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SELECT COMMITTEE ON AGRICULTURAL AND RELATED
INDUSTRIES

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**SENATE SELECT COMMITTEE ON
AGRICULTURAL AND RELATED INDUSTRIES**

Friday, 18 September 2009

Members: Senator Heffernan (*Chair*), Senator O'Brien (*Deputy Chair*), Senators Fisher, Milne, Nash and Sterle

Participating members: Senators Abetz, Adams, Back, Barnett, Bernardi, Bilyk, Birmingham, Mark Bishop, Boswell, Boyce, Brandis, Carol Brown, Bushby, Cameron, Cash, Colbeck, Jacinta Collins, Coonan, Cormann, Crossin, Eggleston, Feeney, Farrell, Fielding, Fierravanti-Wells, Fifield, Forshaw, Furner, Humphries, Hurley, Hutchins, Johnston, Joyce, Kroger, Lundy, Ian Macdonald, McEwen, McGauran, McLucas, Marshall, Mason, Minchin, Moore, Parry, Payne, Polley, Pratt, Ronaldson, Ryan, Scullion, Siewert, Stephens, Troeth, Trood, Williams, Wortley and Xenophon

Senators in attendance: Senators Fisher, Heffernan, Nash and O'Brien

Terms of reference for the inquiry:

To inquire into and report on:

Food production in Australia and the question of how to produce food that is:

- a. affordable to consumers;
- b. viable for production by farmers; and
- c. of sustainable impact on the environment

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Committee met at 9.17 am

CHAIR (Senator Heffernan)—Thank you very much, ladies and gentlemen. I apologise for the chair sleeping in and getting here late and everything. I will take the blame. The captain has to take the blame! I declare open this public hearing of the Senate Select Committee on Agriculture and Related Industries. The committee is hearing evidence on issues relating to the Liverpool Plains within its current inquiry into food production in Australia. I welcome you all here today. It is a public hearing and a Hansard transcript of the proceedings is being made.

Before the committee starts taking evidence I remind all witnesses that in giving evidence to the committee they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to a committee. The committee prefers all evidence to be given in public but under the Senate's resolutions witnesses have the right to request to be heard in private session. It is important that witnesses give the committee notice that they intend to give evidence in camera. If a witness objects to answering a question the witness should state the ground upon which the objection is taken and the committee will determine whether it will insist on an answer, having regard to the ground which is claimed. If the committee determines to insist on an answer a witness may request that the answer be given in camera. Such a request may, of course, be made at any other time. Before I welcome representatives of BHP Billiton I just want to let everyone know that we had 34 points of rain at Junee last night, which is better than a dust storm!

[9.19 am]

DAVID, Mr Stephen, General Manager, BHP Billiton Caroon Coal Project, BHP Billiton

GRANT, Mr Martin, Chief Development Officer, BHP Billiton Coal, BHP Billiton

WOOD, Mr Ian, Vice-President, BHP Billiton Environment and Community Relations, BHP Billiton

CHAIR—I welcome representatives of BHP.

Mr Grant—With your permission I would like to provide you with a short submission, a copy of which we provided just prior to the hearing. Firstly, let me assure the committee that BHP Billiton understands how important agriculture is to the Liverpool Plains. We know many families have been farming in this area for generations and have a very close affinity with the land. Equally, we understand the importance of food production to all Australians. BHP has a long history of constructively working with communities in which we operate to ensure mutually beneficial outcomes from our presence. One thing we have learnt over the last 120 years is that the onus is on us, BHP Billiton, to demonstrate that the environmental and other community issues that stem from our projects are appropriately managed. So, for us, environmental and social impact assessments form a critical part of our decision on whether we move forward from exploration to mine development.

Right now we are in the assessment stage of the Caroon project and in reality we are probably another three years away from submitting a mine plan to the New South Wales government for assessment. In addition to our own studies undertaken as a part of this assessment, the community has called for an independent Namoi catchment water study, which is about to be commissioned. We very much support this water study and have been working actively with the community to see it undertaken. On 1 September we announced that we would partly fund the study and also incorporate the findings into any environmental assessment we undertake. In practical terms, this means that BHP will not submit a development application until the independent water study is complete.

The environmental impact assessment process in any planned project is an iterative one. It involves extensive data collection and analysis and consultation with key stakeholders. Through any assessment process, we consider the inputs, modify our project designs and introduce mitigation measures in response to concerns. I believe the Caroon coal project is a good example of this. At the initial Caroon community meeting in May 2006, BHP Billiton committed that we would not proceed with a mining proposal that would have a negative impact on the deep alluvial irrigation aquifers.

It became clear as we worked through our initial assessment and community consultation processes that longwall mining under the flood plains would result in an unacceptable impact on agricultural practices on the flood plains. So, in August 2008, we announced to the community that we had reduced our targeted exploration area to only one-third of the total licence area and publicly committed not to develop longwall mines under flood plains or deep alluvial aquifers.

In addition, we also committed at this time that we would not open cut anywhere on the Caroona exploration licence. As a result, our exploration work has focused on mine development that will be generally located on the ridge country of Doona Point, Nicholas Ridge and Georges Island. This is shown by a map we have included in the pack today.

As a clear demonstration of this commitment to protect the deep alluvial aquifers and flood plains, we agreed with the New South Wales government three weeks ago to amend the special conditions of our exploration licence. This amendment prevents us from applying for a mining lease that includes any of the following activities: longwall mining underneath the deep alluvial irrigation aquifers, longwall mining underneath the flood plains and open-cut mining on the flood plains. So, while we made these public commitments in August 2008, they have now been written in stone. Together these commitments are significant.

Firstly, BHP has itself declared two-thirds of the exploration licence a no-go area for mining of any description. The remaining one-third, consisting mostly of elevated ridge country, is the focus of our ongoing exploration work. Secondly, longwall mining will be restricted to under the ridge country within the targeted area. Just to be clear, within the targeted area there is still a minor amount of flood plain land. Whilst there will be no longwall mining under the flood plains within the targeted area, there is the possibility of access roadways being constructed on the flanking areas. Lastly, there will be no open-cut mining anywhere in the Caroona project. The bottom line of all this is that the existing agricultural use on the flood plains will remain as it is. We would like to thank you for the opportunity to attend the committee today. My colleagues and I will be happy to take any questions.

CHAIR—Thank you very much. We welcome your attendance today. I note that amongst the people we requested to attend today are Shenhua, who declined our invitation. We will deal with that later. Could I ask a couple of quick questions before I go to Senator Nash. Would the roads on the flood plain be engineered to take into account what would happen if there were a flood? Obviously you would be aware of what happens on a flood plain if you put up a bank. Would there be some environment planning around those roads?

Mr Grant—Again, it is probably important to stress that the focus of our work is on the elevated ridge country. Clearly, as we look to develop a mine in that area, we will be sensitive to the need to keep our infrastructure development away from the flood plains not only because of the agricultural purposes of the flood plains but also from a practical perspective around flooding. Stephen can probably answer the specific question around the detailed layout of roads in that area.

Mr David—In relation to the point we have made about the possibility of access roadways being constructed, I want to stress we are talking underground. We are talking 300, 400 metres under the edge of the flood plain and the ridge. We are not talking about constructing any roadways on the flood plain. We have ruled out open-cut mining. We are only considering underground mining and we are only considering longwall mining under the ridge area. In the centre of the map there is an area called Doona Point in Doona State Forest. Typically we would be looking at 250 to 350 metres below the surface.

CHAIR—Just to clarify for the likes of me, who is not a coalminer, there is open-cut mining, longwall mining; what else is there?

Mr David—They are the only two that we would really look at. That is the high-end production, a large company. Where we talk about developing roadways, they are really roadways just to join mining areas together. Just as you have a tunnel under a city to put in a railway or cables and supplies, we also have tunnels underground that join our mining areas together.

CHAIR—I congratulate BHP on taking on board not only the concerns of the community but the concerns of this committee. Today we have heard that by 2050 we are going to have somewhere between 40 million and 50 million people in Australia to feed. That absolutely is the message that is coming to this committee in dealing with future food tasks. With the amendments to the special conditions of the exploration licence, the great fear that the community has is that somewhere in the future someone will do a dodgy deal and unwind all this. Is this set in stone? What would it take to amend the special conditions on the exploration licence and, sometime in the future, when no-one is looking, turn around and say, 'We are going to go into the flood plain'? Would that be just an act of parliament or—

Mr David—Perhaps I will explain a bit about the process of an exploration licence and then what a mining lease is. We only hold an exploration licence for a period of five years, after which we can apply for that to be renewed and extended for a period of time. The purpose of an exploration licence is really to have time to see if you can define an area where you want to put forward a development application. The process from here is that, if things go the way we would hope, in three or four years time after the water study is complete and we have got the report from that and after we have carried out all our environmental and socioeconomic assessments et cetera, if we believe we have a project we will lodge a development application with New South Wales Planning. Once that is granted then we apply for a mining lease. That mining lease will be over an area much smaller than the current exploration area.

The current exploration area is some 350 square kilometres, of which we have already said we are not interested in two-thirds, from a mining point of view. It is a no-go zone. So our application for a mining lease will be a lot smaller. The ridge area that is defined on the maps you have there is about 126 square kilometres. The mining lease is likely to be something smaller again, but we do not know exactly where. Once we apply for a mining lease and it is granted, what remains—and I think this gets to your question—is that the exploration licence just expires. So it will no longer be an exploration lease; we will hold a mining lease.

The reason that we have asked for it to go into our licence conditions at this stage is that if we were to apply now for a longwall mine under the flood plains that would be a breach of our licence conditions and the government could take the licence from us. Obviously, that is not something that we want to entertain. So that is enforcing—

CHAIR—So are you saying that to put aside the fears—obviously people are worried about what is going to happen in 50 or 80 years time—the only way that this could be overturned would be a decision of the government to change the licence? BHP, for instance, could not; it would be up to the government. The government would have to wear the wrath of the decision.

