

**IN THE MATTER OF**

the Resource Management Act  
1991

**AND**

**IN THE MATTER OF**

applications by Central Plains Water  
Trust to:

Canterbury Regional Council for  
resource consents to take and use  
water from the Waimakariri and  
Rakaia Rivers and for all associated  
consents required for the  
construction and operation of the  
Central Plains Water Enhancement  
Scheme

Selwyn District Council for resource  
consents to construct and operate  
the Central Plains Water  
Enhancement Scheme

**AND**

**IN THE MATTER OF**

a notice of requirement by Central  
Plains Water Limited to:

Selwyn District Council for the  
designation of land for works  
associated with the construction and  
operation of the Central Plains  
Water Enhancement Scheme

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**BRIEF OF EVIDENCE OF CLIFFORD JOHN MAXWELL TIPLER**

14 April 2008

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### **Qualifications and experience**

1. My full name is Clifford John Maxwell Tipler.
2. My qualifications and experience have been presented to this Committee in my primary brief of evidence and has not been repeated here.
3. I have read the code of conduct for expert witnesses set out in Environment Court practice note, and confirm that I have complied with the code in the preparation of my evidence.

### **Scope of Evidence**

4. I will provide in this section of my evidence, the further information requested by the Commissioners that relate to my area of expertise. This will include:
  - Impacts of Synlait and/or Ngai Tahu Properties Ltd (NTPL) having priority over CPWES and the consequences of this on the Waimakariri and Rakaia Rivers
  - Annual volumes of water taken from each river
  - Times of year that the Rakaia and Lower Waimakariri intakes operate
  - Take regime without the Upper Waimakariri intake
  - CPWT's preferred operating scenarios
  - Reservoir height and volume details
  - Preference of take for Rakaia and Waimakariri Rivers
  - Conclusions

### **PRIORITY OF TAKES FROM RAKAIA AND WAIMAKARIRI RIVERS**

5. My initial brief of evidence made the assumption that CPWES had priority ahead of Synlait for water from the Rakaia River and that Ngai Tahu Property Limited ("NTPL") had priority ahead of CPWES for water from the Waimakariri River. The Commissioners have asked specifically for information on:
  - Effects on flow regime in Waimakariri River if CPWES has priority over NTPL with a comparison between the existing situation without NPTL and CPWES as compared to with CPWES and without NTPL.

- Effects on flow regimes in Rakaia River if Synlait is granted consents that retain priority for it, conditions to address this situation, the consequential impacts on the Waimakariri River take and storage capacity and any effects on viability of the schemes if Synlait attains priority consents.
6. I also made the assumption on advice from ECan that the total existing allocation of water for abstraction from the Rakaia River was 34.3 m<sup>3</sup>/s. I have since been advised by ECan officers that there are additional takes that need to be included within the existing allocations that increase the total to 36.5 m<sup>3</sup>/s. The hydrologic modelling I present in with this brief of evidence makes an adjustment for the reduced availability of water in the Rakaia River.
  7. Synlait has two applications for 6 m<sup>3</sup>/s, one is for band 2/3 water (CRC062685) and the other is from the unallocated water after band 5 (CRC054384). My assumptions in the evidence I have given to date have included the full allocation of all band 2/3 water and therefore I do not need to make any further allowance for whether or not Synlait ultimately gain access to this water. The scenarios I present in this brief therefore relate to the 6 m<sup>3</sup>/s take from the unallocated band 6 water.
  8. The scenarios that I have considered to demonstrate the consequential effects of priority between the three parties are:
    - 20/25/240 CPW, NTPL – The base case where CPWES has priority for Rakaia water and NTPL has priority for Waimakariri water. This is equivalent to my initial base case scenario but it has been adjusted for the reduced availability of water in the Rakaia River.
    - 20/25/240 Synlait, NTPL – Where Synlait has priority for Rakaia water and NTPL has priority for Waimakariri water. This represents the worst case scenario for CPWES where lower priority water only is available from each river.
    - 20/25/240 Synlait, CPW – Where Synlait has priority for Rakaia water and CPWES has priority for Waimakariri water.
    - 20/25/240 CPW, CPW – Where CPWES has priority for Rakaia water and Waimakariri water. This represents the best case scenario for CPWES.
  9. I have included in Appendix A a full set of summary statistics for each of a typical, dry and wet year with corresponding hydrographs and flow duration curves, including the rates of takes from each of the Rakaia and Waimakariri Rivers.

## IMPACT OF PRIORITY ISSUES ON REQUIRED STORAGE AND SCHEME RELIABILITY

10. In my first brief of evidence, I demonstrated the consequences of changes to the take regimes that involved increasing the maximum rate of take from the Waimakariri River (between 20 – 40 m<sup>3</sup>/s) and providing, as an offset, changes in storage (220 – 280 MCM) so that the reliability of supply was held constant. I consider the comparisons I made and the conclusions I drew from that assessment to still be relevant to my current assessment and therefore I have only focussed on the consequences of changes in priority.
11. The impact upon the reliability of the irrigation supply if the storage is held at 240 MCM and the impact on the required storage should the reliability be held constant is shown in Table 1. In addition I have included how reliable CPWES would be if there was no storage and there was a run of river supply only.

**Table 1: Priority effects on Reliability and Storage**

Scenario	20/25/240 CPW, NTPL	20/25/240 Synlait, NTPL	20/25/240 Synlait, CPW	20/25/240 CPW, CPW
Reliability with constant storage	98.0%	97.6%	98.4%	98.7%
Storage with constant reliability (ie 98%)	240 MCM	252 MCM	225 MCM	215 MCM
Reliability with no storage	57.6%	56.5%	60.1%	61.1%

12. I interpret the data in Table 1 in the following manner.
- The impact of Synlait gaining priority over CPWES would be to reduce the reliability of the scheme by 0.4%, which is a very small amount. However this can be offset by increasing the storage by 12 MCM which would cost CPWL approximately \$8M and increase the dam height by 1 m.
  - The impact of CPWES gaining priority over NTPL would be to increase the reliability by 0.7%, which again is a small amount. However this would enable the storage to be reduced by 25 MCM at a saving of approximately \$18M.

- The benefit of obtaining priority to the NTPL water from the Waimakariri River is greater than the loss of the Synlait water from the Rakaia. The reason for this is that overall, the volume of water from the Rakaia is less than the volume of water from the Waimakariri and therefore priority access to Waimakariri River water is of a greater benefit.
- The reliability of any of the scenarios without storage is very low, being between 56.5% and 61.1%. However the reliability of the 6 m<sup>3</sup>/s that may be allocated to Synlait if it retains priority is approximately 47%. The reason that this is so much lower than that of CPWES is that CPWES has the advantage of sourcing water from two sources and therefore when one source is off, the other may be on, extending the time water is available and increasing scheme reliability. Nevertheless I do not consider a reliability of 60% to be a sustainable option.

### IMPACT OF PRIORITY ISSUES ON FLOW REGIME IN WAIMAKARIRI RIVER

13. The Commissioners have requested an assessment of the effects on the flow regime in Waimakariri River if CPWES has priority, comparing the existing situation without NPTL and CPWES to that with CPWES and without NPTL. For the four scenarios presented, I have prepared a table of flow statistics for the Waimakariri River, equivalent to the data contained in my Table 4 of my first brief of evidence. These are presented in Tables 2 – 5 following.

**Table 2: Flow Statistics for Waimakariri River Takes - 20/25/240 CPW, NTPL**

	<b>Before NTPL (m<sup>3</sup>/s)</b>	<b>After NTPL and Before CPWES (m<sup>3</sup>/s)</b>	<b>After CPWES (m<sup>3</sup>/s)</b>	<b>Change resulting from CPWES</b>
Mean Annual 7-day low flow	39.46	38.59	38.15	1.14%
Median 7-day low flow	41.49	41.00	41	0.00%
Mean Flow	112.9	110.31	101.33	8.14%
Median Flow	78.26	75.45	63.34	16.05%
Lower Quartile	51.78	49.85	41	17.75%
Upper Quartile	129.15	125.97	116.15	7.80%
Inter-quartile Range	77.37	76.13	75.15	1.27%
Mean annual 1-day flood	998.61*	995.37*	985.47*	0.99%

\*no change if intake gates are closed due to flood condition

**Table 3: Flow Statistics for Waimakariri River Takes - 20/25/240 Synlait, NTPL**

	<b>Before NTPL (m<sup>3</sup>/s)</b>	<b>After NTPL and Before CPWES (m<sup>3</sup>/s)</b>	<b>After CPWES (m<sup>3</sup>/s)</b>	<b>Change resulting from CPWES</b>
Mean Annual 7-day low flow	39.46	38.59	38.15	1.14%
Median 7-day low flow	41.49	41.00	41	0.00%
Mean Flow	112.9	110.31	100.88	8.55%
Median Flow	78.26	75.45	62.83	16.73%
Lower Quartile	51.78	49.85	41	17.75%
Upper Quartile	129.15	125.97	115.43	8.37%
Inter-quartile Range	77.37	76.13	74.43	2.22%
Mean annual 1-day flood	998.61*	995.37*	984.85*	1.06%

\*no change if intake gates are closed due to flood condition

**Table 4: Flow Statistics for Waimakariri River Takes - 20/25/240 Synlait, CPW**

	<b>Before CPWES (m<sup>3</sup>/s)</b>	<b>After CPWES (m<sup>3</sup>/s)</b>	<b>Change resulting from CPWES</b>
Mean Annual 7-day low flow	39.46	38.18	3.24%
Median 7-day low flow	41.49	41	1.18%
Mean Flow	112.9	103.35	8.46%
Median Flow	78.26	66.35	15.22%
Lower Quartile	51.78	41	20.82%
Upper Quartile	129.15	119.04	7.83%
Inter-quartile Range	77.37	78.04	-0.87%
Mean annual 1-day flood	998.61*	998.17*	0.04%

\*no change if intake gates are closed due to flood condition

**Table 5: Flow Statistics for Waimakariri River Takes - 20/25/240 CPW, CPW**

	<b>Before CPWES (m<sup>3</sup>/s)</b>	<b>After CPWES (m<sup>3</sup>/s)</b>	<b>Change resulting from CPWES</b>
Mean Annual 7-day low flow	39.46	38.18	3.24%
Median 7-day low flow	41.49	41	1.18%
Mean Flow	112.9	103.82	8.04%
Median Flow	78.26	66.94	14.46%
Lower Quartile	51.78	41	20.82%
Upper Quartile	129.15	120.07	7.03%
Inter-quartile Range	77.37	79.07	-2.20%
Mean annual 1-day flood	998.61*	989.06*	0.96%

\*no change if intake gates are closed due to flood condition

14. In considering the data in the above tables, I do not believe there is any material difference in the flow regimes in the Waimakariri River between the scenarios as a result of Synlait having priority over CPWES for Rakaia water. There is a reduced impact on the flow regimes of the Waimakariri River if CPWES has priority over NTPL.

#### **VOLUMES OF WATER TAKEN FROM EACH RIVER**

15. When considering the volume of water that will be abstracted from the Waimakariri River for each of the scenarios, the change in the mean flow is the relevant statistic. These are presented in Table 6.

**Table 6: Volumes of water taken from each river**

<b>Scenario</b>	<b>20/25/240 CPW, NTPL</b>	<b>20/25/240 Synlait, NTPL</b>	<b>20/25/240 Synlait, CPW</b>	<b>20/25/240 CPW, CPW</b>
<b>Waimakariri River</b>				
Mean flow before take	110.3	110.3	112.9	112.9
Mean flow after take	101.3 (101.3)	100.9 (100.8)	103.4 (103.4)	103.8 (103.9)
Change in mean flow (m <sup>3</sup> /s)	8.98	9.43	9.55	9.08
Annual Volume of water taken (MCM)	283	297	301	286
<b>Rakaia River – Combined CPWES and ACWT</b>				
Mean flow before take	197.3	195.9	195.9	197.3
Mean flow after take	190.1	190.3	190.3	190.1
Change in mean flow (m <sup>3</sup> /s)	7.26	5.58	5.58	7.26
Annual Volume of water taken (MCM)	228	175	175	228
<b>Rakaia River – CPWES only</b>				
Change in mean flow (m <sup>3</sup> /s)	3.70	3.21	3.21	3.70
Annual Volume of water taken (MCM)	117	101	101	117

\* Note Bracketed figures relate to situation if the storage volume was adjusted to provide a constant level of reliability as shown in Table 1.

16. The data in Table 6 show that for the Rakaia River, if CPWES has priority over Synlait, then approximately 16 MCM of more water would be available to CPWES. If Synlait has priority over Rakaia water, then the take from the Waimakariri River would increase by approximately 14-15 MCM, which is to be expected. The slight differences (16 cf 14 cf 15 MCM) relate to the slight differences in reliability for each

of the scenarios, and had I adjusted the storage required so that the reliabilities were identical, then the extra take from the Waimakariri River would equal the loss of water from the Rakaia. The impact of losing priority for Rakaia water to Synlait will increase the mean take from the Waimakariri River by approximately 0.5 m<sup>3</sup>/s.

17. The impact on the Rakaia River as a consequence of the take of CPWES and ACWT does not change in relation to the potential changes in priority, as these schemes will take all of the unallocated water in the river. I have therefore not provided any additional flow statistics for after CPWES and ACWT for the Rakaia River.
18. Appendix A contains a table of monthly takes from each of the Waimakariri and Rakaia Rivers for each of the four scenarios I have presented. This includes the maximum, mean, minimum and median monthly flows and volumes. Annual volumes are presented in Table 6 above.

### **IMPACT OF PRIORITY ISSUES ON LOW FLOW REGIME IN WAIMAKARIRI RIVER**

19. The impacts on the low flow regime in the Waimakariri River as a consequence of the changes in priority are small. Table 7 presents data equivalent to my Table 6 in my first brief of evidence on the changes to periods of low flow.

**Table 7: Low flow data for Waimakariri River.**

	<b>CPWES- NTPL (days)</b>		<b>CPWES- CPWES (days)</b>		<b>Synlait- NTPL (days)</b>		<b>Synlait- CPWES (days)</b>	
Mean duration of min flow	9.1	9.9	10.1	9.9	9.1	9.9	10.1	10.0
Median duration of min flow	5	6	5	5	5	6	5	5
Maximum duration of minimum flow	90	143	71	142	90	143	71	142

20. In addition to the data in Table 7, I have presented the data in my Figure 26 of my first brief of evidence in Figures 1 – 4 following. Figure 1 is the scenario where CPWES has priority to Rakaia water and NTPL has priority to Waimakariri water as for my original base case scenario.

Waimakariri River - Duration of Low flows  
(20/25/240 CPWT - NTPL)

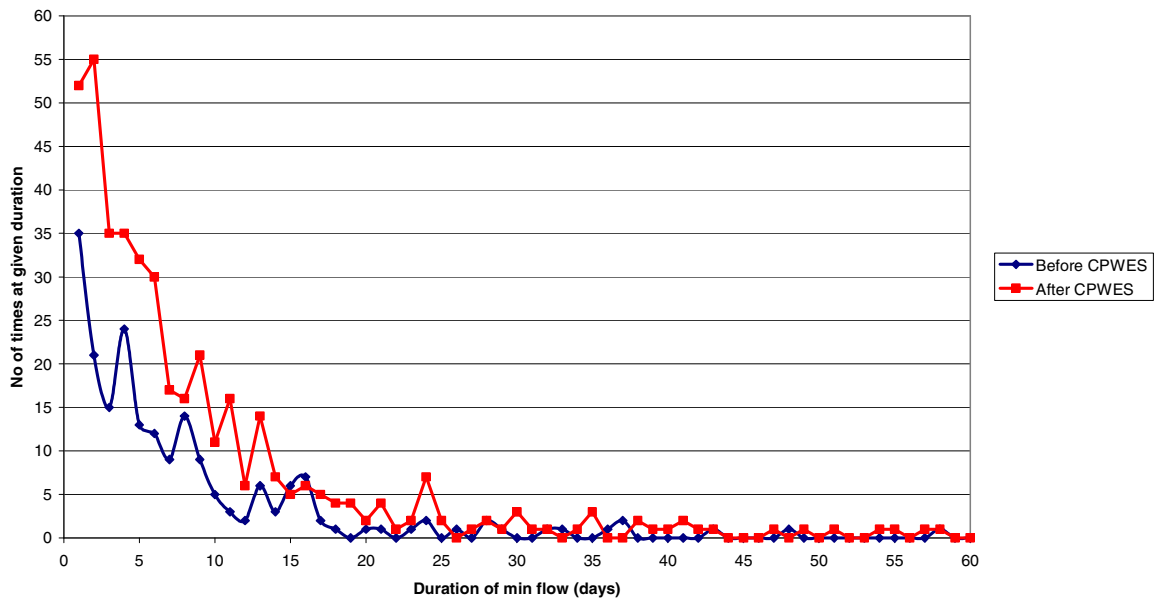


Figure 1: Frequency and duration of low flow events for CPWES priority to Rakaia water and NTPL priority to Waimakariri water

Waimakariri River - Duration of Low flows  
(20/25/240 Synlait NTPL)

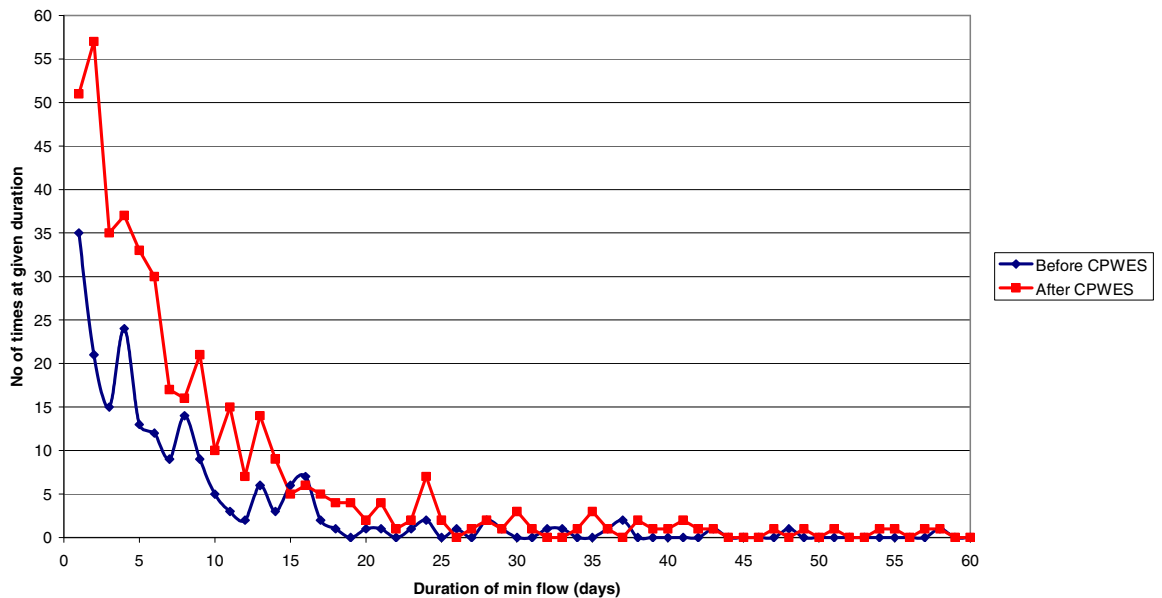


Figure 2: Frequency and duration of low flow events for Synlait priority to Rakaia water and NTPL priority to Waimakariri water.

Waimakariri River - Duration of Low flows  
(20/25/240 Synlait - CPWT)

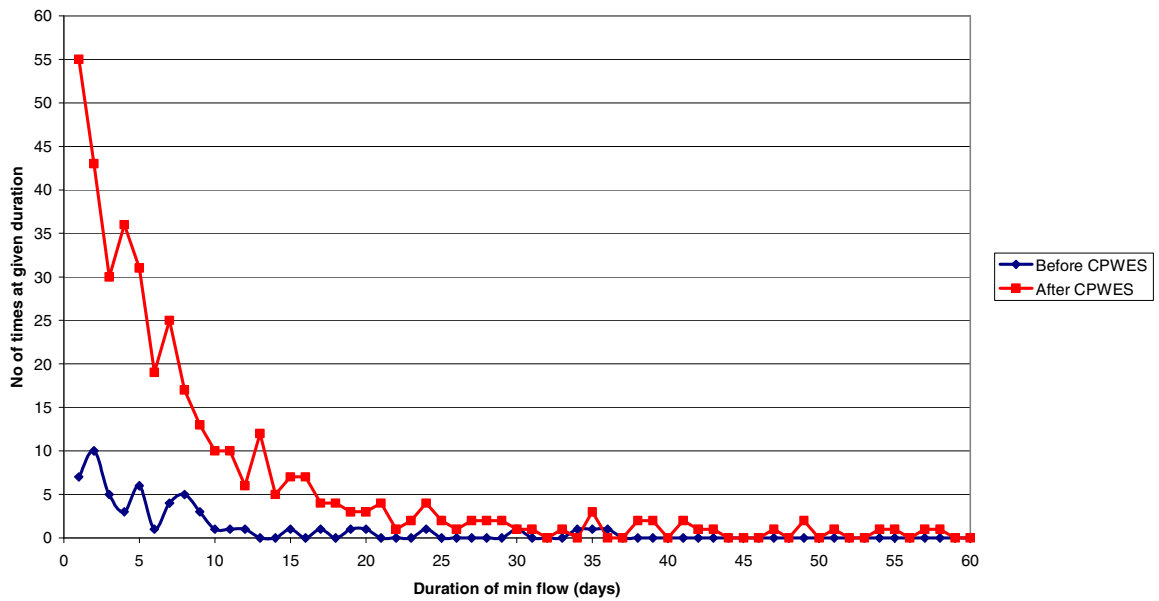


Figure 3: Frequency and duration of low flow events for Synlait priority to Rakaia water and CPWES priority to Waimakariri water.

Waimakariri River - Duration of Low flows  
(20/25/240 CPWT CPWT)

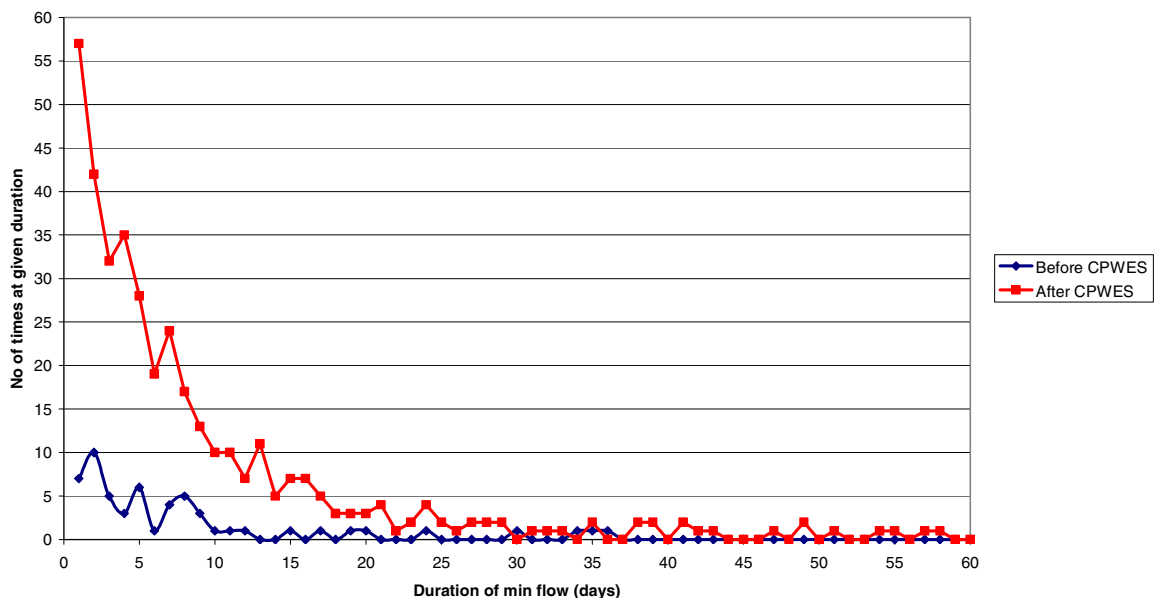


Figure 4: Frequency and duration of low flow events for CPWES priority to Rakaia water and CPWES priority to Waimakariri water.

21. The only difference of significance in Figures 1-4 is the “Before CPWES” graph, which shows a lower starting number of low flow days when CPWES has priority over NTPL. This is to be expected as the combined takes before CPWES in that scenario is less.

22. I have considered again my suggestion for mitigation of these effects as outlined in my paragraphs 142 – 143 of my first brief of evidence, and I stand by comments made at that time. I do not believe there is any material difference in the low flow regimes “After CPWES” whether or not Synlait has priority over CPWES for Rakaia water.

### **HYDROLOGIC IMPACT OF NO UPPER INTAKE - PUMPED STORAGE**

23. If the upper intake is not constructed, then the reservoir would be filled by pumping water from the head race canal over the dam. This therefore means that during the winter, Rakaia River water would be taken to fill the reservoir as well as water from the Waimakariri River. The effect of this will be to reduce the effect on the Waimakariri River in the winter, but there will be no change to the effects during the summer nor will there be any change to the effects on the Rakaia River. As discussed previously, Rakaia River water, if available will be taken either by CPWES or ACWT and my assessment has provided for full abstraction up to the limits imposed by the NWCO. The only difference is that less water will be returned to the river through ACWT’s Rakaia Terrace Hydro Scheme than if no winter water was taken to fill the reservoir. My assessment includes the scenario where no water is returned to the Rakaia River and therefore this consequence has been fully assessed. Table 8 following provides the flow statistics for the Waimakariri River for a pumped storage option.

**Table 8: Flow Statistics for Waimakariri River Takes - 20/25/240 CPW, NTPL – Pumped Storage**

	<b>Before NTPL (m<sup>3</sup>/s)</b>	<b>After NTPL and Before CPWES (m<sup>3</sup>/s)</b>	<b>After CPWES (m<sup>3</sup>/s)</b>	<b>Change resulting from CPWES</b>
Mean Annual 7-day low flow	39.46	38.59	38.15	1.14%
Median 7-day low flow	41.49	41.00	41	0.00%
Mean Flow	112.9	110.31	103.28	6.37%
Median Flow	78.26	75.45	65.4	13.32%
Lower Quartile	51.78	49.85	41	17.75%
Upper Quartile	129.15	125.97	119.14	5.42%
Inter-quartile Range	77.37	76.13	78.14	-2.64%
Mean annual 1-day flood	998.61	995.37*	990.58	0.48%

\*no change if intake gates are closed due to flood condition

24. The equivalent data for the scenario where the Upper Intake is used to fill the reservoir is presented in Table 2. Comparison between data in Table 2 and Table 8 shows that there is a reduction in the effect on the mean flow in the Waimakariri River by approximately 2 m<sup>3</sup>/s. This is offset by an equivalent increase in abstraction by CPWES from the Rakaia River. Similarly the reduction in median flow is reduced by approximately 2 m<sup>3</sup>/s. There is no change in the Mean and Median Annual 7-day Low Flows between these scenarios.

#### **FURTHER INFORMATION REQUESTED FROM CPWT**

25. Much of the information requested in para 38 of the Commissioner's Minute of 27 March 2008 has been provided above, but for completeness I shall refer to each item requested as follows:

- ***Maximum and mean, monthly and annual volume of take from each river for each flow scenario.***

26. These data are contained in Appendix A for each of the four scenarios considered above. The annual volumes taken from each river are found in Table 6.

- ***Times of year where take from Rakaia and Waimakariri Gorge bridge intakes are required if the tunnel is built.***

27. The times of year that the intakes are required can be directly obtained from the tables in Appendix A that provide the data on the abstractions from each river on a monthly basis. If the tunnel is built, then it is probable that the total Waimakariri River take will come from the Upper Intake. There is one possible alternative to this, in that if the Lower Intake is constructed to facilitate early run-of-river irrigation water for the scheme, and then at a later date the upper intake is constructed, then the location of the take could be shared between the two intake sties. The capacity of the upper intake will at a minimum be 20 m<sup>3</sup>/s to fill the reservoir and therefore this will very nearly have the capacity to supply the total scheme demand for most of the time. There is no rational basis at this time to predict how the scheme would be operated so that the take was shared between the two sites and therefore the conservative assumption is that all water could be taken from either site. Data has been provided for both of these situations.

- ***The proposed monthly take regime if the upper Waimakariri intake is not constructed.***

28. If the Upper Intake is not constructed, then the total take from the Lower Intake at the Gorge bridge will be as contained in the table providing Waimakariri River takes for the “20-25-240 CPW NTPL - Pumped Storage” option in Appendix A. Annualised flow statistics are provided in Table 8. Included with the tables in Appendix A, are the data showing the differences in take from the Waimakariri River as a consequence of the Pumped Storage option. In particular these data show the reduction in winter takes as a consequence of having winter Rakaia water to fill the reservoir as well. In the months of April to June, there will be approximately 16 MCM less water taken each month from the river.

- ***CPWT’s preferred operating scenarios***

- ***(a) The rationale for those scenarios***

29. There are two probable operating scenarios. These can be referred to as “Gravity Storage” and “Pumped Storage”. The Gravity Storage option requires the Upper Intake and the Pumped Storage option requires the Lower Intake. Both scenarios require the Rakaia River intake. The operational priority will be to take water for the CPWES from the Rakaia River first and then from the Waimakariri River. The choice between these two scenarios is not straight forward, and in my opinion it is premature to make such a choice. I explain my reasoning for this as follows.

30. The Upper Intake includes a long tunnel from the river terrace face through to the Waianiwi Valley. This option will have the least environmental impact and it has the advantage of enabling the reservoir to be filled under gravity flow, but it has the disadvantage of the highest capital cost. In discussion with CPWL shareholders I believe there is support for this option even though it is more expensive, as it provides security against significant increases in the cost of electricity should the pumping solution be relied upon.

31. The Lower Intake has a long canal up the river terrace face and therefore has a higher environmental impact than the tunnelled option. It requires water to be pumped into the reservoir from the canal at the base of the dam and is therefore subject to higher operating and maintenance costs and electricity supply cost increases in the future, but nevertheless it is the cheaper option when capital and operating costs are taken into account. The Pumped Storage option also allows

Rakaia water to be used to fill the reservoir and therefore reduces the impact on the Waimakariri River in the winter.

