

# NES and Source Protection Zone

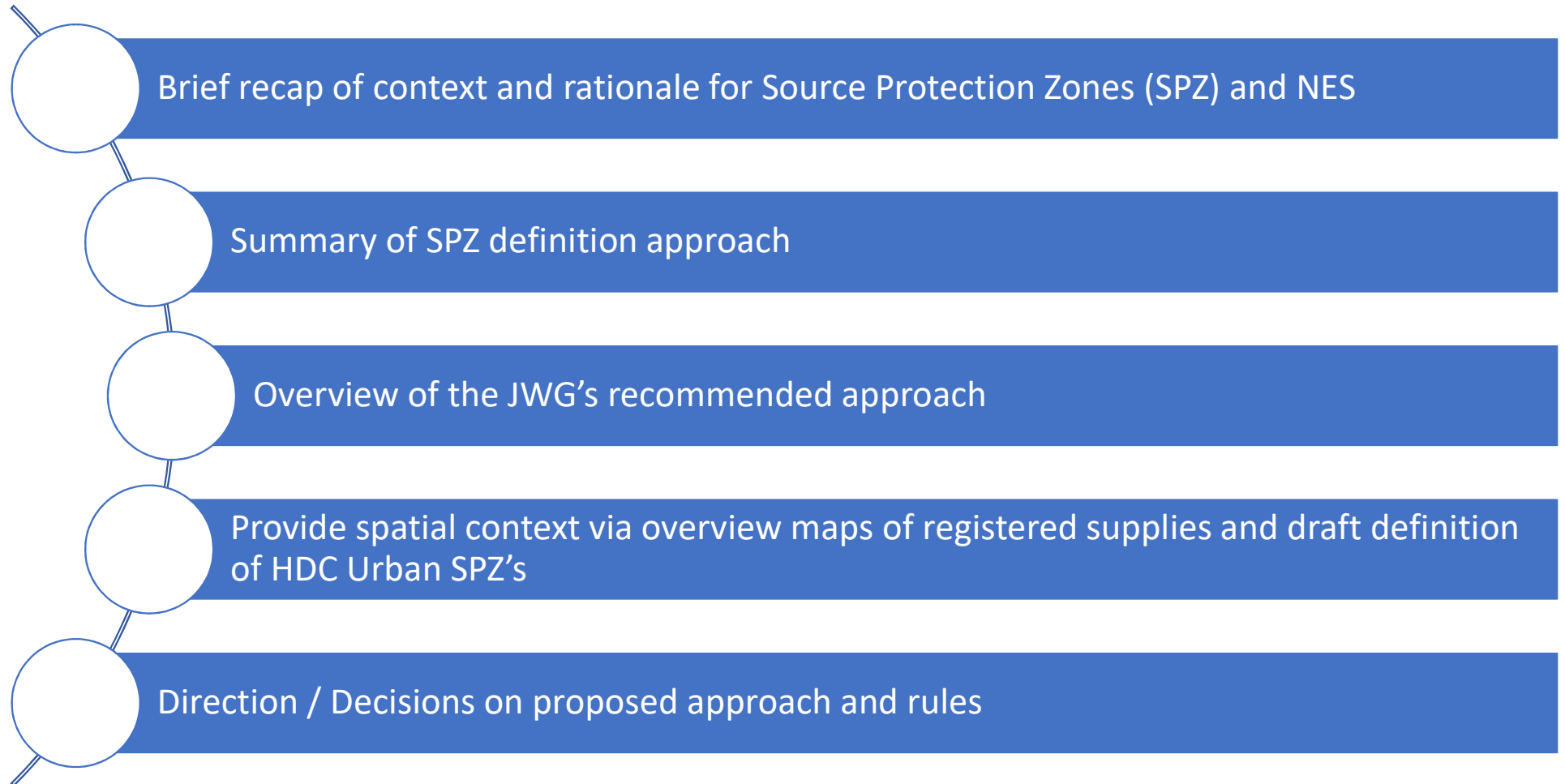
HB Drinking Water Joint Working Group

Tank 42 Presentation

26 July 2018

Information from; JWG, HDC, HBRC, GNS, GEM, and T&T

# Presentation Coverage



# Issue Identification: Why do we need Source Protection?

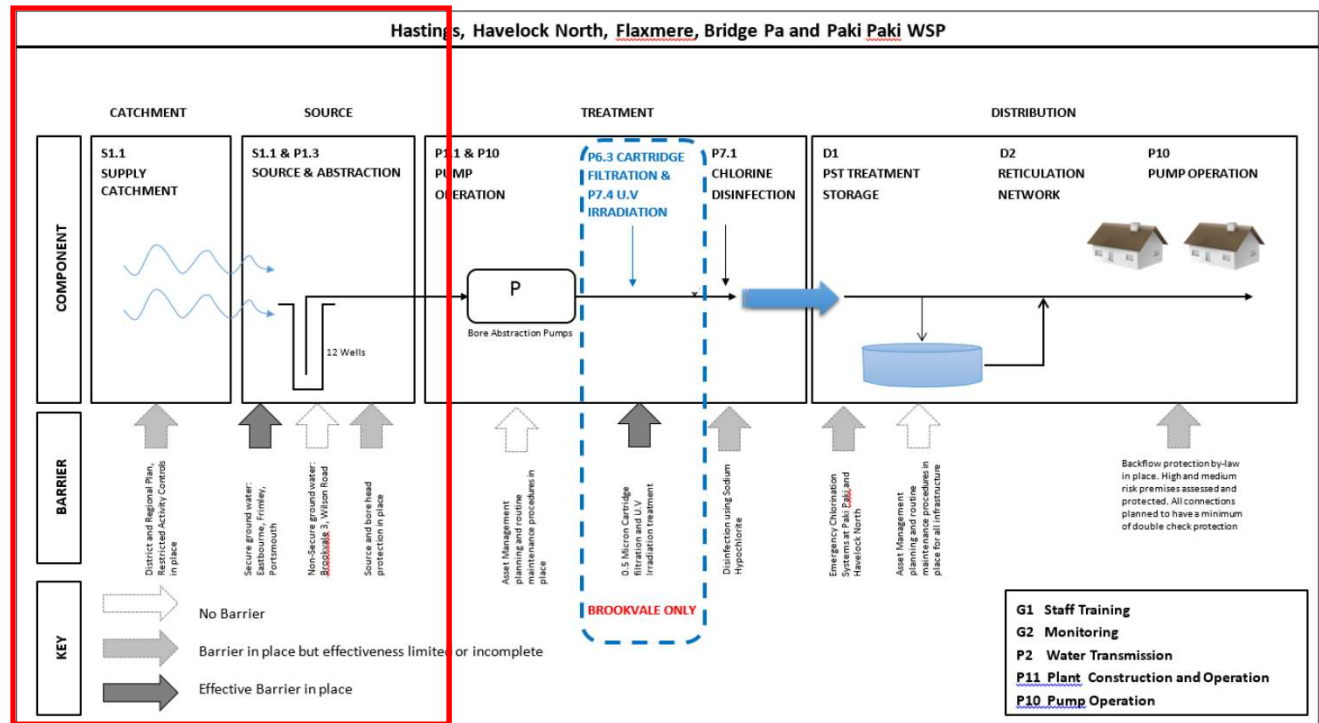
Water is a precious taonga, highly valued in its own right and as a source of human drinking water.

RMA and National Environmental Standard and Health Act

Board of Inquiry Findings

RPS and RRMP Objectives

Catchment and Source management is the critical first barrier in a multiple barrier protection approach



# Summary of Current NES requirements,

The NES has direct relationship to statutory obligations in the Health Act for Drinking Water

Registered Supplies  
< 25 people

NES Does not apply

## Resource Consents

Registered Supplies  
25-500 people

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

# Some of potential contaminant sources

Active and abandoned  
wastewater  
infrastructure  
(microbiological)

Emerging contaminants of concern (e.g.  
PFAS, micro plastics, nanoparticles,  
hormone disruptors such as endocrine  
disruptors)

Dairy feed lots or  
intensive calf rearing  
(protozoa)

