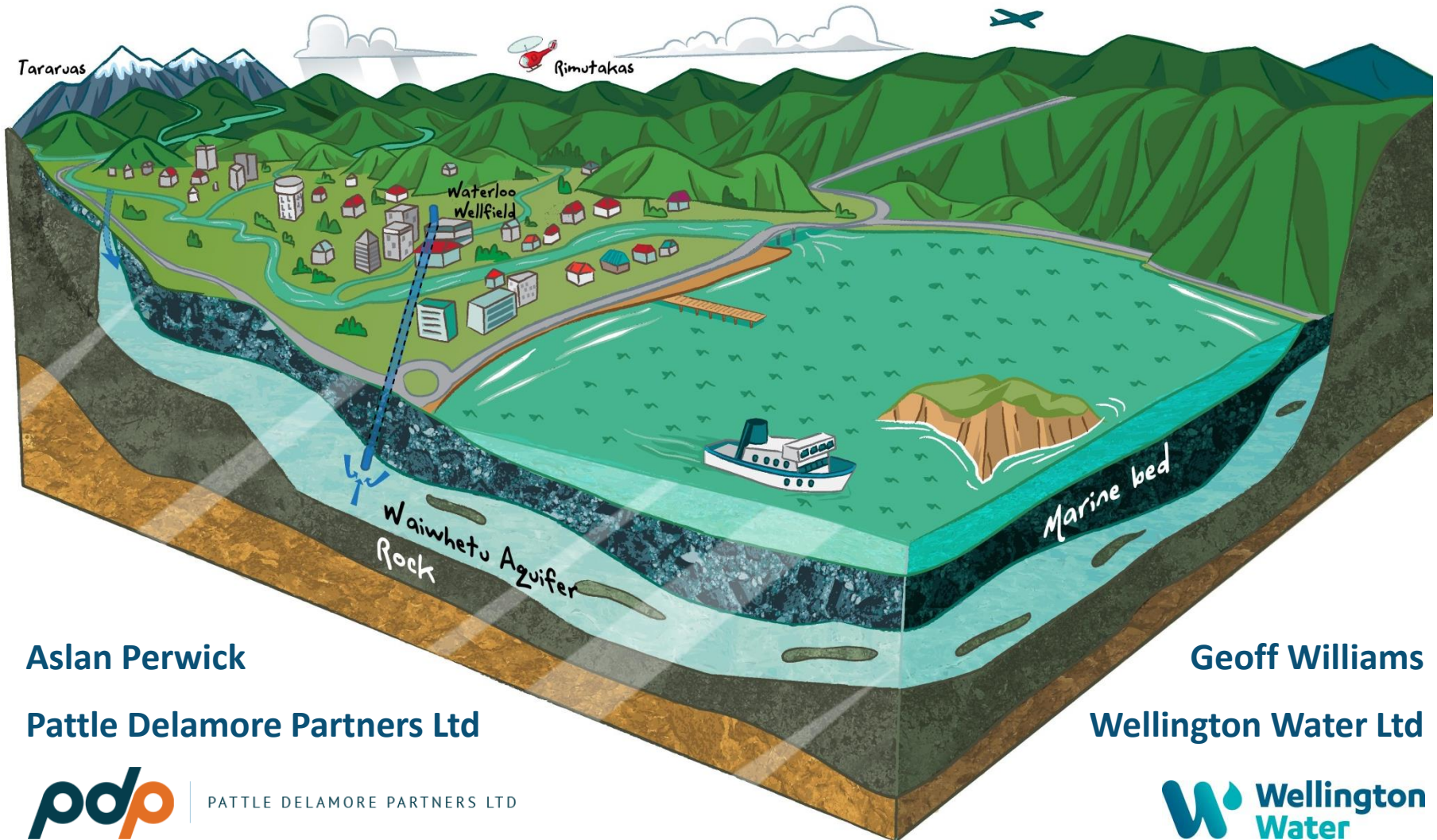


# Defining Groundwater Protection Zones For Wellington Water in the Hutt Valley Aquifer



Aslan Perwick