32. It is my opinion that it is unlikely that two intakes would be constructed as the incremental cost of increasing the capacity of one intake is far less than the cost of replicating the intake at another site. Therefore if the Upper Intake was constructed, there would be no benefit in constructing the Lower Intake. Similarly if the Lower Intake was constructed with the necessary pump station, the sunk capital cost in the pump station and the high capital cost associated with the tunnel would make the Upper Intake option extremely expensive and in my opinion unlikely to be adopted.
33. On economic grounds, with the assumption that electricity costs do not increase more than the rate of inflation (no increase in real terms), the Lower Intake could be preferred. However on environmental grounds, the Upper Intake will have the lower environmental footprint and therefore it could be preferred. Table 9 contains the cost comparison data for each intake.

**Table 9: Capital and Operating Costs for Upper and Lower Intakes**

<b>Component</b>	<b>Upper Intake \$(M)</b>	<b>Lower Intake \$(M)</b>
Upper Intake	8.5	
10 km tunnel	100.0	
Lower Intake		12.5
Lower terrace race inc structures		22.5
Coalgate pump station		30.0
Capitalised cost of O&M costs		20.0
<b>Total costs</b>	<b>\$108.5M</b>	<b>\$85.0M</b>

34. If the Upper Intake is affordable at the time of scheme implementation, then I would predict that that option will be chosen, however if it affects the viability of the scheme in its entirety, then the Lower Intake and pump station will be constructed. I am not able to provide any definitive answer on which is more likely, and therefore CPWT has applied for both.
35. Hydrologic data for both of these operating scenarios has been provided in Appendix A presented as the “20-25-240 CPW NTPL” and “20-25-240 CPW NTPL Pumped Storage” options.

36. The rationale for always taking water from the Rakaia River first has been discussed above. It is my opinion that guidance has been provided by the NWCO as to the capacity of the Rakaia River to provide water for abstraction and this should be relied upon before taking water from the Waimakariri River. Therefore to minimise the effects on the Waimakariri River, the preference to take Rakaia River water first is favoured.

- ***(b) The maximum flow capacity of each of the 3 headrace intake channels***

37. In my first brief of evidence I outlined the advantages to both CPWES and the Waimakariri River of having the ability to take water at a maximum rate of 40 m<sup>3</sup>/s. These include:

- A smaller reservoir volume requiring a lower dam height
- A shorter time frame to fill the reservoir
- The ability to maximise the takes during periods of higher flow

38. Both of the Waimakariri River intake options require the ability to carry 40 m<sup>3</sup>/s as it is probable that only one will be constructed.

39. This is also true for the Rakaia River, however in that instance I have assumed that CPWES would take 20 m<sup>3</sup>/s as a consequence of the sharing agreement with ACWT. Nevertheless that agreement provides for either party to take water that the other party is not abstracting, and therefore CPWES could take the full allocation should it be available. Therefore it is essential that capacity of the infrastructure is 40 m<sup>3</sup>/s. The designation width and construction details supplied by Mr Lewthwaite contemplate a 40 m<sup>3</sup>/s canal from the Rakaia River.

- ***(c) Predicted maximum and mean monthly flow in the headrace, and draw from the reservoir, based on dry, average and wet year scenarios.***

40. The flow in the headrace is dependant upon location. Near each river, the flow will be that from the intake. In the central region it will be a combination of the flow from each river and from the reservoir, less the portion that will be diverted down the distribution network. I have not tried to provide details on the flows in each section of the headrace. I have provided data on the flows from the reservoir and this to be found in the table in Appendix A providing data on the take from storage on a monthly basis. In addition to this, there are data relating to the dry, average and wet years providing the percentage of time that flow from the reservoir is less than the given value on a monthly and annual basis.

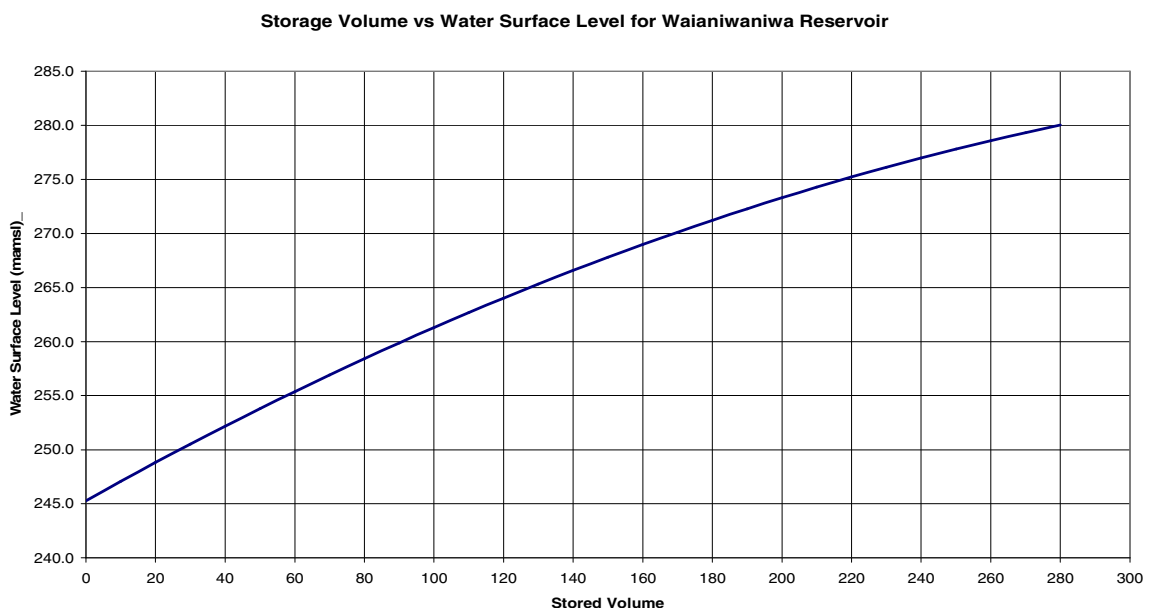
- ***(d) which intake(s) are likely to be constructed, or the order of preference for construction of each, including any factors affecting those choices.***

41. This has been discussed above and is not repeated here.

- ***(e) the likely volume and height of reservoir or range of sizes, including comment on whether the option of not building a reservoir is a realistic option.***

42. The likely volume of the reservoir can be determined from the level of service (reliability) and maximum consented rate of take from the Waimakariri River. In my first brief of evidence, I demonstrated how the reservoir volume needed only to be 220 MCM provided the maximum rate of take from the Waimakariri River was 40 m<sup>3</sup>/s. If the maximum rate of take was 25 m<sup>3</sup>/s then the required storage increases to 240 MCM. Therefore the Commissioners can use my evidence in this regard to determine the volume of storage required by CPWES depending upon the maximum rate of take from the Waimakariri River as they may consider appropriate. I refer to Figure 13 in my first brief of evidence that shows how this relationship works for a range of levels of service.

43. The water surface level in the reservoir can be determined by the relationship between the stored volume and the water surface level as shown in Figure 5. The height of the dam can be calculated from this relationship by adding 3m for freeboard and subtracting 235m which is the elevation of the ground surface at the mouth of the Waianiwaniwa Valley. Thus for a stored volume of 240 MCM, the water surface elevation at full height would be 277 m amsl, the dam crest would be a 280 m amsl, and the height of the dam would be 45 m.



**Figure 5: Reservoir volume vs Height Relationship**

44. Table 1 contains the data relating to the reliability of the scheme should there be no storage. The reliability would be approximately 60% which I am advised would not be sufficient to support investment in the scheme. I therefore do not consider the scheme to be viable if there was no storage provided.

- ***(f) the factors which will decide preference for Rakaia or Waimakariri water.***

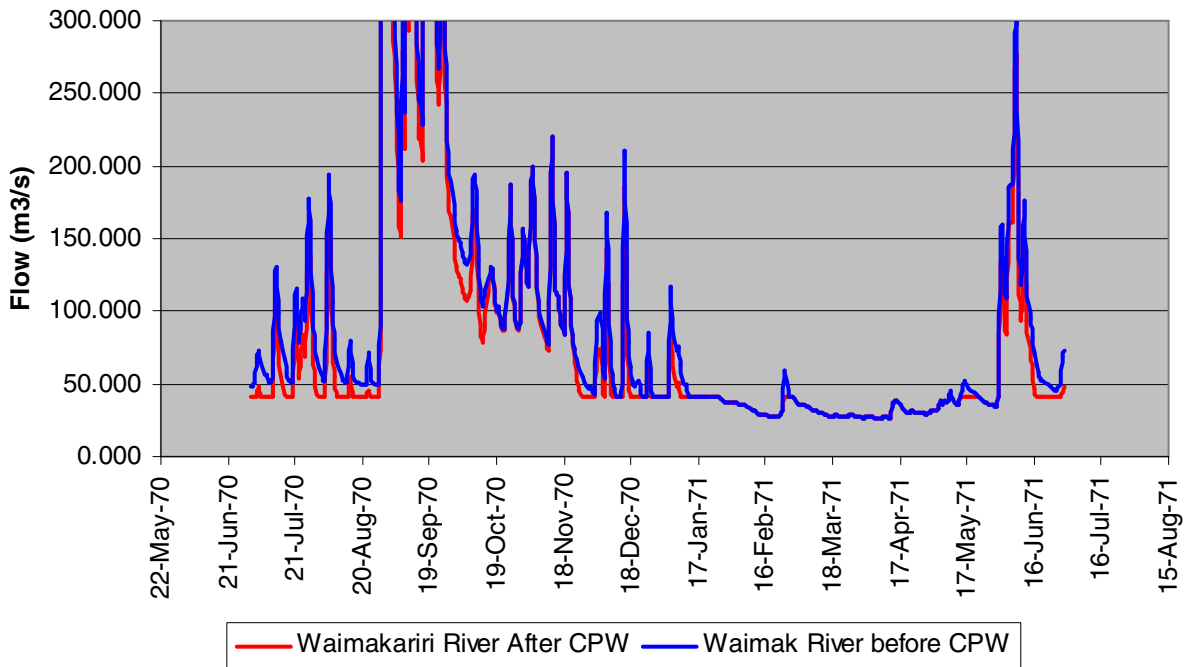
45. As discussed previously, the operational preference is for water to be taken from the Rakaia River ahead of the Waimakariri River. The reasoning for this will not be repeated here. The Rakaia River water will be taken up to the maximum allowable volumes in preference to the Waimakariri River water.

C J M Tipler

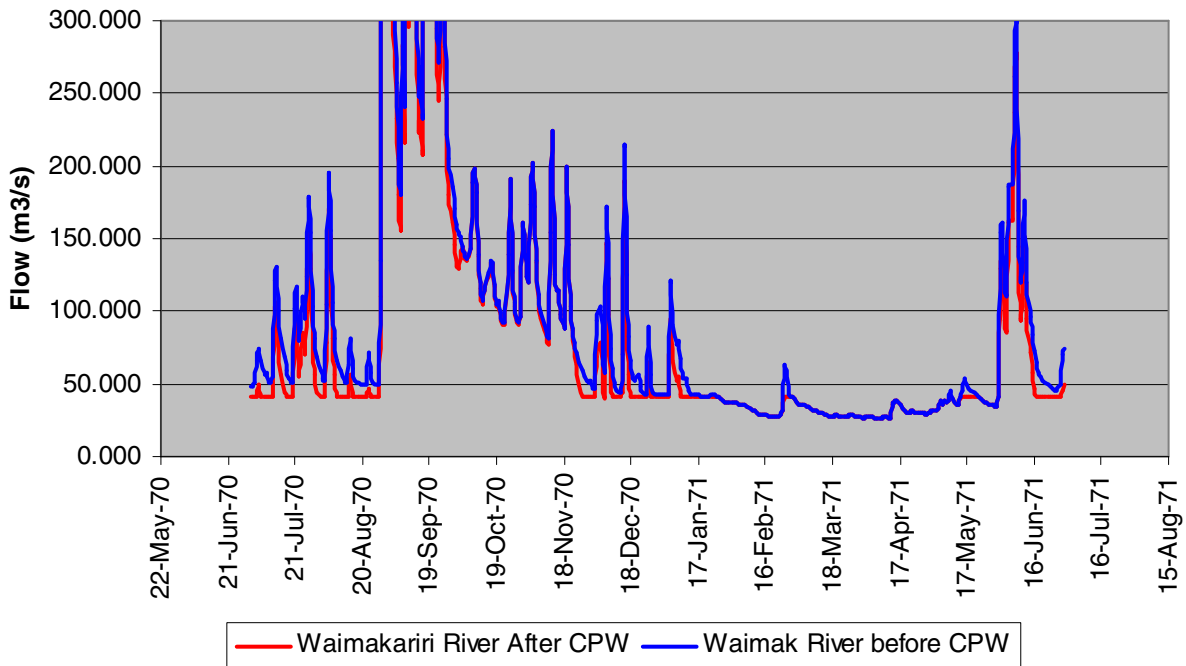
# Appendix A

## Hydrological Data

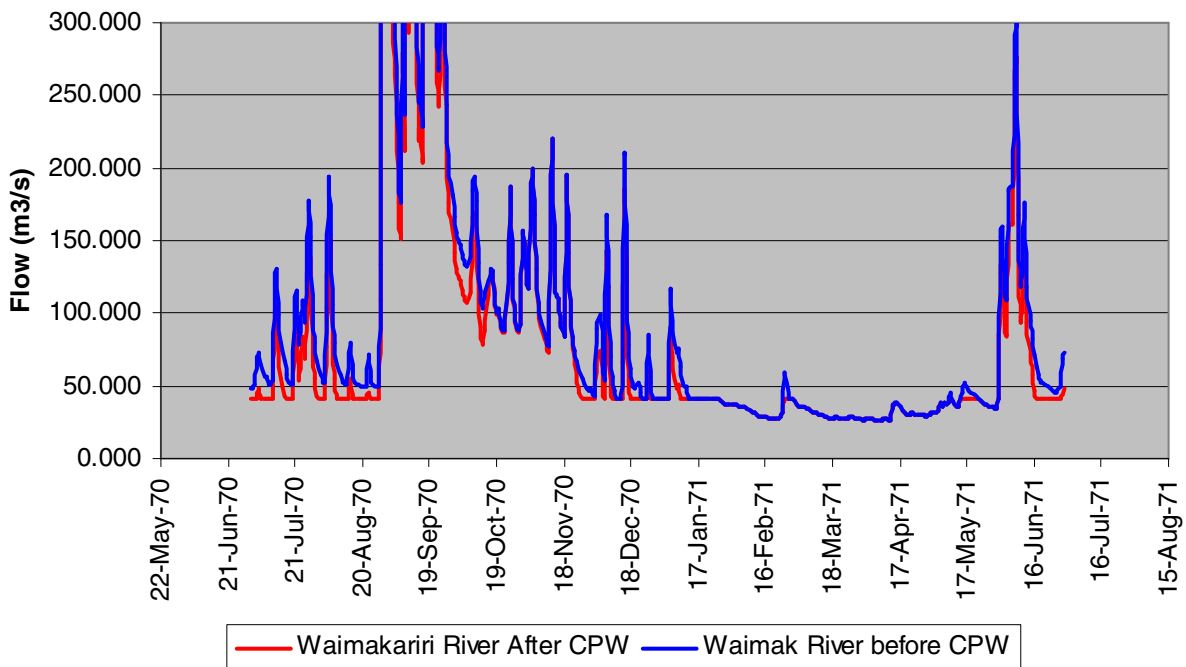
**Waimakariri Takes Dry Year 70/71 - 20/25/240 CPW, NTPL**



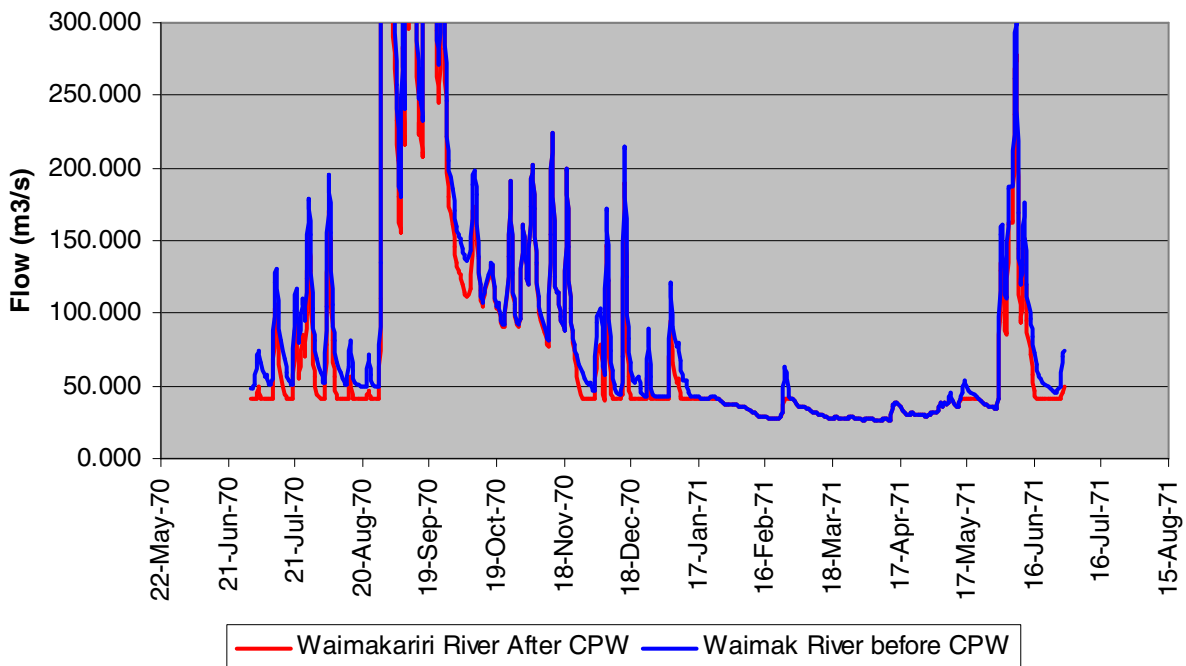
**Waimakariri Takes Dry Year 70/71 - 20/25/240 CPW, CPW**



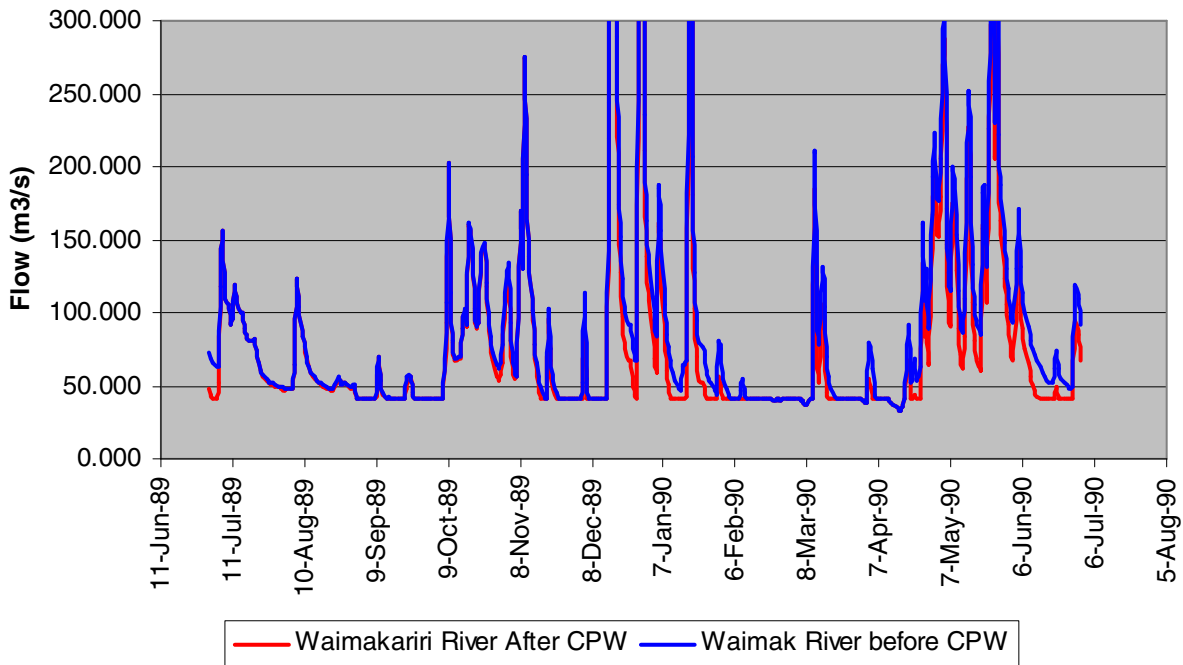
**Waimakariri Takes Dry Year 70/71 - 20/25/240 Synlait, NTPL**



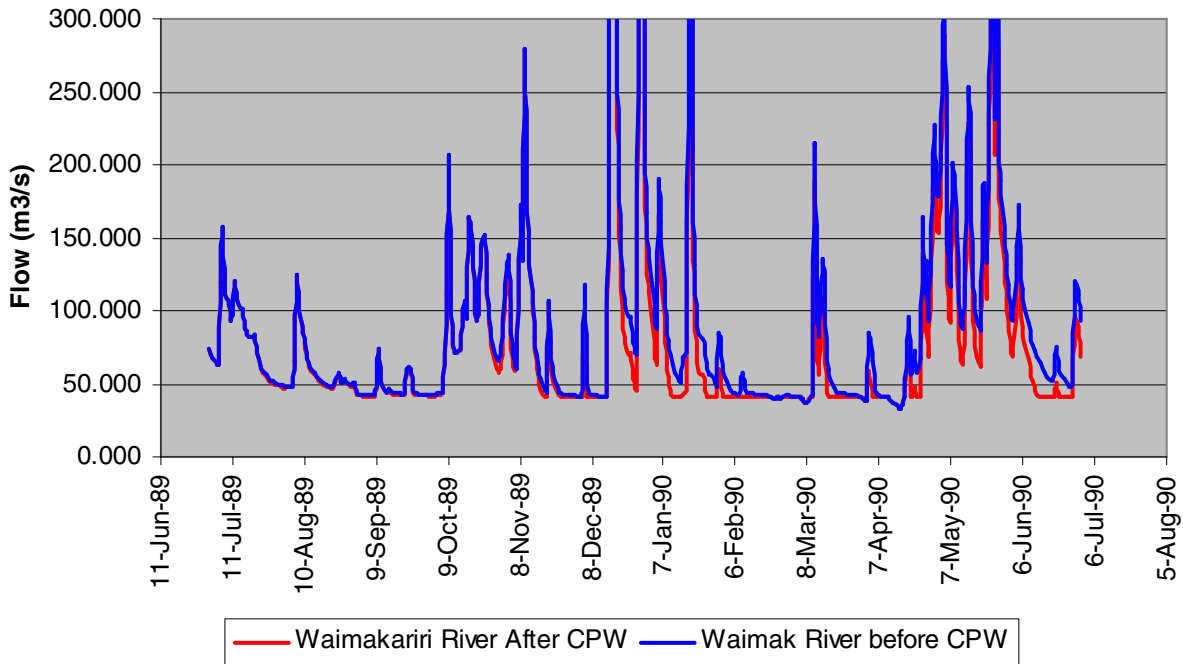
**Waimakariri Takes Dry Year 70/71 - 20/25/240 Synlait, CPW**



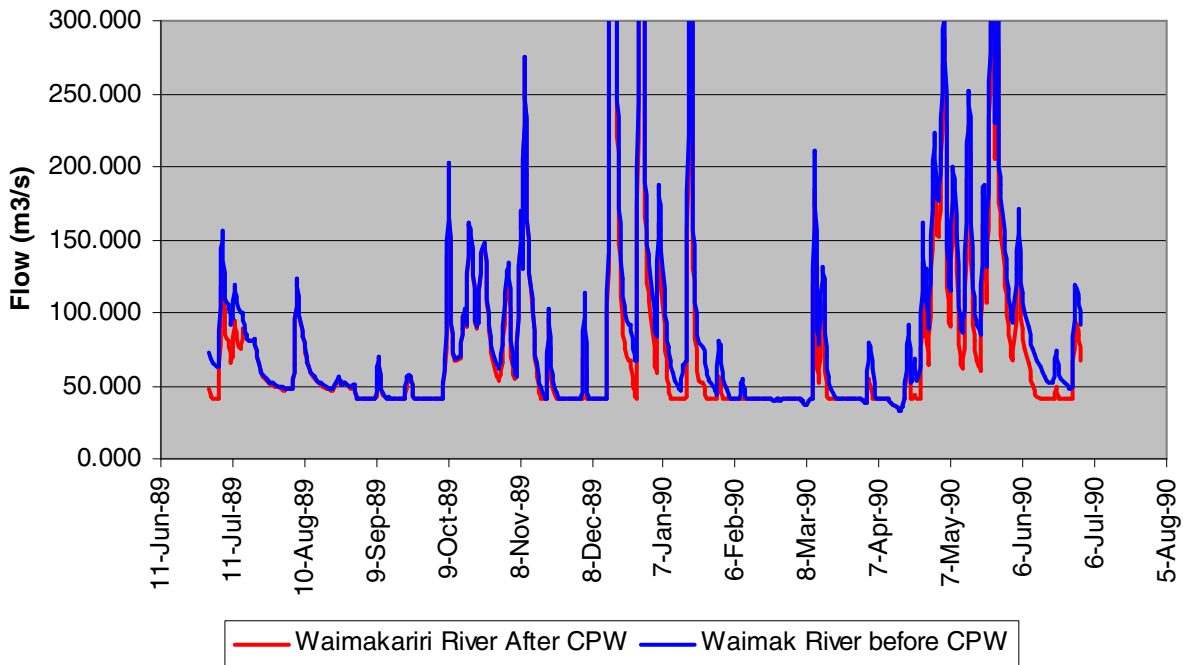
**Waimakariri Takes Typical Year 89/90 - 20/25/240 CPW, NTPL**



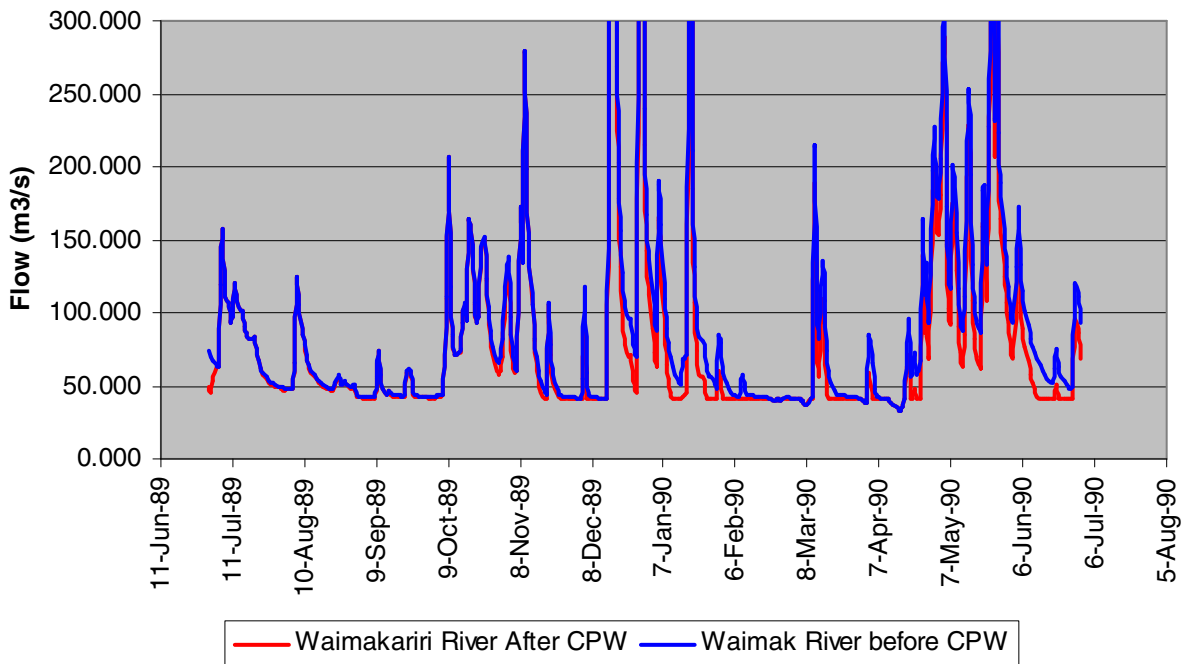
**Waimakariri Takes Typical Year 89/90 - 20/25/240 CPW, CPW**



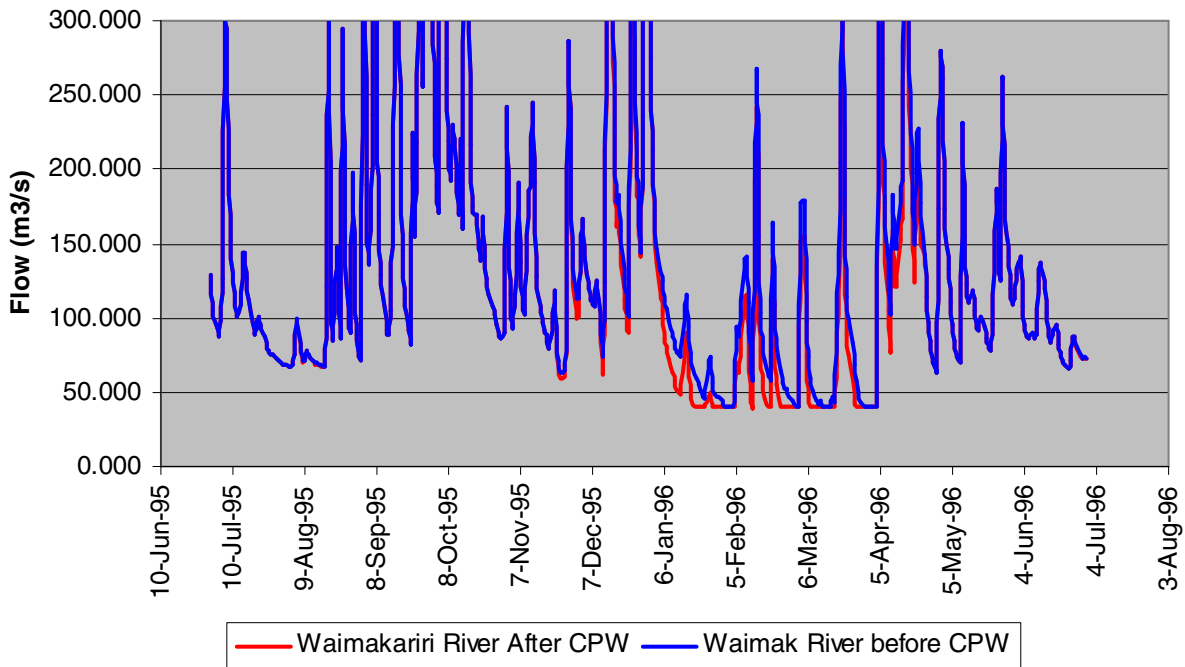
**Waimakariri Takes Typical Year 89/90 - 20/25/240 Synlait, NTPL**



