. These builds look to identify worst case flooding scenarios following projected growth with a coastal boundary condition of a 2% AEP Storm tide plus a 1.18m sea level rise as prescribed by the RCP8.5 climate change scenario.

14 With improved accuracy of Council's modelling within the Timaru Urban catchment, it was considered advisable to take the opportunity provided by the ECAN submission requesting changes to the Flood Assessment Area maps and other submissions identified below to use the most up to date data for Council to identify flood risk within the Timaru Urban Area.

15 From the PTDP notified flood assessment area to the revised Flood Assessment Area provided in Mr Griffiths' memo dated 28.02.25 in support of ECAN's submission [183.28], the number of parcels impacted by the assessment area has decreased across the Timaru Urban Area.

16 Across the Timaru Urban Area, the total rating units impacted by the PTDP notified flood assessment area equated to 6,986 ratable units. Under the revised Flood Assessment Area provided in support of submission 183.28, the number of rateable units impacted decreases to 6,604, a decrease of 382 properties.

17 In comparison, the PTDP notified flood assessment area impacted 14,660 rateable units district wide, while the revised Flood Assessment area in support of submission 183.28 impacts a total of 15,933 properties. An increase of 1,273 properties.

18 Considering the decrease in impacted properties within the Timaru Urban Area by the revised urban flood assessment overlay, this equates to an overall increase of impacted properties across the remainder of the district of 1,655 properties.

19 Given the improved accuracy to flooding areas discussed above, I recommend that the Timaru Urban portion of the Flood Assessment Area Overlay is replaced with the updated overlay.

Submissions – General

20 Multiple submissions were lodged during the notification period of the District Plan Review which included oppositions to the Flood Assessment Area Overlay within urban areas. These submissions are listed below:

a. 38.1 – G.D.M. Offices Ltd – Remove the Flood Assessment Area Overlay from 12 The Terrace.

b. 104.1 – Port Bryson Property Limited – Amend the extent of the Flood Assessment Area and overlay to exclude 16A, 16D, 16E Hilton Highway.

c. 167.3 – Broughs Gully Development Limited – Remove Flood Assessment Area overlay from Road 1 and Road 2 of DEV1 as shown below.

d. 192.3 - Harvey Norman Properties (N.Z.) Limited – Reduce the extent of the Flood Assessment Area at 266 Evans Street.

e. 205.1 – Hilton Development Trust - Remove the Flood Assessment Area overlay from 18 Hilton Highway, Oceanview Timaru.

21 The 5 submissions are in relation to three separate areas within the Timaru Urban Area.

22 The Flood Assessment Area provides an indication of the extent of flooding from a 0.5% AEP Rain event.

23 **Submission 38.1** – The site submitted on is within the George Street Stormwater Catchment which has an updated stormwater model built to TDC's specification. This update model still indicates the possibility of localised flooding on this site during a 0.5% AEP Rain Event.

24 **Submission 104.1, 167.3 and 205.1** – These three submissions are all within the Broughs Gully Sub-Catchment of the Waitarakao/Washdyke Lagoon Stormwater Catchment. The Flood Assessment Area Overlay in this location is still indicative of potential flooding in the event of a 0.5% AEP rain event.

25 I recommend the four submissions above be rejected as the submitters' sites all require assessment of the impact of flooding by a 0.5% AEP rain event prior to future development, even with the use of the more refined mapping within the Timaru Urban Area.

Harvey Norman Submission

26 Submission 192.3 on behalf of Harvey Norman Properties (N.Z) Limited requests relief through the reduction of the extent of the Flood Assessment Area Overlay through their site.

27 A flood assessment undertaken by Pattle Delamore Partners (PDP) has been supplied within Annexure 2 of the submission.

28 PDP undertook catchment modelling of the Te Ahi Tarakihi [Taitarakihi] Creek catchment and presented its results within the letter provided.

29 The PDP flood modelling, completed in August 2022, is in response to the extent of the flood assessment area within the Harvey Norman site being a

result of the Notified District Plan Flood Assessment Area not considering upgrades of the strategic culverts on Te Ahi Tarakihi Creek at State Highway 1/Evans Street and the KiwiRail corridor.

30 Since the PDP model output was produced, TDC has engaged WSP to undertake a full model build of the Te Ahi Tarakihi sub-catchment of the Timaru Urban area to TDC's Stormwater and Wastewater Model Build Specification, incorporating the new culverts at State Highway 1 and the KiwiRail Corridor.

31 The model build specification includes detailed requirements for consideration of Climate Change, specifically the use of the 2090 RCP8.5 climate change scenario which includes a sea level rise 1.18m and storm tide of 2% AEP.

32 In March 2024, WSP supplied TDC with updated modelling results, supplying multiple scenarios for various rain events and with consideration for the full 2090 RCP8.5 climate scenario and without.

