[redacted]

From: Inquiry into Unconventional Gas POV eSubmission Form <cso@parliament.vic.gov.au>
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Inquiry Name: Inquiry into Unconventional Gas in Victoria.

Ms Gayle Margaret
[redacted]

SUBMISSION CONTENT:

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File3:

Coal & CSG Free Mirboo North Submission to Vic Inquiry into Unconventional Gas 8th July 2015

By Email: epc@parliament.vic.gov.au

OR

By Electronic Submission:http://www.parliament.vic.gov.au/epc/article/2657

OR

By Mail: Keir Delaney, Secretary, Environment & Planning Committee, Parliament House, Spring Street, Melbourne 3002

SUBMISSION

to

the Victorian Legislative Council's

Environment and Planning Committee

Inquiry into

Should there be an onshore unconventional gas industry in Victoria?

'Unconventional gas' includes coal seam gas, tight gas and shale gas.

from

First name: **Denyse**
Last name: **Menzies**
[redacted]
Organisation name: **Coal & CSG Free Mirboo North**
Position/Title: **member**
Compiled by: Denyse Menzies,
Anna Hall, Phil Piper, Andrew Corcoran & Gayle Margaret

We would like to make a presentation to a Hearing
Please make this document publicly available on the Inquiry's webpage

Coal & CSG Free Mirboo North Submission to Vic Inquiry into Unconventional Gas 8th July 2015

Dear Planning & Environment Committee members

Thankyou for this opportunity to present our comments supporting our view that Victoria should NOT have an unconventional gas industry.

Our group Coal & CSG Free Mirboo North represents members from Mirboo North and surrounding areas, we have been campaigning since early 2012 when Mantle Mining first applied for Exploration Licences for CSG and coal and then we found that there were adjacent tenements for CSG from other companies as well. Residents in the town and surrounding areas quickly mobilised and a public meeting was held to air concerns and to organise a campaign to oppose this threat. Concern spread across Gippsland as more communities faced the same prospects. We are members of the Gippsland Alliance (over 40 groups), Lock the Gate Victoria (over 70 groups) and Lock the Gate Australia .

We have surveyed our community door to door (about 800 homes or 2,000+ residents) and found that 96.6% of residents do not want this Industry to proceed. As a result, our town and district have declared themselves closed to Mining companies and their representatives. In addition we are a very active group that meets regularly, organises events and has regular media releases including our facebook page with 6,000+ followers now.

Mirboo North is a rural community of about 2,000 residents, situated in the Strzelecki Ranges about 30kms from Trafalgar, Meeniyan & Leongatha. The area contains some of the best farmland in Victoria comprising most of Australia's dairy industry, significant beef herds, potato crops, snow peas plus other smaller enterprises. Leongatha has a large dairy manufacturer , Murray Goulburn, Korumburra has another plant Burra foods and all this supports a range of agribusinesses.

Our committee for this submission has looked at your terms of reference and endeavoured to clearly voice our concerns.

We look forward to your Interim Report (September 2015) and your Final Report (December 2015)

Your time and consideration is appreciated.

Yours faithfully

Denyse Menzies
for Coal & CSG Free Mirboo North

Coal & CSG Free Mirboo North Submission to Vic Inquiry into Unconventional Gas 8th July 2015

1. The prospectivity of Victoria's geology for commercial sources of onshore unconventional gas

Looking at historical evidence , Victoria has large supplies of conventional gas in Bass Strait thus it is reasonable to extrapolate that there are reserves of onshore unconventional gas but as to the amounts available and accessibility of these to justify a viable industry is uncertain at this point in time.

Some of the areas under exploration in Gippsland licences are in close proximately to large coal mines increasing the chances of finding unconventional gas in the form of CSG.

There are no detailed geological maps of South Gippsland and the Bass coast which is being rectified by Earth Resources (DEPPI) who are conducting seismology studies at the moment in these areas and in addition base line water testing of strategically positioned water bores across Gippsland.

The value of base line water studies is important if the unconventional gas industry were allowed to develop, as there is a point of reference in case of any mishaps, resource companies cannot necessarily shirk their responsibilities by saying that it was a natural phenomenon as has been the case in Queensland, where no base line studies were conducted prior to the commencement of the unconventional gas industry in that state**.**

There is a document created by Southern rural water in Oct 2012 called the "Gippsland Groundwater Atlas that has studied the aquifers in Gippsland".

On p59 of this document they highlight regional issues as follows:

- Ongoing regional groundwater level decline in most areas (see p 57)
- Potential sea water intrusion due to aquifer depressurisation.
- Potential cross aquifer contamination due to faulty or poorly constructed bores
- Potential groundwater contamination due to new techniques to extract energy sources
- Land subsidence due to aquifer depressurisation

Bearing in mind the enormous amounts of water that is required to sustain the unconventional gas industry, this creates major problems in the agricultural and existing manufacturing industries dependent on bore water ,with issues of lower water levels in bores and the possibility of salinity problems in the aquifers. In Queensland where unconventional gas has been extracted for some time, a number of farmers have reported reduced water levels in their bores.

2. The environmental, land productivity and public health risks, risk mitigations and residual risks of onshore unconventional gas activities

Environmental risks

The Strzelecki ranges is a geologically active area subject to numerous small eathquakes typically measuring less than 5.5 on the Richter scale. Overseas evidence has linked an increase in siesmic activity to fracking:

> "Studies have found that it's not just the actual drilling and extraction that causes the earthquakes; more often, the routine practice of injecting fracking wastewater into deep disposal wells is to blame. Once the toxic mix of water, sand, and chemicals is underground, it can travel for miles, changing the pressure on fault lines and sometimes triggering earthquakes.
>
> The practice has caused a surge in earthquakes in many areas where fracking is common. Oklahoma in particular has been hard-hit. Once a state where tremors were few and far between, Oklahoma in 2014 had 564 quakes that were at least of magnitude 3— the most in the contiguous U.S. From 1975 until 2008, the state had, on average, only three such quakes per year." http://grist.org/news/fracking-is-definitely-causing-earthquakes-another-study-confirms/

Drilling for methane is a risk for global warming and climate change. Many wells leak methane, or cause methane to leak into the environment near by. Methane is a greenhouse gas with 21 times the effect of carbon dioxide. Methane is often flared off producing carbon dioxide and will produce carbon dioxide when it is burnt by the end user of the gas.

Land productivity risks

As an agricultural area, the presence of multiple wells on a farmer's land would have a negative impact by significantly reducing land available for production, potential contamination of water and soil would also reduce production. Further the presence of wells will cause organic farmers to lose their accreditation and farmers producing animals for meat must make a declaration that their animals are free from chemical contamination – how will they be able to make this declaration? The presence of wells on a farm are also a risk to livestock:

> "The produced water that flows up during the fracking process creates a salty taste attractive to livestock and wildlife. Animals can be exposed to poisonous fracking fluid through fracking fluid spills and/or contaminated water. Animal poisoning can results in death or loss of normal reproductive function, stillbirths, birth defects, and other health problems. Light and noise pollution from fracking wells can also increase stress for livestock." http://www.cafrackfacts.org/impacts/food/

In the USA, farmers whose land has been contaminated have received compensation, sometimes a considerable amount, but the gas companies have been unable to repair the land or contaminated aquifers:

> [Californian] Farmer Fred Starrh says improper storage of produced water contaminated the ground water he used for his crops. He was awarded $8.5 million in a settlement with Aera Energy, short of the billions he says it would take to repair his aquifer. http://www.cafrackfacts.org/impacts/food/

Public Health risks – food

needs more work.

Food and Agriculture Studies

Title	Publication	Authors	Year	Findings
Gas Patch Roulette: How Shale Gas Development Risks Public Health in Pennsylvania	*Earthworks*	Nadia Steinzor and Alan Septoff	2012	Found contaminants associated with oil and gas development are present in air and water in many communities where development is occurring.
Hormones and Endocrine-Disrupting Chemicals: Low-Dose Effects and Nonmonotonic Dose Responses	*Endocrine Reviews*	Thomas Zoeller and John Peterson Myers	2012	Identified 649 chemicals used during natural gas production and found that at least 130 of those could affect the endocrine system. They include petroleum distillates, methanol and other, more obscure compounds with names like dibromoacetonitrile and ethoxylated nonylphenol.
Impact of Gas Drilling on Human and Animal Health	*New Solutions*	Robert Oswald, Michelle Bamberger	2012	Found that the process of hydraulic fracturing may be linked to shortened lifespan and reduced or mutated reproduction in cattle. The study documented hundreds of cows dying as well as stillborn and stunted calves after exposure to hydraulic fracturing spills.

