Submission No 351

INQUIRY INTO COAL SEAM GAS

Organisation: Namoi Water

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Position: Executive Officer

Date received: 7/09/2011

Namoi Water Submission in respect to Coal Seam Gas Extraction

With respect to environmental, economic and social impacts of CSG activities, including exploration and commercial extraction activities, allowable under the NSW Petroleum On shore Act and in particular;

- *The environmental and health impact of CSG activities*
- *The economic and social implications of CSG activities*
- *the role of CSG in meeting the future energy needs of NSW*
- *The interaction of the Act with other legislation and regulations including Land Acquisition Act*
- *the impact similar industries have had in other jurisdictions*

The issue of CSG in NSW is of State importance and there is need for urgent priority of legislation both at State and Federal level to legislate safe guards to preserve public health, food integrity and security.

Namoi Water is the peak industry group for irrigated agriculture in the Peel, Upper and Lower Namoi valleys in the North West of NSW. We are non-profit non-political organization supporting our members to achieve a sustainable irrigation industry that meets the environmental, economic and social needs of our local communities. Namoi Water as the peak water entitlement holder group represents approximately 1000 members. Entitlement holders within the catchment vary in size from single employee operations to businesses employing around seventy employees.

The agricultural activities range from grains and pulses such as sorghum, wheat, soybeans, peanuts, corn, lucerne, vegetables and cotton, to water used for intensive animal production and a variety of niche market food products. The direct contribution to our economy is $800 million per annum. We are one of the most experienced valleys in terms of water reform, having entered reform in NSW several years prior to other valleys. The Namoi has pioneered the NSW industry response to water reform and we apply this experience to the current challenges of Coal seam gas industries expansion in our area.

The Namoi Water study is currently collating data from government, mining and CSG companies to produce a regional model to assess the risks of coal mining and coal seam gas activities in our catchment on water resources. The models will be run using a number of scenarios (5 – in this project) to assess impact. The phase II report has highlighted there is limited data available in CSG water sources outside the companies own data. This data gap is critical flaw in the development of this industry in any region to assess impact.

The Water Sharing Plan processes are based on the precautionary principle in regard to managing water resources, the CSG industry regulation is not based on the same principle yet is dealing with the same resource - water. State policy, legislation and planning procedures need to be rebalanced. State legislation needs to play a role in providing checks and balances in a regional sense, and the Water act has a role to play in safeguarding water resources from mining industry impacts.

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Namoi Water is working with Eastern Star Gas to understand the CSG industry and their technology. We recognise that the gas reserves are a significant benefit to the economy of the State. Long term impacts on community health and the environment (inc water resource environment) should play a major role when assessing projects that add to the community, state and national triple bottom line. We are concerned about the safeguards that are currently not in place if things go wrong eg contamination of an aquifer in 30 years time. What are the various levels of the "make good" provisions, how do these work in practicability?

The CSG industry case is based on comparison of this energy source with others (ie: coal) as a good clean form of energy with few environmental costs. The assumption that natural gas from CSG can act as a transition fuel needs to be challenged. Rather than substituting for coal it is likely that CSG will simply satisfy increasing energy demand and hence increase associated emissions.

The CSG industry promotes local economic stimulus will create jobs in our regional community. The gas industry submissions will highlight the "jobs" benefit in our community, however Eastern Star Gas have stated the current operations employ 25 staff, what % live in our regional community? The bulk of the workforce are fly in fly out. What social research is used by Government and CSG/Coal Mining companies to ensure they don't make the same mistakes repeatedly in each new community they enter and the risk of social disruption caused by transient workforce and camp living arrangements are acceptable to the community. What significant socio economic studies have been done to show benefit of CSG industry expansion in rural communities, what is the real cost benefit to the region and State? What are the potential long term costs to our communities and State if there is damage to water resources, land and agricultural production?

We are using our experience with the CSG companies that are operating in the Namoi to highlight our concerns in this submission. Namoi Water is committed to continue working towards better information exchange between our industries, and lobby government for appropriate safeguards to consider long term and accumulative impacts prior to approval being provided. Our aim is to seek regulation to protect the water resources our industry is dependent upon and upon which the food and fibre this State needs now and for the future. If the water resources cannot be safeguarded then this industry must not be allowed develop in NSW. There should be an immediate moratorium on any further licences or approvals, until the system is reformed. Regional water studies must be conducted prior to granting licences.

Thank you for the opportunity to submit to this inquiry we welcome any opportunity to present our concerns to you and further engage in the required rebalancing of legislation.