33 Figure 1 below gives an indication of the extents of a 0.5% AEP flood event with no Climate Change.

Figure 1

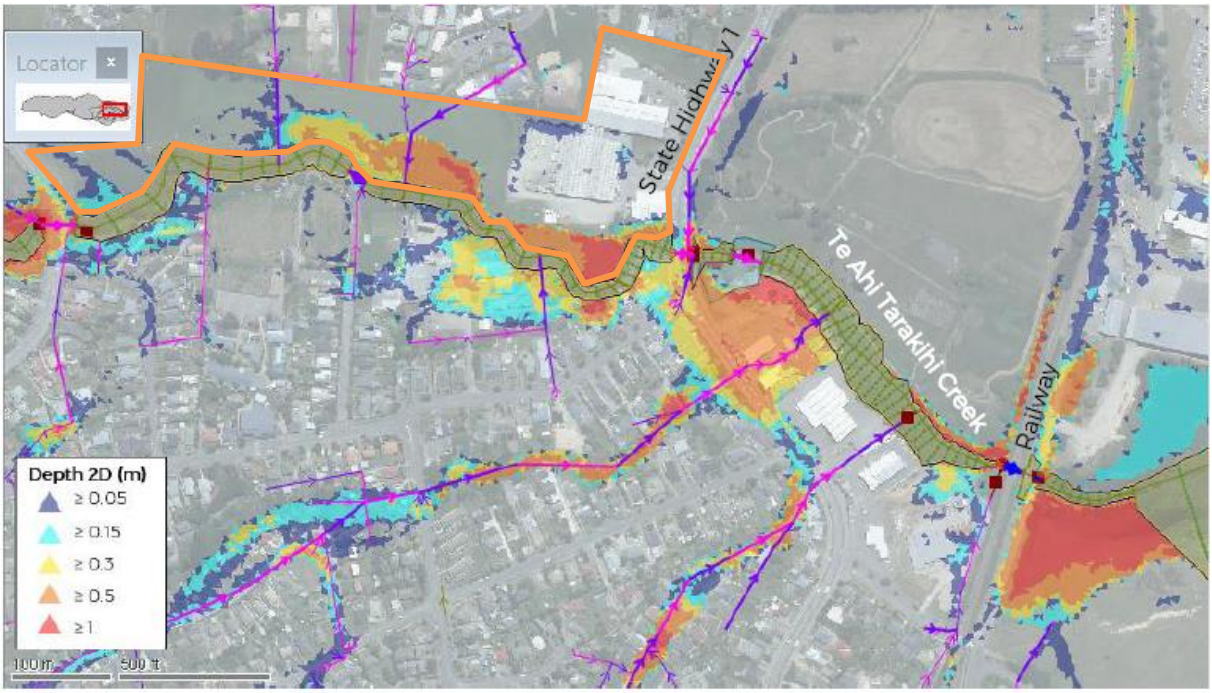


Figure 1-5 Flood extent for the 0.5% AEP event (no climate change).

