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TRANSCRIPT OF PROCEEDINGS

TRANSCRIPT IN CONFIDENCE

O/N H-1225576

INDEPENDENT PLANNING COMMISSION

MEETING WITH DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

RE: NARRABRI GAS PROJECT

PANEL:	**STEPHEN O'CONNOR (CHAIR)** **PROF SNOW BARLOW** **JOHN HANN**
ASSISTING PANEL:	**STEPHEN BARRY** **CASEY JOSHUA**
DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT:	**MIKE YOUNG** **DAVID KITTO** **STEPHEN O'DONOGHUE**
LOCATION:	**VIA VIDEOCONFERENCE**
DATE:	**10.09 AM, THURSDAY, 25 JUNE 2020**

MR S. O'CONNOR: Before we begin, I would acknowledge the traditional owners of the land on which we meet, and I would also like to pay my respects to their elders, past and present. Welcome to the video conferencing today to discuss the proposed Narrabri Gas Project in the Narrabri local government area. My name is Steve O'Connor. I am the chair of this commission panel. Joining me are my fellow commissioners, John Hann and Snow Barlow. Casey Joshua and Steve Barry from the Office of the Commission are also in attendance. In the interest of openness and transparency, and to ensure the full capture of today's information, this video conferencing is being recorded and the full transcript will be produced and made available on the Commission's website.

The video conferencing is one part of the Commission's decision-making process. It is taking place at the preliminary stage of this process and will form one of several sources of information upon which the Commission will base its decision. It's important for the commissioners to ask questions of attendees and to clarify issues where appropriate. If you're asked a question and are not in a position to answer, please feel free to take the question on notice and provide whatever additional information may be necessary in writing which we will then upload to our website. To ensure the accuracy of the transcript, I request that all members today introduce themselves each time before speaking, and for the members to ensure that they do not speak over the top of each other. We will now begin. David, you've seen our agenda. It's a very brief agenda, but - - -

MR D. KITTO: Yes.

MR S. O'CONNOR: - - - after that opening statement we were looking for the department to provide a brief overview. Are you the best person to hand over to?

MR KITTO: I am, Steve. Good day. So in accordance with the Commission's guidelines, we're preparing a detailed presentation to make to the Commission and the community at the public hearings.

MR O'CONNOR: Yes.

MR KITTO: And obviously we're quite keen to work out the logistical details of all that, given COVID and where it will be online or in – and so there's a whole range of things we would like to work out, but we didn't want to go through our report in great detail today because we think we will be doing that in a lot more detail later. We were quite keen to get some idea about the issues that the panel wanted us to focus on in our presentation so that it could be helpful to the members and the community, and obviously we have looked at some of your preliminary questions and some of those will require quite a detailed and fulsome answer, and some of them we can answer in – quite quickly today. So all we were planning to do was to give a very broad overview and then hand it back to the Commission and take it from there if that was okay.

MR O'CONNOR: We're absolutely aligned. We weren't looking for a in depth presentation at all.

MR KITTO: Yes. Yes.

MR O'CONNOR: We've all had the opportunity to read your report and previous to that the EIS etcetera. So we would much rather spend the time focusing on particular matters of interest to us.

MR KITTO: Yes.

MR O'CONNOR: So, yes, that's fine.

MR KITTO: Okay. So I think to start off with, Santos has done a lot of exploration in the area over a number of years and identified a prospective coal seam gas resource there. They're now seeking approval to develop a gas field in the Pilliga State Forest and on some adjoining farmland over an area of about 95,000 hectares, and they would produce up to 200 terajoules of gas a day for the domestic gas market over a period of about 25 years. It has got a capital investment of about 3.6 billion and would generate about 1300 jobs during construction and another 200 during cultivations. There's significant public interest in the project and I think that's really in – about two things: (1) is I think it's about gas development and gas use more generally in New South Wales. So it's about more than just the project in some ways, and then, secondly, it's about the specific concerns about the impacts of the project on that Narrabri region. So in terms of its water resources, impacts on the Pilliga State Forest, and then also on the community in terms of health and safety and social impacts and so on.

The department has been involved in a very extensive process, and this goes over – well over five years even though the development application has been in for the last three, and during that process we have consulted very widely with a broad spectrum of groups, and we've also made all the information publicly available on our website, we've had exhibition, we've had response to the – you know, we've got 23,000 submissions, we've had a response to submissions. All that has been made publicly available. We've run a number of public information sessions up in that area where we met with landholders and special interest groups and we had a number of meetings up in the theatre up there, and we met several hundred members of the community, and then over the last few years we've had meetings with Narrabri Shire Council and some of the other councils in the area. We've attended several meetings of the community consultative committee, we've met with landholders that are in the project area and may have gas wells and development on their land.

We've met several special interest groups that are very concerned about the project including groups like the North West Alliance, who have commissioned a lot of independent experts to give advice, People of the Plains and in some of the broader groups like Lock the Gate, Nature Conservation Council and so on. We've conducted some consultation with some of the key Aboriginal groups. So including

the Narrabri and Wee Waa local Aboriginal Land Councils, and then we've also had a number of meetings with the community more generally. So it has been an extensive process and it has been quite a big job to pull all that together and to identify what some of those key issues are. As I said earlier and as we've tried to present in our report, I do think the key issues fall into three broad categories. One of those is about gas use and development in New South Wales more generally.

In other words, the strategic benefits of the project and whether New South Wales should be focusing on the next 30 years about using gas and what that means for climate change and greenhouse gas emissions and so on. The second subgroup is really – concerns more generally in a number of jurisdictions about the risks of non-conventional gas development and that includes coal seam gas development, but also shale development and fracking and no fracking. A lot of that was the subject of quite a lot of inquiry through the chief scientists and engineer review, and then, thirdly, as I said, in the – in my introduction it is about the Narrabri project itself. So does it have strategic benefits? Has it been designed properly? Are the technical studies up to scratch or not? And what are the likely impacts of the project going to be on? The water resources which are absolutely critical for the – for that part of the world and then also impacts on biodiversity and greenhouse gas emissions and, you know, some of the local community impacts.

So in terms of taking note of those issues and looking at them both in a technical way and in evaluating all those issues, I guess we've done a lot of work that we wouldn't do for normal – a normal assessment of any sort of standard operation, and that's – given the nature that it is a big project with a new industry in New South Wales, we spent a lot of time really looking at other jurisdictions and what's going on there, and there have been several inquiries in – across Australia and in some of those jurisdictions which have all generate – you know, all involve lots of expert reports about the risks and how they might be managed. There has also been in those jurisdictions a lot research papers on health impacts, you know, and that includes in the US and Queensland and so on about the potential health risks and other things which we've actually gone through and looked at in a comprehensive way.

The other thing we did is – you know, a lot of people were saying – were concerned about or have raised concerns about what's going on in Queensland. And so we have been and visited Queensland. We've looked at a number of operations there. We've gone and met a lot of the regulators in Queensland and discussed some of the issues that they've come up with, and so we have a really good understanding of what's going on in Queensland, and, in particular, the significant differences between, you know, what's going on in the Surat Basin, for instance, and the nature of, you know, what would happen in the Narrabri region, and, you know, the key finding there is to be very clear about not making – making sure that if you are making comparisons between the two jurisdictions, you are comparing apples and apples, which is I think a critical thing in all we've come across in the jurisdictions is that there are quite significant differences between jurisdictions that could the material impact on your findings about some of the key issues.

I think, you know, one of the Government's major responses to concerns about pulsing gas development or non-conventional gas development in general was the Chief Scientist and Engineer Review back in 2013 and '14, and there was extensive work done as part of that review, a lot of technical work done, and we've used some of the technical experts from that inquiry to give us advice, in particular on the Narrabri Project, but we've certainly been through all that advice.

We've been through all the recommendations that the Chief Scientist made and looked at their relevance for the Narrabri Gas Project, and some of them are relevant and some of them are more about broader legislative reform and so on, so they're not directly applicable to the Narrabri Project. But we've also looked at the – how that's fed into the New South Wales Gas Plan, the actions that have been taken under the New South Wales Gas Plan and we've also looked at, you know, the upper house inquiry in terms of the progress, in terms of the implementation of all those matters, and we're quite happy to go into them in a lot more detail, but there are a wide range of issues that are quite complex there and we didn't want to get bogged down in that today.

