



## WATER PLAN

# Australian Rogaining Championships 2023

30 September - 1 October 2023  
Goobang National Park, NSW

Top Valley Station  
Lake Endeavour Rd, Parkes NSW 2870

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<b>Date</b>	16/09/2023	<b>Date</b>		<b>Date</b>	
<b>Signed</b>	<i>Ronnie Taib</i>	<b>Signed</b>		<b>Signed</b>	

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## 1. RESPONSIBILITY

Water at the event, including all resupply, is the responsibility of the Event Coordinator Trevor Gollan.

## 2. ASSUMPTIONS

- a) The maximum number of competitors is 200 for the 24-hour event and 150 for the 8-hour event.
- b) There are up to 20 staff and volunteers at the Hash House (HH) and All-night café (ANC).
- c) There are no significant natural supplies of drinking water (creeks and dams).
- d) The location and time of year indicate that the weather will be cool to warm, though the plan provides for warmer than average conditions at the time (daytime mid 20s and altitude 400 to 700m). This will be assessed via BOM forecasts in the week prior to the event.
- e) All competitors will bring and start the event with their own supply of water (2-3 litres). Provision will be made for coach passengers (40 x 3 litres = 120 litres).
- f) Each 24-hour competitor will resupply with 7 litres during the event.
- g) Each 8-hour competitor will resupply with 4 litres during the event.
- h) Each staff and volunteer will use 3 litres of during the event.
- i) 240 litres additional water will be used at the HH and 100 litres at the ANC for food preparation and cleaning.
- j) Each person may use up to 4 litres at the HH pre/post event. This provides a large buffer in case of hot weather or more competitors travelling by coach.

## 3. WATER CAPABILITY

### Volunteers

The following volunteers are dedicated to water drops during the event:

- David Williams, Ronnie Taib
- Richard Sage, Nihal Danis
- Michael Watts
- Standby (at ANC): Nicole Mealing, Andrew Brown

The HH Coordinator Trevor Golan will be available at the HH at all times.

### Vehicles and roads

It is a 4WD road surface to all water points on the course. It may be rain effected and as such the available vehicles for water are:

Vehicle	Owner/Driver	Can act as safety and water patrol?
Large 4WD #1	Rental: David/Ronnie	Yes
Large 4WD #2	Richard/Nihal	Yes
Standby Large 4WD #3	Michael	Yes
Standby soft roader #4	Ronnie/Cecile	Yes – but not past ANC
Standby soft roader #5	David	Yes – but not past ANC

All vehicles will be refuelled on Friday afternoon.

### Communications

See *Safety plan* for details.

- 3/4/5G network on higher parts of the course.
- 1 satellite phone at HH.
- 1 satellite phone in patrol/water car #1.
- 1 satellite phone in patrol/water car #2.

## 4. WATER USAGE ESTIMATE

Table 1: Water user estimate.

	People	Usage (L/person)	Total (Litres)
Bus participants	40	3	120
24h participants	200	7	1400
8h participants	150	4	600
Staff and volunteers	20	3	60
Food preparation HH	1	240	240
Food preparation ANC	1	100	100
HH pre/post event buffer	370	4	1480
<b>Total</b>			<b>4000</b>

## 5. WATER ORDER

This plan is based on 4000L water needed for normal conditions, but 5000L of potable water will be delivered to the HH in case of unexpected exceptionally hot weather. The water will be dispatched to the ANC and water drops using 15/20/25L containers because access roads do not allow large vessel deliveries on the course. NSWRA can only transport/store around 31 containers. ACTRA (Canberra), Goldseekers Orienteers (Orange) and Orange Runners Club kindly offered to lend 25 and 12 containers, respectively, for this event, which will avoid buying containers only just to discard them at the end of the event. **Thanks, ACTRA, Goldseekers Orienteers and Orange Runners Club!** The following sections detail how the containers will be spread over the course to ensure smooth initial distribution and final collection.

