T R A N S C R I P T

STANDING COMMITTEE ON THE ENVIRONMENT AND PLANNING

Inquiry into unconventional gas in Victoria

Melbourne — 6 October 2015

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Mr Timothy O'Brien (affirmed), Operations Manager, Lakes Oil.

The CHAIR — First of all, I say thank you to both of you for reappearing and following up on pieces of evidence that we have received. We have obviously received your letter of 10 July and the material attached but would welcome further commentary, as you wish, and we will certainly ask some questions.

Mr ANNELLS — Thank you. We would like to thank you for the opportunity to reappear. I am sure that over the last three months you have learnt a lot about this industry that you did not know at the beginning, so we are expecting some meaty questions, and we would certainly welcome those.

A couple of things I would like to just outline before I ask Tim to give you a brief outline on some of the work we have been doing over the last three or four months — and that is, yesterday I was fortunate enough to have a visit from a guy by the name of Dr Vikram Rao, who chaired a committee put in place by the state of Connecticut in the US. The legislator there asked him to chair a committee, and the scope and purpose of that committee was to regulate and manage oil and gas exploration development, but protect public health, welfare and environment. In view of what we just heard from the Auditor-General, I think this is an excellent document, which I will leave with you.

It is quite fresh; it was only presented to their legislative committee two or three months ago. I have also put in here the website, which is available as well. This man is still in town and is available if any of you wanted to meet with him. He is here till Thursday, I think. I am sure you have had many offers like that in the past, but this is a very impressive man, and this is a very good set of rules, I might say. It covers both conventional and unconventional gas.

In relation to some of the work we have been doing, Tim will give you some of the more technical side of things, but we have spoken with a number of groups, users, in the community and PACIA, which is the petroleum and chemicals institute, are very strong on providing jobs in this state using ethane. The work we are doing in the western part of the state suggests that using conventional methods, the percentage of ethane that can be recovered from those wells exceeds, or will exceed, the percentages that are being recovered in the Cooper Basin and currently being piped to Sydney.

There is a lot of discussion again around the town relating to retention of gas in Victoria, and we have publicly said that Victorian gas should be used for Victorian jobs, but PACIA are pointing out that gas is gas, and that is for heating. What they really want is the ethane. They are suggesting that not one drop of that ethane should be let out of the state, if we are fortunate enough to be able to start drilling in the western part of the state, and we get the results we expect to get. Ethane is straight jobs, and I think it is important that that point be made, because there will be pressure — as we all know — on unemployment in the coming months.

Tim has been doing some good background work, again on Otway, and we just want to run through that briefly and then open ourselves up to questions, which I am sure, as I said, having been three months on the road, you will have plenty.

Visual presentation.

Mr O'BRIEN — Thank you, Chair and committee, for giving us the opportunity again to present to you. I have attended most of the inquiry, the public hearings, that you guys have held, and since we first appeared in front of you, as we have heard today, you have obviously heard a lot of different submissions from people and picked up a lot of information. But there has been a lot of not necessarily misinformation but some misconceptions about a lot of what is actually likely to happen here in Victoria, as compared to what happens interstate and elsewhere around the world. So, firstly, I just wanted to clarify a few of those points and then go into a little bit of the detail about what we actually do want to do, which is what is most likely to be done across the state.

As I said, Victoria still has a huge onshore conventional and unconventional gas potential. A lot of what we are exploring for onshore does not require fracking, we believe — —

The CHAIR — Can I just ask, you have got this is 'Common onshore gas misconceptions' — you are not actually arguing that that is a misconception?

Mr O'BRIEN — No.

The CHAIR — At the first dot you are saying that is correct — —

Mr O'BRIEN — I am sort of countering — there has been a lot said that there is not potentially any gas onshore, and people have come out saying, 'There isn't any. Don't worry about it, we should just worry about offshore' — —

The CHAIR — You are saying, 'These are the correct points —

Mr O'BRIEN — These are the correct points.

The CHAIR — addressing some of the misconceptions', because the way the table reads is that those statements are misconceptions. That is all.

Mr O'BRIEN — No, sorry; these are correcting those. I am sorry; I should have got the heading right.

The conventional/unconventional potential is in sandstone reservoirs. The greatest potential is not in the coal or the shale onshore, we do not believe. We have huge volumes of these sandstones, which are in some places tight, sometimes not so tight, so they can and they have flowed gas at significant rates across the state.