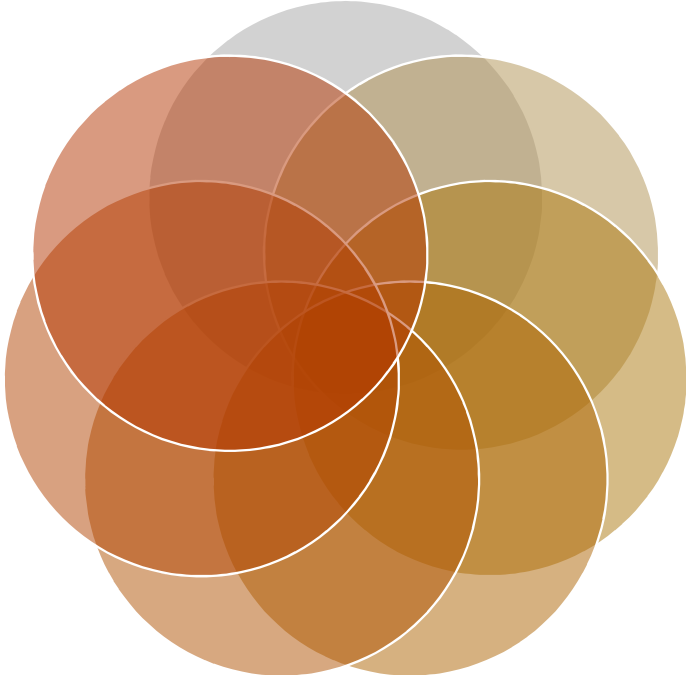
Onsite wastewater  
disposal/treatment  
(microbiological)

Bulk storage of  
chemicals

Former gasworks  
sites (hydrocarbons/  
heavy metals)

Heavy industry  
(various)

Dry-cleaning  
(chlorinated solvents)



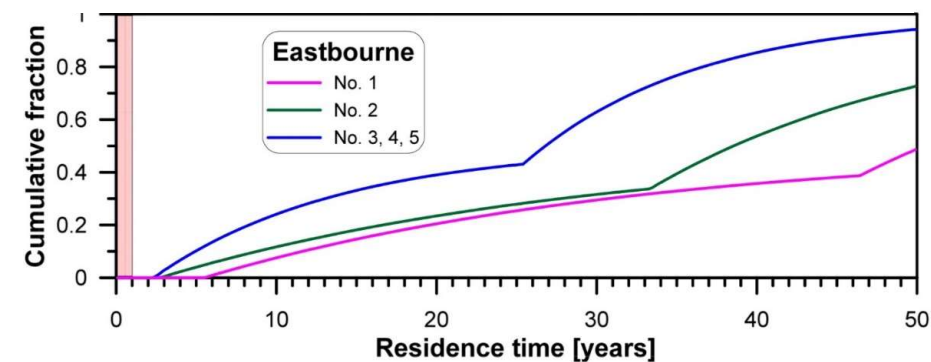
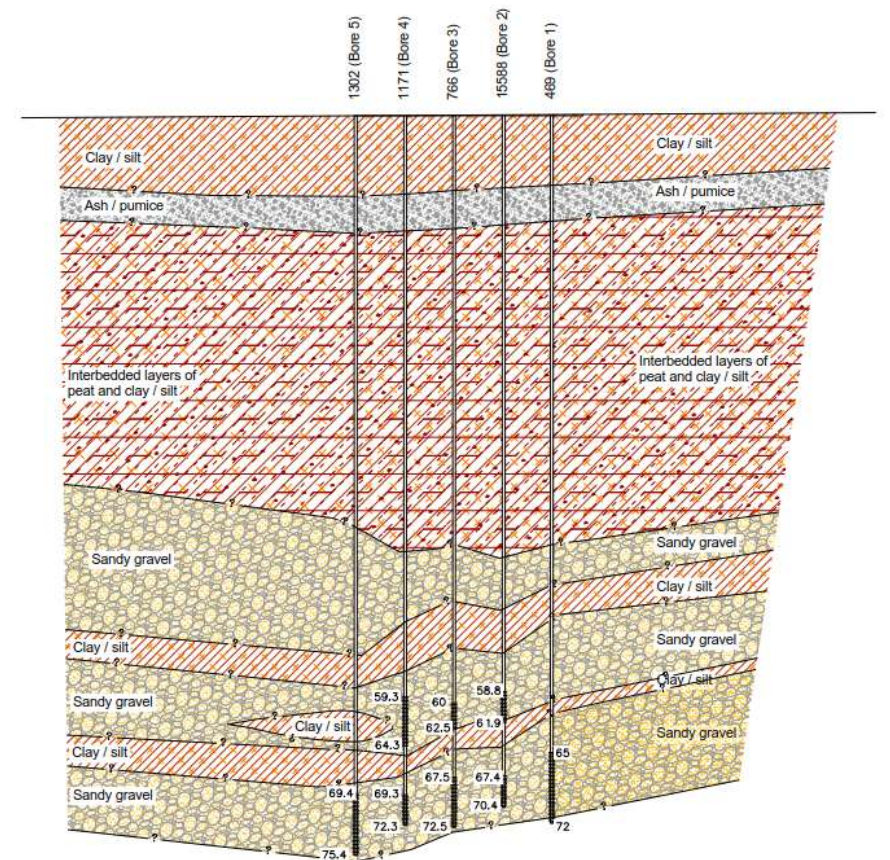
# Contamination Exposure pathways

