



# Takaka FLAG – Update to EPC

## 3: Takaka Water Management Catchments - Overview

23 March 2016

# Outline

- Takaka Water Management Catchments
  - Extent of Freshwater Management Unit (FMU)
  - Catchment dynamics - water resources & linkages
  - Water demand and use considerations

# What makes this area special?



Complex geology and complex water systems



Pure, free drinking water



Economic opportunities: tourism, farming, aquaculture, etc

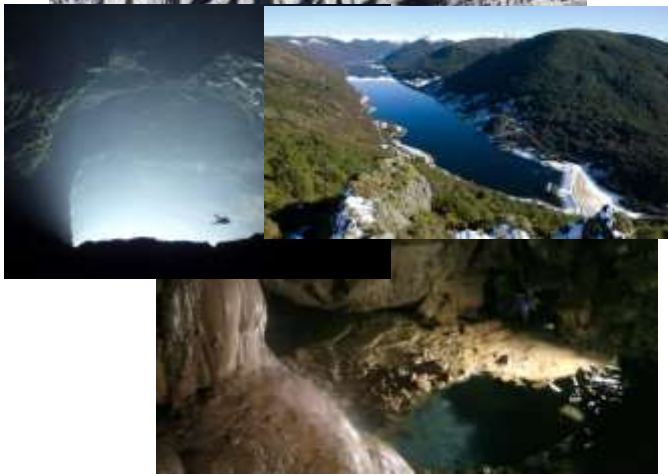
Highest fish diversity measured in NZ (Onekaka)



Lots of rain (and rainbows)