We believe we are very well regulated here in Victoria under the Petroleum Act. A lot of what was put there in the Auditor-General's report seemed to be focused almost primarily on the minerals act. We have very detailed environmental management plans, health and safety plans and public consultation. It was mentioned before that there is limited compensation and caps on compensation. That is just incorrect, under the Petroleum Act. I go out there and negotiate with the landowner, and we have always managed to come to a satisfactory agreement on what is a fair compensation for their loss of productivity for the land and any other interference and everything that they have had.

I was down in Gippsland yesterday talking to some landowners who we have ongoing sites with, and they are more than happy with everything we have done. As I said, there was the article a month or two ago from the landowner at Brucknell, who after being so frustrated by the misinformation took it upon himself to say that Lakes had done everything that we said we would do. We were gentlemen, in his words, to operate under and were much easier to deal with than other authorities that had come through.

Gas production is probably the most efficient use of land. You have one well, which, once it is all drilled and completed and in production, is taking up a 10 by 20 metre area of land. That may produce gas for 20 or 30 years at very significant rates; you are talking hundreds to 1000 times more productive than any farming value you would achieve off it. You are still able to farm all the way around the sites. The farmers that we were dealing with yesterday, their sheep are running all over the place, and they obviously have no issues with any of the infrastructure we have there.

With the tight gas and the conventional gas, we do not produce water. A lot of the focus has been on coal seam gas, which is probably the least likely resource to be produced in Victoria, but most of the animosity is directed at coal seam gas issues where you do have to produce a large volume of water, you are much shallower, you are into interacting with the aquifer a lot more. We are in the Strzelecki Formation of the Eumeralla, which is an aquitard. It is sometimes 1000 metres or more below the aquifer and we do not produce water. If we encounter water, that is it, our well is no good because the water flows preferentially to gas. They are polar opposites to the coal seam gas.

There is no alternative to gas. For a number of energy manufacturing processes, you will see the chart on the right-hand side where manufacturing uses 32 per cent of the gas. That is as a feedstock, so a third of the eastern coast gas goes in as the feedstock for it. As Rob said, ethane is pure jobs. The electricity generation is obviously another third, and mining, which is mainly a direct use of the gas because gas is obviously much more efficient to transport energy as compared to electricity, and so the smaller uses — commercial and residential — are at 13 per cent, but the main ones are the big, heavy, job-providing industries.

The landowners that we deal with are very well informed and compensated and, as I said, do not have any issues with what we are doing. The land uses, we have coexisted for a long time. Increasing gas supply will decrease gas prices, there is no question. There is a limited capacity at Gladstone, so there will not be a massive rush of gas going from Victoria up to Queensland. Once Queensland catches up with their coal seam gas operations, there will not be any need for New South Wales or Victorian gas, so the gas will be used here,

which will obviously keep the price low. With gas resources, there will be new jobs and employment with the industry coming in, which is only good for the state.

The deeper gas reservoirs that we are targeting do not have the impurities of the shallower ones and the offshore ones, where you have high mercury, high CO_2, high H_2S. We are down below the volcanic formations which formed those impurities so they are just not present in the gas we have, and so our gas is less than 0.1 per cent CO_2, which is basically nothing, and no mercury or H_2S.

Renewables currently cannot replace fossil fuels. The technology is not there. Gas is the best thing to complement renewables at the moment because it can be ramped up and down quickly. We do not need thousands of well sites for our resource. At Wombat Field we believe we can produce two-thirds of the gas in that with 12 wells, which can be done from three well sites. Those well sites you will not be able to see from each other, so again it is not as if you are taking over the whole land and turning it into an industrial wasteland.

There are not thousands of chemicals used in fracking and in drilling. Most of it is all biodegradable. They are all chemicals that are used in water bore drilling and other stuff as well. There is no benefit in having some weird cocktail of it, especially nowadays with the slick water fracks, where the idea is basically to get in there, crack the rock and get some sand in there and then get the water back out. You do not need to do complicated gel fracks or anything anymore. Seismicity and subsidence are not something that is associated with tight gas. One of the things in the water study that the department did well was separating broken up into coal seam gas from tight gas and shale gas and all the risks associated with the water and aquifers and everything for tight and shale gas were all low. Coal seam gas was high, moderate, low, all over the place, but at least it showed that the risks that most of the people are concerned about are just not there with what we are doing.

The well bore integrity and water avoidance are the single most important factors for us. As I said, if we flow water, that is it, the well is lost. If the well bore integrity fails, the well is lost, so our asset is that well. Everything else is secondary to that and so our single biggest vested interest is to make sure that that is all right. The chart in the top corner is the model price of the gas that we have had done with some independent groups who have put it at around $1 for our Wombat Field down there in Gippsland as compared to up there around the $5 or $6 for recent offshore developments, which means that we will be able to supply gas at a lower price for the Victorian community.

