



Coal Occupational Health and Hygiene Network:
Practical Control Solutions
13 November 2025

Heat TARPs and Heat Management Plans

Presented by Christine Killip

MD Katestone, CEO Weather Intelligence

Who are we?

- Katestone is an Australian-owned small business founded in 1989.
- We are scientists, engineers, programmers and data experts
- Known for our high quality and problem solving skills

Outline

- Quick Quiz
- Challenges of managing heat
- TARPs – how do you know when they are working properly?
- Kite – Proactive Heat Management made easy

Quick Quiz – Question 1

How fast can your body overheat while undertaking moderate activity and no mechanism to lose heat?

- A. 10 minutes
- B. 30 minutes
- C. 2 hours

Quick Quiz – Question 2

You're listening to the news on the radio and they say the top temperature for Emerald is going to reach 30 today. What does that mean?

- A. It will reach 30 °C anywhere outside
- B. It will reach 30 °C in the shade
- C. It will reach 30 °C in the sun

Quick Quiz – Question 3

How many different Heat Stress Indices have been used since the turn of the century to determine the risk of heat stress and inform the selection of appropriate risk management strategies?

- A. 50
- B. 130
- C. 340

Why is heat stress management important?



- It is your responsibility as part of the work safe act
- Managing heat can improve productivity and staff moral
- Conditions are only going to get hotter

Challenges



- Lack of legislation
 - No simple safe/not safe to work temperature
 - Too many different heat indices (T, WBGT, TWL, etc.)?
 - No close weather station
 - Confusing readings from handheld monitors
 - Heatwave hype
 - Time consuming administrative tasks
 - What are your challenges?
-

Person(s) actions	Normal Status	Level 1 Response			Level 2 Response			Level 3 Response		
Environmental trigger conditions	Apparent Temperature Heat Index = ≤ 34	Apparent Temperature Heat Index = 35 - 45			Apparent Temperature Heat Index = 46 - 53			Apparent Temperature Heat Index = ≥ 54		
Work rate	Un-restricted self-paced work - low risk	Easy	Moderate	Hard	Easy	Moderate	Hard	Easy	Moderate	Hard
Work / rest ratio		No limit on work	50/10	40/20	No limit on work	40/20	30/30	No limit on work	30/30	20/40
Hydration rate (cups water / hr)	Remain hydrated and self-manage hydration	2	2.5	2.5	2.5	2.5	4	2.5	2.5	4
Heat wave	NOTE: Heat wave forecast should be considered when assessing TARP trigger conditions where applicable									
All personnel	<ul style="list-style-type: none"> • Include personal risk assessment • Ensure you have adequate cool drinking water available and drink regularly • Consider time of day and weather and be prepared to escalate to Level 1 	<ul style="list-style-type: none"> • All controls from normal status review personal risk assessment - put additional controls in if necessary • Report any signs of heat stress to the supervisor and others in work group and use 'symptom self-assessment questionnaire' • Consider job rotation and working in shaded areas • Consider time of day and weather and be prepared to escalate to Level 2 			<ul style="list-style-type: none"> • All controls from Level 1 • Notify supervisor, OCE or Health and Safety department of changes to TARP level • Implement higher level controls including task rotation of jobs, follow working alone procedure, take appropriate corrective action to reduce the effective temperature e.g. fans/shade 			<ul style="list-style-type: none"> • All controls from Level 2 • Withdraw to a place of safety as initial response • No work to be undertaken until a risk assessment is completed for the task in consultation with your supervisor or team leader. 		
Appointed supervisor/s and OCE	<ul style="list-style-type: none"> • Monitor ambient temperature, humidity and other indicators of heat stress e.g. clothing; PPE • Ensure general heat stress controls available • Work scheduling can be planned as needed 	<ul style="list-style-type: none"> • As per normal state • Implement work rest regimes as required for Level 1 • Supervisor to discuss thermal stress management at pre-start meetings. • Ensure un-acclimatised persons are not scheduled to work alone • Initiate options that will reduce the temperature of the working place (e.g. access to shade options, use of fans), relocation of work if 			<ul style="list-style-type: none"> • As per Level 1 • Notify superintendent/manager of changes to TARP level • Implement work rest regimes as required for Level 2 • Review thermal stress controls – Implement task rotation of jobs, follow working alone procedure, take appropriate corrective action to reduce the apparent temperature e.g. check fan/shade effectiveness, review work rest 			<ul style="list-style-type: none"> • As per Level 2 • Withdraw team to a place of safety (Non TARP area) as initial response. • No work to be undertaken until a risk assessment (JHA) is completed for the task in consultation with your supervisor or team leader. • Unacclimatised workers to be removed from hot work areas • Implement work rest regimes as required for Level 3 		

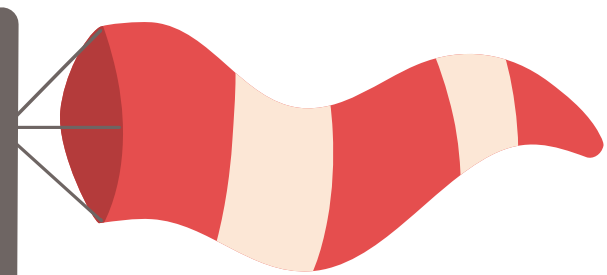
Let's see what George thinks of the TARP!



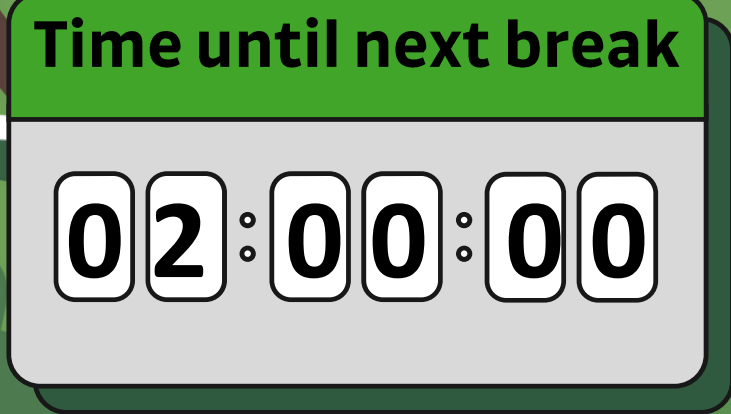
- Average worker, average clothing
- In good health and fit for work
- Hydrated with free access to water
- Thermal balance model (PHS ISO7933)
- 2 hours of sustained work