34 Comparing Figure 1 above with Figure 4A from the PDP evidence, the extents match up relatively accurately.

35 Figure 2 below shows the 0.5% AEP Event with Climate Change from TDCs updated model.

Figure 2

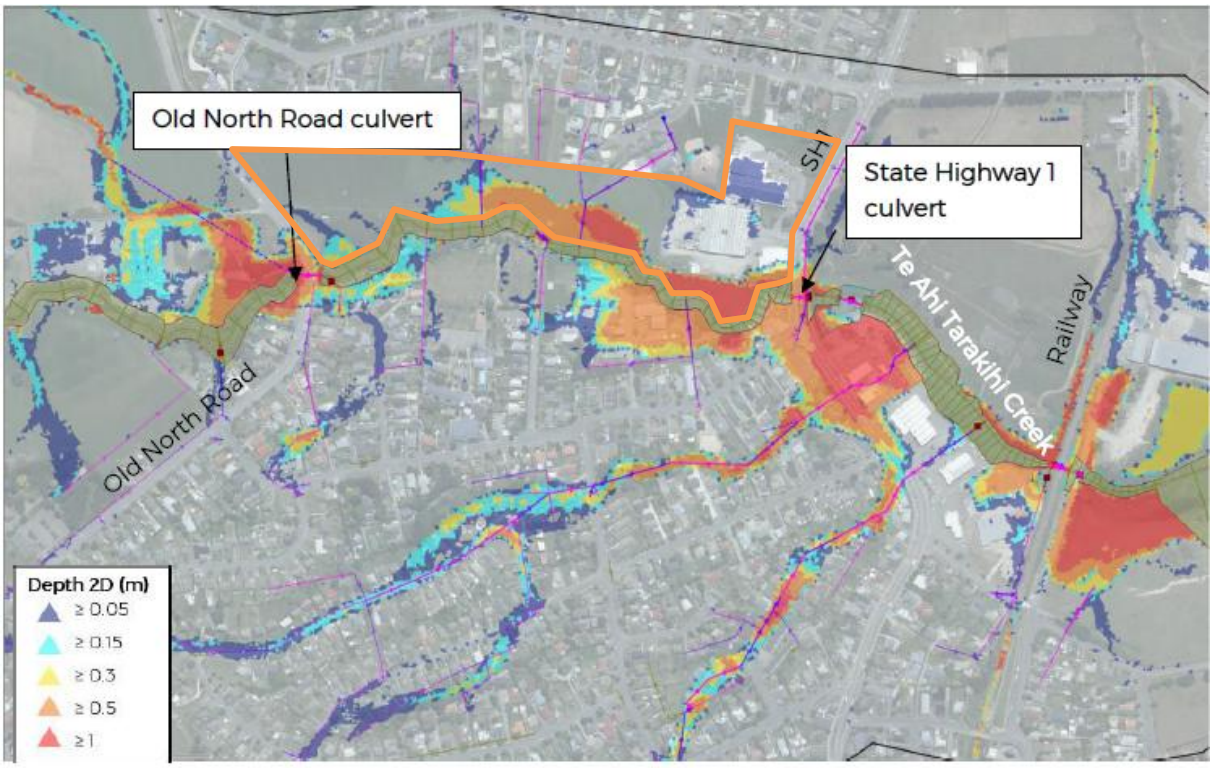


Figure A-10 Existing (no bunds) flood extent for the 0.5% AEP event (RCP8.5 2100 climate change).

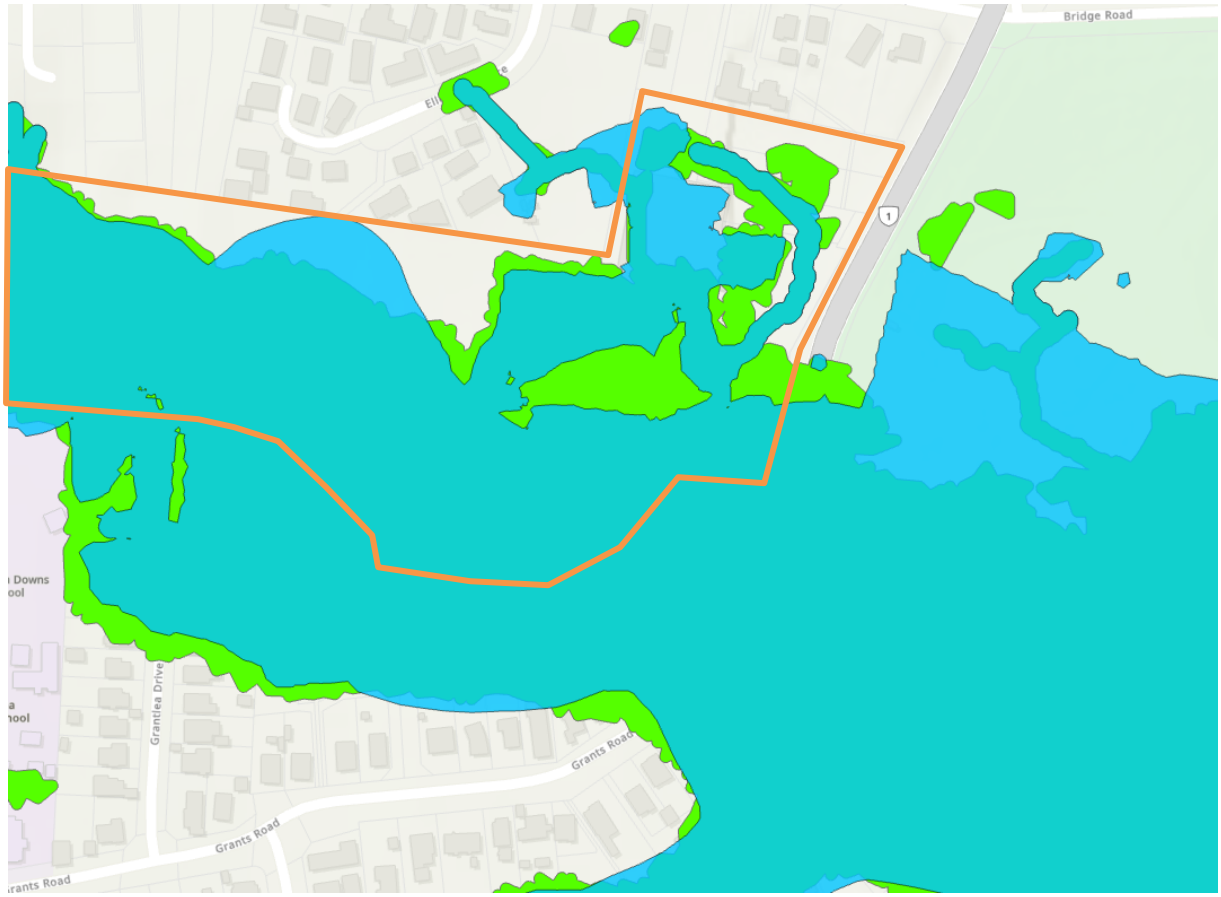
36 The differences between Figure 2 and Figure 1 is an increase in flood depths within the margins of Te Ahi Tarakihi Creek and an increase in localised flooding within the Harvey Norman Site.

