



## Concerned Waterways Alliance comments on GM2030

The Concerned Waterways Alliance (CWA) is a network of community and environment groups from Gippsland to the Otways. We share a deep concern about the degraded state of southern Victoria's rivers, wetlands and aquifers, and are committed to improving their health for the benefit of current and future generations.

CWA welcomes the release of GM 2030 and its commitment to sustainable groundwater use that protects ecosystems and supports living cultural environments. We support the emphasis on scientific, evidence-based management but have several questions and concerns about the framing of the groundwater management scheme, how the strategy deals with the critical issue of vertical connectivity (interconnection between ground and surface water) and the apparent weight given to groundwater extraction within the hydrologic cycle as a whole. Further, GM2030 document lacks detail and defers key decisions and plans to subsequent processes.

We are concerned about GM 2030's emphasis on developing markets and trade. Current PCVs (Permissible Consumptive Volume) are only effective in protecting the resource because of current low levels of use. In the case of surface water, ability to trade has encouraged the full use of entitlements and increased water use, and the same is likely to happen for groundwater. The establishment of an environmentally sustainable level of take (ESLT)<sup>1</sup> and a cap set at that level is an essential precondition for increased trade.

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<sup>1</sup> Defined in the Commonwealth Water Act (2007) s4 as *environmentally sustainable level of take* for a water resource means the level at which water can be taken from that water resource which, if exceeded, would compromise:

- (a) key environmental assets of the water resource; or
- (b) key ecosystem functions of the water resource; or
- (c) the productive base of the water resource; or
- (d) key environmental outcomes for the water resource.

## Vision and framing of policy and decision-making

The document sets out a 'vision' of groundwater management based on a form of sustainable use. This approach appears to be used to inform the structure of actions described, premised upon:

- Information and evidence;
- Regulatory mechanisms
- Rules informing use of regulatory mechanisms.

However, the strategy fails to set out the relevant legal and regulatory principles applying to groundwater management and, subsequently, how those principles are to apply to specific decisions, actions and conduct. For example, the document asserts 'Victoria uses the precautionary principle to manage our water,' an assertion presumably extending to groundwater management, but in the absence of any substantial consideration of what this application means or, more broadly, what the foundations of 'sustainable use' are to mean in the groundwater context. This explication of foundational principles is not an abstract exercise. Those tools are key guidance to policy-making and decision-making and their design and application to specific problems and concerns of groundwater management need to be thought through with rigor. That has previously occurred, for example, through the Tribunal (in a series of groundwater cases in the 2010s) but a relatively forensic approach appears absent from the GM2030 document.

In addition to specific understanding and application of precaution to groundwater management decisions and policy, sustainable use infers application of other key environmental principles – notably intergenerational equity and biodiversity conservation and ecological integrity. That is an obligation on water authorities.<sup>2</sup> The document should explain how this broader, more precise understanding of sustainable use informs groundwater management going forward, not least because they are issues potentially informing challenges to specific decisions such as licensing decisions.

A considered and precise policy framework for application of key sustainability principles to groundwater management decisions is essential to so-called 'modern tools' for groundwater management.

### Outcome 1: Improved, shared understanding of groundwater and its uses

We strongly support the commitment to improved understanding of groundwater which is much needed. While considerable effort has gone into developing groundwater information such as SRW's Groundwater Atlases and Federation University's Visualising Victoria's Groundwater website, it is still very difficult for members of the public to access quality, up to date information about groundwater availability and use, particularly in areas without management plans and in unincorporated areas.

However Outcome 1 makes no reference whatsoever to groundwater quality, impacts of groundwater extraction such as cones or depression, subsidence etc, or potential contamination of groundwater. All these issues are playing out in areas of high groundwater use, particularly in Gippsland where groundwater is impacted by coal mines, irrigation use and offshore oil and gas extraction. Changes in the water table can also lead to both dryland and irrigation salinity problems. Improved understanding

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<sup>2</sup> [MBR028466R.pdf \(water.vic.gov.au\)](#) Statement of Obligations

must include these issues as an expression of the principles of precaution and sustainability discussed above.

#### Priority 1 – Water availability and limits on take

Before a statewide review of limits on take can be carried out, a suitable methodology will need to be developed based on principles of precaution and sustainability. Current caps (PCVs) were set to reflect existing entitlements and did not incorporate any scientific or environmental criteria.