### Water Vessels Used




A 5000L drinking water tank will be rented from Kennards in Parkes and delivered filled with potable water to the HH. The exact model is unknown but may look like:



Due to road conditions, no large vessels can be dispatched on the course and water will be dispatched and stocked at each location using 20-25L water cubes. At least one cube will have a dual-action pump allowing fast and safe water pumping without moving the cube at each location. The pump can be easily moved by competitors from an empty cube to another cube at the water drop. Simple taps will also be available on most spare cubes in case of a pump failure.

Coloured cable ties will be attached to each container and pump to easily identify their owner. They will avoid any markings or alterations to equipment and can be cut off afterwards.

Table 2: Water vessels and taps at ANC and water drops.

		
15/20/25L water cube. Several at each water drop.	Dual action pump. One at each water drop. Can be moved from cube to cube.	Simple tap. Mounted on most spare cubes.

## 6. WATER DISTRIBUTION

In addition to the HH and ANC, there will be six water drops. Table 3 details the expected visits and use per water location based on their position on the course and assuming an average 2.0L refill per participant per visit. It also includes other water uses at the HH and ANC as per Table 1.

The *Initial fill* column indicates how many litres of water will be available at each location at the start of the event (about 76% of the expected use by participants), which considers visits and remoteness of the locations.

Table 3: Expected usage and initial fill per water location (green: NSWRA containers; yellow: Goldseekers Orienteers + Orange Runners Club containers; blue: ACTRA containers).

	Visits (No people)	Expected use (L)	Other use (L)	Initial fill (L)	# 25L	# 20L	# 15L	Total No containers
HH	140	280	1900	100	1	0	5	6
ANC	250	500	100	160	0	8		8
W1	100	200		150	6	0		6
W2	90	180		180	4	4		8
W3	70	140		140	0	7		7
W4	200	400		215	7	2		9
W5	100	200		150	6	0		6
W6	70	140		140	0	7		7
								0
Cars (refills)				290	2	12		14
				150	2	5		7
<b>Total</b>	<b>1020</b>	<b>2040</b>	<b>2000</b>	<b>1675</b>	<b>28</b>	<b>45</b>	<b>5</b>	<b>78</b>
		<b>4040</b>						

The following strategy will be implemented, with times relative to the start of the event:

- -7 days: advise participants in Final Instructions to bring water to event.
- -2 day: 5000L water delivery to the HH.
- -1 day: NSWRA, Goldseekers Orienteers and Orange Runners Club containers dispatched to ANC, W2, W3, W4, W6.
- Evening after arrival of ACTRA coach, and morning before event start: ACTRA containers dispatched to W1, W5.
- Morning before event: Water and safety patrols roster finalised.
- During event:
  - See *Safety and water patrols* section below.
  - Course setter notes will highlight that creek, dam and surface water is unsafe to drink.
  - Remind participants to take care for spillage when refilling at water points.
  - Keep log of water refill times and estimated refill quantities.
  - Capture team visit counts from Intention boards.
- 20h into event (last water patrol): swap containers to repatriate all ACTRA containers towards HH, W1, W5.
- +1 day (end of event): collect all ACTRA containers from W1 and W5 and return to coach before departure.
- +1-2 days: Collect all other containers, organise return to Goldseekers Orienteers, Orange Runners Club and NSWRA.

Table 4 to Table 6 detail how the containers from each association will be dispatched on the course. The number of trips it takes to dispatch containers will depend on the payload of the vehicles used, for now assuming a maximum of 325L per trip (some Hilux models may only accept 470kg while an Isuzu DMax may allow up to 1t). Note that the same trip number across different tables mean the same actual trip.

Table 4: NSWRA Containers filled/dispatched 1 day before event.

Trip #	Destination	L	# 25L	# 20L	# 15L
1	W3, W4, W6	215	7	2	0
2	W2	180	4	4	0
NA	Cars		2	12	0
<b>Total</b>		<b>395</b>	<b>13</b>	<b>18</b>	<b>0</b>
			<b>31</b>		

Table 5: Goldseekers Orienteers and Orange Runners Club Containers filled/dispatched 1 day before event.

