Kier Delaney
Secretary
Environment and Planning committee
Parliament House
Spring St
Melbourne Vic 3002

John Coverdale
[redacted]

Dear Kier,
Please find attached my submission for the parliamentary inquiry into unconventional gas in Victoria. I have answered questions 1-5 as I feel they are relevant to my understanding in this matter. Victoria is an integral part of Australia's food production export market and does not need this highly invasive short term industry.

We have an opportunity in this state to be forerunners in the renewable energy market.

Yours Faithfully
John Coverdale
[redacted]

Q 1. The prospectivity of victorias geology for commercial sources of onshore unconventional gas

- The Otway Basin sits on shale and tight gas with PEP 150 Petroleum Exploration Permits issued to Mawson Petroleum Adelaide (Beach Energy is the parent company of Mawson) PEP 151 Cooper energy also have interests in this region and PEP 171.
- Seismic surveys done in the past have established future exploration of the region, PEP 150 were issued in 2013 to Beach. As the moratorium has allowed no exploration, viability of finds are yet to be established.
- Beach Energy has discovered finds in the Penola trough. Sawpit, Lower Sawpit and Casterton formations. Penola is in SA but is still part of Otway Basin. They have a moratorium as well but were drilling prior to it. The moratorium is on the south east of SA, our immediate neighbour.

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

- Australia has a reputation of being world leaders in food production of the highest quality this is well documented through our exports internationally .The introduction of Unconventional gas mining with its large areas 1.5 to 2 hectares surface pad sites would be detrimental to agriculture and our clean food exports.
- I believe through research done that unconventional gas mining has many concerns to public health; these risks have been evident among residents in Tara Qld, living among highly concentrated fields.
- Eye and skin irritation(both adults & children)
- Headaches,(adults & children)
- Various odours in the air ie rotten egg, sickly sweet, pine tarsal, acetone, creosote.
- Among workers surveyed in the industry,
- Skin irritation
- After biopsy diagnosed with nerve damage hand and feet
- Severe fatigue, headaches and nausea.
  Taken from "Symptomatology of a gas field" April 2013 pages 25&27
  Geralyn Mccarron, MB Bch BAO FRACGP

Q 3.The co existence of onshore unconventional gas activities with existing land and water uses, including-

a. Agricultural production domestic and export market requirements
b. The legal rights of property owners and the impact on property values
c. Any implications for local and regional development, investment and jobs.

Point a) Victoria's temperate climate, high quality soils and clean water support our world-class agriculture industries. In 2012-13, Victoria's agricultural industries used a total land area of 10.6 million hectares. About 6.1 million hectares is mainly for grazing, and 4.5 million hectares is mainly used for cropping. The gross value of agricultural commodities produced was $11.6 billion.

To grow and maintain Victoria's strong agriculture sector, the Department works with industry and on research, development and extension to improve production; connects the sector with international markets; supports industry development; and maintains effective biosecurity controls.

Ref: state govt of Victoria dept of environment and primary industries/agriculture and food

- Bearing this in mind with the reports of the risks involved with the unconventional gas industry from USA and Queensland I do not believe the two industries can coexsist, because of the area of land required by the mining industry, the chemicals used of a hazardous nature.
- We have in this area and the south east of SA a forest industry and the roads are very busy with log trucks bringing product to the Portland port .If the gas industry were to get licence it would an increasing burden on our roads and infrastructure.
- Depletion of water resources for hydraulic fracturing are of great concern, DR Damian Barrett from CSIRO says that shale Gas drilling is likely to use 7-15 ML of water per frack.(up to 25ML) 4.