A methodology to determine an ESLT for groundwater must be prepared and adopted statewide as a matter of priority. ESLTs for all groundwater management areas should be prepared to inform mandatory controls on take and use (for example PCVs). A moratorium on any further take or licensing should be implemented, in order to facilitate a program of ESLT development and implementation (for example through management plans and licensing rules), and priority should be given to systems subject to high use/take, sensitive environmental values (such as Ramsar sites or ‘priority environmental assets’) and known high degrees of connectivity.

In essence, current policy concerning groundwater take, use and management is outdated, unscientific, inconsistent with the purposes of the Water Act, and not fit for purpose.

Appropriate data is essential to the exercise. Since groundwater is a hidden resource, there is much uncertainty around groundwater processes, especially the key aspects of its movement, storage, and quality. Hydrogeologists rely on conceptualising groundwater systems (i.e. geometry, water bodies, aquifer interactions, hydraulics, flow paths, temporal responses and quality) from information such as geology, physiography, soils, land-uses, geophysics, climate, groundwater discharge and groundwater bores. Conceptual models are used to create numerical models with which to run scenarios such as the impacts of pumping, climate change and ecosystem impacts. Data paucity creates considerable uncertainty in both conceptual and numerical models. Therefore, decent quality spatial and temporal data from monitoring bores (the State Observation Bore Monitoring Network) is paramount in sustainable groundwater management.

Modelling parameters with key endpoints are essential for a more accurate understanding of groundwater level fluctuations, groundwater contamination and groundwater ecosystems. But if the data does not exist or is not considered in risk assessment then key trends will be poorly predicted. Decision-making without full knowledge is dangerous.

Ground water caps have not been reviewed since they were established in the 1990s<sup>3</sup>. The Long-Term Water Resource Assessment (LTWRA) for southern Victoria shows a significant decline in groundwater levels across all aquifers which it attributes to reduced rainfall as a result of climate change.

This conclusion points to the obvious connection between groundwater levels and recharge and their dependence on rainfall. Climate change is reducing recharge in the same way that it is reducing surface water inflows. This will end up having a double impact on rivers that are groundwater dependent and closely interconnected with it, such as the Moorabool, Maribyrnong, Barwon and Avon Rivers, which will suffer from both reduced surface flows and

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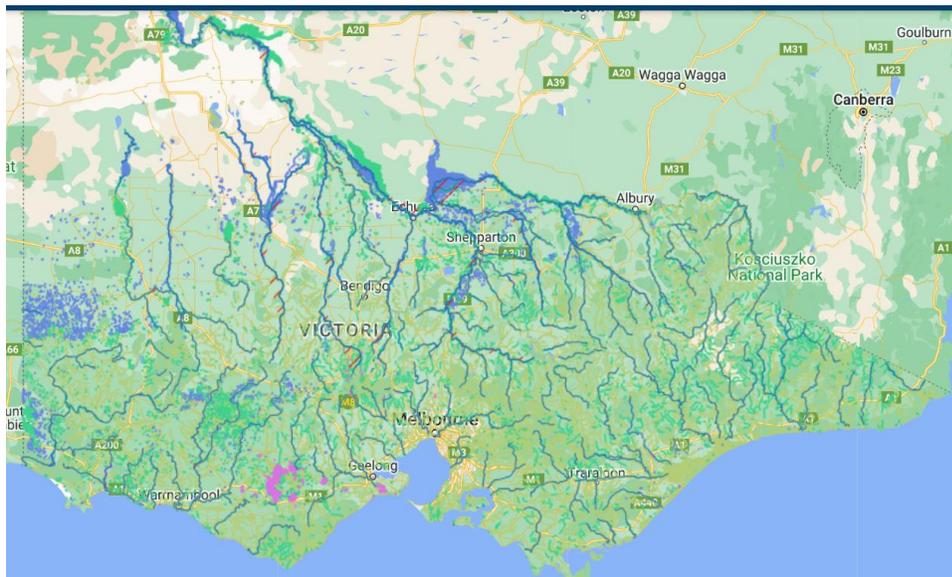
<sup>3</sup> DELWP (2020) Long Term Water Resource Assessment for Southern Victoria p55  
[DELW0146 LTWRA OverviewReport.pdf \(water.vic.gov.au\)](#)

reduced groundwater contributions. These are the types of considerations that will need to be taken into account in the review of limits of take.

#### Priority 2 – GDEs and environmental values

The current state of knowledge of GDEs is extremely poor. The 2018 State of the Environment report was unable to make any assessment of their condition or of the impacts of groundwater extraction on their condition.<sup>4</sup>

As outlined above, groundwater and surface water are closely interconnected and part of the same hydrologic cycle. Rivers and creeks across Victoria are GDEs with greater or lesser vertical and lateral connectivity based on their geological circumstances.