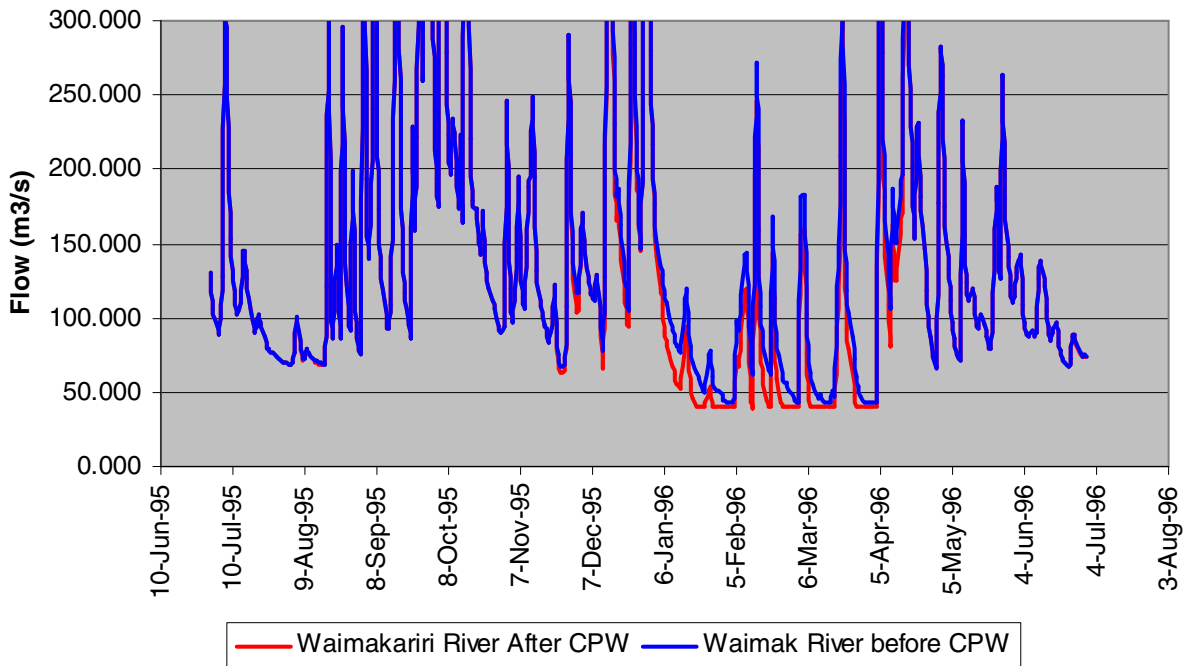
**Waimakariri Takes Typical Year 89/90 - 20/25/240 Synlait, CPW**



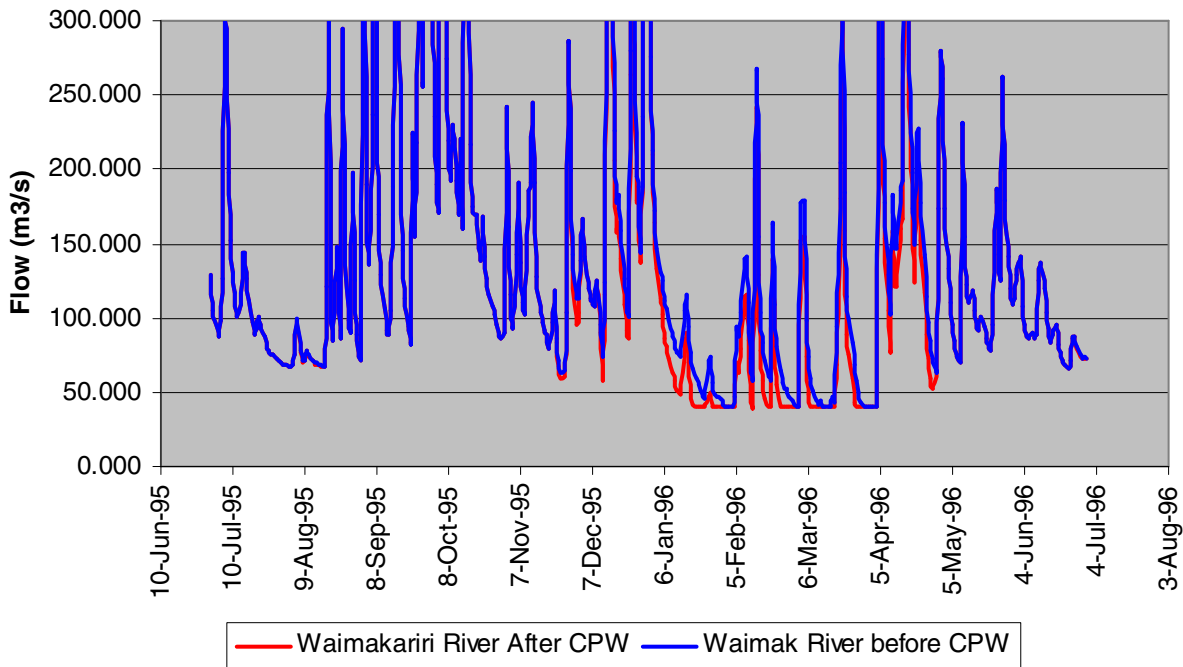
**Waimakariri Takes Wet Year 95/96 - 20/25/240 CPW, NTPL**



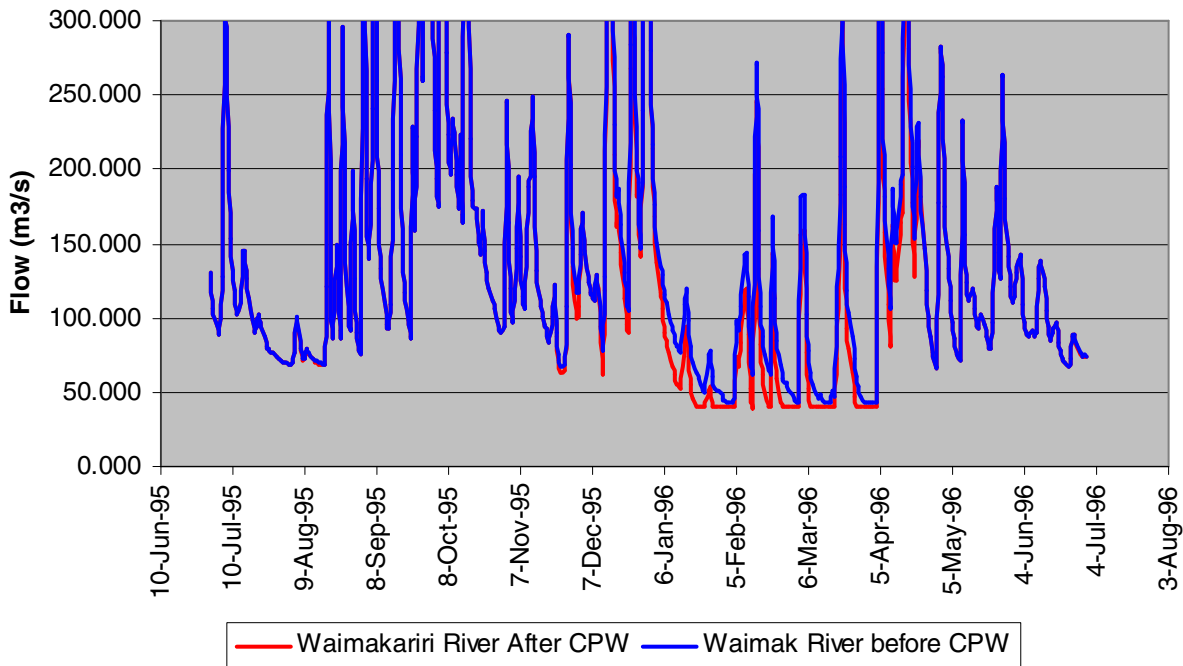
**Waimakariri Takes Wet Year 95/96 - 20/25/240 CPW, CPW**



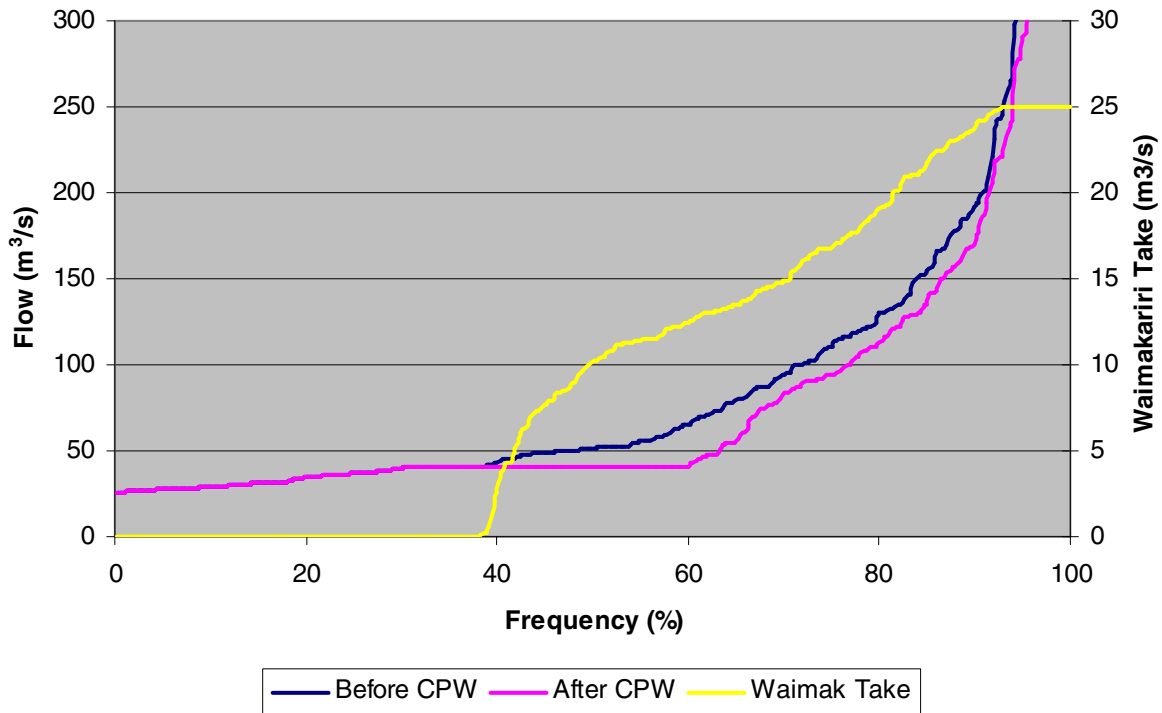
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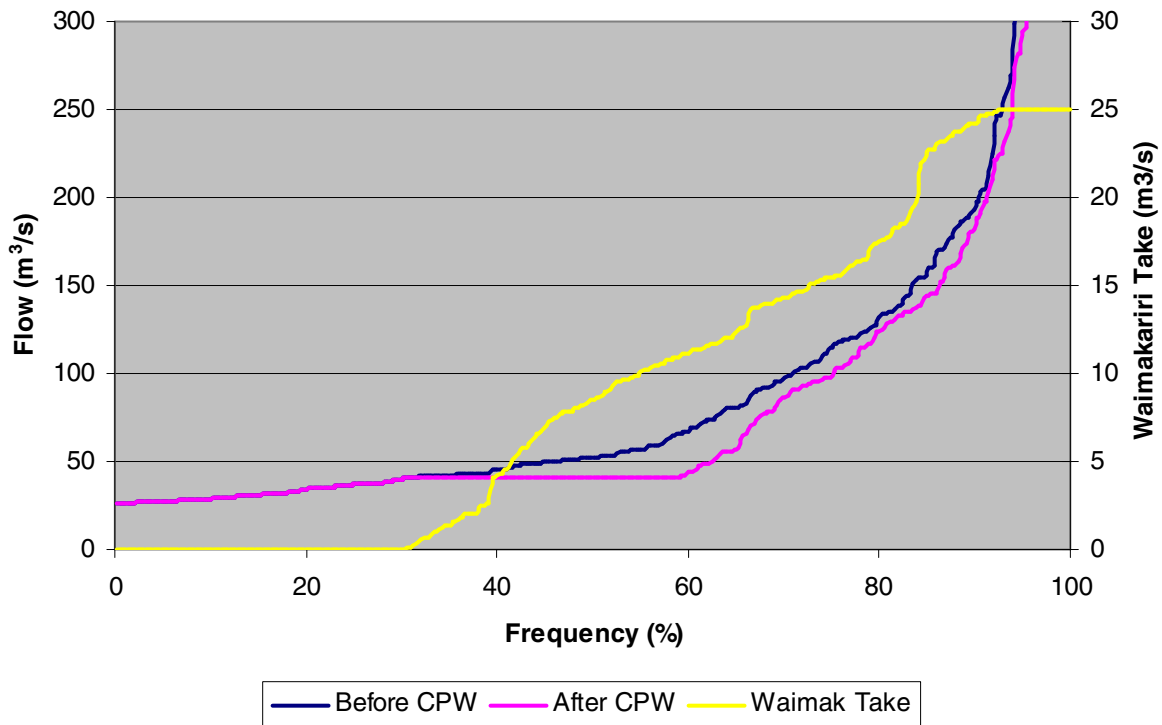
**Waimakariri Takes Wet Year 95/96 - 20/25/240 Synlait, CPW**



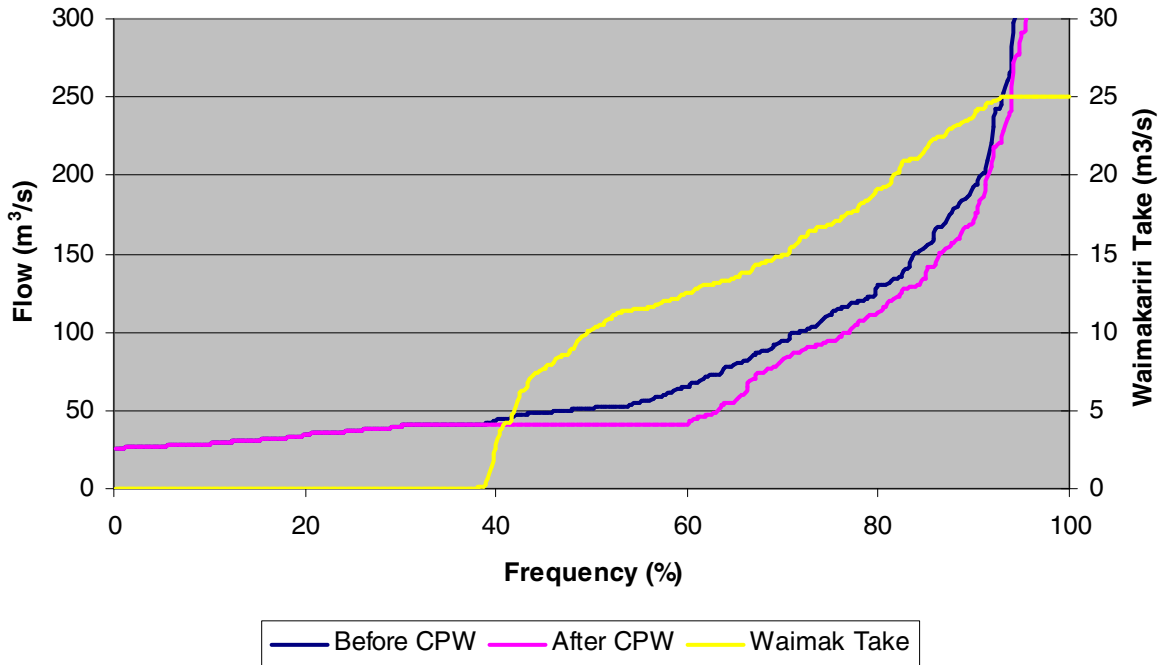
**1970/71 (Dry Year) Waimakariri River Flows - 20/25/240  
CPW, NTPL**



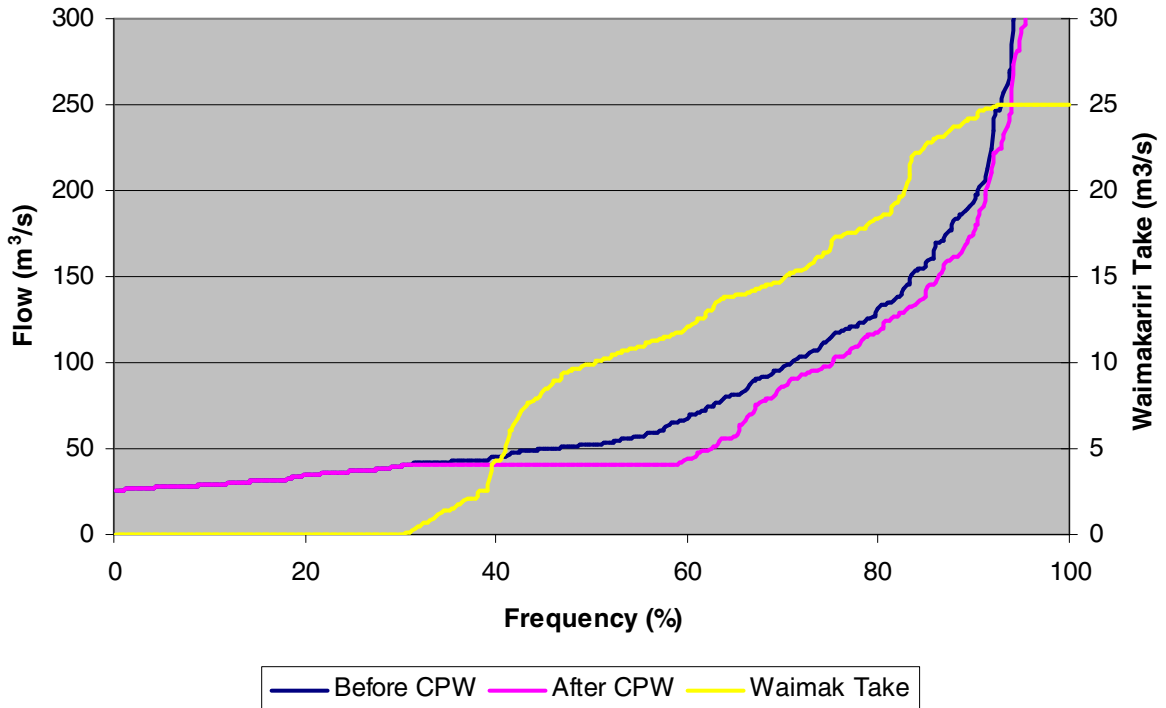
**1970/71 Dry Year Waimakariri River Flows 20/25/240 CPW, CPW**



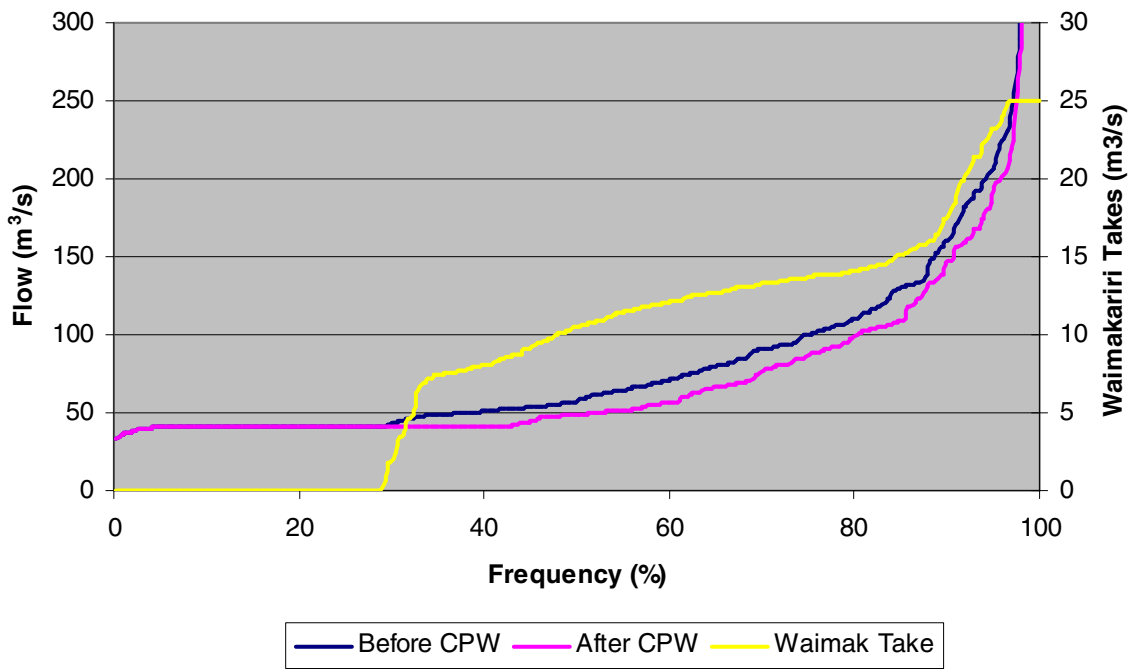
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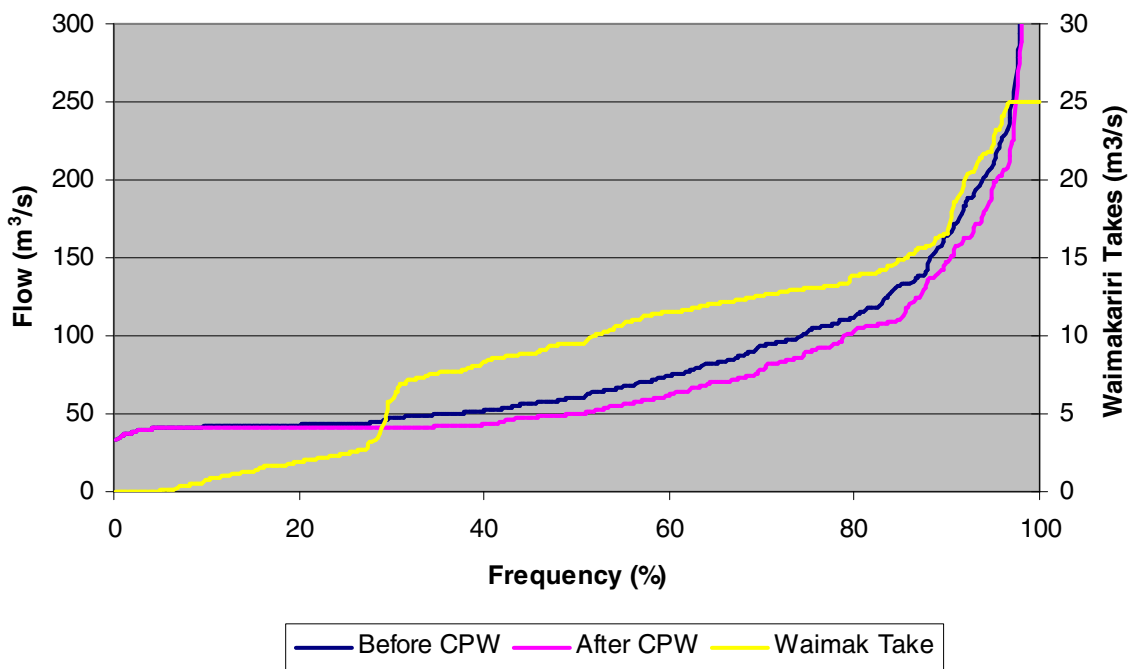
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Synlait, CPW**



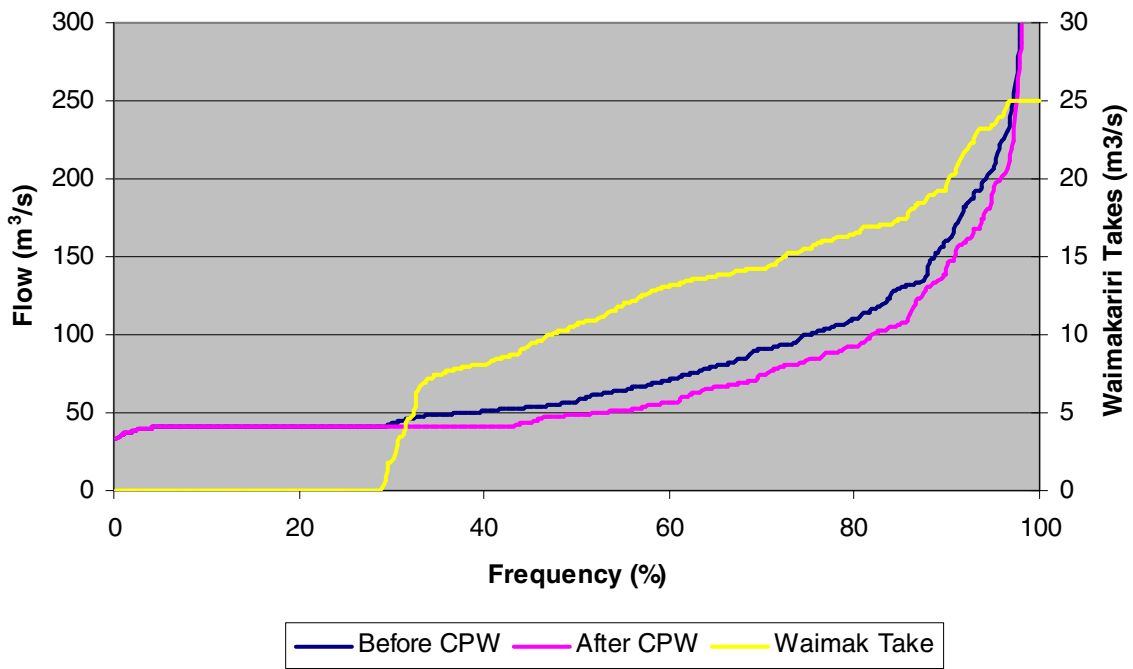
**1989/1990 (Typical Year) Waimakariri River Flows - 20/25/240  
CPW, NTPL**



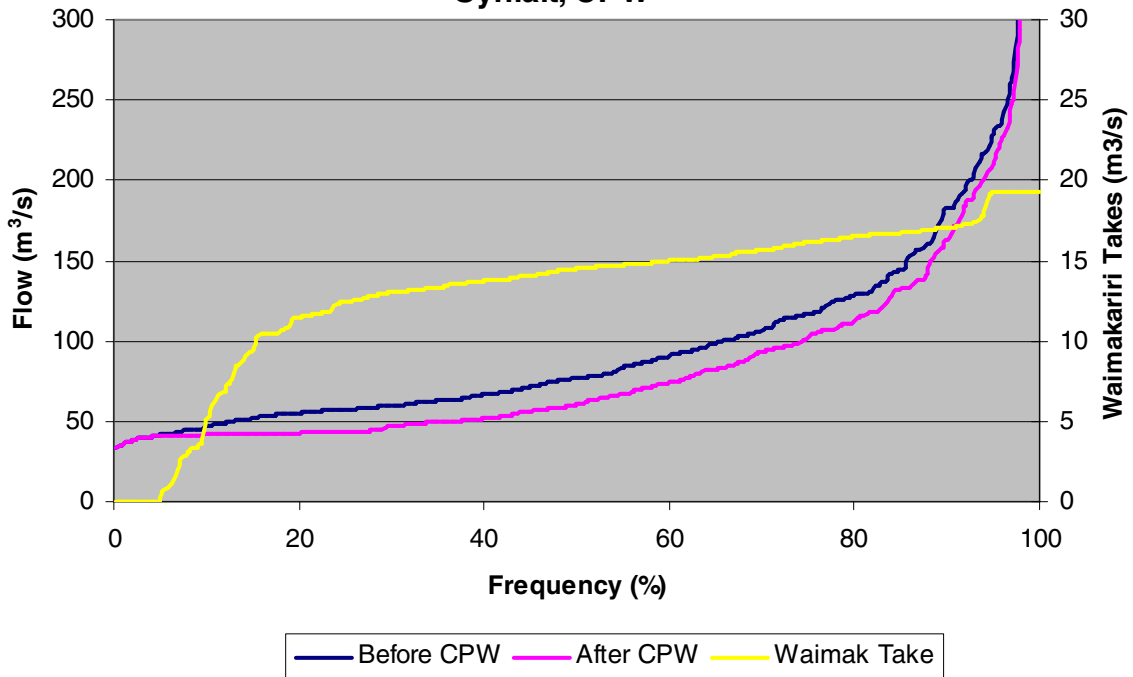
**1989/1990 Typical Year Waimakariri River Flows - 20/25/240  
CPW, CPW**