Mr David—Yes. We could not change that licence condition. It could only be changed, at this stage, by an agreement between us and the government, because we are mid-way through a

licence period. So if we went to the government now and said, 'We want to change back,' they would have to agree. And as you said, we would not ask and they would not do it.

CHAIR—So, finally, in terms of the water, one of the fears of the community is about interfering with the aquifer and the recharge of the aquifer. As I said in Gunnedah, even though it is quite apparent that you could possibly mine the ridges, the risk would depend on what percentage of the recharge came out of the ridges and how you would intercept that in an engineering sense. That will all be part of a study. I understand that we may be tabling a document today that might assist the committee in that regard, on some work that has been done.

Senator NASH—I will probably ask you a lot of laymen's questions. Mining is not my forte. There is the longwall and open-cut mining that Senator Heffernan just asked you about, but you did not name the other types of mining.

Mr David—One is first workings, or disc-driving tunnels. They are more for the purpose of getting from point A to point B. It is not really an economic means of mining. The other is board-and-pillar mining, which is about driving lots of tunnels over an area. It is not something that we are looking at or considering.

Senator NASH—I am not asking what you are considering.

Mr David—Then there are lots of other variations that people might use. But largely there are first workings, which are access roadways. At those access roadways you extract a very small percentage of the overall coal. Hence they do not create any subsidence, which is a key factor. Then you move to longwall mining, where you try to extract a large percentage of the coal in the seam. That creates a certain amount of subsidence on the surface. The third method is the open-cut method, where you basically take off all of the overburden lying above the coal seams and remove 100 per cent of the coal seams.

Mr Grant—Could I just add that for BHP and the Caroonna project it is very important that most of the ridge-land area which we have identified within the targeted zone would have longwall mining underneath it. Outside the targeted area there will be no mining at all of any description, whether it be tunnels, board-and-pillar or anything else in terms of an extraction regime. That is very important to note, and that is what we set out, today, in our submission. There is a map at the back of the document, which we are already communicated to the community around the location of our targeted area. Clearly, we have made commitments that there would be no mining outside that targeted area. It is a very important map for us and something we continue to engage the community on.

Therefore, the debate really comes down to what happens in terms of the very small amounts of flood plain area which lie within the targeted area. The commitment we have made is that we will not longwall mine under those minor flood-plain areas in the targeted area. The only mining we would envisage is the development of the access ways—the tunnels—to enable us to access the productive zones for longwall mining.

Senator NASH—With the special conditions and the three points that you have there, two with the longwall and one with the open-cut, why didn't you just say 'mining'? Why did you define them?

Mr Grant—It is a difficult one and it is a good question. The reason is that we are worried about the fact that development of the access ways will be construed as being mining, which in some ways it is. But we want to make sure that there is a differentiation between the large economic extraction of a coal resource and the access development.

Senator NASH—Why wouldn't you word it in such a way as to do blanket mining with the exception of access ways?

Mr Grant—What we found during our very early days of consultation with the communities and through our early assessment work was that the compatibility of longwall mining under the flood plains was not to occur. Also there was a risk which has been identified, and which is a concern of many community members, around the integrity of the aquifers associated with longwall mining. So the first statement we set out was that there would be no longwall mining under the deep alluvial aquifers and no longwall mining underneath the flood plains, to ensure that there was no concern around the land use on the flood plains going forward due to potential implications of subsidence.

Senator NASH—Again with my very limited knowledge of mining, in all industries things change, you progress and you have new technologies. What happens, then, if another form of mining eventuates, or perhaps an altered form of one of these types of mining with a different name? Couldn't you then use that form of mining under the flood plain? It would not be precluded under these conditions, would it?

Mr Grant—There are a couple of points. That is right, in the strict interpretation. The amendments to the special conditions of our exploration licence make specific reference to longwall mining and also to open-cut mining on the flood plains. What we have decided, and we have communicated this quite clearly to key stakeholders, is that we will not be taking any mining outside our targeted area. That targeted area very much follows the ridge land areas, except for minor amounts of flood plain.

Senator NASH—I do take your point, and you are correct, but it would seem much simpler and clearer in terms of future mining activities if you had simply used 'mining'. Then it would remove any confusion in the future with any different types of mining activity, I would imagine. Correct me if I am wrong, but there was a mine plan before this announcement and I think there is going to be a revised mine plan post the announcement—is that correct?

Mr David—We have not published any mine plans. Obviously our engineers are continuing to collect the data and think, 'What does that mean?' but we are still several years away before we can put down mine plans. The early part of exploration is understanding the geology we are dealing with.

Senator NASH—So there was nothing of the mine plan, in any form that was publicly available, before this announcement?

Mr David—No. What we have shown, and what we said in 2008 was, 'These are the areas, the targeted zones, that we will focus our exploration on.' Later on, if we do put forward a mine proposal, it will be within that area. But there are no mine plans being put out at all.

Senator NASH—I think you answered this earlier when you were talking about how it would just be the road access on the flood plain. I take it from that that there is no construction work planned on, under or in close proximity to the flood plain. The only things are those road accesses.

Mr David—Those road accesses we referred to are under, not on, the flood plain.

Senator NASH—Again, the label says ‘under’, and I accept that, but is that the only construction that is going to occur in any form on, under, in, next to, above or around the flood plain?

Mr David—Yes.

Senator NASH—Again with my limited knowledge, and I understand the mining will just happen on those ridge areas, how many tonnes of coal do you expect are under there? Is it too early in the process or is it something you can have a guess at now?

Mr David—It is too early in the process. There is a process as a publicly listed company that we need to go through to collect sufficient data to make a statement to the market. We are not in that position at this stage.

CHAIR—Can I just follow up on that. Would it be fair to say that you to know at this stage though that there is a viable amount to mine?

Mr David—It is a large resource.

Senator NASH—That is my next question. What tonnage makes a viable mine? You are not going to go to all this trouble if you have not got a bit of an idea of how many tonnes of coal are there before you actually go and mine it. So, roughly, if you are going to go and carry out this exercise, how many tonnes of coal need to be under there?

Mr Grant—It depends really on the investment economics. What we see is a return over a period of time. One thing we focus on quite clearly is the life of the operation. So what we would envisage around a project like Caroonna is that the mine life will be in excess of 30 years and production rates will depend on sizing of equipment at the mine. At this point in time, we have not progressed our studies to a sufficient degree that we can have a definitive response around the volume of coal which will be produced.

Senator NASH—I am just trying to get a clear understanding. If we go particularly to that work on the ridge, you must have a bit of a determination of how many tonnes of coal need to be under there to make this a viable proposition for you.

Mr Grant—I think the best way to provide additional insight is to think through the increments of instalment of infrastructure. The initial operation we would probably envisage at this point in time would be a single longwall operation. There would be approximately five, six or seven million tonnes of coal coming from a single longwall. Then there are possibly two million tonnes at a second longwall mine. Those are the quantum we are talking about.

Senator O'BRIEN—To get our heads around how this might work, is there an existing mine one could look at to see how it would work in this circumstance that you could point us to?

Mr David—As a company we operate a number of underground longwall mines. For longwall mines, we have more than 40 years experience in the Illawarra area mining under what is largely water catchment areas. There are a lot of mines that operate under ridge country. Just north of where we are looking, at Curlewis, a mine was operated for 100 years under the ridge area. It was not longwall mining; it was using earlier technology. If you wanted to have a look at a longwall mine, we could certainly organise the opportunity to do that.

Senator O'BRIEN—Is there one that would be comparable to this, do you think? It is early days, but an approximation rather than—

Mr David—Every mine is similar, but they also all have their own unique considerations. From a longwall mining point of view, they are working under similar areas, yes.

Senator NASH—Would you mind just outlining for the committee very briefly the exploration process in terms of holes that are dug, what actually happens and how that is done. It can just be very brief. I am sure we could get further information, but it would be good for the purposes of the committee today to get a brief outline.

Mr David—The hole we generally drill—and we have drilled over 150 what they call slim core exploration drill holes—is about 100 millimetres in diameter. If we are up on the ridge, as we drill that hole down, we collect core samples. So the actual core we can remove is about 63 millimetres in diameter and about six metres in length, and it is rock or coal. That comes to the surface and goes away to be analysed. That hole may be 500 metres deep. That is about as deep as we go in the area around Caroon.

At the end of drilling that hole down to its full depth and having removed all of that core, prior to sealing the hole back up they geophysically log the hole. So as well as getting a sample they then have a number of instruments that are lowered down and measure the density, the resistivity and other geophysical characteristics, which again go to the geologist to look at. If that is the hole, we may then carry out some further testing, which may be permeability testing, where we are looking at the permeability of the different strata layers to further identify where groundwater systems are and where they are not. At the end of that, that hole will be fully grouted from the bottom to the surface. So the hole is fully grouted up to the surface and cut off, the land is rehabilitated and we move away. That process would typically take three, four or five weeks depending on the depth. There is another type of hole which we do which typically is what happens on the flood plains and also in the ridges. As well as drilling a hole, we actually want to establish a water-monitoring site and have ongoing access to that so we can get longitudinal data and understand the groundwater system.

One of the fundamental things that is very important in all mining operations—and it is certainly important in this area—is for us to get a full understanding of not only the area where we are considering mining but also how that area sits regionally, in amongst the regional geology and the hydrogeology, being the groundwater systems. Those coal seams are continuous. They are not just under the ridge; they are under the flood plains. We have deep alluvial aquifers under the flood plains. So if we are drilling a hole on the flood plain, we will drill through the alluvium

first and stop at that point. Then, while we are drilling through the alluvium, we will geophysically log that part of it and then put a steel casing through the alluvium. That could be up to 100 metres at its deepest point. That casing, then, is fully pressure grouted, basically with a mixture of cement and bedenite. That pressure grout makes a steel casing like a formwork. It then seals everything off in that hole. The hole is actually full of concrete. We will come back the next day or so and start drilling again. This time we are drilling inside a steel pipe. So the aquifer is fully sealed off. We will then continue drilling down to the full depth of where the coal seams are. We may drill a number of holes at that site. What we will do is leave and instrument those holes, just like the department of water and environment do. We will set standpipes and we can actually then measure variations in the water level within the aquifer system and also take samples of the water quality. We are interested in not only the alluvials but the coal seams that lay below these groundwater systems. To build a hydrogeological model, we need to fully understand the relationship between coal seams and other groundwater systems. That was a rather longwinded answer, but they are two quite distinct things.