*Surface water interconnection with groundwater, source VVG<sup>5</sup>*

The Victorian government committed through the National Water Initiative to recognise connectivity between surface and groundwater and develop integrated management plans where the degree of connectivity is high.<sup>6</sup> Yet GM2030 makes no mention of the possibility of managing the two together even in closely connected systems, and as far as we are aware there is still only one integrated management plan in Victoria (for the Upper Ovens). Some groundwater areas that are closely connected to surface water, such as the Lancefield GMU, lack a management plan of any type.

The LTWRA, while claiming that groundwater use had negligible impact on the observed decline in river flows, demonstrated a perfect 1:1 correlation between groundwater use and decline in flows in the Thomson, Bunyip, and Mitchell basins.<sup>7</sup>

<sup>4</sup> [SoE-2018-scientific-assessments.pdf \(ces.vic.gov.au\)](#) indicator WR10 p 518

<sup>5</sup> [Visualising Victorias Groundwater \(VVG\)](#)

<sup>6</sup> National Water Initiative (2004) CI 23x

<sup>7</sup> LTWRA p62

**Table 2:** Results of assessment of impacts of licensed groundwater extraction on waterways

Study area	River Basin	Average Groundwater Use 2011/12-2015/16 (GL/yr)	Impact of licensed groundwater extraction on waterway (GL/yr)				Result (GL/yr)
			1:1	Ground-water model	Hydraulic gradient	Stream depletion	
Bungaree	Moorabool	1.6*	-	-	-	0.6	0.6
Denison	Thomson	8.3	8.3	-	-	-	8.3
Deutgam	Werribee	1.7*	-	-	-	0.4	0.4
Gellibrand	Gellibrand	0	-	0.1**	-	-	0.1
Gerangamete	Barwon	4.6	-	0.6	-	-	0.6
Jan Juc	Otway Coast	2.6*	<i>Methods not applicable for losing streams, and/or insufficient data to assess</i>				
Koo Wee Rup	Bunyip	1.3	-	-	-	0.7	0.7
Moe	Latrobe	0.1	-	-	-	0.1	0.1
Nepean	Bunyip	2.1	2.1	-	-	-	2.1
Warrion	Lake Corangamite	5.3*	-	-	0	-	0.0
Wa De Lock	Thomson	6.9	6.9	-	-	-	6.9
Wy Yung	Mitchell	0.6	0.6	-	-	-	0.6

\*These groundwater use volumes are based on an apportioned usage for the GMA (and area impacting the waterway).  
 \*\* Impacts within Gellibrand GMA are from groundwater extractions in the neighbouring GMA (Gerangamete).

Current management of GDEs is based on perceived levels of risk. Given the impact of climate change on both recharge and discharge, risks are escalating rapidly for rivers and wetlands across Victoria. GM2030 identifies a clear relationship between rainfall and groundwater use (Figure 2) but does not discuss this further in the context of climate change which is likely to increase demand while causing a decline in recharge and discharge to GDEs. Future management must reflect these elevated levels of risk.

Risk identification and management as a precautionary exercise requires, fundamentally, construction of risk as risk to environment assets, processes and functions, or alternatively risk of ‘serious or irreversible environmental damage’.<sup>8</sup> This construction of risk is to be given priority over mere risk of availability of groundwater as a resource for extraction (take).

The acute acidification of Boundary Creek and subsequent fish kills in the Barwon River were the consequence of inadequate risk assessment and management for groundwater extraction at the Barwon Downs borefield. Such lasting damage to GDEs must not be allowed to happen again.

### Priority 3 – improving data and monitoring

Data is collected and held by a wide range of organisations in both the public and private sector, but with little integration of databases and generally unavailable in a publicly accessible format. At the very least, FAIR data principles (findable, accessible, interoperable, reusable) should be mandated for all data collected by the Victorian government and water corporations.

<sup>8</sup> Water Act 1989 (Vic) s 93 (e)

Absence of clear, transparent and freely available information on groundwater resources, extractive use (including licensing and actual take), connections to GDEs (including rivers and wetlands), and limitations and ambiguities in the information base is a crucial constraint on proper public management and administration of what is ultimately a public resource.

The GM2030 document should set out rules and policy concerning:

- A program to collect and disseminate on public platforms the types of information referred to above;
- The degree and nature of uncertainties and information gaps existing in relation to groundwater resources and impacts of its use at any particular time;
- Use and application of information and knowledge that is subject to scientific methods and rigor.