Trip #	Destination	L	# 25L	# 20L	# 15L
1	W3, W4, W6	280	0	14	0
2	ANC	160	0	8	0
<b>Total</b>		<b>440</b>	<b>0</b>	<b>22</b>	<b>0</b>
			<b>22</b>		

Table 6: ACTRA Containers filled/dispatched immediately after arrival of ACT coach.

Trip #	Destination	L	# 25L	# 20L	# 15L
3	W1, W5	300	12	0	0
NA	HH, Cars		3	5	5
<b>Total</b>		<b>300</b>	<b>15</b>	<b>5</b>	<b>5</b>
			<b>25</b>		

Table 7 and Figure 1 indicate the minimum volume of water to stock at each location over time, accounting for the number of participants likely to still visit that location after N hours in the event. This accounts for the 8-hour event completion and remoteness of locations from the HH. The levels are conservative in case some teams run late. The table will be used by the water patrols as an indication of how much to refill each location at each visit.

We will review and adapt this plan based on actual consumption observed at each visit, as well as the number of teams logged in the intention boards.

Table 7: Minimum volume of water to stock at each location over time.

Min volume to stock (L)	0h	4h	8h	12h	16h	20h
ANC	160	160	160	160	140	120
W1	150	150	150	150	150	150
W2	180	180	180	150	150	100
W3	140	140	120	120	100	100
W4	215	215	215	215	170	120
W5	150	150	150	150	150	150
W6	140	140	120	120	100	100
<b>Total water on course</b>	<b>1135</b>	<b>1135</b>	<b>1095</b>	<b>1065</b>	<b>960</b>	<b>840</b>

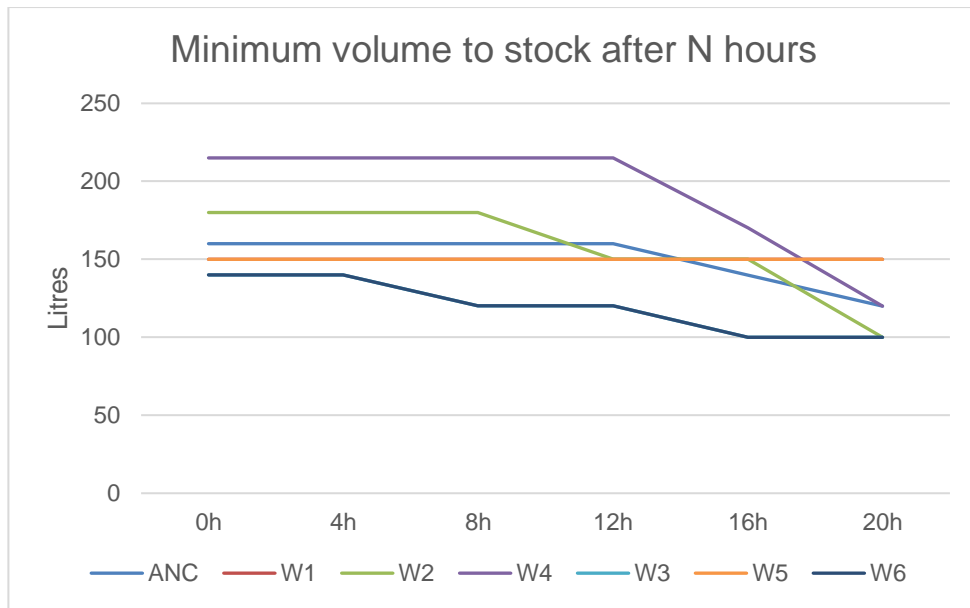


Figure 1: Minimum volume of water to stock at each location over time.

## 7. SAFETY AND WATER PATROLS

Figure 2 illustrates the distances between water locations, noting that W4 is relatively closer to the HH than W3 and W6, hence may receive more visits than these latter.