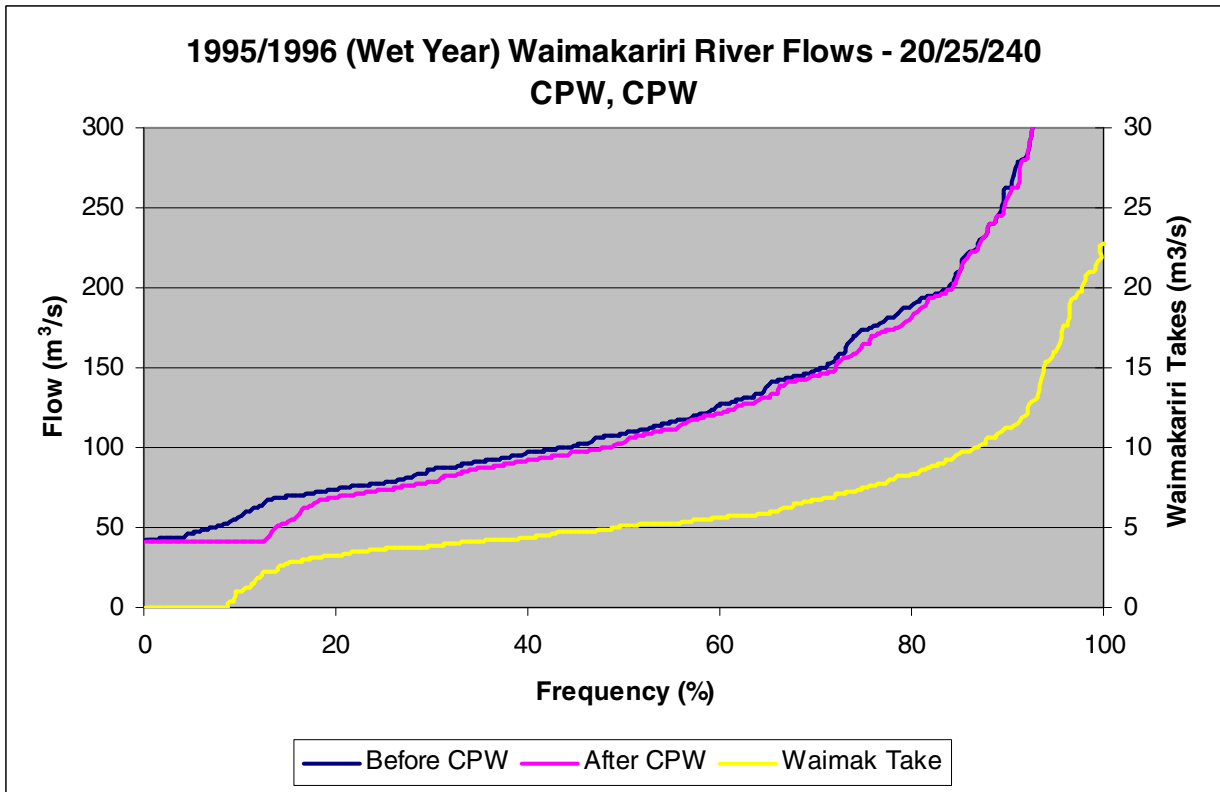
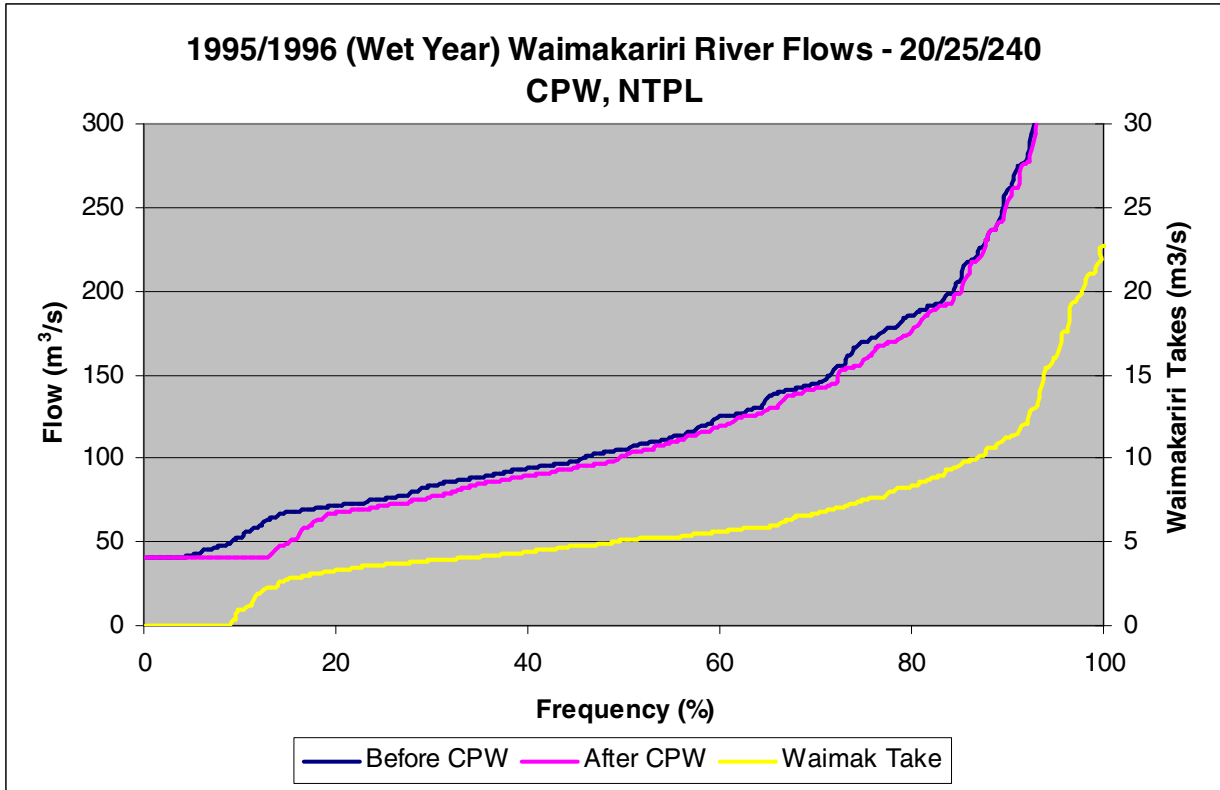


**1989/1990 (Typical Year) Waimakariri River Flows - 20/25/240  
Synlait, NTPL**

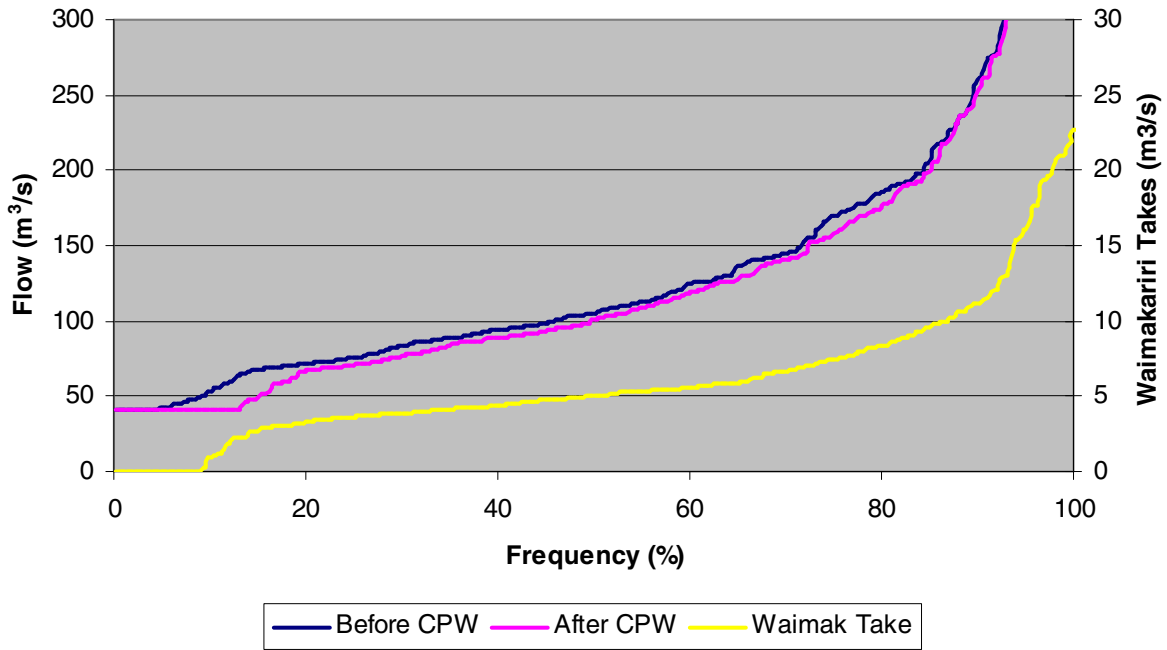


**1989/1990 (Typical Year) Waimakariri River Flows - 20/25/240  
Synlait, CPW**

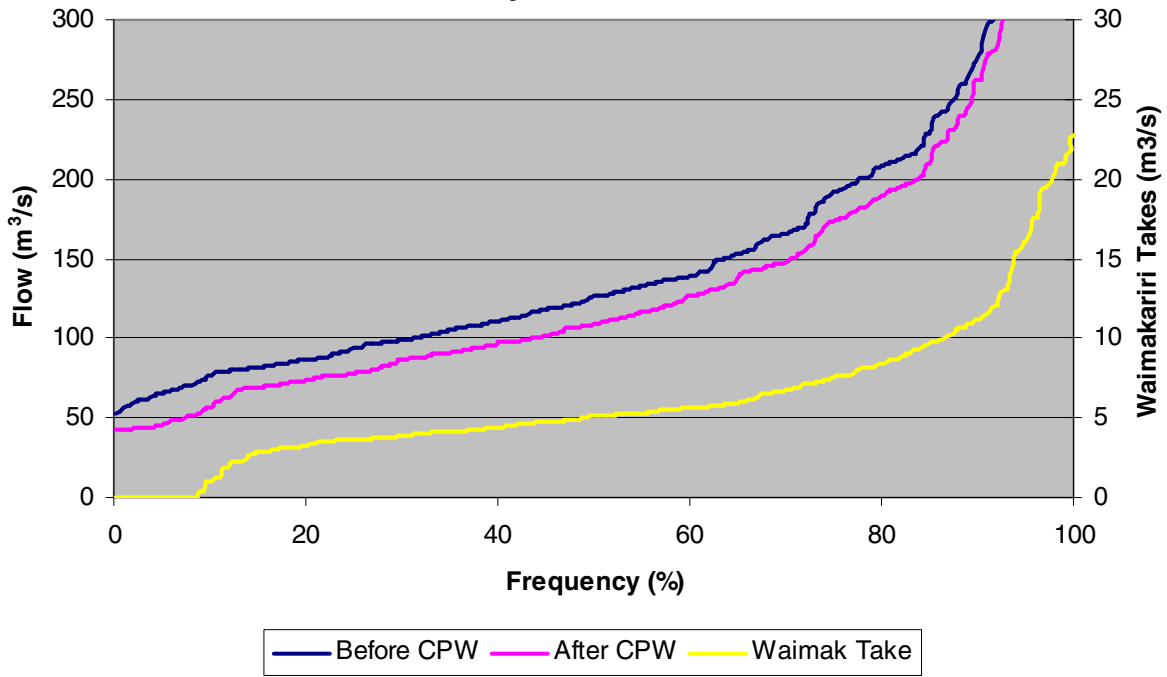




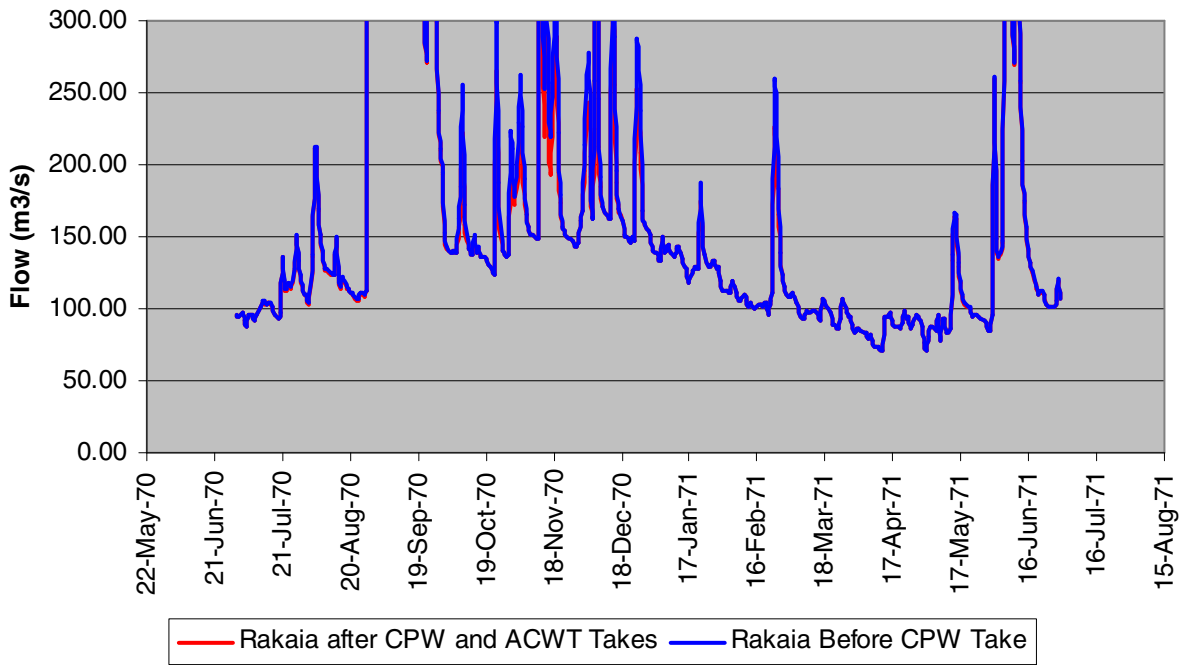
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Synlait, NTPL**



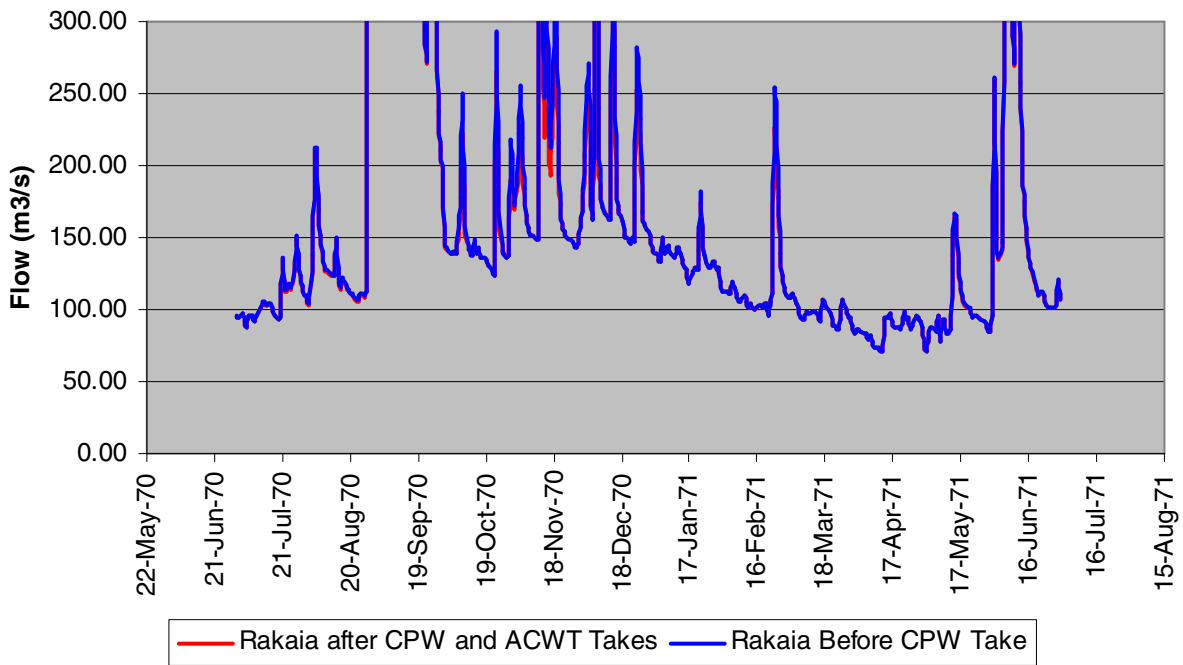
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Synlait, CPW**



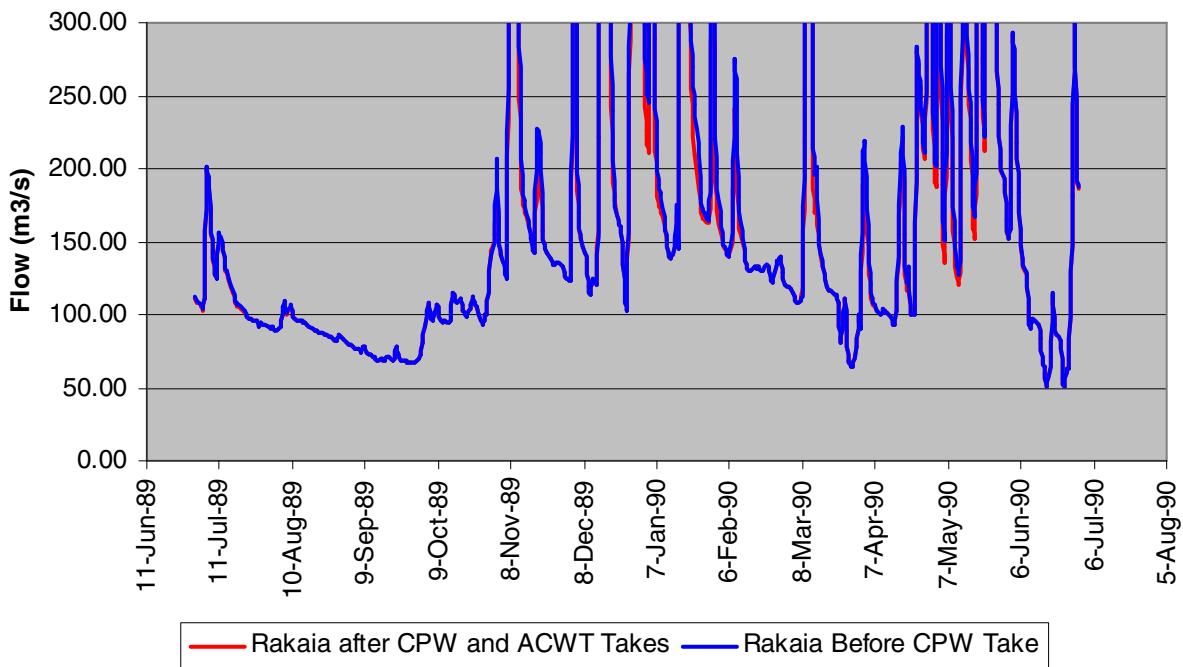
**Rakaia Takes Dry Year 70/71 - 20/25/240 CPW**



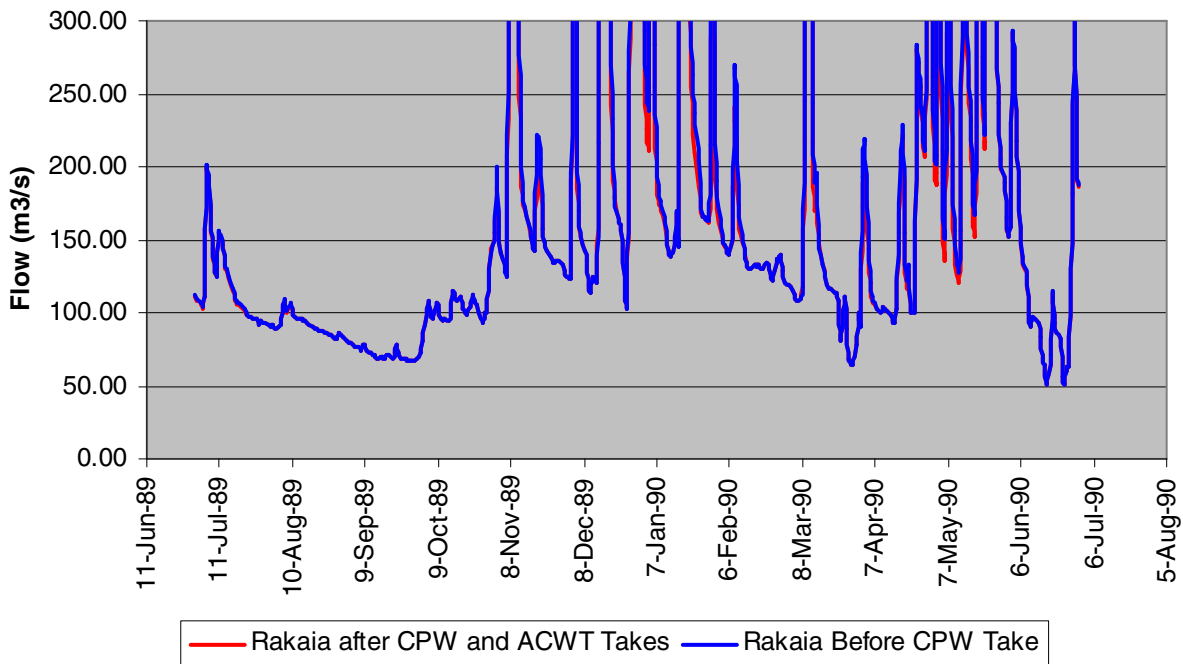
**Rakaia Takes Dry Year 70/71 - 20/25/240 Synlait**



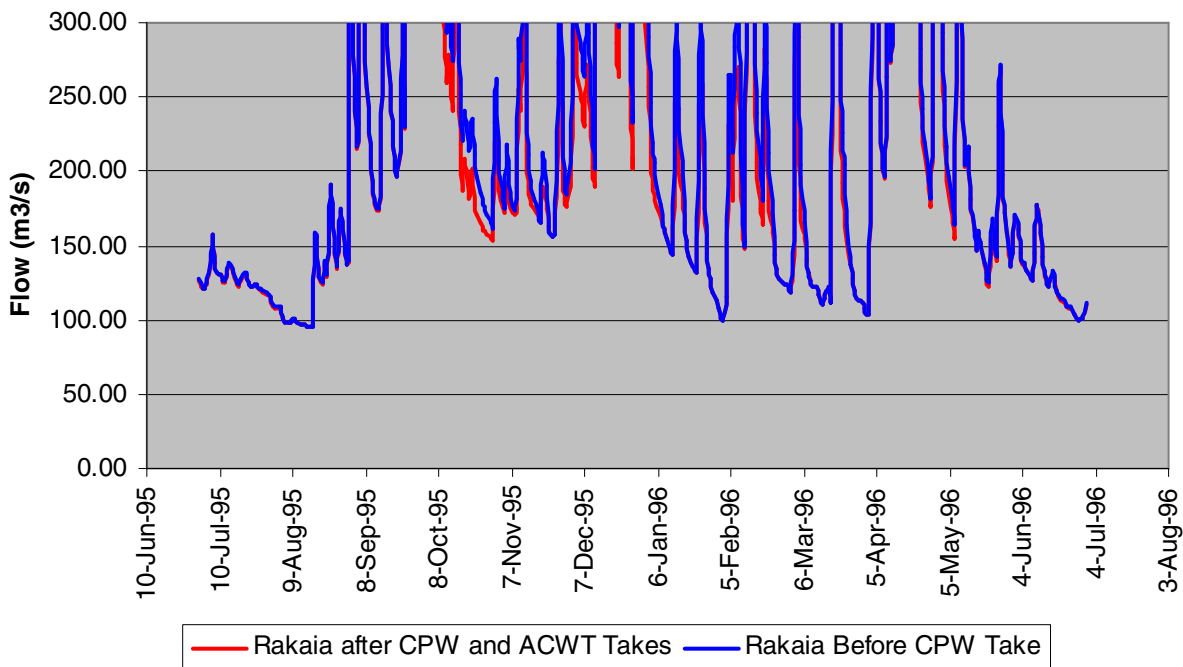
**Rakaia Takes Typical Year 89/90 - 20/25/240 CPW**



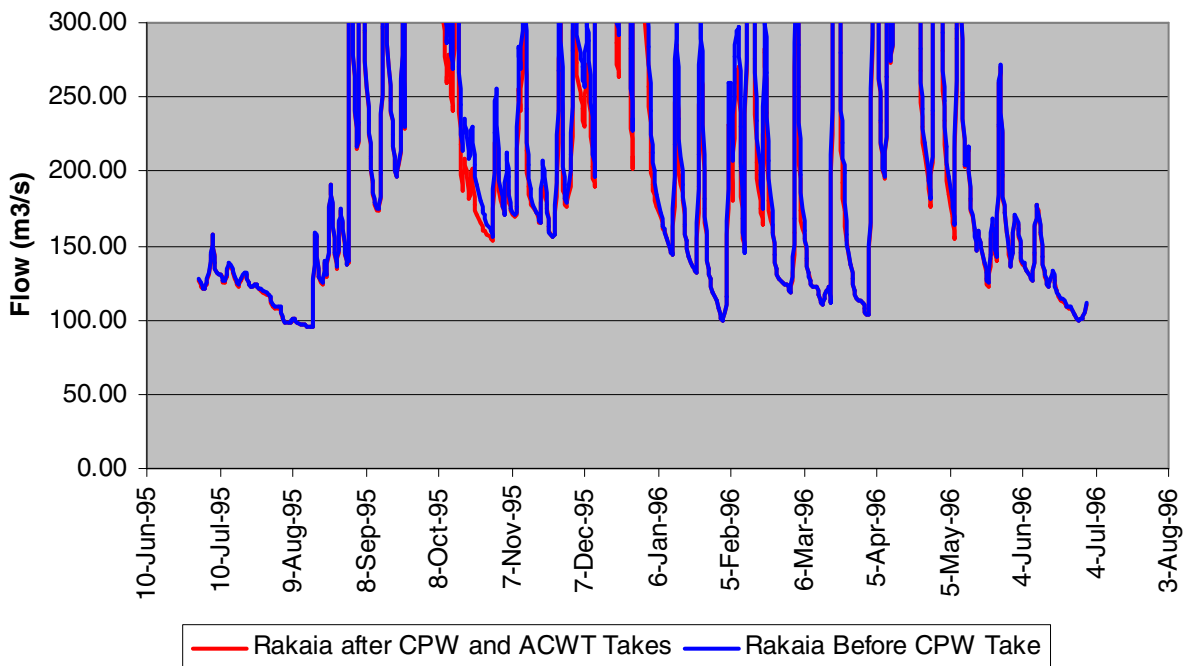
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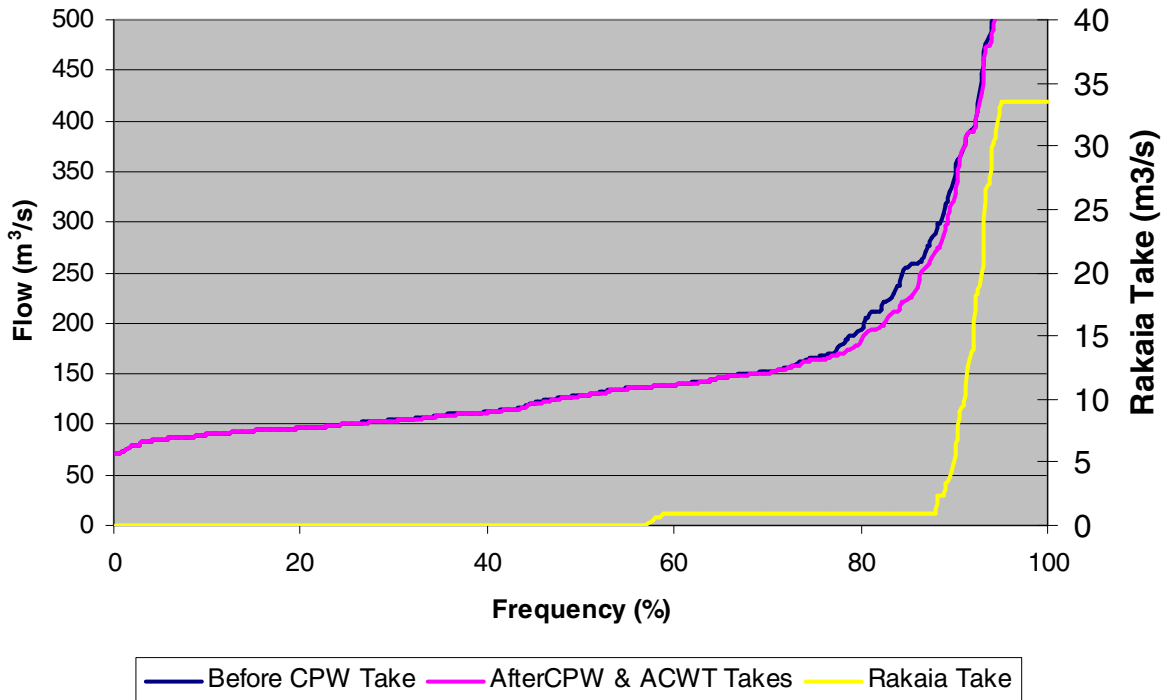
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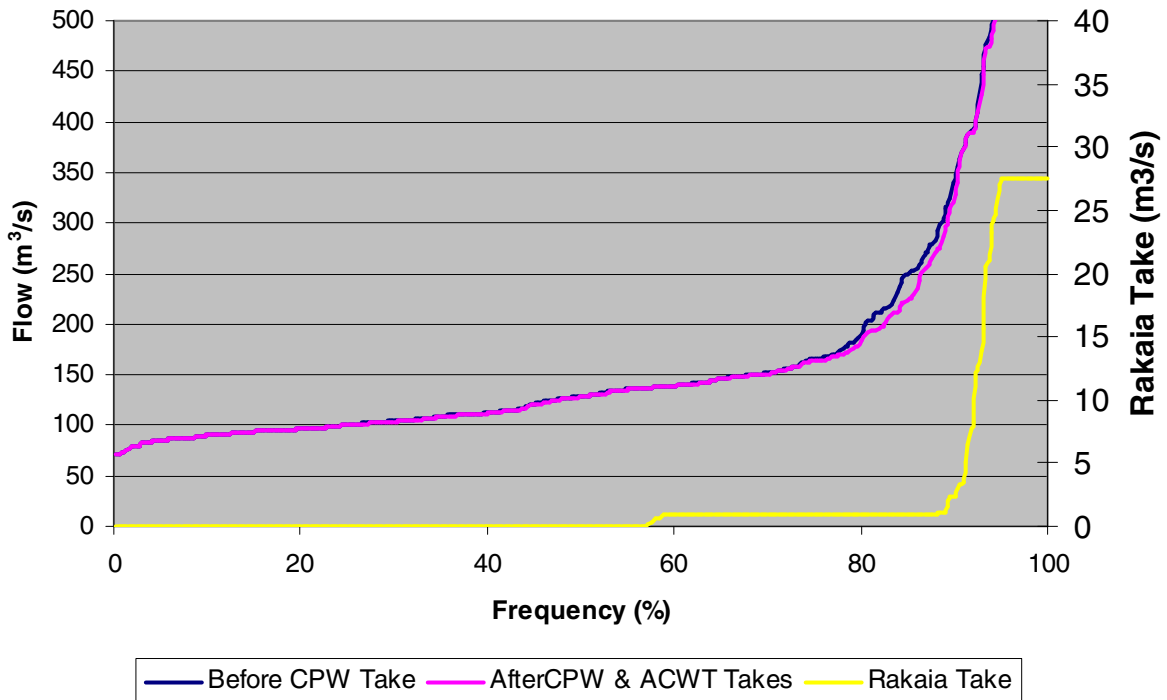
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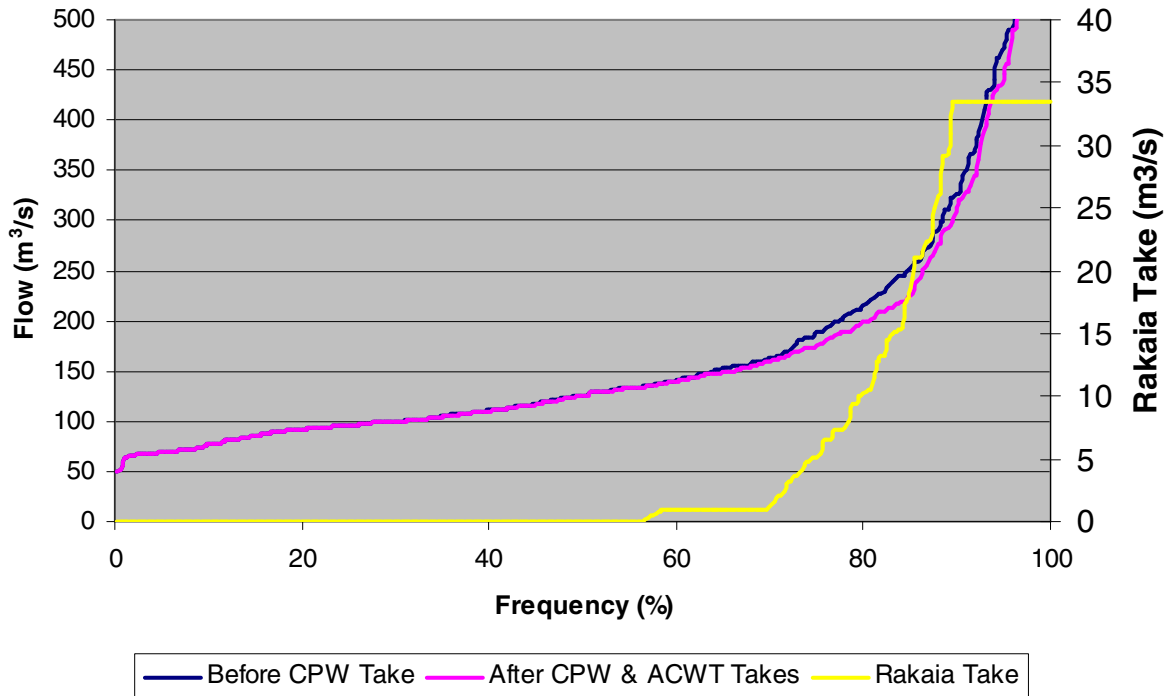
1970/1971 (Dry Year) Rakaia River - 20/25/240 CPW