There is little historic rationalisation of the placement of observation bores or stream flow gauges, many of which were installed opportunistically or for reasons of convenience or to observe a particular problem rather than to provide an overall picture of resource condition and availability. A 10-year monitoring plan should consider where additional observation bores are required to complete the picture and provide data on the environmental condition of groundwater resources.

Regular monitoring of groundwater quality is also required, particularly in areas where contamination is likely to occur, for example in connection with mining, landfill, heavy industry and intense agricultural use. The coal ash plumes that are contaminating groundwater in the Latrobe valley are a devastating example of the impacts of mining on groundwater quality.

Sustainable groundwater management needs to improve the certainty around how much D&S water is being extracted and at what times. The most logical method to do this is through a more complete groundwater monitoring network, including metering of D&S bores. With around 30,000 D&S bores statewide, the current method of estimation may be wildly inaccurate.

## Outcome 2. Modern tools in the statewide framework

Current estimates suggest that only about 30% of groundwater entitlements are used on a regular basis, rising to 50% in some locations under drought conditions.<sup>9</sup> Thus, large volumes of entitlement are held as 'sleeper' licenses, potentially as insurance to protect the reliability of entitlements that are used.<sup>10</sup> If these sleeper licenses were brought into use, as is the entitlement holder's right, it would very likely have an impact on groundwater levels and the sustainability of the resource, with rosters and restrictions on use an inevitable result.

This situation is highly undesirable and a policy failure. Priority Area 7 envisages a review of the groundwater management framework. This should include a full review of s51 licenses to include:

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<sup>9</sup> [SoE-2018-scientific-assessments.pdf \(ces.vic.gov.au\)](https://ces.vic.gov.au/indicator/wr13) Indicator WR 13 p 524

<sup>10</sup> See discussion in Tim Cummins and Associates (2021) 'Water related challenges and opportunities for agriculture in the Gippsland and Central regions of southern Victoria' [20210730-Challenges-and-opportunities Final v3.0.pdf \(water.vic.gov.au\)](https://water.vic.gov.au/20210730-Challenges-and-opportunities-Final-v3.0.pdf)

- The use of sustainability criteria and the precautionary principle in the setting of caps on extraction, taking the findings of the LTWRA and future climate change into account
- A review of the number, volumes and conditions of licenses on issue
- A review of the relationship between licensed volume, reliability, and the need for bans and rosters
- Compensation if the retirement of licenses is required before their expiry date
- Review of resource use under this mechanism within the context of other use and regulation of the same resource under other key mechanisms (such as stock and domestic use and irrigation districts).

Legislative change may be necessary following this review.

The other item that should be reviewed is the current exemption from metering for licenses under 20ML. This exemption means that there is currently over 90,000ML of entitlement in southern Victoria which is not metered<sup>11</sup> and for which extraction rates are unknown. Coupled with the thousands of stock and domestic bores which are also unmetered, there could be significant under-reporting of groundwater use across the state.

### Outcome 3: Streamlined and effective licensing, trade rules and controls

**Priority 8:** The proposed licensing reform will need to consider all the points we have raised in previous sections. Establishing an ESLT for groundwater and appropriate caps on extraction is paramount and key to risk management and protection of GDEs. Fixed term licensing could be made to coincide with the cycle of LTWRAs so that license volume could be adjusted in view of the findings of these assessments. The expectation that licenses will be automatically renewed should be tempered.

**Priority 9:** Expansion of groundwater markets should be treated with utmost caution. Increased opportunity to trade is highly likely to activate currently unused licenses and increase the level of take. Changing the location of the extraction point or increasing use at a particular extraction point may have unknown impacts on other users and on GDEs. Surface water trade has had significant and serious third-party impacts, particularly in the Murray-Darling Basin<sup>12</sup>. The uncertainties around groundwater processes add to the potential risk. Trade should not be encouraged until protective caps have been set and some of the uncertainty has been resolved in a publicly transparent way.