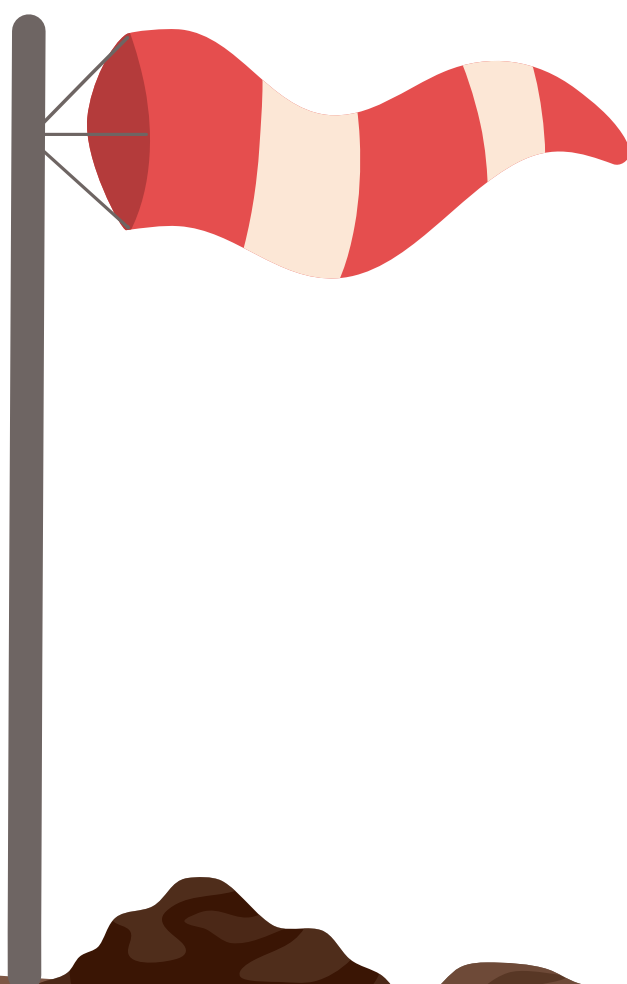


Ambient Temperature °C

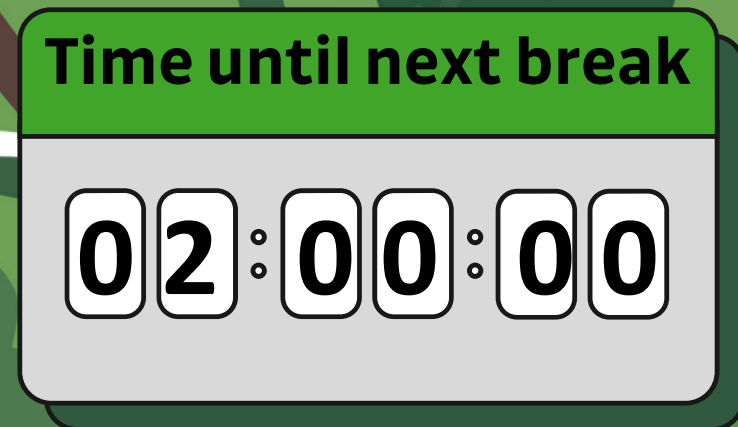


**Body
Temp °C**

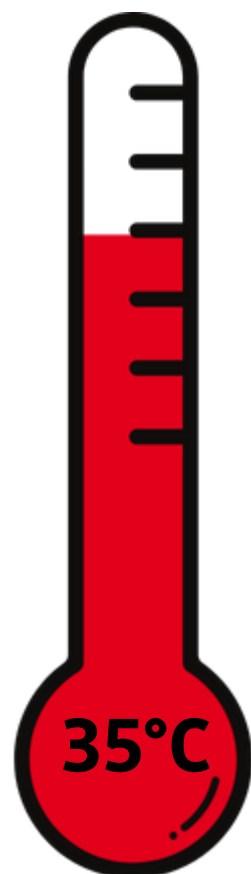
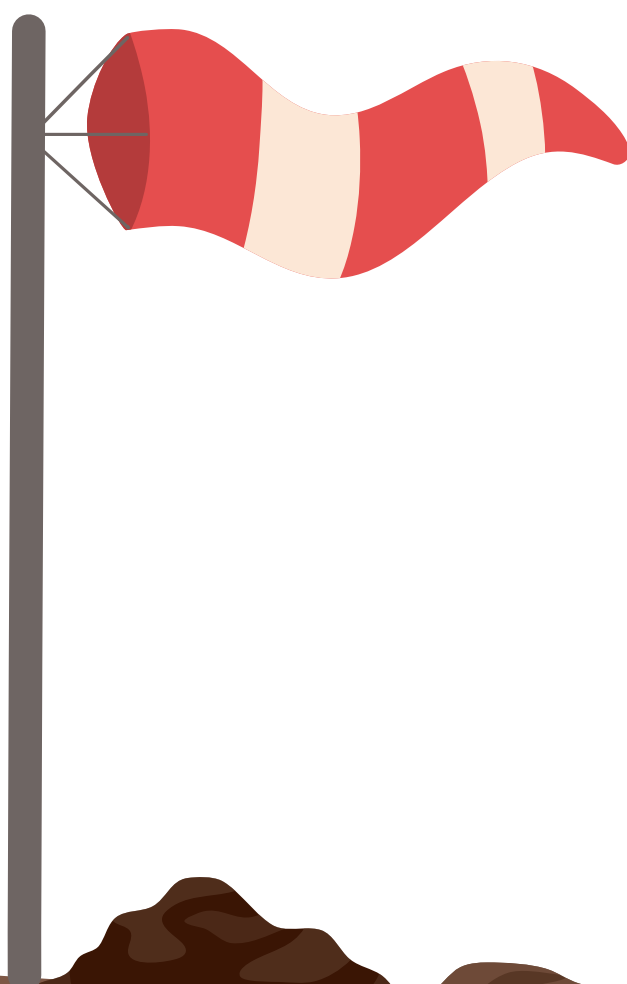




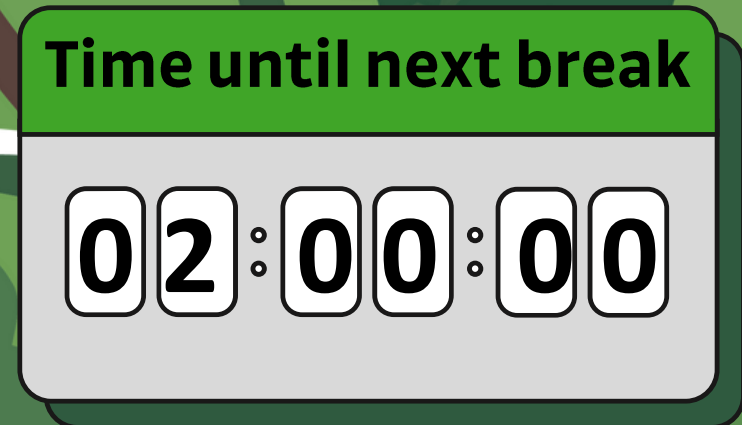
37.7°C



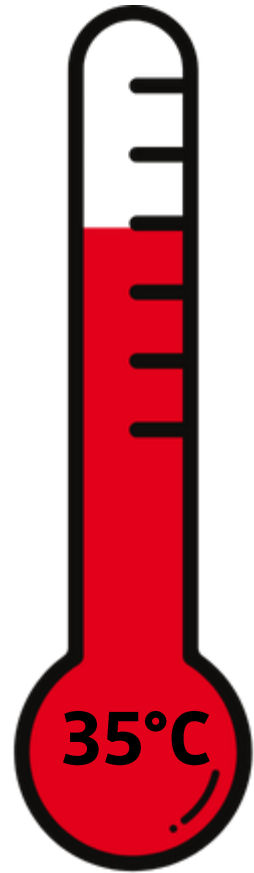
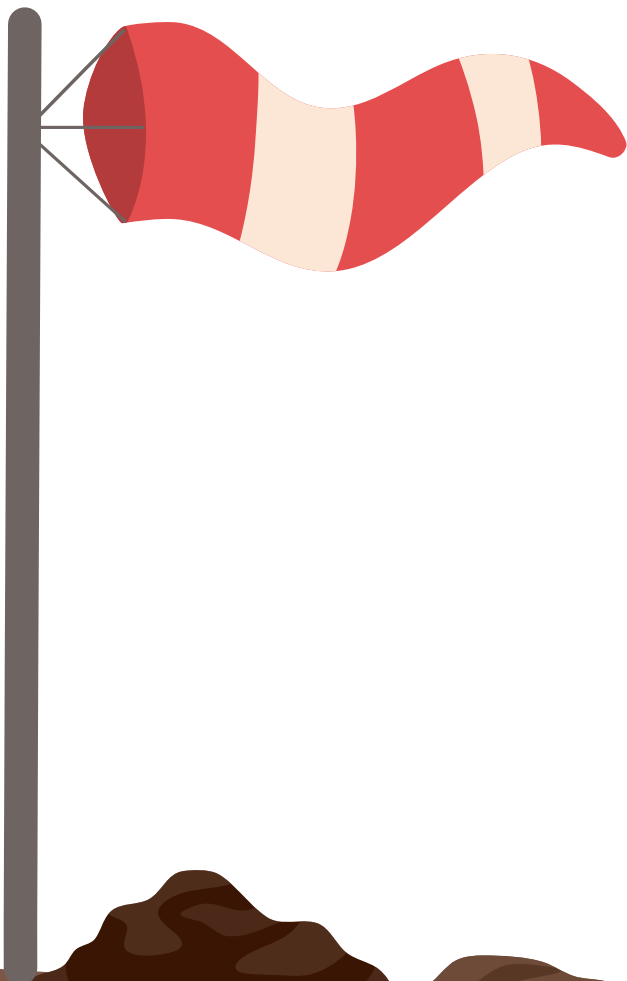
RSHQ TARP
HI = 31.9



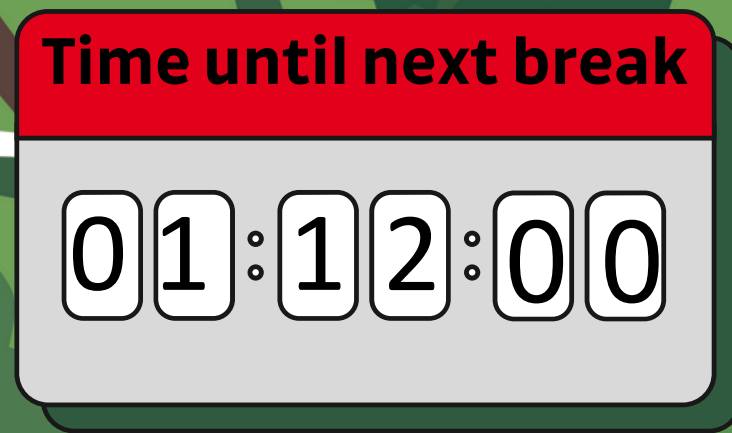
37.8°C



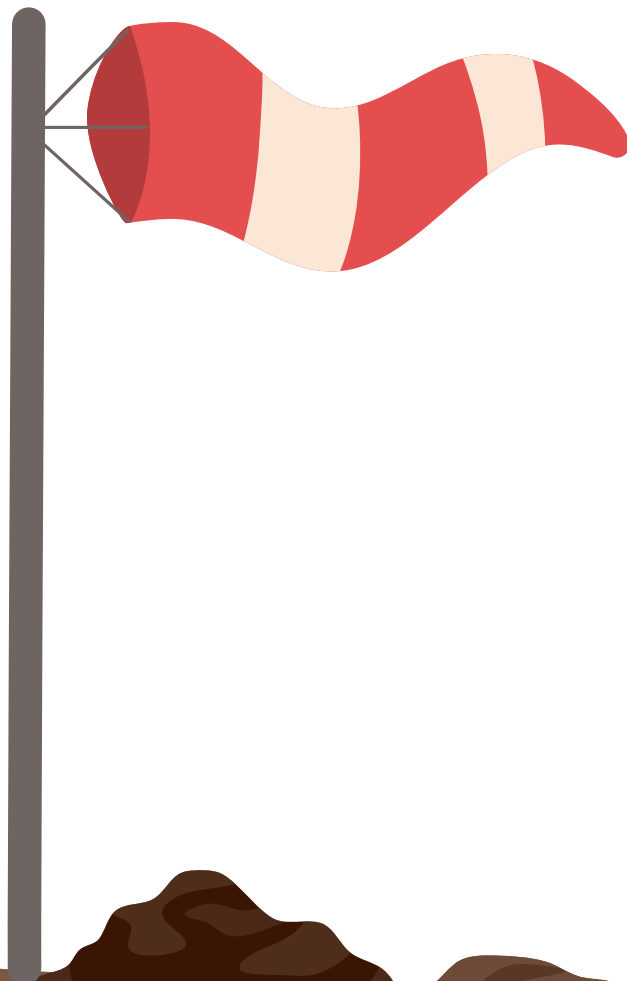
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HI = 40.7