Just a quick example of where we are. What we want to do down there is not really much different to what has been done with the offshore activities for the last 50 years except that the offshore activities are actually in the aquifer, which is the white formation there with the black streaks for the coals. We are down into the Strzelecki beneath that, which is the aquitard, so there is no communication between that higher aquifer and anything happening in the Strzelecki. All of that is cased and sealed off before we get into the gas zones, and as you can see at the Wombat Field there, we have Wombat-5 proposed, which was effectively ticked off with everything except for the letter from the delegate to the minister saying yes, you can go ahead. So we had satisfied all the environmental and technical and safety issues — this is back at the end of 2013. This well was designed to get around the moratorium. There was no fracking involved with this well, it was just a conventional directional drill through the top of the Strzelecki, and unfortunately instead of receiving a letter a couple of days later, nine months later we received a press release letter sort of thing saying it was banned.

It is similar to what we want to do over in the Otway Basin. We are much deeper than the aquifers over there as well, so firstly the two areas we are looking at mainly are obviously PEP 169 around Port Campbell, where there are all the existing fields and the gas plants, and obviously the Corangamite shire, when they presented, were obviously very keen for activities to get going again there. The well we want to do there is right next to the gas plant. As you can see, we are well serviced by pipelines and infrastructure with the port there at Portland, so things can be developed very quickly. So the other talk that it is around five to seven years to develop up these fields is incorrect. It is 400 metres from where that wellhead is to where you would plug it into the gas plant, and Origin owns the land we are on as well, so there is very little there that would hold us up.

You can see the location there, up in the map in the middle, that yellow dot there. There are two gas plants there — the Iona gas plant and the Origins Otway one. You can see the seismic section underneath. The bright colours at the bottom in the middle are the Iona gas field. The amplitude anomalies you see on the seismic indicating where the gas is — we are just on the other side of the fault there to the right where you can see we have high amplitudes up in the Pebble Point in the Waarre formation and we know there is gas down in the Eumeralla underneath as well. This is a 1500-metre vertical well next to a gas plant. It does not get any more

conventional than that, and yet again this was one that was almost approved at the end of 2013 but it has been held up. Origin was allowed to drill their directional horizontal well from onshore to offshore, 12 kilometres down the road, but we were not allowed to drill ours. This inconsistency is giving a lot of uncertainty for the area. We have recently had some large industry conferences in town where people just cannot understand why one has been allowed and not the other. There is just no scientific reasoning for it.

Lastly, this is one of the seismic lines through the new area we are looking at over the north to Port Fairy. It actually indicates a conventional gas target there where you can see the gas cloud there off to the left. You can see where the gas cloud is with the arrows there with the thing to it and then the high energy anomaly there underneath it, which is the blue lines indicating there is your main gas reservoir. But there is some leakage of the gas up through the Eumeralla there, which indicates that you do have a very well charged formation. You see these over conventional fields all over the world. Then you have the frequency washout normally underneath, which is where you lose your frequencies because of the attenuation of the noise going through the ground by the gas reservoir up above. This is next to an old well that was drilled 20-odd years ago, which had gas indications all the way through the Eumeralla and actually had oil shows down in the lower part of the well. We know the oil source and the shale is down there in the lower part of the Pretty Hill/Casterton formation, and so that high anomaly event there sort of correlates around the Windermere sandstone. There could be an oil reservoir within that with an escaping gas cloud above it.

We have conventional plays to go for. The intention we have over the next several years is to try and develop up these conventional plays without the need for fracking. You only frack a well if you cannot get it to flow. Fracking is more expensive than drilling. We believe we can produce this resource without having to do that. I think that is the last one. Do you have any questions?

The CHAIR — I begin by thanking you for your presentation. Just from what you have said here and in your earlier submissions, there is nothing I have heard in evidence that would suggest to me that your essential point that there is significant onshore conventional gas is a fact. There is industry demand, both for energy purposes and for industry as an input product, particularly for plastics and related matters. You do have contracts with groups to supply that gas at a price that is less than the current levels of pricing. Tell me if I am wrong, but that would seem to me to indicate that there is some useful industry and economic pressure that could be applied from onshore gas.

Mr ANNELLS — We just extended one of those contracts actually because of the delays. We have extended the time line of delivery by another two years.

The CHAIR — Yes. My summary is correct. Thank you.

