

## **Schedule 2**

**Assessment of regulatory frameworks governing water use  
by the extractive industry**

**Submission to: Senate Standing Committee on Environment  
and Communications inquiry into water use by the  
extractive industry**

**Sarah Asokendaran**

**PhD Candidate, TC Beirne School of Law, University of  
Queensland**

Sarah Asokendaran, PhD Candidate  
TC Beirne School of Law, The University of  
Queensland  
St Lucia Campus, Brisbane Queensland 4072,  
Australia

Disclaimer: I am making this submission as a private individual and from findings in my doctrinal research. The submission reflects my own views, and not those of TC Beirne School of Law, University of Queensland or any other body.

## **Summary**

In evaluating the adequacy of the regulatory frameworks governing water use by the extractive industry, below are five recommendations submitted for consideration:

1. Clear guidelines in applying the principles of Ecological Sustainable Development (ESD);
2. Incorporating Natural Capital Accounting (NCA) into Environmental Assessments;
3. Key Performance Indicators (KPIs) within statutory water plans should be harmonised;
4. Terminology should be uniformed across states;
5. Reviewing water trading between states to meet future water demand.

The recommendations address the following terms of reference:

- the social, economic and environmental impacts of extractive projects' take and use of water;
- 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;
- any other related matters.

## **Recommendations**

### **1. Clear guidelines in applying the principles of Ecological Sustainable Development (ESD)**

The term ESD is prevalent throughout natural resources legislation and the extractive industry. However its comprehension and application across industry is often inconsistent. This is because of the disconnect that exists between industry and regulators; and with courts and lawyers that contributes to the confusion surrounding the term 'sustainability.'<sup>1</sup> 'Sustainable development,' 'sustainability,' 'sustainable management,' or 'ESD' are terms that are interchangeably used. However, within the legal sphere, sustainability is defined in accordance with the principles of ESD.<sup>2</sup>

Clarity and uniformity within statute to the definition and application of ESD is needed. It is especially essential when extractive industries are regulated for under several different statutes (e.g. petroleum, water, environment legislation) and they all contain the term 'ESD' albeit with varying degrees of emphasis. It is often left up to courts to determine its definition and the application of its principles. However, even courts have trouble defining the principles in its

---

<sup>1</sup> Gavin M Mudd, 'Sustainability of Mining in Australia: Key Production Trends and Their Environmental Implications for the Future' (Research Report, Department of Civil Engineering, Monash University and Mineral Policy Institute, 2009), 1.

<sup>2</sup> Former Senior Judge Christine Trenorden of the Environment Resources and Development Court (SA) acknowledged that terminology of ESD and its subsequent interpretation by the Courts are the responsibility of lawyers and judges. See Christine Trenorden, 'Judicial Review and Ecological Sustainable Development: Where are we Going?' (Paper presented at NELA Conference 2014: Transformation or train wreck? Environmental and Climate Change Law at the cross roads, Sydney, Australia, Dec 2014).

applications. This is largely because, ‘the meaning of ESD depends on the specific legislation that incorporates it.’<sup>3</sup>

His Honour has stressed the importance of terminology used within statute, as interpretation is dependent upon statutory language.<sup>4</sup> For example some statutes give a general description of the principles of ESD – e.g. s 3A Environmental Protection and Biodiversity Act 1999 (Cth) and s 7 of the Water Act 2000 (QLD); and some define the object of the Act as ESD (but does not incorporate the principles) and how to achieve them (e.g. s 3 Environmental Protection Act 1994 (QLD)).

Therefore to achieve clarity and uniformity, ‘it... involves articulating clearly when, how, and what action needs to be taken to achieve ESD.’<sup>5</sup>

## **2. Incorporating Natural Capital Accounting (NCA)<sup>6</sup> into Environmental Assessments**

Natural Capital Accounting should be incorporated when evaluating the economic value of the environment and the feasibility of a project. The feasibility of a project is determined through environmental approvals (EAs) and specifically through Environmental Impact Statements (EIS’s). However, there

---

<sup>3</sup> Chief Judge Brian Preston, ‘The Judicial Development of Ecologically Sustainable Development’ (Speech delivered at the IUCNAEL Colloquium, 22 June 2016) <  
<http://www.lec.justice.nsw.gov.au/Documents/Speeches%20and%20Papers/PrestonCJ/PrestonCJ%20The%20Judicial%20Development%20of%20Ecologically%20Sustainable%20Development.pdf>>.

<sup>4</sup> Ibid, 5.