- Ag Statistics Overview
- Impacts of Drilling on Human and Animal Health
- Fracking and Farmland
- Ozone exposure for U.S. soybean cultivars

http://www.cafrackfacts.org/impacts/food/

Public Heath risks - exposure to chemicals

The chemicals that are used and released by the processes of onshore gas extraction are admitted to be dangerous to human health and therefore can be considered dangerous for the health of livestock and native animals.

> "a study by the University of Missouri and the United States Geological Survey found that chemicals used in fracking could severely disrupt the human body's hormone production, potentially leading to increased risk of cancer, low fertility, and decreased

> sperm quality. The study also found that children would be particularly susceptible to risk.“http://rt.com/usa/fracking-chemicals-found-well-water-243

A study in Pennsylvania of 108 families found the presence of chemicals associated with fracking both in the water and air. Respondents reported various symptoms: rashes, respiratory, sinus and mood problems. They could smell chemicals in the air which also caused their eyes to water and nausea:

> “Janet McIntyre said that drinking bottled water and using a shower at a family member's home have reduced many of the symptoms plaguing members of her family, including her young daughter. But she said she believes the continued irritability, headaches, breathing and other health problems come from air contaminated by the drilling. McIntyre is among the 80 percent of survey participants who reported smelling bad odors.
>
> And then there's the noise. "It's constant, 24 hours a day," she said. "It keeps me up at night."” http://www.huffingtonpost.com/2012/10/18/fracking-pollution-pennsylvania_n_1982320.html

Pets and livestock were reported as having died, at the time the families were getting sick.

After fracking methane has also been found in ground water used for human and animal consumption. The methane exists at levels that support combustion, this has been filmed and documented as occurring both in the USA and Queensland. (documented in the film: Frackman).

Waste water is also potentially contaminated with dissolved radioactive minerals or other poisonous minerals such as arsenic:

> “We found that there were actually quite a few examples of elevated constituents, such as heavy metals, the main players being arsenic, selenium and strontium. And we found each of those metals at levels that are above EPA’s maximum contaminate limit for drinking water.
>
> These heavy metals do naturally occur in the groundwater in this region. But we have a historical dataset that points to the fact that the levels we found are sort of unusual and not natural. These really high levels differ from what the groundwater used to be like before fracking came in. And when you look at the location of the natural gas wells, you find that any time you have water wells that exceed the maximum contaminate limit for any of these heavy metals, they are within about three kilometers of a natural gas well. Once you get a private water well that’s not very close to a natural gas well, all of these heavy metals come down.” http://www.propublica.org/article/new-study-finds-high-levels-of-arsenic-in-groundwater-near-fracking-sites

Risk mitigations – inadequate

In most European countries fracking is banned (France 2011)* or regulated Germany (2015)* so as to require such extensive environmental studies and guarantees to be put in place before drilling is allowed that mining companies have not attempted to meet these comprehensive regulations.

> "PARIS — France's highest court on Friday upheld a government ban on a controversial drilling technique known as hydraulic fracturing, in a defeat for a method that has revolutionized the oil and natural gas industry in the United States. … Environmental concerns, particularly worries about the danger to water supplies, have slowed adoption of the practice in Europe, and the center-right government of former President Nicolas Sarkozy passed a law prohibiting it in 2011."
> http://www.nytimes.com/2013/10/12/business/international/france-upholds-fracking-ban.html?_r=3&
> * (http://www.reuters.com/article/2015/04/01/us-germany-fracking-idUSKBN0MS3PE20150401)

Residual risks

The industry has exploration, construction, production and abandonment stages. All stages will impact future generations:

1. Much of the infrastructure/industrialisation of this Industry remains in perpetuity. This will have implications for future:
   - Planning
   - Land uses
   - Safety eg. Dial before you Dig –type information will be required by landowners as to the location, depth etc of pipes and so on
2. Many of the long term impacts of this Industry are now becoming obvious in America eg. public health, water and air contamination, leaks, fire risk, seismic risk, land subsidence etc.
3. Many long term impacts are still unknown and will require long term health and environmental studies to determine them (as has been the case in the LaTrobe Valley regarding coal)

However, it will become the responsibility of government to monitor, maintain, report on and mitigate this widespread problem. The industry will have long gone and shirked these responsibilities after only about 30 years – such a short lived industry for such long term pain as we already have in Victoria with our mines.

3. The coexistence of onshore unconventional gas activities with existing land and water uses, including —

(a) agricultural production and domestic and export market requirements;

Unconventional gas extraction involves highly invasive processes like dewatering and horizontal drilling. Land use and liveability is compromised due to the operation and infrastructure of unconventional gas extraction.

The extraction of unconventional gas is an industrial process.

The substantial earth works creates mud when wet and dust in dry weather.

Roads are created to each well head, pipes are laid underground from each well head and pumping stations are established. These pumping stations are extremely noisy and operate 24 hours, 7 days a week. There is also constant traffic on all these roads, which are the property of the mining companies on privately owned land.

A flaring pipe which burns unwanted combustible chemicals is required for every cluster of well heads. These flaring pipes must burn 24 hours a day in all weather conditions, creating noxious gas emissions and light pollution at night time.

Added to this is the ever present fugitive emissions of pure methane gas which is not only a health risk but is also an extremely potent green house gas.

Concerns include lowering of the water table, contamination of groundwater and surface water and vast amounts of wastewater with no means of safe disposal.

Coal Seam Gas, Shale & Tight Gas require huge amounts of water during the fracking or drilling process. This water would likely be sourced from town water and underground water supplies. Water for irrigators has already been fully allocated in the Gippsland region with groundwater being used at a rate in which it is depleting faster than it's being replenished. (See Gippsland Grounwater Atlas) The Australian gas industry provides a figure of 11 million litres per shale or tight gas frack so where would the additional water for unconventional gas mining come from?

Without clean, uncompromised water and air farmers cannot farm. Are producers expected to take on this risk here in Victoria? Once an aquifer is compromised there is no going back. We have an incredibly strong clean & green image here in Gippsland for producing some of the country's best & safest food products. Devondale/Murray Goulburn which is centred in Leongatha produces one third of Australia's milk production and is worth 2.9$B annually, 49% is exported.

We have added tourism as an additional land use, because in the Shire of South Gippsland it is one of it's major service sectors as it has approximately one million visitors each year and this includes all people temporarily in the area such as those on business, visiting friends and family and holiday makers.

In statistical terms Tourism is not separately classified as an industry by the Australian Bureau of Statistics as it an amalgam of components of many industries. Most notably this includes the Accommodation and Food and Retail Trade sectors but in reality most sectors contribute to the sector in some way. Research undertaken for Council shows that tourism contributes over $100 million to the local economy and supplies about 650 direct jobs

What tourists would want to visit or even drive through gasfields?

(b) the legal rights of property owners and the impact on property values:

The legal framework that regulates mining is designed to allow mining and unconventional gas developments to go ahead. While laws regulate their operations, the laws alone will not stop coal seam gas (CSG) and other forms of unconventional gas going ahead in communities that don't want gas development. However in this context, peaceful community action in the form of protests which highlights the dangers of this form of mining to the environment, land, air, water and communities are also legal.

The impact on property values is huge. In districts of NSW and Queensland Land Values have dropped by an average of 12%, as soon as a CSG project was announced.

At Tara and Chinchilla in QLD, more than 50 % of the farms are for sale. No one wants to buy a property that has been tainted by CSG. No one will buy a farm in a CSG area.

Even if a farmer were to think that the compensation (lease) from the gas company might offer them an income so that they could ease into retirement and that selling the farm in 10 or 20 years time will be their superannuation, then that is just flawed thinking. No one can sell their farm for a decent price with CSG on it.

In most cases the compensation paid to farmers is minimal and does not even cover the lost yearly production, much less the drop in land value.

(c) Any implications for local and regional development, investment and jobs:

Our agriculture industry is worth $48 Billion dollars annually. This industry is growing every year, it has sustained us for 100 years and will do so for another 100 years but only if we actively protect our farmland, our water and our producers. Any form of unconventional gas industry would pose a huge risk to farming and the thousands of people employed in the agricultural and tourism sectors.