**Priority 10:** Use of saline groundwater should also be treated with extreme caution. Saline groundwater can provide important ecosystem services and support GDEs, for example many of the saline lakes in the Western Districts Ramsar site are groundwater flow-through systems, both discharging and recharging groundwater.<sup>13</sup> Other wetland systems, particularly in northern and western Victoria, may have similar hydrology and be at least partially groundwater dependent. Then there is the added problem of what to do with the salt that is brought to the surface with the groundwater. Millions of dollars have been spent

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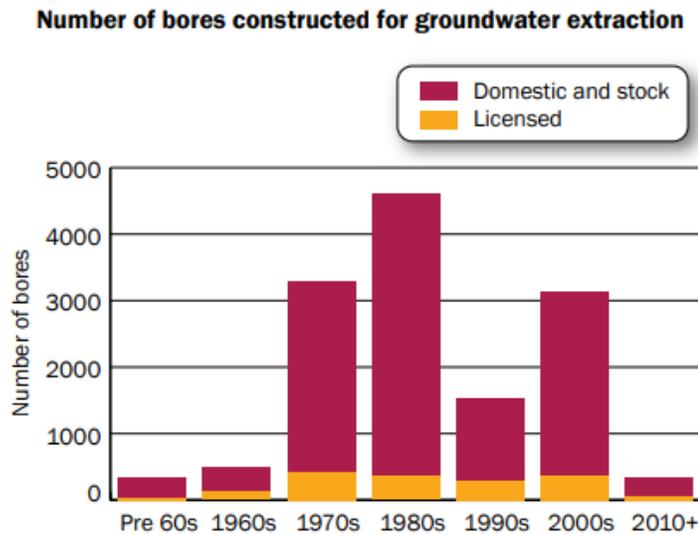
<sup>11</sup> SRW metering action plan

<sup>12</sup> ACCC (2021) Murray-Darling Basin Water Markets Inquiry, Final Report

<sup>13</sup> [Western District Lakes Ramsar site Ecological Character Description \(dceew.gov.au\)](https://www.dceew.gov.au/water/land-use/conservation/wetlands/western-district-lakes-ramsar-site-ecological-character-description)

on salinity mitigation and some southern Victorian catchments such as the Werribee already suffer from excessively saline water.

Priority 11: Stock and domestic bores vastly outnumber commercial bores in southern Victoria as this figure from the Port Phillip and Westernport Groundwater Atlas<sup>14</sup> shows:



This graph shows bores constructed for domestic and stock (D&S) and licensed (non D&S) purposes across the Port Phillip and Western Port region. Bores did not require a licence prior to 1969 and many were registered during the 1970s. The peaks during the 1980s and 2000s coincide with periods of drought. Bores with incomplete construction records are not included.

The region accounts for 30% of all groundwater bores across southern Victoria.

D&S bores are not metered, and use is estimated by the water authorities. It is assumed to be less than licensed use but there is no way of knowing if this is the case in all catchments in all years, particularly in areas where the density of D&S bores is high. It is likely to increase during drought, along with licensed use, and add to pressure on aquifers under these circumstances. In addition, D&S water is effectively free of charge and is not subject to management plans and restrictions in the same way as licensed use. This means D&S users have priority over other users and the environment when water is scarce, which is inequitable.

The unknown temporal and volume usage of D&S groundwater is a large uncertainty when attempting to calculate a water budget for an aquifer. Typically, more water is extracted during droughts, which is when the ecosystem services provided by groundwater are most needed and under severe stress. Sustainable groundwater management needs to improve the certainty around how much D&S water is being extracted and at what times. The most logical method to do this is through a more complete groundwater monitoring network, metering and bringing D&S use into the licensing framework to ensure equity and fairness between users.

<sup>14</sup> [Port-Phillip-GW-Atlas-Complete-Web.pdf \(srw.com.au\)](#) p22

Priority 12: We strongly support initiatives to improve compliance and the government's zero tolerance approach. However effective compliance depends both on full metering, preferably with telemetry, and compliance staff to do the work. Provision for these requirements should be built into water corporations' pricing submissions and tariff structures, so that compliance activity is adequately funded.

Priority 13: We strongly support the return of water to Traditional Owners for their self-determined purposes and the restorative justice approach outlined in the 'Water is Life' roadmap. However, it is unclear how the roadmap applies to groundwater, particularly as much of it is devoted to increasing TO involvement in managing the environmental water reserve, for which there are no groundwater entitlements. Reform and additions to the EWR for groundwater could open up new possibilities for both environmental protection and TO participation in management.

The other major barrier is the government's refusal to consider transferring existing entitlements to Traditional Owners or participate in buybacks. With so much unused groundwater entitlement in existence, a compensation program for those who are willing to relinquish licenses would seem like an obvious method of meeting Traditional Owner needs.

For further information, please contact Juliet Le Feuvre on behalf of Concerned Waterways Alliance

[Concernedwaterwaysalliance@gmail.com](mailto:Concernedwaterwaysalliance@gmail.com)

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