Ms SHING — Thank you, gentlemen, for your further submission and for providing some additional evidence of a forensic nature to the inquiry. Going to the document headed 'Common onshore gas misconceptions', I note that you have actually reiterated a number of the positons that were set out in your initial contribution and you say things like 'New gas resources will bring new employment to regional Victoria'. To me, that seems just like the last presentation you gave us, which had 'Jobs' in great big font and then dollar signs in terms of money that it would bring to the state.

I am wondering where and how it is that you justify the reasoning behind this particular submission, because as a committee we cannot just go by bald assertions from people who come to the committee; we need to have that backed up with evidence. To date, and despite your good efforts in providing us with this document, it seems that you have put some words around it, but I am yet to see how it is that you maintain that new gas resources will bring employment to regional Victoria and that other dot points on this refuting document will be borne out by reference to the evidence. What do you have to say about that?

Mr ANNELLS — Two things. Firstly, as I said, PACIA — only Saturday at the football — reiterated to me that ethane in Victoria is jobs and must not be allowed out of the state. As I said, the work that we have done indicates that the 14 wells that were drilled in the region where want to drill back in the 60s, 70s and 80s were very high in ethane. We would like to be able to prove to a couple of big chemical companies that that is not just something that existed 40 years ago but actually exists today.

Ms SHING — But with respect, you having a conversation at the footy where somebody tells you that this means jobs does not give me a sense of how many jobs that means over which period of time.

Mr ANNELLS — At the last hearing we did say that — we did not name the company — a very large German chemical company was introduced to us by the Victorian economic committee. We took them to Portland, and they were talking 1000 jobs and a billion dollars.

Ms SHING — So it is that kind of detail that we are after.

Mr ANNELLS — But they need the gas. All those facts will be in the Victorian Economic Development Department — they know who they are. They brought them down.

Ms SHING — That is fine, as long as we have got some context to what you are referring to.

Mr ANNELLS — Sure. I am happy to disclose their name in camera, but I do not think it would be right that it should be public.

Ms SHING — No, that is fine. The other thing I wanted to ask you about is that you have indicated in this further submission and also in your primary evidence to the committee that you have spent in excess of $80 million exploring the potential of onshore resources in Victoria. If I were looking at that sort of investment — spending $80 million — I would also want to take care of the community expectations, concerns and positions that were growing in intensity at the same time. So how much do you estimate you have actually spent on that community engagement and consultation at the same time that you have been looking at the occurrence of the resources you have now come to?

Mr ANNELLS — I think it is fair to say that the community concerns have been generated since we drilled our last well, which was 2012.

Ms SHING — How much do you think you have spent in net terms on actually working on community concerns and positions as they have been expressed, including in the context of this inquiry?

Mr O'BRIEN — There were not any concerns with anything we were doing prior to the moratorium coming in. As we said before, Beach Energy came in and were going crack a couple of wells that we drilled. We had spent 10 months consulting with the community. The department kept widening the scope, but it did not have any objections to what we did. The problem we had was that even with registered mail we could not get people to get back to us to confirm that they had received it and that sort of thing, so we had to do four or five visits out there, and eventually we got them sign, yes, they had received the letter, and we ticked off. Unfortunately the moratorium came in a few weeks before we were going to have stuff on the ground —

Ms SHING — The timing interfered.

Mr O'BRIEN — and then that just started noise with it. We have been sponsoring the Churchill Football Netball Club since 2007, the Lakes Entrance Football Club since the same time, Rotary down there and the school at Seaspray — we have been providing benefits for them for a long time, which they have recently started refusing — —

Ms SHING — What do you mean by 'recently'?

Mr O'BRIEN — Was it about two years ago, Rob? They had a school fete that Rob went past and offered to make a donation as well to help them, which was gratefully accepted by the principal and then knocked back by the school council.

Ms SHING — Two years ago.

Mr O'BRIEN — I think it was two years ago.

Mr ANNELLS — Two to three years ago.

Ms SHING — Three years ago; okay.

Mr ANNELLS — It could be three years ago.

Mr O'BRIEN — And this is the same school that used to come to the well site and see the drilling activities and all that sort of thing.

Mr ANNELLS — They used to bring the children to the well site.

Mr O'BRIEN — We sponsor a lot of activities around Gippsland as well. Most of that $80 million obviously was spent prior to all these issues happening. A lot of that money was spent — we were one of the very first to be looking for tight gas across the area, so again it was a little bit of trial and error finding it and working out what we were doing. We believe, though, that the $80 million has been very well spent. We have identified what we believe is a commercial resource there in Gippsland. We just now need to do the same thing over in the Otway Basin.

Ms SHING — If you could have a think about how you would quantify the amount of money spent on that element of community engagement prior to and then after the moratorium, that would be very useful.