Senator NASH—No, it is very informative.

Mr David—Those water-monitoring sites are established, and we will go back generally every three months and take a measurement of the water quality. We have electronic instruments that are measuring fluctuations in the water level every five minutes, and we just download the data.

CHAIR—So it is the pipe encased in concrete, is it?

Mr David—Yes.

CHAIR—The outer casing is concrete?

Mr David—Yes.

CHAIR—So it will not rust out.

Mr David—It is more a sealant. The casing is really the formwork and then the concrete has actually done the sealing for you. But the steelwork stays there.

CHAIR—Because, as you know, casing rusts out.

Mr David—Yes. If it rusts out, you are left with the concrete. At the completion, if it is not going to be left for water monitoring, we still then concrete the thing completely to the surface.

Senator NASH—How many holes would you have dug in either of those scenarios in the ridges in the flood plains?

Mr David—I will look at it from a site point of view. At the moment we are up to 123 drill sites. Eighteen of those drill sites are outside of what was defined as that targeted area, so pretty much outside of the ridge country. Of those 18, 10 have been established as permanent water-monitoring sites. The other eight have been sample tested and then sealed off.

Senator NASH—Has every single one of those holes been encased to date? You are talking about the process of casing. I am asking from the perspective of someone who does not know a lot about mining, but I do know a bit about water. In terms of the casing and the protection, has every single one of those been encased in the appropriate time so that there could be no effect or impact on any of the aquifers?

Mr David—Yes.

Senator NASH—Every single one?

Mr David—Yes. There are procedures that we have to follow. We have audits in place to make sure those procedures are being followed. There is a person who is responsible for doing the casing, and somebody else is actually auditing that process and signing off to make sure it is done.

Senator NASH—So every single one has been done. Could you provide for the committee—not now—what the audit process is. You can take that on notice. That would be really useful. Do you have a hydrologist on site when you are doing all this work?

Mr David—Just on that audit process, it is actually publicly available. Before we rolled out to do anything, we had to develop an exploration environmental management plan and submit it to the Department of Primary Industries. It is quite a comprehensive document. At the back of that is the audit program. I will submit something to you but it is a publicly available document.

Senator NASH—That would be great. Obviously, this is a very sensitive work that is being done. Do you have a hydrologist on site while you are doing all this work?

Mr David—We have a consulting company and hydrologists who do the work for us. Where we are establishing a water-monitoring site, we will have a hydrogeologist supervising that work in accordance with the licence conditions.

Senator NASH—Does that only relate to the 10 sites you were talking about before that are now permanent water-monitoring sites?

Mr David—That is 10 sites on the flood plain. There are more in the ridge country.

Senator NASH—How many on the ridges?

Mr David—I can check that for you. Water-monitoring sites?

Senator NASH—Yes. You can take it on notice. Also, can you confirm to the committee whether a hydrologist is on site while all those holes are drilled?

Mr David—To establish a water-monitoring site we actually need to apply for a licence from DWE. That licence sets out the conditions. The critical part is not the hydrologist; the critical part is having what they term a level 4 driller. That is a driller that is trained and certified to drill these water-monitoring sites. We actually use a level 6 driller.

Senator NASH—Somebody mentioned to me a while ago—correct me if I am wrong—that you had made some public statements about a hydrologist being on site while this was happening. Is that not correct?

Mr David—That is not correct.

Senator NASH—With all the work you have so far done and the holes you have drilled, and obviously all this information about the water and the impact and everything else that you are gleaning, do you consider the ridges above the flood plain are actually recharge zones or potential recharge zones?

Mr Grant—Again, it is a difficult question to answer, given where we are in our study process. These will be questions we will need to clearly answer ahead of our development application. But what I think is important—let me give you a little bit of perspective here—is that the ridgeland area within that targeted zone represents maybe one per cent of the total catchment area.

CHAIR—That is meaningless in terms of a recharge zone. It is of no consequence whatsoever in percentage terms of the recharge. You understand that?

Mr Grant—I am not sure if I do.

CHAIR—You can have a huge area of catchment, but the recharge can come from a very confined area. To give you a demonstration, 38 per cent of the run-off of the Murray-Darling Basin comes from just two per cent of the landscape down the back here.

Mr Grant—I understand what you are saying.

CHAIR—It is quite meaningless to talk about area, unless you are talking about the recharge.

Mr Grant—You are right; there are a number of different factors and that is one.

CHAIR—It is estimated that the sustainable yield of the Namoi aquifer, which was cut back years ago—most farmers lost 60 per cent of their extraction rights from the aquifer; this is a serious issue—is about 130,000 megs. It has been estimated in a water study—not the final water study—that the recharge interception in the ridge country, between Shenhua's exploration and yours, is equivalent to the full extraction that occurs in the subzone of where the mine is, in the irrigation rights: about 30,000-odd megs. It is a very sensitive issue.

Mr Grant—I was just trying to give you a bit of a perspective. Stephen might be able to provide more detail.

Mr David—The role that the ridge country plays in the recharge is a very important question. We briefly mentioned these water-monitoring sites. The purpose of those sites is to collect data so that, eventually, our hydrogeologist will be building a hydrogeological RIP model of the region that will allow us to look at what impact a mine would have on the groundwater systems sitting under the ridge country. We have already said we are not going to have an impact on the deep alluvial irrigation aquifer—

Senator NASH—How do you know that mining on the ridges is not going to have an impact on the aquifer?

Mr David—Today I would not say that we know that. What we are doing is collecting—

Senator NASH—Sorry, I thought you just said that it would not have an impact.

Mr David—No; what we are doing is collecting the data to build the model that will allow us to answer that question. A key part of the data comes from this recharge. We currently have installed a number of monitoring points in the regolith. If there is recharge from the ridges it will be coming off the small regolith zone that sits on the top couple of metres of the ridges—the unconsolidated material that will be running down. What we are doing is monitoring how much water, basically, is in that zone, where it is coming from and where it is going to. That will be an input into the hydrogeological model that will allow us to answer the question: what is the role of the ridge in recharging?

Senator NASH—What is the determinant and what is the criteria where BHP says, ‘Okay; that is going to have too much of a significant impact on the aquifers and on the water system so we are going to have to stop.’ Who decides that and what determines that? Who enforces any ceasing of the mining operation if that impact is determined?

Mr Grant—There are probably two components to that. One is the internal BHP process and one is an external government process around the approval of the development application. Internally we have robust processes in place, including independent peer reviews, which would fully assess our feasibility study and make recommendations about whether or not we fully assess the risk and have put in place appropriate mitigation measures.

Senator NASH—I will just stop you there. What I am after is: who determines how much impact—could you provided it to the committee?—is too much impact on the water system? So when you are doing all this work and you get all this data together, how much effect—how much impact—on the water system is too much: the point at which you would say, ‘We’re not going to mine on the ridges because it is going to affect everything.’

CHAIR—Could I just give you some guidance there? The New South Wales Mining Act 1992 does not mention the word ‘water’ anywhere. It is not, under the act, a consideration, from my interpretation of the act. So it really does beg the question that is being asked, because the Mining Act does not protect the water resource.

Mr Wood—Maybe I could answer this question—or at least attempt to. Within BHP Billiton, as you know, we have made a commitment not to have an adverse impact on the deep alluvial aquifers. That is a public commitment we have made, and we take our public commitments very seriously. As Martin said, the project proponents within BHP Billiton, like our energy coal business, put a project forward for funding to our board. As part of that process people like me, with appropriate expertise, are involved in what we call an independent peer review process. We have to personally sign off, for our board, that we have reviewed the potential impacts of this project and that it is consistent with BHP Billiton’s policies and public statements. If we get that wrong we wear the consequences. We take our public commitments very seriously. In addition—

Senator NASH—Sorry, can I just ask you on that: what are the consequences of getting what wrong?

Mr Wood—If I make a representation to our board, through this public review process, that this project will comply with the company's standards and subsequently it is found not to—

Senator NASH—This is what I am trying to get at. I do not know what the company standards are that say, 'At this point, with this much impact on the water system, we will cease mining.'

Mr Wood—We have said that we will not have an adverse impact on the deep alluvial—

Senator NASH—What is the adverse impact? What is measuring the adverse impact and what are the criteria you are going to measure it against?

Mr Wood—We need to do the detailed studies to understand the environment and once we have—

Senator NASH—I know you have to do the studies, and I know you have to get the data, but you must then have something in place that potentially says, 'The measurements that we have taken show that the negative impact on the water system is too much.' At what point will you say, 'That is too much of an impact on the water system,' if indeed that is determined? What measurement do you use?

Mr Wood—We need to do the detailed studies to understand the potential impact of this project. That will enable us to determine what the impact, if any, will be on those deep alluvial aquifers. We can then present that data to both the community and the government and say, 'Our belief is that that impact will be minimal or nonexistent,' and then the regulators will make a decision.

Senator NASH—Thank you. I take that point. If BHP's view is that the impact will be minimal or nonexistent—and it may well be—and there is an alternative view that says, 'We think that is too much of an impact to allow the mining to go ahead,' where is the check and balance? Who makes the decision and enforces mining ceasing at that point if indeed somebody other than BHP thinks the impact is too great? Who is the arbiter?

Mr Wood—The government, the regulator.

Senator NASH—But, as Senator Heffernan has just pointed out, there is nothing in the mining act that relates to water. So whereabouts, within the government's purview, can they tell you to stop mining?

Mr David—The mining act is covering our exploration work. The Minister for Mineral Resources is not the approval authority of our development application. We would make a development application to Planning New South Wales. They are the authority that Ian is referring to that would make the decision.

Senator NASH—Which piece of legislation allows that minister to stop your mining if it is determined that there is too much negative impact on the water system?