Fantastic swimming & recreation

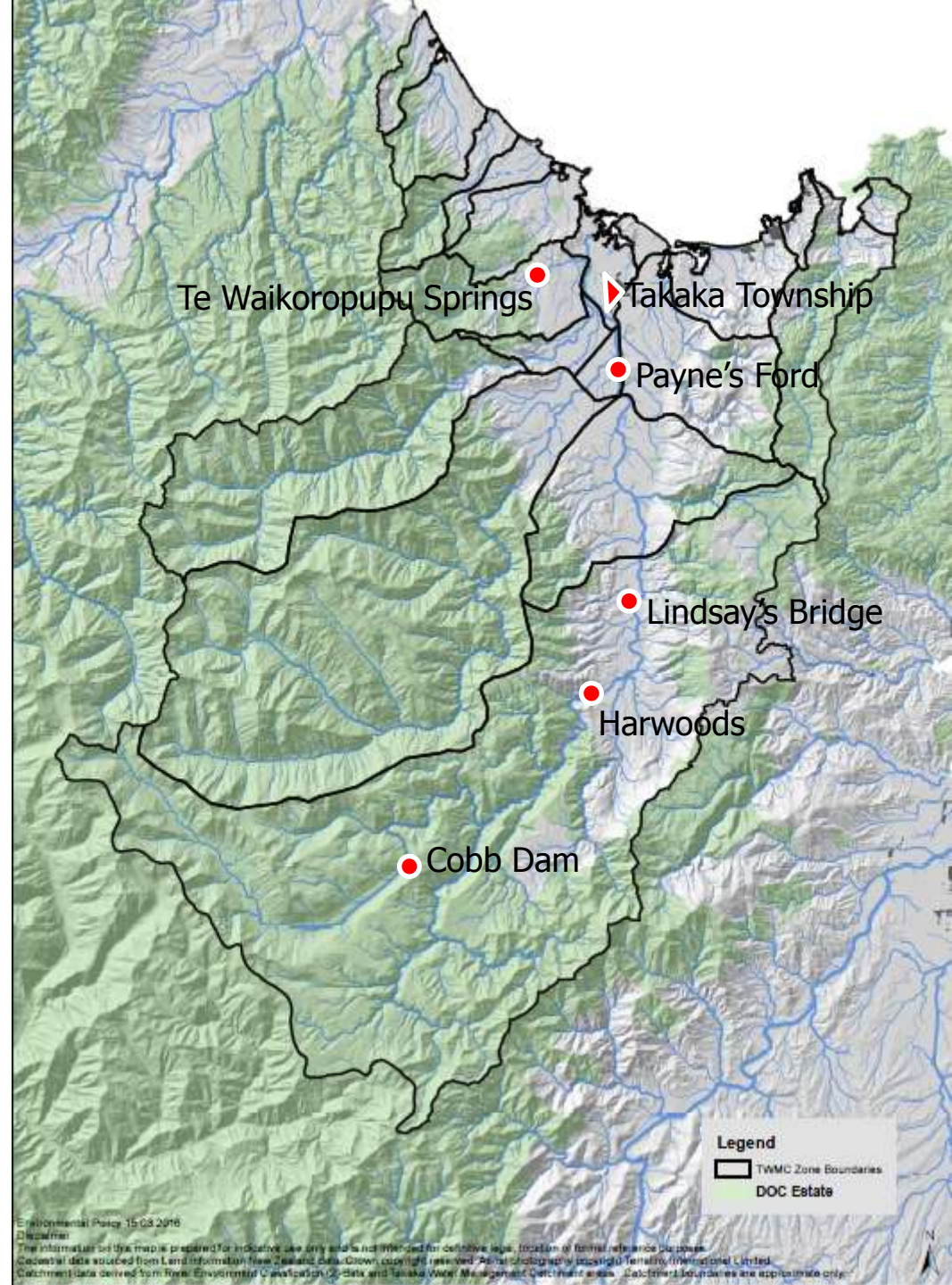


Te Waikoropupu Springs: Wahi Tapu, some of the clearest water in the world



# Takakaka Water Management Catchments (TWMC)

- Freshwater Management Unit (FMU)
- Catchment Zones
  - Surface water catchments
  - Groundwater linkages
    - Groundwater access
    - River drying zone
    - Water quality relationships
- AMA Recharge area
  - Unconfined area of aquifer
  - Contributing catchment areas
- Confined AMA area
  - Confined area of aquifer
- Coastal margin
  - Salt intrusion risks



# Water resources and features

- Rivers

- Spring fed (eg Motupipi, Te Waikoropupu River)
- Intermittent – only flowing during or following rain (eg Rameka)
- Drying reaches – at times all surface water flows into groundwater (eg Takaka River in Middle Takaka zone)

- Lakes

- Closed sinkholes (eg Killarney)
- Artificial – (eg Cobb)



- Groundwater

- 3 main aquifers: Marble, limestone and gravel – linked in places
- Confined and unconfined

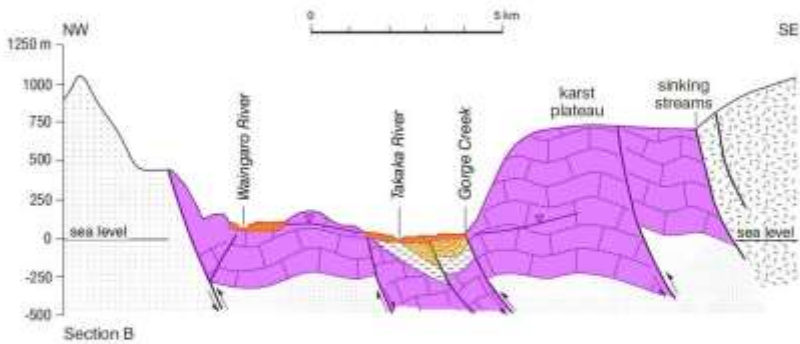
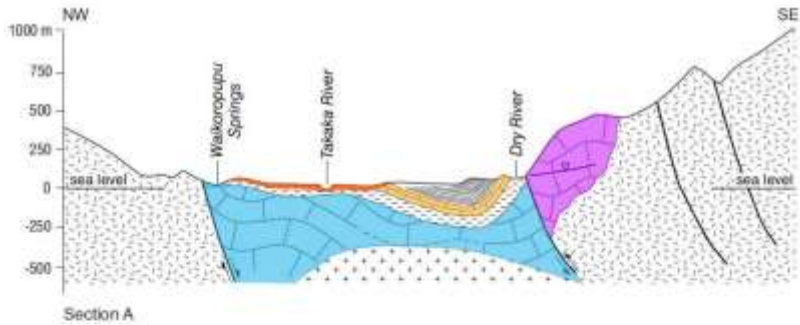
- Springs

- Large (TWS) and small
- Permanent and intermittent
- TWS has tidal and Cobb influence and salt water inflow