I guess for at least over the last decade, several major studies have been done in that broader Narrabri region, you know, to address community concerns not just about gas but about gas and coal mining in that area. You know, at a stage, there were concerns about the Watermark Project and the Caroona Project and the mines around the Leard State Forest, what the cumulative impacts of all that would be and so, you know, there was the Narrabri Order Study that was done a number of years ago, which looked at a number of scenarios about development in that area.

We subsequently had the bioregional assessment that the Commonwealth has done, which has pulled together a lot of that data. And then you've had a lot of work done by CSIRO and Gisera in terms of taking some of that work forward and doing further modelling and further baseline studies and so on, which is really building that broader regional data set, which provides that critical context for any assessment of the Narrabri Project.

There's then been quite a lot of general research done on coal seam gas and some of the elements of it, like people like – groups like the Commonwealth Independent Expert Scientific Committee and we've looked at all that work. And then we've looked at, you know, New South Wales has got several policies – legislation policies and guidelines that are critical to the project. Some of it has been made expressly to deal with coal seam gas, like the codes of practice for – that we introduced following the Chief Scientist's review for Well – particularly the Well Integrity Code, which is to ensure that if gas wells are drilled and how they're operated and then, ultimately, plugged and abandoned, are done in accordance with what's the best practice.

In the Aquifer Interference Policy, which sets out criteria for impacts on water sources, you've got the detailed water sharing plans that have been prepared in those areas, which really deal with the allocation of water within the resources between various water users in those areas and then you have a lot of, you know, the

traditional guidelines and so on in terms of their quality and noise and other aspects. But those really drive or set standards and criteria for acceptable performance in New South Wales and a big part of our process has been making sure that the project can comply with those standards and criteria.

We've been working with a lot of different government agencies over the last few years to assess it, so there's a lot of expertise within government, particularly in terms of the EPA, it was set up as the lead regulator for coal seam gas in New South Wales and has quite a bit of technical expertise in terms of geotechnical expertise and so on. To be able to fulfil that role, we've been working with the Department's water group, including ENRA, about the groundwater modelling and the work that's been done by them in terms of drilling the regional monitoring network and so on.

We've done a lot of work with EPA in terms of fugitive air emissions and other aspects. We've got our own hazards team that has looked at the, you know, explosion risks and well blowout risks and storage risks and so on in terms of the hazards guidelines, and then we've got the Department's Biodiversity Conservation Division, you know, who really looks after all the, you know, assessment tools and so on for biodiversity impacts and so on.

So, we've done a lot of consultation with – in Government and, really, the report that you have before you is the whole of Government report, so we've really worked with everyone to make sure that all those issues are addressed. We've then also, you know – there have been a lot of experts – you know, a lot of the special interest groups that have made submissions on the project, have included advice from other technical experts and we've certainly sought to meet some of those experts to get a better understanding of the key technical issues that they've raised and to consider those issues in our report.

And then, finally, we've sought quite a bit of independent expert advice, so the key part of that was the Water Expert Panel, which was chaired by Professor Peter Cook and had a number of members who have produced a very detailed report summarising all the findings that they have and the process that they went through, which included meeting with community members and landholders and experts from other special interest groups. We've also then got expert advice on hazards and Aboriginal heritage and the social and economic impacts of the project.

So, I think, you know, it's very clear that we've consulted very widely. We've got a good understanding of the key issues raised by the community and the significant concerns of the community about the issues, and we've really carried out a very detailed assessment at a technical level of all those concerns and issues in relation to government legislation, policies and guidelines.

I guess the conclusion – the conclusion of that detailed assessment is that notwithstanding the community concerns, the Department does think that the Narrabri Gas Project offers significant strategic benefits for New South Wales, particularly in terms of addressing, you know, the energy, security and reliability

needs of the State. And it's not just in terms of providing gas supply because there are forecast shortfalls in the gas supply from 2024, so it is about providing additional gas.

But it's also about getting pipeline – the pipeline network built to areas where the more prospective gas resources on the East Coast up, in terms of Queensland and the Northern Territory. It is about facilitating the provision of dispatchable energy into electricity market and then one of the issues that's clearly getting a lot of press interest in the last few days, you know, whether or not it will have any effect on gas prices. Our view is that we will put downward pressure – we're not saying we'll drive them down, but it will put downward pressure on gas prices.

Second conclusion is we do think that the project offers significant benefits in terms of investment in the region, but capital investment and – you know, during the life – operational life of the project. It will create a lot of jobs in that part of the world during construction and then during operations. You know, the Government is committed to benefit sharing on gas projects in New South Wales and has set up a sort of royalty sharing scheme or incentive scheme, which works through the petroleum legislation, and there could be up to $120 million put into that community benefit fund over the 20 to 25 years of the project, and that is all linked to the production of gas and making sure that a proportion of the money generated by that goes back to the area for local and community development, and then I guess the critical finding from ours is that the – you know, the risks of the project in terms of its potential impacts on water resources or biodiversity or herniate or health and safety of the community, social impacts, are generally low, and that the project would be able to comply with the relevant requirements and standards in government legislation policies and guidelines, and, consequently, we don't think that the project will result in any significant impacts on people or the environment, and that any residual impacts of the project can be controlled through strict conditions and strict enforcement of those conditions by the EPA as the lead regulator.

So I know that sounds strange when you have so many people objecting to the project, and one of the things – you know, we do go to some – well, ... in the report is that dichotomy between such significant concern and then going through detailed technical assessment and coming to a conclusion that we think the risks are quite low, and we've tried to explain why that – in a very clear way why we think that is the case in this situation. So our broad findings are that we think the project has merit, but I'm sure there will be a lot of debate on all the different conclusions we've come to, and we're quite happy to answer any detailed questions for the hearing process.

MR O'CONNOR: Thank you, David. It has been quite a journey, five years, and, as you've pointed out, probably unprecedented amount of, you know, investigation and reliance on independent experts etcetera over and above what would normally happen with an application. So it – yes. Having arrived at the Independent Planning Commission, it does have quite a history behind it. We would now like to turn to our correspondence of 22 June which highlighted a number of themes that we wanted to

explore and get a response from the department, and, as you've indicated, some of those responses might have to follow later on in a written capacity if – it's going to take a bit of time to provide that response. The first heading on that correspondence related to water. Is – am I back to you, David, or does Steve or Mike want to - - -

MR KITTO: Yes. Happy to answer it, Steve. So, I mean, we may all chip in, but I – you know, I – if you – I mean, if we're going to work our way through that list, I'm happy to kick off and then Steve and Mike can join in if need be.

MR O'CONNOR: Good. That sounds fine. Just make sure when you do join in, Mike and Steve, just state who you are so the transcript can be accurate. You want to - - -

MR KITTO: So did you want to go through the first question and - - -

MR O'CONNOR: Yes. So it just relates to the – you've already referred to the water expert panel.

MR KITTO: Yes.

MR O'CONNOR: And during the time they were doing their reviews etcetera there was and still is quite a significant drought being experienced in – over much of Australia. I just wanted to get an idea of how they factored that into their consideration and deliberations.

MR KITTO: Yes. So, I mean, from a water regulatory point of view there are obviously cycles in the climate over time, and the – you know, the whole water regulatory regime factors that in. So you've got water sharing plans that divide up the water resources. You know, those water resources are allocated to various uses, but there are abilities within that legislation to – you know, if they're in drought periods, those allocations are adjusted and that is – that applies to all water users whether they be agricultural water users or coal mining companies or what would be gas companies. So a lot of that is factored into that strategic and broader water resource planning and regulation, and I think it's critical that this be seen within that broader context, but in terms of the modelling that has been done for Narrabri, they incorporated all the available historical metadata which is included a broad range of variability in rainfall and drought, incorporating drought periods, and they've also done quite a lot of sensitivity testing in terms of that.

I think what makes this a bit different from other projects in the region is that the water that the project would be taking would be coming from the deeper aquifer, which is highly saline and has no beneficial use at the moment. So all the water they would be taking would be from really deep, unlike some of the coal mines and so on that might be taking water from, you know, the surface extraction or from some of the shallow – directly from some of the shallow – shallower aquifers. So the first thing is that they would operating in a really deep level, and when you look at the water sharing plan for that level there's a lot of water allocated in that area and the –

you know, in terms of the Gunnedah-Oxley Basin water sharing plan. There's a lot of water available and it's unallocated in that allocation, and so – and they would only need a very, very small fraction of that allocation.

