



MILTON



2060

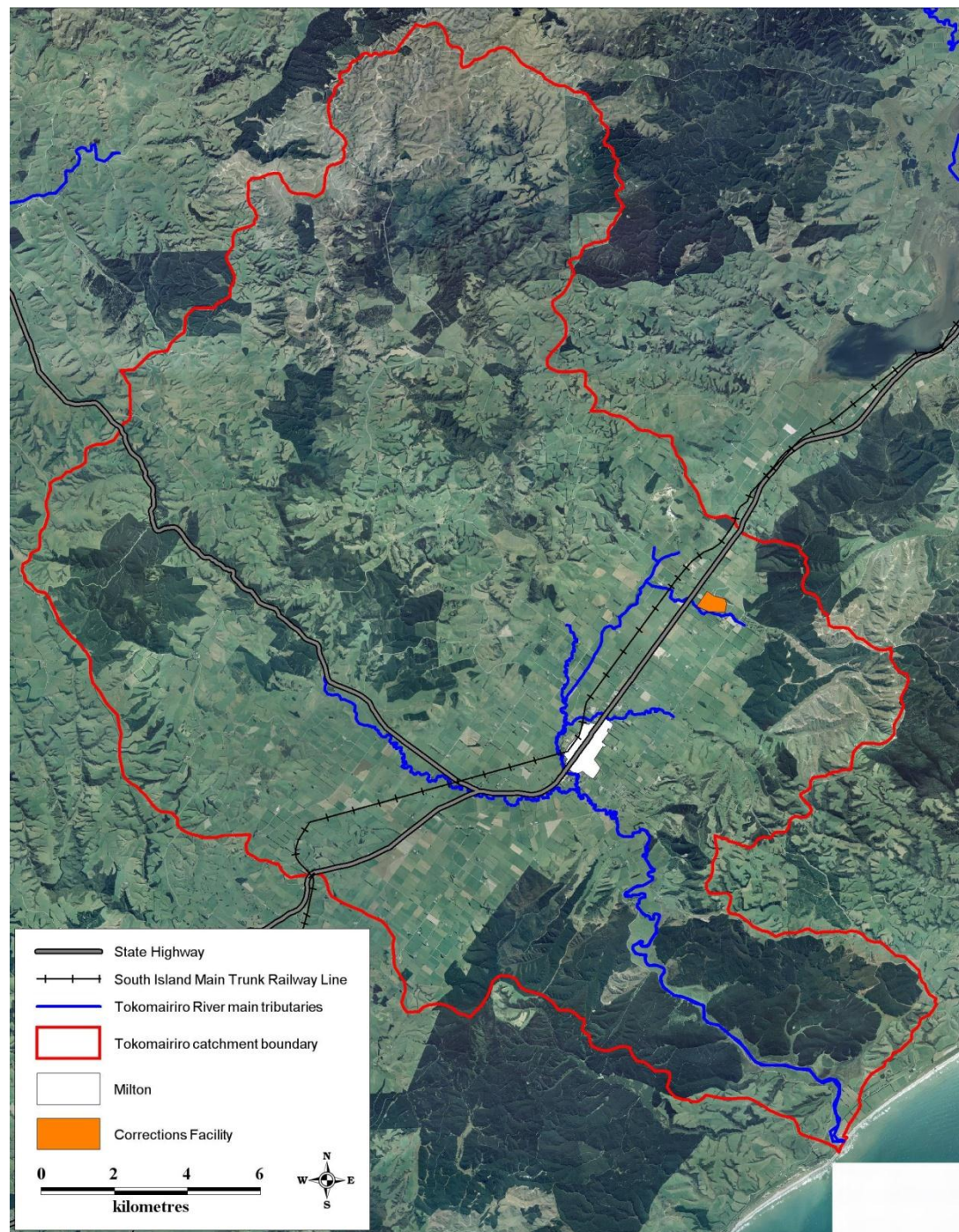


Flood Risk Management Strategy for Milton and the Tokomairiro Plain

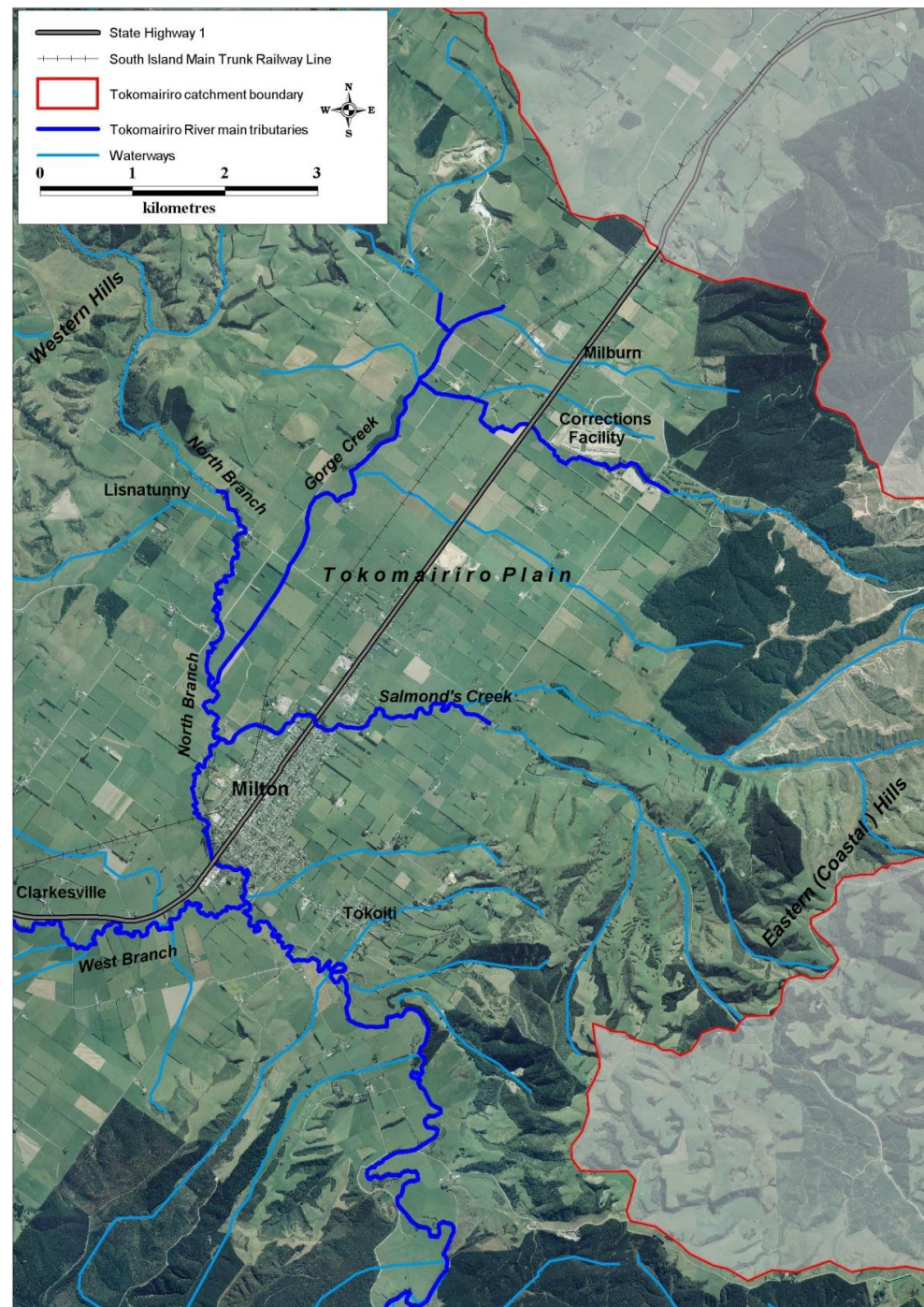


Milton and Tokomairiro Catchment

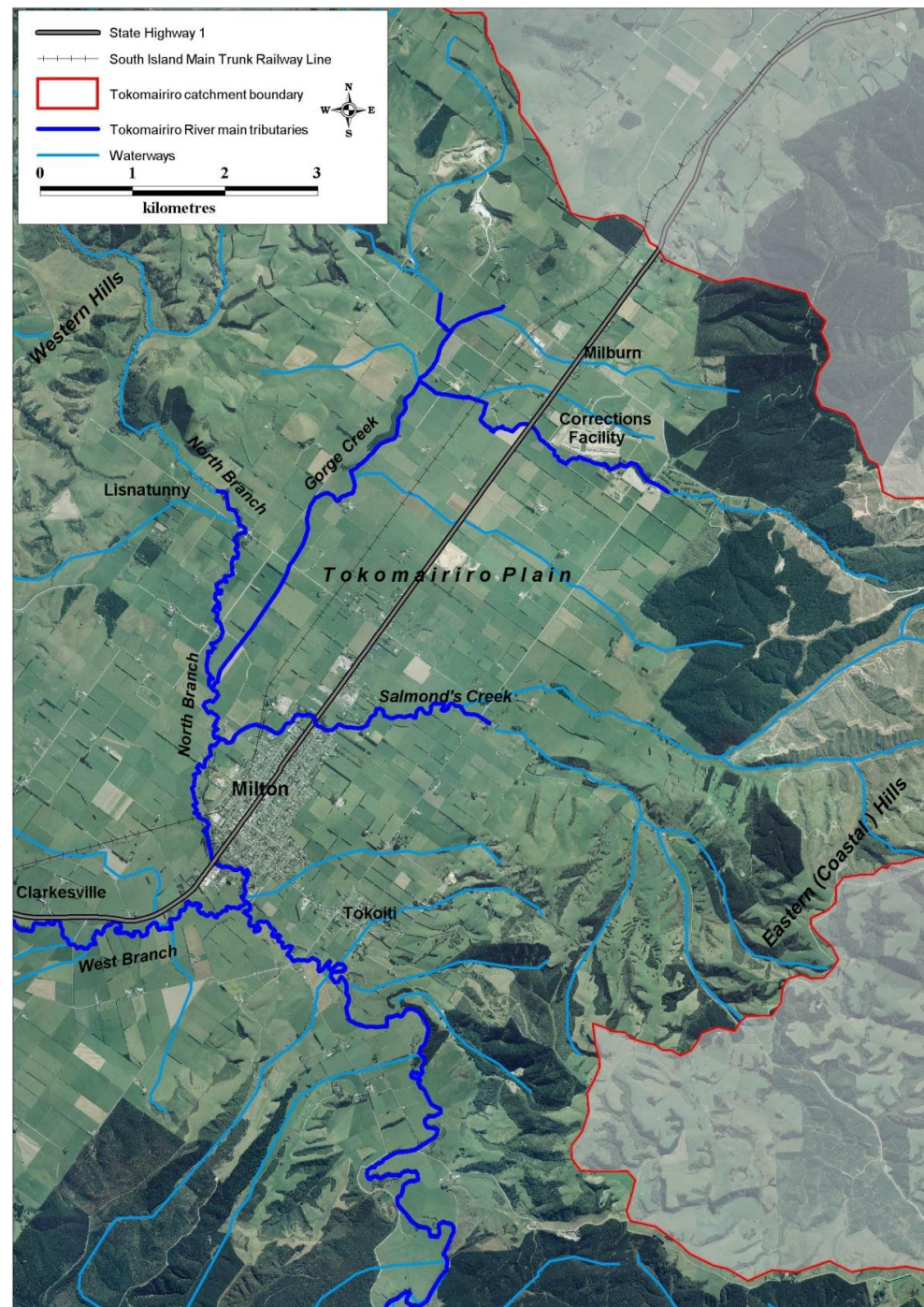




- History of flooding since Milton first settled
- July 2007 flood affected at least 80 houses



- Milton exposed to Tokomairiro River to the west and south and hill catchments to the east