The gas mining industry claim that they will bring a huge number of jobs to local areas. But despite claiming that the unconventional gas boom in Queensland created 100 000 jobs, the entire oil and gas industry in Australia, both unconventional and conventional, only employed 20,000 people in 2013 according to the ABS. And these jobs are short-lived. A boost in employment may last two or three years during the construction phase of an onshore gas project, but many communities are beginning to find that after this very short lived boom phase, there is a lasting bust. (See Landline June 2015)

At the moment the gas industry is foreseeing a reduction in the workforce of up to 75% in Queensland gasfields, as they move from construction to maintenance phases.

Even during the construction boom, an increase in the number of gas-industry related jobs does not paint the whole picture. Increases in rent, the price of labour and increases in the demand on contractors can drive up prices for agriculture, manufacturing, tourism and other parts of the economy that could be devastating for farmers and small business.

4. the ability of potential onshore unconventional gas resources contributing to the State's overall energy sources including —

(a) an ability to provide a competitive source of energy and non energy inputs for Victorian industries;

(b) an affordable energy source for domestic consumers; and

(c) carbon dioxide emissions from these sources;

Natural gas like coal and oil is a fossil fuel , it is predominantly composed of methane but when burnt produces nitrogen oxides and carbon dioxide but in lower quantities than coal and oil.

"The amount of CO2 produced when a fuel is burned is a function of the carbon content of the fuel. The heat content, or the amount of energy produced when a fuel is burned, is mainly determined by the carbon (C) and hydrogen (H) content of the fuel. Heat is produced when C and H combine with oxygen (O) during combustion. Natural gas is primarily methane (CH4), which has a higher energy content relative to other fuels, and thus, it has a relatively lower CO2-to-energy content. Water and various elements, such as sulfur and non-combustible elements in some fuels reduce their heating values and increase their CO2-to-heat contents."

http://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11
http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html

Methane and carbon dioxide are both gases defined as greenhouse gases, it is imperative to reduce these emissions as much as possible in light of the consequences of climate change. The nature of emissions and their calculation is quite complicated , there are 3 categories of emissions 1. Direct emissions 2. Indirect 3. Various Emissions factors which includes future emissions (see tables 1 and 2 below). This is explained well in a federal government document:

http://www.environment.gov.au/system/files/resources/b24f8db4-e55a-4deb-a0b3-32cf763a5dab/files/national-greenhouse-accounts-factors-2014.pdf

Coal & CSG Free Mirboo North Submission to Vic Inquiry into Unconventional Gas 8th July 2015

Table 1: Fuel combustion emission factors - solid fuels and certain coal based products

Fuel combusted	Energy content factor GJ/t	Emission factor kg CO_2-e/GJ (relevant oxidation factors incorporated)		
		CO_2	CH_4	N_2O
Bituminous coal	27.0	88.2	0.03	0.2
Sub-bituminous coal	21.0	88.2	0.03	0.2
Anthracite	29.0	88.2	0.03	0.2
Brown coal	10.2	92.7	0.01	0.4
Coking coal	30.0	90.0	0.02	0.2
Coal briquettes	22.1	93.3	0.06	0.3
Coal coke	27.0	104.9	0.03	0.2
Coal tar	37.5	81.0	0.02	0.2
Solid fossil fuels other than those mentioned in the items above	22.1	93.3	0.06	0.3
Industrial materials and tyres that are derived from fossil fuels, if recycled and combusted to produce heat or electricity	26.3	79.9	0.02	0.2
Non-biomass municipal materials, if recycled and combusted to produce heat or electricity	10.5	85.4	0.6	1.2
Dry wood	16.2	0.0	0.08	1.2
Green and air dried wood	10.4	0.0	0.08	1.2
Sulphite lyes	12.4	0.0	0.06	0.6
Bagasse	9.6	0.0	0.2	1.3
Biomass municipal and industrial materials, if recycled and combusted to produce heat or electricity	12.2	0.0	0.6	1.2
Charcoal	31.1	0.0	4.0	1.2
Primary solid biomass fuels other than those mentioned in the items above	12.2	0.0	0.6	1.2

Source: National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1)
Notes: All emission factors incorporate relevant oxidation factors (sourced from the Department of the Environment National Inventory Report).
Note Energy content and emission factors for coal products are measured on an as combusted basis. The energy content for black coal types and coking coal (metallurgical coal) is on a washed basis.

Table 2: Emission factors for the consumption of natural gas

Fuel combusted	Energy content factor (GJ/m^3 unless otherwise indicated)	Emission factor kg CO_2-e/GJ (relevant oxidation factors incorporated)		
		CO_2	CH_4	N_2O
Natural gas distributed in a pipeline	39.3×10^{-3}	51.2	0.1	0.03
Coal seam methane that is captured for combustion	37.7×10^{-3}	51.1	0.2	0.03
Coal mine waste gas that is captured for combustion	37.7×10^{-3}	51.6	5.0	0.03
Compressed natural gas (reverting to standard conditions)	39.3×10^{-3}	51.2	0.1	0.03
Unprocessed natural gas	39.3×10^{-3}	51.2	0.1	0.03
Ethane	62.9×10^{-3}	56.2	0.02	0.03
Coke oven gas	18.1×10^{-3}	36.8	0.03	0.06
Blast furnace gas	4.0×10^{-3}	232.8	0.02	0.03
Town gas	39.0×10^{-3}	59.9	0.03	0.03
Liquefied natural gas	25.3 GJ/kL	51.2	0.1	0.03
Gaseous fossil fuels other than those mentioned in the items above	39.3×10^{-3}	51.2	0.1	0.03
Landfill biogas that is captured for combustion (methane only)	37.7×10^{-3}	0.0	4.8	0.03
Sludge biogas that is captured for combustion (methane only)	37.7×10^{-3}	0.0	4.8	0.03
A biogas that is captured for combustion, other than those mentioned in the items above	37.7×10^{-3}	0.0	4.8	0.03

Sources: National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1)
Notes: All emission factors incorporate relevant oxidation factors (sourced from the Department of the Environment National Inventory Report).

Coal & CSG Free Mirboo North Submission to Vic Inquiry into Unconventional Gas 8th July 2015

When unconventional gas is extracted from coal seams , shale etc large quantities of water are used in its extraction and in cases also mixed with chemicals (BTEX) this process is referred to as fracking, the water and chemicals are pumped under pressure into the gas laden seams and then pumped out, this water is referred to as co-produced water and varies in its chemical composition, it is always brackish but is unsuitable to be discarded into the environment without suitable processing.

"The compositional characteristics of produced water may be highly variable between coal seam basins, and even between individual wells within a basin. However, high concentrations of total dissolved solids (TDS), composed of a variety of mainly inorganic substances (e.g. sodium, bicarbonate, carbonate, chloride, etc) are generally characteristic. Such high salinity solutions can have significant detrimental impacts if discharged to freshwater streams or rivers. Furthermore, high salinity solutions, particularly those dominated by sodium (rather than calcium or magnesium) salts can severely impact soils if used for irrigation. Long-term use of such high salinity soils can disrupt soil physical structure, impeding drainage and limiting the agricultural suitability of impacted areas. "

"There are a variety of approaches available for the management of produced water and these may generally be categorised as either 'disposal' or 'beneficial use'. A common means of disposal has traditionally been by the use of evaporation ponds. Today this practice is strongly discouraged or banned, as it is in Queensland and New South Wales. As an alternative means of disposal, there is currently significant interest in deep-well injection of either the produced water, or of concentrated produced water brines. In general, beneficial use of produced water is now strongly preferred to disposal and a wide variety of applications are available under suitable circumstances. These include surface water discharge or in-stream flow augmentation, agricultural use (e.g. crop irrigation, livestock watering), on-site industrial use during CSG activities (e.g. dust control, hydraulic fracturing, drilling water, fire protection), off-site industrial use and potable use (i.e., augmentation of drinking water supplies). For many beneficial use applications, and even for some types of disposal, some treatment of the produced waters will be required. There are a range of important approaches to produced water treatment. These include pH adjustment, granular filtration, membrane filtration (including reverse osmosis), adsorption and ion exchange. Some of these processes can produce high quality water, but also produce a concentrated waste stream (brine), which itself requires either disposal or further treatment for beneficial use. Few suitable brine disposal options are currently available, other than deep-well injection to aquifers assessed to be hydraulically isolated from important fresh groundwater resources. As a consequence, produced water brines are currently being stored in ponds and lagoons at a number of sites in Australia, while more permanent management solutions are being assessed. Further treatment of concentrated waste streams to the point of 'zero liquid discharge' is of great interest, but continues to face a number of obstacles, primarily in terms of energy-requirements and associated operational costs. Commercial recovery of some of the major salts from the brine, such as sodium bicarbonate, has been proposed but not yet realised in Australia. Until such opportunities become available, crystallised salts will require disposal, predominantly by landfill. The surface management of produced water, whether it involves treatment, storage, transport, disposal or beneficial use, creates opportunities for accidental release and environmental risks."
Coal Seam Gas: Produced Water and Solids Prepared for the Office of the NSW Chief Scientist and Engineer (OCSE) School of Civil & Environmental

http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0017/44081/OCSE-Final-Report-Stuart-Khan-Final-28-May-2014.pdf

Many of these processes for dealing with the produced water are expensive and also create variable emissions to the addition of gas extraction.
To transport natural gas pipes are used any leakage from pipes, processing plants or gas wells can have serious future emissions contributions with methane being 21 times worse than carbon dioxide in its contribution to green house effects. See table below

Appendix 1 Greenhouse Gas Global Warming Potentials

The Global Warming Potential (GWP) is an index used to convert relevant non-carbon dioxide gases to a carbon dioxide equivalent (CO_2-e) by multiplying the quantity of the gas by its GWP in the table below.

