



19<sup>th</sup> December 2010

Committee Secretary

House of Representatives Standing Committee on Regional Australia

PO Box 6021

Parliament House

CANBERRA ACT 2600

ra.reps@aph.gov.au

Dear Sir

**Submission for the Inquiry into the Impact the Murray-Darling Basin Plan in  
Regional Australia.**

On behalf of the Caroon Coal Action Group (CCAG) and the landholders and supporting industries of the Liverpool Plains, I welcome the opportunity to make this submission to the House of Representatives Standing Committee on Regional Australia.

The Coal Seam Gas Committee of the Caroon Coal Action Group (CCAG) was formed over three years ago as part of CCAG in response to the exploration licenses granted by State Government to explore for coal seam gas (CSG) on the Liverpool Plains. The Liverpool Plains region is located in the Namoi Catchment area which is a major catchment area for the Murray-Darling Basin. As Chairman of this rapidly expanding committee, it is our view that the existing Murray-Darling Basin Plan does not adequately address the massive issues of extraction and contamination to this pristine catchment. These issues are critical to the development of a sustainable MDB and must be factored into the Inquiry.

Please do not hesitate to contact me to discuss this paper.

Yours faithfully

ROSEMARY NANKIVELL

CHAIRMAN

COAL SEAM METHANE SUBCOMMITTEE

CAROONA COAL ACTION GROUP

## **Impacts of Coal Seam Methane Extraction in the Murray-Darling Basin.**

### **The Contribution of the Liverpool Plains to food production and security in Australia and Globally.**

The Liverpool Plains, approximately 450kms north-east of Sydney, covers 1.2 million hectares of the north-western slopes of New South Wales. The area is prime agricultural land and recognized by many to be the best farming country in the world. The landholders are well respected for their innovative and advanced farming practices.

The Liverpool Plains is renowned for its high yields and crops security relative to other farming regions in Australia. Its fertile black soils have a high water holding capacity with reliable summer and winter rainfall. It is an area which yields 40% above the national average and grows a diverse range of crops such as wheat, sorghum, oats, soybeans, barley, corn, sunflowers and cotton. It has a beef industry worth over \$110 million per annum. It also produces chickpeas, soybeans, mungbeans, canola, olives, turkeys, chickens, pigs, lamb and wool. The area is unique in that it produces two crops per year, unlike the majority of farming areas. The Liverpool Plains contribute **\$332 million to the GDP** annually. This figure is based on the last 8 years of drought in Eastern Australia.

### **The Importance of the Namoi Catchment to the Liverpool Plains and the Murray-Darling Basin.**

The Liverpool Plains are located in the Namoi Catchment which feeds into the Murray Darling Basin. The area is bounded to the east by the Great Dividing Ranges, to the south by the Liverpool Ranges and to the west by the Warrumbungle Ranges. These ranges provide a huge recharge to the area. The catchment area is drained by the Namoi River and its tributaries, the Mooki and the Peel Rivers which flow into the Murray-Darling waterways.

Agriculture in this area relies on the sound management of high output aquifers which contribute immensely to its productivity as well as the ability for the soils to retain moisture. While there are many successful irrigated properties, there are even more properties without irrigation where dryland farming techniques are employed. These farms rely on skilful management, innovative practices such as no-till cultivation and a reliable rainfall pattern.

However, the preservation of the aquifers, and hence our water supplies for domestic, stock and farming use is the overriding concern of those who have farmed successfully and innovatively for decades. The National Pollutant Inventory confirms that the Liverpool Plains does not produce food in an environment contaminated by any industry that liberates tonnes of toxic metals, fine silica dusts or carcinogenic petroleum hydrocarbons. It is a pristine area that is not polluted by any industries that leave a legacy of mine drainage, poisoned rivers and creeks, highly saline evaporation ponds and unpredictable methane scalds. This enviable situation must be preserved. If CSG extraction occurs, the Liverpool Plains will lose the purity and volume of its aquifers. The productivity of these plains will be irreparably damaged. Australia's ability to produce clean, uncontaminated food will be damaged irrevocably. The destruction and damage by CSG extraction in this vital area in the Namoi Catchment will diminish and contaminate flows of both surficial and underground water into the MDB.

## **The CSG Extraction process – methods of extraction.**

The extraction of CSG is a relatively new industry in Australia. Commercial production was not significant until 2004 in Queensland. The following is a simple explanation of the CSG extraction process.