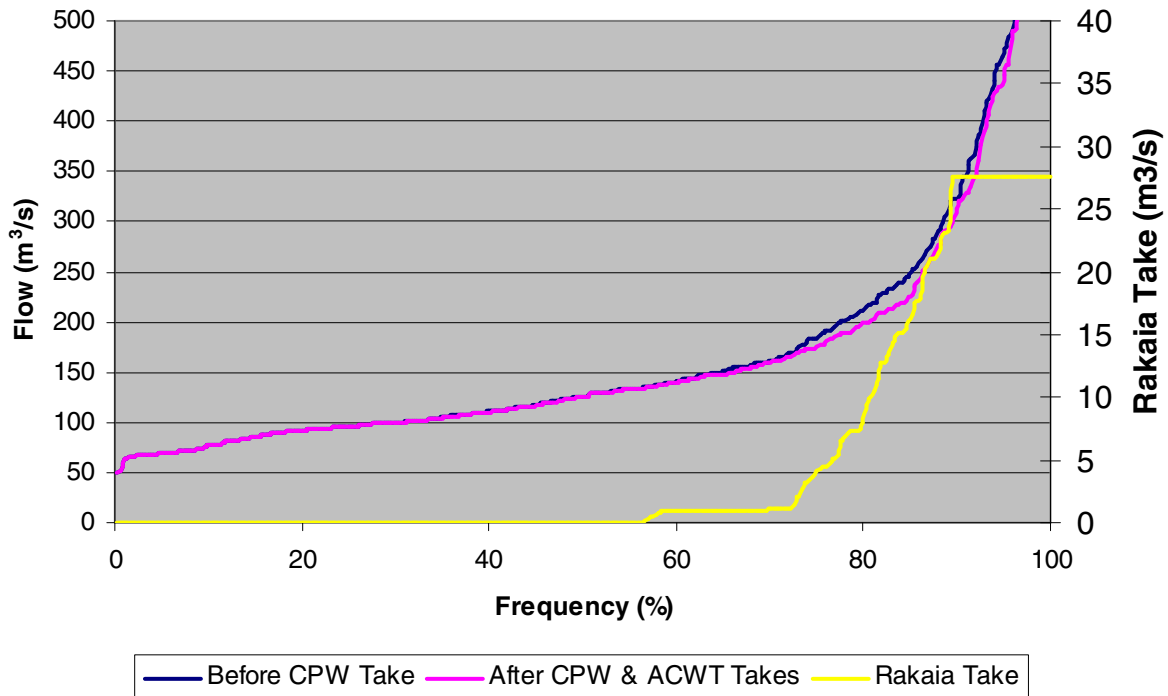
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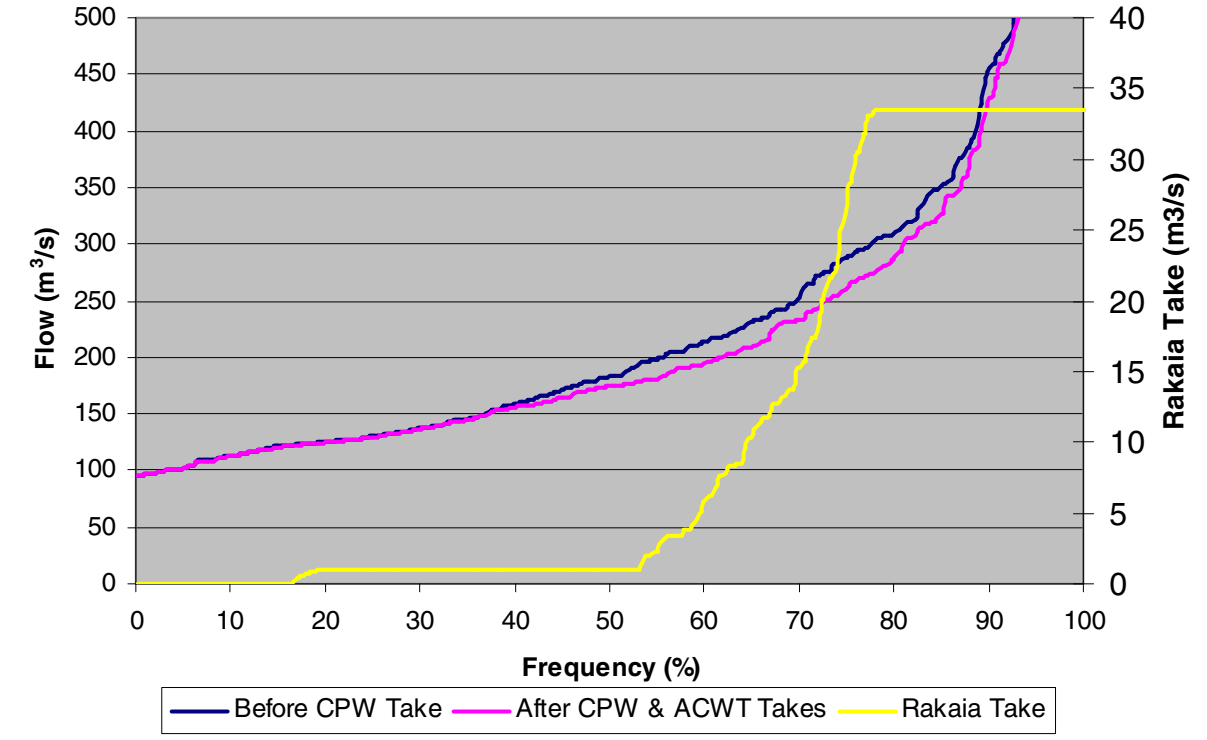
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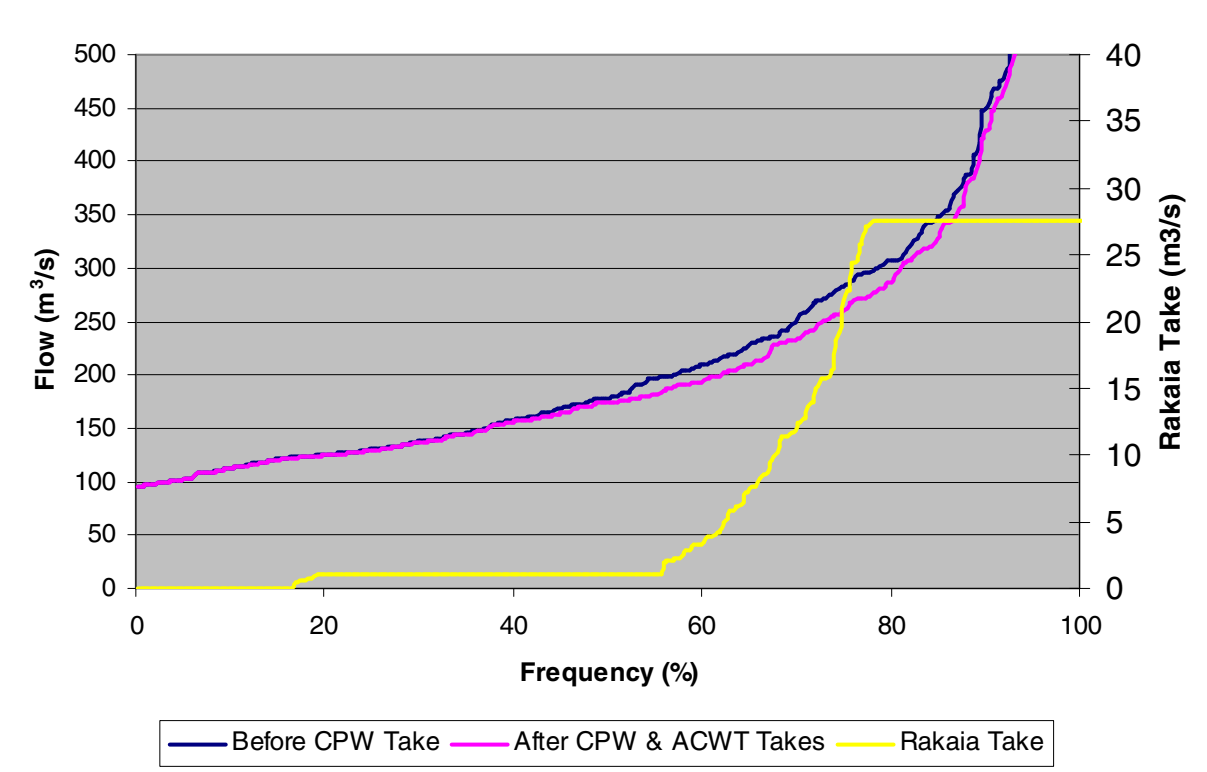
**1989/1990 (Typical Year) Rakaia River - 20/25/240 Synlait**



**1995/1996 (Wet Year) Rakaia River - 20/25/240 CPW**



**1995/1996 (Wet Year) Rakaia River - 20/25/240 Synlait**



CPWES Flow statistics for Rakaia River - Synlait Priority

Typical Year 1989/90			20/25/240 Synlait NTPL						Rakaia River																	
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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115	43%	43%	65%	65%	100%	100%	100%	100%	94%	94%	0%	0%	6%	6%	0%	0%	0%	45%	45%	47%	47%	0%	0%	60%	60%	
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130	52%	52%	77%	77%	100%	100%	100%	100%	97%	97%	7%	7%	29%	29%	0%	0%	11%	11%	74%	74%	53%	57%	3%	3%	63%	63%
135	56%	57%	84%	84%	100%	100%	100%	100%	97%	97%	20%	20%	29%	29%	0%	0%	46%	46%	77%	77%	57%	60%	3%	3%	63%	63%
140	59%	60%	84%	84%	100%	100%	100%	100%	100%	100%	30%	30%	32%	32%	3%	3%	61%	61%	77%	77%	57%	60%	3%	3%	67%	67%
145	62%	62%	87%	87%	100%	100%	100%	100%	100%	100%	40%	40%	35%	35%	6%	6%	68%	68%	77%	77%	60%	60%	3%	10%	67%	67%
150	65%	66%	90%	90%	100%	100%	100%	100%	100%	100%	47%	47%	39%	39%	13%	13%	79%	79%	81%	81%	60%	67%	3%	13%	67%	67%
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160	70%	70%	94%	94%	100%	100%	100%	100%	100%	100%	63%	63%	42%	42%	16%	16%	86%	86%	81%	81%	67%	67%	13%	16%	77%	77%
165	71%	72%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	48%	48%	23%	23%	86%	89%	81%	81%	67%	67%	13%	19%	77%	77%
170	73%	73%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	52%	52%	32%	32%	86%	89%	81%	84%	67%	67%	19%	19%	77%	77%
175	73%	75%	97%	97%	100%	100%	100%	100%	100%	100%	67%	67%	52%	52%	32%	39%	89%	93%	81%	87%	67%	70%	19%	19%	77%	77%
180	74%	76%	97%	97%	100%	100%	100%	100%	100%	100%	67%	70%	55%	55%	39%	42%	89%	93%	81%	87%	67%	70%	19%	23%	77%	77%
185	75%	77%	97%	97%	100%	100%	100%	100%	100%	100%	70%	70%	55%	55%	42%	42%	89%	93%	81%	87%	67%	70%	19%	26%	83%	83%
190	76%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	48%	89%	93%	84%	87%	67%	70%	23%	32%	87%	87%
195	77%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	52%	93%	93%	84%	87%	70%	73%	26%	32%	87%	87%
200	78%	80%	100%	100%	100%	100%	100%	100%	100%	100%	70%	80%	55%	55%	42%	52%	93%	93%	87%	87%	70%	73%	26%	35%	90%	90%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%



Wet Year 1995/96			20/25/240 Synlait NTPL						Rakaia River																	
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
55	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
65	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
70	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
75	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
80	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
85	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
90	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
95	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
100	3%	3%	0%	0%	32%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%
105	6%	6%	0%	0%	42%	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	7%	7%	0%	0%	17%	17%
110	8%	8%	0%	0%	55%	55%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	7%	7%	3%	3%	7%	7%	0%	0%	27%	27%
115	12%	12%	0%	3%	55%	55%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	7%	7%	26%	26%	7%	7%	0%	0%	37%	37%
120	14%	15%	13%	13%	55%	55%	0%	0%	0%	0%	0%	0%	0%	10%	10%	11%	11%	35%	35%	7%	7%	0%	0%	40%	43%	
125	20%	21%	45%	52%	58%	58%	0%	0%	0%	0%	0%	0%	0%	10%	10%	25%	25%	45%	45%	7%	7%	0%	3%	47%	47%	
130	25%	26%	71%	77%	61%	65%	0%	0%	0%	0%	0%	0%	0%	13%	13%	29%	29%	52%	52%	7%	7%	3%	6%	60%	60%	
135	29%	29%	87%	87%	65%	68%	0%	0%	0%	0%	0%	0%	0%	23%	23%	32%	32%	55%	55%	7%	7%	6%	6%	70%	70%	
140	32%	32%	97%	97%	71%	74%	0%	3%	0%	0%	0%	0%	0%	26%	26%	32%	32%	58%	58%	7%	7%	13%	13%	77%	77%	
145	35%	36%	97%	97%	77%	81%	3%	3%	0%	0%	0%	0%	0%	32%	32%	36%	36%	61%	61%	7%	7%	19%	23%	80%	87%	
150	37%	37%	97%	97%	81%	81%	3%	3%	0%	0%	0%	0%	0%	39%	39%	39%	39%	61%	61%	7%	7%	32%	32%	87%	87%	
155	38%	39%	97%	97%	87%	87%	3%	3%	0%	3%	0%	0%	0%	45%	45%	39%	39%	61%	68%	7%	7%	32%	32%	87%	87%	
160	41%	43%	100%	100%	94%	94%	3%	3%	3%	10%	10%	10%	0%	0%	45%	45%	39%	43%	68%	71%	7%	7%	35%	39%	90%	90%
165	44%	45%	100%	100%	94%	94%	3%	3%	10%	16%	13%	13%	0%	0%	55%	55%	43%	46%	68%	71%	7%	7%	42%	45%	93%	93%
170	45%	48%	100%	100%	94%	94%	3%	3%	10%	19%	20%	23%	0%	0%	55%	58%	43%	50%	71%	71%	7%	7%	45%	48%	93%	97%
175	48%	51%	100%	100%	97%	97%	7%	7%	16%	23%	30%	37%	0%	0%	58%	58%	43%	54%	71%	77%	7%	7%	48%	52%	97%	97%
180	51%	54%	100%	100%	97%	97%	10%	10%	16%	26%	50%	50%	0%	0%	58%	68%	46%	61%	71%	77%	7%	10%	52%	52%	100%	100%
185	52%	56%	100%	100%	97%	97%	10%	10%	19%	29%	50%	60%	0%	0%	65%	71%	50%	61%	71%	77%	10%	10%	55%	58%	100%	100%
190	53%	57%	100%	100%	97%	97%	10%	10%	19%	32%	53%	67%	0%	0%	65%	71%	50%	61%	71%	77%	10%	10%	55%	58%	100%	100%
195	54%	60%	100%	100%	100%	100%	13%	13%	23%	35%	57%	73%	0%	3%	68%	81%	50%	61%	71%	81%	10%	13%	55%	58%	100%	100%
200	57%	62%	100%	100%	100%	100%	20%	20%	23%	39%	60%	77%	0%	3%	71%	81%	54%	61%	77%	81%	17%	17%	61%	61%	100%	100%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	104%	100%	100%	100%	100%	100%	100%	100%	100%

# CPWES Flow statistics for Waimakariri River - Synlait Priority, NTPL Priority

Typical Year 1989/90		20/25/240 Synlait NTPL										Waimakariri River															
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June		
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
35	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%	0%	
40	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	13%	13%	27%	27%	0%	0%	0%	0%	
45	31%	45%	0%	13%	0%	0%	80%	87%	23%	23%	30%	37%	35%	48%	3%	42%	82%	100%	74%	81%	53%	73%	0%	0%	0%	50%	
50	38%	52%	6%	26%	35%	45%	83%	90%	23%	23%	37%	40%	35%	48%	13%	45%	93%	100%	77%	84%	53%	73%	0%	0%	10%	57%	
55	47%	58%	19%	39%	68%	68%	90%	93%	23%	26%	40%	43%	42%	48%	23%	58%	96%	100%	77%	87%	63%	77%	0%	0%	27%	60%	
60	51%	62%	26%	45%	77%	77%	97%	97%	23%	32%	47%	50%	42%	52%	26%	65%	100%	100%	81%	87%	63%	77%	0%	0%	37%	63%	
65	55%	64%	35%	45%	84%	84%	97%	97%	29%	32%	50%	57%	42%	52%	35%	68%	100%	100%	81%	87%	70%	77%	0%	6%	47%	63%	
70	59%	69%	45%	52%	87%	87%	97%	100%	39%	42%	53%	63%	48%	58%	42%	74%	100%	100%	81%	87%	73%	83%	0%	10%	50%	73%	
75	62%	70%	52%	61%	87%	87%	100%	100%	45%	45%	60%	63%	48%	61%	45%	74%	100%	100%	84%	87%	73%	83%	0%	13%	57%	73%	
80	65%	72%	52%	61%	90%	90%	100%	100%	45%	52%	67%	67%	48%	61%	58%	74%	100%	100%	87%	90%	77%	83%	0%	13%	60%	80%	
85	68%	76%	65%	84%	94%	94%	100%	100%	52%	52%	67%	70%	52%	61%	65%	77%	100%	100%	87%	90%	77%	87%	0%	19%	63%	80%	
90	70%	79%	68%	90%	94%	94%	100%	100%	58%	58%	67%	70%	52%	65%	68%	81%	100%	100%	87%	94%	77%	87%	6%	23%	63%	87%	
95	73%	81%	71%	97%	94%	94%	100%	100%	65%	68%	70%	70%	58%	65%	74%	81%	100%	100%	87%	94%	83%	87%	10%	29%	73%	90%	
100	75%	82%	81%	97%	94%	94%	100%	100%	65%	71%	70%	73%	61%	68%	74%	81%	100%	100%	87%	94%	83%	87%	13%	29%	73%	90%	
105	77%	84%	81%	97%	97%	97%	100%	100%	74%	77%	77%	80%	61%	68%	74%	84%	100%	100%	90%	94%	83%	90%	13%	32%	80%	90%	
110	80%	86%	90%	97%	97%	97%	100%	100%	77%	77%	80%	80%	61%	68%	77%	87%	100%	100%	90%	97%	87%	90%	19%	42%	80%	97%	
115	82%	86%	90%	97%	97%	97%	100%	100%	81%	81%	80%	80%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	23%	42%	87%	97%	
120	83%	86%	97%	97%	97%	97%	100%	100%	81%	84%	80%	80%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	42%	90%	97%	
125	84%	87%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	45%	90%	97%	
130	85%	88%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	71%	84%	87%	100%	100%	94%	97%	90%	90%	32%	48%	90%	97%	
135	87%	89%	97%	100%	100%	100%	100%	100%	87%	87%	87%	87%	68%	71%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
140	88%	90%	97%	100%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
145	88%	90%	97%	100%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
150	88%	91%	97%	100%	100%	100%	100%	100%	94%	94%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	45%	52%	97%	100%	
155	89%	91%	97%	100%	100%	100%	100%	100%	94%	94%	90%	90%	71%	74%	87%	90%	100%	100%	97%	97%	90%	93%	48%	55%	97%	100%	
160	90%	92%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	71%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	61%	97%	100%	
165	90%	93%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	74%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	68%	97%	100%	
170	91%	93%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	74%	90%	94%	100%	100%	97%	97%	93%	97%	48%	71%	97%	100%	
175	91%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	52%	74%	100%	100%	
180	92%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	55%	77%	100%	100%	
185	92%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	61%	77%	100%	100%	
190	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	68%	77%	100%	100%	
195	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	97%	97%	71%	77%	100%	100%	
200	94%	96%	100%	100%	100%	100%	100%	100%	97%	97%	97%	97%	77%	77%	94%	97%	100%	100%	97%	100%	97%	100%	74%	81%	100%	100%	
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Dry Year 1970/71			20/25/240 Synlait NTPL						Waimakariri River																									
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June									
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	12%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	39%	61%	61%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
35	21%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	61%	61%	84%	84%	87%	87%	19%	19%	0%	0%	0%	0%	0%	0%	0%	0%		
40	30%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	16%	86%	86%	100%	100%	100%	100%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
45	41%	61%	0%	52%	0%	65%	0%	0%	0%	0%	17%	39%	68%	74%	87%	96%	100%	100%	100%	100%	100%	100%	81%	100%	0%	43%	0%	0%	0%	0%	0%			
50	48%	63%	6%	55%	19%	68%	0%	0%	0%	0%	10%	20%	45%	74%	81%	90%	96%	100%	100%	100%	100%	100%	100%	97%	100%	23%	50%	0%	0%	0%	0%			
55	55%	65%	29%	65%	45%	74%	0%	0%	0%	0%	17%	20%	55%	77%	84%	94%	96%	100%	100%	100%	100%	100%	100%	100%	100%	33%	50%	0%	0%	0%	0%			
60	58%	65%	39%	65%	58%	74%	0%	0%	0%	0%	17%	23%	61%	77%	84%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	37%	53%	0%	0%	0%	0%			
65	59%	66%	42%	65%	61%	74%	0%	0%	0%	0%	20%	23%	65%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%	53%	0%	0%	0%	0%			
70	61%	67%	52%	68%	65%	74%	0%	0%	0%	0%	23%	23%	68%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	43%	53%	0%	0%	0%	0%			
75	64%	68%	55%	71%	68%	74%	0%	0%	0%	0%	27%	30%	74%	87%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	57%	0%	0%	0%	0%			
80	66%	69%	65%	77%	74%	77%	0%	0%	0%	3%	30%	33%	77%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	57%	0%	0%	0%	0%			
85	67%	71%	65%	81%	74%	81%	0%	0%	0%	3%	37%	40%	77%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	60%	0%	0%	0%	0%			
90	69%	72%	65%	81%	74%	81%	0%	0%	10%	19%	43%	43%	84%	87%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	60%	0%	0%	0%	0%			
95	70%	75%	68%	84%	74%	81%	0%	0%	16%	29%	50%	50%	84%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	70%	0%	0%	0%	0%			
100	72%	77%	71%	90%	74%	81%	0%	0%	19%	35%	53%	53%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	70%	0%	0%	0%	0%			
105	73%	78%	77%	90%	77%	81%	0%	0%	32%	39%	53%	57%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	70%	0%	0%	0%	0%			
110	75%	79%	81%	94%	81%	84%	0%	0%	32%	45%	57%	57%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	73%	0%	0%	0%	0%			
115	76%	80%	81%	94%	81%	84%	0%	0%	39%	55%	63%	63%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	73%	0%	0%	0%	0%			
120	78%	81%	84%	94%	81%	84%	0%	0%	42%	58%	67%	67%	90%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	73%	0%	0%	0%	0%			
125	80%	82%	90%	94%	81%	84%	0%	0%	48%	68%	73%	73%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	73%	0%	0%	0%	0%			
130	80%	84%	90%	97%	81%	87%	0%	0%	52%	77%	73%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	77%	0%	0%	0%	0%			
135	82%	85%	94%	97%	84%	87%	0%	0%	65%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	80%	0%	0%	0%	0%			
140	83%	85%	94%	97%	84%	87%	0%	0%	71%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	80%	0%	0%	0%	0%			
145	83%	86%	94%	97%	84%	87%	0%	3%	74%	84%	80%	80%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	83%	0%	0%	0%	0%			
150	84%	86%	94%	97%	84%	87%	0%	3%	77%	84%	80%	80%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	83%	0%	0%	0%	0%			
155	85%	87%	97%	100%	87%	87%	0%	7%	81%	87%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	77%	87%	0%	0%	0%	0%			
160	86%	88%	97%	100%	87%	87%	0%	10%	87%	94%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	87%	0%	0%	0%	0%			
165	86%	89%	97%	100%	87%	87%	0%	10%	87%	94%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	93%	0%	0%	0%	0%			
170	87%	90%	97%	100%	87%	90%	3%	10%	87%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	93%	0%	0%	0%	0%			
175	87%	90%	97%	100%	87%	90%	3%	10%	87%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	93%	0%	0%	0%	0%			
180	88%	90%	100%	100%	87%	90%	7%	17%	90%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	93%	0%	0%	0%	0%			
185	89%	91%	100%	100%	87%	90%	10%	17%	94%	97%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	93%	0%	0%	0%	0%			
190	90%	91%	100%	100%	87%	90%	10%	17%	97%	100%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%			
195	90%	91%	100%	100%	90%	90%	10%	17%	100%	100%	93%	93%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%			
200	91%	92%	100%	100%	90%	90%	10%	17%	100%	100%	97%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%			
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		