<sup>5</sup> Ibid, 41.

<sup>6</sup> Natural Capital Accounting is a method in which natural capital is considered in economic valuation of the environment. The United Nations introduced a System of Environmental-Economic Accounting (SEEA) after the UN conference in Rio. ‘Environmental-economic accounts provide the conceptual framework for integrated statistics on the environment and its relationship with the economy, including the impacts of the economy on the environment and the contribution of the environment to the economy. See United Nations Statistics Division, *System of Environmental-Economic Accounting* <  
<https://unstats.un.org/unsd/envaccounting/seea.asp>>.

are two factors that EA's do not fully address. Firstly, in calculating economic value of the environment, EA's or EIS's do not fully encapsulate the intrinsic value of the environment. The confusion that arises from using well-established economic modeling (e.g. input-output method, benefit-cost analysis) does not reflect public perception<sup>7</sup> and the natural capital of the environment.

EIS's that adopt the traditional method of valuing the environment do not reflect the intrinsic value of the environment, as some ecosystem goods and services are not traditionally reflected in markets (e.g. climate change, flood protection). The objective of incorporating NCA as an economic tool to measure the environment is to strengthen decision-making for development. The concept was first introduced through the system of environmental-economic accounting (SEEA) 1993. The Bureau of Meteorology has stated the following:

The SEEA provides clear pathways to account for ecosystems in non-monetary (physical) terms without requiring a reference to the economic system or monetary valuation. This opens the way to accounting for ecosystems from an entirely environmental perspective and for a range of non-monetary values. While such accounts are valuable for many purposes, the SEEA framework provides the added advantage of enabling strong links to the economic system.<sup>8</sup>

Some international businesses and governments have or are in the process of adopting this approach in their business practices and regulations.<sup>9</sup> It would be beneficial to Australia's management of water resources for it to take into account the intrinsic value of the environment.

---

<sup>7</sup> This was reflected in the approval of Carmichael coal mine (Adani decision). See *Adani Mining Pty Ltd v Land Services of Coast and Country Inc & Ors* [2015] QLC 48.

<sup>8</sup> Bureau of Meteorology 2013, *Guide to environmental accounting in Australia*, Environmental Information Programme Publication Series no. 3, Bureau of Meteorology, Canberra, Australia, 1.

<sup>9</sup> E.g. Environmental and Social Benchmarking Analysis of Nautilus Minerals Inc. Solwara 1 Project < <http://www.nautilusminerals.com/irm/content/pdf/earthconomics-reports/earth-economics-may-2015.pdf>>; and see Marjolein Lof et al 'The SEEA EEA carbon account for the Netherlands' (Report, Statistics Netherlands and Wageningen University, 2016).

Secondly, the process of EA's and therefore EIS's is static in nature. EIS's, especially, reflect the assessment of the lifecycle of the project based on current environmental estimates at the time the evaluation was undertaken. Although this sets the benchmark for environmental harm, it has the effect of stifling technological advances. For example, a mining project that has a lifespan of 20 to 30 years will not have any incentive to introduce new technology - even though it could improve environmental performance and be cost effective for the operations.<sup>10</sup> It would perhaps be beneficial to review EIS's at particular stages of the lifecycle of the project; or alternatively introduce an Environmental Management System<sup>11</sup> that will link EIS's to the system that will then allow for projects to be reviewed at all stages. This would have the benefit of addressing environmental impacts that were not, or were, conservatively predicted; and perhaps addressing predicted impacts in an innovative manner.

In summary, NCA has the benefit of better informing economic decisions for the environment as well, as it will help in meeting our international obligations.<sup>12</sup> It also has the added advantage of businesses being able to carry out their NCA when developing a project (e.g. Solwara mining project). Additionally, it would further Australia's sustainability goals and the principles of ESD.

### **3. Key Performance Indicators (KPIs) within statutory water plans should be harmonised**

The KPIs within statutory water plans in the states differ, resulting in water resources being managed differently across states. Although this issue has been

---

<sup>10</sup> Alyson Warhurst and Maria Ligia Noronha, *Environmental Policy in Mining: corporate strategy and planning for closure* (CRC Press, 1999) 115.

<sup>11</sup> Environmental Management System is a 'repetitive cycle with each stage being continuously revisited and improvements made on each visit.' Ibid.