Mr O'BRIEN — Do you want to include land compensation and stuff in that?

Ms SHING — That would be part of the transaction, so if you would like to disaggregate it to the best extent possible, that would be useful.

Mr ANNELLS — I think you need to look at the timing of all this. We did 11 fracks down there. We have already told the committee that, and at that stage nobody took any notice. The department did not even send anybody down to witness what we were doing. They were not interested, to be perfectly frank, because I do not think they believed in unconventional gas at that time.

It really was not until Esso decided they were going to get involved with coal bed methane in that region that the community took any notice. I think that was the instigator or the start of the community concerns, that they saw Esso entering into coal bed methane, and so it sort of escalated slowly from there. But then the moratorium came in, and if you look at the original moratorium it talks about fracking of coal bed methane. I think it caught us by mistake, but who knows.

Ms SHING — By surprise, you mean?

Mr ANNELLS — No, by mistake.

Ms SHING — Right; sorry. It covered you in error.

Mr O'BRIEN — It was before tight gas.

Mr ANNELLS — According to the minister at the time. However, we were stuck with it, and we have not been able to drill a hole since. We have not spent a lot of money on community consultation. We offered to, and at the last hearing we explained to you that we were advised not to go out into the community at the time, and so we did not.

Ms SHING — You were advised by a government department, I think you have indicated.

Mr ANNELLS — No, I think I said the government department, but then I corrected that later.

Ms SHING — Yes.

Mr O'BRIEN — It was the shire.

Mr ANNELLS — We were not wanted in the community. We sort of pulled back.

Mr DALLA-RIVA — Gentlemen, welcome back. You are correct in the sense, Tim, that we have taken a lot of evidence, and I think in the early stages I indicated that I had no knowledge whatsoever in this whole concept of offshore unconventional gas et cetera. I am just a user of it.

Can we go back to your second slide. Victorian gas exploration is very well regulated under the Petroleum Act, yet you then say detailed environmental safety and operational management plans are required, so it is somewhat contraindicated as to those two statements. On the one hand you are saying it is very well regulated. I think you were here when VAGO were presenting their report, and you certainly did not get the impression that the industry is very well regulated when they said there were 58 separate pieces of legislation — their 'Figure 3D Codes of practice used in Victoria, Queensland and New South Wales' and their 'Figure 3B Assessment of

Victoria's regulatory system against better practice'. If you were to look at the regulatory system for shale and tight gas, it pretty much fails on every measure, based on their assessment.

I am just saying, in terms of the exploration process, the realities are that there is no sense in what you are presenting that if exploration was provided and you went to onshore gas, that there are the required regulatory frameworks to ensure that all these issues that we have heard in evidence across Gippsland, the Western District and elsewhere, are going to be met by industry, with no disrespect to Lakes Oil.

Mr O'BRIEN — No; I cannot remember the specifics of that exact table, but every impression I got from reading that report was that they had sort of merged the two acts together and then focused on mainly the coal seam gas aspects of things. That is why it kept referring to Queensland and New South Wales.

The minerals act in Victoria and the Petroleum Act were put together before coal seam gas was really thought of, so coal seam gas got slotted under minerals just so that people with coal permits could hang onto them. But even those people exploring for coal seam gas still do the wells and stuff under the guidance of the Petroleum Act anyway and follow a lot of those. Even Mecrus the other day was saying that for the stuff they are proposing in western Victoria they have done detailed environmental management plans and stuff, and that is part of how the regulator then can regulate us, because they can read, this is what we are proposing to do, here is the risk-based assessment, which again, I do not know how the Auditor-General can say that there is no risk-based assessment; that is exactly — that is all we do basically. The 400 page environmental document I put in is identifying every single risk of every single — and it includes everything from community, to water, to land use, to species and everything, and air pollution. We are drilling an onshore site, but they still incorporate whales and stuff into that, because it comes within the potential 25-kilometre margin, so it is very comprehensive in the risks that it does address.

Again with the technical safety risk assessment that I do on it, we basically sit there and drill a well on paper, effectively, so you go through and every step of the way you are identifying whatever risks might be seen or may occur, how they are dealt with or mitigated or anything like that. Those provisions are there, and they are constantly evolving. Every time I submit a plan it still comes back with another 10 or 20 new things that need to be added to it because best practice is always incorporating new things, but they are not there under the Minerals Act. Again, a similar thing with the landowner compensation stuff. As I mentioned, there is no cap under the Petroleum Act for how much a landowner is paid, but we pay what is fair and just for them and, as I said, I have never had a landowner that I have not been able to get an agreement with to be able to do everything.