37 Based the topography of the Harvey Norman site and the surrounding residential area to the north, in the event of a 0.5% AEP rain event, localised flooding on the site may be experienced.

38 Figure 2 does indicate the flooding within the Harvey Norman building itself. This level of flooding may be plausible for the groundfloor, warehouse level of the site.

39 Figure 3 below provides an indication of the change of the Flood Assessment Area on the site with the Green area indicating the new Flood Assessment Area and the Blue indicative of the Notified Flood Assessment Area.

Figure 3



40 The Green Area can be seen (projected under the Blue Area) to now exclude the main Harvey Norman Building while continuing to cover the majority of the site (Parking area, lower lying warehouse and former PGG Wrightson's Building).

41 This is indicative of the higher elevation of the main Harvey Norman Building on the site.

42 Due this localised flooding within the Harvey Norman site identified by TDCs most current modelling of the Te Ahi Tarakihi catchment, I recommend that the submission to reduce the extent of the Flood Assessment Area Overlay be rejected.

Summary

43 Based on my experience and the details outlined above in respect of the proposed changes to the Flood Assessment Area Overlay in the Proposed District Plan, I agree with the proposed changes, in respect to the Timaru Urban area, as shown in Appendix A and in Mr Griffiths' memo in support of ECAN's submission [183.28] for the whole Flood Assessment Area Overlay.

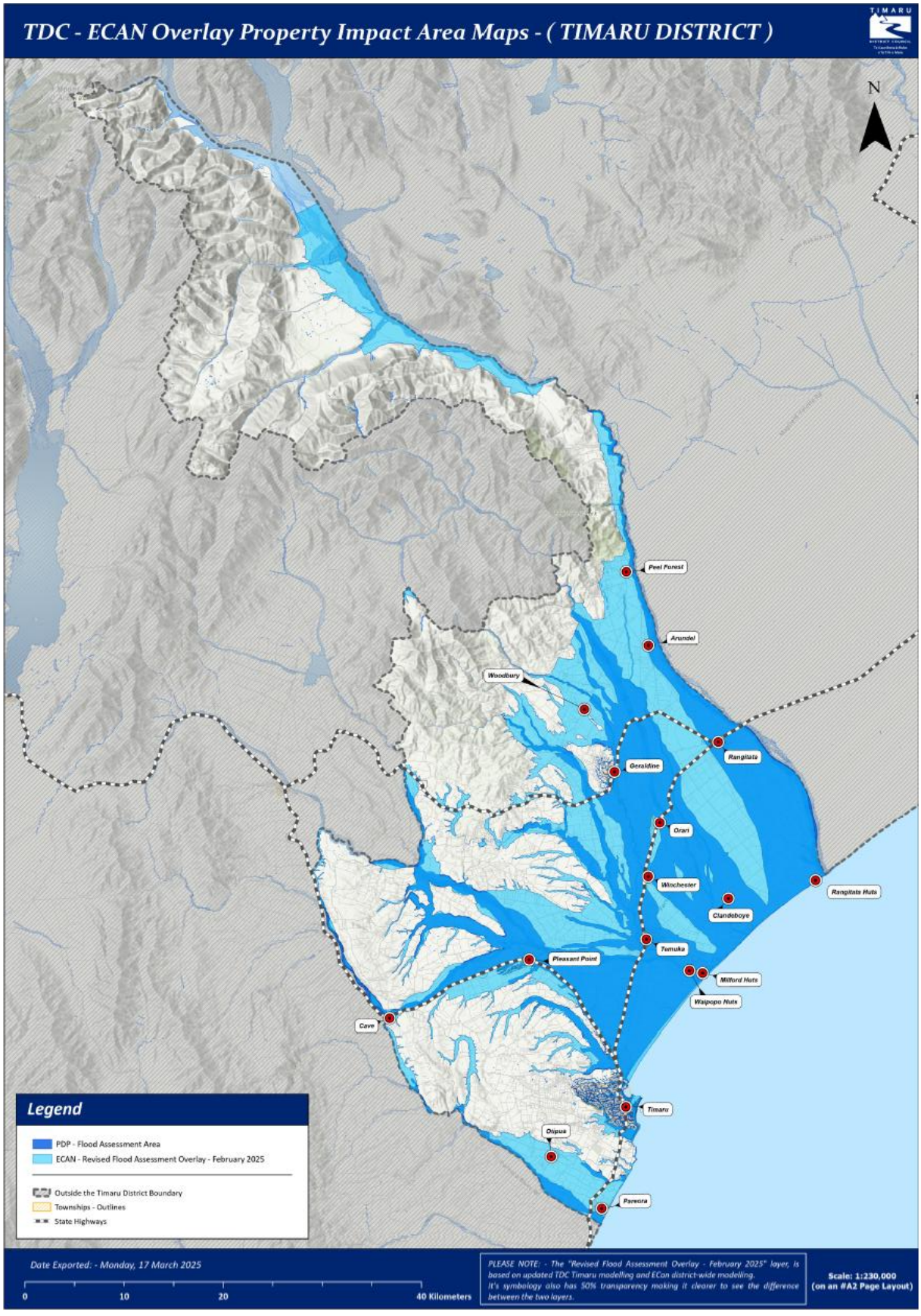
44 In discussions with ECAN on the revised Overlay, ECAN advised that they could not support retaining the outdated urban mapping given the updated modelling being available. I consider it is appropriate to use the updated modelling as it is the most up to date/refined version and it would be inefficient to include an older out of date version.

