Australian Government Productivity Commission
24th March 2021

Please find enclosed the submission to the Productivity Commission in regards to the Draft National Water Reform 2020.

This submission is made on behalf of our farm, Wysall Park, whose seventy-year history, and its continuation, is important for our family and Australia. It is the backbone of what made Australia a lucky country. It is the future of Australia's food security.

The draft report misses one key component; ensuring that there is legislative accountability by State and Federal Governments. In our personal experience, we are helpless in protecting our regionally significant underground water resource, the Condamine Alluvium, due to poor legislative and regulatory tools. We cannot hold the Queensland government accountable, and therefore they are not responsive to our concerns. Please see yellow highlighted areas, which support this argument. The remaining document provides background information.

We have taken an enormous amount of time to provide you with the following submission, such is our concerns regarding this draft report and the impact the resource activity will have on our underground water and farming activities for generations to come.

Tabitha and Celia Karp

Our Personal Story

This is our personal story. Our family has a 740-acre farm in Queensland between Dalby and Cecil Plains, in a district called Springvale (Petroleum Lease 198 & 238). The nearest town, Dalby, is 30km by car. It's a former soldier's settler block (small lot holdings), that sits approximately 1.5km from the Condamine River, and approximately 2.5km from the Horrane Fault (this is a floodplain). We are dry land farmers, black clay soil, and our stock and domestic bore accesses the regionally significant underground water resource, the Condamine Alluvium, a rather shallow formation. Without this bore, we could not live on the farm, which has remained in our family for 70 years. Not only do we use the S&D bore for household purposes, we also use it for stock (we maintain traditional house paddocks to provide a barrier between the cultivation and the farm yard). Furthermore, for the purpose of supporting ecological diversity, we have taken it upon ourselves to revegetate parts of the farm yard with more native trees and plants. We already maintain our trees along the road, including encouraging native grasses, as well as having treed paddocks in the cultivation, including a nature reserve on our farm (native grasses have been maintained within this nature reserve). Furthermore, we have a small house cottage, in addition to the family house, which we rent. The income earned from this cottage is used for the purpose of maintaining this ecological diversity; controlling weeds from floods, planting trees, planting native grasses in the house paddocks (we wish to restore the paddocks to native grasses; an on-going process). As we experience changing climatic conditions, including summer rain being significantly less frequent/reliable, we believe future regenerative farming practices will become an important product to maintain Australia's food security.

Without an S&D bore, our quality of life would be of no value. We live in a harsh land, due to its natural attributes, and added environmental strains (changing climatic conditions). Having a small house garden for beauty and pleasure, helps maintain our mental health. Having a tenant in our cottage allows us to employ a man, who helps us to control weeds/prickly pear and stick pick in the farmyard, house paddocks, nature reserves and roadside in order to slash and maintain/encourage native grasses and control weeds. Without water in our S&D bore, we could not have a tenant + income to main ecological diversity, nor could we have stock in our house paddocks.

The Existing Impacts to the Condamine Alluvium Pre-Coal Seam Gas, including Recharge

The major recharge capacity for the Condamine Alluvium system is through the Main Range Volcanics (the Main Range Volcanics underlies the Condamine Alluvium tributaries further east and sits above the Walloon Coal Measures) and connectivity with the Condamine River. The Condamine River recharge is aided with the series of small weirs constructed along the river between Warwick and Dalby. However, due to the lack of flows and base flows in the river over the last two decades - this source of recharge has been irregular.

'Turkey nest' dams constructed by broad scale irrigators in the Condamine to capture overland flow has limited the flow of water that reaches the Condamine river. In the Springvale area, the Condamine River ceases to flow, and for the most part, it is dry. This is further compounded by less frequent and reliable rains, dryer and hotter periods, and irrigators pumping water directly from the river itself. At these times the river does not act as a significant source of groundwater recharge.

Without the impact of over-extraction, the natural gravity driven gradient for groundwater flow in the Central Condamine Alluvium is from the southeast to northwest. However, due to over-extraction of water since the 1960s, 'cones of depression' in water levels in the Condamine have occurred (East of Cecil Plains and Dalby Area). This has resulted in 'some of the Condamine River becoming disconnected from the underlying aquifer and experiencing a loss of stream flow due to substantial thickness of unsaturated sediments beneath the river bed (*Page 13, Upper Condamine Groundwater Model Calibration Report, CSIRO, September 2008*).