- Ephemeral “paleochannels” play a vital role in reducing or worsening the flood hazard



Swales/paleochannels



West Branch Toko River
1970's

Swales/paleochannels



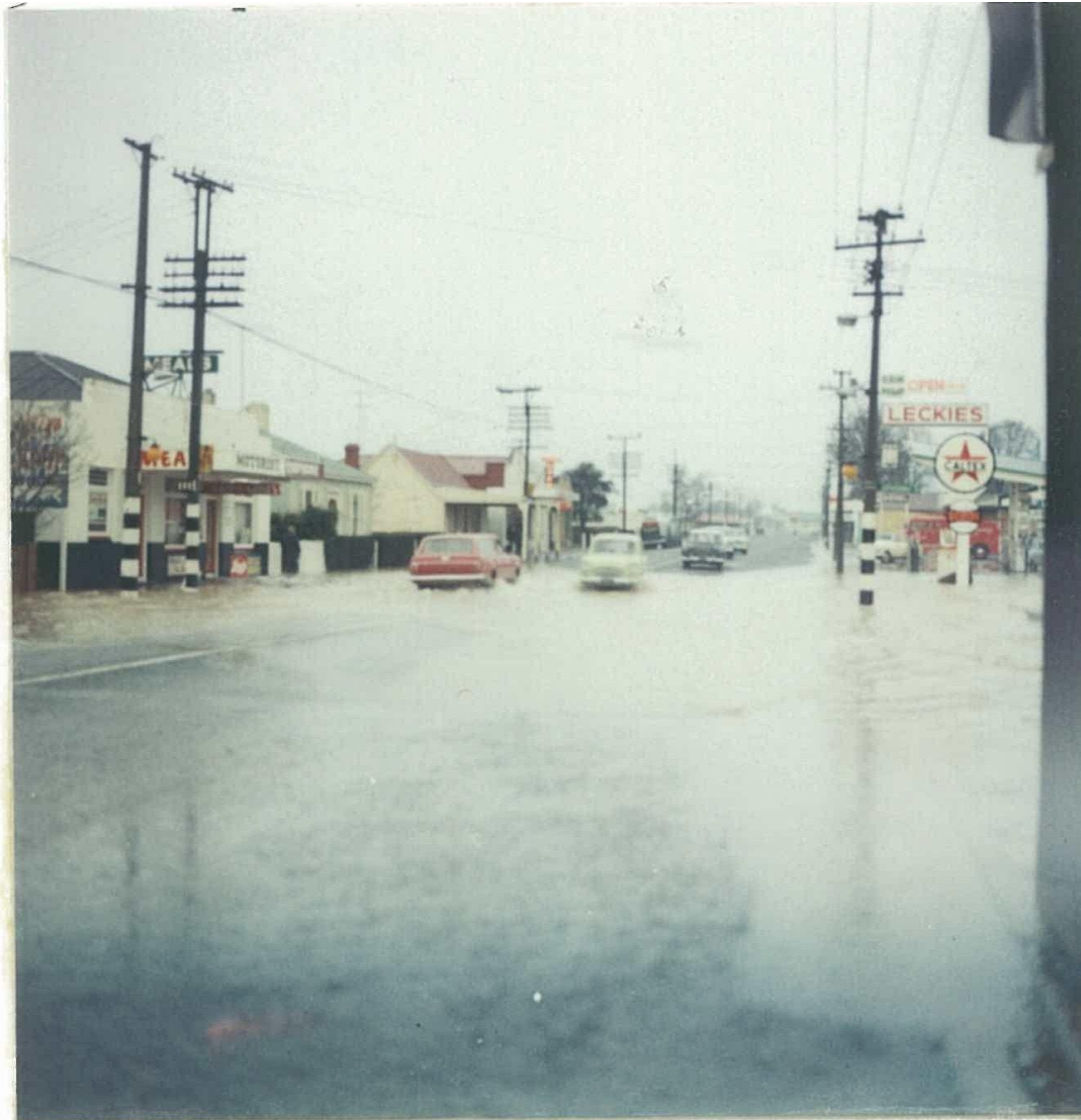
Swale draining towards Milton
February 2012

Swales/paleochannels



Swales draining towards Milton
August 1974

Swales/paleochannels



SH1 looking North (Caltex petrol station) – June 1972

Ponding



Ajax Street – July 2007

Ponding



Ajax Street (foreground) – June 1972

The Milton 2060 project

- Identify how and where Milton may grow in a sustainable, managed way
- Highlight locations where growth can be achieved without risk from future flooding
- Recommend measures that need to be put in place to reduce flooding for the existing community
- Joint working group of CDC and ORC