Table 26: Global Warming Potentials

Gas	Chemical formula	Global Warming Potential
Carbon dioxide	CO_2	1
Methane	CH_4	21
Nitrous oxide	N_2O	310
Hydrofluorocarbons HFCs		
HFC-23	CHF_3	11,700
HFC-32	CH_2F_2	650
HFC-41	CH_3F	150
HFC-43-10mee	$C_5H_2F_{10}$	1,300
HFC-125	C_2HF_5	2,800
HFC-134	$C_2H_2F_4$ (CHF_2CHF_2)	1,000
HFC-134a	$C_2H_2F_4$ (CH_2FCF_3)	1,300
HFC-143	$C_2H_3F_3$ (CHF_2CH_2F)	300
HFC-143a	$C_2H_3F_3$ (CF_3CH_3)	3,800
HFC-152a	$C_2H_4F_2$ (CH_3CHF_2)	140
HFC-227ea	C_3HF_7	2,900
HFC-236fa	$C_3H_2F_6$	6,300
HFC-245ca	$C_3H_3F_5$	560
Perfluorocarbons PFCs		
Perfluoromethane (tetrafluoromethane)	CF_4	6,500
Perfluoroethane (hexafluoroethane)	C_2F_6	9,200
Perfluoropropane	C_3F_8	7,000
Perfluorobutane	C_4F_{10}	7,000
Perfluorocyclobutane	c-C_4F_8	8,700
Perfluoropentane	C_5F_{12}	7,500

58 Department of the Environment

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Eastern Australia (2013) have been acquiring conventional gas form Gippsland's Bass strait for some 40 years, there are still large reserves and the Cooper-Eromaya Basins for about 35 years but supplies as of 2013 are declining. As of 2013 all this conventional gas was used for the domestic market only.
The wholesale prices have been fairly stable $3-$4 per gigajoule but this is possibly set to change with the completion of the Curtis Island LNG plant off Gladstone, in Queensland, with the first exports of unconventional gas, early in 2015 for Asia. Asia is prepared to pay $12 - $13 per gigajoule for natural gas. Many economists are saying that domestic prices will rise in response to this, if consumers have to compete for gas supplies. The NSW regulator has already approved 17.8% rise in retail prices between 2014 – 2016 due to the new export boom.

http://www.smh.com.au/business/comment-and-analysis/local-gas-prices-set-to-soar-as-exports-to-asia-get-under-way-20150118-12rl6c.html

http://www.abc.net.au/news/2014-12-23/lng-milestone/5985532

Victoria has a number of suppliers of conventional gas , well established supply routes and infrastructure with increasing demand for gas in the domestic and business sectors, but if prices increase significantly people may seek cheaper or more sustainable alternatives decreasing the demand for gas. This could result in unconventional sources of gas being predominantly exported.

"The need for policy response & rising prices do not automatically mean the market has failed or that intervention is necessary. While price discovery has been difficult for some time, the linkage to international markets has been coming for a number of years. All users will need to adjust to prices being set in a more dynamic and higher cost environment, particularly those domestic gas users who have had to adapt quickly after decades of fairly steady market fundamentals. Supply will respond to price and there are early signs of this starting to occur in eastern Australia. When considering potential policy options, the extent and duration of any tightness in the market takes on particular significance. In a period of transition, there is a risk price may overshoot export parity until there is sufficient gas supply or information available to the market to overcome any transient market power and readjust risk expectations."

http://www.industry.gov.au/Energy/EnergyMarkets/Documents/EasternAustralianDomesticGasMarketStudy.pdf

"1.1 Foundations of uncertainty The gas market's structure has evolved incrementally and has been supported by timely investment in infrastructure. The structure is characterised by a limited number of major upstream players to leverage economies of scale. There is some basin-on-basin and project competition on the supply side, the effectiveness of which is being tested during this transition period. Eastern Australian Domestic Gas Market Study 13 While the _golden age of gas' and the strong international LNG market present a story of opportunity and export demand, major domestic gas users and retailers are facing significant uncertainty about the availability and price of gas. Prices were always going to rise in the face of increasing production costs, but how far is increasingly difficult to predict in the face of diverging expectations on price and uncertainty about the supply response. The large number of long-term contracts rolling off during this transition period and offers of shorter term contracts compound the uncertainty for major domestic gas users. Major gas users face an inevitable increase in the cost of gas, which will create particular challenges for companies already wrestling with productivity, a strong dollar and import competition. A number of gas users have indicated that they are investigating alternative energy sources or

considering discontinuing gas-intensive operations. The domestic market's ability to deliver efficient outcomes in a period of rapid change is untested and the subject of debate. While many stakeholders say they are satisfied with the bilateral contract market that has characterised trade in gas in Australia to date, there is a growing debate about the adequacy of current arrangements as we move to an export-linked and more dynamic gas market. Underlying this already difficult commercial environment are diverging views of critical price drivers. These uncertainties include: ♣ how quickly CSG can be delivered to meet export requirements and the increasing costs of developing gas resources ♣ the size of the future opportunity in international markets (particularly the potential for additional LNG trains in eastern Australia over the forecast period) ♣ whether opportunities exist to exercise market power and reallocate risk from export projects to the domestic market and the impact of sustained high gas prices on demand ♣ infrastructure constraints that potentially create barriers to entry for new gas supplies. Given these uncertainties, there are questions about how well the gas market will adjust to the new conditions in the presence of massive and rapid change and the possibility of transitional supply tightness. There are also questions about unconventional resource development, a lack of price transparency, and limited liquidity and depth on both the supply and demand sides. It is unlikely that these uncertainties will be fully resolved until the CSG– LNG projects reach a stable production stage."

http://www.industry.gov.au/Energy/EnergyMarkets/Documents/EasternAustralianDomesticGasMarketStudy.pdf

In summary:

- Natural gas is a fossil fuel which when burnt produces significantly lower emissions than coal or oil, however in the extraction of unconventional gas there are a range of additional emissions that come from leakage , processing the gas and processing produced water. Natural gas is a temporary bridge to more sustainable forms of renewable energies, which technology is improving all the time, including storage capacity for non-generation periods.

- Victoria already has an established market and infrastructure setup for convention gas, mainly sourced from Bass Strait with large reserves still available

- Prices for wholesale conventional gas had been relatively low as gas on the Eastern coast has been used only for the domestic market

- LNG plants will now make it possible to export gas to overseas markets at considerably higher prices. Economists are saying that the domestic consumers will have to compete with world prices and pay much higher prices in the next few years as exports are ramped up. The result in increased prices may lead consumers to elect cheaper and/or possibly more sustainable options for energy, thus decreasing the demand for gas. Gas could end up being predominantly an export product and too expensive for the average consumers.

"Natural gas can replace high-emissions fuels like oil and coal and facilitate variable renewable energy sources such as wind and solar. However, concerns about the safety, risk, and environmental impacts associated with shale gas development must be addressed before production can significantly increase."
http://energy.gov/fe/science-innovation/oil-gas-research/shale-gas-rd

5. the resource knowledge requirements and policy and regulatory safeguards that would be necessary to enable exploration and development of onshore unconventional gas resources, including —

(a) further scientific work to inform the effective regulation of an onshore unconventional gas industry, including the role of industry and government, particularly in relation to rigorous monitoring and enforcement, and the effectiveness of impact mitigation responses; and

(b) performance standards for managing environmental and health risks, including water quality, air quality, chemical use, waste disposal, land contamination and geotechnical stability

The SCER Report hopes to create a tripartite system where all stakeholders, Governments, the CSG Industry and the public will all AGREE to best global practices being adopted by the Industry and work together in a "transparent" way that builds "confidence" in the CSG Industry. Communities do NOT agree with this

For all the reasons below, we do not believe that any amount of regulation, monitoring or best practice would make this industry more accountable and responsible or meet with community expectations. SCER has created the concept of Social Licence as the basis for State Governments to decide whether or not this Industry proceeds in their communities. There is no Social Licence for this Industry to operate in Victoria and so this should not go ahead (see Lock the Gate Victoria community survey results and Community Consultation Final Report).