Pattle Delamore Partners Ltd



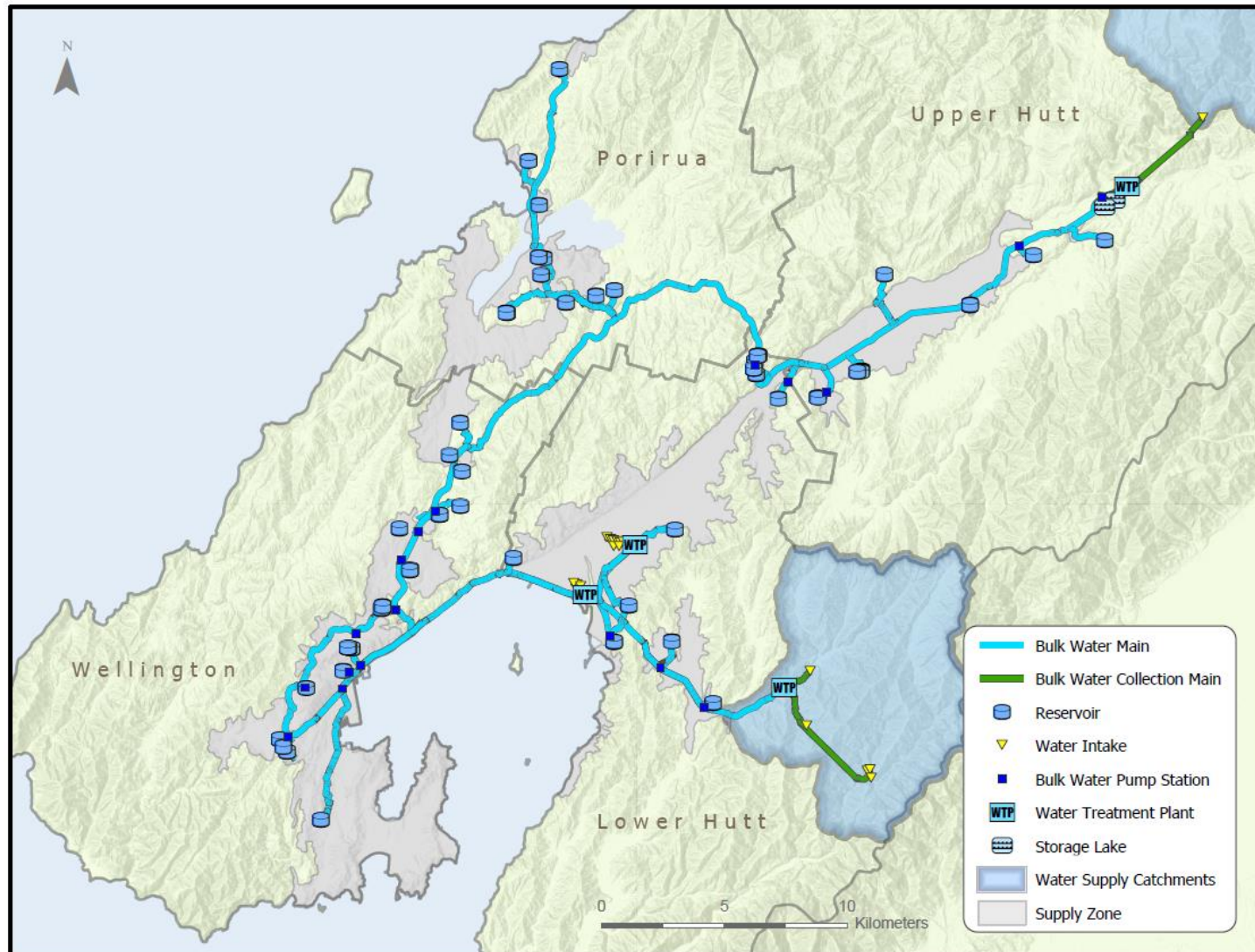
PATTLE DELAMORE PARTNERS LTD

Geoff Williams

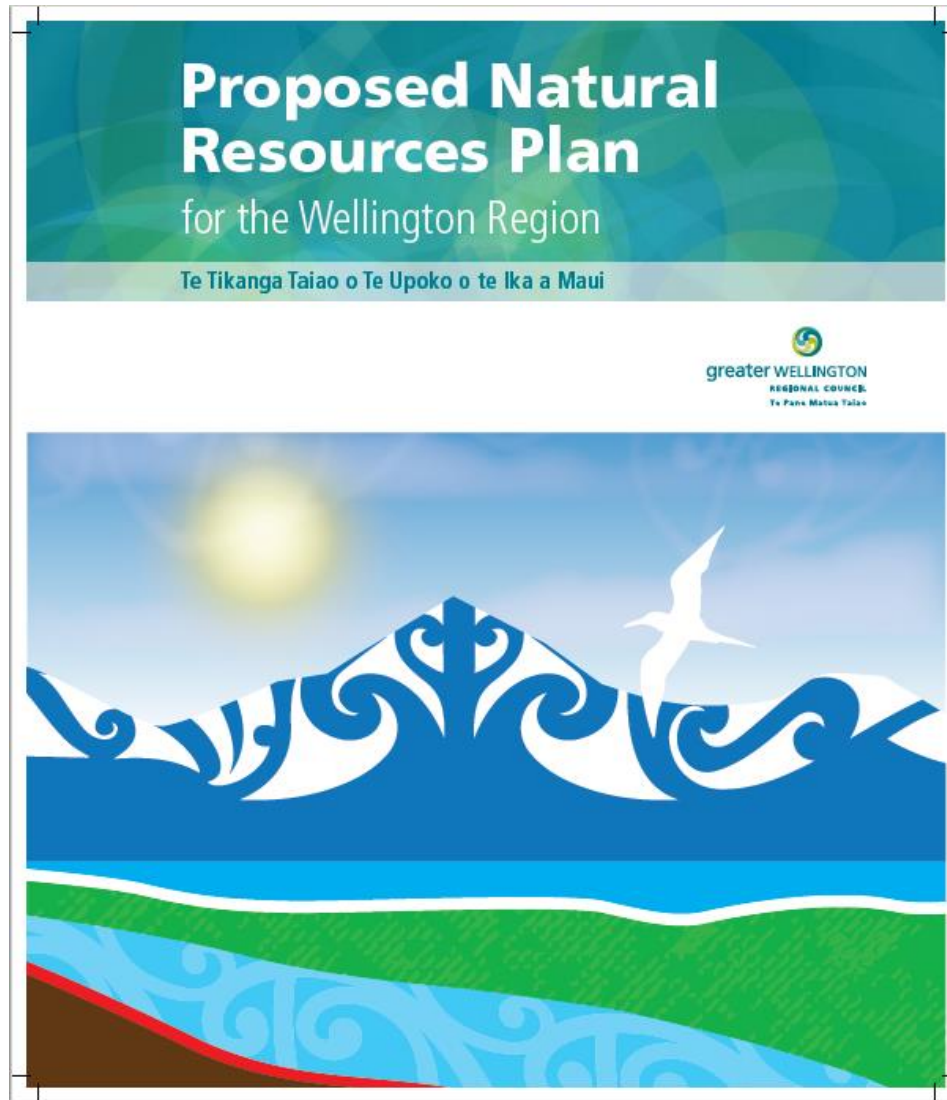
Wellington Water Ltd