Approach

1. Define a set of guiding principles for managing flood risk
2. Understand flood hazard and preparation of flood maps based on existing data and information
3. Consider how land within identified flood hazard areas should be used
4. Identify appropriate methods to achieve sustainable land use

Principles (1)

- Strategy provides a means through which CDC, ORC and the community will work to actively manage flood risk in Milton and the surrounding floodplain
- The framework draws extensively from *New Zealand Standard 9401:2008 Managing Flood Risk*, and centres on the following principles:

Principles (2)

PRINCIPLE 1: ENSURE SAFETY

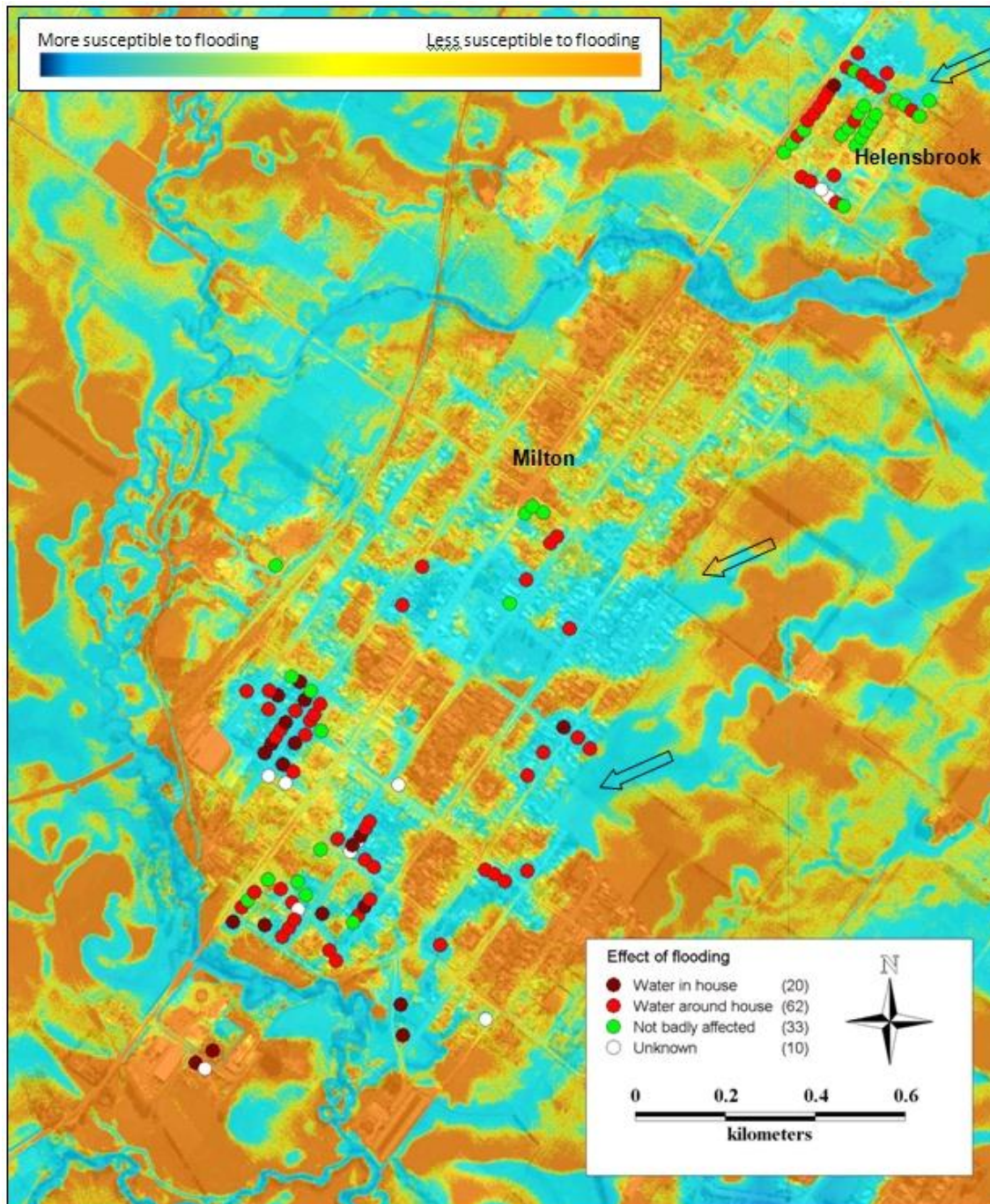
- People, community assets and infrastructure

PRINCIPLE 2: PLAN AHEAD

- Changes in flood hazard, responsible approach to allowing development

PRINCIPLE 3: SUSTAINABLE LAND USE

- Benefits / risks (including residual risks) for existing and new development



Mapping

Land surface
relative to the
surrounding area

The location and
status of houses
affected by flooding
during the July 2007
flood is indicated by
colour coded circles

Flood hazard mapping

Define flood risk management areas based on:

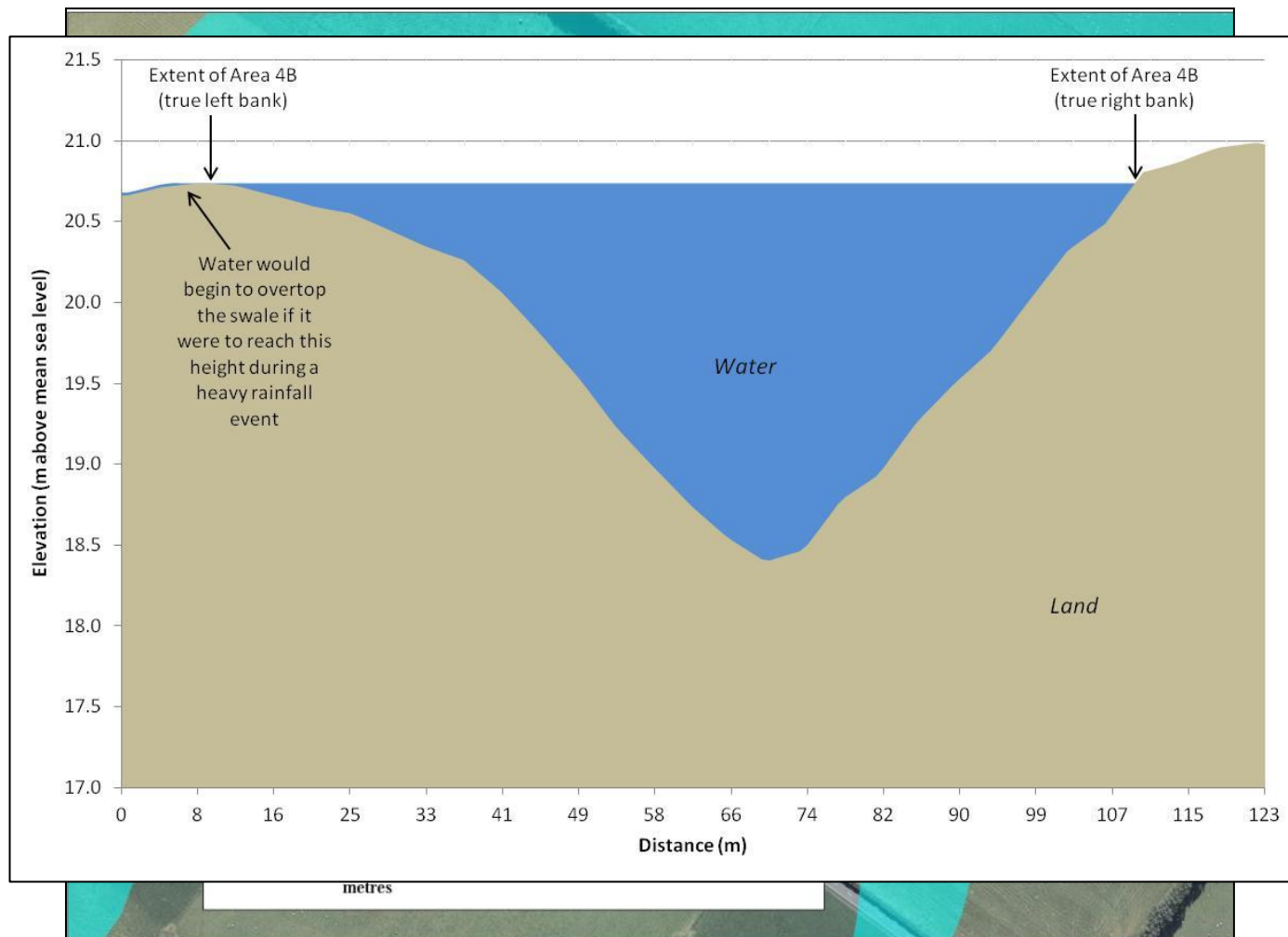
- Depth of inundation;
- Velocity of water at the peak of the flood;
- Duration of flooding.

The potential hazard to people and buildings can be expressed as a product of the velocity and depth. A higher product indicates an increased risk.