<sup>12</sup> Australia is a signatory to the 2030 Agenda for Sustainable Development. Department of Foreign Affairs and Trade, 'the 2030 Agenda for Sustainable Development < <http://dfat.gov.au/aid/topics/development-issues/2030-agenda/Pages/default.aspx>>.

raised previously in a parliamentary report, it has yet to be addressed. Below is the statement by the Doctors for the Environment<sup>13</sup> that was previously raised:

... a national approach is essential to reduce the extensive risks associated with unconventional gas mining. The most (self-) evident reason for this is that sets of unconventional gas operations may take place in regions overlying, and therefore threatening, precious aquifers, aquifers that do not recognise state borders. Here we face the actual, absurd situation in which two (or more!) states may take different approaches to exploration and mining licensing, different approaches to aquifer management, different approaches to the approved use of toxic chemicals, different approaches to waste-water management and different Air Quality requirements. We emphasise, this absurd situation almost exists currently: Victoria has an unconventional gas activity moratorium, South Australia does not, yet SA may come to approve unconventional gas activity in the South East of SA extracting gas in relation to the same aquifer that Victoria is protecting.<sup>14</sup>

Fundamentally, the problem stems from the differing ways in which the states plan for their water resources. Below is a table that illustrates the differences in the contents of statutory water plans between states:<sup>15</sup>

<b>Content</b>	<b>QLD</b>	<b>SA</b>	<b>NT</b>
Ministerial Discretion <sup>16</sup>	Minister has discretion to declare a water plan	No ministerial discretion	Minister has discretion to declare a Water Allocation Plan (WAP)

<sup>13</sup> Doctors for the Environment Australia is an organisation of medical professionals in Australia focused on promoting health benefits through care of the environment. See Doctors for the Environment Australia, <<https://www.dea.org.au/about-dea/>>.

<sup>14</sup> Senate Standing Committee on Unconventional Gas Mining Parliament of Australia, Interim Report, May 2016, 38.

<sup>15</sup> For the purposes of this submission, I have limited the comparison between 2 states and 1 territory: Queensland (QLD), South Australia (SA) and the Northern Territory (NT). Therefore the *Water Act (WA) 2000 (Qld)*, *Natural Resources and Management Act (NRMA) 2004 (SA)* and the *Water Act (WA) 1992 (NT)* will be examined.

<sup>16</sup> *WA 2000 (QLD)*, s 42; *NRMA 2004 (SA)*, s 76; *WA 1992 (NT)*, s 22B.

Objectives <sup>17</sup>	'Sustainable management' objectives	To achieve the principles of ESD	None
Mandatory contents of water plan <sup>18</sup>	<ol style="list-style-type: none"> <li>1. State water plan outcomes and the water to which the plan applies</li> <li>2. Reserved unallocated water</li> <li>3. Objectives of Environmental flows</li> <li>4. Water trading zones if water allocations are managed under plan</li> </ol>	<ol style="list-style-type: none"> <li>1. Allocation of water, to take into account future users of land</li> <li>2. Set out principles for water access entitlements so that they are equitable and sustainable</li> <li>3. Environmental water requirements</li> <li>4. Mechanisms to determine consumptive pool</li> </ol>	<ol style="list-style-type: none"> <li>1. Water allocated within sustainable yield</li> <li>2. Water licences (surface and ground) may be traded</li> <li>3. The cost of Water resource management is to be recovered from licensees</li> </ol>

It should be noted that Queensland, South Australia and the Northern Territory take a vastly differing approach to water planning. Where South Australia has a statewide natural resource management plan that applies to the whole of the state; Queensland's water plans apply to catchment areas (of which there are 23) – and there can be separate water plans for surface or underground water. The Northern Territory on the other hand declares areas to be within a Water Control District of which a water resource then falls within a Water Allocation Plan (WAP).

<sup>17</sup> WA 2000 (QLD), s 41; NRMA 2004 (SA), s 7.

<sup>18</sup> WA 2000 (QLD), s 43; NRMA 2004 (SA), s 76 (4); WA 1992 (NT), s 5.



Among the two states and the Northern Territory, South Australia has the more prescriptive approach to managing their water resources. Because the whole of the state falls within a water plan, the Minister does not have the discretion to declare a water resource to be within a water plan. Instead, when the NRM board identifies a water resource as being important and needs to be protected, a Water Allocation Plan (WAP) is declared within a Region (of which there are eight regions; and they each fall within a plan). Importantly, the WAP must assess the quantity and quality of water and the periods of time that water will be needed by the ecosystems within that water resource.<sup>19</sup>

Essentially what this means for extractive industries and their ‘take and use of water’ is that water taken from shared aquifers, or taken and used in the development of cross-border gas basins are regulated differently.

