Written by Douglas Ferguson with Professors Robert Kooyman and David Milledge

Introduction

The NSW State Government has chosen to speak about the Coal Seam Gas (CSG) industry in northern NSW as if it was a *fait accompli*. However, the people of NSW are still waiting to be provided with the facts and details of the potential impacts on social and environmental values. To quote from the Governments' own commentary about the CSG situation in NSW:

'Ahead of the granting of the Exploration license, strategic land use planning is the process that will be used for identifying land use practices for different areas…'
And in relation to Federal processes we quote from Julia Gillards' letter to Tony Windsor following his successful amendment to the Mining Act at Federal level that requires **consideration of the consequences of the cumulative impact of the mining industry**.
"…will be able to take into account existing bioregional assessments, which will incorporate expert analysis of the spatial characteristics of a region, its ecology, geology and hydrology and related risks…"

This wording captures our core concerns in relation to the internationally acknowledged environmental and ecological values of the NSW Northern Rivers Region (see below).
The Northern Rivers community understands the need to protect the unique values of the region. As a community (and based on quantitative assessment) we have demonstrated, remonstrated and secured international and national recognition of the environmental and ecological values of the region, and built our businesses and lives around those assets. We have grown and matured into an integrated community dedicated to providing diverse and 'clean' agricultural products and protecting local, regional, and continental scale geological, hydrological and ecological processes. This includes minimizing threats to agriculture and the other diverse sustainable economic activities reliant on natural systems and processes.

Our Situation

The Northern Rivers Region hosts a diverse community which includes indigenous people, the living legacy of our pioneer past, and a vibrant culture of more recent settlers who have brought a variety of skills and perspectives into the region. This is a rich mix and a creative and active social milieu that genuinely 'cares for country'.

There exists a robust and diverse agriculture that has been, and should remain the backbone of the region for many generations to come. To threaten this future is, we believe, both shortsighted and economically disastrous. A short list of regional agriculture includes prime beef and dairy production, macadamia orchards, dry-land rice, banana plantations and a wide variety of tropical fruit orchards, pig and poultry production, and soya-bean, corn and vegetable production.
The region is a leader in organic and low-chemical use farming methods across the full spectrum of agriculture*s*. We have sugar-cane farmers who have pioneered methods to control acid sulfate leaching into waterways and oceans. Those methods have been adopted more broadly and are now widespread throughout the national industry. As a community we have been involved in ecological restoration activities that include forest, riparian and dune regeneration. The latter, ironically, focused on repairing the destructive impacts of the last great wave of mining activity in the region (sand-mining).

It is here in the Northern Rivers Region that the movement to protect rainforest nationally and internationally began. The alignment between scientific evidence and a peoples' movement resulted in an expanded mosaic of National Parks that are recognised internationally (World Heritage Listed) and nationwide as 'natural jewels'. Twenty-two percent of our region is National Park and a further twelve percent is under forestry. From these mostly upland treasures the bulk of our water emanates and flows to enrich the lowland aquifers and waterways.

Consistent with community values and efforts we have protected our water supply and recognize that its security into the future is central to our future. **The values, assets and processes described above are our community capital; held in trust for our long-term benefit and survival into the future. They must be protected and sustained.**

Geology and Hydrology
The Focal Peak and Mt Warning volcanoes deposited successive layers of basaltic rocks interspersed with rhyolitic, pyroclastic and conglomerate strata across the landscape some 25 to 20 million years ago. This resulted in the widespread occurrence of fertile, basalt-derived soils, now highly eroded together with their parent rocks (by hydrological action) in some places to reveal the underlying ancient rocks of sedimentary origin. Surrounding Mt Warning is one of the largest calderas or crater rims on the planet. The visually unique Mt. Warning represents the remnant plug of the original volcano. The Original People of the caldera area refer to the Mt Warning shield volcano as *Wolumbiny Momoli.*

The region has a myriad of easterly flowing rivers that run from the flanks of the mountains. These include the Clarence River, the largest river on the east coast of Australia and the Richmond River and its major tributary, the Wilson. Together these rivers and their riparian and mangrove habitats were once part of one of the greatest natural fish hatcheries on the east coast, and though diminished, continue to contribute significantly to coastal and marine resources.

The Northern Rivers Region is a significant source of water: the most precious resource on the driest habitable continent on Earth. The western perimeter of the region is a recharge point into the Great Artesian Basin and the Murray – Darling catchment. In addition, significant surface and sub-surface flows make their way to the ocean, the former through streams and estuaries where they become part of an important Marine Park that protects estuarine, shoreline, and oceanic habitats; and our famed beaches.

The recent extended drought across the Australian continent highlighted the need to conserve and protect water resources even here in one of the wettest places in Australia. The local water management agency (Rous Water) responded with a range of potential investment options and a plan for future water allocation and management. The plan is titled *Water Futures*. Looking on the Rous website it seems there is no predicted inclusion of water use by the Coal Seam Gas industry, theoretically likely to measure in giga-litres, nor is there any discussion of how to limit input of dangerous chemicals into our water sources and 'water futures'. We already have significant hydrological and ecological problems (e.g. riparian degradation, siltation, and chemical contamination) that we have begun to address through community initiatives. Over allocation and contamination of water resources would rupture the fine balance of our hydrology and threatens the ecology and industries of our local region. This is our foremost consideration. We are a mature community that has rejected CSG mining in our region as too great a gamble. **We have opted for the precautionary principle and there is simply no social license for this industry in our region.**