45 In respect of the submissions for changes or removal of the Flood Assessment Area Overlay from the Proposed District Plan, I recommend these are rejected, as all areas are still identified as at risk of flooding in a 0.5% AEP flood event and the data presented is the most current and accurate available to Timaru District Council at this time.

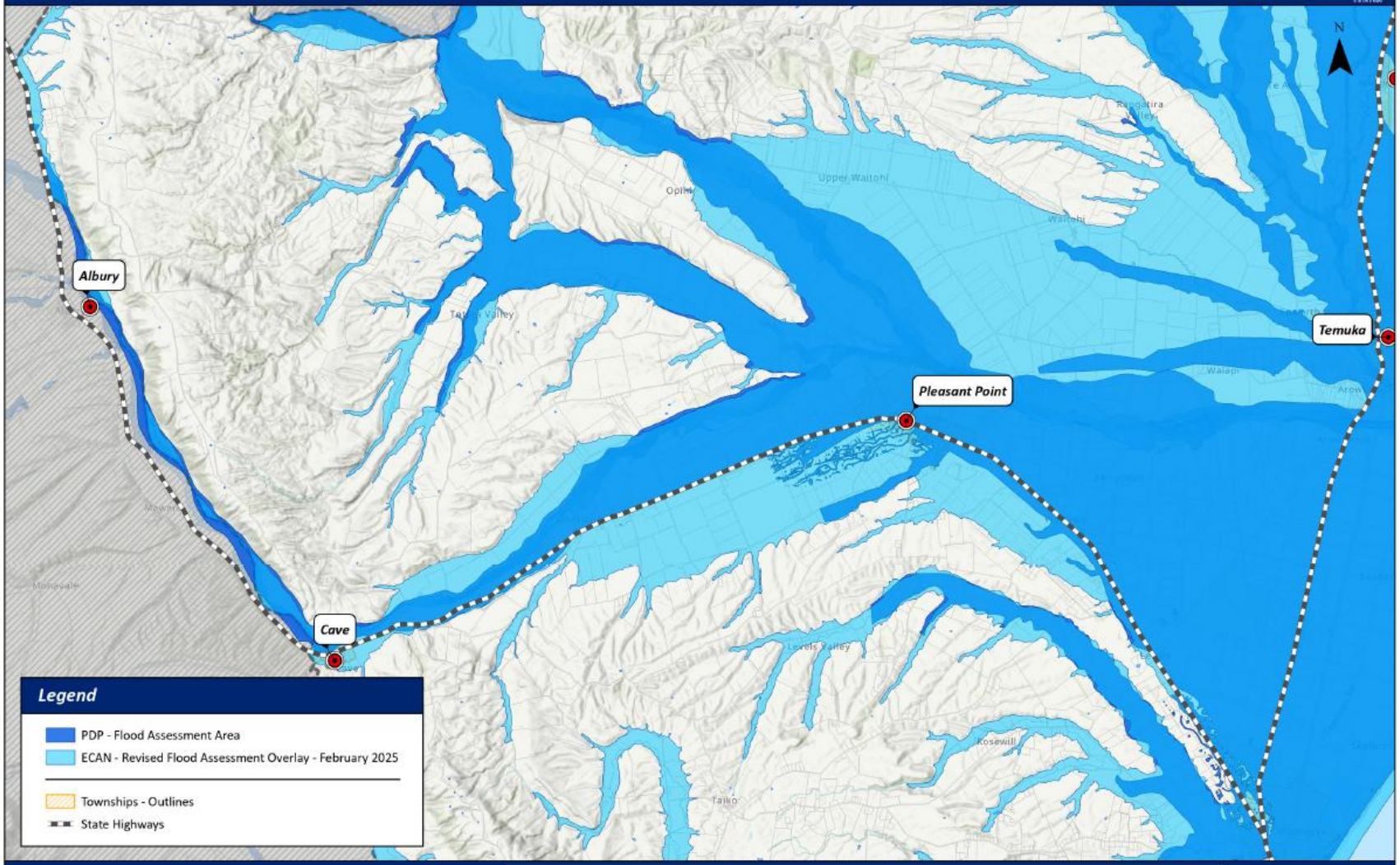
Kevin Kemp

28 February 2025

Appendix A – TDC-ECAN Overlay Property Impact Area Maps