- Estuaries and bays

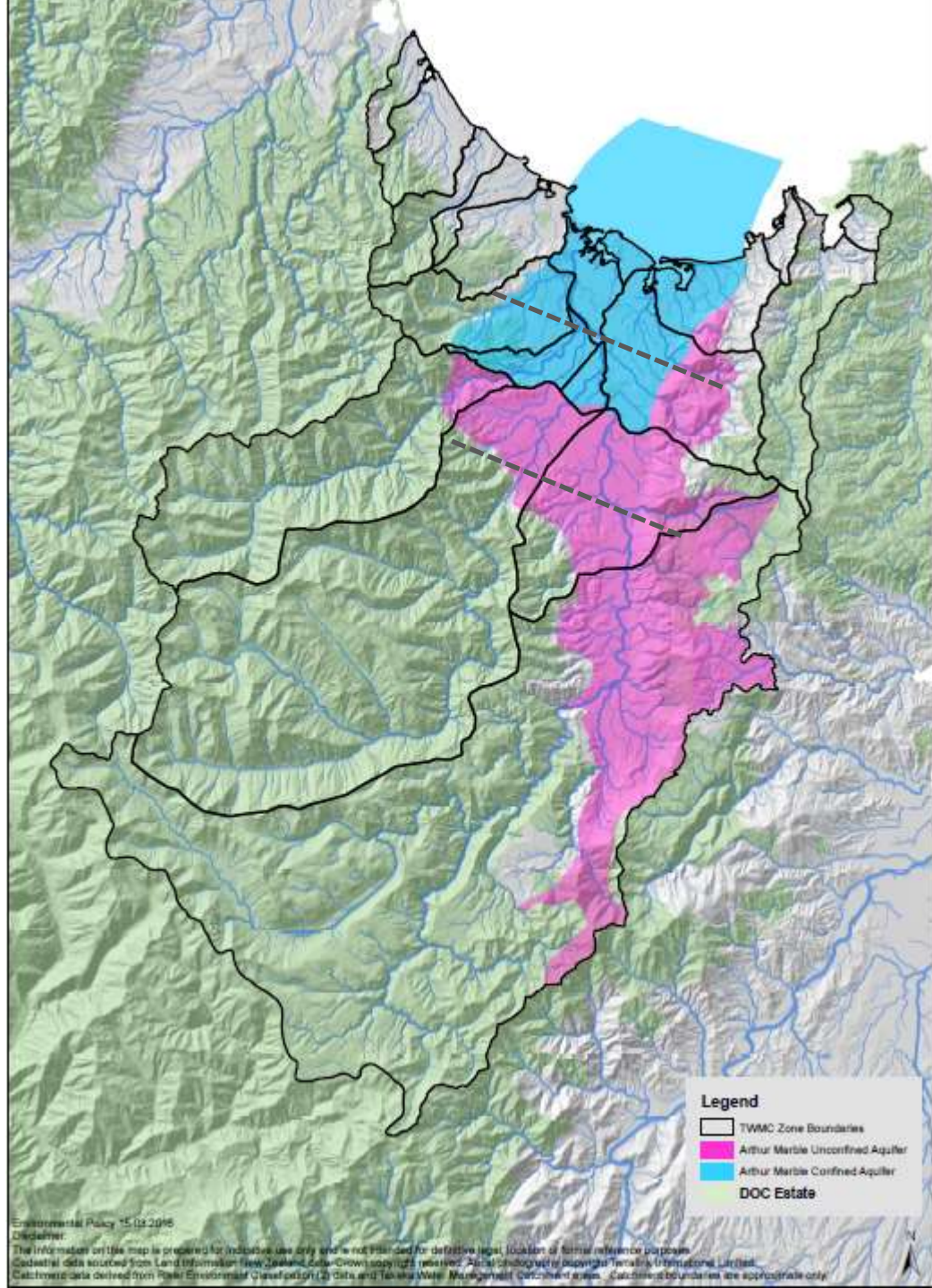
- Affected by surface water flows (eg Motupipi, Waitapu, Pohara, etc)

# Arthur Marble Aquifer (AMA)



## ROCK TYPE AND AGE

- |  |  |
|--|--|
|  Quaternary sands and gravel < 50m          |  Ordovician Onekaka Schist  |
|  Miocene Tarekoha mudstone ~ 800m         |  Ordovician Arthur Marble ~ 1000m<br><i>Unconfined</i> (pink)<br><i>Confined</i> (blue) |
|  Oligocene Takaka limestone 25 - 62m      |  Ordovician Pūkiriuna Schist  |
|  Eocene Motupipi coal measures ~ 5 - 330m |  Lower Cretaceous to Devonian Granite   |
|  |  Lower Cretaceous to Devonian Diorite   |



