



Water Law Review
Office of Living Victoria
PO Box 500
East Melbourne VIC 3002

Response to Water Bill Exposure Draft (2014) – Victorian IAH Branch Submission

Dear Sir/Madam,

Thank you for the opportunity to submit comments to the Victorian Government Water Bill Exposure Draft.

The International Association of Hydrogeologists (IAH) is a scientific and educational organisation for scientists, engineers, water managers and other professionals working in the fields of groundwater resource planning, management and protection. Our mission is to further the understanding, wise use and protection of groundwater resources wherever they occur.

As a professional organisation, the IAH has a world-wide membership of more than 4000 individuals, with approximately 120 members in the Victorian Branch. Our members work in a variety of fields including government, natural resource management, consulting, mining and other industry and academia.

The wise use and protection of groundwater depends on science-based decision making and water laws that facilitate and support this process. Therefore, our members in Victoria have a professional interest in the State's water laws and potential changes in those laws.

The IAH (Victorian Branch) has reviewed the Water Bill Exposure Draft (the Bill) and we would like to raise the following points for consideration:

General Comments

- We believe that a more streamlined legislative framework is necessary to realise the goals of improved integration and sustainability of water management and use in Victoria. Therefore, we support the overall objective.
- Overall, we believe that the changes proposed in the Bill are a positive step in terms of integrated water resources management and protection of water resources. Consistency, simplicity and certainty in the legislative framework are all crucial in both effective water management and in the faith of water users in that water management. The Bill appears to provide more certainty for water users across all sectors, whilst also being more aligned with Victoria's obligations towards the Commonwealth Water Act and the Murray-Darling Basin Plan.

Whole of Water Cycle Management and Managed Aquifer Recharge

- We appreciate the efforts to promote whole of water cycle management (WOWCM), supporting the government's Living Victoria Strategy, but the Bill appears to be unclear as to how WOWCM will be considered in the new two-step planning framework, apart from being seen as local, site-specific solutions.
- WOWCM comprises a range of solutions or tools to deliver more efficient and sustainable water services. One of these is Managed Aquifer Recharge (MAR). MAR has the potential to make a significant difference to the capacity to manage water resources on a large scale in our highly variable and cyclic climate. However, MAR is not practised on a significant scale in Victoria, likely in part



because the current legislative framework is not conducive. Therefore, the IAH supports legislative change that better facilitates MAR.

- The IAH welcomes the “streamlining” of MAR schemes whereby the injection and extraction of water will be considered in an integrated manner and authorised with a take and use licence. However, the ability for proponents to successfully employ MAR as part of WOWCM options relies on a range of other important factors. For example, the EPA Victoria requirement that injected water be of equal or better quality to that contained within the target aquifer means that the aquifer medium itself cannot be regarded as a means of attenuation or treatment of the recharged water. Subject to proper investigation, design and monitoring, aquifer attenuation has been successfully used in MAR schemes for many years internationally and interstate. For example, aquifer attenuation has been specifically utilised, in place of chlorination, for the removal of pathogens from the drinking water supply of Amsterdam for many years. However, from a resource management perspective, this treatment option is still not possible in Victoria.
- It is understood that the intent of Part 8.4 of the Bill regarding Underground Disposal is to protect groundwater against pollution by disposal of waste. IAH is supportive of the protection of groundwater resources. However, Clause 546(1) of this section states that “The Minister must not approve an application in respect of a disposal which, in the opinion of the Minister, would cause the pollution of any groundwater or be detrimental to any aquifer or bore”. This has the potential to unnecessarily inhibit or prevent the implementation of MAR, if, for example, the water to be injected is typical surface water containing bacteria and nitrates. We recommend that MAR be excluded from the definition of disposal in this section and be addressed separately. This is because the objective of MAR is to supplement existing water storages for later use. It is not to dispose of polluted water.

The Precautionary Principle and Groundwater Allocations

We note that the Precautionary Principle is defined on page 5 of the Bill, as follows:

The precautionary principle

(1) The Minister or an Authority in making a decision under this Act must have regard to the principle set out in this section.

(2) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty is not to be used as a reason for postponing measures to prevent environmental degradation.

(3) Decision making must be guided by—

(a) a careful evaluation to avoid serious or irreversible environmental damage, wherever practicable; and

(b) an assessment of the risk-weighted consequences of various options.

- We concur that decision making with respect to groundwater management should include consideration of whether there is clear evidence of threats of serious or irreversible damage and should include an assessment of risk weighted consequences of options. However, conversely, if there is no evidence of threats of serious or irreversible environmental damage, we contend that a lack of scientific certainty should not be used as a reason for postponing a decision on groundwater utilisation.
- Informed groundwater management should include consideration of the risks associated with both over-allocation and under-allocation of the resource. Two fundamental truths in hydrogeology are that there will always be scientific uncertainty regarding groundwater flow systems and that groundwater resources cannot be extracted without generating drawdown. However, it does not follow that this means groundwater resources should not be used, unless we know of threats of serious or



irreversible damage. We will never have a complete understanding of groundwater systems, but we often have enough information to move forward. In a data-poor environment, both the potential cost of not making a decision and the potential cost of making a poor decision should be considered.