Some recharge to the Condamine Alluvium system also occurs from outcrop areas along the eastern and south-eastern margins of the Central Condamine Alluvium, and limited to no upward movement of water and recharge from bedrock, e.g. Walloon Coal Measures, including the Great Artesian Basin formations. There is still a lot of debate and disagreement about the level of connectivity between the Condamine Alluvial system and the underlying Walloon Sandstone bedrocks. The Queensland Office of Groundwater Impact Assessment (DNRME) re-verified on the 12th March 2021 that there is connectivity between the Condamine Alluvium and the Walloon Coal Measures, however it is a question to the degree of connectivity. This degree of connectivity is also determined by geological faults.

The Condamine Alluvium aquifer was over allocated in the late 60's and 70's and it had a Nominal Volume of Allocation around 78GL /year of water extraction. Through overuse the actual extraction decreased over time down to between 35 - 55,000ML/year and the water use was managed through a system of "announced allocations" for each water year. The DNRME would assess their water monitoring bore data and make a call on how much of a water user's water allocation could be used in a water year. This data assessed the previous year's water use as well as aquifer recharge and there were various "announced allocations" over the system - depending on how a specific areas water levels were.

Coal Seam Gas Activity & Development Surat Cumulative Management Area – Encompassing our Farming District – Springvale Area
In 2013, the Commonwealth Government approved the Arrow Energy (Shell & PetroChina) Surat Gas Project 2010/5344 (encompasses the Dalby Expansion Project 2010/5343) under the EPBC Act. The Environmental Authority EPPG00972513 was granted by the Queensland government under the Environmental Protection Act 1994. The original Environmental Authority cannot be obtained publicly, unless a request is made to the Queensland Government Public Register. I am still trying to get a response, two months later. In Petroleum Leases (PL) 194, 198, 230, 238, 252, 258, 260 (situated in the Surat Basin), a major amendment to Arrow Energy's Environmental Authority was granted in 2019. This amendment allowed Arrow Energy (Shell & PetroChina) to increase the number of coal seam gas wells from 691 wells to a total of 1566 coal seam gas wells. In these seven PL tenures, it is estimated by Arrow Energy that an additional 196000ML of water will be produced of the lifespan of the Surat Gas Project (20-25 years).

Due to other Petroleum and Gas companies that exist in the Surat Basin, this area has been identified as the Surat Cumulative Management Area.

In 2015, the Qld Office of Groundwater Impact Assessment (DNRME) estimated that coal seam gas water production in the Surat Cumulative Management Area peaked at 59000ML. This is in contrast to information provided by Arrow Energy, Santos, QGC, Origin, in the Surat Cumulative Management Area, who estimated modelled water extraction from current and proposed coal seam gas projects, with peak extraction of 200000ML in 2015 (*Page 33 Arrow Energy WMMP 2018*).

As of 2016, cumulative water pumped out of coal seams to access the gas held within the Walloon Coal Measures, in the Surat Basin, produced on average 70000 ML of water each year – a seventh of water held in Sydney Harbour.

At The Same Time…..
In 2018 - AgForce made representations to the Commonwealth Government for a "buyback" of the Nominal Volume of allocation for the Condamine Alluvium system. The Commonwealth Government agreed to invest around $70mill in buying back a portion of each water allocation held by water users in the system and through

this initiative the overall volume of allocation was reduced to around 42000ML. The future management of this 42000ML of Nominal Volume of water will again be managed through an "announce allocation" system - however overall use cannot exceed the 42000ML in any one year - so overall if predicted recharge continues - then the system may slowly improve.