Coal seam gas is bonded (through geological and hydrological pressure) to cleats and fractures of the coal. It is held in the coal by burial pressure and water. To extract gas, drilling rigs drill numerous holes into the coal seam aquifer at depths of over 3,500 metres. The aquifer is then dewatered, reducing pressure and causing methane flow in cleats to the well.<sup>i1</sup> The process of “fracking” involves explosives being put down these well holes to fracture the coal seam aquifers. Then a mixture of sand, water and synthetic polymers is forced at great pressure into the coal seam to push the coal seam methane water to the surface. The bulk of the water is extracted at the top of the well. The gas is then piped away to a compressor station for further treatment.

The extraction process involves many megalitres of water. Fresh potable water is necessary to start the process in the initial drilling phase. It is extremely difficult to get industry to commit to a reasonable figure but it is believed to be around 100,000 litres per exploration core-hole. Use of water in the fracking process covers a huge range but figures from America quote again to the 100,000 litres per frac. “We make no apology that the Coal Seam Gas industry is a water intensive one.”<sup>ii</sup>

However the most water usage comes from the dewatering of aquifers before and during the extraction of gas.

## **Industry Justification for the CSG Extraction on the Liverpool Plains.**

Less than three years ago, Santos started a round of “community consultations” preceding the establishment of around 30 exploration wells on the Liverpool Plains. Their justification of the industry rested on three major assumptions all of which have been successfully easily disputed. These claims were that the CSG industry emits lower greenhouse gasses, that the industry footprint is much less than mining for coal and that the industry uses far less water. For the purpose of this Inquiry I will expand Santos’ claim that the industry uses less water than coal. The latter claim is now easily disputed as it is widely known that while the conversion of methane to electricity does indeed use less than a third of the water, it does not take into account the huge amounts of water extracted from aquifers during the actual methane extraction process.

## **Interconnectivity of Aquifers.**

Over the last twelve months the National Water Commission (NWC) has extensively researched the interconnectivity of aquifers. It has proven that indeed aquifers are all interconnected and that large scale extraction of groundwater will drawdown on the potable surface water on which communities and farmers rely.

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## **Gas Extraction and the lowering of water tables and creation of voids leading to subsidence.**

Extraction of one unit of gas results in thirteen and half units of waste water.<sup>2</sup> With gas extraction, comes the lowering of water tables and the creation of voids. These voids lead to subsidence causing cracking and draining of rivers, waterways and aquifers long after extraction has finished.

“Dewatering coal seams will allow for groundwater migration towards coal seam voids. This has significant potential to effectively dewater sections of the study area. Dewatering of the coal seams will adversely affect the groundwater system and will have a flow on effect of reduced or lost stream flow.”<sup>3</sup>

Dewatering will significantly reduce the quantity and quality of available groundwater. Senator Penny Wong, Federal Minister for Climate Change and Water says “Because pumping (from aquifers) can lead to water moving between different levels of an aquifer, it can cause deteriorating groundwater quality either through changing salinity or composition”.<sup>4</sup>

In the Powder River Basin of Wyoming and Montana, the Bureau of Land Management predicted, in their final Environmental Impacts Statement, that development will lower the water levels by 600 to 800 feet over much of the basin. This drawdown can be expected to reach one or two miles outside the productive fields and distances of up to five to ten miles or more during long term production.<sup>5</sup> Potable water supplies will be reduced with significant impact on domestic, stock and commercial irrigation wells.

Coal seam fires are believed to have resulted from fluctuating water levels in gas seams as the underground temperatures rise to ignition level with the extraction of water.<sup>6</sup> They are nearly impossible to extinguish and these types of fires can burn underground for years. This greatly increases greenhouse emissions and contributes to eventual subsidence.

CSG extraction will result in considerable losses to agriculture as farmers de-stock their land because of reduction to water supplies. Crops, particularly in irrigated areas, will lose their high yielding capabilities.

In its recent position statement<sup>7</sup> the NWC states that the CSG industry risks **having significant, long term and adverse impacts on adjacent surface and groundwater systems”** and **current projections indicate that Australian CSG industry could exteact in the order of 7500 gigalites of co-produced water from ground water systems over the next 25 years, equivalen to ~ 300 gigalitres per year. In comparison, the current total extraction from the GAB is approximately 540**

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<sup>2</sup> Environmental Aspects of Coalbed Methane Extraction with Emphasis on Water Treatment and Disposal – L.B. Clarke – for NSW National Parks and Wildlife 2001

<sup>3</sup> Jones T.,2005 (Draft) Report on the Hydrological Investigations Dooralong & Yarramalong Valleys Wyong, Central Coast, NSW January

<sup>4</sup> Gaswatch 65 – Who is out of step here? – HBGAG Group Inc.

