

Source Water Protection

Presentation to TANK Meeting of behalf of
Havelock North Joint Working Group on Drinking Water Safety
31 May 2018

Introduction & Overview

- Introduction & Scope of Work
- Why do we need RMA provisions to protect drinking water sources?
- Drinking Water Sources in TANK Catchment
- What activities & risks need to be managed?
- How are Source Protection Zones determined?
- Options for Regional Plan provisions

**Presentation is for Information Purposes only.
No decisions required from TANK at this meeting**

Issue Identification: Why do we need Source Protection?

Water is a precious taonga, highly valued in its own right and as a source of human drinking water.

RMA and National Environmental Standard

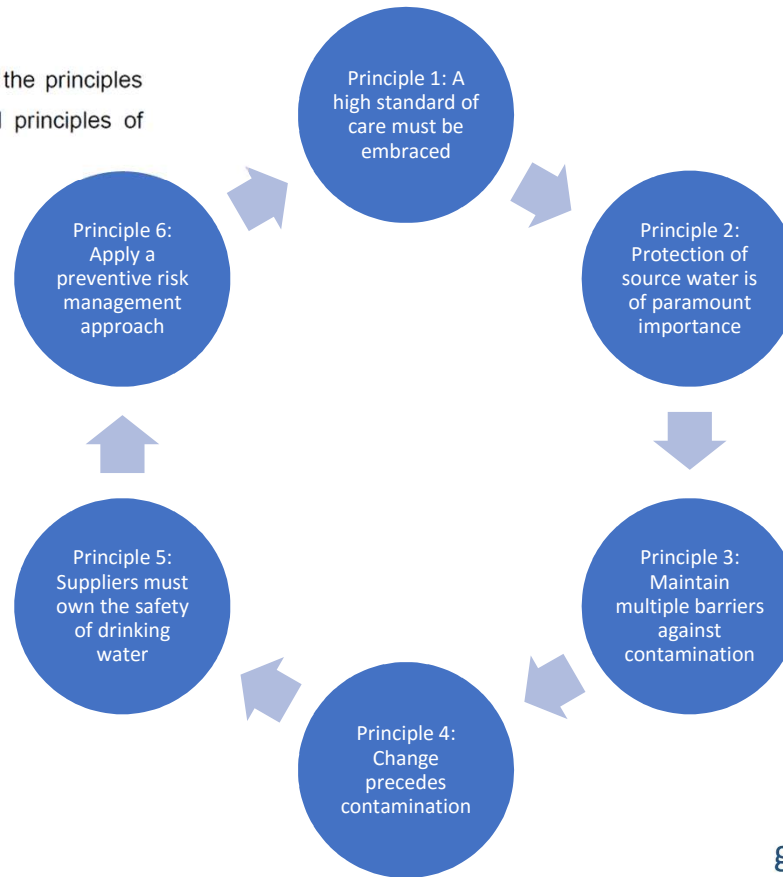
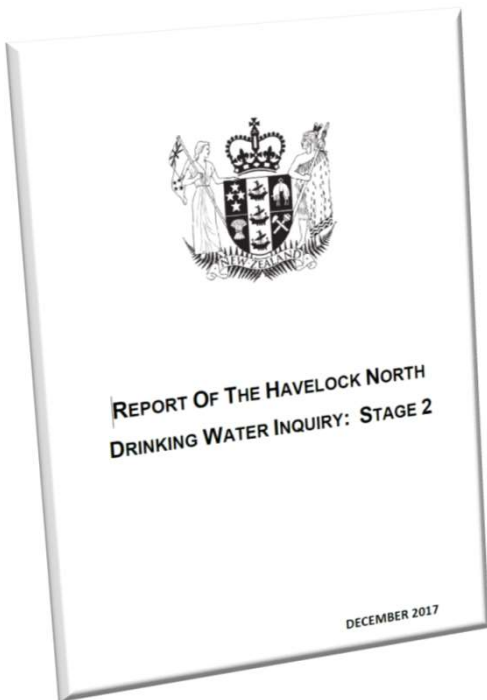
Board of Inquiry Findings