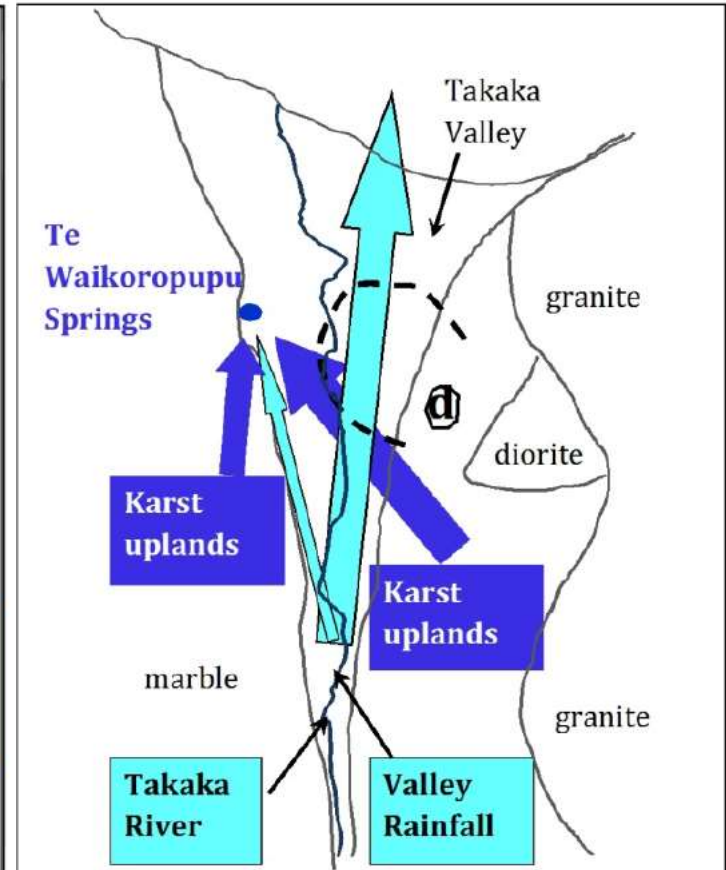
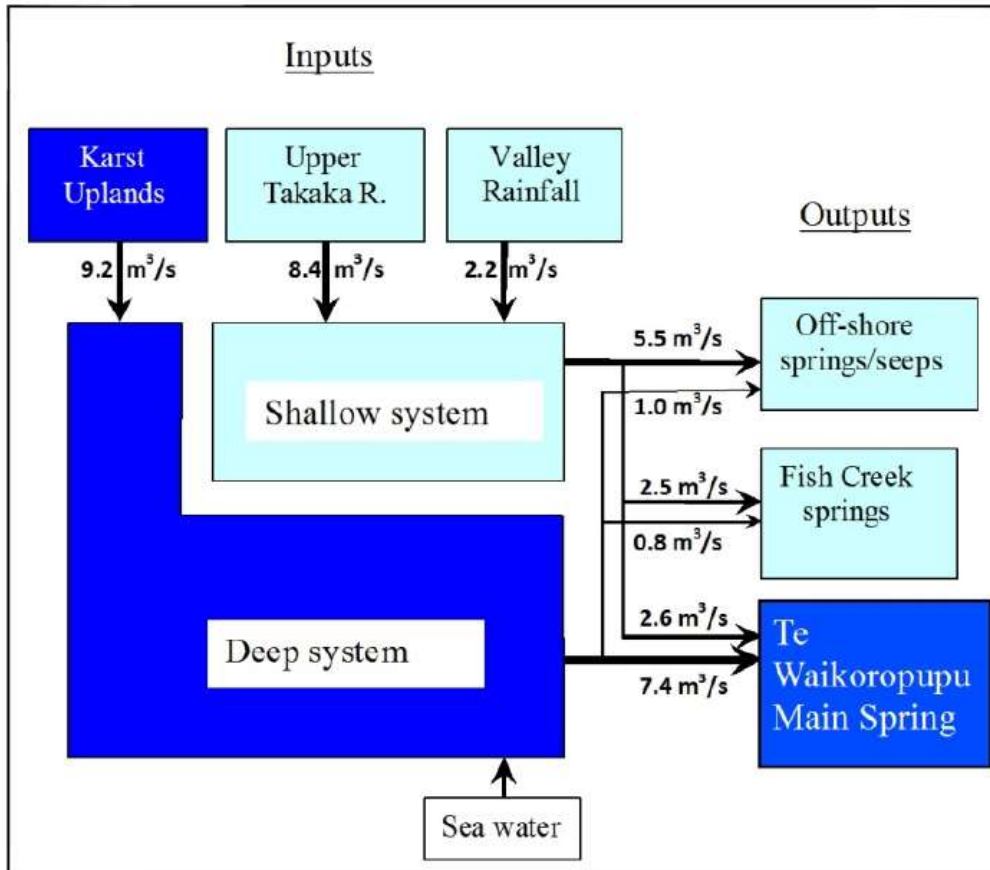
## Legend

-  TWMC Zone Boundaries
-  Arthur Marble Unconfined Aquifer
-  Arthur Marble Confined Aquifer
-  DOC Estate