# Wellington metropolitan water supply



# Proposed Natural Resources Plan (PNRP)

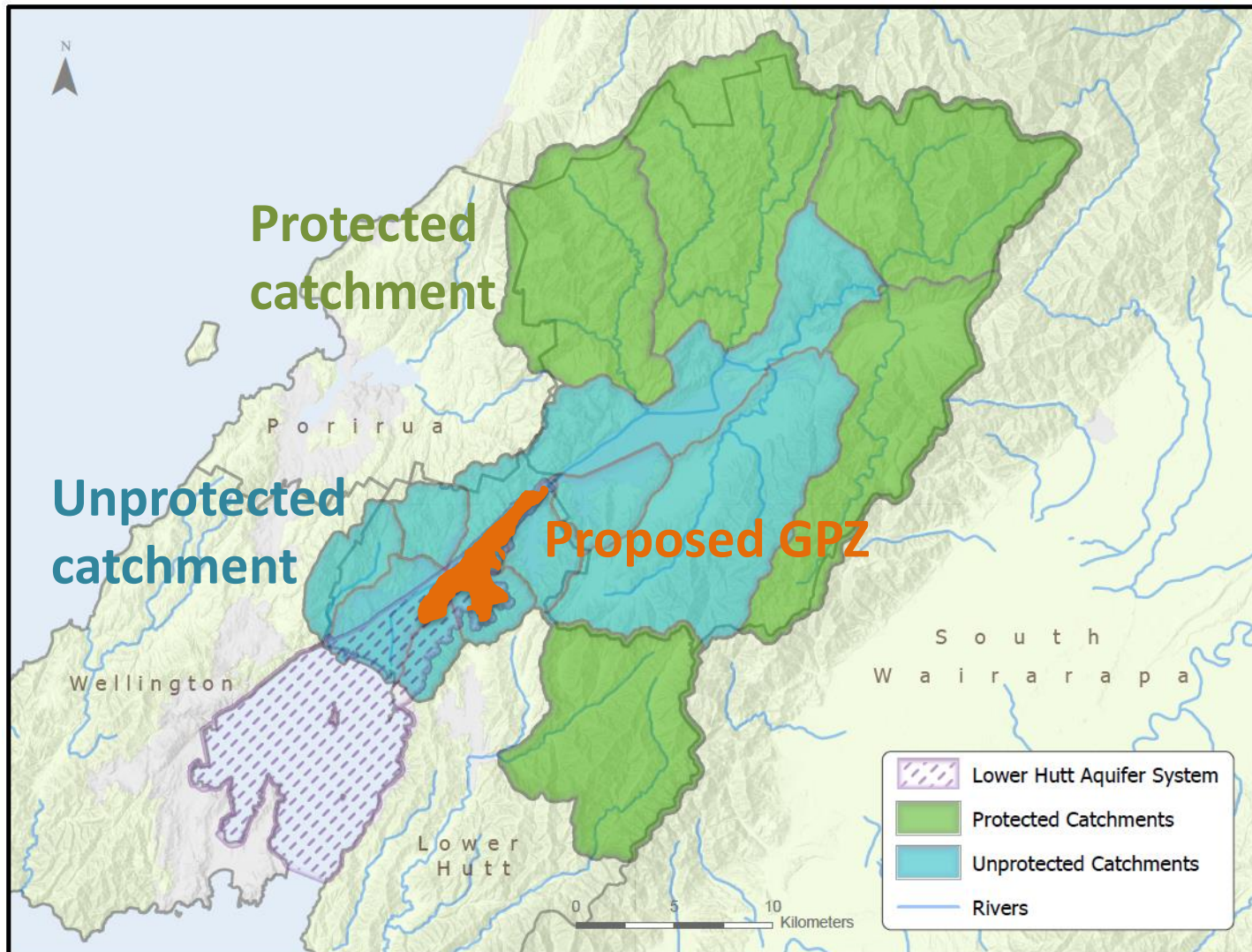


# Proposed groundwater protection