Contamination can enter Heretaunga Plains aquifer systems by:

- Surface contamination leaching into unconfined areas of the aquifer, or in confined areas where the aquitard is thinner or “leaky”
- Operational and decommissioned private bores which intercept the aquifer system - poor bore head security - direct or less restricted pathway into groundwater
- Contamination of springs and spring feed streams for hydraulically connected bore fields
- Stock access to unfenced water ways or run-off during high rainfall events
- Breaches or damage to the aquitard could open pathways for contamination of the aquifer.

# Eastbourne Street borefield

- Aquitards separating the aquifers are not considered to be continuous - groundwater levels are similar for each sandy gravel layer (aquifer)
- Three layers are considered to be part of the same hydrogeological unit/aquifer
- Potential for downward movement of groundwater from surface towards the sandy gravel layers when water levels in the aquifer are below ground level
- Below 100 m depth groundwater sourced from the Ngaruroro River
- Above ~80 m the groundwater has been identified as rainfall or of mixed source at the Tollemache test bore (GNS 2017/33) - applicable to the Eastbourne borefield (2 km northeast)



# Approach for developing SPZs

T+T adopted the approach published by GNS Science (GNS) to establish the SPZ's, including:

- **Immediate protection zone (SPZ1):**
- **Microbial protection zone (SPZ2):** defined by numerical modelling that represents a 1 year groundwater travel time from the bore field (GNS method also allows for an arbitrary fixed radius)
- **Capture zone (SPZ3):** defined by a catchment or hydrogeological boundary. Where a time of travel zone is required to prepare an SPZ3 a 10 year time of travel threshold was used

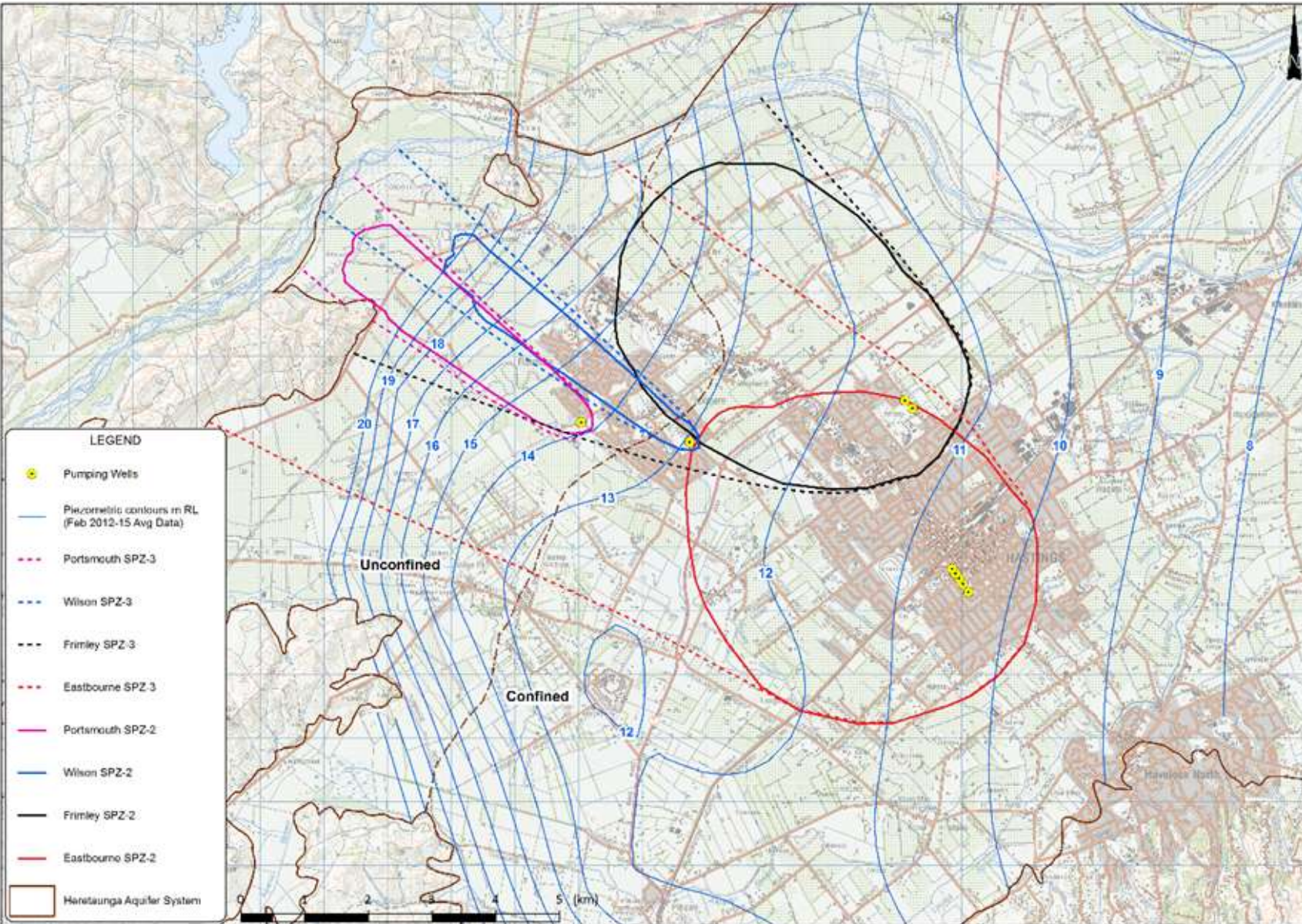
Source: GNS Science, 2014. *Envirolink Tools Project – Capture Zone Delineation – Technical Report, 2013/57.98p.*