RPS and RRMP Objectives

Board of Inquiry – 6 Principles

The Principles

[31] In light of the evidence it heard, and the varying expression of the principles internationally, the Inquiry has identified the following six fundamental principles of drinking water safety for New Zealand:



Board of Inquiry – 6 Principles

Principle 2: Protection of source water is of paramount importance

Protection of the source of drinking water provides the first, and most significant, barrier against drinking water contamination and illness. It is of paramount importance that risks to sources of drinking water are understood, managed and addressed appropriately. However, as pathogenic microorganisms are found everywhere, complete protection is impossible and further barriers against contamination are vital.

Principle 6: Apply a preventive risk management approach

A preventive risk management approach provides the best protection against waterborne illness. Once contamination is detected, contaminated water may already have been consumed and illness may already have occurred. Accordingly, the focus must always be on preventing contamination. This requires systematic assessment of risks throughout a drinking water supply from source to tap; identification of ways these risks can be managed; and control measures implemented to ensure that management is occurring properly. Adequate monitoring of the performance of each barrier is essential. Each supplier's risk management approach should be recorded in a living WSP which is utilised on a day to day basis.

RMA & the National Environmental Standard (Sources of Human Drinking Water)

- Source protection included in Part 2, but is implicit, not explicit

“promote the sustainable management of natural and physical resources. managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety”

- National Environmental Standard Sources of Human Drinking Water was an attempt to “plug a legislative gap” and provide statutory recognition of 1st barrier approach

NES in Summary

Registered Supplies
< 25 people

NES Does not apply

Registered Supplies
25-500 people

Resource Consents

Consider if an event (eg spill, heavy rain) MAY lead to significant adverse effect on drinking water quality? If so, condition MUST be imposed requiring notification of event

Regional Plans

No restriction on Regional Plan Permitted Activity Rules

Registered Supplies
> 500 people

CANNOT Grant Water Permit or Discharge Permit if activity likely to cause health standard or aesthetic guidelines to be exceeded after existing treatment

Consider if an event (eg spill, heavy rain) MAY lead to significant adverse effect on drinking water quality? If so, condition MUST be imposed requiring notification of event

Regional Rules cannot include Permitted Activities UNLESS SATISFIED not likely to introduce or increase contaminants such that health standard or aesthetic guidelines are not met after existing treatment

National Environmental Standard

- A Regional Plan may be more restrictive than the NES
- Do not need to immediately amend Regional Plan Rule until
 - Scheduled Plan Change; or
 - A Plan Change that relates to a relevant Rule is introduced
 - TANK Process requires consideration of Permitted Activity Rules that apply upstream of abstraction points for drinking water sources serving more than 500 people.
- What is meant by “upstream” or “upgradient”?

Drinking Water Supplies in TANK

From Drinking Water Register:

Supply	Pop. Served
Hastings Urban	64,764
Napier City	50,804
Clive	560
Whakatu	337
Omahu	126
Breckenridge	52
Meeanee, Gavin Back St	33
Waipatu	30
McElwee Subdivision	28



Risk Activities

- What sorts of activities are of interest in a water supply protection zone?