zone

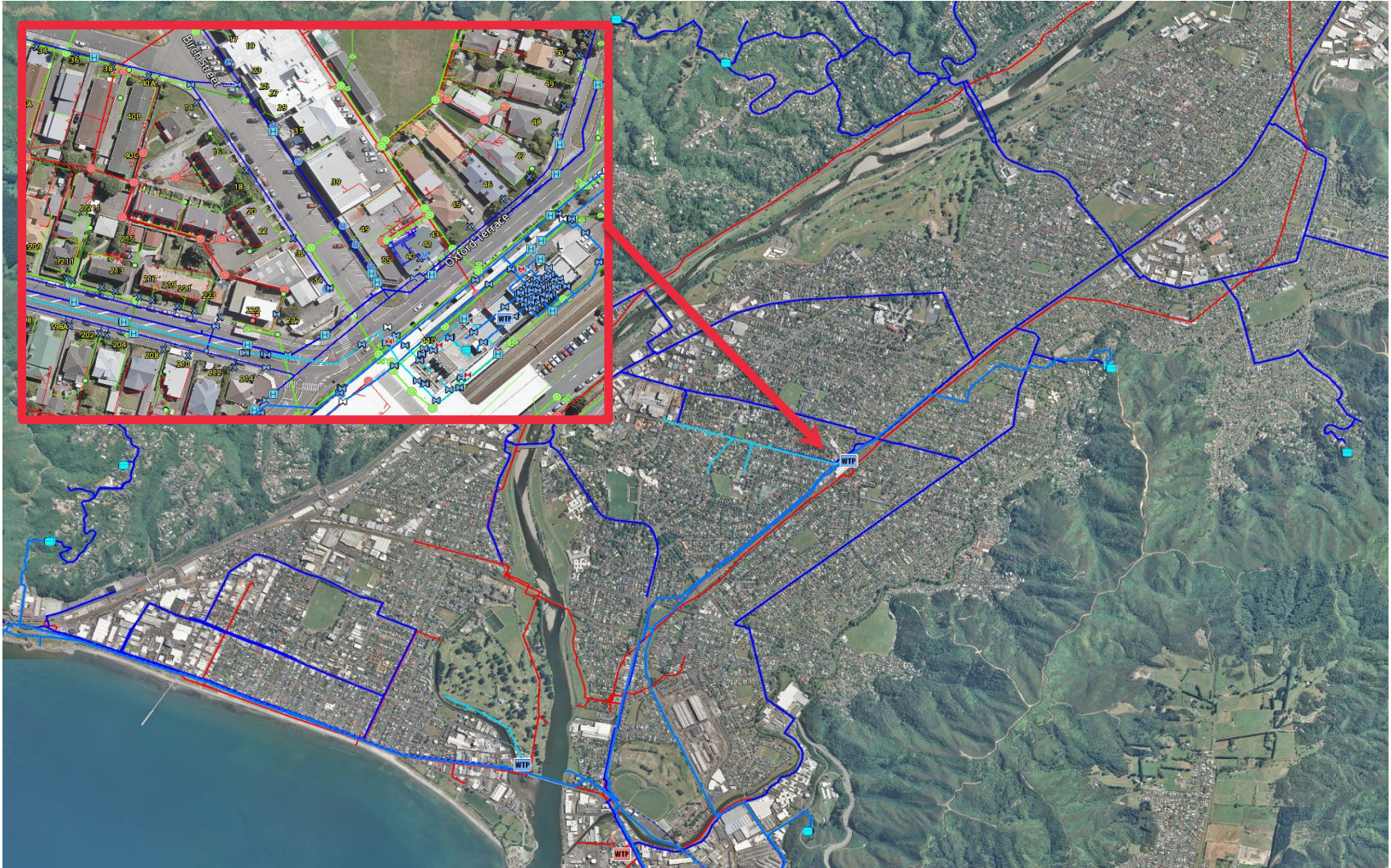


- Based on modeled results
- Assumed “effective” confining layer
- Detached GPZ
- Focused on microbial die-off