<sup>5</sup> Water Issues Associated with Coalbed Methane (Natural Gas) in the Powder River Basin of Wyoming and Montana – University of Wyoming, Laramie and Montana Bureau of Mines and Geology, Billings 2004

<sup>6</sup> Boom in gas drilling fluids contamination concerns in Colorado.

<http://features.csmonitor.com/environment/2009/02/05/boom-in-gas-drilling-fluids-contamination-concerns-in-colorado>

**gigalitres per year.**

Potential risks to sustainable water management have been identified – all of which will impact upon the management of the Murray-Darling Basin. I quote verbatim from the recently released position statement.

They are

1. *Extraction of large volumes of low quality water will impact on connected surface and groundwater systems, some of which may already be fully or over allocated including the GAB and the MDB*
2. *Impacts on other water users and the environment may occur due to the dramatic depressurization of the coal seam including:*
  - i. *Changes in pressure of adjacent aquifers with consequential changes in water availability*
  - ii. *Reductions in surface water flows in connected systems*
  - iii. *Land subsidence over large areas, affecting surface water systems, ecosystems, irrigation and grazing lands.*
3. *The production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and have significant impacts on water quality, and river and wetland health. There is an associated risk, that if the water is overly treated 'clean water pollution' of naturally turbid systems may occur.*
4. *The practice of hydraulic fracturing, or fracturing, to increase gas output, has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality.*
5. *The reinjection of treated waste water into other aquifers has the potential to change the beneficial use characteristics of those aquifers.*

*In addition to these water management risks, CSG development could also cause significant social impacts by disrupting the current land-use practices and the local environment through infrastructure, construction and access.”*

### **Environmental Damage from Infrastructure, Construction and Access of Gas Fields.**

There are three main steps in establishing a gas field. They are field development, the gas pipeline and a central processing facility. At the Gloucester Coal Seam Gas Project in NSW, quite a small project, the field development was based on establishing 60 wells linked by polyethylene gathering lines. All well sites required clearing, leveling, access roads, power and water. With 600m spacing this field covered approximately 86 acres. Approximately 98 km of buried high pressure steel pipeline from wells to the compressor station was necessary and will affect 150 landowners. A central processing facility, consisting of up to 6-7 reciprocating compressors of 3000hp, as well as a dehydration unit and water treatment facility were to be constructed(as at February 2008).<sup>8</sup> This type of industrial activity will result in noise pollution, erosion as areas of land are cleared and

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<sup>8</sup> Gloucester – Coal Seam Project – Project factsheet – March 2008.

loss of native habitat. Further damage to the environment will occur with the establishment of kilometres of pipeline and the resulting erosion and noxious weeds.

Gas fields will result in the loss of food producing land. Large scale disruption of adjoining land will also occur especially during the establishment process.

The industry is poorly-regulated with little respect shown to the environment or the landholders. Near Broke, in the Hunter Valley, drilling has taken place dangerously close to primary schools and into the main aquifer which provides the town with water. Local council was powerless to intervene.

Gas wells are industrial sites and “consideration should be given to classifying them as industrial chemical sites and as such should be controlled by relevant regulations.”<sup>9</sup>

### **Disposal of Waste Water – the industry is still searching for a solution.**

CSG extraction is highly water intensive industry – for which the industry makes no apology<sup>10</sup>. Clean potable water is locally sourced and used throughout the process. As well, the extracted coal seam water has to be disposed of and this has presented huge problems in the gasfields of Queensland - and in many other states of America.<sup>11</sup> This water usually has an extremely high salt and heavy metal content. The heavy metals include hydrocarbons, carcinogens, radioactivity, mercury, copper, silver, arsenic, tellurium, nickel, boron, lead and selenium and halogenated methanes.<sup>12</sup> To date, this water has been left to evaporate in vast shallow ponds ranging from one to 100 hectares. As these ponds have no lining and are held intact by compressed soils, these areas will be extremely difficult, if not impossible, to rehabilitate. Aquifers beneath these ponds will also be subject to the leaching of coal seam water through the compressed earth.

Salinity of CSM water is variable with Total Dissolved Solids (TDS) values varying from 200 to more than 10 000 milligrams/litre. (Plants are affected by water with TDS as low as 1000mg/l.)