# Zone definition approach

- Used USEPA WhAEM model, confirmed appropriate by GNS
- Performed sensitivity analyses
- Peer review by GNS, confirmed approach and suggested further variables reviewed
- Updated zone based on Peer review
- Further refinement and other zones will need to be added over time
- 5 yearly review proposed

# Source protection zones - SPZ2 and SPZ3



# Non-microbial contaminants

Evaluated whether SPZ suitable for non-microbiological contaminants for each bore field for following sources:

- Arsenic from orchard and timber treatment sites,
- Boron and PCP from timber treatment sites,
- BTEX from petrol stations,
- TCE, PCE from dry cleaners and workshop sites.
- Organic contaminants: contaminant migration in groundwater, biodegradation and dispersion.
- Levels would be below DWSNZ for plumes originating outside the SPZ, except for TCE (factor of 8 above DWS)

JWG proposed Planning approach

# Recommended Regional Plan Amendments Overall Structure & Intent

## Objective

- Manage activities in SPZs of **registered drinking water supplies** to ensure water does not become unsuitable for human consumption & risks to supply of safe drinking water are appropriately managed

## Policy

- **Define SPZs via an appropriate technical method; adopt 2km default radius where SPZ undefined**
- Regulate activities that have potential to cause adverse effect / risk to source water safety
- Guidance for decision making on consents
- Encourage & participate in sharing of information and collaborative multi-agency groups

- Proposed approach is **ONLY** those SPZs identified by an appropriate technical method can be used to determine consent status; default areas only inform decision making where consent is required for other reasons
- Activity status in SPZ areas to match activity status of other sensitive areas (eg unconfined aquifers)

# Recommended Regional Plan Amendments

## Overall Structure & Intent

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### Objective

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### Rules


- Improve knowledge re activities in the SPZs and verify Permitted Activity criteria are met
- Where activities already require consent, ensure that risks to drinking water sources are part of decision making process when located within the SPZs
- For some activities where there is an potential risk to drinking water sources, require consent in SPZ areas.
- **Activity status in SPZ areas to match activity status of other sensitive areas (eg unconfined aquifers)**