So it's not really going to be subject to cease to pump rules or so on because it's really in a water source where there's very little competition for that water. So I think that's a critical thing. I think the second aspect is – and we set out a whole range of reasons in my – in our report which I won't go into now – but there are a number of reasons why, you know, the take of water from the shallower aquifer is expected to be, you know – only expected to start in about 200 years after the project has commenced, and in a worse case scenario be about – up to about 60 megalitres of water a day which is a very, very small amount of water in those plans where I think you've got, you know, up to 165 gigalitres of water being used from the shallower aquifer. So, you know, in a drought there is competition for who can take the water out, and, you know, if 60 megalitres are coming out, Santos would need a licence for that water and they would need to obtain that work on the broader water market.

So I don't think there's any doubt that they wouldn't be able to get that water, but they would need to purchase those water rights on the water market and it is, as you would know, a very active water market where, you know, people are – hold onto their shares. I guess the issue is the – you know, in terms of the water balance, the project would be a – you know, produce more water than it uses from the deep aquifers. And so even in drought periods, you know, they would have water for whatever they needed to do on site, and they would probably produce some extra water, you know – that once you put it through the RO plant and so on could be used by other farmers in the area for stock and domestic use or irrigation or whatever the best use of that water may be.

So I think from a drought point of view I think they will be quarantined from a lot of the challenges of operating in that part of the world during droughts because they are operating in the deeper aquifers, and they're not predicted to have a significant – you know, to depend on a significant water take or anything but a minimal water take from the shallower aquifers. So I think they would be quite independent of that sort of broader – those broader drought risks that would apply to a number of other projects in this part of the world.

MR O'CONNOR: Thank you, David. That – you've touched on the water sharing plans under the Water Management Act 2000 in that response. There was just a question around the status of those water sharing plans.

MR KITTO: Yes. So they're all – there's three key water sharing plans that deal with the ground water resources and they're all available on the New South Wales legislation website. The Namoi Alluvium – the current version is the 2019 version. Then you've got the Great Artesian Basin southern recharge zone which is 2008, and then yo'uve got the Gunnedah-Oxley Basin which is the deeper aquifer which is 2011. So they're all on the New South Wales legislation website and we're happy to send you a link to all of those plans.

MR M. YOUNG: I think the other thing to say – it's Mike Young here speaking. The other thing to say on those water sharing plans is you can also look at the current allocations under – you know, the water availability under each of those plans on the – on the website – industry website as well. And, Steve, correct me if I'm wrong, but at the moment most of those water sources appear to be at or near 100 per cent allocation at the moment, so no significant restrictions; is that right?

MR S. O'DONOGHUE: That's right. For the alluvial and the GAB, you know, they're above 90 per cent – they're well above 90 per cent in terms of the allocation, but as Dave said earlier, the – for the Gunnedah-Oxley Basin, being a – not really a water source that's used for agriculture, there's minimal sort of take for that water source.

PROF S. BARLOW: If I may – Snow Barlow here. If I might ask a question there. Those water sharing plans are viable to 10 years after they're formed, so do they automatically roll over? I notice the Gunnedah-Oxley Basin one is 2011, so it really – it'd probably be – need to be rolled over before the project actually starts. Will that happen automatically?

MR KITTO: They are subject to constant reviews, Snow, and they are – you know, they are generally rolled over from period to period, but they can be with incremental changes, so it's very rare for a plan to radically change from one review to another. But they are subject to review and, as you know, there's lots of word going on in the Murray-Darling Basin in terms of sustainable extraction limits and so on, and a lot of that work will feed into any reviews. So, I mean, it's subject to that broader – you know, any broader strategic changes that happen in terms of water allocations and water use in those areas. They are subject to change, but, generally, you know, those changes are subject to quite detailed consultation before they would be – they would be made.

MR YOUNG: I think a couple of – Mike Young speaking. A couple of things to say on there is that there's no question that the water sharing plans that are in place are either not applicable due to the passage of time or ought not to be the relevant matters to consider in the assessment of the project as they currently stand. I do note that the water sharing plan for the Upper and Lower Namoi groundwater source is 2019, so that has been reviewed recently. Steve, were you aware of any current reviews on the other two water sharing plans at this stage?

MR O'DONOGHUE: Not – like Snow says, some of them are fairly dated, so they'd expect they'd be under some review process at the moment, but I can provide further details on that.

MR YOUNG: Yes. I think that might be helpful, to determine whether there are any reviews currently on foot for those plans.

PROF BARLOW: Thank you.

MR O'CONNOR: Okay. The final question under the heading of water just relates to the way the conditions – the proposed conditions are drafted and there's a cap of 1.5 gigalitres per year mentioned in those draft conditions, but we note that it's generally consistent with – yet the Department's assessment reports seem to be very adamant that that limit shouldn't be exceeded, so just a question around whether that was appropriate to have generally consistent with in the condition?

MR KITTO: So, Mike – David Kitto here. So I guess there's two issues there. One is that the cap we're talking about is the 37.5 gigalitres over the life of the project. That averages out at 1.5 gigalitres a year, but there will be some variation. So, in some of the earlier years with the project, there'll be greater extraction as they put a lot of the wells in and then that will taper off, so it's not a hard limit. The limit is more on the total extraction out of that resource as opposed to the sort of strict annual limit. So that's the first issue to make, it's not a – we're not saying it should be a 1.5 gigalitres per year. That's the first point.

And I think the second point is while the conditions say the project should be carried out in accordance with – generally in accordance with the EIS, or the documents that have been prepared, it says strictly in accordance with the conditions, so it's not generally in accordance with that condition. The condition is a strictly in accordance with that condition. And when you look at the condition, it's not – the drafting in condition A14 is not framed in accordance with – generally in accordance, but what it is really doing is setting cumulative levels over the years based on the modelling that they would be doing, so that's why it's not the 1.5, but it all adds up to the 37.5. So, it is a strict limit. It's not a general limit that can be subject to variation and so I think that's - - -

MR O'CONNOR: Yes. I think that's understood. Thank you for that response. The next theme is related to hydraulic fracking and we note there is a condition which strictly prohibits the hydraulic fracking to take place. The question is just around, I guess, ensuring that that is the case. Is there going to be regular inspections taking place or some sort of monitoring system, just to understand what the Department thought would suffice to ensure that condition's complied with?

MR KITTO: Yes. So, Santos has provided a lot of information to demonstrate that the coal seams are permeable and won't need fracking, so they demonstrate a lot through the – you know, a lot of the exploration work that they've done and that's been checked by some of the agencies and so on. So, you know, they're not – there's nothing – no evidence to say that they will need to frack. Secondly, as the condition is very strict, that there's no fracking allowed and there will be regular monitoring in terms of the wells by EPA and others to make sure that there's compliance with those conditions. So, it is a strict liability. No fracking. Full stop. And, you know, the EPA will be responsible for making sure that none of that happens.

MR O'CONNOR: Thank you. Moving on to the fact that there will be a certain amount of salt that is a waste product of the desalination process of the water that's extracted from those deep coal seams, and there's a bit of an open-ended discussion

in the assessment report around whether there will be a reuse of that or whether it might be taken to landfill, I'd just like to get a bit of an update on what the current thinking is, the ultimate destination for that salt.

MR KITTO: So, the EIS – the IS predicted that there would be about 430-odd thousand tons of salt produced over the life of the project. I think the Water Expert Panel, looking at some of the updated water data in the response to submissions and other responses by Santos, thinks that it could be quite a bit higher and that's because the water is very, very – the water is very, very saline, probably more saline than a lot of the water that they'd been dealing with in Queensland in other jurisdictions, and so it could be – you know, they could generate quite a bit more salt.

Now, the upper range that the Panel has come up with is about 850,000, so, you know, almost double. It could be almost double, but a lot of that will depend on, you know, finding – you know, once they get into the actual gas field, they'd get a lot more information on the composition of and the variation of the water between different parts of the area. So, what we're assuming is that it could be anywhere between 430 and 850. I guess what the Panel concluded is, you know, where it's at the lower end or the upper end of that scale, it can quite easily be managed. So, I think that's the first issue, you know, in terms of handling it and storing it and managing it on site, there are very clear-cut engineering ways to deal with that salt on site.

I think the other thing is that sounds like a very big number when you're looking another 25 or 30 years, and so to put that in the context is it's actually, you know, compared to the kind of salt being generated in Queensland in the coal seam gas generation there, it's quite a small amount and if you look at what's going on in the Murray-Darling Basin, you know, they will extract up to 500,000 tonnes a year compared to the 34,000 at Narrabri. That's not to say that it doesn't need to be managed properly. It's just to put things in context that salt is extracted all across Australia a year and is managed in reasonably standard ways.