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The environmental and health impact of CSG activities

• *The economic and social implications of CSG activities*

The preservation of sustainable resources (inc water) must be absolute in addressing economic and social implications of CSG activities. The real risk is that CSG industry exposes the existing base of our communities and other land users to, is third party impacts on our key resources. The environmental costs are higher than just the local cost (the CSG company value of the water resource to the community may differ significantly to how the community values this water).

Many costs are not easy to quantify such as the cost of salinity downstream or leakage into groundwater if it is unclear where the contamination has come from. This industry has as its regulator (self regulation), in what industry with the potential impact and the many unknowns due to lack of regional studies is this acceptable? Unless the extractive industry can prove that there is no impact to our environment, water integrity and quality, food security and human and animal health. The impacts both short and long term will far exceed any benefit in jobs and royalties paid. There is no doubt that the CSG industry will impact on water resources, there must be no circumstances under which the watercourse is permanently damaged or altered.

Our concerns are focused on **subsidence, induced recharge, connectivity, management of co-produced water**.

Induced recharge from adjacent fresh water aquifers needs to be prevented not licensed. **Recommendation:** isotope test CSG production water and cease operation if water from an adjacent and licensed aquifer is detected. This is an accurate representation of a property right and avoids long tail environmental outcomes that simply cannot be anticipated. In other words, regarding adjacent aquifers, leave it as you found it.

Disposal of waste CSG water:
This is the biggest issue of concern with the potential for significant impact. The storage of large volumes of co-produced water awaiting retreatment or reuse potentially contaminated with many toxic substances is a serious risk. Evaporation is no longer a preferred disposal method due to the risk of dam wall failure and spills after intense rainfall events, concern is increasing that reinjected water could contaminate adjacent aquifers in time to come. The current ESG practice is to use the evaporation ponds that they now claim will not be used to stockpile water, whilst waiting for processing through a very small reverse osmosis (RO) plant. The reality is the stockpiled water evaporates while waiting for reverse osmosis processing. The public however, think the water is being processed. Reverse Osmosis (RO) is expensive and the capacity will need to be huge and RO still leaves a potentially noxious waste of salt, heavy metals and sulphides.

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Co-produced water management strategies– Namoi Water has reviewed various strategies which comprise of a number of options such as reinjection after treatment through a reverse osmosis plant, virtual reinjection (substitution against existing water entitlements), beneficial use and discharge to river and creek system. Coal seam produced water contains an array of naturally occurring substances, many are reported as being hazardous to human health, animal health and to the environment. There must be a requirement for treated water to be comprehensively and independently analysed continuously to determine that water treatment standards are maintained to ensure water quality and integrity. The water analysis must list all the naturally occurring contaminants that are being brought to the surface and introduced via drilling or fracture stimulation practices. There must be strict conditions to treating this water so that it meets the Australian guidelines such as ANZECC water quality guidelines. There is no understanding of the impact of changing the micro nutrients through reverse osmosis and disposal in natural creek systems and the impact on downstream riverine health. There needs to be a higher level of treatment than reverse osmosis. The current water treatment is focused on removing salts and is unsatisfactory.

The maximum amount of water listed in megs per day to be discharged should be specifically stated in the authority to operate. The exact discharge point should also be specified in the licensing conditions with meters attached. The exact manner of disposal of the accumulated salts and minerals and the reportable wastes must be addressed under license. The sludge management disposal must be adequately monitored and managed by legislation. We have received presentations from ESG regarding "planning" for this process however there is still a focus on self regulation. If we are to implement effective monitoring and measurement practices as a safeguard then we need to use the data to regulate with appropriate penalties put in place to encourage compliance.

• *The role of CSG in meeting the future energy needs of NSW*

The CSG industry claim that gas fired power stations emit up to 70 per cent less greenhouse gases than existing coal burning plants. We would be keen to see a comparison with whole of life cost of the energy source with other alternatives. This comparison should include land clearing, water management, raw material export, imported pipe to lay initial infrastructure, costs to fly in workers, building of camps, compensation to landholders and loss of productivity, periodic release of methane "fugitive emissions", extraction of water per well head, surface salt bi-product managment, construction of water treatment plants, compression stations, LNG storage, importation of equipment for water treatment facilities, energy to boil the brine water, management of toxic waste left over, liquefying of gas and rehabilitation of land be used in accounting process. Economic considerations of these costs needs to be taken into account when determining if CSG is cleaner than other forms of energy.