Below is a table that illustrates the differences (and similarities) between South Australia’s and Queensland’s statutory water plans that apply to a shared gas basin – Cooper Basin.<sup>20</sup> The Cooper Basin falls within the Far North Prescribed Wells Area Water Allocation Plan (FNPWA WAP) (SA) and the Great Artesian Basin and other Regional Aquifers Water Plan (GABORA WP) (QLD).

<b>FNPWA WAP (SA)</b>	<b>GABORA WP (QLD)</b>
Pool of water specific to Petroleum industry – 60M/L per day of co-produced water to be shared.	General right to take associated water.
Management is by groundwater pressure.	Management is by groundwater pressure.
GDE Impacts based on adaptive management approach e.g. no new	Cumulative drawdown for water for GDE must be less than 0.4m. A WMP must determine the method to

<sup>19</sup> NRMA 2004, s 76(4)(a)(i).

<sup>20</sup> It should be noted that the table is limited to examples selected by the author.

wells within 5km of springs. EIR required if pressure drops.	estimate cumulative drawdown is less than 0.4m.
Acknowledges that taking of water from same aquifer in adjoining state might have detrimental effect – as per s76 (4)(a).	S47 of GABORA Water Plan –must consult with other states if a change or grant of water licence will affect pressure of bores and level at border with QLD.
Water licence is required to take water (from prescribed water resource).	Water entitlement is required for non-associated water.

A specific example of the different ways in which KPIs are measured by the states is the management of GDEs. South Australia takes an adaptive management approach in comparison to Queensland that takes a more prescriptive approach. Although it is acknowledged that states adopt different methods in statutory water planning (prescriptive or principle based), by adopting the same KPIs, states can retain their method of regulating while achieving the same desired result for the management of their groundwater.

Therefore there are two mechanisms that could act as a safety measure for the management of shared GDEs – the harmonisation of KPIs and the acknowledgment and use of s76 (4)(a) NRMA 2004 (SA) and s47 GABORA Water Plan (QLD).

#### **4. Terminology should be uniformed across states**

The terminology used to define water rights is fundamental to the way in which water is legislated in states. Terminology within statute carries legal significance for lawyers and judges as it has the effect of defining statutory water rights. By harmonising terminology, it would make coordination efforts between states easier.

NWI <sup>21</sup>		QLD	SA	NT
Water access entitlement		Water allocations	Water access entitlement	N/A
Water allocations		Seasonal water assignments	Water allocations	N/A
Water plans		Water Plans	Water Allocation Plans	Water Control Districts

There are several reasons for uniformed terminology to be adopted across states: firstly, by standardising key terms and their application within the water industry, it would allow regulators across states to better coordinate efforts in cross-boundary projects and shared aquifers. Effectively, this would mean that water licences in South Australia will have the same definition and application as it would in Queensland and the Northern Territory, and vice versa. As a result of this, industry participants will be able to directly transact with each other (decentralisation of regulations and administration due to similarity in processes) and therefore organically create water markets through trading. The benefit of this would be a reduction in regulatory burden and compliance costs.

## 5. Reviewing water trading between states to meet future water demand

There is concern about water security for current and future use among stakeholders.<sup>22</sup> Water trading is one way that we can meet water scarcity in the future as well as meet current demands. This would involve states utilising and encouraging interstate trade. Although there currently exists interstate trade

---

<sup>21</sup> Intergovernmental Agreement on a National Water Initiative (NWI) 2004.

<sup>22</sup> E.g. for the use in agriculture, industry, public etc.

(e.g. Murray Darling Basin), interstate water trading has yet to be fully adopted and utilised by the states.

In order for this to happen there has to be reciprocal arrangements between states (other than intergovernmental agreements). One possible way of achieving this is through legislative or regulatory changes that allows for the ease of interstate water trading. This would require states to adopt water policy initiatives that allows for optimal trading.

It has been noted that:

Tagged trade requires reciprocal agreements between states to ensure water access entitlements can be recognized and applied in other jurisdictions, enabling users to access their water in either jurisdiction. The access right remains static.<sup>23</sup>

Although it is acknowledged that there exist obstacles to water trading – regulatory burden being one of them - the advantages of optimising water trading between states lie in the creation of a nation-wide network for water trading that could potentially address future water demands.

---

<sup>23</sup> S Wheeler et al, 'Reviewing the adoption and impact of water markets in the Murray–Darling Basin, Australia' (2014) 518 *Journal of Hydrology* 28, 38.