Wet Year 1995/96			20/25/240 Synlait NTPL						Waimakariri River																							
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June							
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
45	7%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	39%	18%	50%	45%	65%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
50	9%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	48%	25%	57%	52%	68%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
55	10%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	58%	32%	57%	55%	68%	10%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
60	12%	18%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	35%	61%	43%	64%	61%	71%	10%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
65	13%	19%	0%	0%	0%	0%	0%	0%	0%	3%	7%	0%	3%	35%	65%	50%	68%	61%	71%	13%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
70	18%	24%	6%	6%	26%	32%	0%	0%	0%	7%	10%	0%	3%	39%	68%	50%	71%	65%	74%	13%	20%	3%	3%	7%	7%	0%	0%	0%	0%	0%		
75	24%	29%	13%	13%	42%	42%	3%	3%	0%	0%	10%	10%	3%	3%	48%	71%	57%	71%	68%	81%	17%	23%	3%	3%	27%	27%	0%	0%	0%	0%		
80	28%	33%	23%	23%	52%	52%	3%	3%	0%	0%	13%	13%	3%	3%	58%	71%	57%	79%	68%	81%	17%	27%	10%	10%	30%	33%	0%	0%	0%	0%		
85	31%	36%	26%	26%	55%	55%	7%	7%	0%	0%	13%	17%	3%	3%	61%	77%	64%	82%	71%	81%	20%	27%	16%	16%	40%	40%	0%	0%	0%	0%		
90	36%	41%	35%	35%	58%	58%	10%	10%	3%	3%	20%	20%	3%	10%	65%	81%	68%	86%	71%	84%	20%	30%	19%	19%	63%	63%	0%	0%	0%	0%		
95	41%	46%	45%	45%	65%	65%	17%	17%	10%	10%	27%	27%	3%	13%	68%	84%	71%	86%	74%	84%	20%	30%	26%	26%	70%	70%	0%	0%	0%	0%		
100	46%	50%	52%	52%	71%	71%	17%	17%	13%	13%	33%	37%	6%	13%	71%	84%	71%	86%	81%	84%	23%	30%	35%	35%	77%	77%	0%	0%	0%	0%		
105	49%	53%	58%	58%	71%	71%	17%	17%	16%	16%	43%	47%	10%	16%	71%	87%	79%	86%	81%	84%	27%	33%	39%	39%	80%	80%	0%	0%	0%	0%		
110	53%	56%	65%	65%	71%	71%	23%	23%	19%	19%	43%	47%	16%	23%	77%	87%	82%	86%	81%	84%	27%	33%	48%	48%	83%	83%	0%	0%	0%	0%		
115	56%	58%	68%	68%	71%	71%	27%	27%	19%	19%	50%	50%	26%	29%	81%	90%	86%	89%	84%	84%	30%	33%	55%	55%	83%	83%	0%	0%	0%	0%		
120	59%	61%	71%	71%	71%	71%	27%	27%	23%	23%	57%	57%	29%	35%	84%	90%	86%	93%	84%	84%	30%	37%	58%	58%	87%	87%	0%	0%	0%	0%		
125	60%	62%	71%	71%	74%	74%	27%	27%	23%	23%	57%	57%	32%	35%	84%	90%	86%	93%	84%	84%	30%	47%	65%	65%	87%	87%	0%	0%	0%	0%		
130	64%	66%	81%	81%	81%	81%	30%	30%	26%	26%	60%	60%	39%	39%	87%	90%	86%	96%	84%	84%	33%	47%	68%	68%	93%	93%	0%	0%	0%	0%		
135	65%	67%	84%	84%	81%	81%	30%	30%	26%	26%	60%	63%	39%	39%	90%	94%	86%	96%	84%	84%	33%	47%	71%	71%	93%	93%	0%	0%	0%	0%		
140	66%	69%	84%	84%	81%	81%	33%	33%	29%	29%	63%	67%	42%	48%	90%	94%	89%	100%	84%	84%	33%	47%	71%	71%	97%	97%	0%	0%	0%	0%		
145	70%	72%	90%	90%	84%	84%	37%	37%	32%	32%	70%	70%	48%	52%	90%	94%	93%	100%	84%	84%	37%	47%	77%	77%	100%	100%	0%	0%	0%	0%		
150	72%	72%	90%	90%	87%	87%	37%	37%	32%	32%	70%	70%	48%	52%	94%	94%	93%	100%	84%	84%	47%	47%	77%	77%	100%	100%	0%	0%	0%	0%		
155	72%	74%	94%	94%	90%	90%	37%	37%	32%	32%	70%	70%	48%	52%	94%	94%	96%	100%	84%	90%	47%	53%	77%	77%	100%	100%	0%	0%	0%	0%		
160	73%	75%	94%	94%	90%	90%	40%	40%	32%	32%	70%	70%	52%	55%	94%	94%	96%	100%	84%	94%	47%	57%	81%	81%	100%	100%	0%	0%	0%	0%		
165	74%	76%	94%	94%	90%	90%	40%	40%	32%	32%	73%	73%	52%	58%	94%	97%	100%	100%	84%	94%	47%	60%	81%	81%	100%	100%	0%	0%	0%	0%		
170	75%	78%	94%	94%	90%	90%	40%	40%	45%	45%	73%	73%	55%	61%	94%	97%	100%	100%	84%	94%	47%	63%	81%	81%	100%	100%	0%	0%	0%	0%		
175	77%	80%	94%	94%	90%	90%	43%	43%	52%	52%	73%	73%	55%	61%	97%	97%	100%	100%	84%	94%	50%	70%	84%	84%	100%	100%	0%	0%	0%	0%		
180	79%	81%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	58%	68%	97%	97%	100%	100%	90%	97%	57%	70%	87%	87%	100%	100%	0%	0%	0%	0%		
185	79%	81%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	61%	68%	97%	97%	100%	100%	94%	97%	60%	70%	87%	87%	100%	100%	0%	0%	0%	0%		
190	81%	82%	94%	94%	90%	90%	50%	50%	58%	58%	77%	77%	65%	68%	97%	97%	100%	100%	94%	97%	63%	70%	90%	90%	100%	100%	0%	0%	0%	0%		
195	83%	84%	94%	94%	90%	90%	50%	50%	65%	65%	87%	87%	65%	68%	97%	97%	100%	100%	94%	97%	67%	73%	90%	90%	100%	100%	0%	0%	0%	0%		
200	84%	85%	97%	97%	94%	94%	50%	50%	65%	65%	90%	90%	68%	68%	97%	97%	100%	100%	94%	97%	70%	73%	90%	90%	100%	100%	0%	0%	0%	0%		
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	104%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		

CPWES Flow statistics for Rakaia River

Typical Year 1989/90			20/25/240 Synlait CPW						Rakaia River																	
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
55	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	
60	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%	
65	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	20%	20%	
70	6%	6%	0%	0%	0%	0%	37%	37%	3%	3%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	0%	0%	0%	23%	23%	
75	9%	9%	0%	0%	0%	0%	70%	70%	6%	6%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	0%	0%	0%	27%	27%	
80	12%	12%	0%	0%	0%	0%	97%	97%	6%	6%	0%	0%	0%	0%	0%	0%	0%	13%	13%	0%	0%	0%	0%	27%	27%	
85	15%	15%	0%	0%	16%	16%	100%	100%	10%	10%	0%	0%	0%	0%	0%	0%	0%	16%	16%	0%	0%	0%	0%	33%	33%	
90	18%	18%	0%	0%	45%	45%	100%	100%	10%	10%	0%	0%	0%	0%	0%	0%	0%	19%	19%	0%	0%	0%	0%	37%	37%	
95	24%	24%	16%	16%	74%	74%	100%	100%	19%	19%	0%	0%	0%	0%	0%	0%	0%	19%	19%	10%	10%	0%	0%	47%	47%	
100	30%	30%	32%	32%	90%	90%	100%	100%	42%	42%	0%	0%	0%	0%	0%	0%	0%	23%	23%	20%	20%	0%	0%	57%	57%	
105	35%	35%	42%	42%	94%	94%	100%	100%	61%	61%	0%	0%	3%	3%	0%	0%	0%	23%	23%	40%	40%	0%	0%	57%	57%	
110	39%	40%	55%	55%	100%	100%	100%	100%	81%	81%	0%	0%	3%	3%	0%	0%	0%	32%	32%	43%	47%	0%	0%	57%	57%	
115	43%	43%	65%	65%	100%	100%	100%	100%	94%	94%	0%	0%	6%	6%	0%	0%	0%	45%	45%	47%	47%	0%	0%	60%	60%	
120	46%	47%	68%	68%	100%	100%	100%	100%	94%	94%	0%	0%	13%	13%	0%	0%	0%	68%	68%	47%	53%	0%	0%	60%	60%	
125	49%	49%	71%	71%	100%	100%	100%	100%	97%	97%	0%	0%	26%	26%	0%	0%	4%	4%	71%	71%	53%	53%	0%	3%	63%	63%
130	52%	52%	77%	77%	100%	100%	100%	100%	97%	97%	7%	7%	29%	29%	0%	0%	11%	11%	74%	74%	53%	57%	3%	3%	63%	63%
135	56%	57%	84%	84%	100%	100%	100%	100%	97%	97%	20%	20%	29%	29%	0%	0%	46%	46%	77%	77%	57%	60%	3%	3%	63%	63%
140	59%	60%	84%	84%	100%	100%	100%	100%	100%	100%	30%	30%	32%	32%	3%	3%	61%	61%	77%	77%	57%	60%	3%	3%	67%	67%
145	62%	62%	87%	87%	100%	100%	100%	100%	100%	100%	40%	40%	35%	35%	6%	6%	68%	68%	77%	77%	60%	60%	3%	10%	67%	67%
150	65%	66%	90%	90%	100%	100%	100%	100%	100%	100%	47%	47%	39%	39%	13%	13%	79%	79%	81%	81%	60%	67%	3%	13%	67%	67%
155	67%	68%	90%	94%	100%	100%	100%	100%	100%	100%	53%	53%	42%	42%	16%	16%	79%	79%	81%	81%	67%	67%	3%	16%	70%	70%
160	70%	70%	94%	94%	100%	100%	100%	100%	100%	100%	63%	63%	42%	42%	16%	16%	86%	86%	81%	81%	67%	67%	13%	16%	77%	77%
165	71%	72%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	48%	48%	23%	23%	86%	89%	81%	81%	67%	67%	13%	19%	77%	77%
170	73%	73%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	52%	52%	32%	32%	86%	89%	81%	84%	67%	67%	19%	19%	77%	77%
175	73%	75%	97%	97%	100%	100%	100%	100%	100%	100%	67%	67%	52%	52%	32%	39%	89%	93%	81%	87%	67%	70%	19%	19%	77%	77%
180	74%	76%	97%	97%	100%	100%	100%	100%	100%	100%	67%	70%	55%	55%	39%	42%	89%	93%	81%	87%	67%	70%	19%	23%	77%	77%
185	75%	77%	97%	97%	100%	100%	100%	100%	100%	100%	70%	70%	55%	55%	42%	42%	89%	93%	81%	87%	67%	70%	19%	26%	83%	83%
190	76%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	48%	89%	93%	84%	87%	67%	70%	23%	32%	87%	87%
195	77%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	52%	93%	93%	84%	87%	70%	73%	26%	32%	87%	87%
200	78%	80%	100%	100%	100%	100%	100%	100%	100%	100%	70%	80%	55%	55%	42%	52%	93%	93%	87%	87%	70%	73%	26%	35%	90%	90%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Dry Year 1970/71			20/25/240 Synlait CPW						Rakaia River																													
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June													
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After						
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%					
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
55	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
60	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
65	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
70	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
75	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	13%	3%	3%	0%	0%	0%	0%	0%	0%				
80	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	20%	10%	10%	0%	0%	0%	0%	0%	0%				
85	5%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	33%	33%	26%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
90	10%	10%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	19%	60%	60%	35%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
95	17%	17%	16%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	42%	42%	90%	90%	55%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
100	24%	24%	42%	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	71%	71%	100%	100%	74%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
105	31%	32%	58%	65%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	36%	81%	81%	100%	100%	81%	81%	13%	17%	0%	0%	0%	0%	0%	0%	0%	0%				
110	36%	37%	65%	68%	19%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	54%	97%	97%	100%	100%	84%	84%	20%	27%	0%	0%	0%	0%	0%	0%	0%	0%				
115	42%	43%	74%	77%	35%	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%	75%	100%	100%	100%	100%	84%	84%	37%	37%	0%	0%	0%	0%	0%	0%	0%	0%				
120	45%	45%	84%	84%	42%	42%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	86%	86%	100%	100%	100%	100%	87%	87%	37%	37%	0%	0%	0%	0%	0%	0%	0%	0%				
125	47%	48%	87%	87%	58%	58%	0%	0%	3%	3%	0%	0%	0%	0%	6%	6%	89%	89%	100%	100%	100%	100%	87%	87%	40%	43%	0%	0%	0%	0%	0%	0%	0%	0%				
130	52%	52%	90%	90%	65%	65%	0%	0%	10%	10%	0%	0%	0%	0%	35%	35%	89%	89%	100%	100%	100%	100%	87%	90%	43%	43%	0%	0%	0%	0%	0%	0%	0%	0%				
135	54%	55%	94%	94%	65%	65%	0%	0%	16%	16%	0%	0%	0%	0%	52%	52%	89%	89%	100%	100%	100%	100%	90%	94%	47%	50%	0%	0%	0%	0%	0%	0%	0%	0%				
140	61%	61%	97%	97%	68%	71%	0%	0%	55%	55%	0%	0%	0%	0%	74%	74%	93%	93%	100%	100%	100%	100%	94%	94%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%				
145	64%	64%	97%	97%	71%	71%	0%	0%	68%	68%	7%	7%	0%	0%	90%	90%	93%	93%	100%	100%	100%	100%	94%	94%	53%	53%	0%	0%	0%	0%	0%	0%	0%	0%				
150	68%	68%	97%	97%	74%	74%	0%	0%	74%	74%	27%	27%	13%	13%	90%	90%	93%	93%	100%	100%	100%	100%	94%	94%	60%	60%	0%	0%	0%	0%	0%	0%	0%	0%				
155	72%	72%	100%	100%	77%	77%	0%	0%	74%	77%	37%	37%	29%	29%	97%	97%	93%	93%	100%	100%	100%	100%	94%	94%	60%	60%	0%	0%	0%	0%	0%	0%	0%	0%				
160	73%	73%	100%	100%	77%	77%	0%	0%	77%	81%	43%	43%	32%	32%	97%	97%	93%	93%	100%	100%	100%	100%	94%	94%	63%	63%	0%	0%	0%	0%	0%	0%	0%	0%				
165	75%	76%	100%	100%	77%	77%	0%	0%	77%	84%	47%	50%	45%	45%	97%	97%	93%	96%	100%	100%	100%	100%	94%	100%	63%	63%	0%	0%	0%	0%	0%	0%	0%	0%				
170	77%	78%	100%	100%	81%	81%	0%	0%	81%	87%	50%	50%	55%	55%	97%	97%	93%	96%	100%	100%	100%	100%	100%	100%	63%	63%	0%	0%	0%	0%	0%	0%	0%	0%				
175	78%	79%	100%	100%	81%	81%	0%	0%	81%	87%	57%	57%	61%	61%	97%	100%	93%	96%	100%	100%	100%	100%	100%	100%	63%	67%	0%	0%	0%	0%	0%	0%	0%	0%				
180	79%	80%	100%	100%	81%	81%	0%	0%	84%	90%	57%	60%	61%	61%	97%	100%	96%	96%	100%	100%	100%	100%	100%	100%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%				
185	79%	80%	100%	100%	81%	81%	0%	0%	87%	90%	60%	60%	61%	65%	100%	100%	96%	96%	100%	100%	100%	100%	100%	100%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%				
190	80%	81%	100%	100%	81%	81%	0%	0%	87%	94%	60%	60%	65%	68%	100%	100%	96%	96%	100%	100%	100%	100%	100%	100%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%				
195	80%	82%	100%	100%	81%	81%	3%	3%	87%	94%	60%	67%	68%	71%	100%	100%	96%	96%	100%	100%	100%	100%	100%	100%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%				
200	80%	82%	100%	100%	81%	81%	3%	3%	87%	94%	60%	73%	68%	74%	100%	100%	96%	96%	100%	100%	100%	100%	100%	100%	67%	67%	0%	0%	0%	0%	0%	0%	0%	0%				
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			



# CPWES Flow statistics for Waimakariri River

Typical Year 1989/90		20/25/240 Synlait CPW										Waimakariri River															
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June		
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
35	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%	0%	
40	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	13%	13%	27%	27%	0%	0%	0%	0%	
45	29%	41%	0%	0%	0%	0%	70%	73%	23%	23%	23%	30%	35%	42%	0%	35%	79%	100%	71%	81%	50%	70%	0%	0%	0%	50%	
50	37%	50%	6%	16%	35%	45%	83%	83%	23%	23%	33%	37%	35%	48%	3%	42%	89%	100%	74%	84%	53%	73%	0%	0%	10%	53%	
55	43%	55%	19%	29%	65%	68%	83%	83%	23%	23%	37%	43%	35%	48%	13%	52%	93%	100%	77%	84%	53%	73%	0%	0%	27%	60%	
60	50%	59%	26%	35%	74%	77%	90%	97%	23%	26%	43%	47%	42%	48%	23%	61%	100%	100%	81%	87%	63%	77%	0%	0%	37%	63%	
65	53%	63%	35%	45%	81%	81%	97%	97%	23%	32%	47%	50%	42%	52%	29%	68%	100%	100%	81%	87%	63%	77%	0%	6%	47%	63%	
70	56%	65%	42%	48%	84%	87%	97%	97%	29%	32%	53%	60%	42%	52%	35%	68%	100%	100%	81%	87%	70%	80%	0%	6%	50%	70%	
75	60%	69%	48%	48%	87%	87%	100%	100%	39%	45%	53%	63%	48%	58%	42%	74%	100%	100%	84%	87%	73%	83%	0%	13%	53%	73%	
80	63%	70%	52%	52%	90%	90%	100%	100%	45%	45%	60%	63%	48%	61%	52%	74%	100%	100%	84%	87%	73%	83%	0%	13%	60%	80%	
85	67%	73%	61%	61%	90%	90%	100%	100%	48%	52%	67%	67%	48%	61%	61%	74%	100%	100%	87%	90%	77%	83%	0%	16%	63%	80%	
90	69%	75%	65%	65%	94%	94%	100%	100%	52%	52%	67%	70%	52%	61%	68%	81%	100%	100%	87%	90%	77%	87%	6%	19%	63%	87%	
95	71%	78%	71%	71%	94%	94%	100%	100%	58%	58%	67%	70%	52%	65%	68%	81%	100%	100%	87%	94%	80%	87%	6%	29%	70%	90%	
100	74%	79%	77%	77%	94%	94%	100%	100%	65%	65%	70%	70%	58%	65%	74%	81%	100%	100%	87%	94%	83%	87%	13%	29%	73%	90%	
105	76%	81%	81%	81%	97%	97%	100%	100%	68%	68%	70%	73%	61%	68%	74%	81%	100%	100%	87%	94%	83%	87%	13%	32%	80%	90%	
110	78%	84%	87%	87%	97%	97%	100%	100%	74%	77%	80%	80%	61%	68%	74%	84%	100%	100%	90%	94%	83%	90%	16%	42%	80%	97%	
115	81%	85%	90%	90%	97%	97%	100%	100%	77%	77%	80%	80%	61%	68%	81%	87%	100%	100%	90%	97%	87%	90%	19%	42%	87%	97%	
120	83%	86%	94%	94%	97%	97%	100%	100%	81%	81%	80%	80%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	42%	90%	97%	
125	84%	87%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	45%	90%	97%	
130	84%	87%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	68%	81%	87%	100%	100%	94%	97%	87%	90%	32%	48%	90%	97%	
135	86%	88%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	71%	84%	90%	100%	100%	94%	97%	90%	90%	42%	48%	97%	97%	
140	87%	89%	97%	97%	100%	100%	100%	100%	87%	90%	87%	87%	68%	71%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
145	88%	90%	97%	97%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
150	88%	90%	97%	97%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	45%	52%	97%	100%	
155	89%	91%	97%	97%	100%	100%	100%	100%	94%	94%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	48%	55%	97%	100%	
160	90%	92%	100%	100%	100%	100%	100%	100%	94%	94%	90%	90%	71%	74%	90%	90%	100%	100%	97%	97%	90%	93%	48%	61%	97%	100%	
165	90%	93%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	71%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	68%	97%	100%	
170	90%	93%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	74%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	71%	97%	100%	
175	91%	93%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	74%	90%	94%	100%	100%	97%	97%	93%	97%	52%	71%	100%	100%	
180	92%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	55%	74%	100%	100%	
185	92%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	61%	77%	100%	100%	
190	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	68%	77%	100%	100%	
195	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	71%	77%	100%	100%	
200	94%	95%	100%	100%	100%	100%	100%	100%	97%	97%	97%	97%	74%	77%	94%	97%	100%	100%	97%	100%	97%	97%	71%	81%	100%	100%	
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Dry Year 1970/71			20/25/240 Synlait CPW						Waimakariri River																											
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June											
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After				
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	12%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	39%	61%	61%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
35	21%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	61%	61%	84%	84%	87%	87%	19%	19%	0%	0%	0%	0%	0%	0%	0%	0%			
40	30%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	16%	16%	16%	86%	86%	100%	100%	100%	100%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%			
45	39%	61%	0%	52%	0%	65%	0%	0%	0%	0%	0%	17%	26%	68%	71%	87%	96%	100%	100%	100%	100%	100%	100%	81%	100%	0%	100%	0%	40%	0%	40%	0%	40%			
50	46%	62%	6%	55%	19%	68%	0%	0%	0%	0%	0%	20%	39%	71%	74%	87%	96%	100%	100%	100%	100%	100%	100%	97%	100%	23%	100%	50%	50%	50%	50%	50%	50%			
55	52%	63%	26%	58%	42%	68%	0%	0%	0%	0%	10%	20%	45%	74%	81%	90%	96%	100%	100%	100%	100%	100%	100%	100%	100%	30%	100%	50%	50%	50%	50%	50%	50%			
60	57%	65%	39%	65%	55%	74%	0%	0%	0%	0%	17%	20%	58%	77%	84%	94%	96%	100%	100%	100%	100%	100%	100%	100%	100%	37%	100%	53%	53%	53%	53%	53%	53%			
65	59%	66%	39%	65%	61%	74%	0%	0%	0%	0%	20%	23%	61%	81%	84%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%	100%	53%	53%	53%	53%	53%	53%			
70	61%	66%	52%	65%	65%	74%	0%	0%	0%	0%	20%	23%	68%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%	100%	53%	53%	53%	53%	53%	53%			
75	63%	67%	55%	68%	68%	74%	0%	0%	0%	0%	23%	27%	71%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	57%	57%	57%	57%	57%	57%			
80	64%	69%	58%	77%	68%	77%	0%	0%	0%	0%	27%	30%	74%	87%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	57%	57%	57%	57%	57%	57%			
85	66%	69%	65%	77%	74%	81%	0%	0%	0%	0%	30%	33%	77%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	100%	57%	57%	57%	57%	57%	57%			
90	67%	71%	65%	81%	74%	81%	0%	0%	0%	0%	40%	43%	81%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	100%	60%	60%	60%	60%	60%	60%			
95	69%	73%	65%	84%	74%	81%	0%	0%	10%	13%	43%	47%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	100%	67%	67%	67%	67%	67%	67%			
100	71%	75%	68%	90%	74%	81%	0%	0%	19%	19%	50%	50%	84%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	100%	70%	70%	70%	70%	70%	70%			
105	73%	76%	77%	90%	77%	81%	0%	0%	23%	29%	53%	53%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	100%	70%	70%	70%	70%	70%	70%			
110	74%	78%	77%	94%	81%	84%	0%	0%	32%	32%	53%	57%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	100%	73%	73%	73%	73%	73%	73%			
115	75%	79%	81%	94%	81%	84%	0%	0%	32%	39%	63%	63%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	100%	73%	73%	73%	73%	73%	73%			
120	77%	80%	84%	94%	81%	84%	0%	0%	42%	55%	63%	63%	87%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	67%	100%	73%	73%	73%	73%	73%	73%			
125	79%	81%	90%	94%	81%	84%	0%	0%	42%	58%	70%	70%	90%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	100%	73%	73%	73%	73%	73%	73%			
130	80%	83%	90%	97%	81%	84%	0%	0%	48%	68%	73%	73%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	100%	77%	77%	77%	77%	77%	77%			
135	81%	84%	94%	97%	84%	87%	0%	0%	55%	77%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	100%	77%	77%	77%	77%	77%	77%			
140	82%	85%	94%	97%	84%	87%	0%	0%	68%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	100%	80%	80%	80%	80%	80%	80%			
145	83%	85%	94%	97%	84%	87%	0%	0%	74%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	100%	83%	83%	83%	83%	83%	83%			
150	83%	86%	94%	97%	84%	87%	0%	3%	74%	84%	80%	80%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	100%	83%	83%	83%	83%	83%	83%			
155	85%	87%	97%	100%	84%	87%	0%	3%	81%	84%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	77%	100%	87%	87%	87%	87%	87%	87%			
160	85%	87%	97%	100%	87%	87%	0%	7%	84%	87%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	77%	100%	87%	87%	87%	87%	87%	87%			
165	86%	89%	97%	100%	87%	87%	0%	10%	87%	94%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	100%	93%	93%	93%	93%	93%	93%			
170	86%	89%	97%	100%	87%	90%	0%	10%	87%	94%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	100%	93%	93%	93%	93%	93%	93%			
175	87%	90%	97%	100%	87%	90%	3%	10%	87%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	100%	93%	93%	93%	93%	93%	93%			
180	88%	90%	100%	100%	87%	90%	3%	10%	87%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	100%	93%	93%	93%	93%	93%	93%			
185	88%	90%	100%	100%	87%	90%	7%	17%	90%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	100%	93%	93%	93%	93%	93%	93%			
190	89%	91%	100%	100%	87%	90%	10%	17%	94%	97%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	100%	93%	93%	93%	93%	93%	93%			
195	90%	91%	100%	100%	90%	90%	10%	17%	97%	100%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	100%	93%	93%	93%	93%	93%	93%			
200	90%	91%	100%	100%	90%	90%	10%	17%	100%	100%	93%	93%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	100%	93%	93%	93%	93%	93%	93%			
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		

Wet Year 1995/96			20/25/240 Synlait CPW						Waimakariri River																					
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June					
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
45	4%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	35%	11%	50%	29%	61%	10%	10%	0%	0%	0%	0%	0%	0%	0%		
50	7%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	39%	18%	54%	45%	65%	10%	10%	0%	0%	0%	0%	0%	0%	0%			
55	9%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	48%	25%	57%	55%	68%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%			
60	11%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	58%	36%	61%	55%	68%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%			
65	12%	18%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	3%	35%	61%	43%	64%	61%	71%	10%	10%	0%	0%	0%	0%	0%	0%			
70	16%	21%	3%	3%	19%	26%	0%	0%	0%	0%	7%	7%	0%	3%	35%	65%	50%	68%	61%	71%	13%	13%	0%	0%	3%	3%	3%	3%		
75	21%	26%	13%	13%	39%	39%	0%	0%	0%	0%	10%	10%	0%	3%	39%	68%	54%	71%	65%	74%	13%	13%	3%	3%	23%	23%	23%	23%		
80	27%	31%	23%	23%	52%	52%	3%	3%	0%	0%	10%	10%	3%	3%	48%	71%	57%	71%	68%	81%	17%	17%	10%	10%	30%	30%	30%	30%		
85	29%	33%	26%	26%	52%	52%	3%	3%	0%	0%	13%	13%	3%	3%	58%	74%	61%	79%	68%	81%	17%	20%	13%	13%	40%	40%	40%	40%		
90	34%	38%	32%	32%	58%	58%	7%	7%	0%	0%	17%	17%	3%	3%	61%	77%	64%	86%	71%	81%	20%	23%	19%	19%	57%	57%	57%	57%		
95	39%	44%	45%	45%	65%	65%	13%	13%	10%	10%	20%	20%	3%	10%	65%	84%	68%	86%	71%	84%	20%	23%	23%	23%	70%	70%	70%	70%		
100	44%	48%	52%	52%	68%	71%	17%	17%	10%	10%	27%	27%	6%	13%	68%	84%	71%	86%	74%	84%	20%	23%	35%	35%	77%	77%	77%	77%		
105	47%	50%	58%	58%	71%	71%	17%	17%	13%	13%	33%	37%	6%	13%	71%	84%	71%	86%	81%	84%	23%	27%	39%	39%	80%	80%	80%	80%		
110	51%	54%	61%	61%	71%	71%	23%	23%	16%	16%	43%	47%	10%	16%	74%	87%	79%	86%	81%	84%	27%	30%	45%	45%	83%	83%	83%	83%		
115	54%	56%	68%	68%	71%	71%	23%	23%	19%	19%	47%	50%	16%	23%	77%	87%	86%	86%	81%	84%	27%	30%	55%	55%	83%	83%	83%	83%		
120	57%	59%	71%	71%	71%	71%	27%	27%	19%	19%	50%	50%	26%	32%	84%	90%	86%	93%	84%	84%	30%	33%	58%	58%	83%	83%	83%	83%		
125	59%	61%	71%	71%	74%	74%	27%	27%	23%	23%	57%	57%	29%	35%	84%	90%	86%	93%	84%	84%	30%	33%	65%	65%	87%	87%	87%	87%		
130	62%	64%	77%	77%	81%	81%	27%	27%	23%	23%	57%	57%	35%	39%	87%	90%	86%	93%	84%	84%	30%	43%	68%	68%	90%	90%	90%	90%		
135	65%	66%	84%	84%	81%	81%	30%	30%	26%	26%	60%	60%	39%	39%	90%	90%	86%	96%	84%	84%	33%	43%	71%	71%	93%	93%	93%	93%		
140	65%	67%	84%	84%	81%	81%	30%	30%	26%	26%	60%	63%	39%	39%	90%	94%	86%	96%	84%	84%	33%	43%	71%	71%	97%	97%	97%	97%		
145	68%	70%	84%	84%	84%	84%	33%	33%	32%	32%	63%	67%	42%	48%	90%	94%	93%	100%	84%	84%	33%	43%	77%	77%	100%	100%	100%	100%		
150	70%	72%	90%	90%	87%	87%	37%	37%	32%	32%	70%	70%	48%	52%	90%	94%	93%	100%	84%	84%	37%	47%	77%	77%	100%	100%	100%	100%		
155	72%	73%	94%	94%	87%	87%	37%	37%	32%	32%	70%	70%	48%	52%	94%	94%	93%	100%	84%	84%	47%	47%	77%	77%	100%	100%	100%	100%		
160	73%	74%	94%	94%	90%	90%	40%	40%	32%	32%	70%	70%	48%	52%	94%	94%	96%	100%	84%	90%	47%	50%	81%	81%	100%	100%	100%	100%		
165	73%	76%	94%	94%	90%	90%	40%	40%	32%	32%	73%	73%	52%	55%	94%	94%	96%	100%	84%	94%	47%	57%	81%	81%	100%	100%	100%	100%		
170	74%	76%	94%	94%	90%	90%	40%	40%	35%	35%	73%	73%	52%	58%	94%	97%	100%	100%	84%	94%	47%	57%	81%	81%	100%	100%	100%	100%		
175	76%	78%	94%	94%	90%	90%	43%	43%	45%	45%	73%	73%	55%	61%	94%	97%	100%	100%	84%	94%	47%	60%	84%	84%	100%	100%	100%	100%		
180	77%	80%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	55%	61%	97%	97%	100%	100%	84%	94%	50%	67%	87%	87%	100%	100%	100%	100%		
185	79%	81%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	58%	68%	97%	97%	100%	100%	90%	97%	57%	70%	87%	87%	100%	100%	100%	100%		
190	80%	82%	94%	94%	90%	90%	43%	43%	55%	55%	77%	77%	61%	68%	97%	97%	100%	100%	94%	97%	63%	70%	90%	90%	100%	100%	100%	100%		
195	82%	83%	94%	94%	90%	90%	50%	50%	58%	58%	83%	83%	65%	68%	97%	97%	100%	100%	94%	97%	63%	73%	90%	90%	100%	100%	100%	100%		
200	84%	85%	97%	97%	94%	94%	50%	50%	65%	65%	87%	87%	68%	68%	97%	97%	100%	100%	94%	97%	67%	73%	90%	90%	100%	100%	100%	100%		
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	104%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		