TDC - ECAN Overlay Property Impact Area Maps - (CAVE , PLEASANT POINT & LEVELS)



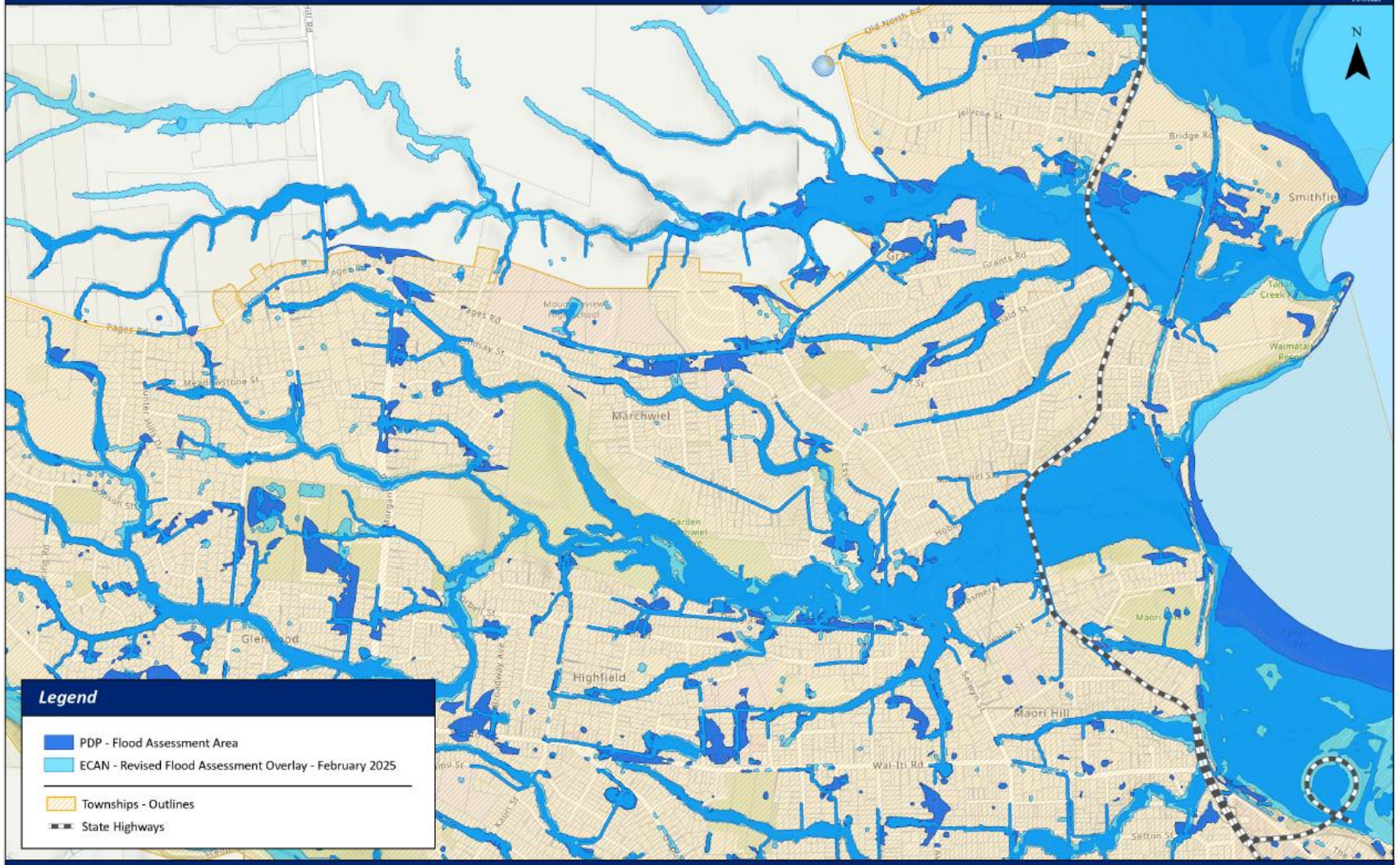
Date Exported: - Monday, 17 March 2025

0 2.5 5 10 Kilometers

PLEASE NOTE: - The "Revised Flood Assessment Overlay - February 2025" layer, is based on updated TDC Timaru modelling and ECan district-wide modelling.
It's symbology also has 50% transparency making it clearer to see the difference between the two layers.