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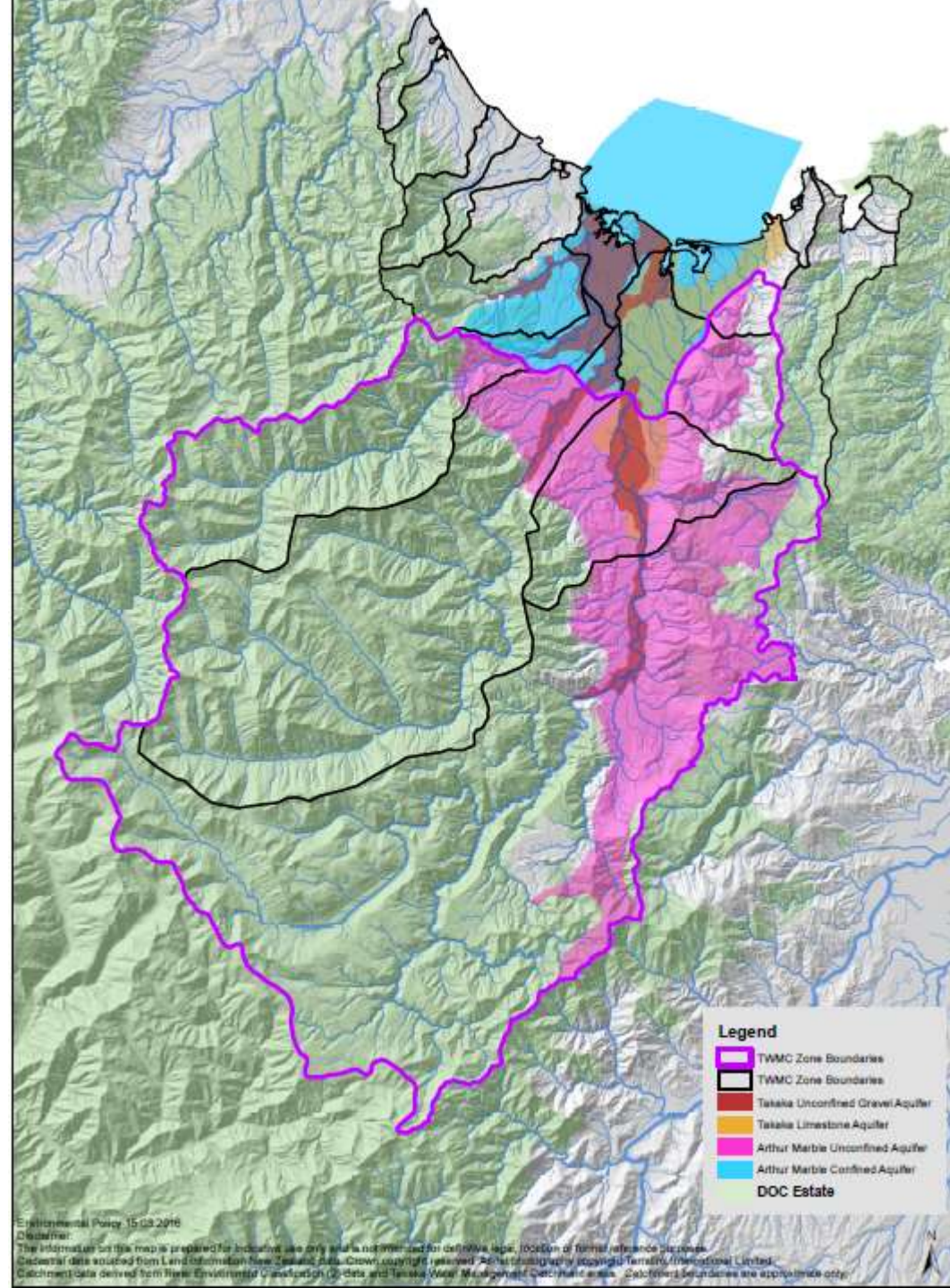
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Catchment data derived from Peak Environmental Visualisation 2.0 Data and Takaka Water Management Catchment system. Catchment boundaries are approximate only.