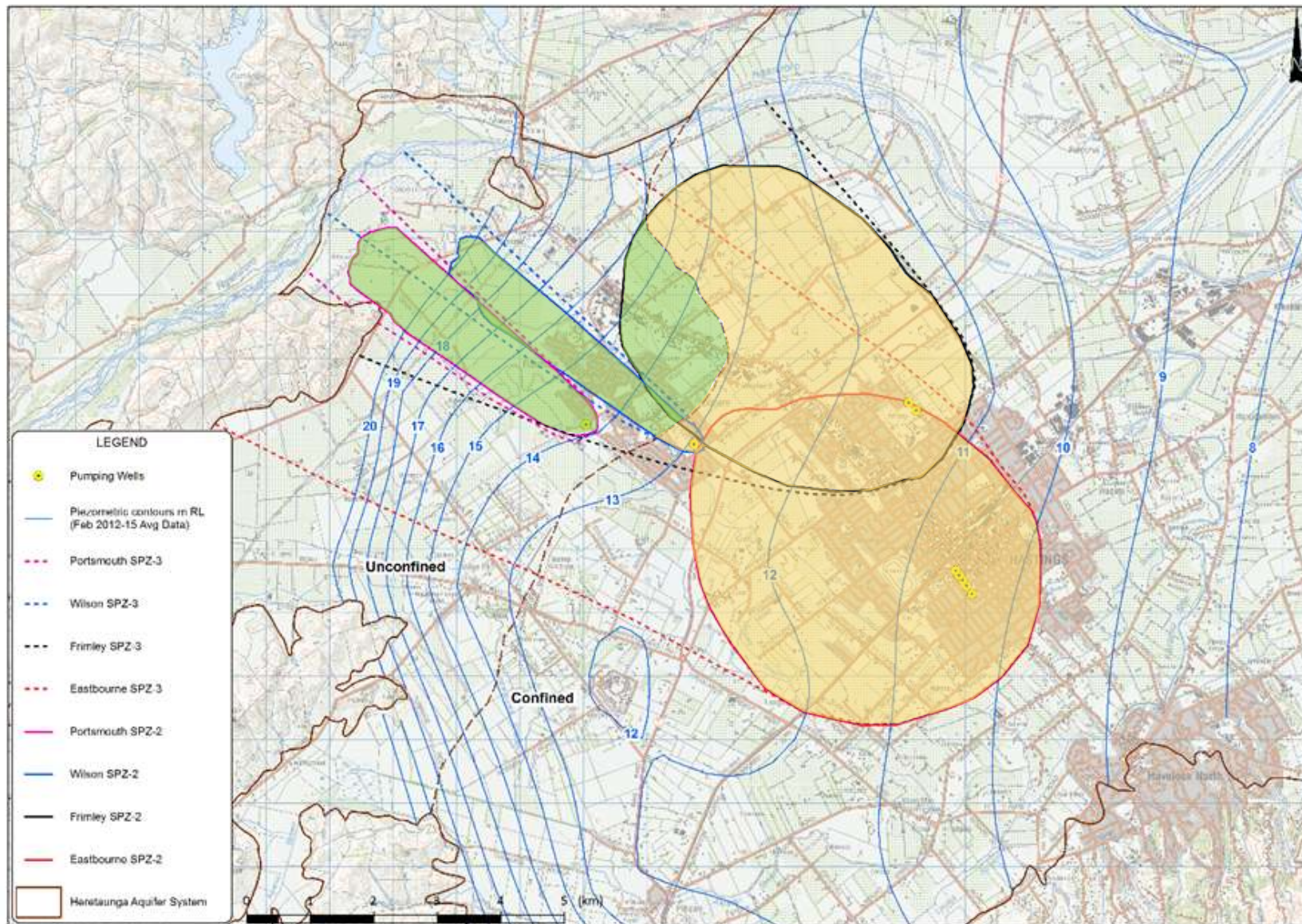
## Overlay of Hastings SPZs with unconfined aquifer

Portsmouth Road, Wilson Road and part of Frimley SPZs are in unconfined aquifer. Activities recommended to be discretionary in SPZs already require consent as Discretionary activity over unconfined aquifer.