Scale: 1:85,000
(on an #A3 Page Layout)

TDC - ECAN Overlay Property Impact Area Maps - (NORTH - TIMARU - Te Ahi Tarakihi & East Waimataitai Creek)



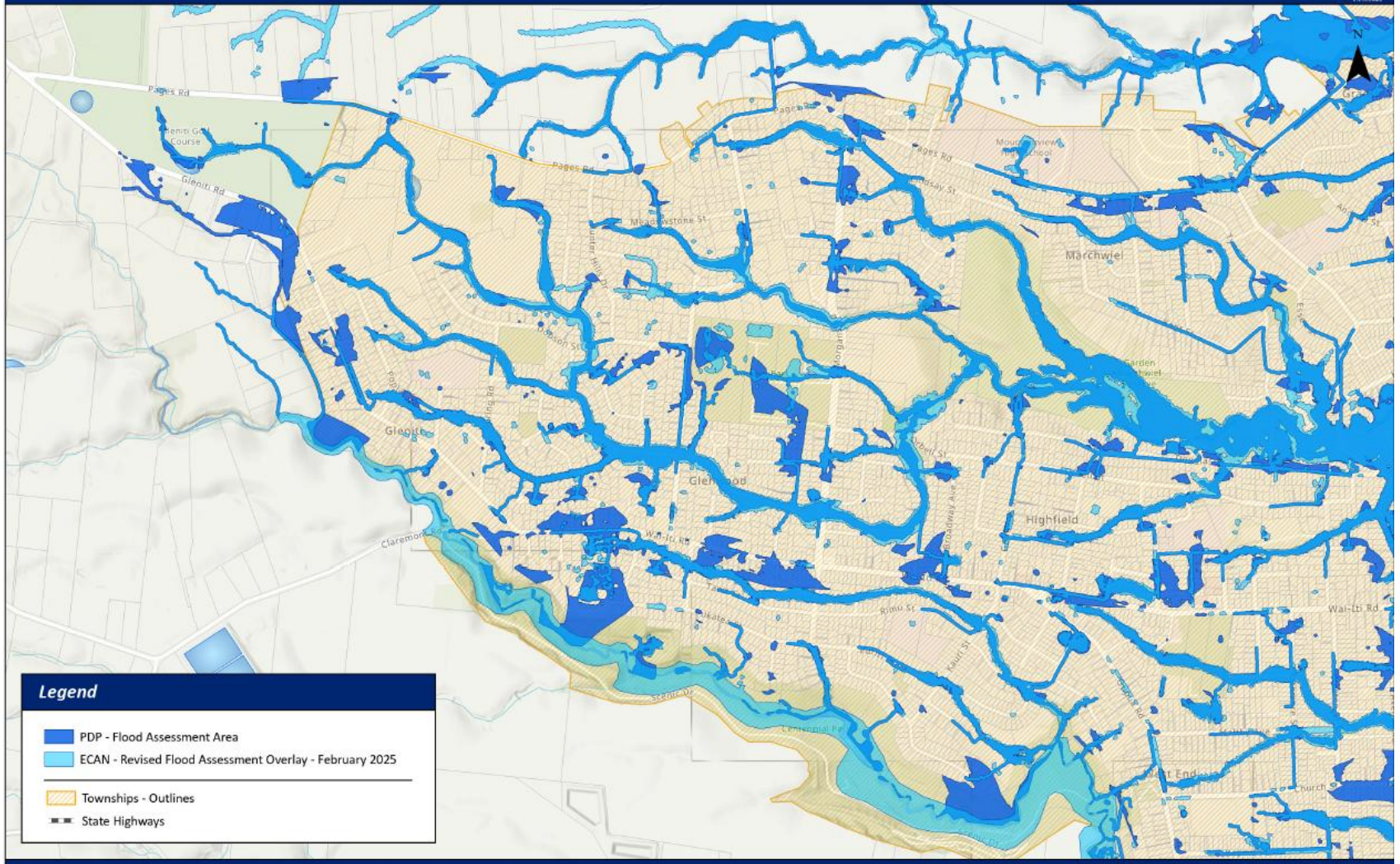
Date Exported: - Monday, 17 March 2025

0 0.35 0.7 1.4 Kilometers

PLEASE NOTE: - The "Revised Flood Assessment Overlay - February 2025" layer, is based on updated TDC Timaru modelling and ECan district-wide modelling.
It's symbology also has 50% transparency making it clearer to see the difference between the two layers.