Even speaking to people within the department trying to get some of the information to the Auditor-General, a lot of their concerns I think were overlooked a little bit on the differences between minerals and petroleum. It sort of needed to be dealt with a lot more separately than what it was.

Mr LEANE — Just two quick things. The nature of the ongoing sites that you said you have visited in recent times, Tim. The nature of the activity that is on those ongoing sites that you visited — what is the nature?

Mr O'BRIEN — The sites we have got at the moment, the two landowners I saw yesterday. One was for a well we drilled back in 2001, so I was getting him to get a final landowner sign-off. That is a new requirement obviously that the department has had before the bond is released for the old permit. That landowner actually has Ignites wells on the property as well, so he has ongoing activities there. We have had a good relationship with him for over 15 years now. He is more than happy with how we have conducted things. The other landowner is one just to the north of him where our North Seaspray-3 well is, and he still has a live suspended well out the front of his property. Again, there are no issues with anything that we have ever done. I am in regular contact with him — —

The CHAIR — We might just have to hold still for a minute until the bells in the lower house finish ringing. Thank you. I appreciate people's patience. If you can continue, Tim.

Mr O'BRIEN — Yesterday the landowner at North Seaspray, when I caught up with him, had great pleasure in showing me his new workshop that has been done and has been helped in some way by the compensation he has been receiving from us. He generates more income from that part of his land than any other part. It is a win-win for both of us.

Mr LEANE — The second question I wanted to ask is: you mentioned in your submission a frustration around uncertainty. Other groups and the coalition recently announced that they would have a policy to increase the moratorium for another five years. Would you much prefer a more definitive outcome? Is that where would like to see it come?

Mr ANNELLS — We were always under the impression that this group would make the decision and we would all abide by the decision of this group, and I think it is a little disappointing that that has come out at this stage

Ms BATH — I have three points or questions to ask you. The first one is, Rob, when you started your submission today you mentioned about ethane in the Otway Basin and being recovered from. I may have missed the first part, but are we saying recovered from a conventional well that is existing now?

Mr O'BRIEN — A new well.

Ms BATH — A new — —

Mr ANNELLS — No. In the area that we outlined there where we want to drill 14 wells have been drilled over time, going back to about 1960. I think I might have said this before, but at that point in time it was useless finding gas because Esso had taken the Melbourne market exclusively for 30 years. So the wells were drilled looking for oil, and they were looking at the basal part of the well, down at 2000-plus metres. All of those 14 wells went through big gas sections, and it is that material that we have sent to the US and had interpreted and why we are so confident on the Otway as a potential big gas field.

But we also have access to the records of each of those wells, and you can tell from the records that they actually record the gas that was recovered and the make-up of that gas. So we can see from the percentages of ethane that was recorded in those wells at that time, in the 60s, 70s and 80s, that it appears to be much higher than the Cooper Basin. They have a special pipeline from the Cooper Basin to take that ethane to Sydney.

Mr O'BRIEN — We also note from the well that we drilled over near Brucknell a couple of years ago, the gas that we recovered from there was very high in ethane and the heavier ones as well.

Ms BATH — Which is two carbons?

Mr O'BRIEN — Yes.

Ms BATH — If we can go to the 'Common onshore gas misconceptions' slide:

Water is not produced during the extraction of gas from tight sandstone.

Whilst that is factually true, it feels to me like that could be a slight misconception in itself, because my understanding is you use a lot of water to pump into the tight gas well to make the fracking occur, and then it comes back up. It is not produced from the earth, because that is a solid piece of rock, but it is produced back up to the surface and has to be dealt with and purified.

Mr O'BRIEN — Or re-used or — —

Ms SHING — Processed.

Mr O'BRIEN — Yes, processed. The greatest fear generally with the coal seam gas is the depletion of the aquifers and the taking away farmers' water that they would have used. The volumes that we would use, if we were to frack these rocks, is nothing near what is being portrayed out there as the 20 or 30 megalitres per frack. You would have to pump for three or four days to be able to do that, which we only pump for 60 minutes. The largest frack that has ever been done in Victoria was 0.2 of a megalitre, and that was in our Wombat-2 well. In the Trifon well, which has got five fracks in it, the largest we would have pumped I think is about 0.7 of a megalitre across five zones. The volumes are not significant. If you think that agriculture in Victoria uses 2.5 million megalitres, even if we were to frack these wells and were doing 100 wells a year, it might be using 5 megalitres per well for multistage ones. The entire industry would be 500 megalitres rather than 2.5 megalitres.