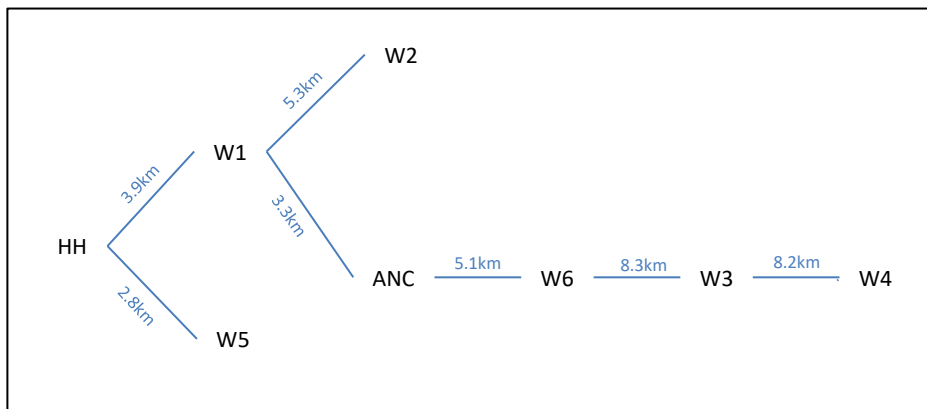


Figure 2: Distances between water locations.

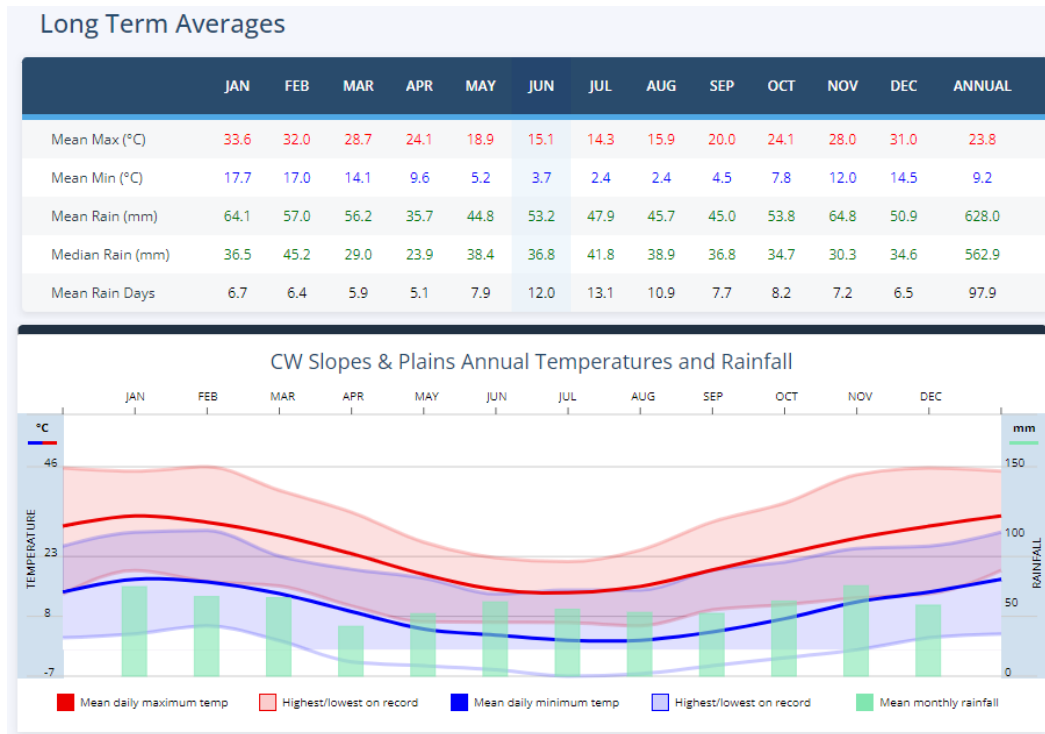
So long that no incident requires the intervention of a safety patrol, the safety patrol vehicles will double as water refill patrols:

- Vehicle #1: large 4WD carrying 325L of water.  
Route: HH-W4, 57.6km return, farm trails with two gates, reasonable fire trails in national park but with some steep/rocky sections after the ANC (were driven with a soft roader during setting).  
Runs: every 4 hours from Sat 15:00 until Sun 08:00.  
Refills: W4, W3, W6. Any leftover water will be used to refill ANC and W1 on the way back.
- Vehicle #2: large 4WD or soft roader carrying 80L of water.  
Route: HH-W2, 18.4km return, farm trails with two gates, reasonable fire trails in national park.  
Runs: every 4 hours from Sat 15:00 until Sun 08:00.  
Refills: W2, W1, ANC (as needed).
- Vehicle #2: same vehicle as previous item.  
Route: HH-W5, 5.6km on a good road.  
Runs: every 2 hours from Sat 13:00 until Sat 21:00.  
Refills: W5.