Resource Knowledge Requirements

This Industry should not proceed in Victoria because:

1. there are still gaps in our scientific knowledge including:
    a. International collaborative research into the combinations of chemicals used by this Industry in small doses (see SCER Final Report)
    b. Data collected by the seismic survey by ER will take about a year to analyse and interpret ie. Results are expected to be available about mid 2016
    c. even the Industry admits that there is a lot of guess-timating until drilling actually occurs. The onus should be on the industry to prove it's own safety and to meet commun ity expectations in this regard.

Industry lack of knowledge and techniques is most apparent in Chapter 5 Hydraulic Fracturing and Chapter 6 Chemical Use of the SCER Final Report. These Chapters are full of comments about the lack of information, data, science etc. available about the chemicals used, the effects of the combinations and quantities of chemicals used, the underground chemicals that are released by the CSG Industry, the effects of these chemicals singularly and in combination etc. . Community groups have been calling for these investigations to occur while the MORATORIUM continues, including Doctors for the Environment, Australia, and the National Toxics Network, Lock the Gate groups, Government and Non-government health organizations and departments etc.

2. most studies are based on Industry data. This data is not questioned even though the Industry's only motive is profit:
    a. in general the Industry continues to over-estimate its potential and benefits whether it be about the quantity and quality of Victoria's natural resources, the financial returns to Victoria or the jobs it will create.

3. there has been no cost benefit analysis to give us the final nett benefit ie. Taking into account all the financial costs of all the impacts of this industry on greenhouse gases and so climate change, water quantity and quality, air quality, displacement of other sectors especially agriculture and tourism jobs, loss of income to landowners, loss of liveability/amenity, devaluation of homes, properties and businesses, costs to health and environment including perpetual impacts etc.;

4. the EDO (now EJA) Report states that Environmental Laws in Victoria were watered down by the previous government:

> *"In Victoria offsets have been widely used in the context of the regulation of native vegetation clearing. They are intended only to compensate for unavoidable ecological damage and loss. The logic of compensating for ecological damage faces the fundamental problem of* ***equivalence between what is destroyed and the 'gains' represented by the offset****...Recent proposals to change native vegetation clearing rules in Victoria foreshadow a major weakening of these laws and much expanded use of offsets."* (EDO Vic current newsletter)

In contrast we know a lot about **Climate Change and Renewable Energy**:

a. There is very little conflict about the scientific reality of Climate Change and our urgent need to sharply reduce our reliance on fossil fuels. Recent statements of these intentions by the G7 as well as China & USA at the G20 only reinforce our need to adapt/transition now
b. The Climate Council (previously Authority) is a trusted organisation
c. According to most polls, the Australian/Victorian population consider the need to limit the impact of Climate Change a priority and are looking to governments for significant actions
d. Victorians/Australians are big adopters of Energy Efficiency so much so that despite population growth, there has been a reduction in demand and so we can now close down coal generation plants like Anglesea. It was also found that the "gold-plating" of our poles and wires has been a significant overspend by our energy distributors due to a fall in demand. Do we really need gas fired electricity generation stations then?
e. Victorians/Australians are increasingly looking to Renewable Energy sources eg. PowerShop and technologies as well as divesting in fossil fuels
f. Australia has already lost a huge amount of investment for the Renewable sector because of Federal policy and statements giving the wrong signals despite our need for higher Revenue
g. The domestic market is looking for cheap energy supplies to keep cost of living expenses and business costs in Victoria down
h. Recent advances in storage technology are now making Renewable Energy more of an option at residential, organizational and community level
i. There is reliable and useful information available to the extent that energy distributors and retailers are looking at options for reducing losses during distribution, limiting the peaks and troughs in demand, redirecting energy where it is needed etc. while using existing distribution and retail systems throughout Victoria.

Therefore, any decision regarding whether or not this Industry proceeds needs to be couched in the context of Climate Change and our Energy Future.

Role of Industry – performance standards for managing environmental and health risks including water quality, air quality, chemical use, waste disposal, land contamination and geotechnical stability as well as effectiveness of impact mitigation responses

If this Industry had to pay the real costs of adequate community and environmental protections, public compliance requirements and full reparations, it would not go ahead (as is now happening in NSW as regulations are tightening). At the very least, the heavy regulations and penalties required would include:

a. adequate numbers and powers of staff to proactively and confidentially supervise the mining companies (as self regulation and self disclosure does not work as seen in QLD & NSW), their Contractors and sub-contractors
b. an independent Arbitrator to deal with disputes between communities and mining companies like the Energy Ombudsman
c. heavy duty fines for infringements of regulation, non compliance and compensation to Victoria in addition to making full, long term reparations
d. full disclosure and transparency of:
    a. government and mining company discussions eg. APPEA Conference, Melbourne May 2015. (see The Saturday Paper 4th July 2015 for a discussion of Lobbying eg. "Mark Ogge, Principal Adviser for progressive think tank The Australia Institute, reckons the mining industry spends about $50million a year trying to buy influence. "And most of that is done in house, not by third party lobbyists. They wine and dine every relevant staffer and beaurocrat. Increasingly, resource departments see themselves just as an arm of industry. There is a revolving door of people who work in the beaurocracy one day, resource industry the next.") This is of special concern given the powerful influence of Gina Rhinehart, a shareholder of Lakes Oil, Seaspray.
    b. contracts made between resource companies and communities/Victoria and individual land owners
e. company/industry responsibility for:
    a. proving their trust worthiness and that their work practices/processes etc. are **safe** and provide long term, sustainable solutions for problems **preventing** and **avoiding** risks not just **mitigating** or **limiting** them eg. Sydney Morning Herald (April 9 2015) reported that in January this year, AGL's operations had been suspended in NSW pending the investigation of the discovery of **banned** BTEX chemicals. Too often government is responding to contaminations. The SCER Final Report also relies heavily on **Active Management** in the field by the industry as and when problems occur rather than pre-empting these problems and avoiding them – the true intention of Active Management.

The SCER Report outlines <u>the CSG Industry's roles</u>:

- Be willing to adopt best global practices
- Do its own risk and environmental assessments
- Deal with unforseen/unpredictable problems as they arise. This is termed "applied learning" and only reinforces the fact that there is a lot that is unknown and unpredictable with this technology.

The majority of the SCER Report (about 60 pages) is dedicated to the BEST GLOBAL PRACTICES for the CSG Industry. Overall our response to these is that:

- The risks are too High. Many incidents around the world, in QLD and in NSW show this to be the case.
- Mitigation will not help. Prevention and Protection of social and environmental assets is the responsibility of Governments and the Industry and is being ignored.
- ALL these processes are **optional** for Industry. The Report does NOT make it compulsory for the CSG Industry to adopt these best practices or as a condition of licence.
- Self assessments, monitoring and reporting by the CSG Industry are INADEQUATE.
- Applied learning ie. continually adapting to unexpected unforseen or unpredictable situations that will occur in such a high risk Industry is UNACCEPTABLE.
- The Industry will always be able to argue that a problem occurred because it was not "reasonably practical" to do such and such ie. it cost too much. As such, it will not be held accountable
- Government Regulators will be under resourced, toothless, reactive and working closely with the CSG Industry, be open to corruption.
- Self assessments, monitoring and reporting by the CSG Industry are INADEQUATE.
- Applied learning ie. continually adapting to unexpected unforseen or unpredictable situations that will occur in such a high risk Industry is UNACCEPTABLE.
- The Industry will always be able to argue that a problem occurred because it was not "reasonably practical" to do such and such ie. it cost too much. As such, it will not be held accountable

By its omissions, limitations, misrepresentations and regulatory approach, the Report has tried to shape and direct community input to support Governments' management of the CSG Industry. We do NOT support the MLUF or the Regulatory Framework. As Bob Wilson has reported, the Senate Inquiry criticised Governments handling of the CSG Industry. It says that Governments' approvals for CSG Industry developments were "*given prematurely*", and that '*the pace of the CSG Industry's development is too far ahead of scientific investigation into its lasting impacts*'. It also says that '*attempts by Governments to regulate the CSG Industry are not keeping pace with the Industry's development'*. In fact the CSG Industry continues to operate without a full and comprehensive understanding of its impacts while the Moratorium is in place for only NEW licenses.