# Arthur Marble Aquifer and Spring flows



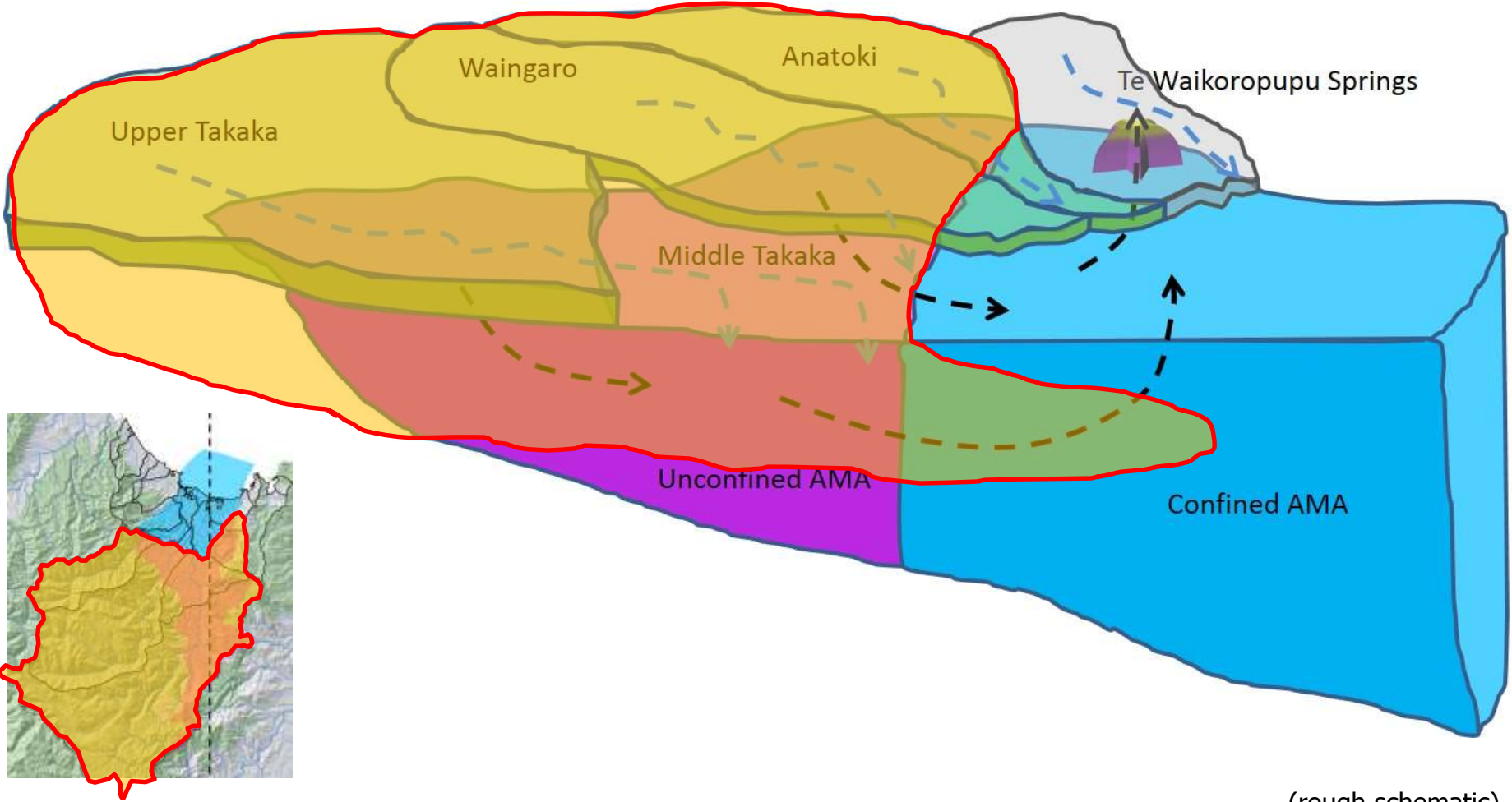
# AMA Recharge Zone

- All catchment areas that overly or feed into the **unconfined** part of the AMA
- These areas feed the **confined** AMA – part of which comes out at **Te Waikoropupu Springs**



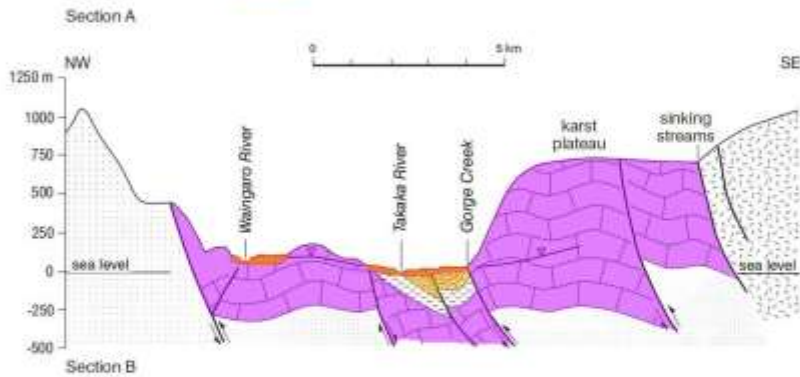
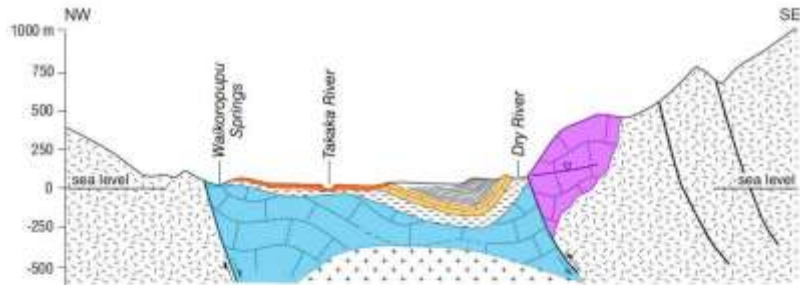