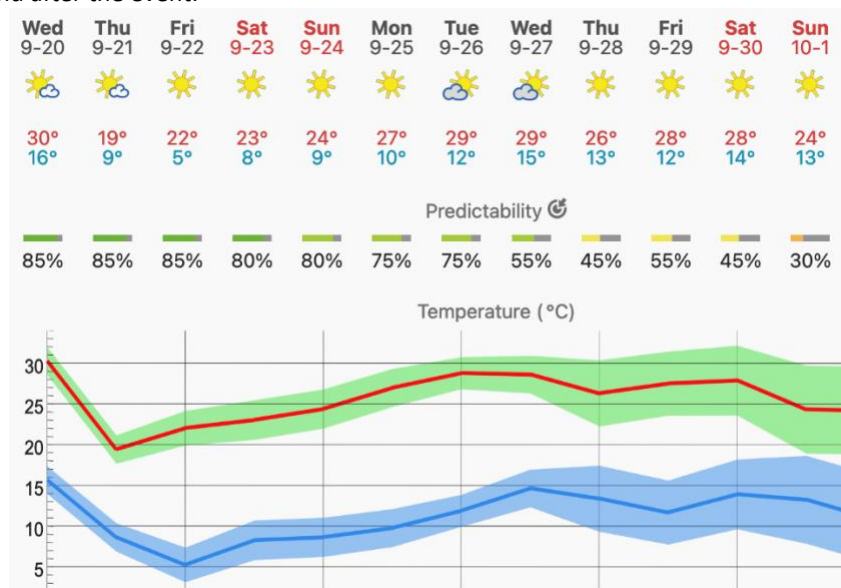
See Table 1Table 11 for hazards and corresponding mitigation strategies that may affect the safety patrol operations.

## 8. EXPECTED WEATHER CONDITIONS

Based on Parkes Airport long-term averages<sup>1</sup>, we expect a temperature min-max range of 4.5-24.1C during the event and a mean of 8 rain days per month in Sep-Oct, noting an 80% chance of El Niño through to September<sup>2</sup>.



The weather forecast<sup>3</sup> as of 20/09/2023 predicts a maximum of 28C [24-32C range] during the event and no rain between now and after the event.



<sup>1</sup> <https://www.weatherzone.com.au/station/SITE/65068/climate>

<sup>2</sup> <https://public.wmo.int/en/media/press-release/wmo-update-prepare-el-ni%C3%B1o>

<sup>3</sup> [https://www.meteoblue.com/en/weather/14-days/parkes\\_australia\\_2153778](https://www.meteoblue.com/en/weather/14-days/parkes_australia_2153778)

## 9. RISK ASSESSMENT SCALES

Table 8: Likelihood scale

Level	Likelihood	Frequency <sup>4</sup>
1	Very Likely	Likely to occur at every event
2	Likely	Likely to occur once a year
3	Unlikely	Likely to occur once every 5 years or more
4	Very Unlikely	Not known to have happened before

Table 9: Consequence / Impact scale

Level	Impact	Consequence or Impact
A	Severe	Kill or cause permanent disability or ill health
B	Significant	Long term illness or serious injury
C	Moderate	Medical Attention and several days off work
D	Minor	First Aid needed

Table 10: Risk level

		Consequence or Impact			
		A. Severe	B. Significant	C. Moderate	D. Minor
Likelihood	1. Very Likely	Extreme	Extreme	High	Moderate
	2. Likely	Extreme	High	High	Moderate
	3. Unlikely	High	High	Moderate	Low
	4. Very Unlikely	Moderate	Moderate	Low	Low

## 10. HAZARD IDENTIFICATION

Course layout and associated route planning may place high demand on certain water re-supply points or the HH. In addition, accidental spillage, leaving taps on and theft can affect the supply.