Mr David—The environmental protection act is what they will assess our project against.

Senator NASH—Can you direct the committee to the precise place in the act where they have the powers to stop you mining?

Mr David—It is not a case of stopping us mining.

Senator NASH—But it might be.

Mr David—They would not approve the project. Under the environmental and socioeconomic assessment that we do, there are a whole range of things that they will be considering as to whether those impacts are acceptable.

Senator NASH—So that I am very clear—as I say, I am a layman with this—it would be the minister's decision to allow that development to go ahead; therefore, it is going to come back to a ministerial decision as to whether or not to approve it? A minister could technically discard any evidence from other areas where there had been a negative impact and could simply approve it to go ahead? Is that correct?

Mr David—I think the question is probably better put to that department. Within their processes they have an independent committee that would also review the data that is put before the department. I think the question would be better directed to the department themselves.

Senator NASH—You are probably quite correct. I have one final question. In terms of the data you are collecting now on the recharge and the run-off and everything that I assume you are doing there, have you tried to access any existing information on those figures?

Mr David—Absolutely. I will take this opportunity to answer the question earlier about how many water monitoring sites are on the ridges. There are currently 11, but we are establishing more sites. Also, in conjunction with the Department of Water and Energy, we have an agreement to monitor six of their sites. Through the Namoi catchment there is quite a network of water monitoring sites that were put in many years ago that are largely monitoring the variations of the alluvial aquifer system. So, where the integrity of that data could be proven, we have an agreement to monitor that data on the department's behalf, provide them with the data. So, yes, we have gone back to the literature survey and we are collecting data from their own monitors. But that was not sufficient. We have had to install, and we will continue to install, a complete regime of monitoring.

CHAIR—Could I let it be known that the committee has received a submission from the Caroona Coal Action Group, which is now on the public record, and we may refer to that.

Senator NASH—I suppose what I was getting at is that, from some of the information that has been received, it seems there has been a significant amount of work done on both the recharge and the runoff. In Caroona it is to the tune of around 11,000 megs for the deep drainage and about 15,000 megs for the runoff. Is this information that you are already aware of?

Mr David—Yes. The work that has been done by the likes of Dr Wendy Timms from the New South Wales university water research laboratory and some others is very valuable work. In fact, Dr Timms is a consultant to the independent community consultative committee reviewing the sort of work that we are doing. But, to be fair, the work they have done is more at a regional level. Whilst they have looked at the recharge from ridges et cetera, if they say the recharge from the ridge country is X, we have to bear in mind that what they are looking at an average. We need to be very clear about the role of the recharge area that we are looking at. What we are looking at within our licence area is Doona Point, Nicholas Ridge and George's Island. We do take their advice as input, but it is a couple of levels below the level of detail we need to ascertain now to build a proper, comprehensive hydrogeological model.

Senator O'BRIEN—The roadways you are talking about between the exploration areas in the case that you progress to mining are actually tunnels, aren't they?

Mr David—Most people would refer to them as tunnels, yes.

Senator O'BRIEN—Will there be multilevel tunnels or a single level of tunnels?

Mr David—It would be within the coal seam. A typical tunnel roadway would be 5½ metres wide and maybe three metres high.

Senator O'BRIEN—Do you imagine that you could draw a line between each of those hatched areas on the map you gave us?

Mr David—No, sorry. Referring to roadways, we are not talking about joining the hatched areas. Any mining is within the hatched areas. Outside of the hatched areas, there will be no mining of any description.

Mr Grant—On the perimeter of those hatched areas, there are minor amounts of flood plain. Under those flood plain areas in the target area we are having this conversation around the tunnels, which will provide access. Along the margins of the flanks of those areas, we are looking to provide those access ways to enable us to provide access to the production—

Senator O'BRIEN—To join the bodies effectively for the resource?

Mr Grant—To join the working areas within each one of those shaded blocks.

Senator O'BRIEN—You probably understand how it is going to be done a lot better than I do or, in that case, anyone sitting on the committee, which is why I was asking the question about seeing in practice how this works so that we can understand it better. You said that you envisage the depth will be around 250 metres maximum.

Mr David—No, we could go deeper. It could be 400 metres. The coal seams are not flat. They actually dip from the north-east down to the south-west. Within that central Doona area that we have hatched on the map, right at the northern end it is probably 200 metres. If I go as far as the southern extremity of our lease, we are getting close to 500 metres.

Senator O'BRIEN—That is over about 20 kilometres?

Mr David—It is 24 kilometres across, and you are looking at about 10 kilometres north.

Senator O'BRIEN—Are you proposing to use the rail line to remove the resource once mined?

Mr David—This is a work in progress, but the Caroona area has a rail line—the Binnaway line—running right through the middle. That is an obvious advantage to the area. The rail line would need some upgrade work to take the volume and the size of trains. But, yes, we would look to link onto that rail line with a rail loop.

Senator O'BRIEN—You said BHP Billiton is partially funding the independent Namoi catchment water study.

Mr Grant—That is correct. We have made a commitment to do so.

Senator O'BRIEN—A proportionate amount or a fixed money amount?

Mr Grant—It is a difficult question. We are very keen to ensure that everyone views the water study to be truly independent, so at this point in time we have not committed to a—

CHAIR—You would not want to be seen to be putting all the dough in, or no-one would believe you.

Mr Grant—No.

Senator O'BRIEN—It depends how you structure it.

Mr Grant—At this point in time there is no clear budget for the water study, and that will hopefully come out in the coming months. Once we see that budget we will have a much better ability to confirm what quantum of funding we will be putting in.

Senator O'BRIEN—Who will set the study's terms of reference?

Mr David—The terms of reference are already set. That is a process that took some eight months. The minister appointed Pam Allan as an independent chair. She brought together a number of parties—the Caroona Coal Action Group, all the mining companies in the region, the gas companies and the councils—and over a period of months we sat down and developed the terms of reference, which were then recommended to the minister. The minister, Minister Macdonald, has now accepted those terms of reference and has appointed Mal Peters as the independent chairman. In turn, Mr Peters has advertised and now appointed what they call the Ministerial Oversight Committee, which is representatives of the mining, gas, farming and regional development organisations. They will be the ones with this oversight, ensuring that it is independent. So BHP does not sit on that committee.

Senator NASH—I cannot believe it takes so long to get the terms of reference. That is extraordinary.

Senator O'BRIEN—It was done by a committee. That is probably the answer. How were the team of people chosen, or how will they be chosen, to conduct the study?

Mr David—They have not been chosen yet. That will be for the committee to decide.

Senator O'BRIEN—So BHP will have no input into that?

Mr David—No. It is very important this is independent and is seen to be independent.

Senator O'BRIEN—On the other hand, BHP has the raw data, I presume, from the hydrological studies.

Mr Grant—That is right. Certainly within the Carooona area, BHP will be able to contribute a lot of information to the water study. But it is also important to recognise that this is a whole-of-catchment water study and the area of interest will be far wider than just the Carooona focus. So, yes, there will be a lot of information and a lot of data on the Carooona area, and I suspect what we will see is that information becomes a lot more scarce once we get further away from Carooona. But we will definitely be contributing the information we have collected to the water study.

Senator O'BRIEN—What is the typical above-ground footprint of a longwall underground mine?

Mr Grant—In terms of the actual infrastructure component?

Senator O'BRIEN—Yes.

Mr Grant—Again, it probably depends on the nature of the processing operations. I will let Stephen talk to the specifics, but one of the key aspects is whether or not the coal quality at Carooona is sufficient to enable the direct export without processing. At this point in time, we believe that the coal quality is very high at Carooona and we are hopeful that that will be the case. In terms of the specifics, I will let Stephen answer that question.

Mr David—The footprint of an underground mine is obviously much smaller on the surface than for an open-cut mine. Typically, we will be talking hundreds of hectares—that is all. Again, as Mr Grant said, a big determinant is whether or not you need processing facilities, but it is a relatively small footprint.

CHAIR—Can I congratulate BHP for being here today. Unfortunately, I have a lot of questions I would like to ask which I am not going to have time for, so we may have to revisit this somewhere at some time. But it seems to me that we need to understand the water issue as much as the rest. I congratulate you for setting the precedent as a great Australian flagship, BHP, to say you are not going to mine a flood plain, which means that your neighbours up there, Shenhua, will have to give serious consideration to putting the same proposition on the table. I have to say, we will be formally writing to them asking them to appear, given that they have declined today.

I want to ask a couple of quick questions on the extraction. Somewhere between 100 and 1,000 litres of water is the figure they give for the amount of water you bring out during coal mining. Do you have any idea of how much water will be involved in this mine?

Mr David—At this stage we are in the process of collecting the data to develop that water balance. How much water depends on how much water is already in the coal seam. So, we are collecting samples and analysing that—and we have water monitors in place—to understand just how much moisture will be contained in the coal seams.

CHAIR—I well recall when Paul Lander, who sadly died on a tennis court in Sydney, was the minister for water in Neville Wran's government. They allowed the licences that were issued in the Namoi aquifer to give the aquifer a mining life of 30 years—that is the amount of water—like the northern aquifer in China. They then got some wisdom a few years ago and reduced everyone's extraction rights. The problem that I face here is that the Mining Act, in its present form, does not recognise the water issue. So I think that ought to be amended to reflect all the problems that have been raised here today. The figures in relation to interception and run-off into the local river are in the submission we have received from the Carroona Coal Action Group, but as you may be aware I take a keen interest in water, anyhow.

If there is a possibility that between your area and Shenhua there is something like 23,000 megs of interception, and the extraction for that sub-zone is 30,000-odd megs then that is a huge impact on the sustainability of the farming irrigation in that area. So I guess—I know!—we need to make sure that this mining operation will not, in the longer term, cause the aquifer to be depleted to the point where it is useless.

Mr David—Absolutely.

CHAIR—I would have thought that if that were to occur we would all have a serious problem.