- *Onshore Natural Gas Community Panel,Camperdown,26/2/15 (4*)

- **Statistics of effects USA**
- Fracking wells since 2005 82,000
- Toxic wastewater produced in 2012(billion gallons).....280
- Water used since 2005(billion gallons).....250
- Chemicals used since 2005(billion gallons).....2
- Land directly damaged since 2005(acres).....360,000

- *Ref: Fracking by numbers key impacts of dirty drilling at state and national level. Environment America.*

basin	*Basin area km2*	*Number of shale gas wells*	*Water needed for fracking(GL)*	*Fracking water per year (GL)*	*Groundwater sustainable yield (GL per year)*	*Groundwater abstraction (GL per year)*	*Water footprint compared to gas footprint*
Otway (onshore)	*44,105*	*3,446*	*51.7*	*2.1*	*1998*	*238*	*0.5*

Table 2
Shale gas basin in (Otway Basin) showing the potential number of wells (assuming well space of 800 metres and fairways making up 5% of the basin). The estimated volume of water needed to frack these wells assumes 15 ML/well. The volume of fracking water per year assumes a 25 year life span of the field. Groundwater sustainable yield and groundwater abstraction values from NLWRA (2001) and AWR2005 (http://www.water.gov.au/). Shale gas basin boundaries were used to clip all groundwater management units (GMUs) within the shale gas basin and a pro rata estimate of sustainable yield made based on NLWRA 2001. Water footprint is the factor by which the area of land needed to sustainably withdraw 15 ML of water for fracking exceeds the area of land (640,000 m_2) covered by each gas well.

Ref Australian Council of Learned Academics.
Potential Geological risks associated with shale gas production in Australia January 2013 project code AAS801

Contamination of Aquatic Systems

Eco Logical Australia (2013) summarise the potential incidents that can lead to the contamination of aquatic systems as including spillage, overflow, water ingress or leaching from cutting/mud pits owing to:
-limited storage capacity;
-operator error;

-storm water or flood water ingress; or
-poor construction or failure of pit liner;
spillage of concentrated hydraulic fracturing fluids during transfer and final mixing operation (with water) that occurs onsite owing to:
-pipework failure;
-operator error;
spillage of flowback fluid during transfer to storage owing to:
-pipework or well failure during the operation;
-insufficient storage capability and overflow;
-operator error;
loss of containment of stored flow back fluid owing to:
-tank rupture;
-overfilling of lagoons due to operator error or limited storage capacity;
-water ingress from storm water or floods;
-poor construction or failure of liner;
spillage of flow back fluid during transfer from storage to tankers for transport owing to:
-pipe work failure; or
-operator error
spillage of flow back fluid during transport to wastewater treatment works.

Source: Eco Logical Australia (2013) and references there in: Broderick, et al., 2011; New York State Department of Environmental Conservation, 2011; New York City Department of Environmental Protection, 2009.

Point b) the current law only allows landowners and mining companies to negotiate compensation via VCAT (Victorian Civil and Administrative Tribunal) each landowner should have the right to veto mining companies from access to land.

Point c) Direct jobs would be minimal as FIFO workers are often engaged in this industry. This would be a short term shot in the arm for our district with no long term value and would leave behind large scars on the landscape.eg below Qld project. *Santos averaged a 3000-strong workforce during the construction phase but that figure has fallen to just 600 employees in recent weeks.*

A spokesman for the company confirmed that number could fall again later in the year as the company continued with moves to reduce expenditure in the region. Queensland country life Penelope Arthur 16th Feb 2015.

Q 4.The ability of potential onshore unconventional gas resources contributing to the states 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
c) Carbon dioxide emissions from these sources

Part a) Australia's conventional gas resources are mostly located offshore from WA Carnarvon, Browse and Bonaparte basins .Offshore from Victoria in the Gippsland, Otway and Bass basins and onshore in the cooper-Eromanga basin in South Australia. Geoscience Australia states that there is 60 years of resources at current level of production .Victoria supplies will last another 30 years. *Ref: ibid and Gas market task force research paper R Gallagher parliament of Victoria 2014*

Part b) Beach Energy has also found conventional targets in SA at their Bungaloo-1 site sawpit sandstone layers. So it would seem that we can find an affordable source for domestic consumers without exploring unconventional shale deposits, hence using horizontal fracking.

Part c) Carbon dioxde emissions are only part of the situation more serious are Methane emissions more harmful than carbon dioxide.