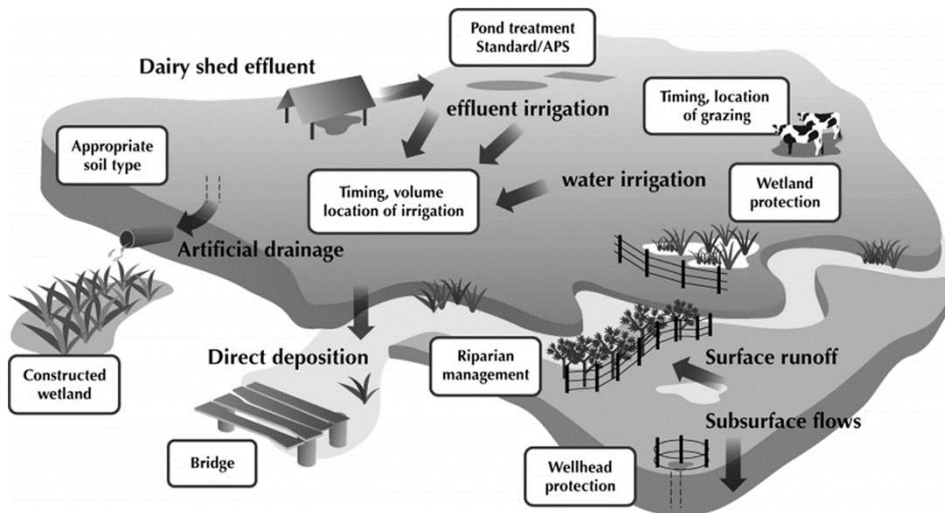


Table 3.5: Human activities and associated inputs into freshwater ecosystems with human health risks

Activity	Contaminants	Health risks
Agriculture and horticulture	Sediments Nutrients Pesticides and other toxic chemicals and metals Faecal microbial contaminants	Immune and endocrine disruption Retarded physical and cognitive development, blue baby syndrome
Industry	Nutrients Toxic chemicals and metals Oils	Foetal malformation and death
Mining	Sediments Toxic chemicals and metals	Nervous system and reproductive dysfunction
Urbanisation, infrastructure and development	Sediment Pesticides and other toxic chemicals and metals Oils Faecal microbial contaminants	Behavioural changes Cancers Waterborne disease
Recreation	Oils and fuel Toxic chemicals	

Modified after Slaney and Weinstein 2004.

From: Guidelines for Drinking Water Quality Management, NZ

Risk Activities

- Board of Inquiry, Stage 2 report, Part 3 – GENERAL RISK LANDSCAPE
 - Baseline vs Event
 - “events typically include flooding and heavy rain, droughts, power failures, or organisational factors such as complacency or inadequate resourcing. **Evidence of supply safety under baseline conditions is not evidence that this safety will be maintained under such event conditions.** Failures can occur at any time, may occur slowly over time without red flags being raised, and cannot necessarily be detected in a timely manner to prevent consumer exposure to contamination”
 - Aquifer Changes
 - “GNS advised the Inquiry that the **permeability of aquifers and aquitards should be considered a dynamic variable** which can change as a result of stress and strain.”

Risk Activities

- Board of Inquiry, Stage 2 report, Part 3 – GENERAL RISK LANDSCAPE
 - Bores drilled through aquifer protection layers
 - Sources of human wastewater (disposal areas, wastewater infrastructure)
 - illegal earthworks or connections
 - discharges of nitrates upstream of collection areas or into water sources
 - building piles;
 - use of herbicide /pesticides and, more generally, pollutants from farmland
 - urban land use activities
 - forestry
 - Landfills (closed and operational)

Understanding & Assessing the Risks

- Source Protection Zone ≠ Eliminating Risks

[624] The Inquiry emphasises the need to be precise and careful with the wording that is used for this clarification in ss 6 and 30. Several expert panel members noted the challenge of absolute protection of drinking water sources in the New Zealand context where sources are varied and often part of complex systems. This accords with the risks posed to source water discussed in Part 3. The Inquiry agrees with Dr Mitchell's sentiment that "protection" needs to encompass identifying and understanding the risks to drinking water sources and addressing and managing them appropriately.



How are Risk Activities Currently Managed?