Mr David—I go back to our first statement that we made in 2006. Before we did any work we said, 'We will not bring forward a mining proposal that will have a negative impact on that deep alluvial irrigation aquifer.' Now, we still stand by that. So if we find, as you were saying, the recharge of those ridges is of the quantum you are talking about, and if our operations would disrupt that recharge, then clearly we would go back to that first commitment we made: it is unacceptable.

CHAIR—Fair enough. I congratulate BHP on your tenacity in your commitment to coal mining and also in reflecting the concerns of the community. I just hope other people who take up exploration licences show the same corporate responsibility. Welcome to Senator Fisher!

Senator NASH—I just have two quick questions. The first I should have asked at the very beginning: how do you define a flood plain? What is your definition of the 'flood plain'? When you say you are going to keep off it, there must be a definition of the area you are going to stay off.

Mr David—That is actually one of the issues. There are a number of definitions that people use in different areas. That is one of the reasons we called it the 'targeted exploration area'.

People have said, ‘Well, why didn’t you just say, “No flood plain.”’ That was because there is a zone where you move from a ridge area to a flood plain, and there are different definitions depending on who you talk to.

Senator NASH—So what you have done is identify an area that has ‘flood plain criteria’, if you like, rather than use the flood plain definition.

Mr David—Some people would argue that within our targeted area there are small amounts of flood plain. And at this stage we are not going to get into that debate. The important thing, when you look at the flood plain, is that it does not get subsided. That is another commitment that we have already made by saying that we are not going to open cut it and we are not going to longwall mine underneath it.

CHAIR—Hopefully, that sets a precedent for the Haystack Plain and everywhere else we are interested in.

Senator NASH—Finally, how many towns in the Liverpool Plains actually rely on the aquifer? I imagine this would be pretty important for you to know.

Mr David—When you say ‘actually rely’, that is a question I would like to take on notice. I know that certainly the alluvial aquifer flows up through Gunnedah, but there are a number of smaller towns and it is a question of where their bores are located. There would be quite a few. If you wanted an accurate answer, I would like to have the chance to research that.

Senator NASH—If you could that would be great, because it is obviously very important that the impact is not just in that local area, the impact is about potentially impacting on all those towns in the region if they are relying on that aquifer.

CHAIR—Anyhow, it would be fair to say, and I congratulate you once again for appearing, that your commitment is to legally lock up your capacity to mine under the flood plain, to partly fund a water study. It is an early recommendation that I will be making to this committee’s report that we seek some amendments to the mining act to include water in the primary legislation. Once again the water question remains unanswered but hopefully we will get those answers. Thank you very much for your attendance today. I hope your good example is followed by other people.

Mr David—Thank you very much.

[10.22 am]

CUMMINGS, Dr Jason, Assistant Director, Environmental Policy, Minerals Council of Australia

HOOKE, Mr Mitchell Harry, Chief Executive Officer, Minerals Council of Australia

CHAIR—Welcome. You have heard the information for witnesses. After you make an opening statement we will ask some questions.

Mr Hooke—Thank you for the invitation to appear today. I have been asked to address the interaction between two of Australia's most important industry sectors, agriculture and mining. Given that we have not made a formal submission to this inquiry, I thought it might be useful to expand a little more in my opening remarks than I might normally do when I attend such inquiries. I do this obviously in my capacity as CEO of the peak body representing the Australian exploration, mining and minerals processing industry in Australia and internationally. I do so perhaps less obviously from an agricultural background. I was born and bred in the Western District of Victoria. I got a rural science degree from the University of New England and started my career as an agricultural adviser on the Darling Downs pioneering zero tillage farming systems. I was subsequently involved in industry organisations both in Queensland and here in Canberra.

Agriculture and mining are sectors that were the bedrock of the Australian economy a hundred years ago. They are the bedrock today and they will be the bedrock in the foreseeable future. Fundamental to this longevity is that these industries are resourceful, innovative, technologically advanced and socially and environmentally progressive. From my position in the minerals industry and my experiences in agriculture, I can attest to the remarkable transformation of both these industries in their contribution to the global pursuit of sustainable development and their capacity to identify and remedy social and environmental legacies of the past. The scale of these industries' joint contribution to the social and economic welfare of all Australians is underestimated to this nation's peril—as if I need to tell this committee that. The minerals industry is about 8.5 per cent of Australia's GDP and agriculture is about three per cent. In the year to date earnings from agricultural and resources exports exceeded \$190 billion and minerals exports alone are nearly 50 per cent of Australia's total exports. That is equivalent to the annual GDP of Ireland or Denmark.

The two sectors also play a critical role in meeting the food, fibre, energy, metals and minerals needs of many parts of the globe. Society requires these products, which can be sourced from overlapping and adjacent elements of the landscape. For continued economic growth, these resource industries must and will continue to coexist. Despite the critical nature of our partnership, there is an emerging perception that mining and agriculture cannot coexist. There is a view around that the interests of these two great sectors are incompatible, particularly where they are co-located. Both history and current practice provide compelling evidence to the contrary. Mining has, does and will continue to coexist with agriculture across Australia. Let me give you a few examples.

In the Hunter Valley, underground coalmining occurs beneath highly productive vineyards and pastures. In Victoria, cattle graze on land once mined for brown coal, adjacent to operating mines. There are cattle grazing on former coalmines in the Bowen Basin in Queensland. Mineral sands operations are used for beef and dairy production in Western Australia. In regional towns like Bendigo and Orange, mining provides water for the townships, diversifying supply risks. In South Australia, the amount of water BHP Billiton saves by assisting farmers to cap bores and line drains is less than what Olympic Dam draws from the artesian basin. Across Australia, extensive buffer lands surround open-cut mines and are used for agricultural conservation purposes such as wildlife corridors.

We are in the business of working with agriculture, not working against it. We are in the business of being an integral part of the communities in which we operate, not confronting them. And we are in the business of contributing to the development of sustainable communities—that is, communities that can grow and develop beyond life-of-mine. We are not just here today, gone tomorrow.

At an industry to industry level, farming and mining have a proud record of working together to overcome problems, the most recent of which is our partnership with the NFF to ensure that regional communities have a pool of skilled labour and can work in both key sectors. The NFF and the MCA have been working together for two years now on the Australian Regional Agricultural and Mining Skills Project. This is a living, breathing example of the two industries working collaboratively and constructively, despite attempts by some to drive a wedge between us.

As I said earlier, the perception that we cannot coexist is wrong. And it is increasingly the populist view that is media-driven that minerals companies are moving in on Australian prime agricultural land. The apparent conflict between agriculture and mining should be viewed neither through the prism of food security nor the prism of resource security. Rather, it is about the questions of compatibility, and the interests of the individual landholder and the surrounding community, and proposed mining activities. Let me pick up on a few facts to support this attempt to dispel the myth.

The intersection between these two great industries is not great; indeed, it is very acute. Agriculture occupies some 70 per cent of Australia's landmass; mining occupies less than 0.3 per cent—a ratio that the ABS previously characterised as land less than the combined area of the car parks of Australia's pubs. Similarly, promoting conflict on a platform of environmental compatibility, especially water, is without real foundation.

The minerals industry in Australia accounts for less than 2.4 per cent of Australia's net water consumption. In the Murray-Darling Basin, the industry uses 20 gigalitres of water annually, which is 0.15 per cent of the total water consumption in the basin. There are over 40 major minerals operations in the basin, accounting for approximately five per cent of total national minerals production. To put this in perspective, the total amount of water the minerals industry consumes in the Murray-Darling Basin is equivalent to four per cent of the storage capacity of Cubbie Station. The CSIRO recently concluded that mining's impact on water resources in the Murray-Darling was so small as to be immeasurable.

The value added per megalitre of water used is the highest amongst industrial users in Australia. We are recording something in the order of \$86,000 per megalitre used on average for coalmining, and ranges from \$50,000 to \$25,000 for other sectors of the minerals industry. And we have a pretty good record in recycling, reconditioning and reuse. By comparison, agriculture represents 60 per cent of Australia's consumptive water use and the value added per megalitre consumed ranges between 160 megalitres for rice to 3,900 megalitres for vegetables.

The point of this statistical comparison is to dispel the misconception that mining is sucking up Australia's water. We are not. The perpetuation of these myths—that mining is voraciously chewing up Australia's best agricultural lands and water resources—seriously undermines the platform upon which these two great industries can work, through a process of effective land-use planning. This is where the real focus should be. The real focus should be where these two industries can collaborate their efforts with regulators for better land-use planning, not some internecine battleground—

CHAIR—How much further have you got to go with this?

Mr Hooke—About two minutes. It should not be some internecine battleground founded in an illusion that mining is diminishing food and water resources in the community. We think a better way to go is to have much better land use planning. Effective land use planning accounts for a variety of land use factors to balance development, conservation and community expectations. Let me put on the record that there will be some areas where mining and minerals development will be considered inconsistent with the protection of ecological, cultural and landscape values. But there is a range of factors that need to be considered in determining whether there is prima facie an incompatibility between exploration and mining and other land values, in this case agriculture. At the core of such consideration should be land use planning made on a case-by-case basis. We think it can be done a heck of a lot better and in partnership between farmers and miners, and with the regulators.

Let me put the regulatory bit on the table. Mining is the most heavily regulated industry in Australia, and that includes agriculture. We have to undertake environmental impact assessments, we have to undertake social impact assessments and we have to put up mine closure plans which detail what the post mining landscape is going to look like, what are the rehabilitation requirements for the reclamation, what is the monitoring, what is the compliance regime and then the sureties to ensure that we actually meet our commitments on the way through.

My second point—and these are my last two points, Chair—is regarding the supposed automatic conversion from exploration to mining. Based on the reports to the Australian Stock Exchange there are some 5,450 exploration projects in Australia, and yet there are only 1,136 facilities producing minerals commodities. A rate of 1,000 to one of exploration to mining is about the rate of conversion.