- Therefore, we caution against the potential misuse of the precautionary principle in the management of groundwater resources. There is a risk of unnecessarily locking up groundwater resources. The risk-weighted consequences that are considered should not be limited to environmental consequences. In the application of the precautionary principle to groundwater management, we recommend that Clause (3)(b) above be modified to the following: “(b) an assessment of the risk-weighted **environmental, economic and social** consequences of various options”.
- An example of where a decision was made to facilitate extraction despite ongoing uncertainty was the granting of a Bulk Entitlement to Barwon Water to take groundwater in the Anglesea region. At the time of this decision, Geelong was facing severe water shortages and Barwon Water was seeking a large water allocation. Despite a detailed technical investigation, uncertainty still remained as to whether unacceptable impacts would be caused by groundwater pumping. In this case, a licence was granted which contained ongoing requirements for detailed monitoring, triggers and review.
- We note that the maximum term for which a take and use licence can be issued or renewed is to be increased from 15 to 20 years. While we concur that this is a good idea from a certainty perspective for the license holder, it is also important that effective monitoring takes place and that entitlement capping is revisited on a regular basis, for example every five years. Due to the uncertainty inherent in groundwater systems, it is important that flexibility is retained in the management of those systems.

Licensing of Domestic and Stock Bores

- In previous reviews of the Sustainable Water Strategies for regions of Victoria, we have expressed the opinion that Domestic and Stock bores should be licensed for extraction as well as for construction purposes across the board, in line with current National practices. Without a thorough understanding of the extent to which the resource is being developed, it is more challenging to manage it effectively. Therefore, we are supportive of the proposal to phase in operating licenses for these bores.
- In some parts of Victoria, domestic and stock bores can represent a substantial proportion of water use. However, we are concerned that the proposed implementation approach will be very slow and important areas may not be fully covered for many years, if at all. In the case of existing bores, waiting for property ownership changes to then issue an operational licence will mean that accurate estimates of domestic and stock bores may still not be known for many years. We would like to see further details on compliance and enforcement of these new licences, given the difficulty in detecting the bores and/or the use of the water. We recommend that the Bill sets out ways in which this valuable information is captured in a more timely manner, for example, through engagement with existing licence holders (i.e. many S&D owners in rural locations are also holders of current surface water or groundwater licences), or in the case of urban or peri-urban residents, through engagement of Water Corporations.

Forest Plantations

- The IAH supports sustainable and integrated catchment management and a key input to achieving this is the quantification of all key inputs, uses and stores of the water. In this context we support the licencing of new forest plantations, but we also believe that this does not go far enough. All plantation forestry should be licenced to take and use water and be within the Victorian Water licencing



framework, to ensure that current and future land uses (including plantation forestry) do not lead to distortions in the licencing system and do not conflict with other initiatives such as carbon farming and environmental plantings.

Dewatering/Depressurisation

- The new Bill lacks clarity on how it deals with large developments or widespread groundwater extraction for mine dewatering or conventional and nonconventional gas extraction (both on- and offshore), including Coal Seam Gas. We believe that this needs to be clarified to provide greater certainty to proponents of large developments and also to the water authorities, the community and environmental stakeholders.
- The new Bill does not appear to indicate how construction dewatering will be addressed.

Definitions

- We note that in the Bill, “**aquifer**” is defined as “any geological structure or formation, or artificial landfill, that is underground and permeated, or capable of being permeated, permanently or intermittently with water”. In hydrogeology texts, an aquifer is defined as rock or sediment that is a geological formation, group of formations, or part of a formation which is saturated and sufficiently permeable to transmit economic quantities of water to wells, bores and springs (Fetter, 1988). Much of the subsurface is not sufficiently permeable to meet this definition, and the upper part is typically unsaturated.
- We note that in the Bill, “**groundwater**” is defined as “any water occurring in, or obtained from, an aquifer and includes any matter dissolved or suspended in any such water”. In hydrogeology texts, groundwater is defined as the water held in the pores in the ground below the water table (Fetter, 1988). This includes the solids dissolved in that groundwater. However, it does not include suspended solids. Suspended solids generally do not exist in groundwater. When suspended solids are reported in groundwater samples, they are typically an artefact of the combined groundwater sampling and bore construction techniques rather than being representative of in-situ groundwater.
- We recognise that there may be an objective to capture all of the subsurface in the Water Act and all of the groundwater in the subsurface in the Water Act. However, using incorrect technical terms in legislation has a potential to cause confusion. We trust that Victorian government hydrogeologists have been consulted regarding these definitions.

We would be pleased to discuss or clarify any of these above points, when convenient.

IAH appreciates the opportunity to submit comments on this document. If you have any further queries on the content of our submission, please contact Alan Wade, Chairperson Victorian Branch of the IAH.

Yours faithfully,

Anthony Brinkley, Ben Hall and Alan Wade

Executive Committee, Victorian Branch, International Association of Hydrogeologists

References:

Fetter, C.W., 1988, Applied Hydrogeology, published by Merrill Publishing Company, 592 pp.