Activity	RRMP	Activity	RRMP
Fertiliser application	Permitted	Stormwater	New TANK provisions
Pesticides / Agrichem	Permitted, GrowSAFE	Vegetation clearance	Permitted (conditions apply)
Wastewater Disposal	Permitted – Discretionary (depends on scale & system)	Bore drilling	Controlled – consent must be granted
High Stocking Rates	Feedlots are Permitted (conditions apply)	Abandoned / unmaintained bores	Non-Complying
Offal Pits or similar	On-property: Permitted	Bore decommissioning	Permitted – no consent required.
Solid waste disposal	On-property: Permitted Otherwise requires consent	Landfills	Controlled - Discretionary
Animal Effluent Disposal	Controlled		
Hazardous substances	HASNO	Foundation Piles, poles	Building Act ?
Fuel Storage Tanks	HASNO	Earthworks	District / City Plans
Mining	District & Regional Plans	Road runoff	District / City Councils / Stormwater Rules
Wastewater reticulation	District / City Councils		

Determining Source Protection Zones

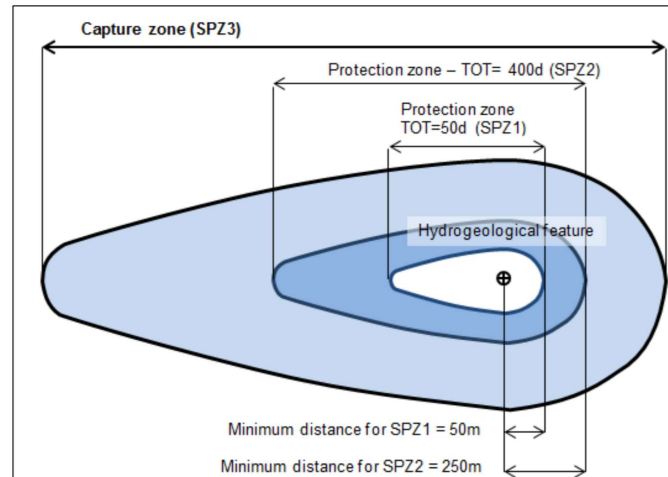
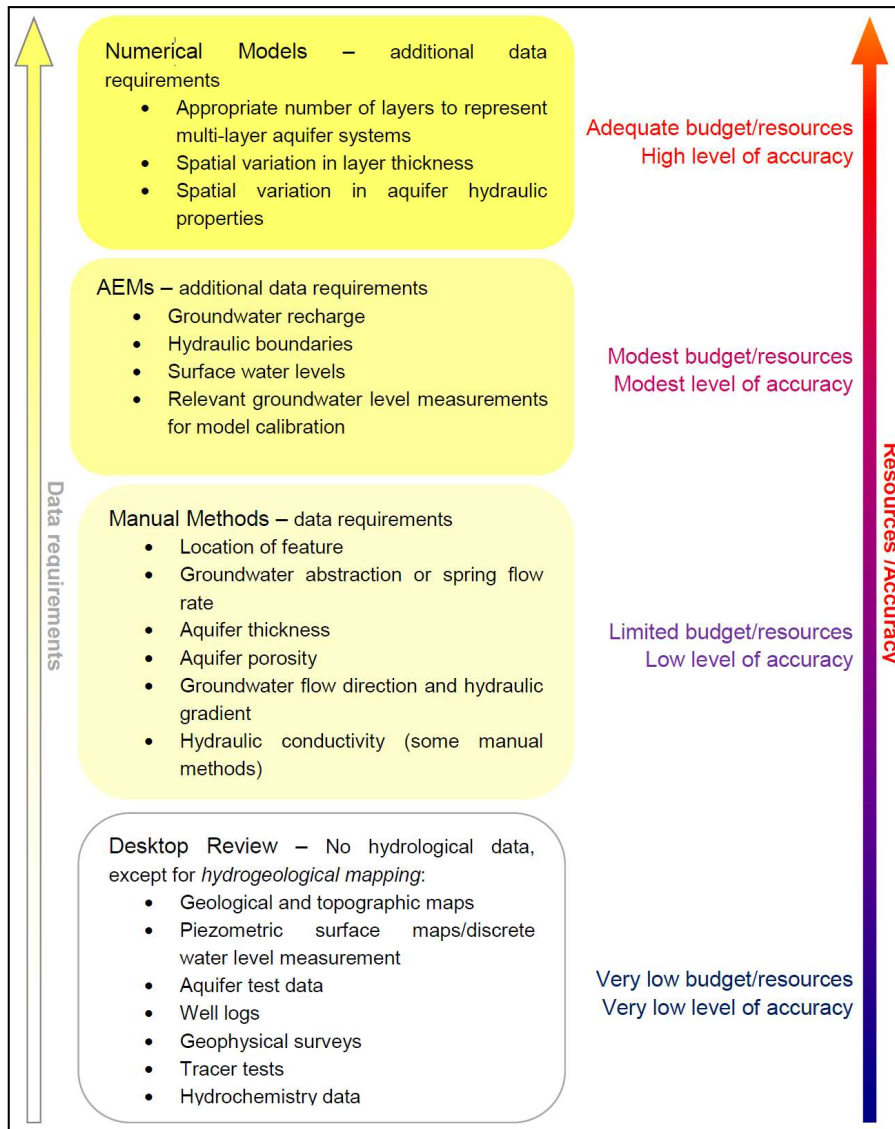