# AMA Recharge Zone



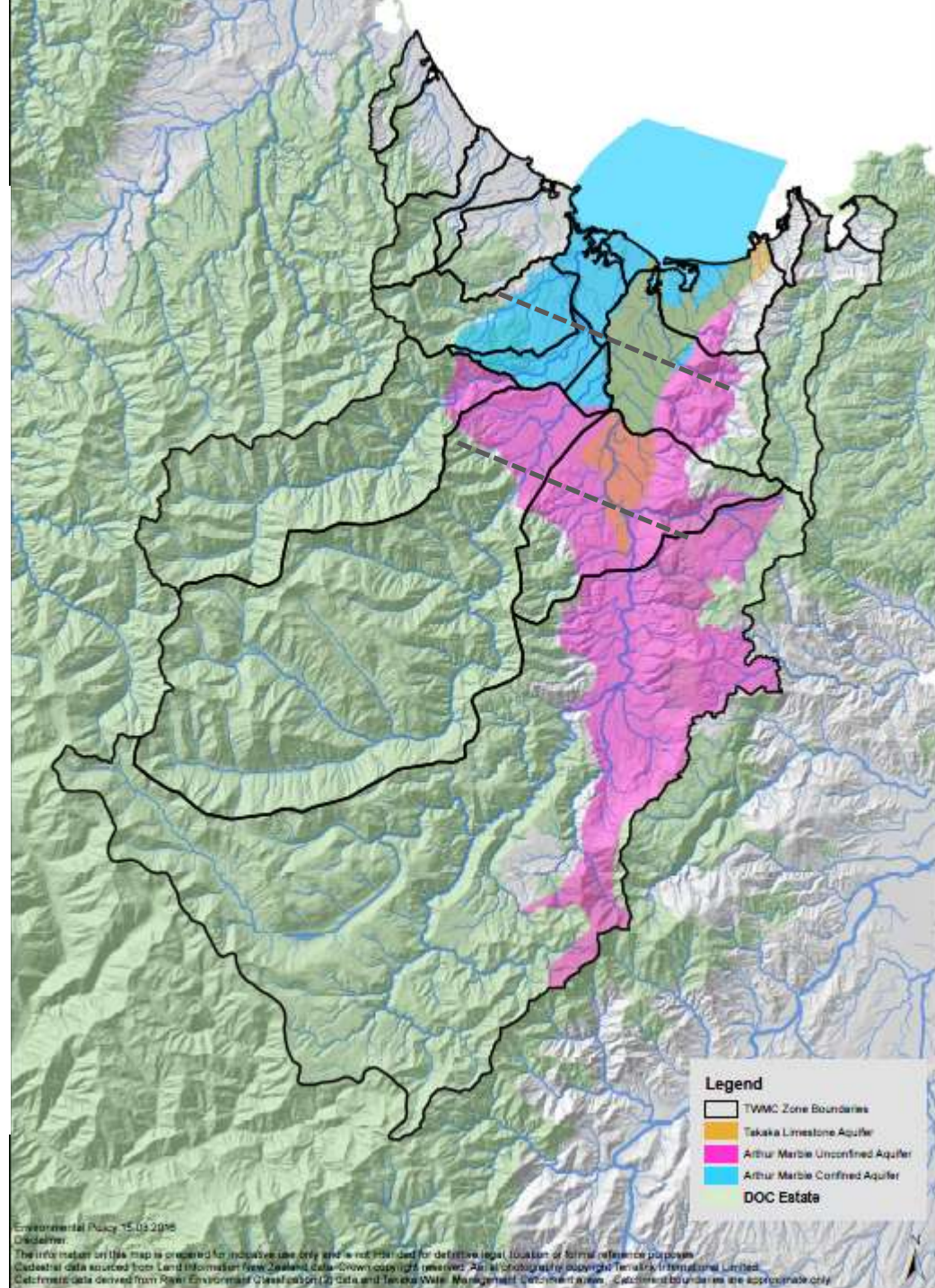
(rough schematic)

# Takaka Limestone Aquifer (TLA)



## ROCK TYPE AND AGE

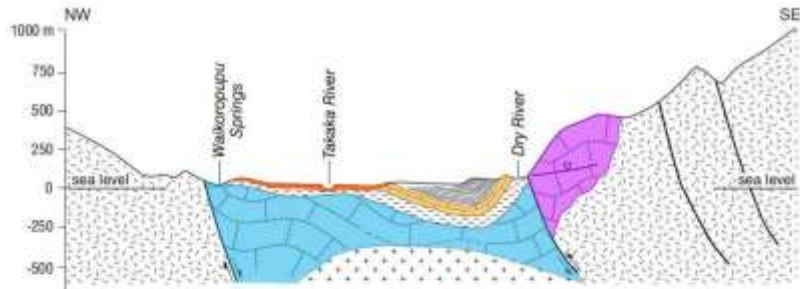
Quaternary sands and gravel < 50m	Ordovician Onekaka Schist
Miocene Tarekohe mudstone ~ 800m	Ordovician Arthur Marble ~ 1000m <i>Unconfined</i> (purple) <i>Confined</i> (blue)
Oligocene Takaka limestone 25 - 62m	Ordovician Pūkiriuna Schist
Eocene Motupipi coal measures ~ 5 - 330m	Lower Cretaceous to Devonian Granite
	Lower Cretaceous to Devonian Diorite



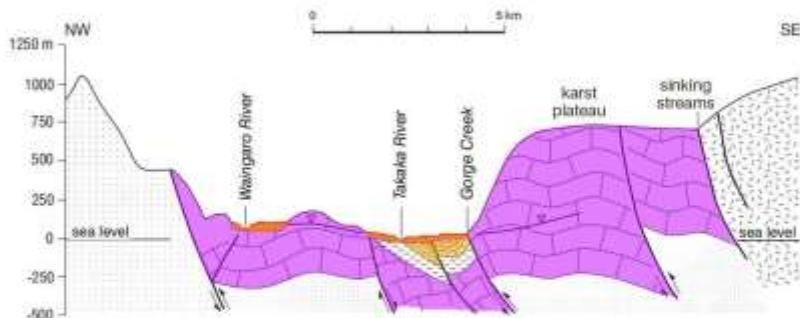
## Legend

- TWMC Zone Boundaries
- Takaka Limestone Aquifer
- Arthur Marble Unconfined Aquifer
- Arthur Marble Confined Aquifer
- DOC Estate