Table 11: Hazards and mitigations.

Risk / Hazard	Risk level	Measure to address risk
Containers stolen at water drop (4-C)	Low	All water drops are on private property or parts of national park only accessible by pedestrians 8km+ away. Good spread of water drops on course. Safety patrols and water refills to occur at least every 4h.
Dual-action pump failure (3-D)	Low	Simple tap available on at least another cube at each water location.
Container tipped over and left open (3-D)	Low	Rogainers reminded to close taps at briefing. At least 4 containers at each water drop. At least one container with dual action pump tap to eliminate need to tip container over.
Higher demand than expected at any water drop (3-C)	Moderate	Water refill logs (kept by water patrols) and Intention boards (filled by competitors) at water drops will help track and predict water demand. Should higher than expected demand at a water drop be predicted or observed, a satellite phone will be carried by each water patrol and

<sup>4</sup> NSW Rogaining Association does not have adequate data to make full assessment of the frequency of risks occurring.



		<p>used to contact the HH to request the standby vehicle to start operating immediately:</p> <ul style="list-style-type: none"> <li>• Vehicle #3: large 4WD or soft roader using selected HH and/or ANC containers.</li> <li>• Route: as required.</li> <li>• Runs: every 4 hours between Vehicle #1 patrols, or as required.</li> <li>• Refills: as required. Should additional water be required quickly between ANC and W4, this vehicle may use from the ANC stock and only drive ANC-W4, or shuffle containers between water drops. The other vehicles will then refill the ANC at their next passage.</li> </ul>
Water drops access difficulty (3-B)	High	<p>High initial fill and large buffer at each refill, to last 8+ hours. Large 4WD with a chainsaw on board used for water patrols. Satellite phone in water patrol vehicles. Water drops were vetted and located on reasonably well-maintained fire trails without major identified access risk.</p> <p>Should a road suddenly become unusable (e.g., fallen tree or spot flooding), the patrol will use its satellite phone to contact the HH and request the standby vehicle to start operating immediately:</p> <ul style="list-style-type: none"> <li>• Vehicle #3: large 4WD or soft roader using selected HH and/or ANC containers.</li> <li>• Route: as required.</li> <li>• Runs: every 4 hours between Vehicle #1 patrols, or as required.</li> <li>• Refills: as required.</li> </ul> <p>The North entry to the course can be used in an emergency. Detailed instructions are in the Safety plan Section4 (Event description) under Vehicle access.</p>
Volunteer unavailable (4-D)	Low	At least six volunteers available in HH to perform water resupply tasks.
Extremely hot weather (3-C)	Moderate	<p>Monitor BOM forecast in the lead up to event. If over 30C forecast:</p> <ul style="list-style-type: none"> <li>• Increase water delivery at HH to 5000L – Already done as a precaution.</li> <li>• Same mitigation as for <i>Higher demand than expected at any water drop</i></li> </ul> <p>Emphasise in final instructions and briefing for Rogainers to bring and carry water.</p>
Low supply at HH (4-A)	Moderate	<p>Assumptions are conservative and include a 4L/person buffer and extra 1000L. Cubes are versatile and can be shuffled across water drops to keep overall levels appropriate for competitors. Town water available in Parkes (35km, 30min drive).</p>
Response required to another incident on course (3-C)	Moderate	<p>Should the Water patrol vehicle #1 or #2 need to act as safety patrol to attend to an incident:</p> <ul style="list-style-type: none"> <li>• Standby vehicle #3 immediately replaces that water vehicle, using selected HH and/or ANC containers. This standby vehicle will collect the containers from the vehicle being replaced as they meet on the road, if possible.</li> <li>• Route: same as the vehicle being replaced.</li> <li>• Runs: same as the vehicle being replaced.</li> <li>• Refills: same as the vehicle being replaced.</li> </ul>

Several concurrent incidents (4-B)	Moderate	Standby vehicles #4 and #5 can be used to implement the mitigations listed above.
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