The Queensland government, in its recent discussion paper on the management of coal seam water has assumed a very conservative TDS value of 2500 mg/l. Using projections for the LNG industry in Queensland of an annual volume of 100 GL of CSG water, it is calculated that disposal of this water in two-metre-ponds requires 5000ha in year one and 10 000ha (100km<sup>2</sup>) by year 15. These estimates are for area only and do not consider design requirements for the maximizing efficiency of brine concentration, safety, allowance for rainfall, nor maintenance or decommissioning requirements. Exploration may also add to the total water produced.<sup>13</sup> The area of evaporation ponds required for

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<sup>9</sup> Coal Bed Methane Hazards in New South Wales – CM Atkinson – January 2005

<sup>10</sup> Jordan Bunnings Driller Santos Community Consultation Spring Ridge July 2009.

<sup>11</sup> Water Issues Associated with Coalbed Methane in the Powder River Basin of Wyoming and Montana – Department of Resources, University of Wyoming, Laramie and Montana Bureau of Mines and Geology, Billings.

<sup>12</sup> Coal Seam Gas Water – Queensland’s Water Crisis – TressCox Lawyers – Newsletter Article – 16 December 2008

<sup>13</sup> Management of water produced from coal seam production – Discussion paper – May 2009 – Queensland Government, Department of Infrastructure and Planning.

disposal of an annual volume of 100 GL of CSG water over 30 years is roughly two and half times the size of Sydney Harbour. At the end of 30 years, this area could contain more than 7.5 million tons.<sup>14</sup> Disposal of this vast amount of salt has not been addressed.

As yet, the gas companies have no commercially viable alternatives to evaporation ponds despite their promises of solutions such as using water extracted for tree plantation and application of reverse osmosis. Practices such as reverse osmosis and reinjection are extremely expensive and highly energy intensive. Reinjection in the Liverpool Plains would result in widespread contamination of the complex and interconnected aquifers underlying the plains. The Queensland government has demanded that the use of evaporation ponds to be discontinued as a primary means of disposing of CSM water. Remediation of existing evaporation ponds is to occur within three years.<sup>15</sup> It would be expected that the NSW state government adopt similar or ideally far more stringent standards.

From a food producer's viewpoint, these evaporation ponds result in highly toxic salt being blown by the wind onto adjoining farmland or leaching into the aquifers beneath them. Vast tracts of arable land are used up hosting these ponds. Many farming communities have successfully dealt with salinity issues to date, but the wind-blown salt only exacerbates these problems. It causes scalding and deterioration of soil quality and promotes the growth of noxious weeds.<sup>16</sup>

#### **Increased Seismic Activity resulting from the “fracking process” and reinjection.**

There is increasing evidence that exploration drilling and the fracking process is directly related to increased seismic activity. The Upper Namoi Catchment is located on the Hunter-Mooki fault line – the same fault line as the disastrous Newcastle earthquakes. There is increasing seismic activity around mines in the Hunter Valley. It is essential that this instability will not be increased by the CSM extraction processes.

However, the evidence from international experience is of concern. In May 2006, an earthquake erupted triggered by exploratory drilling causing mudslides in the East Java province of Sidoarjo. Over 75,000 people were displaced with massive damage to homes and infrastructure and the environment. Santos, the gas company operating here in the Upper Namoi Catchment, were the technological lead for a gas project in the area and held an 18% stake in its Indonesian Brantas production sharing contract. Santos has subsequently quit the stake to extricate itself from any potential future penalties for the mudslide disaster.<sup>17</sup>

Since June 2<sup>nd</sup> 2009, there have been five small earthquakes in Texas Barnett Shale gasfields. In May, earlier this year, three other smaller quakes were also felt at Bedford, a suburb of Dallas and Fort Worth and Grand Prairie. Seismic activity was not recorded in the town's history until the establishment of a rapidly expanding CSM industry. A

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<sup>14</sup> Management of water produced from coal seam production – Discussion paper – May 2009 – Queensland Government, Department of Infrastructure and Planning.

<sup>15</sup> Management of water produced from coal seam production – Discussion paper – May 2009 – Queensland Government, Department of Infrastructure and Planning.

<sup>16</sup> Coal Bed Methane Hazards in NSW – C.M. Atkinson - January 2005

<sup>17</sup> Update 1 – Santos exits Indonesia venture, mudflow liability – Reuters – 29/12/2008

geologist has subsequently been employed to examine the connection between the fracking process and the earthquakes. Other seismic activity associated with fracking and similar technologies have occurred in Ohio USA, Bazel Switzerland and the Gazli gas fields in Uzbekistan.<sup>18</sup>

### **Irreparable damage and destruction of aquifers.**

Damage to the aquifers occurs during the “fracking process” where water, sand and polymers are forced down well holes at great pressure. Explosives are also used in the fracking process. The fracking process is best described as hitting a plate with a hammer from 10 paces. You will achieve your aim of breaking that plate – but you have no control over the extent of the fracture or the amount or size of the pieces that plate will be broken into.<sup>19</sup> This will irreparably alter the structure and permeability of the aquifers and their water transporting characteristics. After fracking, methane gas, drilling fluids and the highly-toxic saline water extracted from the coal seam beds are able to migrate throughout aquifers and poison water supplies.