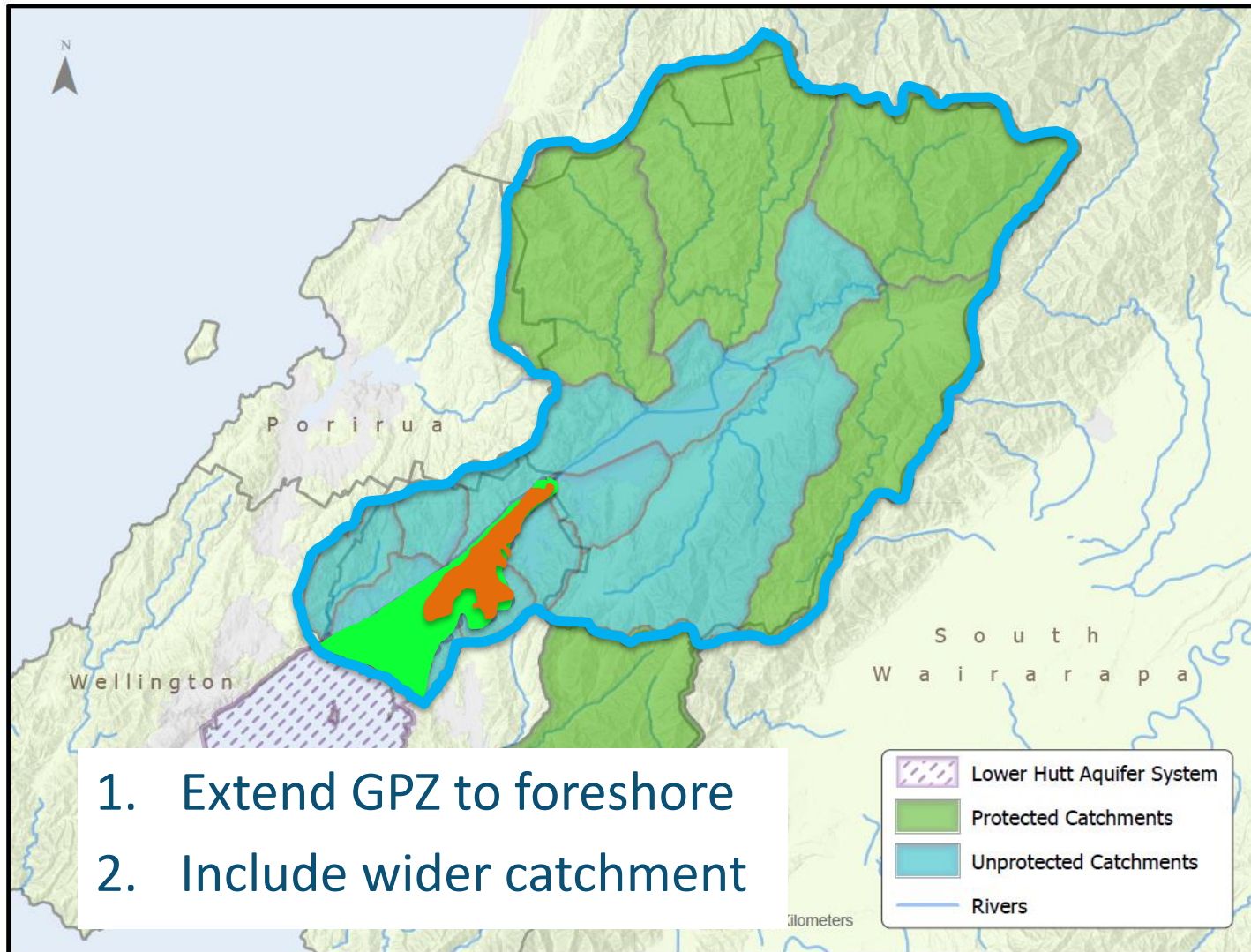
# Protected catchment?



# Aquifer under a city – just a theoretical risk?



# PNRP submissions



# Aquifer contamination (2016 - 2018)

stuff ☰ national

## Wellington Water bosses don't want a repeat of Havelock North incident

Nicholas Boyack · 14:13, Oct 06 2018

[f](#) [t](#) [r](#) [e](#) [p](#)



NICHOLAS BOYACK/STUFF

This image shows a man in a plaid shirt and a hat filling a large clear plastic water bottle at a public water tap. Another person is visible in the background, also using the tap. The setting appears to be an outdoor public area.