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•*The interaction of the Act with other legislation and regulations including Land Acquisition Act*
CSG mining must be listed under the Protection of the Environment Operations At, so that oversight can be made by DECCW. CSG must also be included under the State Water Act so that compliance with State Acts and guidelines regarding the integrity of the river systems and waterways can be enforced.

Lack of information and accountability: There is no matrix or document control register available to account between CSG companies, environmental authorities, industry and investment exploration conditions and the State and Federal conditions on CSG projects. The public is not aware if due process is occurring when there are issues. For example ESG was reprimanded for low level environmental contamination at a site during the December 2010 flooding, this is not the first time, however this information was not made available at the time of the event or after on public record. Nor is the most up-to-date material on CSG development available to communities in which they are proposing development. There is no requirement for neighbor notification, nor communication or public consultation on exploration sites. A further practical example is that when REF's are amended via written hard copy these amendments are not available on line on public registers due to privacy restriction loop hole that CSG companies take advantage of. These same amendments are used to gain incremental changes to existing operations without full disclosure and review of plans for the entire resource.

The provision of proof is based on the data the company provides in the application process, Namoi Water like many other organizations has read and reviewed the publicly available REF's with consultancy reports attached providing evidence of risk mitigation strategy or resource reviews and environmental impact statements. How are these reports reviewed in detailed or ground truthed by the various departments responsible? What credibility should be placed on a subjective report that is focused on a small area impact and has limited accountability for its recommendations. Will the consultants stand up and be counted when Bohena creek has high levels of salinity and in the next rain event runs into the Namoi. As the discharge point for ESG co-produced water, this can potentially have a serious impact on Native fish numbers and reducing the Namoi's rating in the Sustainable Rivers Audit which determines ecosystem function levels, upon which the basin planning process has used as the scientific driver of river health?

No community or impacted industry has the level of resources (outside the example of the recently developed Namoi Water Study) to provide objective science to present the level of detail required to adequately assess these reports from a cumulative perspective. Nor does the current department responsible for this process have the staff resources to prosecute these reports to enable best practice in planning. Yet in the same legislative context the onus of burden of proof lays with the water access license (WAL) holder to prove damage or impact by CSG extraction. The significant financial imbalance between CSG company and WAL owner and the capacity of a WAL owner to seek independent hydrological services are critical considerations for current and future water licensing capacity.

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Legislation and due process:

CSG companies and their representatives, have long enjoyed access and input into the legislation, conditioning and regulation under which they operate. CSG industry development is largely facilitated on a reactive basis with a focus on self regulation. NSW has yet to review the make good provisions in terms of CSG, when this occurs the make good provision must be for the aquifer as a whole not just the individual bore hole impacted and must be in perpetuity. WAL holders in the alluvial aquifers are monitored regularly via the Water Act legislation (Water Sharing Plans developed under the precautionary principles) and are regulated by the Office of Water and Minister for DPI.

Provisions exist for NOW hydrologists (FTE staff across the state) to measure and manage the aquifers and test bores to detect changes to the catchment water resource and individual zones and thus impose restrictions on water access licences **immediately** to rectify any downward trend. An example of this immediate action in our catchment is the use of section 324 to restrict access in Zone 11 area of Maules creek during 2007-2010. These restrictions are in ground water aquifers that ***do*** recharge, the CSG drilling that is currently taking place in many cases is in aquifers that are thought not to recharge and have no such constraints as the water is considered a bi-product to the main activity and thus is treated as such. NOW hydrologists estimate the resource the gas industry is working in is a massive old water resource and therefore the water extraction is based on this vast resource number and is considered sustainable despite the lack of recharge.

The State focus to date has been on the need for a licence to extract if recharge is induced from higher aquifers (aquifer interference policy). The NSW government has advocated for growth in use in the water sources where CSG companies operate within the Basin plan negotiations. Yet for every other groundwater source without a finalized WSP the lower of the two figures provided (either CAP or history of use numbers) was used. The history of use figure in this water source is minimal, however NSW Government is advocating for the higher CAP number to be included in the new Basin Plan. There is no requirement for Isotope testing of water in CSG exploration or extraction activity to determine the age of the water extracted, this process would clearly show if there is connectivity. ESG have stated that they isotope test the Coal seam but not the water. They have recently stated they will undertake isotope testing of water however this needs regulatory review to ensure it is effective in the intent to determine induced recharge.

There appears to be a focus on accepting the damage rather than preventing it happening in the first place; or to require licencing from one aquifer to another, or alternatively pay for damage along the way when it occurs. It is extremely concerning when the CSG industry has a significant lag period between cause and effect and has the potential to have impacts on groundwater which last hundreds of years.