Methane contamination of water was evident in an analysis of 60 water wells near active gas wells in the US. [34] Most were contaminated with methane at levels well above US federal government safety guidelines for methane. The majority of water wells situated one kilometre or less from a gas well, contained water contaminated with 19 to 64 parts per million of methane. Wells more than a kilometre from active gas had only a few parts per million of methane in their water. The study used chemical and isotopic analyses to identify the high levels of methane in well water as being produced in the deep shale, released by gas drilling activities. In Australia, sampling of CSG released water from Bohena Creek in the Pilliga Forest, New South Wales, detected methane at the Eastern Star Gas discharge site at 68 micrograms per litre (ug/l), whereas it was not detected in the upstream control sample.

Ref: National Toxin network, Toxic chemicals in the exploration & production of gas from unconventional sources Dr Mariann Lioyd Smith Senior advisor NTN

Q5. 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
b) Performance standards for managing environmental and health risks, including water quality, air quality, chemical use, waste disposal, land contamination and geotechnical stability

Part a) My reference to scientific research on this is Anthony Ingraffea,Phd,PE PSE Healthy Energy who gives a 1 hr presentation on u tube introduction to Shale Gas Extraction. Professor at Cornell University.

http://psehealthyenergy.org

Facts about fracking – live science

www.livescience.com/34464-what-is-fracking.html

The contentious debate of hydraulic Fracturing will always have its opponents and proponents and the safety can never be guaranteed no matter how rigorous the monitoring.

Part b) Performance standards that need to be put in place should be;

- Thorough baseline studies of water before any drilling starts.
- Insurance cover by mining companies that would fully compensate all concerned.

If Unconventional gas mining cannot be guaranteed to be completely safe, due to a multitude of unknowns it should not be given licence unless the following conditions are met before moratorium is lifted. Consider the following 5 conditions of a bill passed in New Brunswick Parliament Canada 2014

- A "social licence" be established through consultations to lift the moratorium;
- Clear and credible information on the impacts on air, health and water so a regulatory regime can be developed;

- A plan to mitigate impacts on public infrastructure and address issues such as waste water disposal is established;
- A process is in place to fulfil the province's obligation to consult with First Nations;
- A "proper royalty structure" is established to ensure benefits are maximized for New Brunswickers

  Ref CBC News New Brunswick 2014

- Complete transparency and disclosure of all chemicals used .Mining companies tend to not to disclose.

  Chemicals and other drilling fluid additives that could leave a residual toxicity should not be added to any drilling fluids or cement slurries (i.e. grouts) used to drill and complete any water bore *(why not for mining industry) my words in italics*

Ref: Minimum construction requirements for water bores Australia edition 3 Feb 2012 section 7 page 41

750 chemical products with 650 containing hazardous substances and 279 products with trade secrets were identified by the US House of Representatives Committee on Energy and Commerce. 9These include carcinogens (eg naphthalene), neurotoxins (eg isopropanol), irritants/sensitisers (eg sodium persulfate), reproductive toxins (eg ethylene glycol) and endocrine disruptors 10 (eg nonylphenol). Some of the chemicals have been found to be dangerous at concentrations near or below chemical detection limits, 11 (eg glutaraldehyde, brominated biocides (DBNPA, DBAN), propargyl alcohol, 2-butoxyethanol (2-BE), heavy naphtha.) Many chemicals have not been assessed for their long-term impacts on the environment and human health. In Australia, of the 23 identified as commonly used ‘fracking’ chemicals, only 2 had been assessed by the national regulator, National Industrial Chemicals Notification and Assessment Scheme (NICNAS) and neither for their use in CSG.
12 The mixtures used in drilling and fracking fluids are also not assessed for toxicity or persistence and can form new compounds when exposed to sunlight, water, air, radioactive elements or other natural chemical catalysts. Industry self-reporting on 9,310 individual US fracking operations between January 2011 and September 2012, noted cancer causing chemicals were used in one out of every three

HF operations. While not all companies report and not all chemicals used in the process are disclosed because of 'trade secret' exemptions, industry did report that known carcinogens like naphthalene, benzyl chloride and formaldehyde were used in 34 percent of all HF operation.

Ref National Toxin network, Toxic chemicals in the exploration & production of gas from unconventional sources Dr Mariann Lioyd Smith Senior advisor NTN

Tasmanian government bans fracking for another 5 years.