Figure 3: Schematic representation of CZ and PZ for a pumping well in a homogeneous anisotropic aquifer (modified from Carey *et al.*, 2009). The regional groundwater flow direction is from left to right. Drawdown contours are not shown.

Capture Zone: TOTAL area that contributes to water that will eventually end up at the abstraction point.

Protection Zone: Area defined by travel time of water to the abstraction point.

Protection zone depends on the contaminants of interest. Typically defined as a **Microbial Protection Zone – 1 year travel** based on bacteria and virus survival.

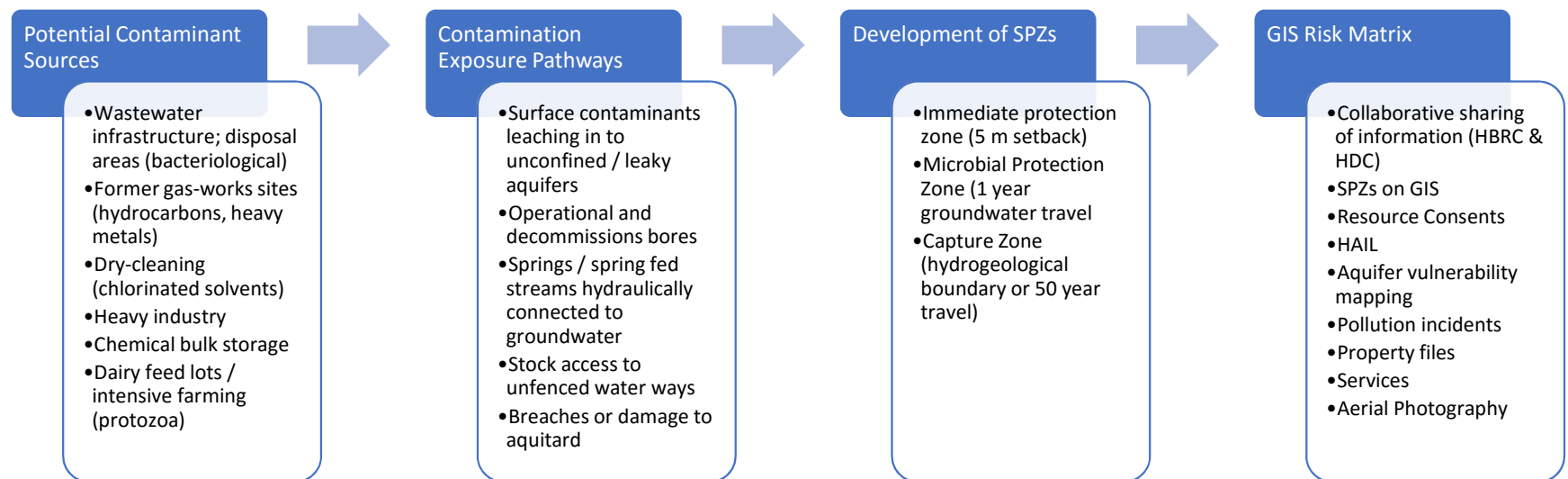


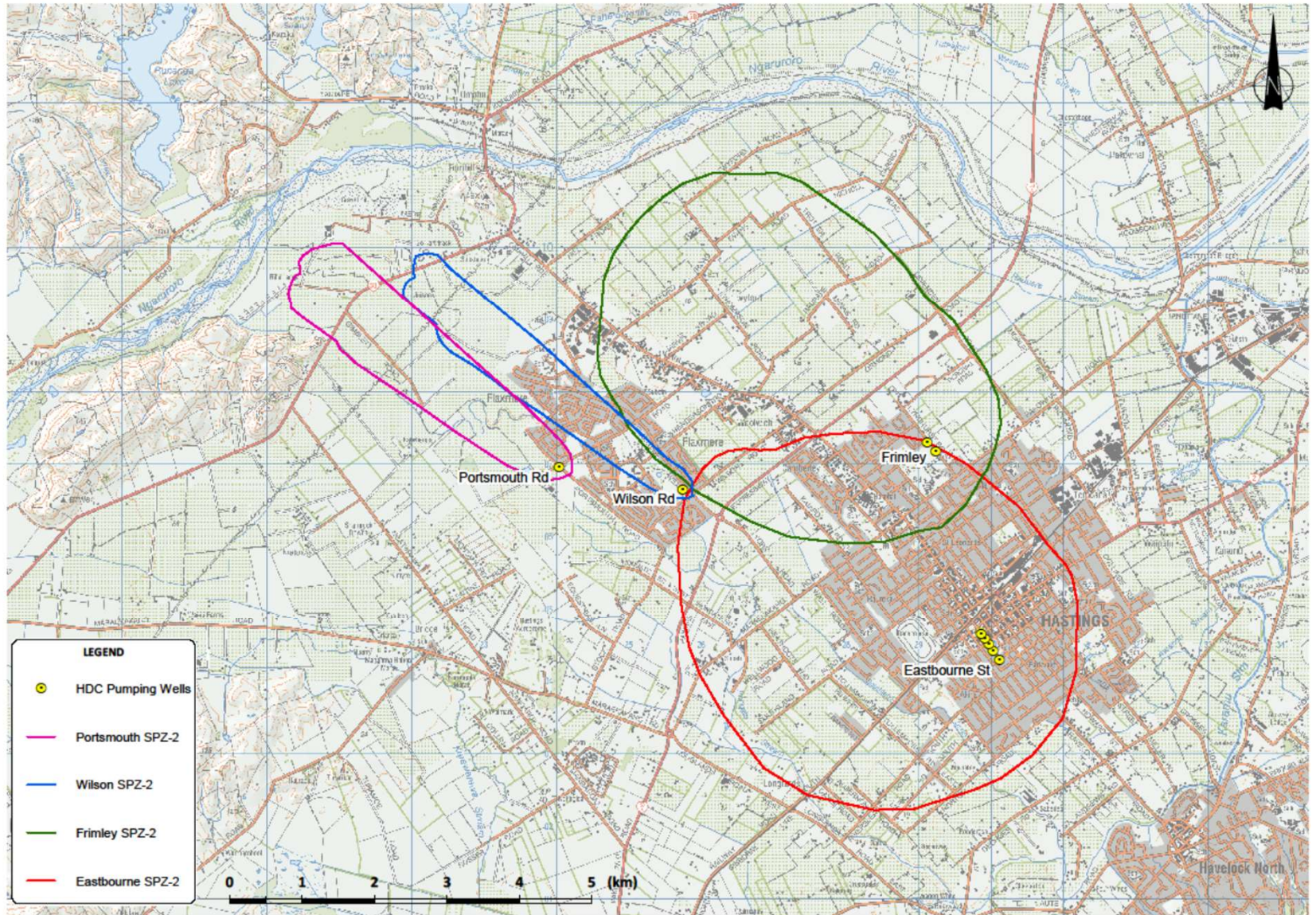