To conclude, to deliver better planning for natural resource management we advocate the development of integrative land use planning that can be used as a basis for land use decision-making by governments at all levels, which can take us through this complexity, this inconsistency, this overlapping range of regulations that our industry is confronted with, along with question marks about integrity and credibility. Such a model can be truly integrative. It can

incorporate land use managers in the region and all current proposed land use activities, and it can be founded in a very important aspect, which is that the needs and expectations of the communities involved are front and centre. We can all do this in partnership with the rural industry. We do have a good track record of coexistence. We are reinvigorating our joint efforts to overcome common labour supply and training shortages in regional Australia and to pick up the forgotten people, who are in remote and regional Australia.

CHAIR—Thanks very much. That is quite a mission statement and quite a PR piece. I congratulate you. Going to your point about coal versus agriculture in GDP, I think it is quite meaningless to compare GDP production when it comes to feeding the world and the global food task. You threw that away as not so important. Let me say on the record that the global food task is far more important than the global energy task. That is a PR exercise by you, and you are paid to do it—and well paid, I hope. There is no argument that mining cannot coexist with agriculture. BHP, we are pleased to say, have recognised the worries and concerns of intercepting good farming land and the subsidence of a flood plain; we congratulate them. Why does the mining act ignore water?

Mr Hooke—I do not think it does.

Mr Cummings—I am glad that question got asked again. My understanding in New South Wales is that—and the National Water Commission has a report on this —minerals operations occur under multiple pieces of legislation, and water is required to be considered by minerals operations under the New South Wales EP&A Act, the New South Wales Water Act and the Protection of the Environment Operations Act. In practice, that means that water needs to be considered at the project approval stage, as we heard earlier. But, also, the operations provide annual environmental management reports to state government. They consider the ongoing impacts and mitigation efforts on water resources at the operation scale.

CHAIR—My concern is that if you had a cowboy government and a cowboy miner then the general public would not be protected. Can I just give you an instance of that. I had a report from Beijing the other day that a certain coalmining mob up there do not recognise—this has come from their office—that there is a problem with mining on a flood plain. That is the head office.

Another recent instance is that two months ago the New South Wales government bought a property to turn it into a national park to save the ibis rookery. But the property they bought was the wrong one. The ibis rookery is on the property next door. Yet, all the government documentation and the press release from the minister says, ‘This is to save this very sensitive rookery.’ But unfortunately the bureaucracy did not understand the geography, and the rookery is next door. The Minerals Council, and rightly so, is very aggressive on this stuff. I do not think that you are very sympathetic in reality to the agricultural food thing, and that is your job.

Senator O’BRIEN—There is no question there, Mr Chair.

CHAIR—But there are serious issues with the way these approvals are given, Senator.

Senator O’BRIEN—I am suggesting that there is a time for making statements, but we have limited time and questions would be better.

CHAIR—Yes. Away you go.

Senator O'BRIEN—I was not jumping in to take the call, but I am happy to. Mr Hooke, good luck tomorrow night, but I am not barracking for Geelong.

Mr Hooke—That is very kind of you.

Senator O'BRIEN—I am barracking for the other team! You talked about statistics in terms of the water extraction of the mineral industry. In this case, this inquiry is particularly looking at the Caroon project and the issue of water interception. How common is the process that BHP Billiton is going through of contributing to an independent water study of the impact of the mining operation? And, in terms of Minerals Council policy, does the organisation think that should be the normal process in any new development that commences from this point?

Mr Hooke—Thanks for the question. Firstly, I am disappointed that the Minerals Council has given you the impression that we do not see compatibility between land uses. This is not a question of mutual exclusivity; this is a question of development and compatibility. I think you will find that the membership that I represent reject the assertion that they do not think that agriculture is an important part of the equation. I do not think it is an either/or question about the importance of food security or resource security. It is a question of whether you want to eat, drink or sleep—and you are going to need to do all three. It is the same thing when it comes to mining and agriculture. I have to say that I went through that litany of examples as to where the coexistence is to try to dispel some of the myths that unfortunately you are now bringing to the fore that there is a contest when, in fact, there is not.

In terms of the processes you are talking about, it goes back to the point BHP Billiton was making a moment ago. They have their internal processes and they have their external processes. Internal processes are not only what companies do in terms of regulatory compliance but also go beyond regulation. This is an industry that 10 years ago understood that it was looking down the barrel of losing its social licence to operate. There has been a remarkable transformation in the way in which it goes about its engagement with communities and its recognition of the needs and expectations of communities. There is probably no better example of how far the industry has come in that respect than its Indigenous relations.

In terms of its environmental compatibility, all new mining projects are required to obtain planning approval under the relevant state environmental planning and assessment regulations, and that includes all of the issues and matters that you are addressing. When you go beyond that and you get into the social licence to operate, you are then actually talking about how well you get on with the communities in which you operate. That is where the rubber really hits the road. What Bill and Betty think in Struggle Street in downtown Melbourne or Sydney is nice to know, but it is not the critical issue. The critical issue is in those communities. There has to be confidence within the communities that the companies are acting in accordance with not only the regulatory requirements and obligations but also the wider perspective of what environmental and social dividends actually look like and the community's role and say in those processes. So, at a high level, there is a big tick. We are not immune to having laggards. Our industry has the normal bell curve of distribution of leaders, bulk and laggards like everybody else.

The Minerals Council of Australia has put out a publication called *Enduring Value*. That is the industry's guide to the practical implementation of sustainable development. You cannot be a member of the Minerals Council of Australia unless you commit to that, including to the reporting obligations. Do you want to add anything?

Dr Cummings—Yes, thank you, Mitch. Going back to the fundamental of the question, the operational scale assessments are common across all operations. The regional scale assessments are implemented less commonly, and usually to fill gaps in regional governance issues. So there are examples in the Pilbara and in the Bowen Basin of regional biodiversity studies.

Senator O'BRIEN—I will use the issue of the interception of water—

CHAIR—Which you have not answered yet.

Senator O'BRIEN—I thought that perhaps you had. I just want it to be clear. Are you saying that an environmental assessment of any project will automatically, as a matter of law, deal with the issue of the impact of the interception of water?

Mr Hooke—Yes. And it goes to the next step, as I said: the internal and the external.

Senator O'BRIEN—So in relation to whether it is BHP Billiton or some other operator, be it an Australian company or an overseas company, the operator would have that obligation?

Dr Cummings—That is correct. And that is determined by the legislation in each of the states. It is certainly the case in New South Wales and Western Australia. Current best practice is that those studies are undertaken regardless—and for operational reasons too, related to safety and water management.

Senator O'BRIEN—Are you able to point us to the provisions of the legislation that underpin that and to give us any examples of other assessments that might address that issue?

Mr Hooke—Absolutely. We will take that on and write back to you. We will give you that. We will list all of the legislation. It is quite exhaustive.

CHAIR—We are running out of time. You will provide that.

Mr Hooke—I was just going to give you a live example, if I may.

Senator O'BRIEN—Sure.

Mr Hooke—I was at Olympic Dam the other day—this is all on the public record and the BHP Billiton guys will correct me if I get it wrong—and the water usage there today is about 35 or 36 gigalitres. They saved 38 gigalitres by capping and lining the bores. They had to go through all the processes of what impact they would have on the Artesian Basin and in drawing water from it, just as they are going through now with the expansion—having to go through 4,000 pages of environmental assessments in terms of the impact on the water and the proposal to have a desalination plant. But the point is that in terms of the local community and going

beyond the regulatory compliance, they were the ones that paid for the capping and lining of the bores, which saved the community, the farmers and the environment a lot of water.

Senator O'BRIEN—Okay.

CHAIR—Do you represent Shenhua?

Mr Hooke—No.

CHAIR—What do we do about that? If you have mining companies in Australia that are sovereign-government funded, or partially owned, and which do not fall under your custodianship—

Mr Hooke—Just a technical point, if I may. We represent the industry and the member companies of the Minerals Council of Australia. We do not represent BHP Billiton or Rio Tinto—

CHAIR—No.

Mr Hooke—They speak for themselves.

CHAIR—You are as independent, I presume, as the people who pay you. BHP would contribute to the Minerals Council—

Mr Hooke—They do; yes.

CHAIR—But Shenhua do not.

Mr Hooke—No. They are not members of the Minerals Council of Australia.

CHAIR—As a general rule, do many of these sovereign Chinalco-type companies contribute to the—

Mr Hooke—The constitution of the MCA requires them to have operations here in Australia to be members. They could be associate members—like Freeport McMoRan is, for example, even though they do not have operations here in Australia. They wanted to become a member of the Minerals Council of Australia so that they could commit to *Enduring Value*, which is this practical guide to sustainable development. But your question is a good one. No. 1, we represent the industry. No. 2, the people who support the MCA in representing the industry are those member companies. No. 3, yes; Shenhua could become a member of the MCA. If they had operations here they could become full member. If they do not have operations here they could become an associate member, which means they would be part of the team.

Senator FISHER—Mr Hooke, is the MCA's membership list on the public record?

Mr Hooke—Yes; absolutely—and on the web.

Senator NASH—I am just trying to get a bit of an understanding in a practical sense of what actually happens when you hit an aquifer.

Mr Hooke—I am sorry.

Senator NASH—When you are drilling. I should have asked BHP before. We have had a lot of discussion about the impact on aquifers. What actually happens, or what can be the effects?

Mr Hooke—Are we talking about the 380 bores on the Liverpool Plains, of which 360 are already flowing bores? Or are we talking about our bores?

Senator NASH—I am asking for a layman's perspective when you are drilling if you hit an aquifer what can be the effects.

Dr Cummings—I am not a professional in this area but my understanding is that it depends on the pressure in the aquifer. For example, when we put a bore down sometimes we need to put a pump in there to pump the water out. Other times, if the pressure is sufficient and the depth and the bore hole is big enough, the water will come out. Then you cap the bore, as Mitch referred to before, to control that water flow.

Senator NASH—What about, as is often talked about, potential effects on the aquifer downstream? How does that process work?

Dr Cummings—The operations develop very complicated three-dimensional groundwater models that predict the impacts, which look like contour maps.

CHAIR—You do not know.

Dr Cummings—Then there are monitoring bores put into to monitor those impacts.