I think in terms of big question was the – what is the likely chemical composition of the salt. So will it have lots of heavy metals or chemicals of concern, and the water expert panel's conclusion was very clear that they expect it mostly to be comprised of sodium carbonate, and that there would be very few heavy metals or chemicals of concern in the salt, and based on that they think it would be classified as a – as general solid waste, non-putrescible waste, which could be sent to any landfill, and there are a number of landfills within 150 ks that could take it, although Narrabri Council is saying, you know, their landfill is too small. They don't want to take it and Santos is not going to send it there. And it may well be that it will end up going to a larger landfill, but there's no doubt that there are plenty of facilities that can take it and that it can be managed as a part of a general waste stream of a project.

I think what the panel is saying is, you know, there is quite a lot of work going on in Queensland in terms of whether they could be a beneficial – you know, the ..... salt could be put to beneficial use. They haven't found a commercial use for it at this

stage, but there's ongoing work along those lines, and what the panel's saying is that given the high sodium carbonate content of the salt here, it may be – you know, it's – there's a better chance of it potentially finding a beneficial use. And so ..... Santos should do quite a bit of work to try and find a beneficial use before they rush to send it to a landfill, and we agree with that. So there are conditions in there where they will have to do some detailed studies under the conditions to try and find a beneficial use. You know, that might be working with some of the companies in Queensland and, you know, so you get some kind of an economy of scale to produce something beneficial.

It may be that they can do something on their own or that there will be some third party that would be willing to take it. We don't know the exact answer to that, but I guess the fallback position is that if that's not reasonable or feasible, then it can be quite safely managed at a number of landfills as general solid waste, and we've also got conditions that require them to, you know, make sure that – you know, that all that salt is classified as general solid waste. So, you know, that it – you know, you don't get some of the waste that has chemicals of concerns. So there will be a constant checking, and there are also conditions there to make sure that, you know, they're stored in ponds with liners, and, you know, in accordance with EPA requirements for handling solid wastes.

So I think the broad variation in salt is – you know, will be refined over time as you get better and better information about the precise nature of the water coming out of those deeper aquifers and the variation in that water, and we would expect it to be somewhere between 430 and 850, but we don't know the – you know, the – we've got a range. We don't have a precise number at this stage.

MR O'CONNOR: From those investigations in – particularly in Queensland, is all the salt that's produced up there being disposed of to landfill at the moment? Notwithstanding that they are looking at other more commercial reuse options.

MR KITTO: So quite a bit of it's being stored on site, you know, in storages, and they are looking for beneficial uses. You know, I don't want to – you know, there's probably a broad variation. I'm happy to go and find out, you know, the precise state of play there, but I think a lot of it is being stored on site and the hope is that there will be a beneficial use, but if it isn't it will end up going to landfill.

MR O'CONNOR: Okay. Thank you. Next topic – and you touched on this in your general intro – about the potential for the project to put downward pressure on gas prices.

MR KITTO: So, I mean, this has obviously been a key issue raised by the community since our report was published. I think it's a complex issue because the gas market is obviously subject to many, many variables and there are obviously limits to the extent to which any single project could affect that market, particularly a project like Narrabri gas which is reasonably small in terms of the broader gas market. So I guess our finding – the finding in our report is based on a very detailed

review of a broad range of material. It's not based on one single piece of modelling in appendix G or appendix H. It really is based on a very detailed investigation of the strategic benefits of the project as a whole, and, more particularly, in terms of its energy, security and reliability matters, and that has involved a review of the broader energy market which includes the electricity market and the gas market, which is – you know, sometimes they're related, but sometimes separate to the gas market.

And so we've looked at a lot of the detailed work that has been done by AMEO, but particularly the ACCC when it comes to pricing of gas and all the variables that might affect the pricing of gas, and the ACCC is going through detailed inquiry that's due to conclude in, I think, 2025, and they publish quarterly reports and so on, and we've had a lot of, like ..... detailed review of those reports. It's quite a bit of work going on in the Commonwealth government and they've got their domestic gas mechanism to ensure that there's sufficient gas for domestic supply. You know, in terms of the broader electricity markets, looking at the Finkel Review and the chief scientists and engineer's review of the energy market. You know, it's all the modelling that has been carried out for the project. That advice from Brian Fisher. So I think that – you know, in terms of this it's probably something that we will try to address because we know that – of the community interest. We would try to address it in a bit more detailed in our presentation to the Commission at the public hearing.

MR O'CONNOR: Okay. Thank you, David. The next question relates to the fact that Santos have made a commitment that 100 per cent of the gas that would be generated would go to the domestic market, but we didn't see anything in terms of draft conditions requiring that to be the case. Just a reference to Santos being prepared to accept a condition of Petroleum (Onshore) Act 1991.

MR KITTO: Yes.

MR O'CONNOR: If you just want to expand on why there's not a condition similar to the no fracking condition.

MR KITTO: Yes. So this is an area which, you know, opens up a number of complex legal and policy issues, and I think the simple answer is that, you know, there is no gas reservation policy in New South Wales, and certainly, you know, the time that the expiration licences were granted will – or these petroleum resources. It wasn't on the basis that a proportion of that gas resource would be earmarked for the domestic market. So in terms of the commercial nature of, you know, the granting of those licences and so on. So I guess the issue is, you know, Santos when they started the project, they didn't make a commitment to send all the gas to the domestic market. It was open-ended, and that was certainly something that was raised by the community in the public information sessions and in submissions and so on. They have changed their position on that, and we obtained quite detailed legal advice on how that commission – that – you know, the commitment for them to provide it to the domestic market could be best incorporated or, you know, given some teeth.

And we looked at potential conditions under the EP&A Act or, you know, conditions under the Petroleum (Onshore) Act, and the advice ..... was that, you know, given the state owns the resource and Santos was willing to amend the terms on which, you know, that allocation or the, you know, production release would be granted, that it was most appropriate for it to be reflected as part of the resource allocation and the state – you know, Santos and the state agreeing to earmark that resource for sole provision to the domestic market. And it wasn't something where there was a policy basis and so on for imposing such a condition on, you know, development consent and so on.

There are a number of other complex legal issues to do with export and Commonwealth legislation and other bits and pieces, so it is something that we have had an incredible amount of – like, there's been a lot of legal advice and investigation of it, and I guess our view is Santos has made the commitment. That commitment will be reflected in the commercial terms of the – any petroleum production licence granted for it, and it's not a matter that should be dealt with by condition in the EP&A Act. I'm happy to go into that in more detail, but there are some very, very complicated ins and outs of that simple answer.

PROF BARLOW: Steve, it's Snow here. Can I just have the supplementary here to ask David about that? So, you know, is it a fair summary of that, David, there will be binding agreements between Santos and the state to make the gas from this gas field available to the State of New South Wales?

MR KITTO: To the domestic market.

PROF BARLOW: Yes.

MR KITTO: There is – that's not necessarily all New South Wales, but it is to the domestic market.

PROF BARLOW: Yes, fine. That's okay.

MR KITTO: Yes. So it will be used for domestic – it will be – it can only be used – sent to the domestic market. It cannot be sent overseas to, you know – and that is really reflecting the commitment that Santos has made.

PROF BARLOW: And that's reflected in not something between the department, but something between – the binding agreement between Santos and the State of New South Wales.

MR KITTO: Which is the – who owns that resource on behalf of the people of New South Wales, yes.

PROF BARLOW: Yes.

MR YOUNG: And it's Mike Young here. It would be imposed directly on the petroleum production lease as a relevant requirement or, you know, legally binding commitment under that lease, and we have been consulting, obviously, with the Regional New South Wales Mining, Exploration and Geoscience and – so that arm of government which reports to the Deputy Premier John Barilaro, who is well-aware of that commitment and will be imposing those conditions once a petroleum production lease is granted following any decision on the planning approval.

MR O'CONNOR: Thank you, Mike. Did that satisfy your question, Snow?

PROF BARLOW: Yes. Yes. I think there's some comfort in that answer. Thank you.

MR O'CONNOR: Moving on to financial assurance, there's obviously risk involved with any operation in – mining operation, and this is no exception. So we just wanted to understand a little bit more about how the financial insurance and assurance of those risks, both, you know, during operation and after closure, how the department sees those risks being managed.