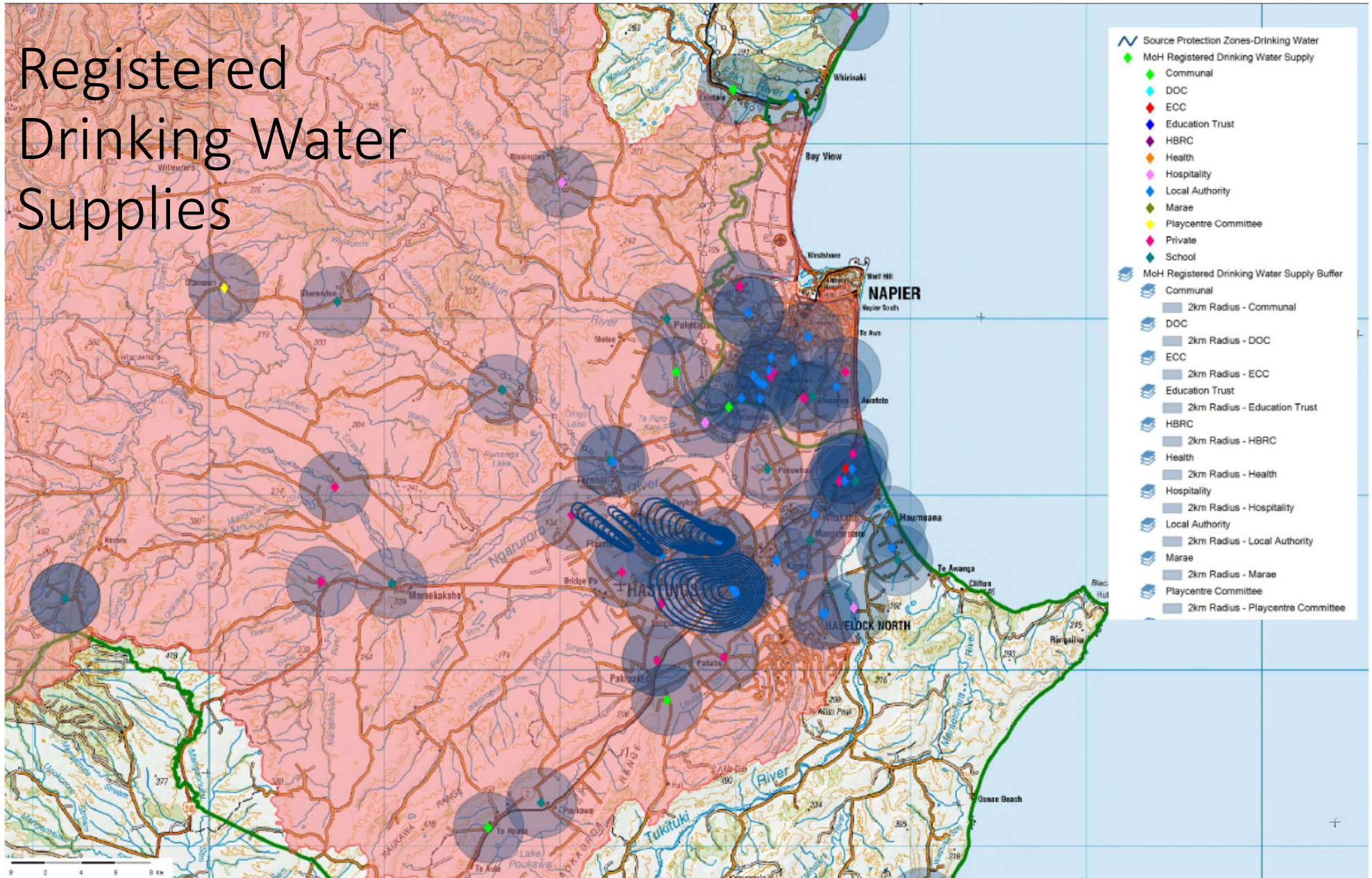
[Solid waste on production land; new sewage systems; solid waste to land; discharges that may enter water; animal effluent]

 Recommendations do not change activity status in these areas

 Recommendations change activities from Permitted or Controlled (Animal Effluent) to Discretionary (ie, give the SPZ similar status to the unconfined aquifer area)