Over 40,000 wells are projected for Queensland alone. It is to be expected that a similar amount will be constructed in NSW. This will have a “swiss cheese” effect on the aquifers. Much is made of the industry’s foolproof method of rehabilitation and sealing off of these wells. However, given the salinity of the groundwater at these depths corrosion of steel casings must occur. Cement also has an accepted shrinkage factor of 15%. The integrity of these wells must be maintained to prevent depressurization occurring in the aquifers – particularly after long periods of time. What government department will be responsible for maintaining these plugged wells? Will the gas companies that have profited so much still be obligated to do this? In 20 years, 30 years or 100 years and more?

### **Methane migration.**

Methane, being highly volatile and soluble, migrates easily and quickly through fractures to the surface or to nearby openings such as water wells.

In September 2004, within a fortnight of initial gas testing, a CSM well north of Newcastle was shutdown as several boreholes up to 300m away began to blow off methane gas. At the time, there was a strong gas flow of 280,000 cubic feet/day even though the water level was still approximately 300 metres above the coal seam. This illustrates that even with only a partial withdrawal of the hydrostatic pressure, methane will migrate quickly and in unpredictable directions.<sup>20</sup>

In surface methane seepages through the soil, methane displaces the soil oxygen and the soil becomes anoxic leading to soil poisoning and vegetation destruction.<sup>21</sup> These are critical issues for farmers and would seriously affect their production levels as well as contaminating the quality of their produce.

CSG extraction occurs in 31 states of the USA. There are many reports of methane migration and it has now been publically acknowledged by the EPA that there is danger

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<sup>18</sup> Hunter Valley Protection Alliance Forum 7/09/09

<sup>19</sup> Marcellus Shale Group – website – N.Y. State

<sup>20</sup> Coal Bed Methane Hazards in NSW – C.M. Atkinson - January 2005

<sup>21</sup> Jones T.,2005 (Draft) Report on the Hydrological Investigations Dooralong & Yarralong Valleys Wyong, Central Coast, NSW January.

to human life from contamination and the migration and build up of methane in enclosed areas. The example of one Wyoming rancher who was told by a local gas company to always keep a window open in his house to prevent explosions in enclosed areas is fully documented and not isolated.<sup>22</sup> Obviously methane migration is a considerable risk to both humans and livestock.

### **Soil Poisoning.**

There is evidence of soil poisoning from CSM extraction in the Murray-Darling Basin is well described. Some examples include incidents at the Bohena well in an area of the Pilliga State Forest when a retaining wall of the salt water pond collapsed after a major rain event. In a separate event, an extensive leakage in a dam (excavated in sandy soil) resulted in the spread of sodic/saline liquid through the subsoil and shallow aquifers. Water from the dam and black sludge showed to have high levels of tannin with a sodium level of 3,700mg/litre. The area of dying vegetation continued to expand until this area covered an area of over 250m and a maximum width of 100 metres. This was considered to be a chronic case of sodic soil poisoning exceeding those previously occurring in the Powder River Basin in the USA.<sup>23</sup>

### **Contamination from Drilling and Fracing Fluids.**

Core hole drilling during the exploration process and extraction drilling differs significantly from drilling for water for stock and domestic use. When sinking a water bore in this area, the use of drilling fluids is rare as farmers rely on different drill heads, air and water to sink their wells to levels of around 80 metres. In contrast, CSM drilling rigs drill to and from depths of over 850 metres through many layers of aquifers using more than 30,000 litres of drilling fluids in the exploration phase.<sup>24</sup> Thirty to forty per cent of this drilling fluid is never recovered.<sup>25</sup> These fluids can contain benzene, glycol-ethers, toluene, ethanol and nonylphenols and other contaminants – all have been linked to health disorders.<sup>26</sup>

In some areas of Colorado, up to 100 million gallons of fluid is used per “frac” job. Some wells require five to ten “frac” jobs per well resulting in elevated methane and chloride levels in groundwater samples.<sup>27</sup>

As of 5<sup>th</sup> September 2009, the American EPA publically acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours.<sup>28</sup> Links have also been made

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<sup>22</sup> [http://i2.democracynow.org/2009/9/3/fracking\\_and\\_the\\_environment\\_natural\\_gas](http://i2.democracynow.org/2009/9/3/fracking_and_the_environment_natural_gas)

<sup>23</sup> Coal Bed Methane Hazards in NSW – C.M. Atkinson - January 2005

<sup>24</sup> Ralph McIver – Santos Representative – Roadside meeting Blackville 15<sup>th</sup> September 2009 – Gunnedah Basin NSW.