Scale: 1:12,000
(on an #A3 Page Layout)

TDC - ECAN Overlay Property Impact Area Maps - (WEST - TIMARU)



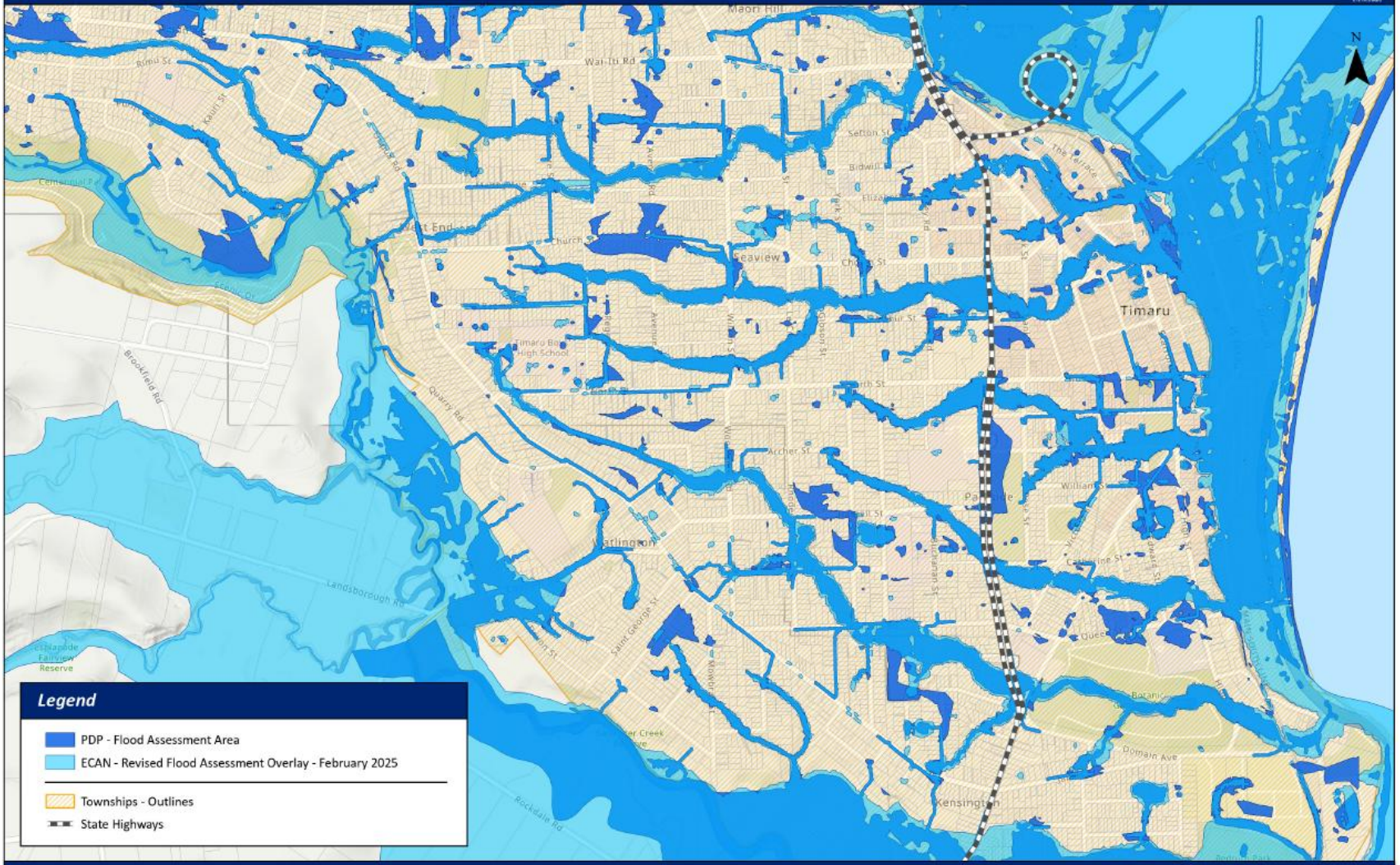
Date Exported: - Monday, 17 March 2025

0 0.35 0.7 1.4 Kilometers

PLEASE NOTE: - The "Revised Flood Assessment Overlay - February 2025" layer, is based on updated TDC Timaru modelling and ECan district-wide modelling.
It's symbology also has 50% transparency making it clearer to see the difference between the two layers.

Scale: 1:11,863
(on an #A3 Page Layout)

TDC - ECAN Overlay Property Impact Area Maps - (SOUTH-EAST - TIMARU)



Date Exported: - Monday, 17 March 2025

0 0.35 0.7 1.4 Kilometers

PLEASE NOTE: - The "Revised Flood Assessment Overlay - February 2025" layer, is based on updated TDC Timaru modelling and ECan district-wide modelling.
It's symbology also has 50% transparency making it clearer to see the difference between the two layers.

Scale: 1:11,863
(on an #A3 Page Layout)