The CSG Industry is inherently UNable to be socially or environmentally safe. It represents UNacceptable social and environmental. The only way to adequately address this matter is to BAN the CSG Industry in Australia.

According to the SCER Final Report, we are to rely on the Industry's **self monitoring**:

- Best practice or Codes of practice – it specifies 18 leading global practices. With the trend of Deregulation and International Trade agreements for services and products, it is clear that the Industry will increasingly try and override our government decisions, policies, regulations etc. while communities increasingly look to our governments for stronger actions in the public interest
- Adaptive management, continued improvement and applied learning ie. Whenever negative impacts and unforseen/unexpected incidents occur in the field during CSG operations, the Industry will **TRY** to deal with it as best they can. This is acknowledgement that the Industry does NOT know enough about the techniques and methods it needs to employ in order to prevent these impacts
- Responsibility and Accountability in an Industry of Contractors and subcontractors

Even when these so called global best practices are currently used by the CSG Industry, they do NOT prevent impacts and will NOT PROTECT social and environmental values. The CSG Industry's way of minimizing long term liabilities is to:

- take risks that are TOO HIGH – ignoring or down-playing their own risk assessments;
- delay, disrupt and deny any thorough investigation; and
- deny any causation, responsibility, accountability or liability for impacts that communities have exposed.

Evidence shows that to date, the CSG Industry is a poor corporate citizen:

a. did not voluntarily ban the use of fracking or BTEX chemicals
b. has not consulted with communities EL by EL as required to negotiate a SL
c. has not provided information to shareholders about the risks and costs of the industry to communities and the environment
d. hides behind commercial in confidence when it comes to details of chemicals, combinations and doses used and of agreements with individual landowners
e. has been slow to acknowledge and warn communities of accidents or problems
f. has not developed satisfactory means or proof of making its industry safe for communities and the environment
g. has regularly appealled decisions in order to minimise penalties (Yesterday GDFSuez refused to pay the government for it's CFA bill)

This is the first occasion world wide where the CSG Industry has been asked to detail why it should be able to proceed before any Exploratory drilling occurs. Usually, CSG companies make their way into an area where landholdings are large and landowners fairly isolated and so easily manipulated and "persuaded" or "bullied" as Bill Heffernan's Federal Inquiry overwhelmingly discovered (see media reports).

The fact that we are able to specify all the problems surrounding the Industry and weigh up whether/not it should proceed in Victoria, is acknowledgement of the fact that no amount of self regulation, best practice or active management in the field as and when problems arise will protect communities and our environment from this Industry.

The SCER Final Report also audited how the system has been overseen by the QLD and NSW governments and recommends many of these be used in Victoria. It does not take into consideration the wealth of Federal and Victorian protections that have disappeared and are still threatened by deregulation, removal of red and green tape and of creating a 'one-stop shop' for Industry. Victoria has many more protections than both these States and so should not forego these to enable this industry to proceed.

The SCER Final Report also limits Industry compliance to completing paperwork the vast majority of which the Government's Monitoring Authorities will not check let alone audit. There is too much reliance on this Indutry to self monitor and the government could not afford to provide adequate staffing levels and powers to regulate this. Public Regulators are usually the last to know after much repressing, modifying and delaying tactics by Industry in providing them access and in the face of strong community monitoring and awareness raising.

There are many instances of accidents both in Australia and overseas that have not been adequately dealt with according to community expectations even though some of them have not been illegal and conversely, some that have been illegal have not been sufficiently penalised or held responsible for remedial works etc. (see Accident list). This is especially true where there is a lack of Industry responsibility for maintaining wells after they are abandoned ie. cease producing gas even though this is a perpetual legacy of the Industry.

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Major impacts to communities and the environment are the very nature of this Industry. They include unacceptable risks to:

a.greenhouse gases and so climate change
b.water quantity and quality
c.air quality
d.soil contamination
d.liveability/amenity etc.

The SCER Final Report suggests that the Industry **mitigate** ie. limit/reduce these impacts. However:

a. some risks may seem limited to mining companies but are quite risky for landholders (eg. as each well has a minimal (about 3%) risk, landowners take on a much bigger risk with each well that is drilled on their land (ie. 3% x no. of wells)
b. some risks cannot be mediated eg. It is a fact that once the building boom is over (only 3-4 years), communities face a deep and longer lasting bust eg. currently near Roma (see Landline July 2015 – What Happens After CSG?)
b. some risks cannot be mitigated eg. It is a fact that the very nature of this Industry requires that ever more wells are drilled to release the water pressure so that gas can be captured for processing and export.
d. Victorians are adverse to having their water used and treated several times. Victoria's clean-green image is also built on this.
d. It is a fact that a lot of the infrstructure associated with CSG wells, collection and processing of methane etc. consists of lots of pipelines connecting each well and the well head. This is true even for horizontal drilling (up to 3 km). This impact will remain in perpetuity. It would be extremely difficult and costly for the government to map, monitor and administer future landuses (agricultural or otherwise) once the wells stop producing. Each well has a life expectancy of about 10-15 years only and the whole Industry has a life expectancy of 30-50 years (see Bill Heffernan media reports).

This is why "carrots" like **Royalties for Regions**, various **funds and bonds** should be rejected. Royalties for Regions is an attempt to divide and conquer communities and so break the opposition/resistance that the Lock the Gate movement has. Strangely, such corporate 'sponsorships" for sporting clubs or the sewerage system near Roma then become arguments for the Industry when in fact they are compensation for the impacts associated with this Industry wherever it occurs.

A better option would be to follow Norway that has a common wealth fund from it's royalties of 90% that drives infrastructure developments and is decided by an elected government with reference to social and environmental justice/fairness. This may also address the lack of royalties and taxes we receive from the mining industry despite the recent boom and the high levels of financial support from governments/taxpaers.

Various **Funds & Bonds** have been suggested as ways of ensuring that CSG companies have the funds to cover rehabilitation costs should they be needed eg. a water catchment is contaminated etc. The very fact that we are considering the need for such a possibility/probability is evidence that we should not take these sorts of risks. The only way to do this is to not enable the Industry to proceed in Victoria.

The CSG Industry is a complex network of contractors and subcontractors (businesses and individuals). The onus is on any individual or government impacted to "show cause". This is nigh impossible especially against a multinational company. This is why the onus should be

on the industry to prove it's safety, to give guarantees, to ensure, to prevent etc. BEFORE it is enabled by government. So far, we are NOT convinced. The mining industry's corporate reputation has been badly damaged in recent years. Operations that cannot be proven to be safe at every stage of the process should not proceed.

Role of Victorian Government - Policy & Regulatory Safeguards, Monitoring & Enforcement to enable this Industry to proceed in Victoria

So far the Federal government has developed the SCER Harmonious Regulatory Framework to enable this Industry to proceed in all states and territories with as little so-called red and green tape as possible. As a signatory to the COAG Agreement, the Victorian Government now has the power to decide whether or not this Industry should proceed in Victoria.

Victoria is the only State that has held a public Inquiry prior to this Industry carrying out any Exploration. This government is to be congratulated for listening to community concerns, for making this an election issue and for sticking to their pre-election promise of holding this Inquiry.

It is now up to our Governments to reject and ban the CSG (and other unconventional gas) Industries as well as New Coal Mining. At the very minimum, Governments should ban all fracking due to its UNacceptable high social and environmental risks/costs and stop all means of legal privileged treatment of the CSG/Mining Industry over individuals and the public (as per the EDOV's recommended legislative changes).

Governments have previously made similar decisions about other out dated industries like Petroleum (to remove lead), Refrigeration and Air Conditioners (to remove CFCs), Asbestos (to stop its use), Tobacco (to stop promotion of smoking and harmful additives) – all for the public good.

We are still suffering the social, environmental and economic consequences of having endured the development and growth of these harmful Industries/Industrial processes. Let's act now to avoid making the same mistake with the CSG (including shale and tight gas) and New Coal Mining Industries. We do not want or need another story of toxic contamination for generations to come.