MR KITTO: Well, this – you know, the whole concept of financial insurance or assurance is something that came out of the Chief Scientist & Engineer's review and recommendations for managing coal seam gas, and the Chief Scientist recommended that there were three levels or three levels of safeguards. The first of those was security deposits under the Petroleum legislation, which would deal mainly with rehabilitation of the site; secondly, that there should be some financial assurance and insurance, and that was really to deal with, you know, incidents that might happen, so you know, well blowouts or explosions or things that might affect people and property, but also to deal with some of the potential longer-term risks associated with plugging and abandoning wells and so on.

And then there should be a third level of safeguard, you know, given that the wells may be – you know, that abandoned wells might be – well, could be in place in perpetuity, but if something happened in four or five or six hundred years time, there would be a way for remedial action to be taken, and so there should be some program within the government that should cover those things. So that was the recommendation of the Chief Scientist. There was – EPA has done quite a detailed investigation of that over the last couple of years and recently published a report that's on their website in terms of, you know, the response to that Chief Scientist's recommendation.

I think, you know, in the context of Narrabri, what does that all mean? I think that the critical point to make is that based on our – all the work that we have done, we're not expecting there to be any significant impacts on people or the environment, and, you know, so the residual risks for people, you know, landholders within the project area or adjoining area, are expected to be extremely or very, very low. So I think that's the first thing, is that clearly, you know, based on the detailed assessment, our findings are that the risks should be relatively low.

In terms of the security deposits, they will be worked out in the normal way. I guess the critical issue is how the financial insurance/assurance would be – would work, and where government's ended up is that the best way to deal with that would be through the environmental protection licence, because that licence is subject to review over time, unlike development consent conditions which are fixed at certain points and so on. So it gives you a much better flexibility to address issues and to ramp – ratchet up the assurance/insurance depending on the level of risk over time, because you would expect the risk to vary over the life of the project.

So I guess in terms of the key risks during the operational life of the project, they really are in terms of incidents, and the key risks are, you know, in terms of some of those, like, exploding risks or well blowout risks, which are expected to be very low provided, you know, you go through your final safety analysis and you do your monitoring and you have your leak detection systems in place and you – so there will be – you know, there will be risks, and I guess EPA will carry out an assessment of that risk from time to time and require Santos to provide a financial assurance to deal with any of those risks or to obtain insurance to cover those risks.

And it might be something that we can go into more detail in at the public hearings, but the issue is, you know, they would deal with that through the licence, and it would vary over time, and Santos would need to have suitable insurances in place. I think the other issue is at some point, if the project goes ahead, you will get to a point where the wells will all be plugged and abandoned and buried in accordance with the Well Integrity Code, and there will be a risk assessment there, you know, what it might cost for ongoing monitoring and so on, and it could come up with some kind of a financial assurance to ensure that Santos pays for that monitoring and so on to be carried out over time, you know, once they relinquish their petroleum production licences and so on.

And so there would be an annuity that would be set aside, and at some point in, you know, the next 100 or 200 years, there would have to be a government program in place and there is the Legacy Mines Program in place at the moment. It would need to be properly resourced to deal with any safeguards. Now, the advice we're getting from the panel – the water expert panel and so on – is that if you carry out the wells in accordance with the Well Integrity Code and that, you know, that Code is likely to be updated over time as we get more and more knowledge on these sorts of things, but if you carry things – if you make sure that the wells are drilled and operated and then plugged and abandoned in accordance with the Code, the risks for those long-term impacts are likely to be very, very low.

But we will have assurances in place. I think – just from a – just to – for completeness, I think the other aspects that – there will be other protections in place for landowners in the area so there will be a whole range of conditions, you know, in any development consent there would be conditions on environment protection licence, conditions on the petroleum production licence and conditions on the water access licences, and there are extensive enforcement powers under all sets of those legislation to ensure, you know, things can – secondly, you will have – you know, if

Santos is going to drill on individual landowners wells and – like properties and so on, they will have to have detailed landholders agreements.

You know, landholders would cover, you know, the design and location of any infrastructure, but it would also cover things like make good provisions or any risk provisions, and then also compensation that would be paid to landowners for compensation. And then, lastly, the Petroleum (Onshore) Act does have provisions in it for compensable loss. So you know, in terms of protecting or going to addressing the recommendations of the chief scientist and the engineer, I guess the government is looking at relying on a range of measures to protect landowners and the environment from any significant environmental impacts. So assurance is one of those measures, and government has decided that the best way to do that is through using the petroleum – I mean, sorry, the environment protection licence and the powers under the – you know, the Protection of the Environment Operations Act.

Again, this is quite a complicated area and it hasn't been rolled out for other projects. I'm sure there will be quite a bit of interest. I mean, we're happy to go into more detail in the public hearings.

MR O'CONNOR: Thank you. That does give us an idea of the approach that the government is looking to take following on from the chief scientists and engineers review. The next theme relates to technical advisory groups. There are a number of conditions in the – draft conditions that have been put forward by the department, talking about setting up expert advisory groups. One is in relation to water issues, another in relation to Indigenous heritage issues. Anyway, I guess we're just keen to know if these sorts of advisory groups have been established for other projects, how they've worked, how you envisage this working and is it going to be purely advisory, you know, just trying to get a better understanding of what's proposed.

MR KITTO: So we've used a number of expert panels or advisory panels in projects in the past, and so for instance it's quite common in mining projects in Sydney's drinking water catchment to be subject to an expert review. There are a number of expert panels in the Western coal field around Lithgow that have looked at issues, you know, with sensitive projects in the past like, you know, the Cowal Gold Mine and impacts on, you know, Lake Cowal and we've had expert panels, so there's quite a long history in New South Wales of using expert panels, and sometimes that's just on a project basis but now what we're moving towards in drinking water catchment and so on is really to have a single panel that's established by government to deal with providing advice on a range of different projects, as opposed to project-based panels.

So I think quite often we would use a panel on an individual project, but once you start to get a scale of development that might be expanded to a standing advisory panel – its advice. So in this instance, I guess what we're saying is if this project is approved it would be the first sort of major project approved, and we would have a project-based panel rather than a broader-based panel. But if you look at what's happened in the past it may well be expanded to include other issues. I think in

terms of how the project panel might work, there are a number of different ways you can set it up. I guess in this situation, given the significant community interest in here, we are looking at having, you know, from a water panel perspective to have independent experts but to also have people – representatives from the community so it's not just a technical panel.

You know, it can incorporate community views on the project, and I think if you look at the chief scientist and engineer's recommendations a big driver of this was to really be as open and transparent as possible and to bring, you know, the community and the experts together to inform, you know, the carrying out of the project. So certainly we think the water expert panel has played a very significant role in this project in terms of consulting with the community and factoring in community concerns and considering their concerns. And we certainly want to extend that role, but also we're looking at an advisory group that included the community so it wasn't simply a technical panel. We've got other models that could be used and we're quite happy to discuss those but in this instance we thought it would be good to get a combination and technical.

The second panel here is on Aboriginal heritage and I guess the key issue here was, you know, when Santos was consulting I think there were well over 500 registered Aboriginal parties. Now, from a workability point of view it would be hard to have consultation with 500 groups all the time on – so it really was having a panel that had key representatives of the community that would then consult with those broader RAPS or registered aboriginal parties, but there would be a core group that would make critical decisions on where infrastructure would be located and to avoid and manage impacts, and so we thought that was a critical committee that could – that should be put in place.

I think the conditions are reasonably self-explanatory there, and they were meant to be advisory. I don't think we've ever had a panel where you would have a decision-making independent body in terms of, you know, where you would just have the consultants or independent experts making it – you know, the panel is set up in – the IPC or Independent Planning Commission is set up in legislation. I guess, in this the feeling is the department or the EPA in particular as the lead regulator would be responsible for regulating things and exercising any statutory powers and so on. And so the technical – the independent experts would really be providing advice to government and then it would be up to government to make the final decision. And I think that's consistent the recommendations in the chief scientist's and engineer review where it was really seen as there would be a standing panel providing advice to government on a range of matters. And that would fit into a government decision, not really a decision by the independent panel.

MR YOUNG: Mike Young here. Just to add to that, David, to sort of flesh that out a little bit. I think that's important to say and compare it, perhaps, to like the community consultative community in that these committees would have broad representation and technical expertise and, indeed, in regard to the Aboriginal technical working group, you know, have representation from relevant parties. But I

think the sorts of activities they would do, yes, are not so much regulatory activities but advisory. I think the other thing they would do is not just advise government but they would potentially advise Santos as well in regard to, you know, matters of relevance to those groups.