Mr ANNELLS — But you are correct that that water coming back to the surface, it is very important that that is monitored. In the United States they have portable reconditioning plants that will do it on site.

Ms DUNN — Thank you, gentlemen, for your submission. There is a handful of things I want to follow up on, and I will be as quick I can, because I know the clock is against us. I just want to follow up on Melina's questions in relation to water first off. You mentioned that the greatest fear is taking away water from farmers and the like. I would suggest that in the evidence we have heard before this committee, one of the greatest fears is in relation to contamination of aquifers and how that is managed. Do you have any views in relation to cross-contamination of aquifers, and has Lakes Oil done any analysis in relation to contamination of aquifers?

Mr O'BRIEN — We do not have any cross-contamination of them. The surface aquifers are sealed off behind the surface casing, which is fully cemented back to surface, before we drill down into, in the Gippsland case, the lower Latrobe aquifer. That aquifer is then cased off and sealed before we start going into the reservoir zone. There is no way that any fluids can get around. When you are just drilling a normal hole, and if it is not a successful one, you have to plug and abandon it, you have to physically isolate any potential aquifer formation that you have seen, whether it is in use or not. That is just part of a normal plug and abandonment procedure, which the department regulates.

The formations that we are targeting are aquitards, so as determined by Southern Rural Water that they are not in communication with any of the overlying aquifers. When it comes to the actual contamination stuff, again, because we are so much deeper than the used aquifers, there is no physical chance of anything that we do down at that depth breaking its way up through the rocks. Otherwise naturally any of the formation waters that are in the Strzelecki, the Eumeralla, are generally saline, and so there is no record of any of that contamination being just seen naturally going up into the overlying ones.

Before we were about to do the work with Beach Energy we were doing a regional study around the permit in Gippsland there to get a baseline study. Obviously the work the department has done with the recent stuff is giving us a bit more of a baseline study, but we will do another one once we work out where it is that we are going to be operating. We will do a study of the aquifers around there just so that we do have that prior knowledge to ensure that there are no surprises coming back or no accusations later on or anything like that.

Mr ANNELLS — Can I just say something on that. One of the suggestions in this US model — it is a regulation, not a suggestion — is that the driller takes samples of the farmers' water within a certain distance of the proposed well before the well is drilled and then subsequently at certain times to make sure that there is no pollution or has been no pollution.

Ms DUNN — In relation to the graph on the misconceptions slide, I am just curious, particularly in relation to electricity generation, because current information released from the Department of Economic Development, Jobs, Transport and Resources indicates that in terms of electricity generation in Victoria, in relation to gas, it contributes 4 per cent, yet your graph here talks about 29 per cent of gas. I am just wondering if you might be able to explain what this graph is actually representing, because they do not seem to reconcile.

Mr O'BRIEN — I think that 4 per cent you are talking about is the larger scale electricity generators, people like APM, who get gas direct from Esso and they generate their energy on site. Because you cannot transmit electricity as efficiently as you can transport gas, and so they are an end user of the gas who generate their energy on site. A lot of the other industries around Melbourne do the same thing, the energy-intensive ones. Whereas the 4 per cent one I think is just the base load power generation, which is what we are talking about.

Ms DUNN — Does the 29 per cent include the 4 per cent?

Mr O'BRIEN — I assume so, yes. I would have to check. These are numbers taken out of the report there in 2012, so I have not gone and looked into the detail of it. But I assume that 4 per cent is the base load power, not the industry.

Ms DUNN — You are suggesting that 25 per cent is generated by smaller generators?

Mr O'BRIEN — Yes, site-specific for their own uses.

Ms DUNN — Yes, for their own site-specific usage. Thank you for that. Just lastly on this misconceptions slide, you talked about, 'There are not thousands of chemicals used'. How many chemicals does Lakes Oil use?

Mr O'BRIEN — Do you mean what have we used? I am not sure of an exact number but the drilling muds might have a dozen additives, which I guess if you wanted to break them down, there are a few individuals. If you are going into individual elements inside it, I am not sure what the lists that even the health department had saying the 1300 or whatever they had. With fracking there are about six main chemicals that you would use to give you six different property effects. I think the big number that gets put around is they have taken every single chemical from every single company that has provided it and lumped them altogether and they say this is what is used in each one. But they have specific uses depending on the rocks you are doing, how large a frack you are trying to do, what your style of frack is.

Ms DUNN — In terms of Lakes Oil and your operations and your drilling, which may be conventional or unconventional, in your inventory of chemicals, how many would that be?

Mr O'BRIEN — If we were drilling, we would have, say, a dozen to 18 chemicals on site.