The long-term economic benefits of our agricultural and 'nature-based' industries are a priority consideration. **Our sustainable industries create a basis for our future and must be protected. Not replaced by the short-term economic and unsustainable gains of the CSG industry.**
Our flourishing educational institutions have built their reputations and research focus on easy access to 'natural systems'. Our life-style and nature-based tourism industry attracts over two million national and international visitors annually. **Together with our diverse agriculture these provide the basis for our long-term sustainable future.**

In Australia subsurface water is our greatest and least understood asset. This concurs with the latest planning data from the United Nations which was confirmed in a press release on the sixteenth of January 2012 by the National Centre for Groundwater Research and Training. They explain that ninety seven percent of global fresh water is under the ground and consider it a matter of national security: **'Where our national security is concerned, we should spare no effort to assure it.'**

CSG Related Risks

When it comes to the CSG industry the biggest problems are 'produced water' reaching the surface and underground chemical contamination of aquifers. This 'produced water' comprises waste-water laden with toxins. It is this water that will be brought to the surface as part of the CSG process (Entrekin *et al*. 2011). Refer also to the Australian Water Commission's (AWC) publication of September 2011 titled *Onshore co-produced water: extent and management.*

In relation to the guidelines detailed in the National Australian Water Initiative, it is clear that there remain a litany of unknowns and intangibles in relation to the CSG industry and its processes that are likely to influence surface and sub-surface water quality and flows.

There are no reliable water data or projections of how CSG will affect our water systems because government and industry do not know, and likely cannot predict.

The feasibility and efficacy of either surface storage methods or re-injection methods in a region with periodic high rainfall and extremes of water flow through hilly and mountainous terrain and across a frequently inundated floodplain must be considered extremely low. The low-lying coastal floodplains and wetlands of our region is where the bulk of the industry is projected to take place. Some of those areas, including the wetlands of the Richmond River Valley support the highest diversity of resident and migratory waterfowl on the NSW East Coast (Gosper *et al*. 1983; DECC 2008). These wetlands also represent important refuges for waterfowl from inland Australia at times of continental drought.

Due to proximity, our region has become a victim of the CSG frenzy in adjacent areas of Queensland. **Anxiety about the future has reached unprecedented levels in our community due to the threatened CSG 'invasion' of our region.**

The Federal Government approved the Bowen-Seurat-Curtis Island gas complex without informing UNESCO of the potential damage to the Great Barrier Reef (a World Heritage listed site). This was an international treaty violation. In issuing licenses to explore for CSG, the NSW State Government has similarly failed to assess and inform UNESCO of the dangers to our regional World Heritage listed assets**. These are serious violations and omissions that compound the social justice issues associated with the imposition of a destructive industry into a sensitive environment that supports a diverse community.**

Ecology

The Northern Rivers Region is at the center of a nationally and internationally recognised biodiversity hot-spot.

The South Eastern Queensland Bioregion (including NSW Northern Rivers Region, Department of Sustainability, Environment, Water, Population and Communities 2008) has the highest number of eucalypt species, the highest number of marsupial and micro-chiropteran bat species, the equal highest number of frog species (with the Queensland Wet Tropics) and the second equal highest number of bird species (again with the Queensland Wet Tropics) of any Australian bioregion (Brown *et al.* 2000, NSW National Parks and Wildlife Service 1995). The Bioregion is equal second (with the Jarrah Forest and Warren Regions of Western Australia) to the Queensland Wet Tropics in terms of faunal and floristic diversity across the entire continent.

It forms part of the recently listed and newly identified "Forests of East Australia: The 35th Biodiversity Hotspot (Williams *et al.* 2011). This listing corresponds with two World Wildlife Fund (WWF) Ecoregions: the Eastern Australian Temperate Forests and Queensland's Tropical Rainforests. The region contains more than 1,500 endemic vascular plants, meeting the criterion for global biodiversity significance, and more than 70% of natural areas have been cleared or degraded, meeting the criterion for a hotspot. The hotspot, although covering a large latitudinal range (15.5–35.6 degrees South), has a predominantly summer rainfall pattern with increasing rainfall seasonality northwards into tropical areas of north Queensland. It covers large tracts of elevated tablelands and drier inland slopes, particularly in New South Wales, where it extends inland beyond the New England Tablelands and the Great Dividing Range.

This international and national 'ecological' setting of the northeast of NSW highlights just how important this area is. The Northern Rivers Region and particularly the far northeast has the highest concentration of rare, endemic and endangered (listed under the NSW *Threatened Species Conservation Act* 1995) plant and animal species, populations and communities in New South Wales. Zoogeographically, the vertebrate fauna of the forests and natural habitats of the northeast of NSW are, area for area, one of the richest and most diverse in Australia (CSIRO Division of Wildlife and Ecology 1995). This reflects both the diversity of habitats and the palaeogeographic history of the area. A combination of tropical, temperate and local evolutionary and ecological influences have generated and protected many species through Australia's long history of climate change and climatic oscillations. The area remains as one of the most important moist forest *refugias* in Australia (Kooyman *et al*. 2011). The area, all its habitats, species, communities and populations must be protected and sustained.

Conclusion

For the Northern Rivers there is little to be gained and much to be lost from allowing the Coal Seam Gas industry to operate in our region. Please take heed of our concerns and adopt both the Federal and State Government criteria presented at the beginning of this document. We believe critical evaluation will show the destructive potential of this industry and the potential for loss of irreplaceable community and natural assets. In any cost-benefit analysis our region will lose; please help us protect our water, our ecology, and our home.

References

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