So some of the tasks that they may be asked to do include things like reviewing the various management plans and providing input and comments on those management plans before they're finalised and, in particular, in regard to Aboriginal cultural heritage as the infrastructure is cited through the field development protocols and plans, you know, having an involvement in, you know, site selection and an avoidance of sensitive sites and so forth. So, an ongoing sort of role, not just at the beginning but also as the project develops and also reviewing things like monitoring data, being a point of advice for Government and for the EPA and regulators to look at monitoring information, verification of modelling, all those sorts of things, where you would see that experts could provide, you know, input and add value to the ongoing regulation of the project.

MR O'CONNOR: Thanks, Mike. So, it's clear that it's providing advice to the proponent and to government agencies?

MR YOUNG: That's how I would see it because that's certainly how we've tended to set up some of the other panels because, clearly, if it's just advice to Government, that's fine and that's probably the most important function, but, you know, obviously, from a day-to-day operational point of view, Santos will be seeking, you know, input and advice on some of those issues as it progresses development and – correct me if I'm wrong, David, but I'd say that, you know, that would be a useful source of advice to Santos too as they do progress the project.

MR O'CONNOR: Okay. Thank you. Moving on then to regulation, the EP&A has mentioned the regulator. Do you see the EPA as having that compliance and enforcement role when it comes to the – making sure that the conditions are abided by?

MR KITTO: So, that's – Government has made that decision and so EPA is the lead regulator, and they will have the ability to take enforcement action under all – you know, whether it's the EP&A Act or the Petroleum (Onshore) Act or the Protection of the Environment Operations Act, so the EPA will be able to take action under all of those.

Having said that, I think it's important from a regulatory point of view to understand that it would be regulated – if it's approved, it would be regulated under both State and Commonwealth law, so there would be Commonwealth – you know, Commonwealth role in any regulatory function and I think, you know, while the EPA – at a State level, while the EPA is the lead regulator, it – you know, just like with the assessment of the project, it will be done in a hollow government way.

So, the Department will be working closely with the EPA as we'll be working with Mining, Exploration and Geosciences, who's responsible for petroleum production licence, and we would be working with the water agencies in terms of the water – the water legislation and so on. So, it would be done in a hollow government way, but, certainly, any regulatory action or compliance action, the EPA would be leading the process.

MR YOUNG: Mike Young here. David, would it be worth touching on – or, Steve, touching on the fact that, obviously, this is not a new thing for the EPA, that this has been going on for some time and there's a – it's been resourced accordingly?

MR O'DONOGHUE: Well, that's right. I mean, there's been a – there's been a big team set up in the EPA to – with experts engaged to regulate the Santos operations to date and more broadly around the State for the exploration activities. But, certainly, for Santos, for some years now, there's been EPA officers out at Narrabri, you know, directly regulating the site and they've – involving a lot of site inspections, review of reports and enforcing, you know, the various – the various instruments under the exploration list and there's environmental protection licence that does cover all their operations out at Narrabri at this point in time for the exploration activities.

MR KITTO: Just – David Kitto here – one aspect there is it did come up in the upper house inquiry in terms of the resourcing of that EPA team because they have had this dedicated gas team for a number of years now. I think what the EPA is looking at doing is to integrate that expertise into some of the general – more general teams in the area and so if the Commission does want an update on some of those things, we're quite happy to provide it, but I think that the simple issue is that there will be that expertise within the EPA and that function will be carried out, you know, whether it's by a dedicated gas team or a general team, it will be adequately resourced and carried out by the EPA and that's the Government commitment and there's no change to that commitment.

MR O'CONNOR: Thanks, David. The - - -

MR J. HANN: Steve, could I ask a question that relates to that and it's probably better to do it now rather than later. It's John Hann here. Dave, just in relation to the EPA and their regulatory role, and this is really by way of example, so with the Water Expert Panel's recommendation, and I say – suggest the recommendation is to do with setting up a transient groundwater model. And I guess the question is, will the EPA have access to such a model and will they be able to work, if you like, with transparency and so will the community also have access to that sort of information as it's generated, in other words, if approved, once that's in the full production mode, there will be a lot of monitoring, with a new model like that, how will that work with the EPA? What access do the EPA have to that?

MR KITTO: So, I mean, I think the aim is for Santos to update – you know, significantly update the current model that they have and to factor a lot more information into that model and to validate and calibrate it, but I think it will be that

– that will be the key model that will be used and that will be independently reviewed by experts. It will be independently – like reviewed by Government and so on, but that will be the model that everyone is working off and that will be updated every time there's a gas development plan that needs to be signed off by the secretary – planning secretary and so on. That will continue to happen, but that will be the model. It's – there is a – and this is where, you know, you get into what's happening in other jurisdictions.

You know, in Queensland, for instance, where you've got several major gas companies in the Surat Basin operating next to each other and they are operating – you know, they are extracting gas from an aquifer which is used by agricultural users and other areas and in a jurisdiction where you don't need water licences if you're a gas operator and so on, there were, you know, a lot of issues with cumulative water impacts in terms of which operation was causing what impacts and how you would make good and so on under that Queensland legislation.

And what they did there was they set up an independent agency within Government to carry out a whole range of – you know, to develop its own model and then to get data from all the companies and do all that modelling and to manage who was going to be responsible for what cumulative impacts and so on. Now, that could happen, but I guess we're saying in this situation, that's not warranted, one, because of the differences in the particular circumstances that you're not going to have those cumulative impacts, and so there's no need to set up another model where you are already managing quite a complex natural resource allocation issue.

So, certainly, with the Chief Scientist and Engineer, you will see that, you know, in terms of where you strike that balance between if you had a fully-fledged gas industry in New South Wales, similar to what you've got in Queensland and so on, you might ratchet that modelling and so on up over time, but, certainly, in this situation, it is a relatively small project and site. I think what we would see is the model would be Santos' model, but that would be subject to a whole range of review by Government and independent experts and it would be that model. I don't think we're looking at the EPA coming up with a different model and modelling those sorts of things.

MR HANN: So, the EPA via, say – it's John Hann here – the – one of the technical advisory groups, for example, they would have access to - - -

MR KITTO: Yes, yes.

MR HANN: - - - the – Santos' model in terms of - - -

MR KITTO: Yes.

MR HANN: - - - understanding the progressive monitoring of and feedback of the data?

MR KITTO: Yes.

MR YOUNG: So, it's Mike Young here. John, you noticed in the conditions that the various management plans and modelling and so forth need to be prepared in consultation with various agencies. You know, obviously, the water experts within Government, but potentially also the Water Advisory Group, the EPA and so forth. So they'd not only be – have access to the information but be involved in ensuring that the nature and extent of that verification was, you know, appropriate, and, you know, according – in accordance with best practice. There's also in the condition requirements to make a whole lot of monitoring information and management plans publicly available on the website, and, I mean, correct me if I'm wrong, David, but I would expect that monitoring data and modelling information and so forth in due course would be available – publicly available for people to be able to have a look at.

MR KITTO: That's right, Mike, and I think the – John, the other thing is from a monitoring perspective, there will be two sorts of monitoring going on. One will be Santos's monitoring, but the government is committed to putting a number of, you know, regional ..... groundwater monitoring network that will be operated by government, particularly in those deeper aquifers. So you can see the response of the deeper aquifers to any extraction of water. So both Santos will be generating monitoring data about a whole range of factors, but government will also be monitoring the impacts of the project, and both sets of data you would expect would be fed into the model to validate and calibrate it. So it's not just Santos's monitoring that will be relied upon, but it – at this stage it will be the one model that everyone will be working off that model and improving that model and validating and calibrating it over time.

MR HANN: Thanks very much, Dave. Thanks, Mike.

MR O'CONNOR: We might move on then to the – just the last theme which relates to the – sorry. No. There was a question about the proposed - - -

MR KITTO: The code.

MR O'CONNOR: - - - code. Yes. The Well Integrity Code being reviewed.

MR KITTO: Yes. Yes. So it is subject to review at the moment. I think that – you know, they are aiming to have something for public consultation in August this year, which will probably lead to some refinements in the code. Just a couple of things on the code. So if the project does go ahead, you know, over the next 20 or 30 years, you would expect a number of reviews of the code, and, really, Santos will be required to comply with whatever the update – whatever the code is at the time. So it's not that the code is fixed – would be fixed in its current form now for the life of the project. You know, the code will go through successive reviews over the life of the project and Santos would have to comply with the current version of the code. I think the other thing to bear in mind is not a lot of gas development has happened since the first code has been made.