Senator NASH—Just what happens in terms of compensation, whether or not it is to do with aquifers or whatever, with mining, where it is determined that compensation is necessary? What determines that? How does it operate and how does that whole process work, if you like?

Dr Cummings—From a water perspective, in New South Wales, for example, the miners have to purchase water entitlements like anyone else from the state government or other users.

Senator NASH—What about where there has been an effect on the land itself? Again from a layman's perspective I was of the understanding that if there is a material change or where there is actually a defect to the land or where you are mining that compensation is paid in some instances? Or am I completely wrong?

Mr Hooke—Compensation in Queensland is under the Mineral Resources Act and there is also the coal seam gas act and the petroleum gas act. There are quite confusing differences in the legislative provisions. But they pay compensation upfront in terms of access to land. In terms of the Mineral Resources Act, that pays compensation that is made good under all sorts of provisions. I think your question is going to questions of compensation if there is a deleterious environmental impact. Is that where you are going?

Senator NASH—Thank you. That is precisely the phrase I was looking for.

Mr Hooke—I do not know the answer to that.

CHAIR—Can I add to that with the instance of the Hunter Valley evidence we received in Gunnedah where a Japanese coalmining company started a mine there. You can look at the record of the *Hansard*. They acquired a series of farm around it, including a dairy farm, and allowed the dairy farmer to continue to farm. Sadly, within 18 months or two years they had to shut the dairy farm down because not only the cows and the cows' milk were contaminated but also the water was contaminated. There was a direct impact on food production in the area. How does the Minerals Council think we can safeguard those events? The solution was just to get rid of the cows.

Mr Hooke—I do not know the answer to that and I am not even going to try to speculate for fear of putting you into another degree of hilarity that we do not know the answer and I am not going to try and muck you around. I do not know the answer in terms of the compensation aspect of those processes.

CHAIR—It was not a question of compensation; it was a question of farming viability. The viability of farming there was destroyed. So the solution was not to fix up the problem. They had already bought the farm. It was to shut down the farm and get rid of the cows.

Dr Cummings—Firstly, there are the existing regulatory processes in place where the impact are reported annually to the state government and there are existing community consultative committees that receive that information. So part of it is an adaptive management issue and approach.

Mr Hooke—It is the monitoring and the changing processes.

CHAIR—The actual dust and the contamination not only of the aquifer and the running stream eventually contaminated the pasture. The mine is still operating, it is just that the cows are gone. I agree that there is an important role for mining, but we are here giving consideration to protecting the agricultural land that is available in Australia. And it is not the Minerals Council or the government that has solved the problem in the instance of BHP's exploration right, it was actually BHP that solved the problem. So if we get miners that are not such good citizens then we could have a continuous problem.

Mr Hooke—Yes. And it goes to the point that we keep coming around to, and that is the intersection between the regulatory processes, the role of the sovereign state—in this case, the state governments—and the role and responsibility of the mining companies in terms of their social licence to operate. I gave that earlier answer because I thought we were picking up on the Senator's question about the compensation processes within the state legislation in terms of the deleterious impacts of mining as you go through the process. I am sure everybody appreciates that the regulatory requirements are such that, under the respective acts, not only are they required to put up annual reports about their compliance and monitoring processes but there are also requirements for remedial action. In answer to the question that I thought you were asking—'What are the compensation processes?'—I do not know, but I am happy to take a question on notice.

CHAIR—That was not my question. My question was about long-term viability. It is easy to go to the BHP boardroom, but it is a bit harder to go to a government overseas and try and convince them that they have made a mistake.

Mr Hooke—With respect, the requirement for ensuring that the conditions of the mining lease are met stipulate quite clearly the terms and conditions upon which that mining activity proceeds. If they have been not met, violated, not complied with or what have you then the onus is on the state regulatory authorities.

CHAIR—I understand that, but we are looking at something specific on the Haystack Plains and the Liverpool Plains. The solution has come from the miner, not from the process.

Mr Hooke—That is the point I was trying to make. We know that the regulatory problems have problems. We know that they are inconsistent. We know that they are not all that flash. We also know that we can do more from an industry perspective, not just as our own individual companies. That is why we keep talking about land-use planning processes. In all the public commentary I have had on this from farmers, every one of them comes back to their lack of confidence in the state regulatory processes and the desire to reform some of those.

Senator NASH—You spoke before about not knowing about the compensation processes for the deleterious impacts. Is that contained within the legislation? As you do not know about that, where would you direct the committee to find that information?

Mr Hooke—I said I would come back to you on that.

Senator NASH—No, you did not.

Mr Hooke—Yes, I did. I said I would take it on notice.

Senator NASH—If you could do that, that would be terrific. Finally, in your opening statement you made some comments about mines returning water to towns. Could you repeat for me what you said about that?

Mr Hooke—Yes. It was Bendigo and Orange.

Senator NASH—I am interested in Orange.

Mr Hooke—I said that, in regional towns like Bendigo and Orange, mining provides water for the townships, diversifying supply risks.

Senator NASH—How does that actually work in Orange? Are we talking about Cadia?

Dr Cummings—Yes. In Orange the mine has a water balance with a diversity of supply sources, including from the township. It also provides environmental flows back to the Belubula River, which are then available.

Senator NASH—My understanding is that there was a huge blue in the town because the mine actually needed more water.

CHAIR—You ought to go to Orange and find out the truth! The Cadia East application, which has just been knocked back, is intercepting the Belubula River—it is 30-odd gigs, a very small flow. The impact of that Cadia East proposition was going to destroy the whole show. I will give you the technical details if you want to know the truth about that. I will table them.

Senator NASH—My point was that the opening statement seemed to intimate that the mine was putting water back into the town. But I know that it had to go through council at some point to be given enough water for six months. It was a council decision to give them some more water. So I would perhaps be a little cautious about remarks of that nature.

CHAIR—As a consequence of the serious problem in the upper Lachlan, they are going to block the Lachlan at Condobolin at the end of October—and what is going on in the Belubula is contributing to that problem.

Dr Cummings—Our understanding is that the Cadia Valley operation attracts about 1.2 per cent of water from the Lachlan—1.2 per cent of consumptive use in the Lachlan.

CHAIR—With great respect, consumptive use and availability are completely different matters, because the run-off in the Lachlan system for the last four years has been zero allocation, except for one year, for general purpose water. There is going to be four per cent—2,500 megs high-security water—this year. Downstream from Condobolin every landholder and all the livestock are going to be cut off from their human critical needs water with the stroke of a pen. Senator Fisher, you have the call.

Senator FISHER—Mr Hooke, like Senator Nash I struggle to absorb all the wisdom that you delivered in your very rapid opening statement. You talked about compatibility between mining, existing land use and the environment. Are they the betweens? Are they the factors you are balancing in terms of compatibility?

Mr Hooke—Yes.

Senator FISHER—So it is compatibility between mining, existing users and the environment. Is the Minerals Council saying that there always can be compatibility between mining, existing users and the environment or that there always must be before mining proceeds?

Mr Hooke—Absolutely the latter, there has to be. In fact, as I said in my opening remarks—and I am sorry it was so rapid—was that there will be areas where mining and minerals development will be considered inconsistent with the protection of ecological, cultural and landscape values. You heard today one case study from BHP Billiton, which has said that where there is incompatibility then through a land use planning process the circumstances will designate their own outcome. I also made the point that communities have to be involved in the process, and the community's expectations of the requirement for the miners to actually return post mined land use to its pre mine classification is part and parcel of the process of getting project approval. That involves the community. It involves the stakeholders in the process. It involves an understanding on sound science of what is the prospect of being able to return post mined land to its pre mine classification. Therefore, if you cannot meet those requirements, then, ipso facto, the project will not proceed.

Senator FISHER—You are clearly saying that there must be compatibility. Let me take you back a further step. You have referred to cultural or social issues. Are you saying, in fact, that there must be compatibility between mining, existing land use, the environment and community or social or cultural? You used the word ‘cultural’.

Mr Hooke—I did.

Senator FISHER—Was that actually a third factor that must be put in the input end in determining whether there is compatibility between mining and these other things?

Mr Hooke—The project approval processes require there to be a consideration on a case-by-case basis of what is the protection of those ecological—

Senator FISHER—I understand your reference to the project approval processes, but I am asking about the Mineral Council’s position in terms of what there must be compatibility between before mining can proceed.

Mr Hooke—We are saying that—

Senator FISHER—You are telling me that in terms of determining compatibility you take community and social into account, which of course is very important, but I am inquiring at a more fundamental level. Are you accepting that community and social issues should be part of those factors?

Mr Hooke—Yes, we do. It should be one of the factors in determining whether or not a project goes ahead.

Senator FISHER—So must there be compatibility between mining, existing land use, the environment, and community and cultural expectations before mining can proceed?

Mr Hooke—Senator, you are trying to take me into a position where I am taking some sort of a perspective on what is a veto and what is not a veto. What I am saying to you—

Senator FISHER—I am just asking your view, Mr Hooke—

Mr Hooke—I understand where you are going.

Senator FISHER—and I am trying to understand it.

Mr Hooke—Are you going to keep cracking at this, or are you going to give me a chance to come back to you?

Senator FISHER—An answer would be good.

Mr Hooke—Yes, but I am not going to give you that kind of categorical answer. What I am saying is: those are all factors that are taken into account in the process of determining whether there is or is not incompatibility.

Senator FISHER—Okay. Thank you.

Mr Hooke—You are asking me to give you an absolute statement of what is or what is not, and I am not going to do that.

Senator FISHER—No, you have actually said—

CHAIR—With great respect: don't take the bait. Just keep calm, mate.

Senator FISHER—You have actually said you cannot do that, and that is an acceptable answer to me. Thank you for giving it. So, if I understand you correctly, you are saying: to the extent that compatibility gets determined, it is determined by a fabric of legislation and regulation and perhaps also—in the case of a BHP, if we accept the scenario that has been put to us today—the voluntary acts of a mining company concerned?

Mr Hooke—Yes.

Senator FISHER—Getting to the end point, I presume that, logically following through that sequence, it means that on some occasions there will simply not be compatibility between mining, existing land use, the environment and community and social expectations?