# Registered Drinking Water Supplies

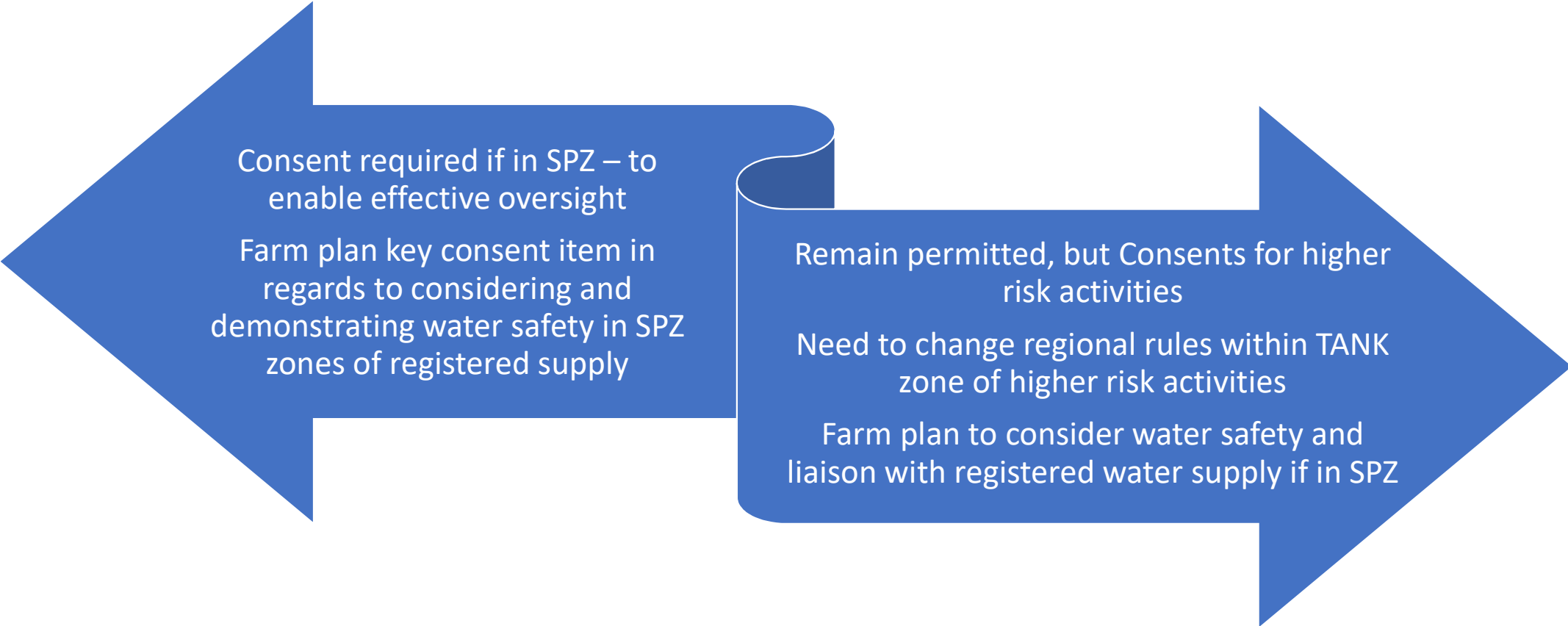




# Rule Recommendations – Summary & Intent

	Current Activity Status	Recommendation	Activity
<b>No Change to Activity Status:</b> Addition of standards / matters of control or discretion	<b>Permitted</b>	<b>Retain Permitted Activity</b> status but require more information and / or notification & verification within SPZs	Stock Feed, Compost, biosolids & Soil conditioners Bore Decommissioning Production Land Use ( <b>require consultation with water supply authority in development of Farm Plans</b> )
	<b>Controlled or Restricted Discretionary</b>	<b>Add matters of control / discretion</b> to include drinking water sources where activity is located within SPZ	Renewal of existing water takes Stormwater discharges Closed landfills
<b>Changes to Activity Status where activity occurs within SPZ</b>	<b>Permitted</b>	<b>Elevate to Restricted Discretionary within SPZ</b>	Vegetation Clearance (where root structure intersects aquitard or confining layer) Feedlots / feedpads
		<b>Elevate to Discretionary within SPZ</b> (as per current rule framework where activity is over unconfined areas)	Solid waste on production land New sewage systems Solid waste to land Discharges to land that may enter water
	<b>Controlled</b>	<b>Elevate to Restricted Discretionary within SPZ</b>	Bores (construction & use)
		<b>Elevate to Discretionary within SPZ</b> (as per current rule framework where activity is over unconfined areas)	Animal effluent

# Productive land JWG discussion on 2 options



Consent required if in SPZ – to enable effective oversight

Farm plan key consent item in regards to considering and demonstrating water safety in SPZ zones of registered supply

Remain permitted, but Consents for higher risk activities

Need to change regional rules within TANK zone of higher risk activities

Farm plan to consider water safety and liaison with registered water supply if in SPZ

# Decisions

- Recommendation one: production land use controls to be included in permitted activity rule with expanded requirements for Farm Environment Plans in SPZ, and changes to regional rules for noted activities - Y/N
- Recommendation two: All other rules to be accepted by TANK as recommended by JWG subject to further technical refinement Y/N