So there's not a lot of new empirical data that's going to feed into the new code, although there is clearly bits and pieces that have happened in Queensland and so on that can refine. I think the biggest focus is on what, if anything, should be done in terms of dealing with horizontal drilling as opposed to vertical drilling, but there should be something available for public consumption in August this year.

MR O'CONNOR: So, as I said, that brings us to the last group or theme and these might be the sort of things that you might want to take away and respond in writing to, but it was just around seeing that link or that nexus between how you believe the key concerns have been – can be appropriately addressed in your report, and then seeing in the conditions how that's put into effect. We think that's important in terms of understanding just how comprehensive the conditions are going to be in achieving what's set out in the report, and, likewise, the link between those relevant recommendations from the New South Wales chief scientists and engineer review in 2014 – how they've found their way into the conditions. So I'm not sure whether that's an easy thing to just address now or whether you want to present something in writing to us.

MR KITTO: I think what we would like to do, Steve, is to try to address that as best as we can in the public hearings because I think there would be a broader public interest in understanding the link between – from the concern through the assessment to how it's reflected in the conditions. And so I think we will go to some effort to explain that more fully. I'm not sure the public hearings will be the best way to deal with all the chief scientist stuff. Not – we will address it to the extent that it's relevant, but I'm sure there will be a lot of concerns, you know, in terms of the – you know, the upper house inquiry raised a whole lot of concerns about the implementation of those recommendations, governments still preparing its response to that upper house inquiry and so on. So there are some things that are specific to those recommendations in a general way.

We're happy to deal with that in a – that we – you know, at the hearings to the extent that we can, but we might provide some written advice to the Commission on some of those issues as well.

MR O'CONNOR: That sounds a good approach, David. I'm more than happy to accept that.

MR KITTO: Yes.

MR O'CONNOR: I just have one or two other questions and then my fellow commissioners no doubt may have some questions as well. In – we were talking about conditions a moment ago. So, in particular, condition A9 and A10.

MR KITTO: Yes.

MR O'CONNOR: The heading for those conditions is the third commencement, and it talks about certain phases of the project being deferred until certain works are

undertaken, and I just wanted to understand – because the recommendation isn't presented that this is a deferred commencement consent, but you have some deferred commencement conditions.

MR KITTO: Yes.

MR O'CONNOR: So if you can just clarify what's exactly intended in that regard.

MR KITTO: So you're right in that sense in that there's a very specific meaning in the EP&A Act about a deferred commencement which is essentially certain preconditions have to be met before a proponent or applicant would be able to act on a consent. I don't think these are conditions in that sense. So it's not saying the project couldn't go ahead in any form prior to those preconditions being met. What it is saying is, you know, phase 1 is essentially Santos does need to do some more appraisal – gas appraisal work prior to detailed construction, and what it's saying is there – you know, there's no – you know, provided they're – you know, the amount of appraisal work is restricted to a reasonable level, you know, that work should be allowed to be carried out, but I guess, you know, the pipeline is a critical component of the project and you wouldn't want the full-blown construction of the project to start without you having some certainty that a pipeline is approved and, you know, can be delivered, and then, secondly, that, you know, they can't start producing until that pipeline is in place and is connected to the project. So I think those conditions are clearly to deal with the issue that the pipeline is being dealt with separately to the gas field, and you wouldn't want to full-blown gas filed to be developed until there was certainty about the pipeline.

MR O'CONNOR: Fine. That was our understanding. We just wanted to confirm that was the case.

MR KITTO: Yes. Yes.

MR O'CONNOR: My second question relates to a New South Wales government publication in March this year. I think it was called the Net Zero Plan. It talks about the goals to be achieved in terms of greenhouse gas emissions by 2030. I couldn't see reference to that in the assessment report from the department. Is it covered in that report or is that something that we might need to ask you to specifically address?

MR KITTO: We've considered it, Steve. We haven't expressly – you know, it's – we haven't done an express A, B and C. We're quite happy to provide some supplementary information on that, but in our assessment on greenhouse gas emissions we've looked at the full range of documents to the extent that they are relevant to the project. If the Commission wants further – you know, further advice on how that particular plan relates to Narrabri, we're happy to provide some supplementary advice to the Commission.

MR O'CONNOR: That would be appreciated. We would like to see, given the relative newness of that plan, just how - - -

MR KITTO: Yes.

MR O'CONNOR: - - - you believe the Narrabri project is assessed against that code or that policy. John, I might go to you first. Do you have some outstanding questions?

MR HANN: Look, I've got just one and it really follows on. Thanks, David and Mike. You went a long way to answering my understanding of how the regulatory ..... monitoring and the modelling might work, but if I can use an example. One of the key assumptions around the gas extraction is that – and the impacts is that the coal seams are essentially hydraulically isolated, I think is the term. And I'm just trying to understand what's the process for monitoring that, because the water expert panel make it clear that that's not going to be confirmed until it's in an operational phase. There's just not enough data for that and that's understood. So the critical aspect will be the monitoring of that, and it's just trying to understand what – how do you envisage the process working of the monitoring of that, detecting if they are or are not substantially hydraulically isolated, and how that will be factored into modelling and so on? So it's really just an understanding of the process.

MR KITTO: So, John, I think the first point I'd make in response to that is clearly there is a lack of detailed information on the deeper strata because not a lot of development has actually happened in that strata, and there are things that you would want to find out in more detail over time. But I think the overarching conclusion is that there is a lot of information known about the area at a regional scale. And then, you know, in terms of the broad geology, there's no doubt that there are aquitards in there. Now, in terms of detailed testing of the integrity of the whole aquitard and whether there's some weaknesses here or there or – you know, I think at a broad regional level the information is quite well known.

It's whether there's weaknesses here in terms of structure. You know, there's no major structures that anyone's aware of at a regional level. You know, there might be some minor faults and structures. So a lot of that will be worked out. So I guess in terms of that broad risk assessment, it's not that there's complete lack of information. There's good knowledge at a regional level. It's a question of how that might pan out in localised levels. So, for instance, is the aquitard uniformly strong across all 95,000 hectares or are there certain weaknesses in certain spots and so on? You'll only find that information out through further drilling and investigation and so on.

So I guess while we say there's uncertainties, it is uncertainties about localised impacts. When you look at the work that's done on the Namoi groundwater – like, the Namoi water study and the CSIRO work and so on, they're all consistently saying that the – you know, the likely risk on the shallow aquifers is low, but there's a lot more that you'd want to know about the deeper strata. Now, some of that is in terms of the geology, as you point out. So it is about the integrity and the permeability of all those layers between the deep coal seam at 800 kilometres underground and the shallow aquifers and, you know, the sort of 200 – above two,

three hundred metres. So it is about the integrity of all that strata in terms of the permeability and so on.

And so, you know, phase 1 of the project involves more drilling and appraisal, and they'll get a lot more information there. But then, you know, the way that it would work under the conditions is for every set of wells they drill, they would have to update that and come back with the – with revised predictions and so on in terms of each set of new wells, and that would be subject to a sign-off by the planning secretary. So the critical things you want to know is clearly want to know a bit more – a lot more about the properties of the geological strata, you definitely want to know a lot more about local faults and so on so that you can avoid localised impacts, but you also want to know more about the composition of the gas and so on so that you can design your wells in terms of the steel casing or the cement casing, and the specifications will vary depending on those sorts of things.

So there's a lot of detailed work that will go on, but you can only really find out some of those things to minimise the risk. But it is minimising them within a broader conclusion that those risks are quite low. So it's actually more managing it at a management level to say if, for instance, you do pick up in certain strata that there are weaknesses in a certain area or the aquitard thins out in a certain area, you might avoid drilling wells in those sorts of areas and so on. So it is about managing risk and obtaining that information over time. So I think when we're saying there's – there is some evidence from the exploration and the work that has been carried out, but it's not like, for instance, coal mining in that area where it's been happening for 40 years and you've got a lot more empirical evidence about the specifics.

So there are some uncertainties and I think we've got quite a good idea about the things that we really want information on, particularly the geology and structure and, you know, those sorts of things. But in terms of certain things like seismic risk and substance risk and some of those, we really rule those out as being key issues for this area. So it is really down to integrity of the geological strata, the composition of the gas and the water from a management perspective. I think those are sort of the key issues. And phase 1 will get us a lot more data on that, but then the idea is to do everything in an incremental way with, you know, checks and balances along the way so that you're not just rolling out all 850 wells. You know, you can adapt over time based on any new information that we get and we can manage that risk.