Tasmanian primary industries minister Jeremy Rockcliff said there was uncertainty around fracking, and his decision would "protect Tasmania's reputation for producing fresh, premium and safe produce".

Stephen smiley ABC News 26th Feb 2015

Lancashire Bans Fracking

Lancashire council has rejected planning application by shale gas explorer Cuadrilla to frack in the county.

Adam Vaughan The Guardian Monday 29th June 2015

New York Bans Fracking ,Albany

New York formalized its ban on high volume hydraulic fracturing for natural gas on Monday, concluding a 7 year environmental & health review that drew a record number of public comments.

The New York Times June 29 2015

Italy..... September 2014 ban introduced as part of the law of stability 2014 in order to protect groundwater and soil and promote "efficient use of national water resources"

www.ilfattoquotidiano.it/2014/09/04/fracking

The above are a few examples of worldwide concern for this industry.

Five year Gas Ban Gets Nod.

Farmers at the VFF conference voted to Ban an unconventional gas industry in Victoria for at least the next 5 years and will lobby government to have a permanent power of veto over all mining on agricultural land.

Weekly Times 1st July 2015 by Kath Sullivan

Summary Perhaps the home truths of this industry come from 4 local men who have worked in the gasfields in WA and Tara Queensland, have simply said they would not want this industry for Victoria because of its invasive nature .and industrialization of landscape.

The unconventional gas industry should not be given the go ahead at all because of the unforeseen consequences and overall risks and hazards to health, water, land, social fabric of community and the environment. Australia being one of the driest continents on earth doesn't need its water resources depleted for short term gain.

With the conventional gas reserves that are available, 30 years in Victoria a more long term sustainable future would be to transition from conventional stocks of gas to renewable forms of energy in that time.

Communities across Victoria are voicing their disapproval of this industry over 60 communities across Victoria have declared themselves Gas field free through surveys.

The South West of Victoria with the Glenelg River and Glenelg National Park discovery Bay, The Great South West Walk and picturesque coastline among other natural areas of significance together with grazing and farmland do not need to be industrialized and raided by this industry.

History of Hydraulic Fracturing in Australia

Language that is used by the industry is,

"Fracking is a safe process that has proven so in over 60 years of experience in Australia"Director of the energy resource information centre Steve Wright.

Ref ABC News,Kate Hill ABC South East.Article "Fracking fact finding trip by SA MPs hears pros and cons of Shale Gas industry"

There has been fracking in a vertical form only, not directional unconventional methods of horizontal drilling. Vertical versus Horizontal Wells

Vertical Wells – Verticals wells are the traditional type of oil or gas well that go straight down, typically to a depth of about 50-300 feet. These wells penetrate perpendicular to the rock layer containing the oil or gas reserve. Hydraulic fracking on vertical wells is commonly used for "well stimulation" to increase the efficiency and output of the well. Compared to horizontal well fracking, this type of fracking requires lower pressure and volume.

Horizontal Wells – Horizontal wells terminate with the wellbore parallel to the rock layer containing the oil or gas reserve. Horizontal wells also reach a much deeper depth than vertical wells. For example horizontal wells drilled in the Barnett Shale Basin in Texas goes down between about 1,500 to 5,000 feet, while the horizontal wells drilled in the Bakken Shale Formation in North Dakota go down to up to 10,000 feet. Due to the higher pressure associated with these depths hydraulic fracking must be done at a much higher pressure and volume.

- See more at: http://setxind.com/upstream/how-hydraulic-fracking-is-used-and-the-reasons

-for-it/#sthash.pnKqKjwF.dpuf

So when the industry says it's been fracking for 60 years its of the vertical style ,which is quite misleading.

Consider the following statement.

"Shale Gas production in Australia is in its infancy with just 12 exploration wells drilled as of March 2012.Australia has one Shale Gas production well which is located in the Cooper Basin"

Ref Potential Geological Risks Associated with Shale Gas Production in Australia. (aust council of learned academics jan 2013 project code AAS801) Introduction Page 6.

Thank you for considering my Submission,

John Coverdale [redacted]