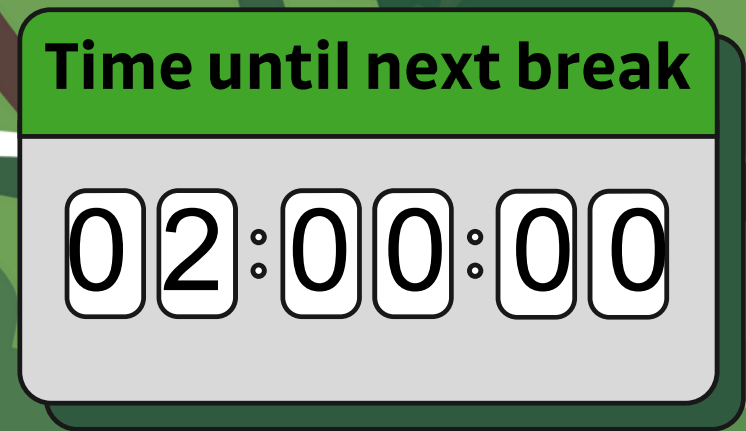
38.4°C



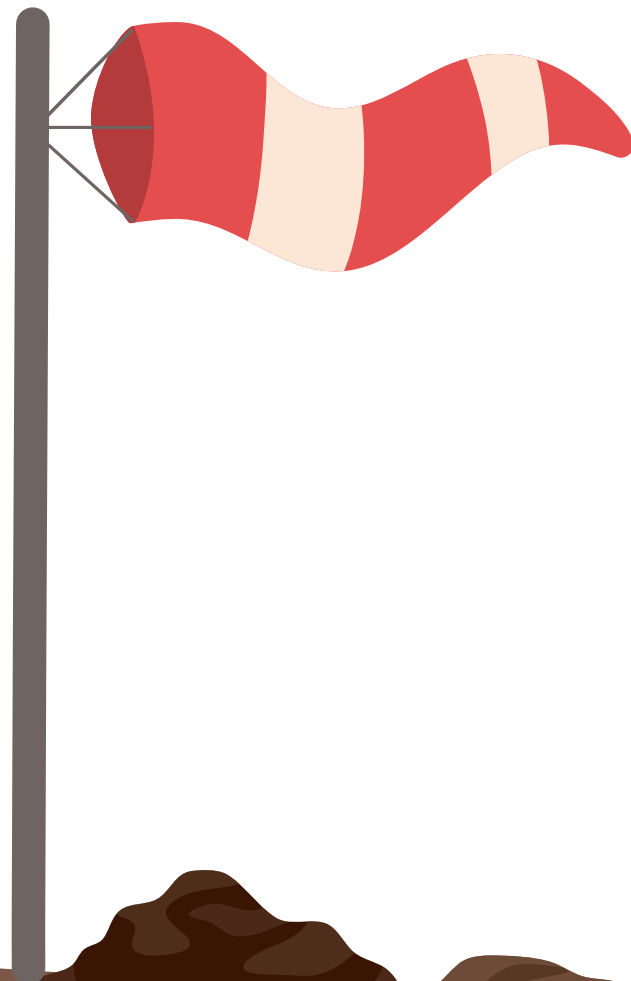
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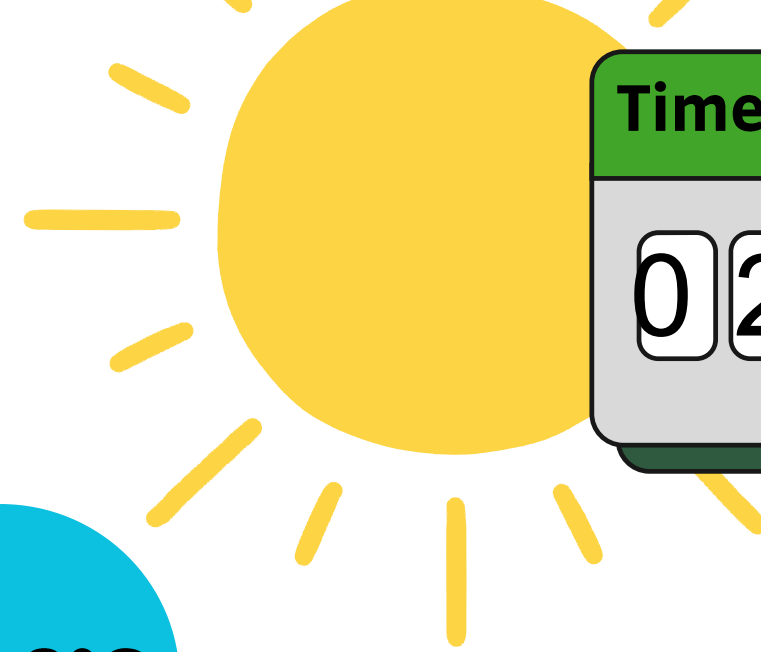
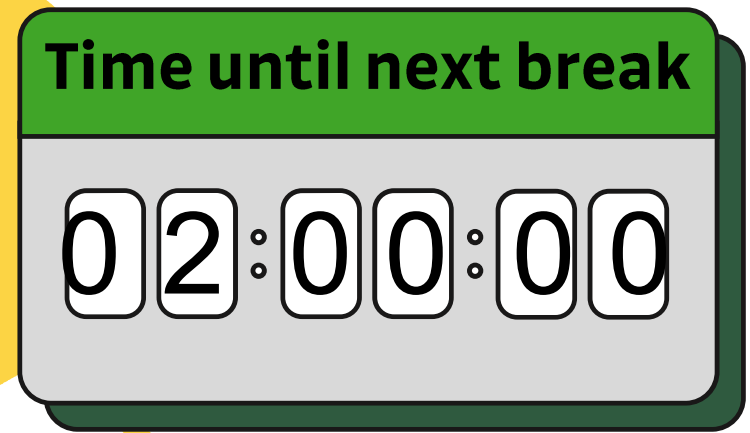
37.7°C



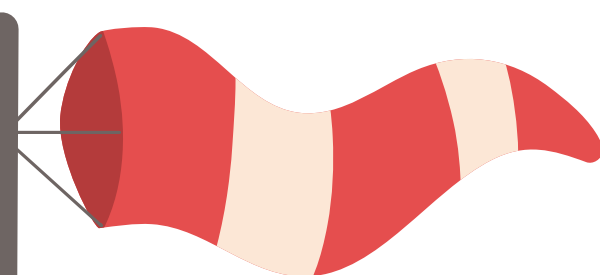
RSHQ TARP
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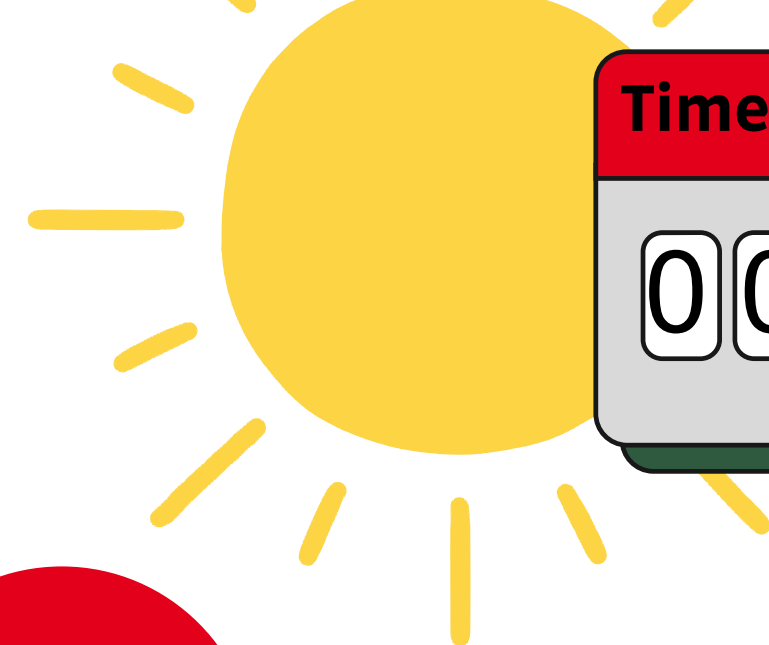
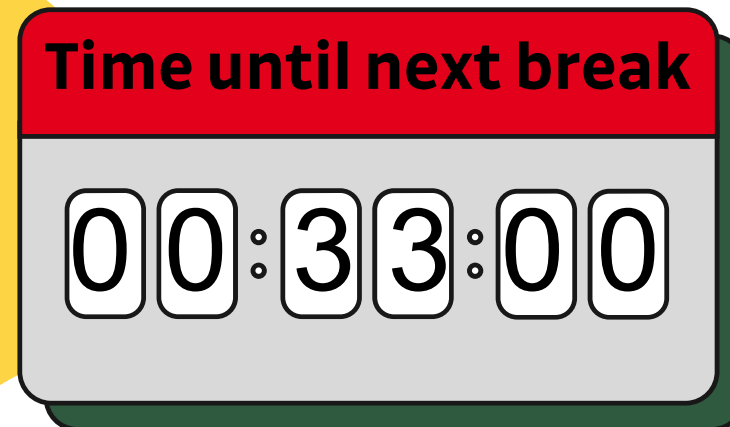
37.8°C