CPWES Flow statistics for Rakaia River

Typical Year 1989/90			20/25/240 CPW NTPL						Rakaia River																	
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
55	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	
60	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%	
65	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	20%	20%	
70	6%	6%	0%	0%	0%	0%	37%	37%	3%	3%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	0%	0%	0%	23%	23%	
75	9%	9%	0%	0%	0%	0%	70%	70%	6%	6%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	0%	0%	0%	27%	27%	
80	12%	12%	0%	0%	0%	0%	97%	97%	6%	6%	0%	0%	0%	0%	0%	0%	0%	13%	13%	0%	0%	0%	0%	27%	27%	
85	15%	15%	0%	0%	16%	16%	100%	100%	10%	10%	0%	0%	0%	0%	0%	0%	0%	16%	16%	0%	0%	0%	0%	33%	33%	
90	18%	18%	0%	0%	45%	45%	100%	100%	10%	10%	0%	0%	0%	0%	0%	0%	0%	19%	19%	0%	0%	0%	0%	37%	37%	
95	24%	24%	16%	16%	74%	74%	100%	100%	19%	19%	0%	0%	0%	0%	0%	0%	0%	19%	19%	10%	10%	0%	0%	47%	47%	
100	30%	30%	32%	32%	90%	90%	100%	100%	42%	42%	0%	0%	0%	0%	0%	0%	0%	23%	23%	20%	20%	0%	0%	57%	57%	
105	35%	35%	42%	42%	94%	94%	100%	100%	61%	61%	0%	0%	3%	3%	0%	0%	0%	23%	23%	40%	40%	0%	0%	57%	57%	
110	39%	40%	55%	55%	100%	100%	100%	100%	81%	81%	0%	0%	3%	3%	0%	0%	0%	32%	32%	43%	47%	0%	0%	57%	57%	
115	43%	43%	65%	65%	100%	100%	100%	100%	94%	94%	0%	0%	6%	6%	0%	0%	0%	45%	45%	47%	47%	0%	0%	60%	60%	
120	46%	47%	68%	68%	100%	100%	100%	100%	94%	94%	0%	0%	13%	13%	0%	0%	0%	68%	68%	47%	53%	0%	0%	60%	60%	
125	49%	49%	71%	71%	100%	100%	100%	100%	97%	97%	0%	0%	26%	26%	0%	0%	4%	4%	71%	71%	53%	53%	0%	3%	63%	63%
130	52%	52%	77%	77%	100%	100%	100%	100%	97%	97%	7%	7%	29%	29%	0%	0%	11%	11%	74%	74%	53%	57%	3%	3%	63%	63%
135	56%	57%	84%	84%	100%	100%	100%	100%	97%	97%	20%	20%	29%	29%	0%	0%	46%	46%	77%	77%	57%	60%	3%	3%	63%	63%
140	59%	60%	84%	84%	100%	100%	100%	100%	100%	100%	30%	30%	32%	32%	3%	3%	61%	61%	77%	77%	57%	60%	3%	3%	67%	67%
145	62%	62%	87%	87%	100%	100%	100%	100%	100%	100%	40%	40%	35%	35%	6%	6%	68%	68%	77%	77%	60%	60%	3%	10%	67%	67%
150	64%	66%	90%	90%	100%	100%	100%	100%	100%	100%	47%	47%	39%	39%	13%	13%	71%	79%	77%	81%	60%	67%	3%	13%	67%	67%
155	66%	68%	90%	94%	100%	100%	100%	100%	100%	100%	53%	53%	42%	42%	16%	16%	79%	79%	77%	81%	67%	67%	3%	16%	70%	70%
160	69%	70%	94%	94%	100%	100%	100%	100%	100%	100%	63%	63%	42%	42%	16%	16%	79%	86%	81%	81%	67%	67%	13%	16%	77%	77%
165	71%	72%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	48%	48%	23%	23%	82%	89%	81%	81%	67%	67%	13%	19%	77%	77%
170	72%	73%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	52%	52%	26%	32%	86%	89%	81%	84%	67%	67%	19%	19%	77%	77%
175	72%	75%	97%	97%	100%	100%	100%	100%	100%	100%	63%	67%	52%	52%	29%	39%	86%	93%	81%	87%	67%	70%	19%	19%	77%	77%
180	73%	76%	97%	97%	100%	100%	100%	100%	100%	100%	67%	70%	52%	55%	32%	42%	86%	93%	81%	87%	67%	70%	19%	23%	77%	77%
185	75%	77%	97%	97%	100%	100%	100%	100%	100%	100%	67%	70%	55%	55%	39%	42%	89%	93%	81%	87%	67%	70%	19%	26%	83%	83%
190	76%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	48%	89%	93%	81%	87%	67%	70%	23%	32%	87%	87%
195	76%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	52%	89%	93%	81%	87%	70%	73%	26%	32%	87%	87%
200	77%	80%	100%	100%	100%	100%	100%	100%	100%	100%	70%	80%	55%	55%	42%	52%	93%	93%	84%	87%	70%	73%	26%	35%	90%	90%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%





# CPWES Flow statistics for Waimakariri River

Typical Year 1989/90		20/25/240 CPW NTPL												Waimakariri River													
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June		
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
35	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%	0%	
40	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	13%	13%	27%	27%	0%	0%	0%	0%	
45	31%	45%	0%	10%	0%	0%	80%	87%	23%	23%	30%	37%	35%	48%	3%	42%	82%	100%	74%	81%	53%	73%	0%	0%	0%	50%	
50	38%	52%	6%	23%	35%	45%	83%	90%	23%	23%	37%	40%	35%	48%	13%	45%	93%	100%	77%	84%	53%	73%	0%	0%	10%	57%	
55	47%	58%	19%	39%	68%	68%	90%	93%	23%	26%	40%	43%	42%	48%	23%	58%	96%	100%	77%	87%	63%	77%	0%	0%	27%	60%	
60	51%	62%	26%	45%	77%	77%	97%	97%	23%	32%	47%	50%	42%	52%	26%	65%	100%	100%	81%	87%	63%	77%	0%	0%	37%	63%	
65	55%	64%	35%	45%	84%	84%	97%	97%	29%	32%	50%	57%	42%	52%	35%	68%	100%	100%	81%	87%	70%	77%	0%	6%	47%	63%	
70	59%	68%	45%	48%	87%	87%	97%	100%	39%	42%	53%	63%	48%	58%	42%	74%	100%	100%	81%	87%	73%	83%	0%	10%	50%	73%	
75	62%	70%	52%	52%	87%	87%	100%	100%	45%	45%	60%	63%	48%	61%	45%	74%	100%	100%	84%	87%	73%	83%	0%	13%	57%	73%	
80	65%	72%	52%	52%	90%	90%	100%	100%	45%	52%	67%	67%	48%	61%	58%	74%	100%	100%	87%	90%	77%	83%	0%	13%	60%	80%	
85	68%	74%	65%	65%	94%	94%	100%	100%	52%	52%	67%	70%	52%	61%	65%	77%	100%	100%	87%	90%	77%	87%	0%	19%	63%	80%	
90	70%	77%	68%	68%	94%	94%	100%	100%	58%	58%	67%	70%	52%	65%	68%	81%	100%	100%	87%	94%	77%	87%	6%	23%	63%	87%	
95	73%	79%	71%	71%	94%	94%	100%	100%	65%	68%	70%	70%	58%	65%	74%	81%	100%	100%	87%	94%	83%	87%	10%	29%	73%	90%	
100	75%	80%	81%	81%	94%	94%	100%	100%	65%	71%	70%	73%	61%	68%	74%	81%	100%	100%	87%	94%	83%	87%	13%	29%	73%	90%	
105	77%	82%	81%	81%	97%	97%	100%	100%	74%	77%	77%	80%	61%	68%	74%	84%	100%	100%	90%	94%	83%	90%	13%	32%	80%	90%	
110	80%	85%	90%	90%	97%	97%	100%	100%	77%	77%	80%	80%	61%	68%	77%	87%	100%	100%	90%	97%	87%	90%	19%	42%	80%	97%	
115	82%	85%	90%	90%	97%	97%	100%	100%	81%	81%	80%	80%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	23%	42%	87%	97%	
120	83%	86%	97%	97%	97%	97%	100%	100%	81%	84%	80%	80%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	42%	90%	97%	
125	84%	87%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	45%	90%	97%	
130	85%	88%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	71%	84%	87%	100%	100%	94%	97%	90%	90%	32%	48%	90%	97%	
135	87%	89%	97%	97%	100%	100%	100%	100%	87%	87%	87%	87%	68%	71%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
140	88%	90%	97%	97%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
145	88%	90%	97%	97%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%	
150	88%	90%	97%	97%	100%	100%	100%	100%	94%	94%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	45%	52%	97%	100%	
155	89%	91%	97%	97%	100%	100%	100%	100%	94%	94%	90%	90%	71%	74%	87%	90%	100%	100%	97%	97%	90%	93%	48%	55%	97%	100%	
160	90%	92%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	71%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	61%	97%	100%	
165	90%	93%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	74%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	68%	97%	100%	
170	91%	93%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	74%	90%	94%	100%	100%	97%	97%	93%	97%	48%	71%	97%	100%	
175	91%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	52%	74%	100%	100%	
180	92%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	55%	77%	100%	100%	
185	92%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	61%	77%	100%	100%	
190	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	68%	77%	100%	100%	
195	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	97%	97%	71%	77%	100%	100%	
200	94%	96%	100%	100%	100%	100%	100%	100%	97%	97%	97%	97%	77%	77%	94%	97%	100%	100%	97%	100%	97%	100%	74%	81%	100%	100%	
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Dry Year 1970/71			20/25/240 CPW NTPL						Waimakariri River																											
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June											
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After				
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	12%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	39%	61%	61%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
35	21%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	61%	61%	84%	84%	87%	87%	19%	19%	0%	0%	0%	0%	0%	0%	0%	0%			
40	30%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	16%	86%	86%	100%	100%	100%	100%	100%	100%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%			
45	41%	61%	0%	52%	0%	65%	0%	0%	0%	0%	17%	39%	68%	74%	87%	96%	100%	100%	100%	100%	100%	100%	81%	100%	0%	43%	0%	0%	0%	0%	0%	0%				
50	48%	63%	6%	55%	19%	68%	0%	0%	0%	0%	10%	20%	45%	74%	81%	90%	96%	100%	100%	100%	100%	100%	100%	97%	100%	23%	50%	0%	0%	0%	0%	0%				
55	55%	65%	29%	65%	45%	74%	0%	0%	0%	0%	17%	20%	55%	77%	84%	94%	96%	100%	100%	100%	100%	100%	100%	100%	100%	33%	50%	0%	0%	0%	0%	0%				
60	58%	65%	39%	65%	58%	74%	0%	0%	0%	0%	17%	23%	61%	77%	84%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	37%	53%	0%	0%	0%	0%	0%				
65	59%	66%	42%	65%	61%	74%	0%	0%	0%	0%	20%	23%	65%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%	53%	0%	0%	0%	0%	0%				
70	61%	67%	52%	68%	65%	74%	0%	0%	0%	0%	23%	23%	68%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	43%	53%	0%	0%	0%	0%	0%				
75	64%	68%	55%	71%	68%	74%	0%	0%	0%	0%	27%	30%	74%	87%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	57%	0%	0%	0%	0%	0%				
80	66%	69%	65%	77%	74%	77%	0%	0%	0%	3%	30%	33%	77%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	57%	0%	0%	0%	0%	0%				
85	67%	71%	65%	81%	74%	81%	0%	0%	0%	3%	37%	40%	77%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	60%	0%	0%	0%	0%	0%				
90	69%	72%	65%	81%	74%	81%	0%	0%	10%	16%	43%	43%	84%	87%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	60%	0%	0%	0%	0%	0%				
95	70%	75%	68%	84%	74%	81%	0%	0%	16%	29%	50%	50%	84%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	70%	0%	0%	0%	0%	0%				
100	72%	77%	71%	90%	74%	81%	0%	0%	19%	35%	53%	53%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	70%	0%	0%	0%	0%	0%				
105	73%	78%	77%	90%	77%	81%	0%	0%	32%	39%	53%	57%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	70%	0%	0%	0%	0%	0%				
110	75%	79%	81%	94%	81%	84%	0%	0%	32%	45%	57%	57%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	73%	0%	0%	0%	0%	0%				
115	76%	80%	81%	94%	81%	84%	0%	0%	39%	55%	63%	63%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	73%	0%	0%	0%	0%	0%				
120	78%	81%	84%	94%	81%	84%	0%	0%	42%	58%	67%	67%	90%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	73%	0%	0%	0%	0%	0%				
125	80%	82%	90%	94%	81%	84%	0%	0%	48%	68%	73%	73%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	73%	0%	0%	0%	0%	0%				
130	80%	84%	90%	97%	81%	87%	0%	0%	52%	77%	73%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	77%	0%	0%	0%	0%	0%				
135	82%	85%	94%	97%	84%	87%	0%	0%	65%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	80%	0%	0%	0%	0%	0%				
140	83%	85%	94%	97%	84%	87%	0%	0%	71%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	80%	0%	0%	0%	0%	0%				
145	83%	86%	94%	97%	84%	87%	0%	3%	74%	84%	80%	80%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	83%	0%	0%	0%	0%	0%				
150	84%	86%	94%	97%	84%	87%	0%	3%	77%	84%	80%	80%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	83%	0%	0%	0%	0%	0%				
155	85%	87%	97%	100%	87%	87%	0%	7%	81%	87%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	77%	87%	0%	0%	0%	0%	0%				
160	86%	88%	97%	100%	87%	87%	0%	10%	87%	94%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	87%	0%	0%	0%	0%	0%				
165	86%	89%	97%	100%	87%	87%	0%	10%	87%	94%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	93%	0%	0%	0%	0%	0%				
170	87%	90%	97%	100%	87%	90%	3%	10%	87%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	93%	0%	0%	0%	0%	0%				
175	87%	90%	97%	100%	87%	90%	3%	10%	87%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	93%	0%	0%	0%	0%	0%				
180	88%	90%	100%	100%	87%	90%	7%	17%	90%	97%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	93%	0%	0%	0%	0%	0%				
185	89%	91%	100%	100%	87%	90%	10%	17%	94%	97%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	93%	0%	0%	0%	0%	0%				
190	90%	91%	100%	100%	87%	90%	10%	17%	97%	100%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%	0%				
195	90%	91%	100%	100%	90%	90%	10%	17%	100%	100%	93%	93%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%	0%				
200	91%	92%	100%	100%	90%	90%	10%	17%	100%	100%	97%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%	0%				
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			

Wet Year 1995/96			20/25/240 CPW NTPL						Waimakariri River																			
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June			
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
45	7%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	39%	18%	50%	45%	65%	10%	10%	0%	0%	0%	0%	0%		
50	9%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	48%	25%	57%	52%	68%	10%	10%	0%	0%	0%	0%	0%	0%		
55	10%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	58%	32%	57%	55%	68%	10%	10%	0%	0%	0%	0%	0%	0%		
60	12%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	35%	61%	43%	64%	61%	71%	10%	10%	0%	0%	0%	0%	0%	0%		
65	13%	19%	0%	0%	0%	0%	0%	0%	0%	3%	7%	0%	35%	65%	50%	68%	61%	71%	13%	13%	0%	0%	0%	0%	0%	0%		
70	18%	24%	6%	6%	26%	32%	0%	0%	0%	0%	7%	10%	0%	3%	39%	68%	50%	71%	65%	74%	13%	13%	3%	3%	7%	7%		
75	24%	28%	13%	13%	42%	42%	3%	3%	0%	0%	10%	10%	3%	3%	48%	71%	57%	71%	68%	81%	17%	17%	3%	3%	27%	27%		
80	28%	32%	23%	23%	52%	52%	3%	3%	0%	0%	13%	13%	3%	3%	58%	71%	57%	79%	68%	81%	17%	20%	10%	10%	30%	33%		
85	31%	35%	26%	26%	55%	55%	7%	7%	0%	0%	13%	17%	3%	3%	61%	77%	64%	82%	71%	81%	20%	23%	16%	16%	40%	40%		
90	36%	41%	35%	35%	58%	58%	10%	10%	3%	3%	20%	20%	3%	6%	65%	81%	68%	86%	71%	84%	20%	23%	19%	19%	63%	63%		
95	41%	45%	45%	45%	65%	65%	17%	17%	10%	10%	27%	27%	3%	10%	68%	84%	71%	86%	74%	84%	20%	23%	26%	26%	70%	70%		
100	46%	49%	52%	52%	71%	71%	17%	17%	13%	13%	33%	37%	6%	13%	71%	84%	71%	86%	81%	84%	23%	27%	35%	35%	77%	77%		
105	49%	52%	58%	58%	71%	71%	17%	17%	16%	16%	43%	47%	10%	13%	71%	84%	79%	86%	81%	84%	27%	30%	39%	39%	80%	80%		
110	53%	55%	65%	65%	71%	71%	23%	23%	19%	19%	43%	47%	16%	19%	77%	87%	82%	86%	81%	84%	27%	30%	48%	48%	83%	83%		
115	56%	58%	68%	68%	71%	71%	27%	27%	19%	19%	50%	50%	26%	29%	81%	87%	86%	89%	84%	84%	30%	33%	55%	55%	83%	83%		
120	59%	61%	71%	71%	71%	71%	27%	27%	23%	23%	57%	57%	29%	35%	84%	90%	86%	93%	84%	84%	30%	33%	58%	58%	87%	87%		
125	60%	62%	71%	71%	74%	74%	27%	27%	23%	23%	57%	57%	32%	35%	84%	90%	86%	93%	84%	84%	30%	43%	65%	65%	87%	87%		
130	64%	66%	81%	81%	81%	81%	30%	30%	26%	26%	60%	60%	39%	39%	87%	90%	86%	96%	84%	84%	33%	43%	68%	68%	93%	93%		
135	65%	67%	84%	84%	81%	81%	30%	30%	26%	26%	60%	63%	39%	39%	90%	90%	86%	96%	84%	84%	33%	43%	71%	71%	93%	93%		
140	66%	68%	84%	84%	81%	81%	33%	33%	29%	29%	63%	67%	42%	42%	90%	94%	89%	100%	84%	84%	33%	43%	71%	71%	97%	97%		
145	70%	72%	90%	90%	84%	84%	37%	37%	32%	32%	70%	70%	48%	52%	90%	94%	93%	100%	84%	84%	37%	47%	77%	77%	100%	100%		
150	72%	72%	90%	90%	87%	87%	37%	37%	32%	32%	70%	70%	48%	52%	94%	94%	93%	100%	84%	84%	47%	47%	77%	77%	100%	100%		
155	72%	74%	94%	94%	90%	90%	37%	37%	32%	32%	70%	70%	48%	52%	94%	94%	96%	100%	84%	90%	47%	53%	77%	77%	100%	100%		
160	73%	75%	94%	94%	90%	90%	40%	40%	32%	32%	70%	70%	52%	52%	94%	94%	96%	100%	84%	94%	47%	57%	81%	81%	100%	100%		
165	74%	76%	94%	94%	90%	90%	40%	40%	32%	32%	73%	73%	52%	55%	94%	94%	100%	100%	84%	94%	47%	60%	81%	81%	100%	100%		
170	75%	78%	94%	94%	90%	90%	40%	40%	45%	45%	73%	73%	55%	61%	94%	97%	100%	100%	84%	94%	47%	63%	81%	81%	100%	100%		
175	77%	80%	94%	94%	90%	90%	43%	43%	52%	52%	73%	73%	55%	61%	97%	97%	100%	100%	84%	94%	50%	70%	84%	84%	100%	100%		
180	79%	81%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	58%	61%	97%	97%	100%	100%	90%	97%	57%	70%	87%	87%	100%	100%		
185	79%	81%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	61%	68%	97%	97%	100%	100%	94%	97%	60%	70%	87%	87%	100%	100%		
190	81%	82%	94%	94%	90%	90%	50%	50%	58%	58%	77%	77%	65%	68%	97%	97%	100%	100%	94%	97%	63%	70%	90%	90%	100%	100%		
195	83%	84%	94%	94%	90%	90%	50%	50%	65%	65%	87%	87%	65%	68%	97%	97%	100%	100%	94%	97%	67%	73%	90%	90%	100%	100%		
200	84%	85%	97%	97%	94%	94%	50%	50%	65%	65%	90%	90%	68%	68%	97%	97%	100%	100%	94%	97%	70%	73%	90%	90%	100%	100%		
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	104%	100%	100%	100%	100%	100%	100%	100%	100%		

# CPWES Flow statistics for Rakaia River

Typical Year 1989/90			20/25/240 CPW CPW						Rakaia River																	
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
55	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	
60	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%	
65	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	20%	20%	
70	6%	6%	0%	0%	0%	0%	37%	37%	3%	3%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	0%	0%	0%	23%	23%	
75	9%	9%	0%	0%	0%	0%	70%	70%	6%	6%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	0%	0%	0%	27%	27%	
80	12%	12%	0%	0%	0%	0%	97%	97%	6%	6%	0%	0%	0%	0%	0%	0%	0%	13%	13%	0%	0%	0%	0%	27%	27%	
85	15%	15%	0%	0%	16%	16%	100%	100%	10%	10%	0%	0%	0%	0%	0%	0%	0%	16%	16%	0%	0%	0%	0%	33%	33%	
90	18%	18%	0%	0%	45%	45%	100%	100%	10%	10%	0%	0%	0%	0%	0%	0%	0%	19%	19%	0%	0%	0%	0%	37%	37%	
95	24%	24%	16%	16%	74%	74%	100%	100%	19%	19%	0%	0%	0%	0%	0%	0%	0%	19%	19%	10%	10%	0%	0%	47%	47%	
100	30%	30%	32%	32%	90%	90%	100%	100%	42%	42%	0%	0%	0%	0%	0%	0%	0%	23%	23%	20%	20%	0%	0%	57%	57%	
105	35%	35%	42%	42%	94%	94%	100%	100%	61%	61%	0%	0%	3%	3%	0%	0%	0%	23%	23%	40%	40%	0%	0%	57%	57%	
110	39%	40%	55%	55%	100%	100%	100%	100%	81%	81%	0%	0%	3%	3%	0%	0%	0%	32%	32%	43%	47%	0%	0%	57%	57%	
115	43%	43%	65%	65%	100%	100%	100%	100%	94%	94%	0%	0%	6%	6%	0%	0%	0%	45%	45%	47%	47%	0%	0%	60%	60%	
120	46%	47%	68%	68%	100%	100%	100%	100%	94%	94%	0%	0%	13%	13%	0%	0%	0%	68%	68%	47%	53%	0%	0%	60%	60%	
125	49%	49%	71%	71%	100%	100%	100%	100%	97%	97%	0%	0%	26%	26%	0%	0%	4%	4%	71%	71%	53%	53%	0%	3%	63%	63%
130	52%	52%	77%	77%	100%	100%	100%	100%	97%	97%	7%	7%	29%	29%	0%	0%	11%	11%	74%	74%	53%	57%	3%	3%	63%	63%
135	56%	57%	84%	84%	100%	100%	100%	100%	97%	97%	20%	20%	29%	29%	0%	0%	46%	46%	77%	77%	57%	60%	3%	3%	63%	63%
140	59%	60%	84%	84%	100%	100%	100%	100%	100%	100%	30%	30%	32%	32%	3%	3%	61%	61%	77%	77%	57%	60%	3%	3%	67%	67%
145	62%	62%	87%	87%	100%	100%	100%	100%	100%	100%	40%	40%	35%	35%	6%	6%	68%	68%	77%	77%	60%	60%	3%	10%	67%	67%
150	64%	66%	90%	90%	100%	100%	100%	100%	100%	100%	47%	47%	39%	39%	13%	13%	71%	79%	77%	81%	60%	67%	3%	13%	67%	67%
155	66%	68%	90%	94%	100%	100%	100%	100%	100%	100%	53%	53%	42%	42%	16%	16%	79%	79%	77%	81%	67%	67%	3%	16%	70%	70%
160	69%	70%	94%	94%	100%	100%	100%	100%	100%	100%	63%	63%	42%	42%	16%	16%	79%	86%	81%	81%	67%	67%	13%	16%	77%	77%
165	71%	72%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	48%	48%	23%	23%	82%	89%	81%	81%	67%	67%	13%	19%	77%	77%
170	72%	73%	97%	97%	100%	100%	100%	100%	100%	100%	63%	63%	52%	52%	26%	32%	86%	89%	81%	84%	67%	67%	19%	19%	77%	77%
175	72%	75%	97%	97%	100%	100%	100%	100%	100%	100%	63%	67%	52%	52%	29%	39%	86%	93%	81%	87%	67%	70%	19%	19%	77%	77%
180	73%	76%	97%	97%	100%	100%	100%	100%	100%	100%	67%	70%	52%	55%	32%	42%	86%	93%	81%	87%	67%	70%	19%	23%	77%	77%
185	75%	77%	97%	97%	100%	100%	100%	100%	100%	100%	67%	70%	55%	55%	39%	42%	89%	93%	81%	87%	67%	70%	19%	26%	83%	83%
190	76%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	48%	89%	93%	81%	87%	67%	70%	23%	32%	87%	87%
195	76%	79%	97%	97%	100%	100%	100%	100%	100%	100%	70%	77%	55%	55%	42%	52%	89%	93%	81%	87%	70%	73%	26%	32%	87%	87%
200	77%	80%	100%	100%	100%	100%	100%	100%	100%	100%	70%	80%	55%	55%	42%	52%	93%	93%	84%	87%	70%	73%	26%	35%	90%	90%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%



Wet Year 1995/96			20/25/240 CPW CPW						Rakaia River																	
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
55	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
65	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
70	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
75	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
80	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
85	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
90	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
95	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
100	3%	3%	0%	0%	32%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%
105	6%	6%	0%	0%	42%	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	7%	7%	0%	0%	17%	17%
110	8%	8%	0%	0%	55%	55%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	7%	7%	3%	3%	7%	7%	0%	0%	27%	27%
115	12%	12%	0%	3%	55%	55%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	7%	7%	26%	26%	7%	7%	0%	0%	37%	37%
120	14%	15%	13%	13%	55%	55%	0%	0%	0%	0%	0%	0%	0%	10%	10%	11%	11%	35%	35%	7%	7%	0%	0%	40%	43%	
125	20%	21%	45%	52%	58%	58%	0%	0%	0%	0%	0%	0%	0%	10%	10%	25%	25%	45%	45%	7%	7%	0%	3%	47%	47%	
130	25%	26%	71%	77%	61%	65%	0%	0%	0%	0%	0%	0%	0%	13%	13%	29%	29%	52%	52%	7%	7%	3%	6%	60%	60%	
135	29%	29%	87%	87%	65%	68%	0%	0%	0%	0%	0%	0%	0%	23%	23%	32%	32%	55%	55%	7%	7%	6%	6%	70%	70%	
140	32%	32%	97%	97%	71%	74%	0%	3%	0%	0%	0%	0%	0%	26%	26%	32%	32%	58%	58%	7%	7%	13%	13%	77%	77%	
145	35%	36%	97%	97%	77%	81%	3%	3%	0%	0%	0%	0%	0%	32%	32%	36%	36%	61%	61%	7%	7%	19%	23%	80%	87%	
150	37%	37%	97%	97%	81%	81%	3%	3%	0%	0%	0%	0%	0%	39%	39%	36%	39%	61%	61%	7%	7%	32%	32%	87%	87%	
155	38%	39%	97%	97%	87%	87%	3%	3%	0%	3%	0%	0%	0%	45%	45%	39%	39%	61%	68%	7%	7%	32%	32%	87%	87%	
160	41%	43%	100%	100%	94%	94%	3%	3%	0%	10%	10%	10%	0%	0%	45%	45%	39%	43%	61%	71%	7%	7%	35%	39%	90%	90%
165	42%	45%	100%	100%	94%	94%	3%	3%	3%	16%	13%	13%	0%	0%	48%	55%	39%	46%	65%	71%	7%	7%	42%	45%	93%	93%
170	44%	47%	100%	100%	94%	94%	3%	3%	6%	19%	17%	20%	0%	0%	55%	55%	39%	50%	68%	71%	7%	7%	45%	48%	93%	97%
175	47%	51%	100%	100%	97%	97%	7%	7%	10%	23%	23%	37%	0%	0%	55%	58%	43%	54%	71%	77%	7%	7%	48%	52%	97%	97%
180	49%	54%	100%	100%	97%	97%	10%	10%	16%	26%	30%	50%	0%	0%	58%	68%	43%	61%	71%	77%	7%	10%	52%	52%	100%	100%
185	51%	56%	100%	100%	97%	97%	10%	10%	16%	29%	50%	60%	0%	0%	58%	71%	46%	61%	71%	77%	10%	10%	55%	58%	100%	100%
190	52%	57%	100%	100%	97%	97%	10%	10%	19%	32%	50%	67%	0%	0%	65%	71%	46%	61%	71%	77%	10%	10%	55%	58%	100%	100%
195	53%	60%	100%	100%	100%	100%	13%	13%	19%	35%	53%	73%	0%	3%	65%	81%	50%	61%	71%	81%	10%	13%	55%	58%	100%	100%
200	56%	62%	100%	100%	100%	100%	20%	20%	23%	39%	57%	77%	0%	6%	68%	81%	50%	61%	71%	81%	17%	17%	61%	61%	100%	100%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	104%	100%	100%	100%	100%	100%	100%	100%	100%