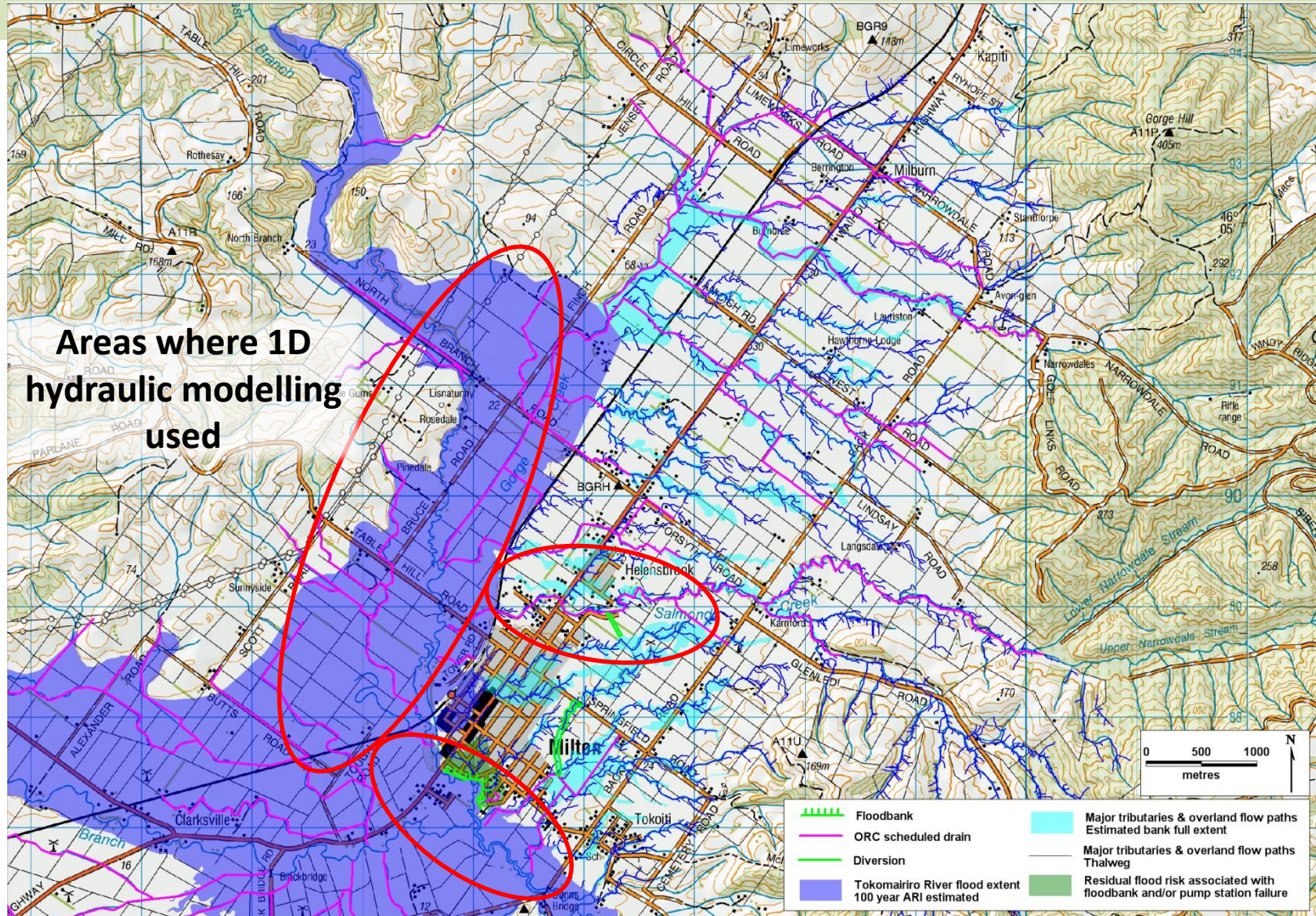
Flood hazard mapping

- Topography: river channel surveys for the Tokomairiro River and Salmond's Creek, and LiDAR data;
- Ground features and land use;
- Water level and flow velocity calculations (including hydraulic modelling when practical);
- Information collected during past flood events (including photographs) and discussions with local residents.

