



Submission by International Association of Hydrogeologists

To: Senate Environment and Communications References Committee

On: Parliamentary Inquiry into Water Use by the Extractive Industry

Due date: 15th December 2017

The submitting organisation

The International Association of Hydrogeologists (IAH) is the international peak scientific professional organisation engaged in groundwater resources management. It has a global membership of more than 4000 hydrogeologists, groundwater scientists and engineers; the Australian Chapter is the largest national chapter, with more than 500 members. This submission has been assembled by the Australian Chapter of the IAH, with contributions from members across Australia. The signatory to this submission is Lange Jorstad, President of the Australian National Chapter.

Lange Jorstad

President, IAH Australian Chapter

Submission

1. Overview

The IAH appreciates the invitation from the Senate Environment and Communications References Committee to prepare this submission on the regulation of water use by the extractive industry. We acknowledge that water use by the extractive industry is an emotive issue that attracts greater public scrutiny than other major water use industries. We infer from the nature and wording of the Terms of Reference that this review was commissioned due to concerns that the current state of water use regulation for the extractive industry is potentially inadequate.

2. Terms of Reference

It is understood that the Senate has tasked the Environment and Communications References Committee with evaluating and reporting on the adequacy of the regulatory framework governing water use by the extractive industry, with particular reference to:

- (a) the social, economic and environmental impacts of extractive projects' take and use of water;
- (b) existing safeguards in place to prevent the damage, contamination or draining of Australia's aquifers and water systems;
- (c) any gaps in the regulatory framework which may lead to adverse social, economic or environmental outcomes, as a result of the take and use of water by extractive projects;
- (d) any difference in the regulatory regime surrounding the extractive industry's water use, and that of other industries;
- (e) the effectiveness of the 'water trigger' under the Environment Protection and Biodiversity Conservation Act 1999, and the value in expanding the 'trigger' to include other projects, such as shale and tight gas; and
- (f) any other related matters.

3. Summary of Key Issues

Contributions to this submission were received from IAH members from different states and industry sectors. While the nuance of the contributions varied slightly, the following common themes were evident:

- The extractive industry is the most highly regulated of the major water use industries in Australia, despite not being the biggest water user. The development approval process in each state is generally rigorous for groundwater, with requirements for technical hydrogeological evaluations, baseline and operational monitoring, and "make good" provisions to rectify impacts to the beneficial uses of water resources. No other water use industry is subject to the same level of regulation.
- The limited regulation of other, significantly larger water users is considered to represent a greater risk to groundwater resource management than the stringently regulated extractive industry. To effectively manage Australia's groundwater resources, all groundwater users should be subject to a similar level of regulation.

- There is substantial duplication between State and Federal regulatory frameworks. The IAH considers that State frameworks are generally adequate to regulate extractive industry developments, and that the duplication of effort to satisfy federal regulations is not often justified by the limited additional value they provide to water resource protection.
- The Water Trigger under the EPBC Act 1999 is considered to be loosely defined in its application, and its limited application to coal mining and the CSG industry does not have a clear, scientific rationale. If such an instrument is necessary, it should apply to any development with the potential to affect Matters of National Environmental Significance, and should have clear guidelines for distinguishing between matters of local and national significance.
- There are many cases in which a significant portion of water used by the extractive industry is returned to the environment, either to the source from which it was derived, or for another beneficial use. However, there is currently no system of “credit” in water licensing schemes to account for water returned to a water source. The IAH recommends that the Parliamentary Inquiry considers the merits of Net Volume Licensing (NVL), where water licenses are limited to the volume of water consumed, and therefore account for water temporarily extracted and then returned to the environment.

4. Specific Matters

The Social, Economic and Environmental Impacts of Extractive Projects’ Take and Use of Water

To provide the necessary context for our submission, we feel it is important to put extractive industry groundwater use in context, relative to all other major consumptive groundwater uses in Australia. We refer to the groundwater use summary in Deloitte Access Economics (2013) *Economic Value of Groundwater in Australia*. The estimated annual groundwater consumption in Australia in 2013 was 3,500 billion litres (or Gigalitres, GL), of which approximately 60% was used for irrigation, 17% for manufacturing and other industries, 12% for mining, 9% for urban water supply and 5% for household water supply. Despite using only one fifth of the agricultural groundwater use, mining productivity directly reliant on groundwater contributes an equal amount to the GDP, approximately \$1.6 billion. The total value of production that is dependent on groundwater (considering direct consumption and non-extractive values) was estimated at \$33.8 billion, of which iron ore mining contributes approximately \$24 billion. Hence, mining generates significant economic and social value for comparatively modest water use.

The social, economic and environmental benefit and impacts of resource developments, like all developments, are assessed during the planning approval process. Projects in which there is likely to be an impact from groundwater withdrawals are rigorously assessed through hydrogeological assessment involving field investigations, numerical modelling and other groundwater investigative work performed primarily by members of IAH Australia.

In Australia, where regulation is extensive, all phases of the project from approval to operation to closure are conditioned to ensure this. Approvals and conditions acknowledge longer term negative impacts of a project, and it is ultimately the role of the approvers to balance these against the benefits of the project to decide if development should proceed. There is always the possibility and reality of negative impacts. However, this is no different to any other endeavour be it irrigation, intensive livestock production, industrial, power generation or the multitude of other uses which require water as part of their processes. For example, groundwater extraction in certain agricultural

areas has resulted in substantial depletion and salinization of groundwater resources, and contamination with nutrients and pesticides, however these operations are subject to far less regulatory scrutiny than extractive projects.