<sup>25</sup> Boom in gas drilling fluids contamination concerns in Colorado.

<http://features.csmonitor.com/environment/2009/02/05/boom-in-gas-drilling-fluids-contamination-concerns-in-Colorado>

<sup>26</sup> Boom in gas drilling fluids contamination concerns in Colorado.

<http://features.csmonitor.com/environment/2009/02/05/boom-in-gas-drilling-fluids-contamination-concerns-in-Colorado>

<sup>27</sup> Geoffrey Thyne – University of Wyoming – Boom in gas drilling fluids contamination concerns in Colorado. <http://features.csmonitor.com/environment/2009/02/05/boom-in-gas-drilling-fluids-contamination-concerns-in-Colorado>

<sup>28</sup> [http://i2.democracynow.org/2009/9/3/fracking\\_and\\_the\\_environment\\_natural\\_gas](http://i2.democracynow.org/2009/9/3/fracking_and_the_environment_natural_gas)

to damage to kidney, immune systems and reproductive development.

### **Contamination from Drilling and Fracing Fluids and its effect on agriculture.**

There is a limited amount of information on the effects of this type of contamination on agriculture in Australia. However in Garfield County, infertility in breeding herds and sterility in bulls increased dramatically. Pigs and cattle stopped cycling and sheep bred on an organic dairy farm had a rash of inexplicable still births. These animals all grazed close to drilling waste pits, where wastewater that included fracing fluids was misted in the air for evaporation.<sup>29</sup>

In other states of America there are reports of cattle dying after grazing close to CSM wells. Wildlife, such as deer, have developed cancers and tumors after grazing and drinking around supposedly rehabilitated well sites – clear evidence that agriculture and gas mining cannot successfully coexist.<sup>30</sup>

It is essential for the continued production of quality food and fibre in this area that it is kept pollutant free and the food chain is not affected in this way. This would have dire repercussions on our export industry. Meat and Livestock Australia (MLA) to ensure that Australian meat is clean, safe and free from chemical residues asks (Q7): “Do stock have access to leaking transformers, capacitors, hydraulic equipment or coal mine wastes?” They go on to say that carcinogenic PCBs, very persistent industrial chemicals, “have been found in soil below leaking electrical transformers, in the oil leaking from capacitor starts on larger electric motors, **on former coal mining leases and in materials such as coal washery wastes (chitter)** that have been brought on to farms for use as road base of stockyard surfaces”. The MLA is well aware that toxic residues should not make their way into the food chain.

As some of CSG sites in this area are located in the headwaters of the Mooki, the contamination of these aquifers will spread to the fertile flood plains below.

(Please see an attachment of sump ponds overflowing into the Pilliga State Forest – a critical recharge area of the Great Artesian Basin and catchment area for the MDB. This occurred after heavy rain in January 2009)

### **Economic Impacts on Farmers.**

Properties in gas field areas in America have been devalued by approximately 22 %. However farmers receive 12% of royalties as well as money derived from the gas companies leasing their land. This represents a considerable income and explains, in part, why the CSG industry was established with so little resistance from landholders.

This is in stark contrast to the situation in Australia. Gas companies lease the tiny portion of land on which the gas well is located. Gas companies in Australia “are not in the habit of purchasing large tracts of land.”<sup>31</sup> This may place some farming families in financial jeopardy as they lose the use of portions of their land and their properties are significantly devalued. Sale of properties would be difficult as few prospective buyers would purchase land in areas located around gas fields.

Gas leaks, methane and salt scalds, and even well explosions are all part of the methane industry. It should be emphasized that the maximum life of a CSM well is around 30

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<sup>29</sup> Drill for Natural Gas, Pollute Water – Abraham Lustgarten and ProPublica

<sup>30</sup> <http://www.sierraclub.org/scp/chronicles/episode4.aspx>

<sup>31</sup> Kathryn Logan – Santos Representative - Blackville Community Consultation – 20<sup>th</sup> May 2009

years and many wells last only around 7 years. This is certainly a horrifying contrast to the quiet, sustainable productivity of the Liverpool Plains where farmers expect to hold their land for generations.