Flood hazard mapping

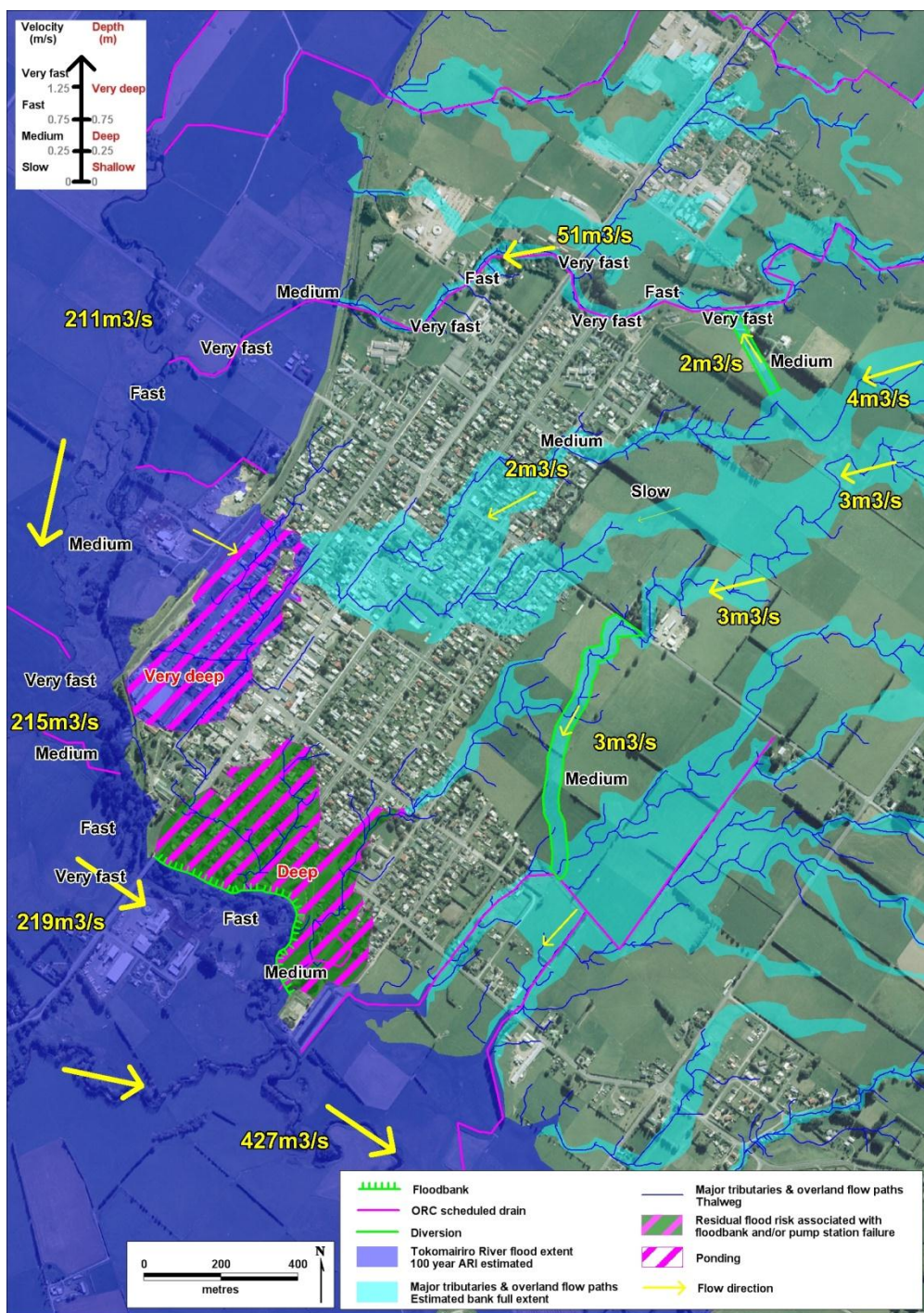


Flood hazard – Toko Plain



Flood hazard – Milton

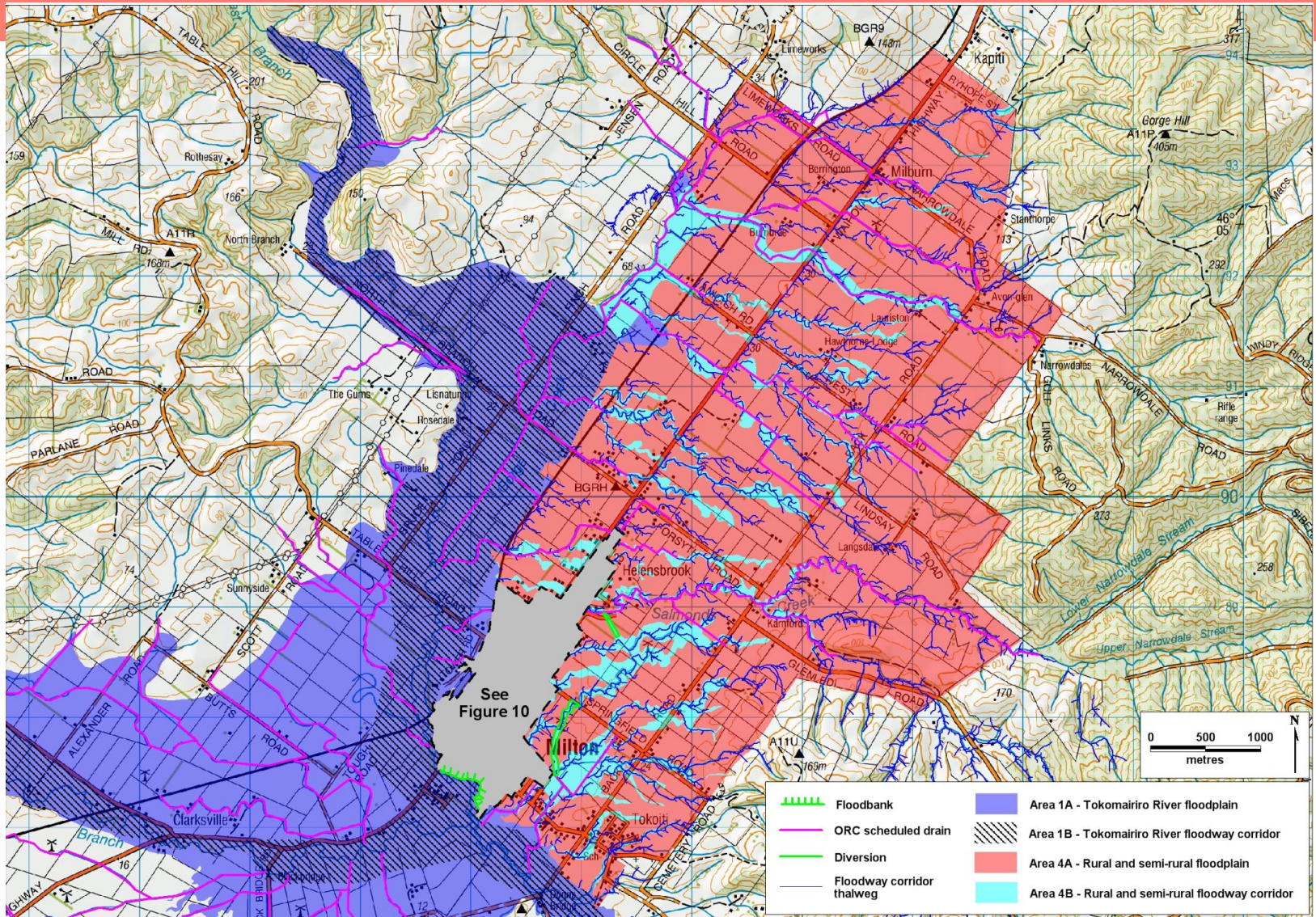
- Areas of ponding and conveyance
- '100 yr' flood
- Depth, velocity and duration