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The basis of presentations by CSG companies to our organisation is on the premise that there is no connectivity between where the CSG extraction is occurring and the alluvial aquifer. Yet the submissions received by the Federal MDBA inquiry committee indicate otherwise in other regions. We have not seen data generation by the department that oversees this industry to ground truth these assumptions or if it is being generated it is not publicly available.

CSG companies have various means of well stimulation techniques not limited to hydraulic fracing. Our understanding is the fraccing is not viable in the current ESG development areas at this time. In Qld disclosure of the nature of all these "operations" is not transparent as they are classed as "commercial-in confidence" techniques. Therefore, it would not be possible for the government to regulate other well stimulation techniques if they do not know what these techniques entail or the risks they pose. The potential impact to the water resource system would also go unaddressed. The above demonstrates inconsistencies and systemic problems in CSG development governance and the many implications that manifest from it.

Conclusion

A strategy needs to be designed to implement environmentally sustainable development of CSG and coal industries with view to transitioning to renewable energy. There must be regional independent strategic planning that identifies and permanently excludes areas of important natural resources or productive agricultural land from exploration or mining. There needs to be independent review and determination of all mine proposals and statutory third party appeal rights. Regional water studies should be conducted prior to granting exploration or extraction approvals for CSG. All water extraction must be licenced metered and adhere to strict water quality requirements and testing to determine if recharge is induced. There should be cumulative impact assessment of all existing and proposed CSG operations. The full impact must be considered up front including any proposed future variations modifications or extensions. There should be regular and thorough independent reviews of compliance with conditions of approval. These conditions must also be inforced. The government must seek urgent analysis of long term costs and benefits of CSG industry (over 100 years) that includes all external costs to determine its credentials as a "clean" energy source. All forms of fraccing must be prohibited as it poses a severed risk to water resources and human health. The impost on communities to keep abreast of CSG development is a significant impost on agricultural land holders. There must be public register of conditions, compliance, controls and approval processes. The public must be aware if the financially complicit regulator is safeguarding their community and the environment.

The community concern that has been expressed to date in NSW regarding CSG development must be acknowledged and this inquiry is a first step in that process. The Government must address the concerns that are being expressed in this review process by the community for their regional health, environment and sustainability. The long term impacts of various technologies being used by CSG industry needs to be subject to National Standards. The variable core hole casing techniques in use are being questioned overseas, ie: using one, two or three layers of casing at various levels within core hole. Is the government assured that industry best practice is

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enough to prevent interference and will not degradate over time 50-100 years resulting in contamination of the overlying aquifers? The time lag between cause and effect from CSG development and its impacts must be a part of the legislation to safeguard the environment and water resources. A proactive response is needed from Government and is called upon by communities to answer the questions on environmental, social and long term sustainability. Adopting a peer review process and using the precautionary principle for development the Government can reduce the variable impacts that result from adaptive management response such as in the Qld CSG expansion.

It is well recognized that economic systems move faster than environmental and social systems which creates a disconnection and discontent. There is already a groundswell of concern for CSG industry and its expansion in NSW. The overseas experiences are not encouraging as to the impacts socially and environmentally. Longer term economic impact will be a consideration of hindsight if we allow our productive assets (land, water & regional communities) to be compromised for short term gain. There remain many unanswered questions, for example the byproduct salt and how it will be dealt with, the value adding option is considered likely to be unviable and the reinjection or burying of salt in our catchment is not acceptable.

Our concern in regard to the salt impact is critically related to the MDBA basin plan. There is a real risk of increasing saline water introduction into the system if the CSG industry expansion is not well managed and strategically planned. It is our understanding that the dewatering process may indeed establish connectivity in some aquifers, whilst reassurances from CSG companies that this stops their production, the safeguards and testing of well field development and impacts at a regional scale are unknown. Sesimic reflection data to infer strata formation properties is subjective and does not provide detail. Water and gas pathways cannot be determined, as per ESG experience in drilling into fractured rock system in Narrabri. Can transmissivity be established by government departments at depth and scale of regional studies when the data is held solely by CSG companies? The data gaps are alarming and the use of planning departments focused on application approval is not conducive to a system managing for longevity of the whole system. Modelling and State held data is limited and this is a key factor in our call for the government to pause CSG exploration and production approvals until such time as we have the mechanisms in place to safeguard the water resources and land use above CSG resource.

Namoi Water does not purport to have technical expertise in CSG however our endeavour is to obtain knowledge and make informed judgment based on our significant experience with government and regulation in regard to water reform. We welcome the opportunity to present to the inquiry committee if required.

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