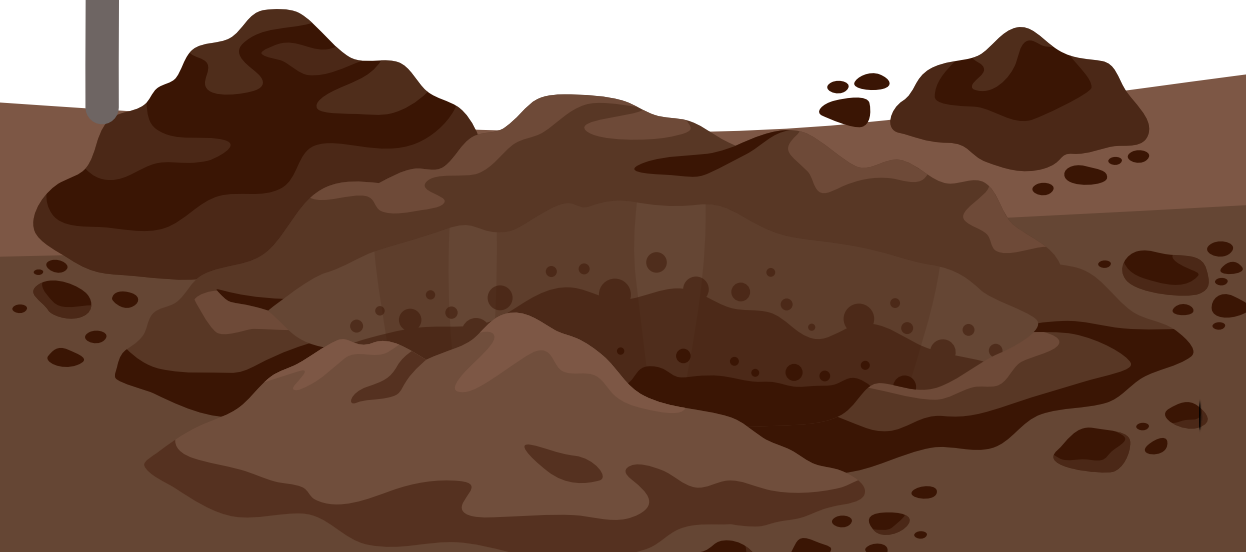
RSHQ TARP
HI = 40.7



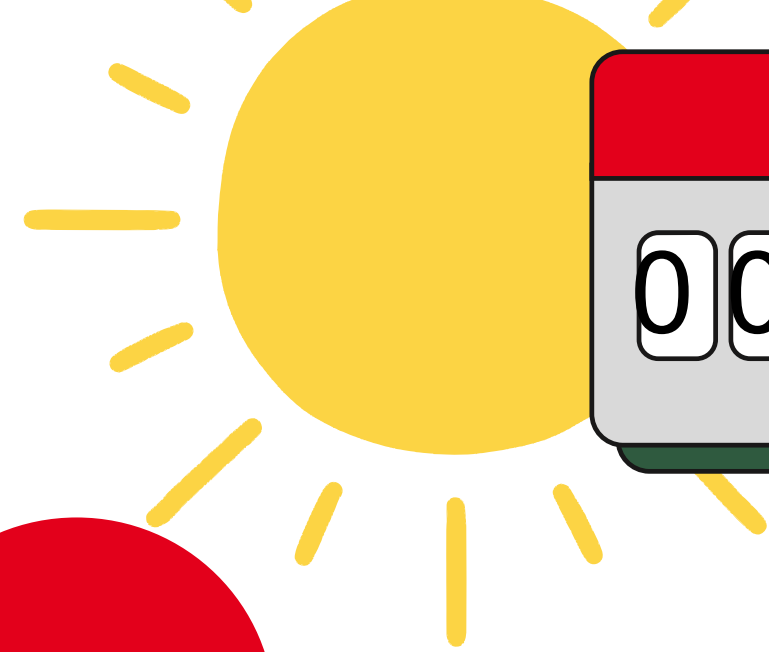
40°C



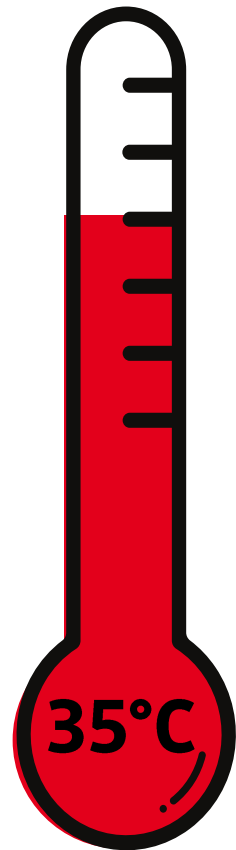
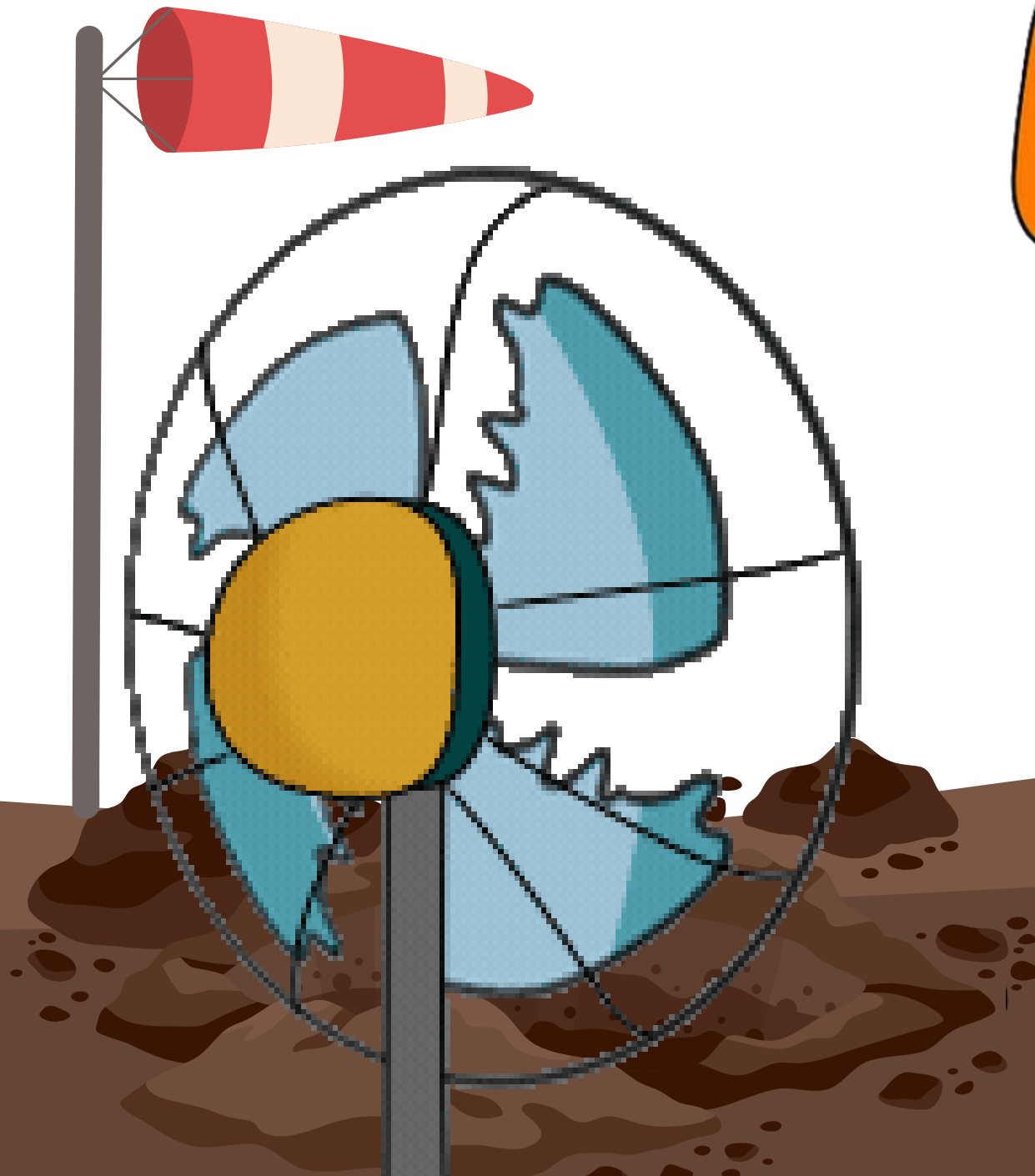
RSHQ TARP
HI = 53.4



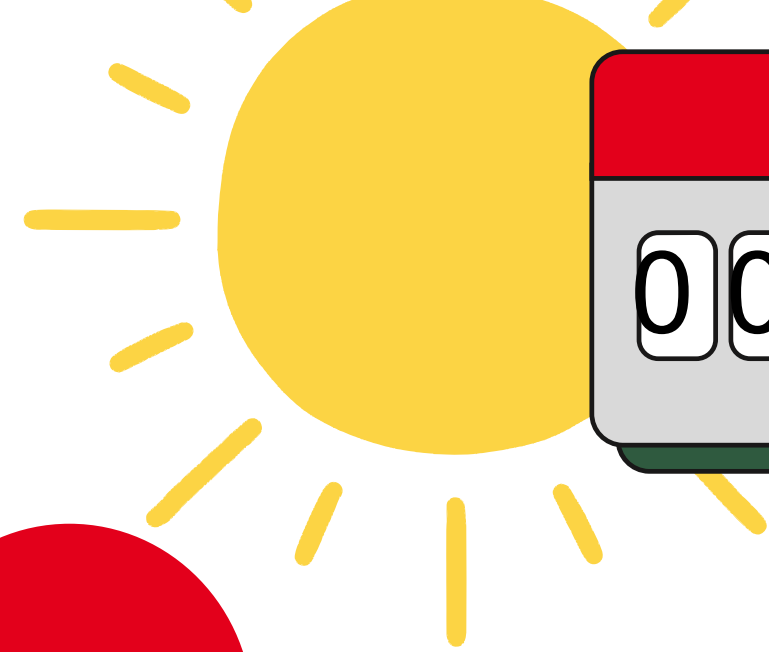
39.8°C



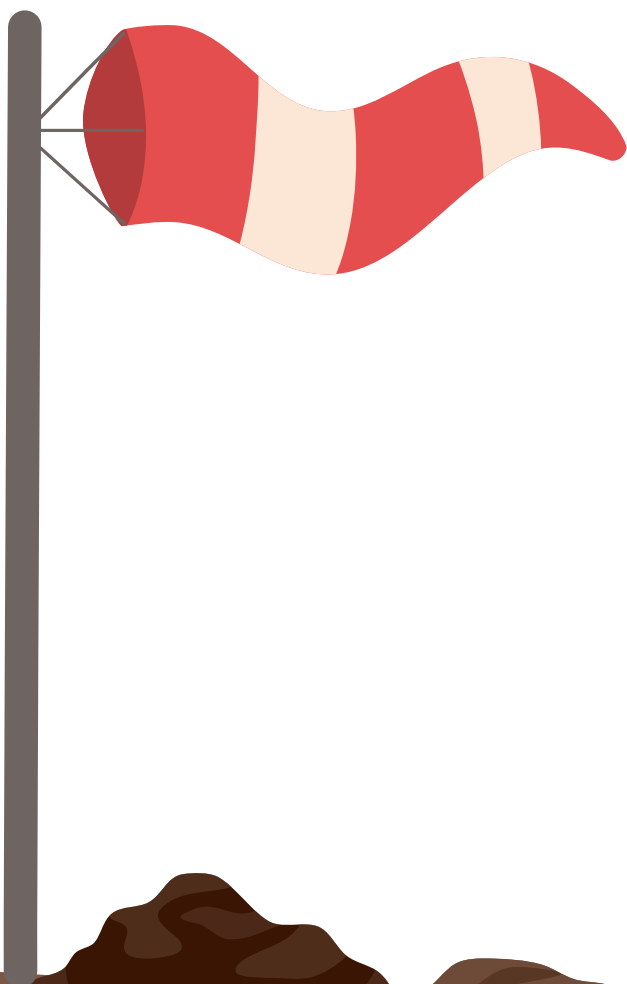
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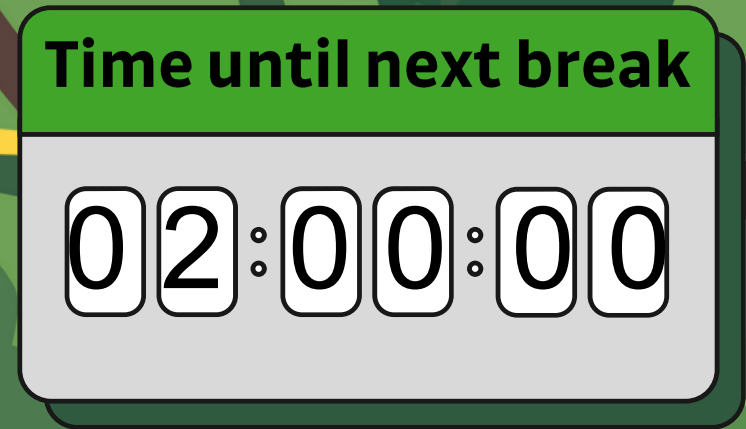
39.1°C