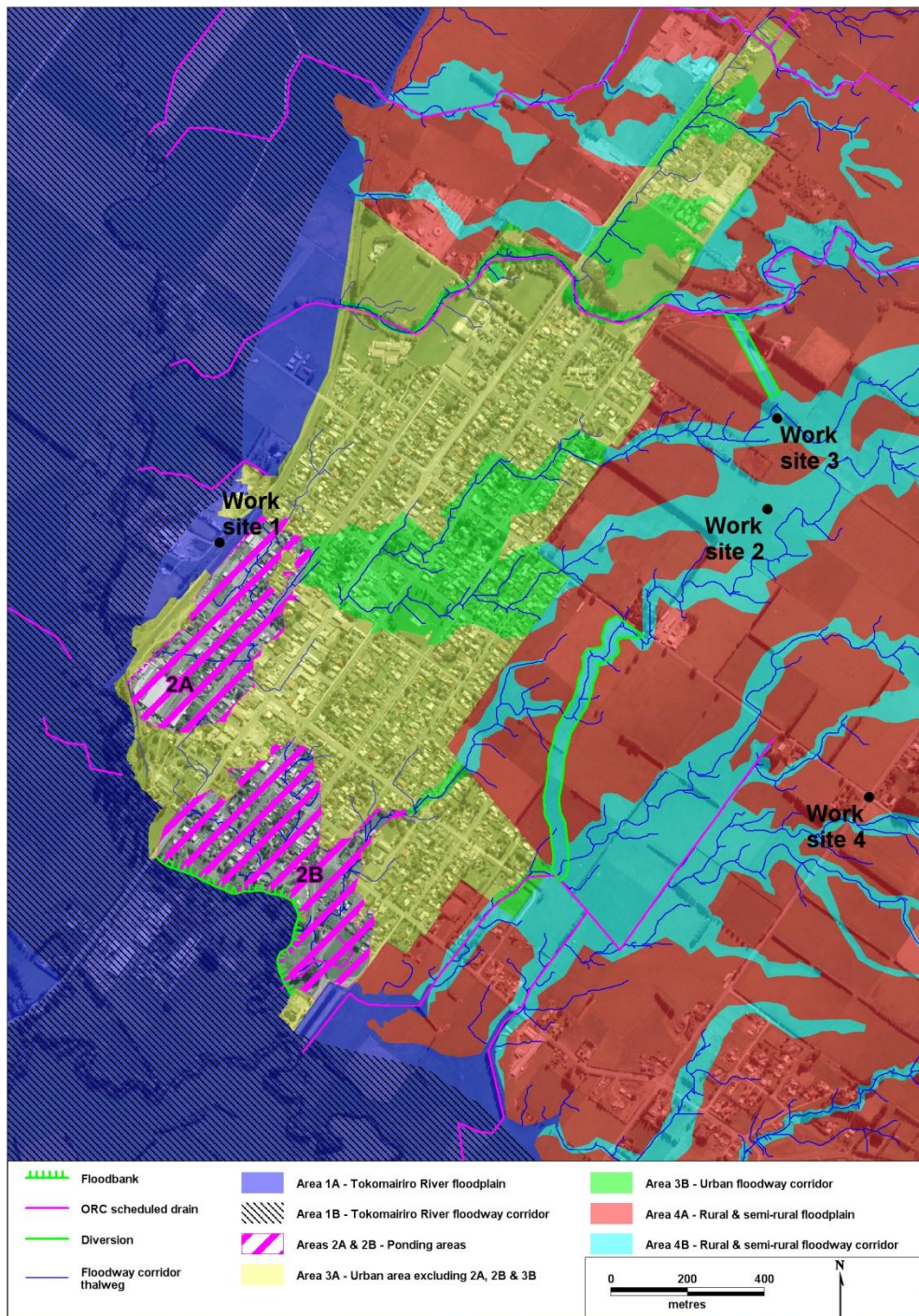
Flood hazard areas

- Low-lying (urban) ponding areas
- Toko River 'floodplain' and 'floodway corridors' where flows sufficient to cause a risk to safety or assets
 - Milton urban area
 - Rural and semi-rural areas on the Tokomairiro Plain.

Flood hazard areas – Toko Plain



Flood hazard areas – Milton



How should we respond to risk?

Options fall into three main categories:

PERSONAL RESPONSIBILITY

- Awareness, ability to respond, flood-proofing buildings

PROTECTION WORKS

- Bunds, diverting flood water

LAND USE CONTROLS

- Apply to areas with similar land use and flood hazard characteristics

Land use controls – District Plan

A range of land use controls proposed:

- Avoid development in areas with an unacceptable level of flood hazard.
- Suitable forms of development and redevelopment occur in areas of moderate flood hazard
 - No increase in flood risk over time
 - Decrease in risk where possible

Public consultation

- April – May 2012
- Public meeting to present Strategy
- Info days
- Public feedback requested
- Feedback considered by working party
- Minor amendments to hazard area boundaries
- Strategy adopted by both Councils July 2012

Implementation

- Clutha District Council
 - Flood sensitive urban design
 - District Plan review
 - Physical works
- Otago Regional Council
 - Range of actions prior, during and after flood events
 - Support implementation by CDC
- Joint 3 yearly review

Summary

- Milton 2060 Strategy a joint initiative of Otago Regional and Clutha District Councils
- Combines functions and responsibilities of both
- Intended to enable long term sustainable development in Milton
- Ensure flood risk does not increase, and that over time, existing risks are reduced
- A practical example of *NZS:9401 Managing Flood Risk*

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- Jean-Luc Payan & Mike Goldsmith (Otago Regional Council)
 - With thanks to Murray Brass (Clutha District Council)
 - The full Milton 2060 Strategy can be accessed at www.orc.govt.nz