← Hastings Urban Method

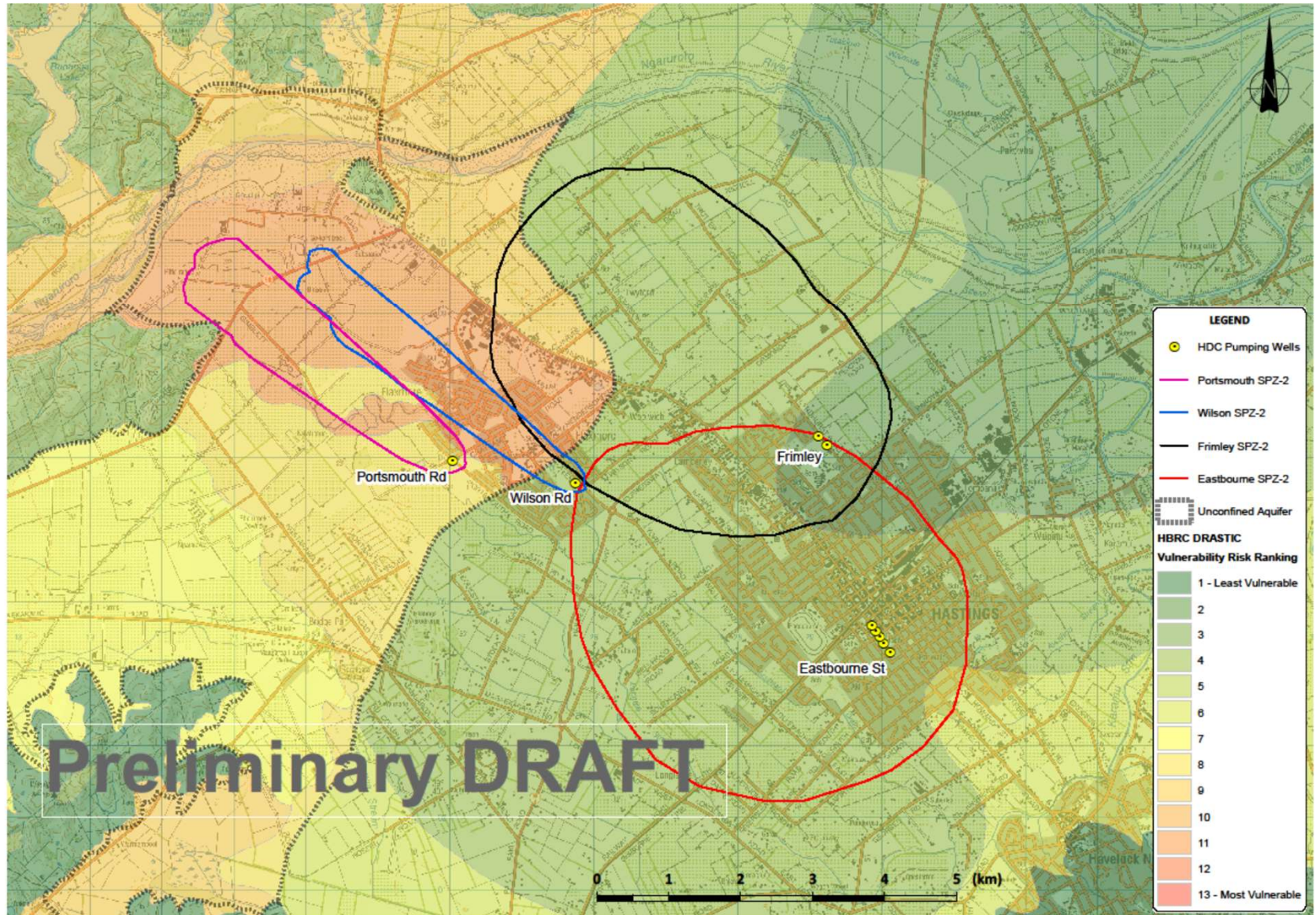
← HBRC has been applying default 2km radius zone

Hastings Urban Water SPZs

- Tonkin + Taylor have been developing SPZs for the four main supply bore fields, primarily to support Catchment Sanitary Inspection, assist with risk assessments and support future management.