### **Conclusion.**

Clearly the CSG industry will destroy the pristine nature of the Mooki/Namoi Catchment and significantly diminish and contaminate our water supplies. Our productivity will be slashed. Our sustainable long term industry will be destroyed in favour of a short-term opportunistic industry that will leave the environment irreparably damaged. Prime farming country all over Australia is under threat from not only urbanisation, but also the extractive industries. Given that there are extensive gas fields in the headwaters of the Murray-Darling Basin in Queensland, similar plans and projections for Narrabri and exploration in the Upper Namoi Catchment, the effects of CSG gas extraction on groundwater in the Murray Darling Basin will be devastating. Put simply it will destroy the Murray-Darling's underground water – the lifeline of Eastern Australia. Indeed the success of the MDB Plan depends entirely on incorporating ground water into the plan. Many a crusty farmer will tell you that a river is only as full as the aquifers that feed into it. Therefore it is essential that the MDB incorporates all groundwater including the Great Artesian Basin and subsidiary basin such as the Surat and Gunnedah Basins. It is also essential that the many ranges, hill and ridges are taken into account as these serve to collect and channel the water.

It is critical that the Upper Namoi Catchment be preserved for agricultural production and the long term sustainability of the Murray-Darling Basin be protected. We have the opportunity now to preserve agricultural land and save our valuable and essential waterways for future generations from food and water shortages while contributing to the GDP and slowing climate change.

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## **Appendix 4 – Recommendations from the 255A[A] inquiry into ‘The impacts of mining in the Murray Darling Basin’**

On 12 August 2009, the committee tasked the Environment, Communications, and the Arts References Committee to hold an inquiry into ‘The impacts of mining in the Murray Darling Basin’.

On 4 December 2009 the Committee delivered the following recommendations:

### **Recommendation 1**

The committee recommends that all governments support the Namoi Catchment Water Study and not take further decisions in relation to the licensing of mining and extractive industries in the Namoi catchment until that study is completed and publicly released.

### **Recommendation 2**

The committee recommends that, as a matter of priority and preferably prior to the release of future Mineral Exploration Licences, state governments establish regional water plans in areas potentially subject to mining or extractive industry operations.

### **Recommendation 3**

The committee recommends that the Commonwealth Government:

- investigate the scope of Section 255A of the *Water Act 2007* to determine whether it applies to groundwater resources located in ridge country. If this is not the case, the committee recommends that the Commonwealth Government amend Section 255A to include groundwater resources on all land types.
- Work with the states to ensure the prohibition of the licensing of mining or extractive industries in the event that a study conducted under section 255A indicates that development would have adverse impacts on groundwater resources and the environment.

### **Recommendation 4**

The committee, noting extensive planning and research already being undertaken including the National Water Initiative, the Basin Plan, regional water plans and other studies currently underway,

- Urges all governments to maximise use of information and data gleaned from planning and research activities to ensure that coordinated analysis of regional water plans takes place, so as to better understand the cumulative impacts of mining in the Murray-Darling Basin; and
- Recommends that the Commonwealth Government works to ensure the prevention of new mines or extractive industries in the Murray Darling Basin if their impacts on water resources are inconsistent with the Basin Plan.

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Source: Environment, Communications, and the Arts References Committee Report, 'The impacts of mining in the Murray Darling Basin' [http://www.aph.gov.au/senate/committee/eca\\_ctte/mining\\_mdb/report/report.pdf](http://www.aph.gov.au/senate/committee/eca_ctte/mining_mdb/report/report.pdf), accessed 10/09/2010

**Eastern Star/Santos Narrabri Coal Seam Gas Exploration Project, Dewhurst sites.**

**Pictures taken 1<sup>st</sup> January, 2010 after seasonal rains (a 'normal' rain event).**

**Picture 1. Environmental damage caused by poor construction of gas exploration drilling ponds after rain at site Dewhurst 17.**