While the potential for social, economic and environmental impacts from extractive projects does exist, substantial benefits are also gained from such projects. Groundwater resources in rural areas that would otherwise not be developed due to the cost and technical difficulty of accessing them are developed by mining companies. Mining projects bring economic support, often to rural areas, in the form of employment, direct spending and royalties. Ultimately, the balance of positive and negative impacts associated with extractive projects is similar to many groundwater-supported industries. In the case of mining and extractive industries, the cost burden for assessment and regulatory compliance is usually borne solely by the proponent.

Existing safeguards in place to prevent the damage, contamination or draining of Australia's aquifers and water systems

Australian federal, state and local approvals and conditioning processes from EIS through to operations and closure are amongst the most stringent in the world. Indeed, it has recently been estimated that regulatory compliance costs are about 10% of the lifecycle cost of resource developments, and therefore a significant investment consideration for new projects.

Licensing and approvals for groundwater use associated with extractive industry projects must account for:

- public interest
- ecological sustainability
- environmental acceptance
- prejudice to future needs for water
- detrimental effect on other existing groundwater users
- whether the need could be provided from another source (e.g. recycled water)

The planning approval process also requires a robust monitoring program to identify emerging impacts, and contingency measures to either restore or compensate for the impacts. Often the impacts to groundwater resources associated with extractive projects are not permanent, and will become restored over time following completion of the projects (acknowledging that the timeframes for full restoration of the resource can be decades). Accordingly, mitigation measures are designed to support or compensate for the affected values of the groundwater resource until the values are eventually restored.

It must be noted that many IAH members responding to this submission expressed an opinion that state and federal regulation of extractive projects is substantially duplicative and often requires inordinate effort for limited additional benefits in terms of delivering protection for water resources. Our members felt that there would be significant benefit in reviewing state and federal regulations, and reducing duplication of regulatory functions to the extent practicable.

Any gaps in the regulatory framework which may lead to adverse social, economic or environmental outcomes, as a result of the take and use of water by extractive projects

The current water planning framework does not adequately recognise the temporary nature of water use for resource developments, which leads to lower levels of certainty for new projects in the approvals stage. Furthermore, water legislation does not currently acknowledge the return of appropriate quality water to the resources bank. For example, one Coal Seam Gas operator in

Queensland has treated poor quality groundwater extracted as part of gas production to high quality standards, and has returned over 15 GL of water to aquifers of the Great Artesian Basin, yet there is no framework in place to incentivise such managed aquifer recharge on a wider scale, or account for its benefits in water resource planning.

One such option is Net Volume Licensing (NVL), where an extractive industry extracts a specific volume from a river or aquifer and then returns most of that water to the original source (for example, 95% is returned). In this case a water extraction license is issued for the net volume actually used/consumed. Specific conditions are imposed concerning water quality, monitoring, reporting and charging. This approach has significant advantages in some cases. The IAH recommends that this approach be adopted by the Parliamentary Inquiry in specific circumstances. Further details on this licensing approach are available if necessary.

Any difference in the regulatory regime surrounding the extractive industry's water use, and that of other industries

A strongly held view by our members is that there is an imbalance in the level of regulation applied to the extractive industry compared to other groundwater consumers.

Groundwater used by the extractive industry is generally licensed in the same way as other users. However, groundwater use in the extractive industry has historically been regulated in a more stringent way than other users, such as agriculture, with annual reporting requirements for groundwater extraction (all bores must be metered), groundwater levels and groundwater quality parameters. In most cases, other industries, which constitute the vast majority of water allocation, are not even required to measure their water use.

To effectively manage a resource, you must have some degree of certainty over its use. Without adequate monitoring of non-extractive water use, better management of water resources will be unachievable.

The effectiveness of the 'water trigger' under the Environment Protection and Biodiversity Conservation Act 1999, and the value in expanding the 'trigger' to include other projects, such as shale and tight gas

As a general principle, the IAH support the development and application of regulation based on clear, scientific principles, for the protection of water resources from all development-related impacts. The Water Trigger was designed to capture projects of National Significance, and is limited in scope to coal based mining and CSG projects. The IAH offers the following opinions on the effectiveness of the Water Trigger as a regulatory instrument, as expressed by our members:

- In practice, many resource projects which have limited impacts of only local significance are referred to the EPBC Act under the Water Trigger. The guidelines for a project to fall under the water trigger are broad, general, and open to interpretation, to the extent that almost any CSG or large coal mine activity could be captured. There are limited guidelines for determining what is truly of national significance and what it not.
- Its limited application to coal based mining and CSG projects does not have a clear, scientific justification from the perspective of groundwater resource management. Expanding the scope to include shale and tight gas still results in a narrow focus on the mining and gas industry.
- Such an instrument, if required, should apply to all groundwater users and not single out coal mining and the onshore gas industry without a clear, scientific rationale for doing so. It should encompass all industries with the potential to affect groundwater resources and associated values of national significance.

- There is substantial duplication between state and federal regulation, resulting in referrals under the Water Trigger providing limited additional benefit to the protection of groundwater resources beyond those provided by state-based regulation.

Other related matters

IAH Australia has no significant comments beyond those addressed in the previous sections.