# Takaka Gravel Aquifer (TGA)



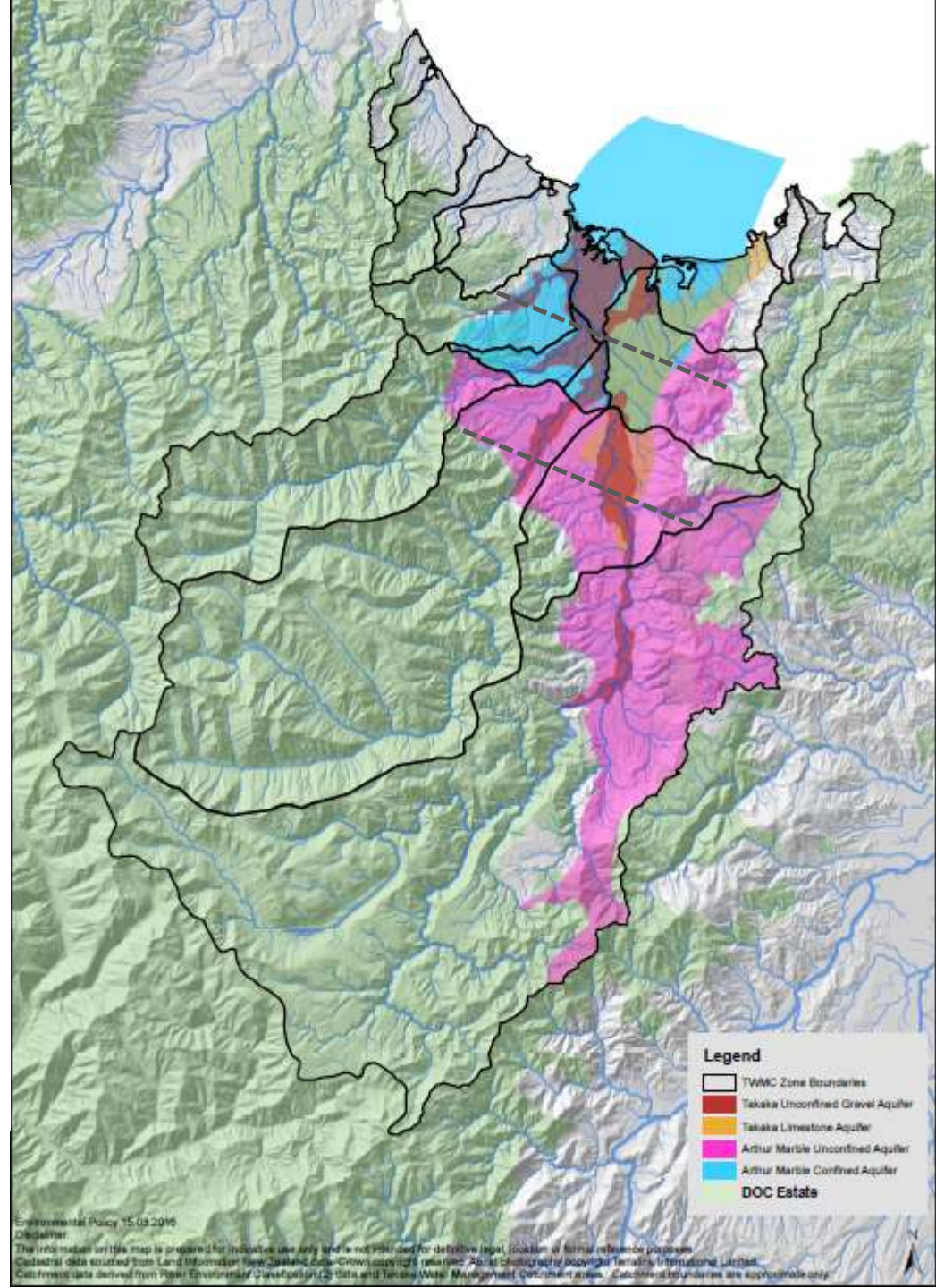
Section A



Section B

## ROCK TYPE AND AGE

- |  |  |
|--|--|
| Quaternary sands and gravel < 50m        | Ordovician Onekaka Schist  |
| Miocene Tarekohe mudstone ~ 800m         | Ordovician Arthur Marble ~ 1000m<br>Unconfined (orange) / Confined (red) |
| Oligocene Takaka limestone 25 - 62m      | Ordovician Pūkiriuna Schist  |
| Eocene Motupipi coal measures ~ 5 - 330m | Lower Cretaceous to Devonian Granite                                     |
|  | Lower Cretaceous to Devonian Diorite                                     |



## Legend

- TWMC Zone Boundaries
- Takaka Unconfined Gravel Aquifer
- Takaka Limestone Aquifer
- Arthur Marble Unconfined Aquifer
- Arthur Marble Confined Aquifer
- DOC Estate

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Disclaimer:

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Geological data derived from Peter Gossamer's 'Geology of the Takaka Area' (1975) and 'Geology of the Takaka Area' (1975) and 'Geology of the Takaka Area' (1975). Contour lines are approximate only.

# Water demand and use

- Demand for maintaining or improving water quality
  - Swimming and other recreation
  - Cultural and spiritual values (eg Te Waikoropupu Springs)
  - Drinking water (particularly groundwater)
  - Fishing and food gathering (freshwater and coastal)
  - Tourism, aquaculture, hydro-electric
- Demand for consumptive use of water
  - Farming, industry and commercial uses
    - Waiting list
    - Future potential demands – eg bottled water
  - Urban growth
- Understanding potential conflicts
- Understanding pathways of effect and risks
- Complex water system we don't fully understand

Questions?