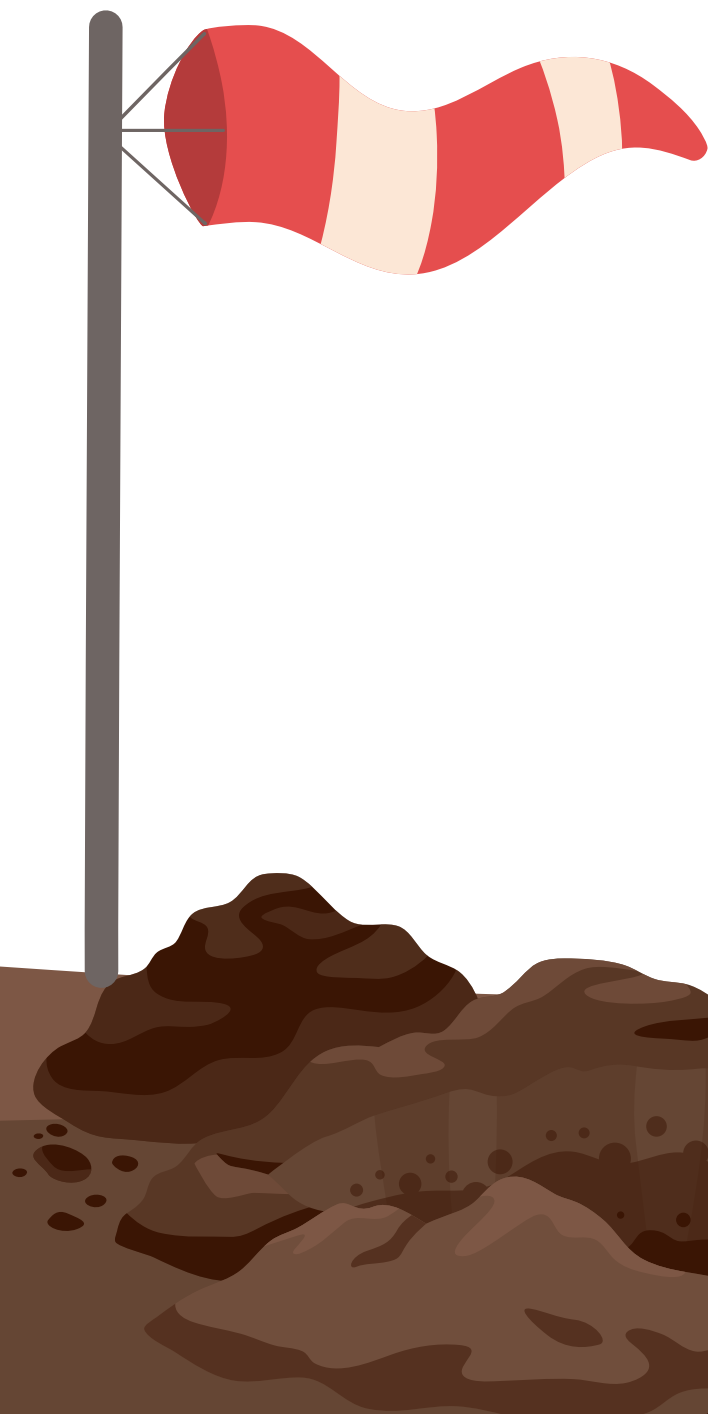
RSHQ TARP
HI = 40.7



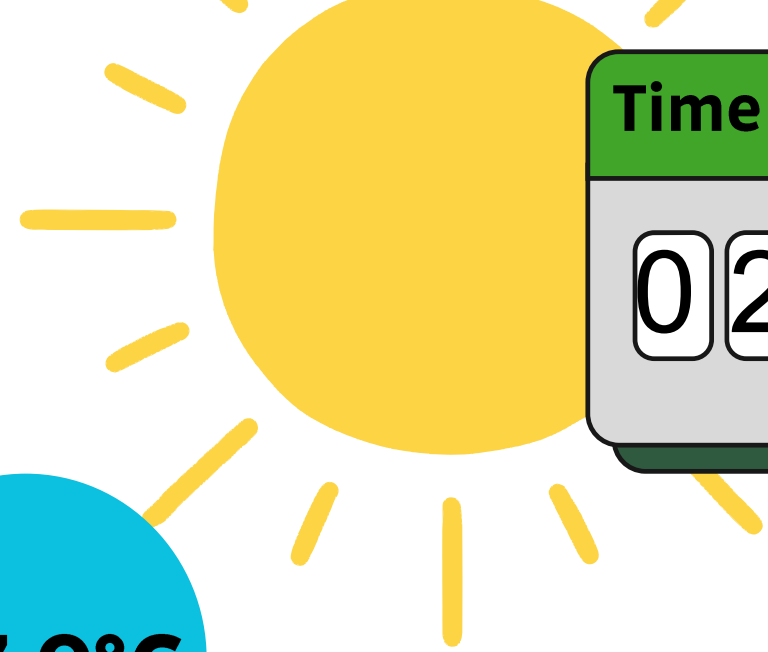
37.7°C



RSHQ TARP
HI = 36.7

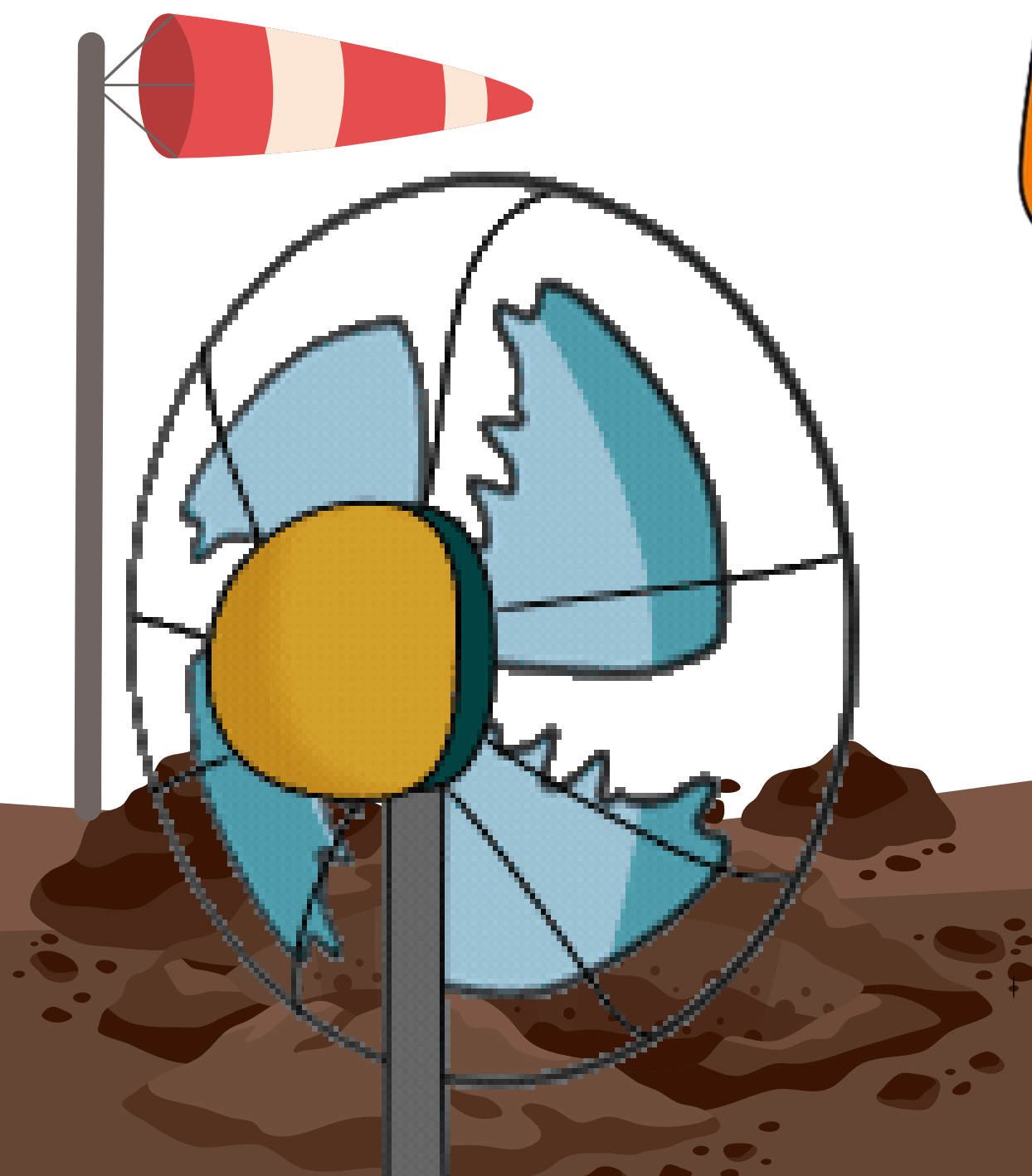


37.9°C

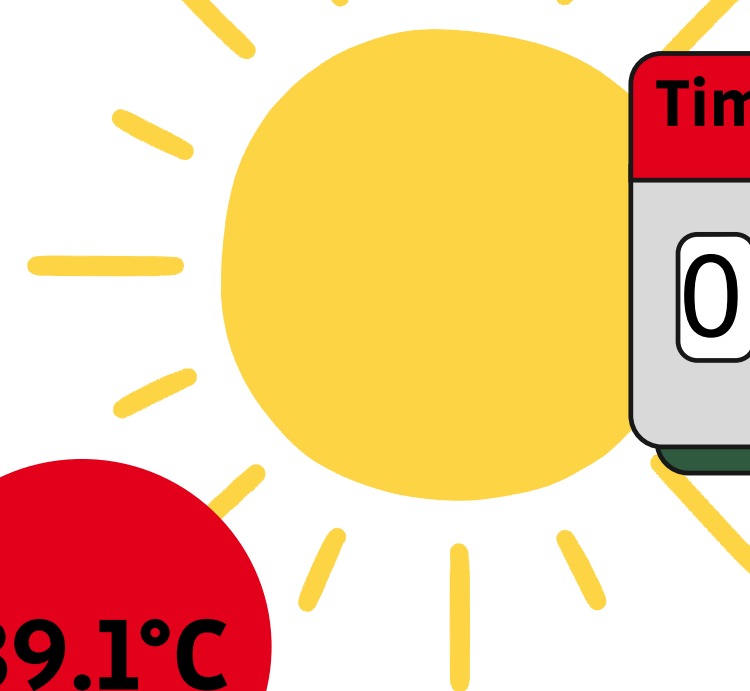
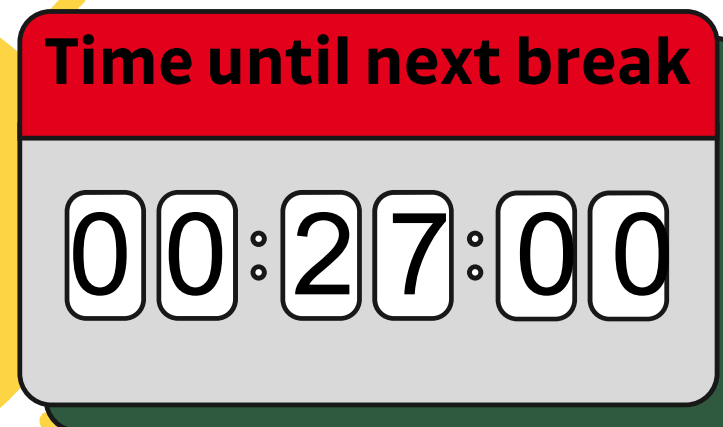