Ms DUNN — So 12 to 18 would be in your purchase orders, I guess, as a way to track how many.

Mr O'BRIEN — These are all public. We have a mud engineer who actively looks after the mud system on site, and they source and provide the chemicals and they look after the rheology of it. But all of that is obviously listed there on the daily reports that are submitted, and the volumes are measured as part of our well completion activities. We need basically a discharge registry, so every chemical we use on site — fuel and everything — is all recorded for emissions purposes and that sort of thing.

Ms DUNN — In terms of those 12 to 18 chemicals, would you be able to provide the committee with details of what those chemicals are that Lakes Oil currently utilise?

Mr O'BRIEN — I would have to take that on notice.

Ms DUNN — I do not assume you would have them on you.

Mr O'BRIEN — I can reel off some of them but if you want to just make sure that it is exact, I can provide the MSDS.

Ms DUNN — I would be impressed if you listed off 18, but I am happy to — —

Mr O'BRIEN — I can do it. I could get pretty close. I can do that with the MSDS sheets and stuff like that if that is what you would like. We can do it for the fracking and stuff as well.

Ms DUNN — That would be very useful because no-one has been able to answer the question of which exact chemicals are used. Just on the chemicals, is Lakes Oil aware of any of the short or long-term impacts in relation to the usage of those chemicals?

Mr O'BRIEN — Pretty much everything we use is biodegradable and so there are no long-term effects of it. There are some things, like the biocide that we use is not something you would want to drink in a concentrated version but it is the same thing that goes into our drinking water. Caustic soda again is not something you would want to handle all over yourself but diluted out that is the way we control the pH in the well. The rest of it, the gels and stuff — guar gum is used in ice-cream as a thickening agent. Potassium chloride effectively is a fertiliser but we use that as a clay-stabilising material. The polymers we have in there are just to provide viscosity to thicken the mud up to help clean the hole and keep the cuttings out. There is not a lot of stuff in there that is not in, as I said, the normal stuff under your sink.

With the frack fluid you are basically looking for the same properties. You need to be able to carry the sand into the hole rather than carry the rock out of the hole in drilling. You want to try and bring your friction and stuff down as much as possible, so you lubricate it a little bit. You obviously want to control the bugs interacting with the biocide and keep your pH under control, and you have an inhibitor as well to stop scale and rust in the pipe just to ensure that your well is looked after as well as possible. There are no exotic things in there that we need for any of the processes that we do. We are not getting into synthetic-based muds or oil-based muds. There is no benefit for that onshore, and yet that is used obviously offshore all the time, drilling into the aquifer, which has not caused any problems.

Ms DUNN — Thank you for that. I think a list would be useful for the committee.

Mr O'BRIEN — I can do that.

Mr RAMSAY — Just a quick one. In relation to your recommendations, you are asking the committee to allow Lakes Oil to drill two exploratory conventional wells in the Otway Basin to collect data. Is that in relation to the tight gas that you are seeking through the fracking method? What data are you wanting to get from those conventional wells that unfortunately or fortunately — your point of view — are covered under the moratorium at the moment?

Mr O'BRIEN — Those wells will provide us information on everything. It provides the information on the exact geology that is at those locations. One of the wells, most likely to be the one next to the plant, is targeting the same formation that has been producing there at Iona since 83, which is now use for the gas injection. We know that the formation above where the right spot is, there was an oil leg in Iona that has been displaced by some of the gas, so there is a good chance that there is an oil play up there, and then the underlying Eumeralla is gas saturated. We believe at that location the Eumeralla will flow naturally anyway, but it will certainly give us the rock properties to say yes or no as to whether it will not.

And the other well, again we are targeting an indication of a conventional play on there, but we know that Greenslopes well, where the black line is, that was drilled back in the 80s, has given us, as Rob was saying, an indication that there is a high ethane value in the content in the gas. The rock has actually quite good permeability and porosity, which was very encouraging, which has given — the analysis that has been in the States has indicated that that should flow naturally without having to be fracked, but because this work was done by someone else not looking at this specific sort of thing, we cannot be sure of that until we put a drill bit down there to see what is going to happen. But every indication we have, and that is why especially with this latest work that we have done showing the gas cloud and the high energy event — —

The CHAIR — Tim, I am going to have to draw a line here because I am conscious that people have got party room meetings. I thank Lakes Oil for the evidence it has provided today. There is a question on notice.

Ms SHING — In addition to the other information that you are going to provide on notice around before and after the community consultation and engagement and that you know what money you think you have spent on it.

The CHAIR — Thank you. I declare the hearing closed.

Committee adjourned.