This is also an opportunity for Governments to institute widespread Energy Conservation and to transition to Renewable Sources of Energy Supply. Germany, with its large manufacturing economy, has already done this – so, why can't we? – as has South Australia.

We would very much like to see some goodwill on the part of our Governments regarding this inquiry process. We are hopeful that the communities' submissions will NOT be ignored for financial or any other reasons, as has happened with other community consultation processes like the **Greenfield Report.** We do not want any more empty reassurances from Governments or or seemingly predetermined decisions.

The SCER Report outlines Governments' roles:

- Educate and inform the public with key messages and facts so that we can provide a "more mature" response ie. be the promotional arm of the Industry. The public believes that Governments are ignoring their social and environmental protection responsibilities;
- Regulate the Industry ie. work closely with the Industry. Like other Regulatory bodies it will be under resourced, toothless when it comes to enforcement and behind the 8ball to start with;
- Conduct random audits of the Industries Reports

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Government monitoring and enforcement agencies are insufficient to ensure the safety of the Industry – especially as a lot of the risks and costs to communities and the environment are the sorts of things that need to be either accepted or rejected from the beginning because they are intrinsic to this Industry. Communities under ELs have decided to reject this industry as bringing too many risks and costs with it.

Given the urgency of addressing Climate Change and reducing our reliance on fossil fuels as the G7, China & USA have stated recently, it is important that the Victorian Government ensure that this Industry does not proceed in Victoria. Instead it needs to:

1. advocate on behalf of Victorians and lobby the Federal Government strongly about:
    a. its White Paper on Energy
    b. much stronger Climate Change policy and action including Energy Conservation
    c. a price on carbon and methane or an emissions trading scheme
    d. a mining rent tax
    e. support the Landholders' Rights to Refuse (Gas and Coal) Bill 2015 introduced to Federal Parliament by Senator Larissa Waters recently
    f. independent makeup of advisory and decision making bodies like the Federal Independent Expert Scientific Panel that comprises many people with links to the mining industry
    g. support the recently established Australian Climate Roundtable: Joint Principles for Climate Policy
    h. a real RET (as well as introducing a Victorian RET)
    i. lessening or stopping Tax Emption status of our community and environmental groups

2. adopt a policy that reinforces the need for Social Licence ABOVE economic forecasts (like the Reith Report) ie restore balance to mining approvals after the previous government's preference for financial/economic forecasts. For example, today NSW Minister Stokes has announced he is scrapping an unfair policy in the planning system that puts economic factors first when assessing mining projects, ignoring the environment and communities.

3. adopt a policy to address Climate Change across all portfolios as a priority. Strong statements like 'creating a zero emissions (carbon and methane) economy by 2020' etc. are needed now

4. adopt a policy to secure an Energy Future for Victorians that avoids the worst of Climate Change impacts, reduces our reliance on fossil fuels, diversifies our energy mix and encourages investment and takeup of Renewable Energy.

5. create a domestic reserve of Bass Strait gas as the AWU, Morwell has suggested and as has occurred in WA. This would give Victoria an adequate timeframe in which to transition to Renewable Energy. According to Peter Ryan, Bass Strait natural gas has 30+ years of supply. Although it currently only supplies the domestic market, the concern is that the over-reaching international contractual obligations that QLD CSG companies have signed up to, may force us to look at Bass Strait gas to meet their export obligations. This would then take away supply from large businesses like Murray Goulburn and APM who do not have any other form of energy to fall back on, thereby jeopardising their businesses and local rural economies.

6. adopt a Social Justice policy to ensure that the poorest households and least competitive businesses are not unfairly impacted/disadvantaged by large increases in energy costs as a result of internationalisation/exporting Australia's energy resources. Points 3 & 4 would

assist this especially if price increases for a domestic reserve are limited ie. Consierably lower than export prices. As energy costs are a large proportion of budgets of households and businesses, these actions may also have the effect of attracting more investment and busisnesses to Victoria.

7. commit to consistent not conflicting and arbitrary Industry developments like this regional planning like the Gippsland Food Plan etc.

8. resist impacts of deregulation and International Trade Agreements that are against the public interest –especially where harmful products are concerned (see The Saturday Paper 4/7/15)

9. encourage divestment in fossil fuels and investment in Renewables.

10. acknowledge that the community generally and especially those communities under EL are very aware, well educated and informed about this industry and daily developments both in Victoria, Australia and overseas. In so doing, it should stay away from any attempt to spend taxpayers money on public "educational" programs. This would only reinforce the already too close relationship between government and the industry and be perceived as the promotional arm of the industry.

In summary, it seems that the Victorian government can either maintain the status quo of encouraging fossil fuels (CSG mining and new coal mines), greenhouse gas emissions (carbon and methane – 21 times worse) and so worsening Climate Change impacts, undermining of the renewable sector, creating the seeds for more conflict or it can reduce our reliance on fossil fuels by not allowing this Industry to proceed in Victoria and thereby address these pressing matters.

There are many examples in Australia and overseas of effective ways in which the Victorian Government can ensure this Industry does not proceed in Victoria including:

a. long term or indefinite **Moratorium** that can only be lifted if Social Licence is gained and certain conditions are met ie. Victorians are convinced that the Industry has proved its safety and undertakes to behave as a responsible corporate citizen etc.
b. **rescind, buy back or compensate** companies for ELs (but not for lost future earnings). Regarding NSW government's buyback scheme that was due to end last week but has been extended until September 2015: AGL announced 7/7/15 (see Echonetdaily) that it would divest coal seam gas assets in Western Sydney and the Hunter Valley (a $193 million write down covering over 15,000 square kilometres of NSW. The licences stretched from the Southern highlands, through the Illawarra and Sydney's drinking water catchment, up to the Central Coast and through parts of the wine-growing region of the Hunter Valley). This seems to be a clear sign that the industry is unviable and faces ongoing conflict with agricultural landowners and local communities in the region. The article states: There is a lesson for potential gas producers in the Northern Rivers (NSW) that trying to advance projects in agricultural and close knit communities just doesn't work…The government should be using the AGL decision to…ensure the licences are either bought back or cancelled in the public interest…(This) is a step in the right direction to protecting our land and water from risks posed by coal seam gas…. it means our water catchment will no longer be considered less important than the profits of a mining company… NSW Energy Minister Anthony Roberts has warned coal seam gas companies their exploration licences could be stripped from them if they do not follow AGL's example of selling licences in sensitive areas back to the government. Mr Roberts told the *Financial Review* that the 'very generous' buyback scheme

would only last until September and after that companies with exploration licences would have to 'use it or lose it'. NSW Energy Minister Anthony Roberts has been negotiating with Metgasco over compensation after the company successfully challenged the government's decision to cancel its drilling license for its Bentley project. We understand from EJA that this was because the government did not follow proper process in its bid to avoid conflict between police/security and 10,000+ people. (see Nature Conservation Council of NSW.

c. Setting a cut-off date for granting of **ELs** to minimise costs to the government including legal action
d. not allowing Licences to be Retained (for when/if the Industry becomes viable). In 2012 a new **Retention Licence** (RL) was introduced to the Mineral Resources (Sustainable Development) Act 1990 that gives CSG license holders the rights to hold a license for 10 years and renew it twice. These licenses are a precursor to a mining license, meaning, you have extractive worth but the market may not be economically viable, the technology is not evident or you need to hold area to sustain the operations of an existing business. Large areas of prime agricultural land can be left in limbo for many years without due regard to ongoing existing agribusiness surety or ability to improve. e.g. Yallourn's unallocated lands and Mantle Mining's just granted Retention Licences. There is also increasing evidence to suggest the rapid expansion of mining industries acts to 'crowd out' other export industries by causing a sharp rise in the Australian dollar and by causing jobs shortages in trades and other areas. For more information contact Mark Ogge of The Australia Institute, re the Economic Impacts of Coal and Gas Onshore Mining on Other Industries.

The concept of a **Social Licence** for this industry (and others) should be maintained and reinforced. Although not prescribed, the overwhelming community opposition to this industry is evident in:

a. Community door to door surveys conducted by local Lock the Gate groups in Victorian communities under CSG EL (see results list)
b. The many protest actions put to Councils with ELs
c. The Community Consultation Final Report. (water's down the strength of opposition in communities under EL and misrepresents CSG to city/suburban as 'natural" gas like they already use when it is known by all that this is an export industry NOT for domestic supply as with Bass Strait gas)

For discussion of Legislation required to redress the '**privileged position'** of mining companies see EDO Report.