Time until next break
02:00:00

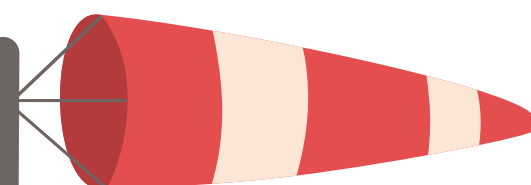
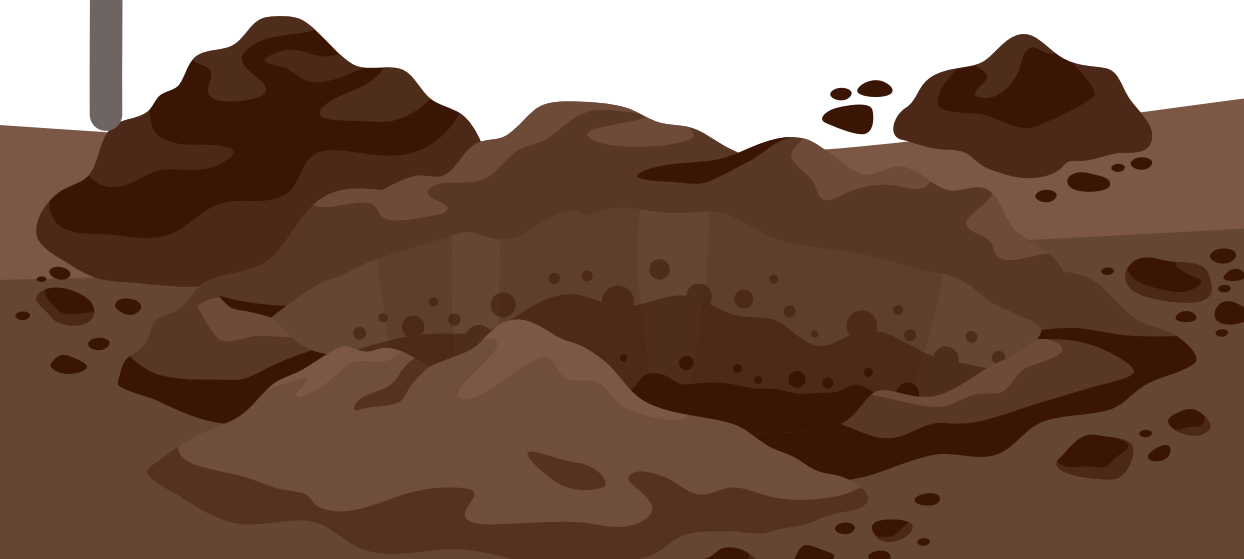
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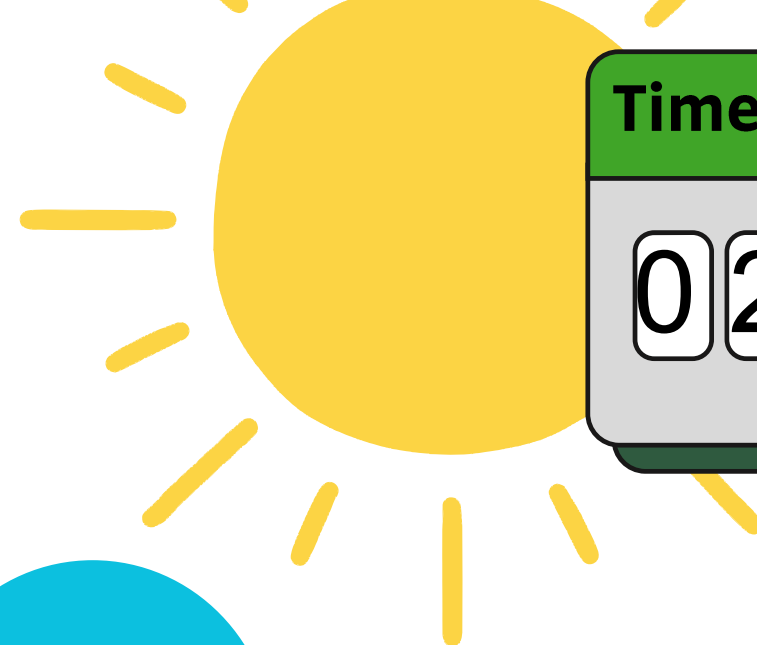
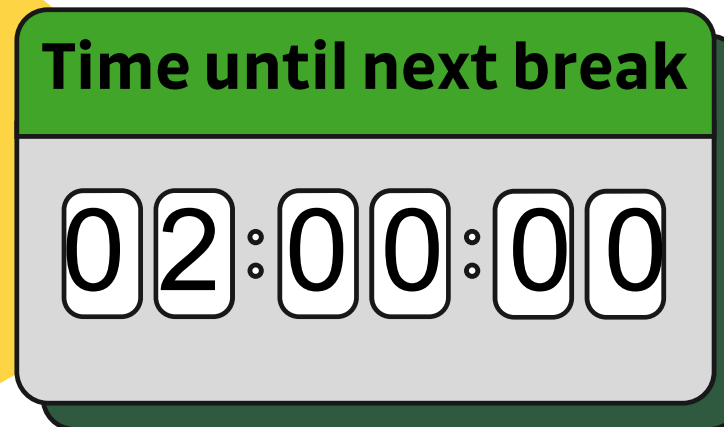
39.1°C



RSHQ TARP
HI = 36.7



37.9°C



RSHQ TARP
HI = 36.7

What does this mean?

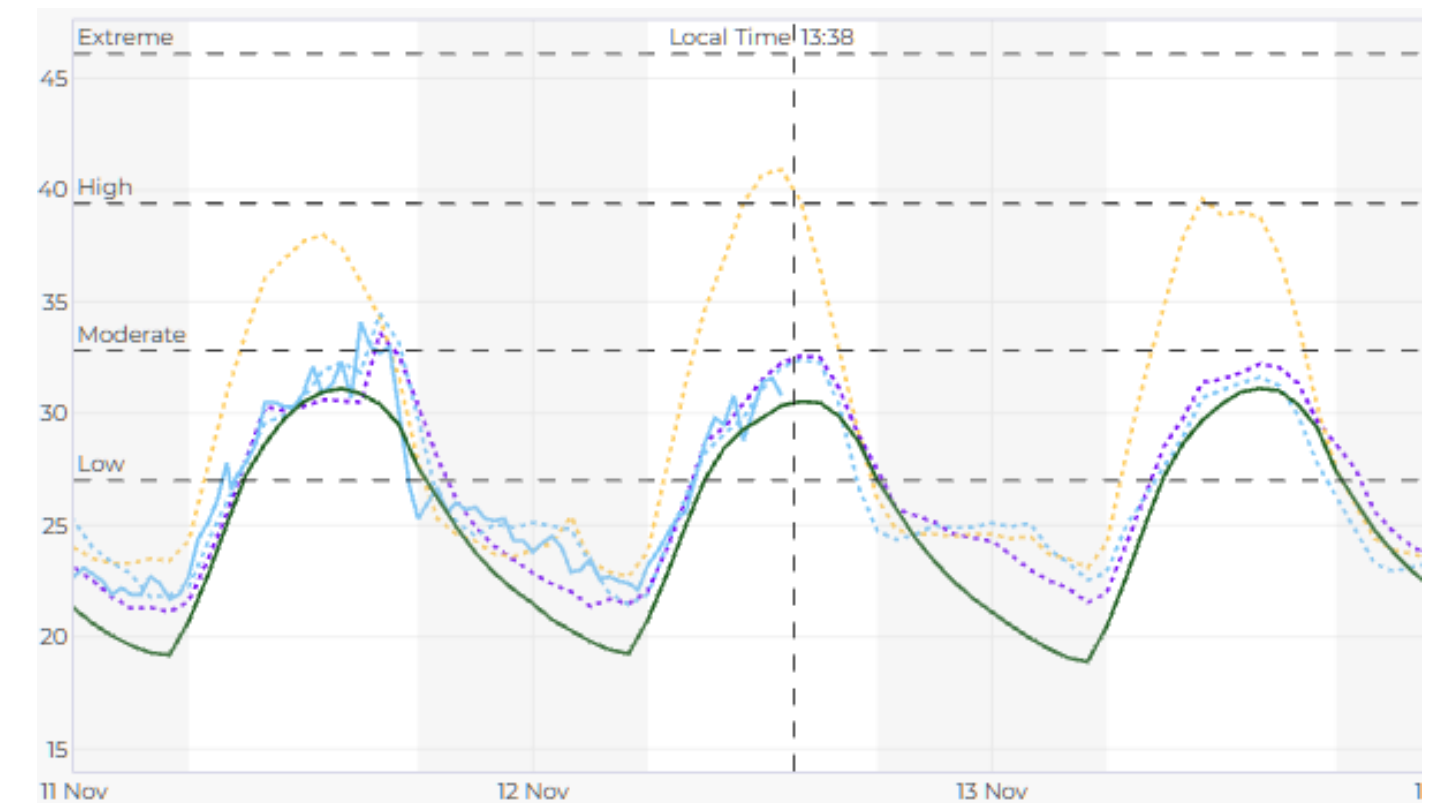
- No single index is perfect for all applications
- A TARP based on Heat Index works well in some conditions but not all conditions
- Heat Index does not account for working in the sun or influence of wind (cooling or heating)
- However, it could be a good first indicator (if set to a conservative level)

A true indicator of success is the absence of heat incidents while also maintaining productivity

TARP improvements

Person(s) actions	Normal Status	Level 1 Response			Level 2 Response			Level 3 Response		
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Hydration rate (cups water / hr)	Remain hydrated and self-manage hydration	2	2.5	2.5	2.5	2.5	4	2.5	2.5	4
Heat wave	NOTE: Heat wave forecast should be considered when assessing TARP trigger conditions where applicable									

- Swap out Heat Index for Apparent temperature (look at all 3!)
- Or better still use SEG Heat Risk level
- Add a caution for very hot dry windy conditions



TARP improvements



- Heatwaves!
- **You don't need a heatwave to have a heat illness.**
- A heatwave is a 3 day period, which makes it difficult to identify the actual high risk times.
- They highlight conditions that are considered extreme for the local climate (so if you have fly in/fly out workers its not as relevant – they may be more at risk without a heatwave)
- A heatwave warning issued by BOM is for temperature only
- Humidity heatwaves exist and can be more dangerous to working outdoors than temperature heatwaves alone

What is the solution?

