

20 October 2014

Variation 1 – Response to questions from Hearing Panel to Dr Anthony Davoren, 30 September 2014

Response to the following questions were requested by the hearing panel:

A. HydroTrader

- Confirm the number of transfers less than 80,000m³.

B. HydroServices

- Confirm annual (seasonal) volume for Jones Road application (CRC143281); and
- Confirm the volume of Adaptive Management consents in the combined Selwyn-Waihora zone.

A. HydroTrader

In response to the question from Commissioner van Voorthuysen regarding a threshold, below which a transfer could be processed without having to surrender a portion of the allocation. I recommended 80,000m³ as a pragmatic threshold volume.

Since May 2008 HydroTrader has brokered 28 transfers in the Selwyn-Waihora Combined Allocation Zone as follows:

- 11 (39%) were for less than 80,000m³/year, with a total annual volume of 520,272m³ of a total volume traded of 5,044,694 m³.
- The total volume traded across all zones in this period was 6,631,134m³. There were 35 trades of which 12 were for less than 80,000 m³/year and a total of 596,800 m³.

Obviously it would be helpful if ECan calculated the same numbers for all trades, although as expressed to the Panel I consider HydroTrader brokers the greatest proportion of trades, likely about 70-80%.

B. HydroServices

- a) Commissioner van Voorthuysen requested confirmation of the annual (seasonal) volume for CRC143281 and the proportion of the allocation limit calculated for the Kaituna Groundwater Zone (KGZ).

The calculated annual volume using measured profile available water was 1,125,000m³/year.

In my evidence the annual land based recharge for valleys in the KGZ has been calculated as follows:

Kaituna Valley	11.98Mm ³ /year
Prices Valley	6.0Mm ³ /year
Greylees	<u>4.5Mm³/year</u>
Total	22.48Mm³/year

If the allocation limit is set as 50% of land based recharge, the allocation limit is 11.24Mm³/year. The recharge calculation **does not** include rainfall recharge from the area of Kaitorete Spit that would reasonably be included in the KGZ (Figure 1).

The annual volume proposed for CRC143281 is approximately 10% of the KGWZ allocation limit I have calculated of 11.24Mm³/year.

- b) During the Rakaia-Selwyn and Selwyn-Waimakariri GWZ hearings I was responsible for maintaining the Master Table of Applicants with all the details of the consent applications. This included the Adaptive Management volume for each application, essential to respond to Commissioner requests for various scenarios and impacts in different seasons; e.g. 2000-01 and not just the 2005-6 season that was of greatest concern. The Adaptive Management volumes from the final Master Tables were:

Rakaia-Selwyn GWZ	39.2Mm ³ /year
Selwyn-Waimakariri GWZ	<u>23.9Mm³/year</u>
Total	63.1Mm³/year

Environment Canterbury record the volumes as:

Rakaia-Selwyn GWZ	36.8Mm ³ /year
Selwyn-Waimakariri GWZ	<u>24.2Mm³/year</u>
Total	61.0Mm³/year

I am unable to explain the discrepancy between the two volumes for the Rakaia-Selwyn GWZ.

DATED this 3rd day of October 2014



Dr Anthony Davoren

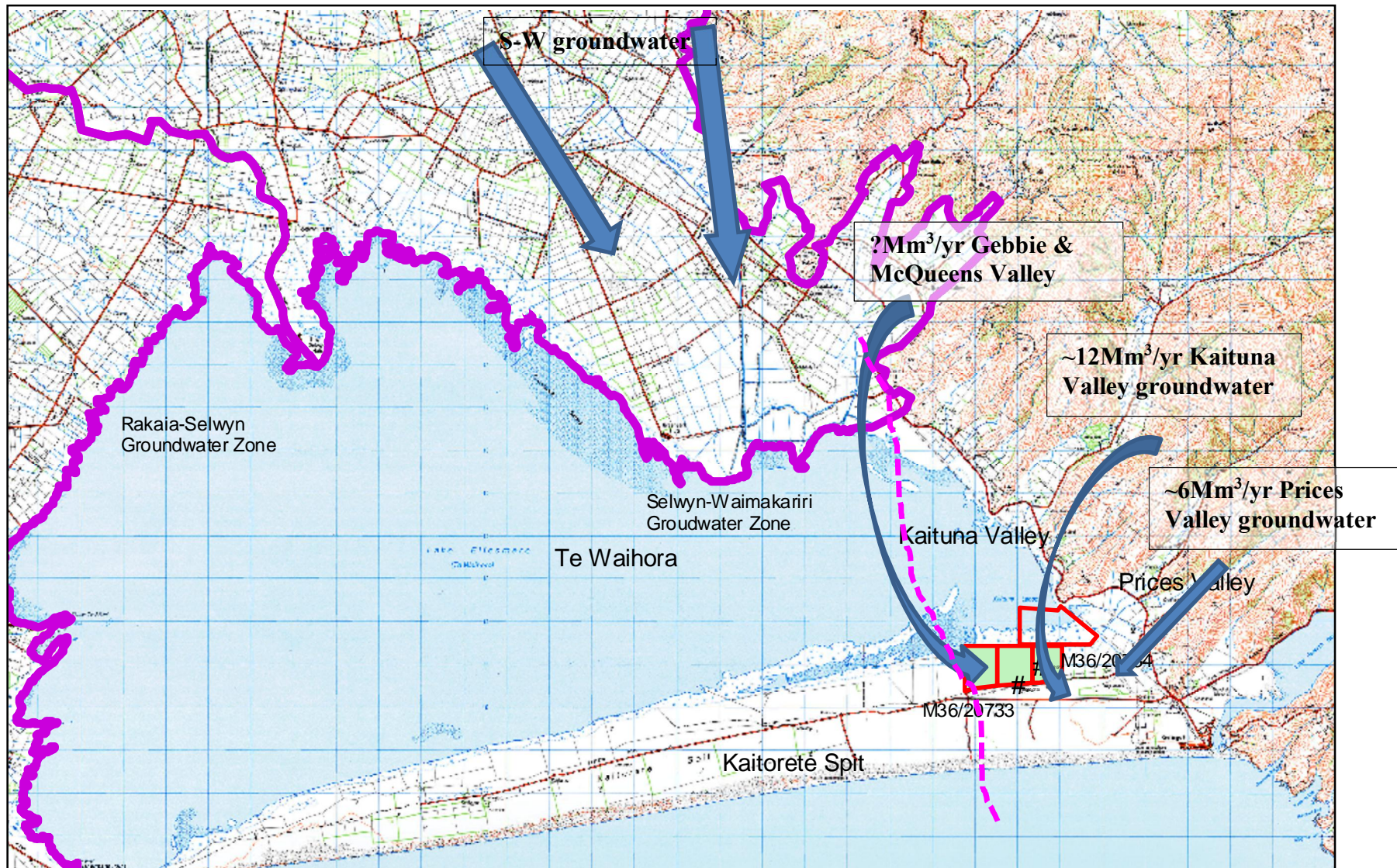


Figure 1. Conceptual groundwater flow from Kaituna Valley and Prices Valleys toward Kaitorete Spit and approximate zone boundary ().