Newshub.  
28 August 2019

AUCKLAND 15° 7°  
MORE WEATHER >

HOME NZ WORLD POLITICS SPORT RWC19 ENT TRAVEL LIFESTYLE RURAL

## BPA chemical found in Wellington drinking water aquifer - report

02/10/2018 | Newshub reporter

[Reddit](#) [Tweet](#)



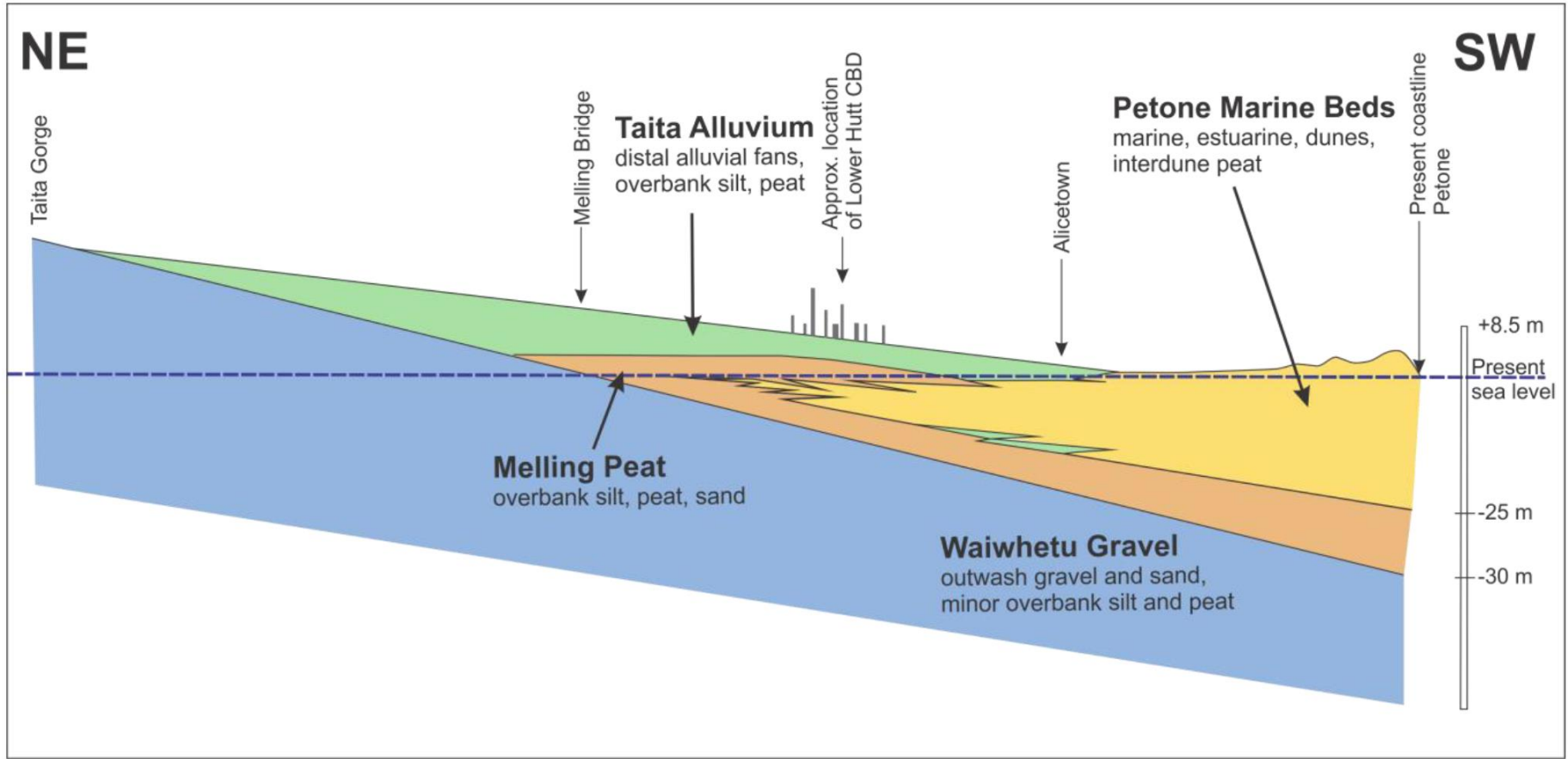
Photo credit: File

13 - 15 SEPT  