- Keep it simple and consistent
- Take a systematic approach
- Identify high risk groups and set your TARP accordingly
- Pick an index that works for you and stick with it (allow feedback)
- Consistently communicate the risk across your teams
- Be prepared!



Using Kite for Managing Heat Stress

- **Step 1 – Pre-Summer Preparation**

Kite's [Thermal Risk Assessment](#) will **systematically** walk you through the factors that influence the risk of a heat event for a Similar Exposure Group (SEG). From this, you will be able to:

- **Identify high-risk SEGs** for monitoring or additional controls
- Identify SEGs whose risk **changes with environmental conditions**
- Develop a **Trigger Action Response Plan (TARP)** with actions and additional controls for each trigger level

- **Step 2 – Proactive Management**

Use **Kite** to identify conditions at your site that have higher risk of potential heat illness via:

- **Forecasts of heat risk** for the next 7 days (incorporating temperature, humidity, wind speed and solar radiation)
- Daily **Heatwave** (temperature and humidity) outlook for atypical conditions
- Review of risk outlook for the entire site workforce or each SEG identified in Step 1



Outsmart your weather risks.
Streamline environmental management.



- **Step 3 – Keep your teams informed**

– Having a consistent method to identify the risk will ensure your teams feel safe. Keep your teams informed with **different levels of communication** regarding the likelihood of a heat illness. Options include:

- **Customised messaging** for different groups or levels of management
- Prestart **Toolbox reports** (via email) either daily or before each shift
- Customised messaging to convey risk as well as **potential controls** (e.g as per your site **TARP**)
- **QR code** for contractors to see your site's heat risk outlook
- **SMS** alerts when your triggers are met

- **Step 4 – Continual improvement**

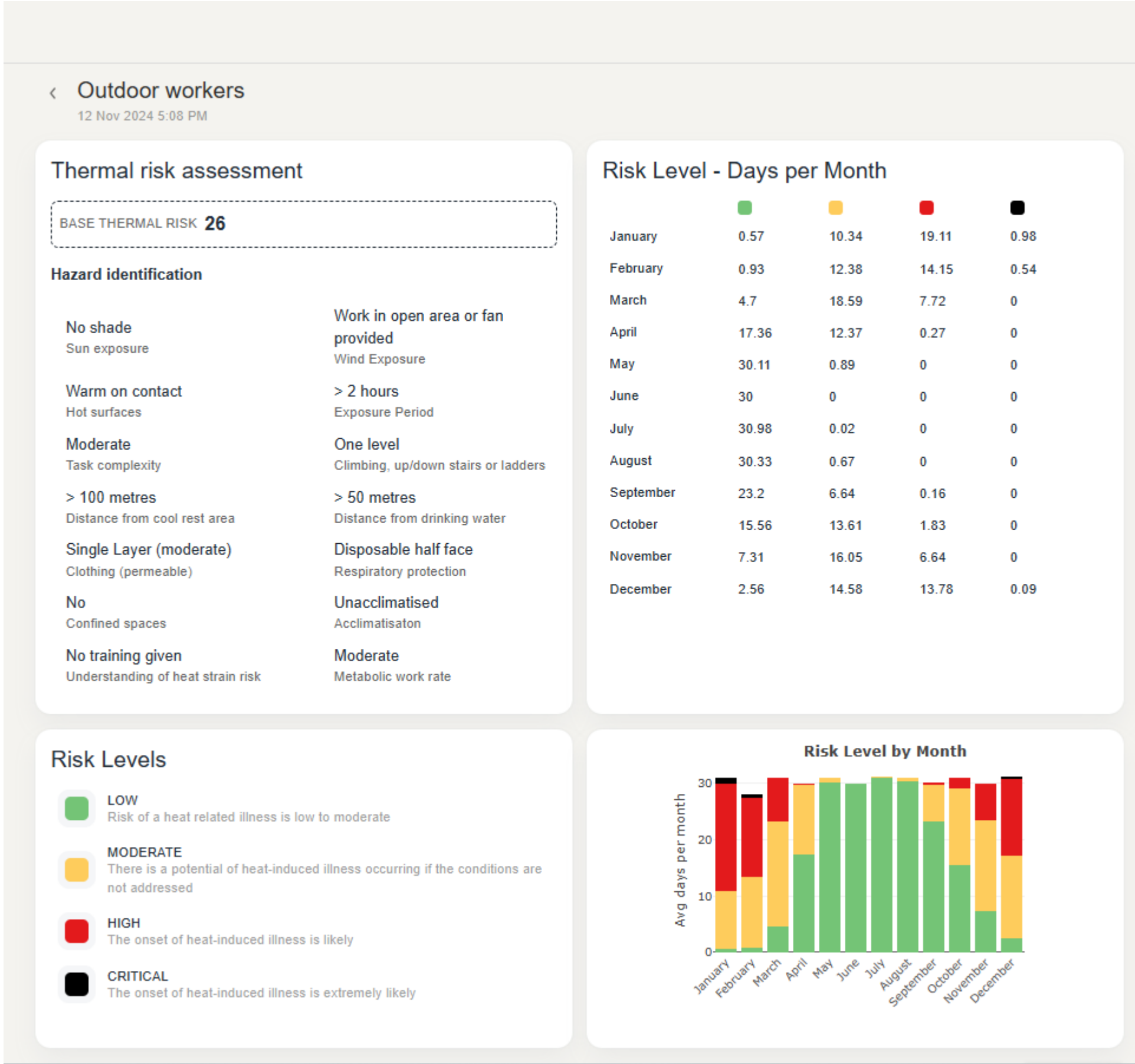
– Finally, assess whether your triggers and controls are working effectively.

- **Were there any near misses?**
- **What are the front-line workers saying?**
- **Were they adequately protected?**

– **Assessing the risk of heat illness is not an exact science**, and there are many pieces to the puzzle that need to be considered to ensure your team's protection.

– **Gather feedback** from your teams - this can be done at the end of a shift (via **Kite Heat Symptoms log**) or through supervisor observations. **Update your TARP** as needed to make sure your triggers and controls are appropriately set.



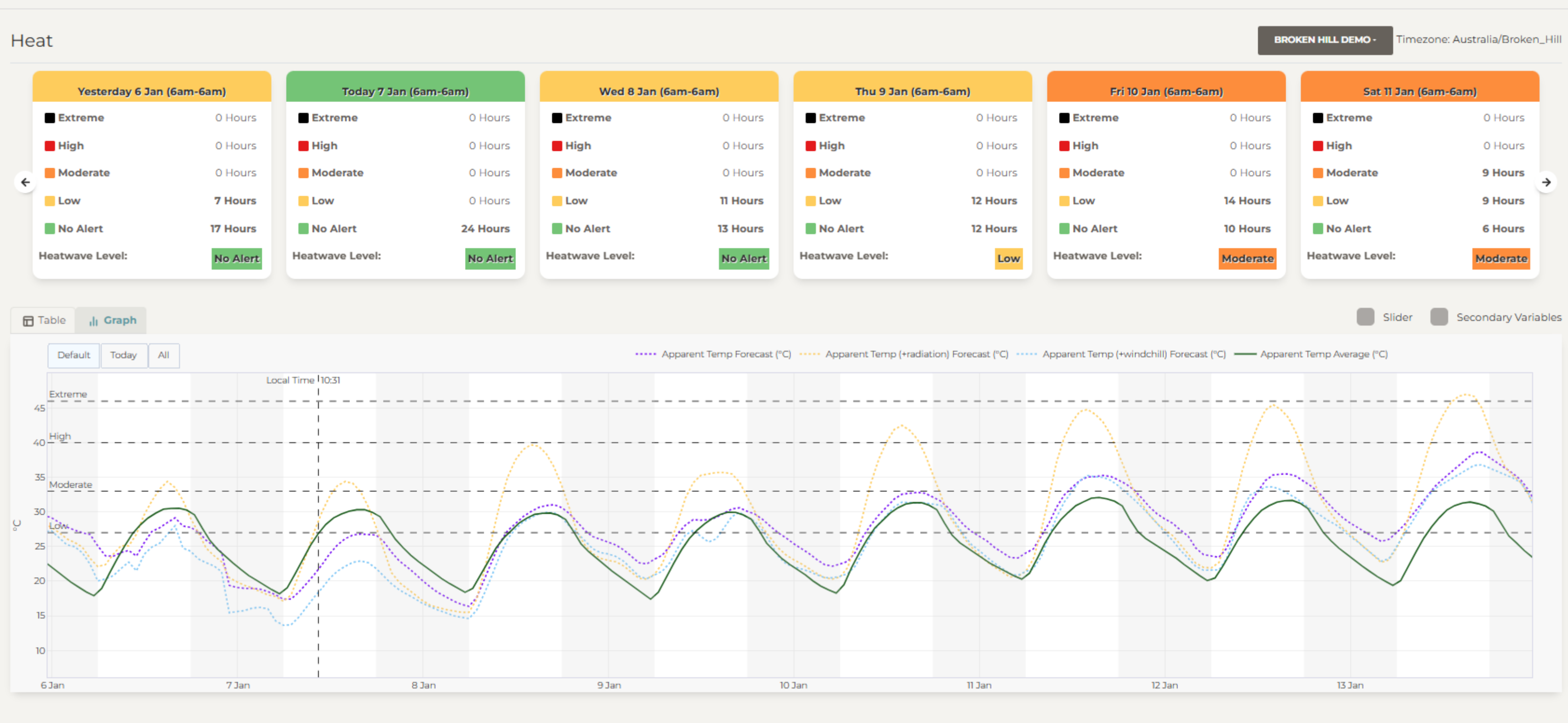


Thermal Risk Assessment

- Follows AIOH Basic Thermal Risk Assessment methodology
- Uses site based 45 year historical climatology
- Use to identify SEGs at risk
- Once the SEGs are set up you can:
 - Undertake a quick risk assessment
 - collect heat stress symptoms