It was with great difficulty that the Senate negotiated the **Federal Water Trigger Legislation** in the face of declining federal protections for Australia's ground water. Queensland and NSW are still trying to catchup, making policy and regulations on the run. If enabled by the Victorian government, it would fall to Local Councils to process work applications/plans from CSG companies if they want to go on to production. This would be very difficult, putting ratepayers in conflict with their Councils as there is no Social Licence in Victoria.

Creating **Exclusion Zones** have also been considered. However, as the Lock the Gate community campaign against this Industry has progressed, we have moved away from this as a solution because:

a. All Victorian communities under EL understand and empathise with each other. We won't trade one region for another.
b. The impacts of this Industry affect all Victorians and Australians whether it be quality of our air, soil and water, food production, current economic sectors, health or that of our fauna and flora and general liveabiliyt/amenity of the state etc.

c. Victoria is densely populated and much smaller than most other States.

The New Scientist 10/08/2013 reports that in the USA, shale gas was meant to create a source of cheap, low emissions energy. However, it has meant cheaper coal prices, increased use of coal and increased emissions.

> "…seduced by a **false promise** of cheap, plentiful energy from shale gas, we will cut back on investment in truly green, renewable alternatives…as the costs and emissions associated with shale gas rise in the future…we will end up on a costly bridge to nowhere." Victoria needs to be smarter than this and take steps now to avoid these problems.

Gippsland's Food Plan – Vision & Strategic Framework 2012 (See Source Documents) paints a very different future for our farming lands, food and tourism businesses that is inconsistent and incompatible with onshore gas mining and the MLUF.

Victoria is different: more densely populated, extremeley productive with increadible natural beauty. As such, Victoria can differentiate itself from other states. It has already taken the first step by having this inquiry before any industry development. It can take strong action on Climate Change and our Energy Future in the public interest and so not enable this industry to proceed.

6. relevant domestic and international reviews and inquiries covering the management of risks for similar industries including, but not limited to, the Victorian Auditor-General Office's report *Unconventional Gas: Managing Risks and Impacts* (contingent upon this report being presented to Parliament) and other reports generated by the Victorian community and stakeholder engagement programs.

The SCER Report outlines the public's role as participation in decision making about individual projects. This is far too narrow. We would rather the Victorian Government establish a formal advisory role for community groups like EDO Vic, Doctors for the Environment Australia, National Toxics Network, Lock the Gate Alliance etc. to participate in decision making about all aspects of this and similar (harmful) Industries as per the ACF's recently announced roundtable for Climate Change and appropriate industry development for this State to enable the findings of this Inquiry to be formed into actions.

The government should acknowledge that it is only through widespread monitoring and growing public concern about this industry, that the SCER Report, this Inquiry and various changes to legislation in NSW and QLD are still occurring. The public's identification, highlighting and voicing of their concerns must then be well informed, knowledgeable, expert, justified, valid and a necessary contribution to public debate about the best way forward to secure the health and well being of communities, our environment (including natural resources) and so appropriate industry development.

As a broad based community network (throughout Mirboo North and District, Gippsland, Victoria, Australia and throughout the world), we are constantly researching, gathering and sharing a very broad range of information resources. In addition to Government and Industry websites and publications, we have found the following resources and people very informative and well founded. This has given rise to our position of opposing this Industry and arguing against it at every opportunity.

Dr. Gavin Mudd, Lecturer, Environmental Engineering, Monash University,
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Mark Ogge, re the Economic Impacts of Coal and Gas Onshore Mining on Other Industries, Researcher and Public Engagement Officer, The Australia Institute
Ph: 0421 272 884 E: mark@tai.org.au Web: www.tai.org.au

Mining the Age of Entitlement – State Government Assistance to the Minerals & Fossil Fuel Sector, Technical Brief No. 31, ISSN 1836-9014, The Australia Institute, June 2004
Matt Grudnoff, Fracking the Future – Busting Industry Myths about CSG and FACT SHEET nst. Paper No. 16, ISSN 1836-8948, The Australia Institute, March 2014

Jeremy Moss, Alicia Coram, & Grant Blashki, Is Fracking Good for Your Health? – An analysis of the impacts of unconventional gas on health and climate, Technical Brief No. 28, ISSN 1836-9014, The Australia Institute, November 2013

SLR Consulting Australia P/L, A Review of the Key Considerations on the current and potential interactions between dairy and unconventional gas mining activities in co-existing regions in Eastern Australia, Briefing Report Number: 630.10836, prepared for Dairy Australia, July 2014 referred to as the Dairy Australia Report

Latest maps of Exploration Licences held by various companies in the onshore gas industry
www.geovic.gov.au
http://www.dpi.vic.gov.au/earth-resources/explortion-and-mining/tools-and-resources/geovic

The Chief Scientist of Australia statement 31st July 2013
www.abc.net.au/news/2013-07-31/national-press-club-professor-ian-chubb/4856576

The Chief Scientist & Engineer, NSW – Initial Report on the Independent Review of Coal Seam Gas activities in NSW, July 2013 http://www.chiefscientist.nsw.gov

Southern Cross Univeristy (SCU) Researchers' Response to the Chief Scientist & Engineer, NSW, Initial Report
http://www.getresearch.com.au/index.php/research/mining/item/2083-researchers-welcome-chief-scientist%E2%80%99s-report-on-coal-seam-gas

The SCER National Harmonised Regulatory Framework for Natural Gas from Coal Seams Report
SCER (Standing Council on Energy Resources)
http://scer.govspace.gov.au/files/2013/06/National-Harmonised-Regulatory-Framework-for-Natural-Gas-from-Coal-Seams.pdf

The Gippsland Groundwater Atlas, published by Southern Rural Water
http://www.srw.com.au/Page/Page.asp?Page_Id=689

Duke University: 'Increased stray gas abundance in a subset of drinking water wells near Marcellus shale gas extraction, http://www.pnas.org/

The Southern Cross University 'Fugitive Emissions from CSG'
http://www.scu.edu.au/coastal-biogeochemistry/index.php/70/

List of onshore gas industry Accidents in Australia
http://coalseamgasnews.org/wp-content/uploads/2012/10/Contaminated-sites-and-accidents-related-specifically-to-CSG-in-Australia.pdf

The MLUF (Multiple Land Use Framework)
http://www.scer.gov.au/workstreams/land-access/mluf/

Horizontal drilling – "Fracking-free CSG", The Gippsland Farmer, August 2013, p1&4. Also see the APPEA website.

The Environmental Defender's Office (EDO) request for veto
Reforming Mining Law in Victoria
www.edovic.org.au/downloads/files/law_reform/EDO_Reforming_Mining_Law_in_Victoria.pdf

The VFF request for 'right to veto' for farmers
Monday 22nd July 2013 VFF on ABCRural:
http://www.abc.net.au/news/2013-07-22/vff-calls-for-farmer-veto-rights-on-mining/4835034
http://www.abc.net.au/news/2013-07-22/4834968

CSIRO rejects claims made by APPEA regarding groundwater and coal seam gas
http://www.csiro.au/Portals/Media/Groundwater-and-coal-seam-gas.aspx

The Australia Institute 'Mining the Truth'
https://www.tai.org.au/?q=node/384

Clarke, R. 'Gas has a worse climate footprint than coal'
http://www.greenleft.org.au/node/53313

The New Water Trigger Legislation
http://www.environment.gov.au/epbc/about/2013-amendments-q-and-a.html

Gippsland's Food Plan – Vision & Strategic Framework 2012
http://rdagippsland.com.au/wp-content/uploads/2012/07/GFP-Final-Discussion-Paper-RDAG.pdf
http://www.gippslandtimes.com.au/story/1592408/gippslands-food-plan/

Australian Dairy Farmers 'Election Wishlist' – Renewable energy investment
http://www.weeklytimesnow.com.au/article/2013/08/07/579059_print_friendly_article.html

Consequences of Shale gas developments in the USA
The New Scientist, 10/08/13, p 37 – 41

Community submissions to the SCER draft Report (links to each submissions are at the very bottom of the page) http://www.scer.gov.au/workstreams/land-access/coal-seam-gas/

'Farmers against Fracking Rally'
http://www.weeklytimesnow.com.au/article/2013/08/19/579926_politics-news.html

Gippsland is Precious
http://www.youtube.com/watch?v=WH5MS-v2prc

Gasland, directed by Josh Fox, distributed by New Video group
http://www.gaslandthemovie.com/

Frackman, DVD and Film
Also - various TV, Radio and u-tube items and people from NSW & QLD who have been directly impacted by this industry