AT PUKEKO  
BOOK NOW  
More From Newshub

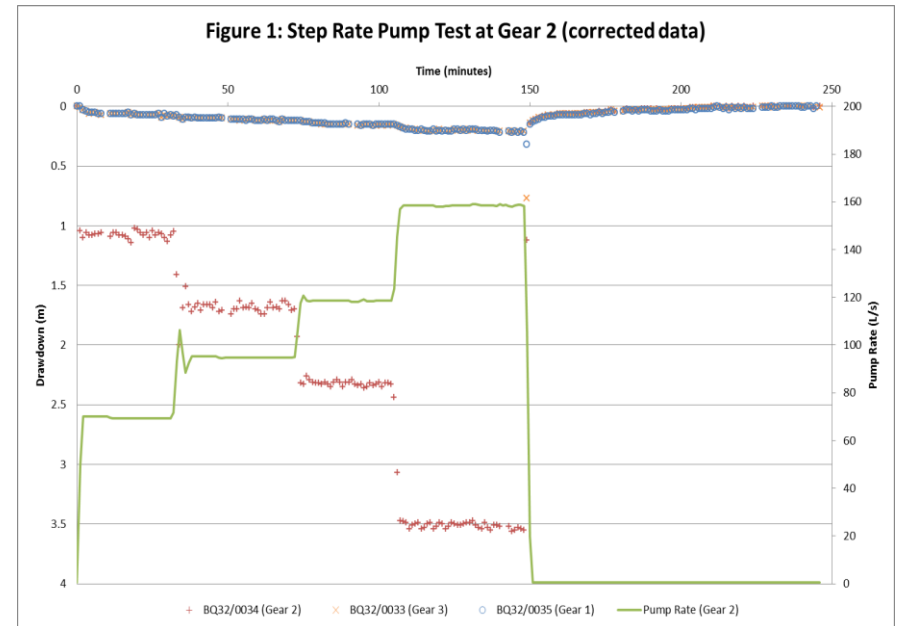
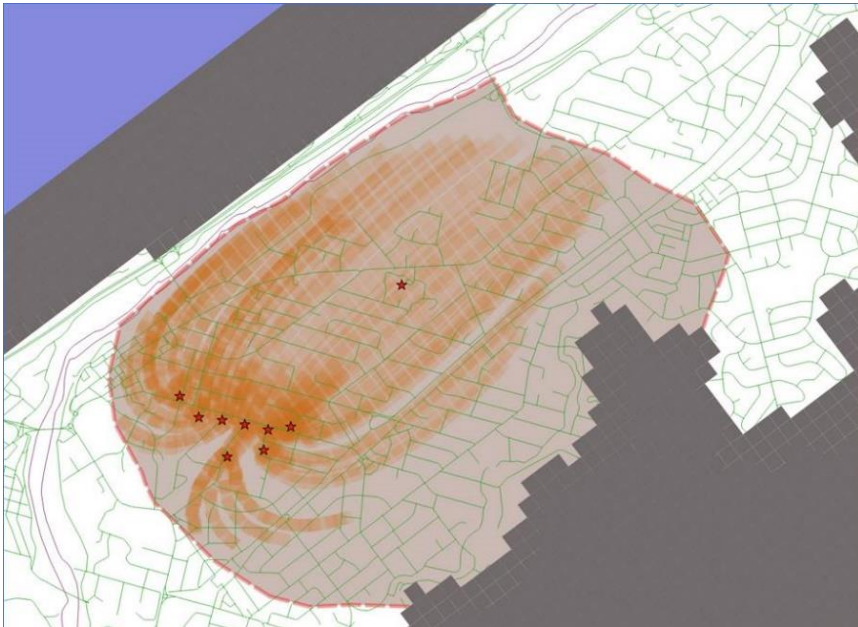
This image shows a close-up of a glass of water with a lemon slice on a wooden surface. The glass is partially filled with water. The background is slightly blurred, showing a wooden table.