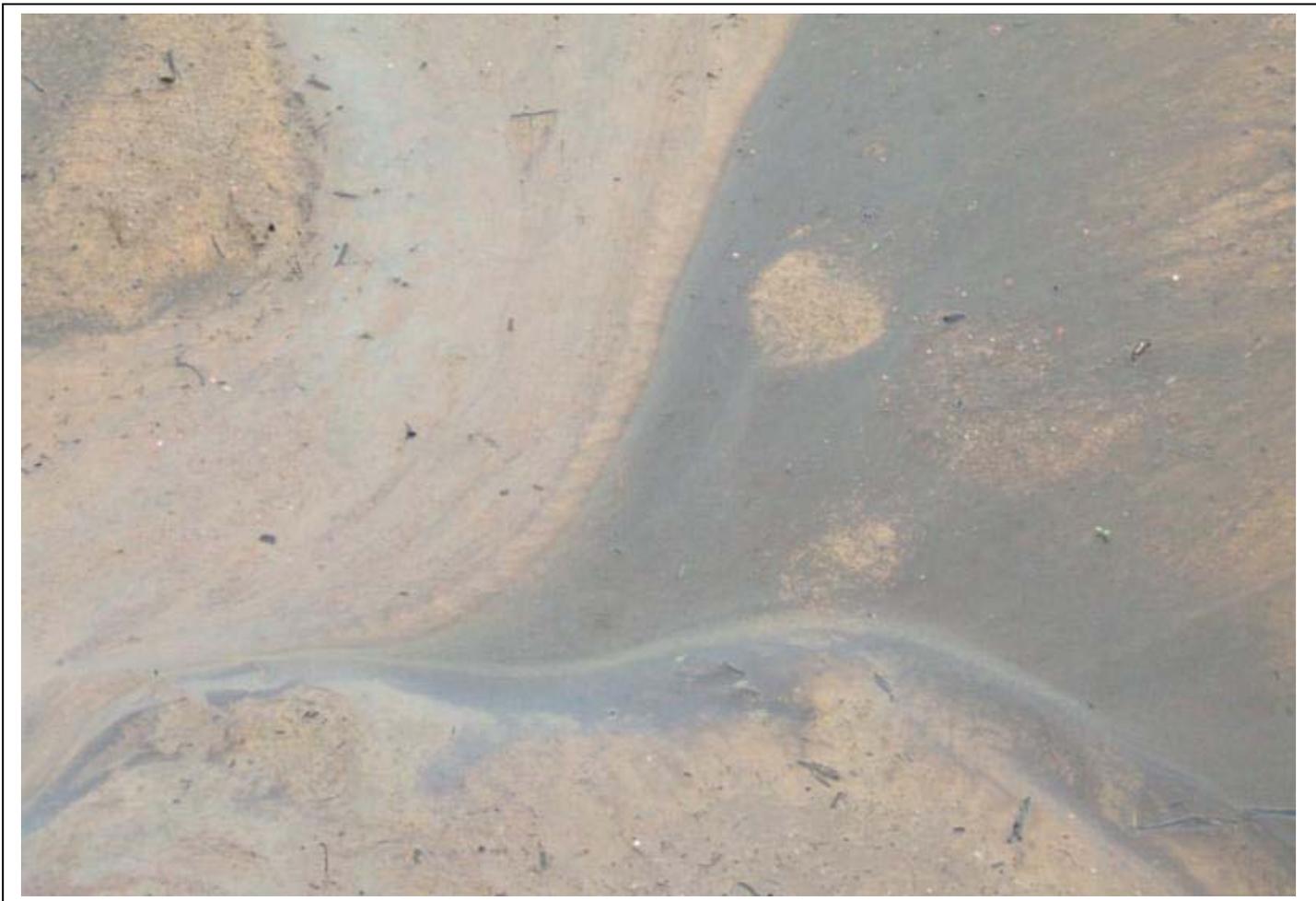
**Note contaminated water overflowing from the sump pond.**



**Picture 2. Site Dewhurst 16H. Sump pond overflowing. Note also the waste from the well head also contaminating and leaking over the site and ultimately into the East Pilliga State Forest.**



**Picture 3. Site Dewhurst 17. Unknown material escaping from pit including waste drilling fluids and tailings from the bore hole.**



**Picture 4. Site Dewhurst 16H. Contaminated water escaping into the East Pilliga State Forest. This water linked up with water from the overflow at Dewhurst 17H. Water from here runs into Jacks Creek and ultimately into the Namoi Catchment which feeds into the Murray-Darling Basin.**

**Note also that this site is unfenced – only steel posts with one very low wire was put around this site to protect native animals – inappropriate containment for what is really an industrial site.**



**Picture 5. Site Dewhurst 17H. Accumulated water from pits overflowing into the East Pilliga State Forest.**



**Picture 6. Contaminated water from both Dewhurst 16H and 17H sites flowing down to Jacks Creek and thence into the Namoi Catchment and into the Murray Darling Basin.**