The final comment I will make is in relation to the Qld Government's management of the Great Artesian Basin. Over the last two decades there has been in excess of $300mill of taxpayers and pastoral water user's money invested in the capping and piping of uncontrolled artesian bores. This program has resulted in significant reductions of water wastage from free flowing bores and the last figure I heard was these savings are > 200,000ML/year. However, the Qld Government is allowing coal seam gas companies to develop gas wells that extract around 65000ML/year in the Surat Basin from the Great Artesian Basin formations without any water charges. There are no restrictions on the volumes of "produced water" that coal seam gas companies can extract as part of their coal seam gas extraction operations. When other water users (including primary producers) wish to access GAB water for any new enterprises, they are required to either purchase from the Qld Government - an allocation of GAB water if unallocated water is available in their particular management area. However, if unallocated water is not available, they are forced to try and find a water user with an existing water license who is a willing seller. This is a grossly inequitable and hypocritical policy position by the Qld Government and indicates they are not supportive of agriculture. Primary producers have contributed significant funds to the capping and piping of the GAB bores to reduce wastage and the water savings are given away to the CSG Industry.

The Risks and Impacts from Coal Seam Gas Activity on the Regionally Significant Condamine Alluvium
Interlayer flux into the Condamine Alluvium (under non-CSG development conditions) comprises upward flux from the Walloon Coal Measures. Coal seam water production, from the Walloon Coal Measures, will cause a reduction in the existing upward flux to the Condamine Alluvium (*Page 32 Arrow Energy WMMP 2018*). A reduced flux may lead to drawdown in the Condamine Alluvium and its water levels. However, the maximum reduction in upward flow to the Condamine Alluvium occurs 29 to 45 years later, reaching the base of the alluvium, proceeding the maximum coal seam water production (*Page 40 Arrow Energy WMMP 2018*). The lifespan of an average coal seam gas well is anywhere from 20 to 25 years, depending on the quality of well construction and amount of gas present. Therefore, maximum impact to water levels in the Condamine Alluvium occurs post coal seam gas activity.

In our opinion, after 70 intimate years of farming this land, the Condamine Alluvium is a finite water resource, and once drawdown/depletion, contamination occurs, it can not be replenished by a resource proponent or government agency. Nature takes precedence.

Where there are geological faults, for example, the Horrane fault, there is further concern in regards to gas migration/contamination and additional water drawdown to the Condamine Alluvium. This is a reality in our area, Springvale. Arrow Energy and OGIA are moving forward with development, despite lack of evidence regarding the Horrane Fault and how this affects connectivity between the Walloon Coal Measures and the Condamine Alluvium. The little evidence available by Arrow Energy and OGIA, suggests there is connectivity between the Walloon Coal Measures and Condamine Alluvium in the Horrane Fault area (*Page 58, Hydrogeological characterisation of faults in the Surat Basin by Office of Groundwater Impact Assessment, December 2020*).

In the event, we lose our stock and domestic bore, due to cumulative usage by resource proponents, and other non-coal seam gas users, we would then consider drilling a new stock and domestic bore in the next formation, the Springbok Sandstones. However, it is predicted, by Arrow Energy and the Qld Office of Groundwater Impact Assessment (DNRME), that the Springbok Sandstone will lose water in the short and long-term in our area. Currently, a small number of farmers in the Central Condamine Alluvium area, have bores accessing the Springbok Sandstones compared to the more accessible Condamine Alluvium. We would then consider drilling a stock and domestic bore in the Walloon Coal Measures. However, we could not afford to drill at this depth, and if we could afford it, this formation has also been predicted to lose water in the short and long-term in our area, by Arrow Energy and the Qld Office of Groundwater Impact Assessment (DNRME) (*Figure 3.1, 3.2, 3.3, 3.4, Stage 1 CSG Water Monitoring and Management Plan, Arrow Energy*) & (*Page 94, 95, 96, 98, 99, 100, Underground Water Impact Report for the Surat Cumulative Management Area by Office of Groundwater Impact Assessment, July 2019*) .

Despite the heterogeneous (diverse in character) nature of the Condamine alluvium, which implies that its hydraulic properties (underground water formations) are also variable in space, Qld Office of Groundwater

Impact Assessment (DNRME) and Arrow Energy conclude low connectivity between the Walloon Coal Measures (where the gas is situated) and the Condamine Alluvium, meaning the loss of water in the Condamine Alluvium is minimal (Page 7, Hydrogeological characterisation of faults in the Surat Basin by Office of Groundwater Impact Assessment, December 2020) & (*Page 75, Underground Water Impact Report for the Surat Cumulative Management Area by Office of Groundwater Impact Assessment, July 2019*) & (*Page 34, Stage 1 CSG Water Monitoring and Management Plan, Arrow Energy*).