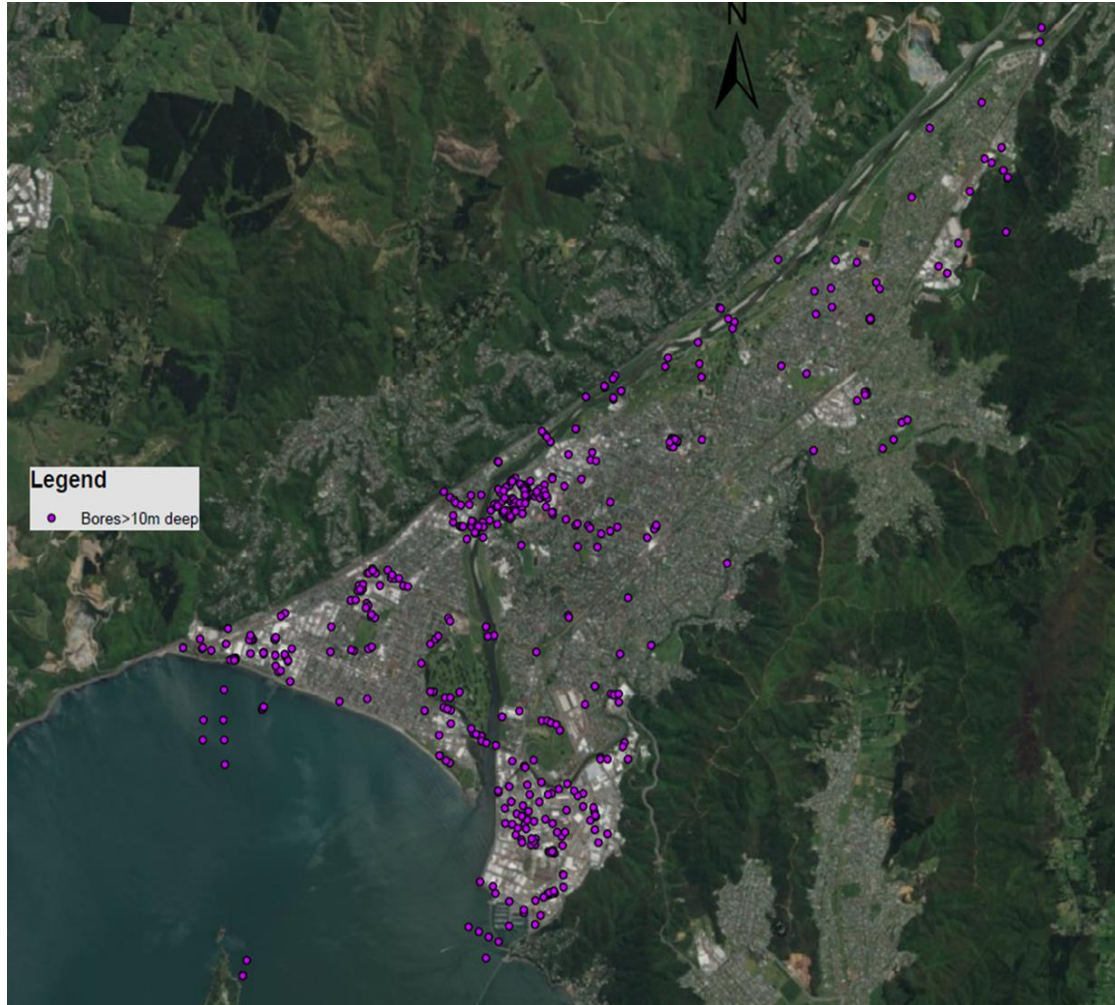
# New information on spatial variability of the aquitard



# New information on drawdown & hydraulic gradient reversals



# Unknown integrity of boreholes which puncture the aquitard



# Boreholes as conduits – the problem is not new

stuff

national

## Abandoned oil wells still cropping up in New Plymouth back yards after 100 years

Jeremy Wilkinson · 17:23, Oct 11 2016



ANDY JACKSON/STUFF.CO.NZ

Daveena Dawrant talks about discovering an old oil well in her New Plymouth back yard.

Daveena Dawrant could never figure out why grass wouldn't grow in her backyard – it turns out she was living on top of an oil well.

"There was this soggy spot in the ground and no plants would grow on it," she said.

It wasn't until 6000 litres of crude oil a day began leaking from the abandoned Blenheim-1 well underneath her neighbour's house in

Print Email Facebook Twitter More

## Moves to extinguish fire in coal bore

Updated 22 Aug 2012, 11:22pm

The Queensland Government is working on a plan to extinguish and cap a fire in a coal exploration bore near Dalby on the Darling Downs.

John Taylor

Source: 7pm TV News QLD | Duration: 2min 9sec



# Key points submitted at PNRP hearing

## 1. Extend the GPZ to include the entire Lower Hutt valley floor to the Petone foreshore. Reasoning:

- Degree of natural hydraulic confinement
  - Fans from the surrounding hills
  - Preferential flow paths from 'piercing' of the aquitard
  - Integrity of borehole seals
  - Influence of third-party pumping
  - Relocation of abstraction points in the future
-

# Key points submitted at PRNP hearing

## 2. Include the wider catchment in the Hutt Valley groundwater protection area. Reasoning:

- Connected nature of the river and aquifer system
  - Some chemical contaminants do not readily break down in the environment
  - Existing WTP's do not treat for chemical contaminants
-

# Groundwater protection - before and after



Before hearing

After hearing

# What did we learn?

- Conceptual assumptions can be incorrect
- Aquifer properties/behaviour can change, even after being stable for long periods
- Chemical contaminants persistent in the environment may come from the wider catchment

Model predictions to inform policy should be treated with care. An 'in-concert' approach is recommended where model results, monitoring information and real-world risks are considered together, to protect the resource long-term

## Questions?

---