# CPWES Flow statistics for Waimakariri River

Typical Year 1989/90		20/25/240 CPW CPW																				Waimakariri River				
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
35	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%	0%	0%	0%
40	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	13%	13%	27%	27%	0%	0%	0%	0%
45	29%	41%	0%	0%	0%	0%	70%	73%	23%	23%	23%	30%	35%	42%	0%	35%	79%	100%	71%	81%	50%	70%	0%	0%	0%	50%
50	37%	49%	6%	10%	35%	45%	83%	83%	23%	23%	33%	37%	35%	48%	3%	42%	89%	100%	74%	84%	53%	73%	0%	0%	10%	53%
55	43%	54%	19%	19%	65%	68%	83%	83%	23%	23%	37%	43%	35%	48%	13%	52%	93%	100%	77%	84%	53%	73%	0%	0%	27%	60%
60	50%	59%	26%	26%	74%	77%	90%	97%	23%	26%	43%	47%	42%	48%	23%	61%	100%	100%	81%	87%	63%	77%	0%	0%	37%	63%
65	53%	62%	35%	35%	81%	81%	97%	97%	23%	32%	47%	50%	42%	52%	29%	68%	100%	100%	81%	87%	63%	77%	0%	6%	47%	63%
70	56%	65%	42%	42%	84%	87%	97%	97%	29%	32%	53%	60%	42%	52%	35%	68%	100%	100%	81%	87%	70%	80%	0%	6%	50%	70%
75	60%	69%	48%	48%	87%	87%	100%	100%	39%	45%	53%	63%	48%	58%	42%	74%	100%	100%	84%	87%	73%	83%	0%	13%	53%	73%
80	63%	70%	52%	52%	90%	90%	100%	100%	45%	45%	60%	63%	48%	61%	52%	74%	100%	100%	84%	87%	73%	83%	0%	13%	60%	80%
85	67%	73%	61%	61%	90%	90%	100%	100%	48%	52%	67%	67%	48%	61%	61%	74%	100%	100%	87%	90%	77%	83%	0%	16%	63%	80%
90	69%	75%	65%	65%	94%	94%	100%	100%	52%	52%	67%	70%	52%	61%	68%	81%	100%	100%	87%	90%	77%	87%	6%	19%	63%	87%
95	71%	78%	71%	71%	94%	94%	100%	100%	58%	58%	67%	70%	52%	65%	68%	81%	100%	100%	87%	94%	80%	87%	6%	29%	70%	90%
100	74%	79%	77%	77%	94%	94%	100%	100%	65%	65%	70%	70%	58%	65%	74%	81%	100%	100%	87%	94%	83%	87%	13%	29%	73%	90%
105	76%	80%	81%	81%	97%	97%	100%	100%	68%	68%	70%	70%	61%	68%	74%	81%	100%	100%	87%	94%	83%	87%	13%	32%	80%	90%
110	78%	84%	87%	87%	97%	97%	100%	100%	74%	77%	80%	80%	61%	68%	74%	84%	100%	100%	90%	94%	83%	90%	16%	42%	80%	97%
115	81%	85%	90%	90%	97%	97%	100%	100%	77%	77%	80%	80%	61%	68%	81%	87%	100%	100%	90%	97%	87%	90%	19%	42%	87%	97%
120	83%	86%	94%	94%	97%	97%	100%	100%	81%	81%	80%	80%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	42%	90%	97%
125	84%	87%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	65%	68%	81%	87%	100%	100%	94%	97%	87%	90%	29%	45%	90%	97%
130	84%	87%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	68%	81%	87%	100%	100%	94%	97%	87%	90%	32%	48%	90%	97%
135	86%	88%	97%	97%	100%	100%	100%	100%	84%	84%	80%	83%	68%	71%	84%	90%	100%	100%	94%	97%	90%	90%	42%	48%	97%	97%
140	87%	89%	97%	97%	100%	100%	100%	100%	87%	90%	87%	87%	68%	71%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%
145	88%	90%	97%	97%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	42%	48%	97%	97%
150	88%	90%	97%	97%	100%	100%	100%	100%	90%	90%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	45%	52%	97%	100%
155	89%	91%	97%	97%	100%	100%	100%	100%	94%	94%	90%	90%	68%	74%	87%	90%	100%	100%	97%	97%	90%	93%	48%	55%	97%	100%
160	90%	92%	100%	100%	100%	100%	100%	100%	94%	94%	90%	90%	71%	74%	90%	90%	100%	100%	97%	97%	90%	93%	48%	61%	97%	100%
165	90%	93%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	71%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	68%	97%	100%
170	90%	93%	100%	100%	100%	100%	100%	100%	97%	97%	90%	90%	74%	74%	90%	94%	100%	100%	97%	97%	93%	93%	48%	71%	97%	100%
175	91%	93%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	74%	90%	94%	100%	100%	97%	97%	93%	97%	52%	71%	100%	100%
180	92%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	55%	74%	100%	100%
185	92%	94%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	90%	94%	100%	100%	97%	97%	93%	97%	61%	77%	100%	100%
190	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	68%	77%	100%	100%
195	93%	95%	100%	100%	100%	100%	100%	100%	97%	97%	93%	93%	74%	77%	94%	97%	100%	100%	97%	100%	93%	97%	71%	77%	100%	100%
200	94%	95%	100%	100%	100%	100%	100%	100%	97%	97%	97%	97%	74%	77%	94%	97%	100%	100%	97%	100%	97%	97%	71%	81%	100%	100%
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Dry Year 1970/71			20/25/240 CPW CPW						Waimakariri River																									
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June									
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	12%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	39%	61%	61%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
35	21%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	61%	61%	84%	84%	87%	87%	19%	19%	0%	0%	0%	0%	0%	0%	0%	0%		
40	30%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	16%	86%	86%	100%	100%	100%	100%	61%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
45	39%	61%	0%	52%	0%	65%	0%	0%	0%	0%	0%	17%	26%	68%	71%	87%	96%	100%	100%	100%	100%	100%	100%	81%	100%	0%	40%	0%	0%	0%	0%			
50	46%	62%	6%	55%	19%	68%	0%	0%	0%	0%	0%	20%	39%	71%	74%	87%	96%	100%	100%	100%	100%	100%	100%	97%	100%	23%	50%	0%	0%	0%	0%			
55	52%	63%	26%	58%	42%	68%	0%	0%	0%	0%	10%	20%	45%	74%	81%	90%	96%	100%	100%	100%	100%	100%	100%	100%	100%	30%	50%	0%	0%	0%	0%			
60	57%	65%	39%	65%	55%	74%	0%	0%	0%	0%	17%	20%	58%	77%	84%	94%	96%	100%	100%	100%	100%	100%	100%	100%	100%	37%	53%	0%	0%	0%	0%			
65	59%	66%	39%	65%	61%	74%	0%	0%	0%	0%	20%	23%	61%	81%	84%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%	53%	0%	0%	0%	0%			
70	61%	66%	52%	65%	65%	74%	0%	0%	0%	0%	20%	23%	68%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%	53%	0%	0%	0%	0%			
75	63%	67%	55%	68%	68%	74%	0%	0%	0%	0%	23%	27%	71%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	57%	0%	0%	0%	0%			
80	64%	69%	58%	77%	68%	77%	0%	0%	0%	0%	27%	30%	74%	87%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	57%	0%	0%	0%	0%			
85	66%	69%	65%	77%	74%	81%	0%	0%	0%	0%	30%	33%	77%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	57%	0%	0%	0%	0%			
90	67%	71%	65%	81%	74%	81%	0%	0%	0%	0%	40%	43%	81%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	60%	0%	0%	0%	0%			
95	69%	73%	65%	84%	74%	81%	0%	0%	10%	13%	43%	47%	84%	87%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	53%	67%	0%	0%	0%	0%			
100	71%	75%	68%	90%	74%	81%	0%	0%	19%	19%	50%	50%	84%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	70%	0%	0%	0%	0%			
105	73%	76%	77%	90%	77%	81%	0%	0%	23%	29%	53%	53%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	70%	0%	0%	0%	0%			
110	74%	78%	77%	94%	81%	84%	0%	0%	32%	32%	53%	57%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	57%	73%	0%	0%	0%	0%			
115	75%	78%	81%	94%	81%	84%	0%	0%	32%	32%	63%	63%	87%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	73%	0%	0%	0%	0%			
120	77%	79%	84%	94%	81%	84%	0%	0%	42%	42%	63%	63%	87%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	67%	73%	0%	0%	0%	0%			
125	79%	80%	90%	94%	81%	84%	0%	0%	42%	45%	70%	70%	90%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	73%	0%	0%	0%	0%			
130	80%	81%	90%	97%	81%	84%	0%	0%	48%	52%	73%	73%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	70%	77%	0%	0%	0%	0%			
135	81%	83%	94%	97%	84%	87%	0%	0%	55%	61%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	77%	0%	0%	0%	0%			
140	82%	84%	94%	97%	84%	87%	0%	0%	68%	77%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	80%	0%	0%	0%	0%			
145	83%	85%	94%	97%	84%	87%	0%	0%	74%	84%	77%	77%	94%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	83%	0%	0%	0%	0%			
150	83%	86%	94%	97%	84%	87%	0%	3%	74%	84%	80%	80%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	73%	83%	0%	0%	0%	0%			
155	85%	87%	97%	100%	84%	87%	0%	3%	81%	84%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	77%	87%	0%	0%	0%	0%			
160	85%	87%	97%	100%	87%	87%	0%	7%	84%	84%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	77%	87%	0%	0%	0%	0%			
165	86%	88%	97%	100%	87%	87%	0%	10%	87%	87%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%	93%	0%	0%	0%	0%			
170	86%	88%	97%	100%	87%	90%	0%	10%	87%	87%	83%	83%	94%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	93%	0%	0%	0%	0%			
175	87%	89%	97%	100%	87%	90%	3%	10%	87%	87%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	93%	0%	0%	0%	0%			
180	88%	89%	100%	100%	87%	90%	3%	10%	87%	87%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	93%	0%	0%	0%	0%			
185	88%	90%	100%	100%	87%	90%	7%	17%	90%	90%	90%	90%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	87%	93%	0%	0%	0%	0%			
190	89%	90%	100%	100%	87%	90%	10%	17%	94%	94%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%			
195	90%	91%	100%	100%	90%	90%	10%	17%	97%	97%	90%	90%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%			
200	90%	91%	100%	100%	90%	90%	10%	17%	100%	100%	93%	93%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	93%	93%	0%	0%	0%	0%			
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		

Wet Year 1995/96			20/25/240 CPW CPW						Waimakariri River																			
Flow	Full Year		July		August		September		October		November		December		January		February		March		April		May		June			
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After		
5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
45	4%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	35%	11%	50%	29%	61%	10%	10%	0%	0%	0%	0%	0%		
50	7%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	39%	18%	54%	45%	65%	10%	10%	0%	0%	0%	0%	0%			
55	9%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	48%	25%	57%	55%	68%	10%	10%	0%	0%	0%	0%	0%	0%			
60	11%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	58%	36%	61%	55%	68%	10%	10%	0%	0%	0%	0%	0%	0%			
65	12%	18%	0%	0%	0%	0%	0%	0%	0%	7%	7%	35%	61%	43%	64%	61%	71%	10%	10%	0%	0%	0%	0%	0%	0%			
70	16%	21%	3%	3%	19%	26%	0%	0%	0%	0%	7%	7%	35%	65%	50%	68%	61%	71%	13%	13%	0%	0%	3%	3%	3%	3%		
75	21%	26%	13%	13%	39%	39%	0%	0%	0%	0%	10%	10%	3%	3%	39%	68%	54%	71%	65%	74%	13%	13%	3%	3%	23%	23%		
80	27%	31%	23%	23%	52%	52%	3%	3%	0%	0%	10%	10%	3%	3%	48%	71%	57%	71%	68%	81%	17%	17%	10%	10%	30%	30%		
85	29%	33%	26%	26%	52%	52%	3%	3%	0%	0%	13%	13%	3%	3%	58%	74%	61%	79%	68%	81%	17%	20%	13%	13%	40%	40%		
90	34%	38%	32%	32%	58%	58%	7%	7%	0%	0%	17%	17%	3%	3%	61%	77%	64%	86%	71%	81%	20%	23%	19%	19%	57%	57%		
95	39%	44%	45%	45%	65%	65%	13%	13%	10%	10%	20%	20%	3%	6%	65%	84%	68%	86%	71%	84%	20%	23%	23%	23%	70%	70%		
100	44%	48%	52%	52%	68%	71%	17%	17%	10%	10%	27%	27%	6%	13%	68%	84%	71%	86%	74%	84%	20%	23%	35%	35%	77%	77%		
105	47%	50%	58%	58%	71%	71%	17%	17%	13%	13%	33%	37%	6%	13%	71%	84%	71%	86%	81%	84%	23%	27%	39%	39%	80%	80%		
110	51%	54%	61%	61%	71%	71%	23%	23%	16%	16%	43%	47%	10%	13%	74%	87%	79%	86%	81%	84%	27%	30%	45%	45%	83%	83%		
115	54%	56%	68%	68%	71%	71%	23%	23%	19%	19%	47%	50%	16%	19%	77%	87%	86%	86%	81%	84%	27%	30%	55%	55%	83%	83%		
120	57%	59%	71%	71%	71%	71%	27%	27%	19%	19%	50%	50%	26%	29%	84%	90%	86%	93%	84%	84%	30%	33%	58%	58%	83%	83%		
125	59%	61%	71%	71%	74%	74%	27%	27%	23%	23%	57%	57%	29%	35%	84%	90%	86%	93%	84%	84%	30%	33%	65%	65%	87%	87%		
130	62%	64%	77%	77%	81%	81%	27%	27%	23%	23%	57%	57%	35%	39%	87%	90%	86%	93%	84%	84%	30%	40%	68%	68%	90%	90%		
135	65%	66%	84%	84%	81%	81%	30%	30%	26%	26%	60%	60%	39%	39%	90%	90%	86%	96%	84%	84%	33%	40%	71%	71%	93%	93%		
140	65%	67%	84%	84%	81%	81%	30%	30%	26%	26%	60%	63%	39%	39%	90%	90%	86%	96%	84%	84%	33%	40%	71%	71%	97%	97%		
145	68%	70%	84%	84%	84%	84%	33%	33%	32%	32%	63%	67%	42%	42%	90%	94%	93%	100%	84%	84%	33%	40%	77%	77%	100%	100%		
150	70%	72%	90%	90%	87%	87%	37%	37%	32%	32%	70%	70%	48%	52%	90%	94%	93%	100%	84%	84%	37%	43%	77%	77%	100%	100%		
155	72%	73%	94%	94%	87%	87%	37%	37%	32%	32%	70%	70%	48%	52%	94%	94%	93%	100%	84%	84%	47%	47%	77%	77%	100%	100%		
160	73%	74%	94%	94%	90%	90%	40%	40%	32%	32%	70%	70%	48%	52%	94%	94%	96%	100%	84%	90%	47%	50%	81%	81%	100%	100%		
165	73%	75%	94%	94%	90%	90%	40%	40%	32%	32%	73%	73%	52%	52%	94%	94%	96%	100%	84%	94%	47%	57%	81%	81%	100%	100%		
170	74%	76%	94%	94%	90%	90%	40%	40%	35%	35%	73%	73%	52%	55%	94%	94%	100%	100%	84%	94%	47%	57%	81%	81%	100%	100%		
175	76%	78%	94%	94%	90%	90%	43%	43%	45%	45%	73%	73%	55%	61%	94%	97%	100%	100%	84%	94%	47%	60%	84%	84%	100%	100%		
180	77%	80%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	55%	61%	97%	97%	100%	100%	84%	94%	50%	63%	87%	87%	100%	100%		
185	79%	81%	94%	94%	90%	90%	43%	43%	55%	55%	73%	73%	58%	65%	97%	97%	100%	100%	90%	97%	57%	67%	87%	87%	100%	100%		
190	80%	81%	94%	94%	90%	90%	43%	43%	55%	55%	77%	77%	61%	68%	97%	97%	100%	100%	94%	97%	63%	67%	90%	90%	100%	100%		
195	82%	83%	94%	94%	90%	90%	50%	50%	58%	58%	83%	83%	65%	68%	97%	97%	100%	100%	94%	97%	63%	67%	90%	90%	100%	100%		
200	84%	84%	97%	97%	94%	94%	50%	50%	65%	65%	87%	87%	68%	68%	97%	97%	100%	100%	94%	97%	67%	67%	90%	90%	100%	100%		
3500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	104%	104%	100%	100%	100%	100%	100%	100%	100%	100%		

## CPWES Flow statistics for Discharge from Storage

Typical Year 1989/90		20/25/240 CPW NTPL Storage data											
Discharge (m3/s)	Full Year	July	August	September	October	November	December	January	February	March	April	May	June
5	78%	100%	100%	100%	100%	87%	58%	68%	4%	22%	77%	100%	100%
10	80%	100%	100%	100%	100%	90%	69%	71%	8%	22%	77%	100%	100%
15	82%	100%	100%	100%	100%	93%	73%	77%	13%	26%	80%	100%	100%
20	84%	100%	100%	100%	100%	97%	73%	84%	13%	33%	83%	100%	100%
25	87%	100%	100%	100%	100%	100%	73%	87%	21%	44%	93%	100%	100%
30	89%	100%	100%	100%	100%	100%	81%	97%	21%	56%	100%	100%	100%
35	93%	100%	100%	100%	100%	100%	88%	100%	38%	74%	100%	100%	100%
40	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Dry Year 1970/71		20/25/240 CPW NTPL Storage data											
Discharge (m3/s)	Full Year	July	August	September	October	November	December	January	February	March	April	May	June
5	73%	100%	100%	100%	100%	83%	39%	4%	0%	45%	100%	90%	100%
10	75%	100%	100%	100%	100%	87%	39%	11%	4%	45%	100%	100%	100%
15	76%	100%	100%	100%	100%	87%	48%	18%	4%	45%	100%	100%	100%
20	79%	100%	100%	100%	100%	90%	52%	39%	15%	45%	100%	100%	100%
25	83%	100%	100%	100%	100%	93%	65%	50%	27%	48%	100%	100%	100%
30	86%	100%	100%	100%	100%	100%	77%	50%	42%	48%	100%	100%	100%
35	90%	100%	100%	100%	100%	100%	87%	71%	58%	58%	100%	100%	100%
40	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Wet Year 1995/96		20/25/240 CPW NTPL Storage data											
Discharge (m3/s)	Full Year	July	August	September	October	November	December	January	February	March	April	May	June
5	88%	100%	100%	100%	100%	100%	100%	39%	62%	65%	93%	100%	100%
10	90%	100%	100%	100%	100%	100%	100%	48%	66%	74%	93%	100%	100%
15	93%	100%	100%	100%	100%	100%	100%	71%	69%	77%	93%	100%	100%
20	94%	100%	100%	100%	100%	100%	100%	74%	69%	87%	100%	100%	100%
25	96%	100%	100%	100%	100%	100%	100%	81%	79%	94%	100%	100%	100%
30	98%	100%	100%	100%	100%	100%	100%	90%	83%	97%	100%	100%	100%
35	98%	100%	100%	100%	100%	100%	100%	97%	86%	97%	100%	100%	100%
40	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**20-25-240-CPW NTPL**

Takes from Rakaia River by CPWES

	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM
Min	0.0	0.7	0.0	1.3	0.0	1.5	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	0.2	0.0	0.6	0.0	2.0
Average	7.6	20.5	5.7	14.8	5.0	15.0	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	2.6	7.8	4.0	11.1	7.7	20.6
Max	19.9	44.9	19.9	42.5	19.9	36.1	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	19.9	29.8	19.9	40.6	19.9	49.5
Median	2.2	20.4	0.0	14.3	0.0	14.7	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	1.0	4.1	1.0	8.7	3.6	16.9

Takes from Rakaia River by CPWES and ACWT

Min	0.0	1.3	0.0	2.5	0.0	2.8	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	2.0	0.0	3.4	0.0	5.3
Average	15.7	42.1	11.0	28.6	9.9	29.9	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	18.1	53.2	16.6	45.6	19.1	51.1
Max	54.6	96.4	51.0	80.4	44.2	68.2	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	54.6	119.4	54.6	91.6	54.6	124.6
Median	4.3	42.6	0.0	28.1	0.0	29.3	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	11.5	46.7	7.2	44.2	9.2	40.6

Takes from Waimakariri River by CPWES

Min	0.0	8.2	0.0	0.6	0.0	6.9	0.0	1.4	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.4	0.0	6.0
Average	11.9	32.0	9.2	24.6	10.0	30.4	11.8	31.6	12.8	36.3	9.7	32.7	7.0	21.9	5.3	20.8	4.1	15.8	3.7	10.9	7.1	19.1	15.0	40.3
Max	25.0	67.0	25.0	50.6	25.0	61.6	25.0	64.8	25.0	67.0	25.0	64.8	25.0	66.2	25.0	67.0	25.0	64.8	25.0	66.5	25.0	63.8	25.0	63.6
Median	10.5	28.0	2.8	22.0	3.2	30.2	8.2	31.5	10.9	41.5	3.0	40.2	0.0	7.0	0.0	2.7	0.0	1.6	1.0	5.2	2.7	16.2	16.5	40.7

**20-25-240 Synlait NTPL**

Takes from Rakaia River by CPWES

	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM
Min	0.0	0.4	0.0	0.7	0.0	1.1	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	0.2	0.0	0.6	0.0	1.5
Average	6.2	16.6	4.5	11.6	4.0	12.2	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	2.4	7.0	3.4	9.4	6.2	16.7
Max	16.5	35.9	16.5	34.4	16.5	28.5	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	16.5	27.1	16.5	32.8	16.5	40.5
Median	1.1	16.2	0.0	11.6	0.0	12.0	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	1.0	4.1	1.0	7.0	1.1	13.3

Takes from Rakaia River by CPWES and ACWT

Min	0.0	1.0	0.0	1.9	0.0	2.5	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	1.7	0.0	3.2	0.0	4.9
Average	14.3	38.2	9.8	25.4	9.0	27.1	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	17.9	52.5	16.0	43.9	17.6	47.3
Max	51.2	92.7	47.6	72.3	40.9	60.6	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	51.2	116.6	51.2	84.9	51.2	119.1
Median	3.2	38.3	0.0	24.9	0.0	26.7	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	10.6	46.7	6.5	41.7	5.9	36.8

Takes from Waimakariri River by CPWES

Min	0.0	8.2	0.0	0.6	0.0	6.9	0.0	1.4	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.1	0.0	6.0
Average	12.4	33.3	9.6	25.6	10.1	30.5	12.2	32.6	13.5	37.3	10.0	33.7	7.5	23.7	5.7	21.5	4.4	16.8	4.0	11.7	7.7	20.1	16.0	42.9
Max	25.0	67.0	25.0	59.3	25.0	61.6	25.0	64.8	25.0	67.0	25.0	64.8	25.0	66.2	25.0	67.0	25.0	64.8	25.0	66.5	25.0	63.8	25.0	65.4
Median	11.5	29.1	3.4	22.0	3.2	30.2	9.7	31.5	11.5	41.4	4.5	40.2	0.4	13.6	0.0	8.2	0.0	1.6	1.0	6.0	3.8	17.1	18.7	40.7

20-25-240 Synlait CPWES																								
Takes from Rakaia River by CPWES																								
	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM		
Min	0.0	0.4	0.0	0.7	0.0	1.1	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	0.2	0.0	0.6	0.0	1.5
Average	6.2	16.6	4.5	11.6	4.0	12.2	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	2.4	7.0	3.4	9.4	6.2	16.7
Max	16.5	35.9	16.5	34.4	16.5	28.5	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	16.5	27.1	16.5	32.8	16.5	40.5
Median	1.1	16.2	0.0	11.6	0.0	12.0	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	1.0	4.1	1.0	7.0	1.1	13.3
Takes from Rakaia River by CPWES and ACWT																								
Min	0.0	1.0	0.0	1.9	0.0	2.5	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	1.7	0.0	3.2	0.0	4.9
Average	14.3	38.2	9.8	25.4	9.0	27.1	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	17.9	52.5	16.0	43.9	17.6	47.3
Max	51.2	92.7	47.6	72.3	40.9	60.6	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	51.2	116.6	51.2	84.9	51.2	119.1
Median	3.2	38.3	0.0	24.9	0.0	26.7	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	10.6	46.7	6.5	41.7	5.9	36.8
Takes from Waimakariri River by CPWES																								
Min	0.0	13.8	0.0	0.7	0.0	0.8	0.0	2.0	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.1	0.0	13.4
Average	13.8	37.1	11.0	26.9	11.5	32.6	12.9	34.5	11.7	33.2	9.5	32.1	6.5	20.4	5.1	20.0	4.0	15.2	3.9	11.3	8.0	20.7	16.9	45.2
Max	25.0	67.0	25.0	60.1	25.0	64.0	25.0	64.8	25.0	67.0	25.0	64.8	25.0	66.7	25.0	67.0	25.0	64.8	25.0	66.8	25.0	64.5	25.0	65.5
Median	14.1	34.9	7.1	25.6	7.1	32.9	12.0	38.2	8.7	35.0	1.0	40.7	0.0	6.3	0.0	2.4	0.0	1.6	1.0	6.0	3.8	17.2	19.8	45.5
20-25-240 CPW CPW																								
Takes from Rakaia River by CPWES																								
	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM		
Min	0.0	0.7	0.0	1.3	0.0	1.5	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	0.2	0.0	0.6	0.0	2.0
Average	7.6	20.5	5.7	14.8	5.0	15.0	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	2.6	7.8	4.0	11.1	7.7	20.6
Max	19.9	44.9	19.9	42.5	19.9	36.1	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	19.9	29.8	19.9	40.6	19.9	49.5
Median	2.2	20.4	0.0	14.3	0.0	14.7	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	1.0	4.1	1.0	8.7	3.6	16.9
Takes from Rakaia River by CPWES and ACWT																								
Min	0.0	1.3	0.0	2.5	0.0	2.8	0.0	1.6	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.3	0.0	1.0	0.0	2.0	0.0	3.4	0.0	5.3
Average	15.7	42.1	11.0	28.6	9.9	29.9	5.6	15.1	2.9	7.9	0.8	2.0	0.7	2.1	0.7	2.1	0.8	2.3	18.1	53.2	16.6	45.6	19.1	51.1
Max	54.6	96.4	51.0	80.4	44.2	68.2	20.0	34.1	20.0	28.2	1.0	2.6	1.0	2.7	1.0	2.7	1.0	2.6	54.6	119.4	54.6	91.6	54.6	124.6
Median	4.3	42.6	0.0	28.1	0.0	29.3	2.9	14.6	1.0	6.9	1.0	2.2	1.0	2.4	1.0	2.3	1.0	2.6	11.5	46.7	7.2	44.2	9.2	40.6
Takes from Waimakariri River by CPWES																								
Min	0.0	13.8	0.0	0.7	0.0	0.8	0.0	2.0	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.4	0.0	13.4
Average	13.3	35.6	10.6	26.0	11.4	32.6	12.3	33.0	11.0	31.3	8.9	30.3	6.0	18.9	4.9	19.5	3.6	14.2	3.4	10.1	7.4	19.7	15.9	42.5
Max	25.0	67.0	25.0	53.5	25.0	64.0	25.0	64.8	25.0	67.0	25.0	64.8	25.0	66.7	25.0	67.0	25.0	64.8	25.0	66.8	25.0	64.5	25.0	65.5
Median	12.7	34.2	5.9	25.4	7.1	32.9	10.2	31.5	7.0	29.4	1.0	37.7	0.0	2.7	0.0	2.4	0.0	1.4	1.0	5.2	2.9	16.2	17.5	45.3
20-25-240 CPW NTPL Pumped Storage																								
Takes from Waimakariri River by CPWES																								
	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM		
Min	0.0	8.2	0.0	0.6	0.0	5.4	0.0	0.9	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.4	0.0	5.5
Average	11.7	31.4	9.1	24.4	9.3	28.1	5.9	15.7	6.8	19.5	5.3	16.7	4.8	15.1	4.0	13.9	1.8	7.1	3.7	11.0	7.0	18.7	14.8	39.7
Max	25.0	67.0	25.0	50.6	25.0	59.5	25.0	49.4	25.0	50.6	21.0	44.1	21.0	44.1	21.0	50.1	21.0	34.4	25.0	38.4	25.0	58.4	25.0	59.9
Median	10.2	27.2	2.8	22.0	3.1	26.9	1.1	13.2	4.3	17.1	1.0	17.1	0.3	7.0	0.8	5.0	0.0	2.1	1.0	5.2	2.4	16.2	16.3	39.8
Change in Waimakariri River take for pumped storage																								
	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM		
Min	0.0	0.0	0.0	0.0	0.0	-1.5	0.0	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	
Average	-0.2	-0.5	3.4	-0.3	4.3	-2.3	0.2	-15.8	3.9	-16.9	4.6	-15.9	4.1	-6.8	3.2	-6.9	1.0	-8.7	1.1	0.1	3.0	-0.4	7.1	-0.6
Max	0.0	0.0	5.1	0.0	5.1	-2.1	5.0	-15.4	5.0	-16.4	20.0	-20.7	20.0	-22.1	20.0	-16.8	20.0	-30.4	5.1	-28.1	5.1	-5.3	5.1	-3.7
Median	-0.3	-0.8	2.8	0.0	3.1	-3.3	-1.8	-18.2	3.3	-24.4	0.0	-23.1	-0.7	0.0	-0.2	2.3	-1.0	0.5	0.0	0.1	1.4	0.0	12.6	-0.8
Takes from Storage																								
	January		February		March		April		May		June		July		August		September		October		November		December	
	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM	m3/s	MCM		
Min	0.0	0.6	0.0	0.9	0.0	6.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.4
Average	14.4	41.1	20.7	50.7	14.5	38.9	4.3	16.4	0.8	5.4	0.0	0.0	0.0	0.4	0.0	0.3	0.1	0.6	0.2	1.5	1.5	5.7	6.5	17.8
Max	43.3	84.1	43.6	91.8	42.5	80.1	39.9	62.9	28.3	15.5	0.1	0.0	1.0	1.1	1.0	0.4	1.0	1.9	14.9	9.4	33.7	27.8	42.6	57.9
Median	9.7	37.7	24.2	51.0	10.7	35.8	0.0	9.6	0.0	3.3	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.5	0.0	0.7	0.0	2.4	0.0	12.4