As presented in the Surat Gas Project SREIS by Arrow Energy concerning only Arrow Energy coal seam gas activity: Predicted flow changes to the alluvium indicate relatively minor impacts (reduced flow) peaking at between 456ML/year and 1022ML/year. Year of maximum drawdown is predicted for 2100.
As presented in the Surat Gas Project SREIS by Arrow Energy concerning all, cumulative, coal seam gas activity: Predicted flow changes to the alluvium indicate relatively minor impacts (reduced flow) peaking at between 657ML/year and 1387ML/year. Year of maximum drawdown is predicted for 2100.

These above cumulative figures do not encompass; other Petroleum activities (excluding coal seam gas); changing climatic conditions; irrigation usage, recharge inflows.

To put this into perspective, a 2013 paper predicted that recharge to the Condamine Alluvium from the Walloon Coal Measures measured a minimum recharge of -1650ML/year to a maximum 3650ML/year. (*Page 11, 12, UWIR Report 2019*). OGIA cautions making conclusive assumptions of these results due to the different geographical footprint across the Central Condamine Alluvium. This is in spite of OGIA and Arrow Energy undertaking a simplified approach to their own studies; only two test sites in the Condamine Alluvium, to test for connectivity between the Condamine Alluvium and Walloon Coal Measures. This approach ensures their low connectivity theory and one could question the modelling used.

Furthermore, it is acknowledged by all that extraction/outflow of water from the Condamine Alluvium exceeds recharge levels. However, in their contradictory nature, OGIA estimates of inflow to the Condamine Alluvium from the Walloon Coal Measures are unknown, due to lack of long-term groundwater level data.

Queensland Areas of Regional Interest
The Surat Gas Project by Arrow Energy (Shell & PetroChina), under Environmental Authority EPPG00972513, is situated in a Priority Agricultural Area, as identified in the Regional Planning Interests Act 2014 (this replaced Strategic Cropping Land and the Strategic Cropping Land Act 2011, under which we were protected). Priority Agricultural Areas represent Queensland's high value producing agricultural land. Priority Agricultural Areas cover 3% of Queensland. To date, the Regional Planning Interests Act 2014, the overarching piece of legislation guiding the coal seam gas industry, has not carried out its original intent: to protect agricultural values (underground water) and Priority Agricultural Areas. It is currently under review since the 17th March 2021, however revisions will take years, and by then, it will be too late. In the meantime, the Environmental Authority granted to Arrow Energy, including the accompanying EA conditions, do not address, nor protect what it was supposed to under the original intent of the RPI Act 2014; agricultural values (underground water) and Priority Agricultural Areas.

Other significant pieces of Queensland legislation that are compromised; The Environmental Protection Act 1994; The Water Act 2000.

A State Government who are Complicit
In our observations of the Queensland government, and ultimately Arrow Energy, we question the accuracy and transparency of data and evidence in regards to potential impacts on the regionally significant underground water resource, the Condamine Alluvium, due to coal seam gas activity. The regulatory processes that were supposed to guide the coal seam gas industry, whilst protecting Priority Agricultural Areas and regionally significant underground water resources, lack transparency and accountability. This is due to legislation not performing its intent, clear bias in existing legislation favouring resource proponents, no clear mechanisms in existing State and Federal legislation to protect regionally significant underground water, lack of transparency in seeking data and information from relevant Queensland government departments (leading to misinformation and poor decision making by landholders who willingly accommodate coal seam gas activity on their farming properties), government departments intentionally having limited knowledge and scope outside of their duties – leading to lack of accountability/transparency. The Queensland Government Owned Corporation Stanwell Corporation Limited (Stanwell's interest was transferred to CleanCo Queensland Limited, a Government

Owned Corporation, in 2019), an Environmental Authority holder listed in the Environmental Authority granted to Arrow Energy – one could question the intentions of the Queensland government based on their investment portfolio holdings. Overall, due to the intentional lack of accountability by the Queensland government, as farmers, we have nowhere to turn, and as such, underground water resources are under threat in Queensland.