Options for including SPZs in TANK Plan

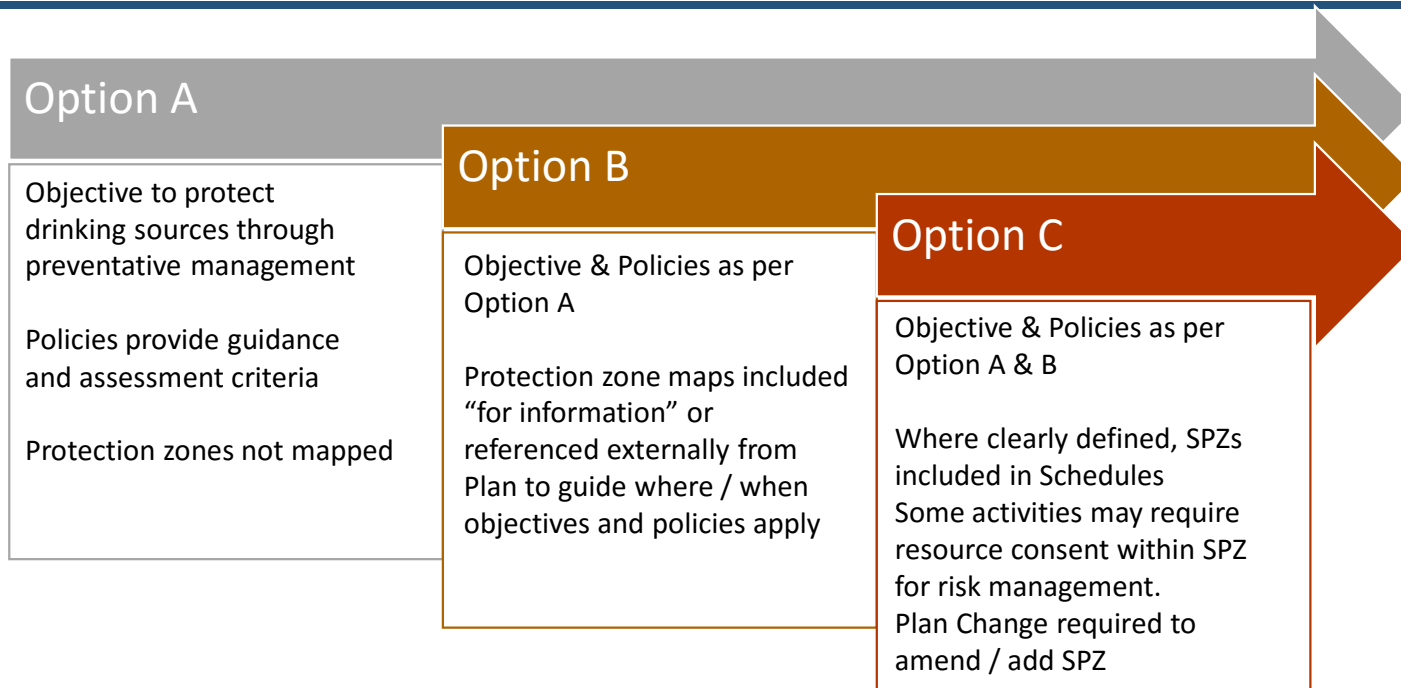
Intention is to:

- Provide guidance as to where & what activities may present risks to drinking water sources
- Explicit consideration of effects on drinking water sources
- Obtain better information about what activities are occurring in source zones

Assumptions:

- Registered drinking water supplies only
- Application restricted by TANK Catchment boundaries at present
- SPZs need to be defined to high level before regulatory (Rule) options can be considered
- Likely suite of tools including RMA and non-RMA methods

Options for Including SPZs to TANK Plan



Supported by non-regulatory methods for sharing of information and agency coordination and collaboration; Suite of tools including RMA and non-RMA methods

Next Steps

- Feedback from TANK Meeting
- Development & Assessment of Options A, B, C
- Reporting back to JWG and TANK for consideration