MR YOUNG: And Mike Young here, David. Is it fair to say also that there's, you know, requirements for them to meet certain objectives and demonstrate that they have been meeting those impact objectives or outcomes, performance measures, over time - - -

MR KITTO: Yes.

MR YOUNG: - - - and that they need to demonstrate that progressively so it's not sort of, you know, open slather for the whole project at the beginning? It's very much a progressive and incremental development of the project and demonstrating

along the way through empirical monitoring data that they would produce but also supplemented by government monitoring information and modelling that would be checked by experts, including the water technical advisory group, before new areas were released for development.

MR KITTO: Yes. And I'm sure, John, things – it will come up during the hearings and the further assessment in terms of making all the monitoring data publicly available, and certainly that was one of the key drivers of the chief scientist and engineer. Now, one of the things we've encountered during the assessment is that some of the data is commercial in confidence because it goes to, you know, the feasibility of the project and other bits and pieces. And so there is an element of government having access to all data but really working out where the balance sits in terms of making as much data as possible publicly available.

And so, you know, it's a similar thing we're dealing with in the Southern Coalfield at the moment in terms of getting data into, you know, the SEED database and having it – you know, ideally, you get to a point where all that information is available as open-source data in the cloud and so on. But there are a number of issues to work through, and certainly we will need to work through those issues over time as database systems get better and better. But the commitment is, you know, that as much data as possible, absolutely possible – and we will push that as far as we can – will be made publicly available.

But, yes, we do need to accept that some of the data will have a commercial aspect to it and so there's no question that government won't have access to that data, but it might be something that we'll need to be able to treat in confidence. So it's a really tricky area. I'm sure it's going to come up quite a bit in the hearings and in the discussion about where the line is drawn in terms of striking the right balance. And, again, we're happy to have further discussions about those sorts of things.

MR YOUNG: So Mike Young here. Just - - -

MR HANN: Thanks very much .....

MR YOUNG: Just to add to that – sorry. Mike Young here. At the end of the day, John, there's powers that the government would have to – you know, if the information – the monitoring data shows that there are unexpected issues in terms of the nature and extent of the impacts and meeting the relevant performance measures and the predictions in the EIS, there's clear enforcement powers that the development can be halted and the – essentially the wells, you know, switched off to avoid any unforeseen or significant impacts that may result, not that – the assessment indicates that's very, very unlikely but, of course, the community will be very keen to see safeguards and contingency measures in place to ensure that the greater – you know, the water resources are protected.

MR HANN: Thanks very much, Mike. Thanks, David.

MR O'CONNOR: Anything further, John, from you?

MR HANN: That's all for me, Steve.

MR O'CONNOR: Okay. Snow, is there anything outstanding from your perspective?

PROF BARLOW: Yes, a couple of things. You said, David, that, you know, the water allocations and water models have been based on the existing, you know, past climate data. Was there any thought given to modelling sort of future climate change? Because this is the question that is bedevilling the whole Murray-Darling Basin at present, is the allocations have been made on historic climate.

And there's an attendant question there, is that the salt retention ponds have been based – their location has been based on the one in 100 year, but under a slightly different climate, you know, there are questions whether one in 100 years is enough. And, you know, we have seen these extreme events in – not very far north, in central Queensland, that have resulted in sort of deluges that have caused problems in that area. So has any thought been given to having a look at, you know, what may be coming in that area, particularly with regard to the retention of salt ponds?

MR KITTO: I mean, Snow, if I understand you correctly, there's really two components to that. One is have they modelled scenarios which incorporate climate change; the answer to that is yes, they have. So they've done sensitivity testing, which looks at a number of scenarios both in terms of the water tank, but also in terms of, you know, the water balances and how they would need to manage those things once – at the surface. So I think those sorts of scenarios have been incorporated into the water modelling, both the surface and the groundwater modelling.

The second aspect is the risks of offsite impacts due to, you know, extreme events in terms of their salt ponds and so on. I think all the ponds will be out of the, you know, the one in 100 year, and I'm not sure about the problem of maximum flood, but I think the – you know, our assessment is there's quite a bit of land available in their processing facilities and quite a bit of discretion in terms of how they could, you know, increase the size of ponds or move ponds to areas where those risks are lower. So I – certainly the – you know, Chris Fell from the water expert panel did look at a number of matters and said, look, it would need to be monitored over time but that there were, you know, several environmental responses that could be carried out.

So it may be, and this was a question I was going to come to maybe later in terms of the logistics of the hearings and so on. You know, we have got some of these experts that will be able to answer that question in much more detail, Snow, than I would and to take you through, you know, the specific engineering aspects of designing and making sure that those ponds are not liable to significant aspects and so on. And it's

just a question of making those experts or those experts briefing the panel separately at some point if need be.

MR YOUNG: Mike Young here. Snow, I'd just add to that as well, I guess, in terms of that climate variability, I think the key aspect in terms of the allocation and the groundwater impacts is because of the seams and the strata where the water is likely to be extracted from in terms of the coal seam being a kilometre down, etcetera. The issue of climate variability and over a 20-year period or 25-year period, etcetera, is probably not likely to be a big issue for the project.

As David said, using the words, it's kind of, to some extent, quarantined from drought, so it's probably less relevant to the actual water balance in terms of the deep aquifers and more relevant, as you say, to potentially those surface flooding-type impacts. I don't know, Steve, whether you had any further detail on the modelling in terms of the PNF or indeed what would happen under that scenario in terms of dilution of or escape of any saltwater from the site under those extreme conditions.

MR O'DONOGHUE: Well, it was an issue that Chris did look at in terms of the capacity of the storages to hold, you know, the produce water and the various waste streams. So he – the WEP has recommended in terms of developing the – you know, in the detailed final design of that, you know, that that issue be further looked at, but certainly it comes around, yes. The operating levels within the ponds themselves and the available freeboard within the ponds, that should be kept there to account for extreme weather events. I guess the issue is that if capacity is exceeded and there's issues, then the wells can be shut in to avoid further water being transferred to the ponds as well. So there are mitigation measures that can be incorporated in those wetter events.

MR KITTO: So I think there's quite a bit in – if you go and look at the water expert panel, particularly in terms of the salt and so on, the panel did go into that in quite a bit of detail.

PROF BARLOW: Yes, I had read that David. Yes. It's just these sort of extreme events, but thank you very much. I agree with you, Mike. The – you know, the slow burn of climate is not – unlikely to have much impact on the aquifers; it's really the extreme events that might come forward affecting the potential, you know, catastrophic breakage of one of those salt retention ponds.

MR O'CONNOR: Anything further from you, Snow?

MR KITTO: Well, just to add to that as well, like, our hazard – in terms of the hazard studies, I mean, that – the risk of ponds overflowing and so on is – was considered in the hazard studies under State Environmental Planning Policy 33 and so on, and so our hazard expert also looked at that issue in terms of the Leewood and the Bibblewindi facility, and again the risk there was defined as low. So it was looked at by the expert panel – the water expert panel, but it was also looked at from a hazard perspective in terms of whether, you know, any of the ponds onsite would

pose a risk – an offsite risk to people or the environment. And the conclusion there was that while it would need to be managed in an engineering sense, those risks were relatively low. So it's not just the water expert panel, but it was also looked at by our hazards expert.

PROF BARLOW: Thank you, David and Mike. No, Steve, I don't have another question.

MR O'CONNOR: Okay. So that response – I appreciate that offer that if – and I think the timing might well be after the public hearing – there are some further questions we might have that might be best answered by members of some of your expert panels, that's much appreciated. We may well want to take you up on that offer. Has either Steve or Casey – Steve Barry or Casey got any questions that they would like to see put to the department?

MR BARRY: No, I'm okay. Thank you. Steve Barry here.

MR O'CONNOR: Thank you. If that's the case, then I think that wraps up this session. Thank you very much, Mike and Steve and David, for your time and the – well, particularly for the team behind you three that no doubt helped you put together that report. Obviously, a lot of scrutiny will take place in relation to that report over time, so I'm sure it's been, you know, very thoroughly gone through. We look forward to hearing your presentation at the public hearing, and as we've alluded to, we may well come back to some further questions following that time. So thanks very much, and I'll - - -

MR KITTO: Thanks very much.

MR O'CONNOR: From Auscript's point of view, that's the end of this briefing.

PROF BARLOW: Thank you.

MR YOUNG: All right. Thanks.

MR O'CONNOR: Thank you.

PROF BARLOW: Thank you, Dave. Thank you, Mike and Steve. Much obliged.

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