Standard Heat Dashboard – Web

Graph or Table view



SEG Heat Dashboard - Web



Outlook Dashboard

<

Demo Dashboard

Client View

↺

-

DEMO

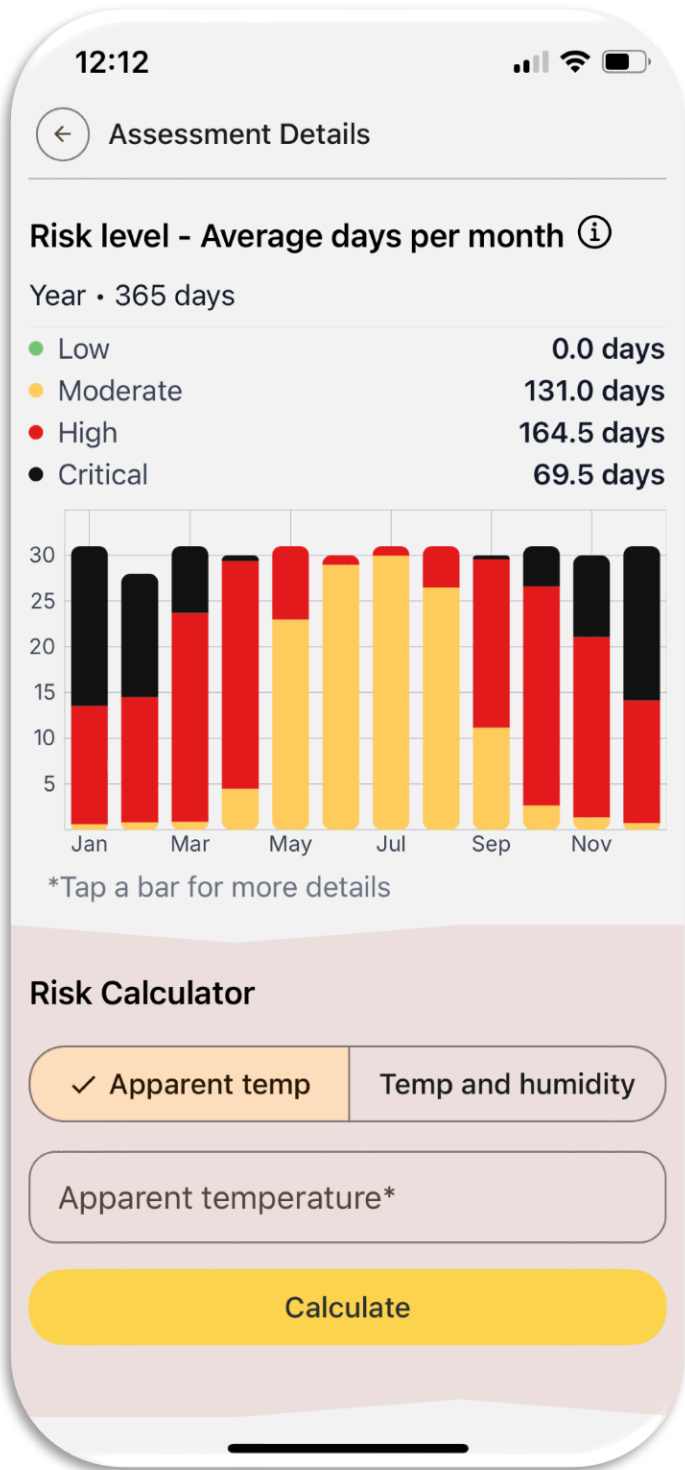
Outlook Dashboard

MT ISA DEMO - Timezone: Australia/Brisbane

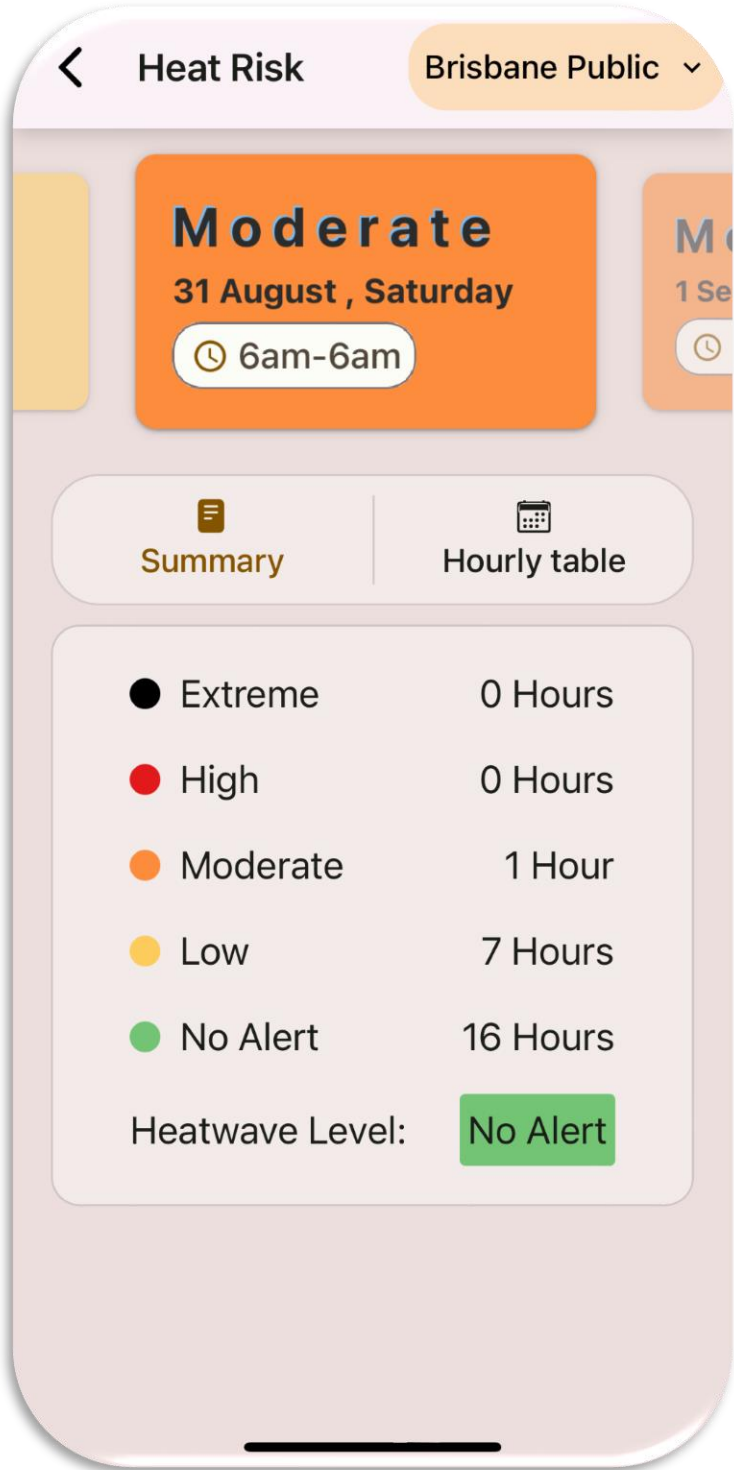
DATE	WED 27 NOV	THU 28 NOV	FRI 29 NOV	SAT 30 NOV	SUN 1 DEC	MON 2 DEC	TUE 3 DEC	WED 4 DEC	THU 5 DEC	FRI 6 DEC	SAT 7 DEC	SUN 8 DEC	MON 9 DEC	TUE 10 DEC
Heatwave Warning	No Alert	No Alert	No Alert	No Alert	No Alert	No Alert	No Alert	No Alert	No Alert	High	High	High	High	High
Heatwave Intensity (Temp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heatwave Intensity (Temp+Humidity)	0	0	0	0	0	0	0	0	0	0	0	1.1	1.8	2
Rain Risk	Heavy Rain Likely	Heavy Rain Likely	Heavy Rain Likely	No Rain	No Rain	No Rain	No Rain	Rain Likely	Rain Likely	No Rain	No Rain	No Rain	Heavy Rain Likely	Rain Likely
Rainfall (mm)	41.9	34.8	25.7	0	0	0	0	2.9	6.1	0	0	0	15.6	6.8
Rain Chance (%)	95	95	95	1	1	1	1	24.9	92.2	1	1	1	95	82.2

Kite – Mobile App

Thermal Risk Assessment



Daily Summary View



Heat Stress Symptoms

12:16

New Observations

Thermal risk * Coal Mine Worker

Observation date/time 12 Nov 2025 12:16

Symptoms

Are you sweating excessively? ☐

The body produces sweat to cool itself, but in hot and humid conditions this mechanism can become less effective. Constant or heavy sweating is one of the first indications of heat stress.

Are you thirsty or feel dehydrated? ☐

If fluids aren't replaced regularly, dehydration develops, worsening heat stress and limiting the body's ability to cool itself.

Are you feeling tired or weak? ☐

Heat forces the body to work harder to regulate its temperature, causing fatigue

Let Kite do the hard work for you!



Register for a free trial

<https://weatherintelligence.global/kite-registration/>



See Kite in action

<https://kite.weatherintelligence.global/>



(07) 3369 3699



us@weatherintelligence.global



<https://weatherintelligence.global>



Sign in with Username or Email

Username

Enter your Username

Password

Enter your Password



Forgot your password?

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Continue as guest



We've turned years of experience into practical know-how.
Explore it all in our free knowledge base.

HeatHub

Work Safer in the Heat

[HTTPS://HEATHUB.COM.AU/](https://heathub.com.au/)