Mr Hooke—Yes.

Senator FISHER—In that case, is there ever anything that can resurrect that, or are you saying there will be some situations where mining cannot proceed because there is not compatibility?

Mr Hooke—I am not sure I quite understand the question. I agree that there will be instances where there is incompatibility. Prima facie you could argue that case. But you need to go through the processes to get there. I do not understand what you mean by 'resurrect'.

Dr Cummings—The way I interpret it is that it may not be acceptable at the moment to do an operation in a certain location, but community attitudes may change in five to 10 years.

Mr Hooke—And technologies.

Dr Cummings—And the resource value may change through time.

Senator FISHER—Well, indeed, if that is the factor between which compatibility is not met—it may well change over time.

Dr Cummings—Any of those factors may change over time.

Mr Hooke—And technology.

Senator FISHER—Thank you.

CHAIR—Do you agree that there should not be mining under flood plains?

Mr Hooke—Personally, yes.

CHAIR—On behalf of your—

Mr Hooke—That is not a question that I have put to my council in that respect, because it is actually a case-by-case and an individual company by company prospect—

CHAIR—That is the problem.

Mr Hooke—proposal, procedure. But you asked a nice question, from a personal perspective. From a personal perspective I could not envisage—and I thought you were going to ask me for an example—open-cut mining on the Jimbour Plain. I cannot envisage open-cut mining on the Liverpool Plains.

CHAIR—So, for instance, if Shenhua doesn't come to a resolution that is going to offset for giving up the flood plain on their exploration rights, would you be sending a message to Shenhua that you do not agree with them?

Mr Hooke—No, I would not do that.

CHAIR—Who would?

Mr Hooke—I would not get into the commercial underpants of our companies. I would not do that. But you asked me a straight-up question about what I personally thought.

CHAIR—That is fair enough and you gave a straight-up answer before, which I congratulated. I thank you for your attendance today.

Mr Hooke—No worries. Thank you.

CHAIR—We will just have a five-minute, old man's water break, and then be back.

[11.11 am]

MILHAM, Mr Nick, Director, Socioeconomic Evaluation, Industry and Investment NSW

MULLARD, Mr Brad, Executive Director, Mineral Resources, Industry and Investment NSW

CHAIR—Welcome. I remind senators that the Senate has resolved that an officer of a department of the Commonwealth or a state shall not be asked to give opinions on matters of policy and shall be given reasonable opportunity to refer questions asked of the officer to superior officers or to a minister. This resolution prohibits only questions asking for opinions on matters of policy and does not preclude questions asking for explanations of policy or factual questions about when and how policies were adopted. Officers of departments are also reminded that any claim that it would be contrary to the public interest to answer a question must be made by a minister and shall be accompanied by a statement setting out the basis of the claim. Would you like to make an opening statement?

Mr Milham—Firstly, we would like to assure the committee right from the outset that the New South Wales government is committed to ensuring the long-term viability of our two most important industries in rural New South Wales, agriculture and mining. Combined, these two industries are valued at around \$32 billion per annum to the state's economy. Agriculture in a typical year is valued at approximately \$9 billion and mining at \$23 billion. Agriculture employs 70,000 people and mining about 21,000 people. Together with multipliers, these two industries account for about 210,000 jobs in New South Wales. For the future of New South Wales, these two industries must coexist. Recent New South Wales government policies and actions show clearly that it is working towards this end.

The New South Wales government is aware of current community concerns regarding coal exploration and possible future mining in the highly fertile productive areas such as the Liverpool Plains. Some of the state's rich agricultural lands also overlie valuable mineral resources and concerns about resource competition have arisen. The geological processes that made that particular region excellent for agriculture have also provided the area with valuable coal reserves. However, if mining was unnecessarily—and I emphasise that word—excluded from prime agricultural land, it would significantly impact on New South Wales regional economies and the broader state interest.

Mining brings significant economic benefits and employment opportunities to people living in regional and rural areas of the state. This occurs through job creation, investment, community enhancement programs and regional development. Mining underpins towns such as Broken Hill and Cobar in western New South Wales and provides major economic stimulus to centres such as Orange, Mudgee, Parkes, Dubbo, West Wyalong, Gunnedah, Nyngan, Lithgow and Narrabri. Mining's contribution to regional New South Wales has been even greater as the state continues to go through the worst drought in its history, and it will continue to play a vital role in regional economies in the current economic situation. Importantly the ongoing viability of some farming communities will only be possible where individual businesses are able to access off-farm income from industries such as mining.

There is a strong regulatory framework in New South Wales to ensure that the impacts of mining activities on the environment, including agricultural lands and water sources, are considered and minimised. The regulatory framework also enables an appropriate balance to be achieved between competing land uses. This framework comprises legislation, regulations, environmental planning instruments, policies, guidelines and supporting information.

The government's development assessment process is extensive, transparent and rigorous and provides for full community input. The legislation of primary importance for mining and exploration is the Environmental Planning and Assessment Act 1979. The Mining Act 1992, the Petroleum (Onshore) Act 1991, the Protection of the Environment Operations Act 1997, the Water Management Act 2000 and the Water Act 1912 are also significant instruments.

It is important to recognise that an exploration licence is not an approval to develop a new mine; rather, an exploration licence allows a company to undertake exploration and environmental feasibility studies only and is subject to stringent environmental conditions. In New South Wales any new mining proposal is subject to an environment assessment process under the Environmental Planning and Assessment Act. That addresses all potential impacts of the proposal, including cumulative impacts. Coal projects, for example, require a major project approval from the Minister for Planning under part 3A of the EP&A Act. As part of that process a comprehensive environmental assessment must be prepared by the proponent, which is subject to public exhibition and agency consultation requirements. The EP&A Act uses merit based assessment processes that weigh up the competing values of land and requires all relevant values to be assessed in order to achieve an appropriate balance between mineral development and agricultural and environmental values.

As this committee is well aware, there is currently conflict between agriculture and mining on the Liverpool Plains. Coalminers Australia Pty Ltd, a subsidiary of BHP Billiton, and China Shenhua Energy Company hold exploration licences in the Gunnedah area. There are also a number of petroleum exploration licences held in this area. On 1 September 2009 the New South Wales government announced an amendment to the special conditions of BHP Billiton's exploration licence that will quarantine the flood plains from longwall and open-cut mining by BHP. These measures were introduced to protect prime agricultural land on the flood plain and deep alluvial irrigation aquifers in the Liverpool Plains from longwall and open-cut mining.

An exploration licence was granted to China Shenhua Energy Company in October 2008. As already highlighted, the exploration licence allows the company to undertake coal exploration and environmental feasibility studies only. While undertaking these activities the company is required to adhere to stringent environmental conditions. In New South Wales the Minister for Mineral Resources, the Hon. Ian Macdonald MLC, is also the Minister for Primary Industries, which includes agriculture, forestry and fisheries. A combined mining and agricultural portfolio encourages a more informed analysis of state development and creates balance, reduces conflict and encourages sustainable growth in both the mining and farming industries. Mining and farming must coexist for the long-term benefit of regional communities. The focus should be on working to ensure that we can make the best use of both sectors for the benefit of the community. Recent government policies and actions show clearly that the government is working towards this end.

Given community concerns, the Hon. Ian Macdonald MLC initiated discussions with both agricultural and coal exploration and mining interests in the Liverpool Plains. Agreement has been reached on the scope and terms of reference for a water study in the Namoi catchment to consider these issues. In accordance with the governance structure outlined in the agreed draft terms of reference, the minister has established a ministerial oversight committee to progress the water study. This is a small, high-level representative group comprising an independent chair and representatives from key stakeholders. The minister has appointed Mr Mal Peters, former President of the New South Wales Farmers Association, to be the independent chair of this committee. That committee had its inaugural meeting on Monday, 24 August. The ministerial oversight committee will liaise regularly with the stakeholder advisory group, who will keep the local community informed on the progress of the study. This group will have wide representations to ensure transparency and inclusiveness.

The process I have just outlined indicates that the New South Wales government is responding to community concerns. We are confident that our regulatory framework ensures careful consideration of agricultural, mining and environmental values that will result in appropriate outcomes. I note that the issue of mining and its impacts is being considered through other forums as well as this committee. For example, the National Water Commission has commissioned a study on the potential local and cumulative impacts of mining on groundwater resources. The study is being progressed through the auspices of the water working group under the Ministerial Council on Mineral and Petroleum Resources. As well as responding to this Senate committee, the New South Wales state government has provided a submission to the Senate inquiry into the impacts of mining in the Murray-Darling Basin.

CHAIR—Thank you very much. I extend our appreciation to the New South Wales government for allowing you to be here today. They obviously knew what we were like, because they sent a big bloke! Mr Mullard, you originally attended a meeting with the community up there before all this started. Could you describe your first intersection with the local community, when that might have been?

Mr Mullard—Sorry, I am not quite sure which meeting you are referring to.

CHAIR—The very first meeting you attended with the community groups.

Mr Mullard—Which? I have been to—

CHAIR—You attended a meeting with a group of people who are now the Caroonia action group. There was a view put to you at the consultative meeting that no mining exploration should occur until the water study was complete. Do you recall that?

Mr Mullard—No, I do not. The water study has only been announced in the last—

CHAIR—It is not a question of being announced. The proposition was put to you, as I understand it—and I can get you some contemporaneous notes of the meeting—that no exploration should occur until the water study had been completed. You do not recall that?

Mr Mullard—I do not recall that.

CHAIR—I will provide you with the contemporaneous notes. At that meeting, according to the contemporaneous notes, you said, ‘We are going to go ahead anyhow.’

Mr Mullard—I do not think I would have said that.

CHAIR—I will provide that for you. Not selling the Snowy was a really good example of a community group taking action. The federal government and the state government wanted to sell the Snowy. Do you think the problems we are now highlighting would have been highlighted if the community action had not started? Do you think the system was adequate given that the mining act does not actually talk about water?

Mr Mullard—The mining act is not there to govern water. We have different acts that govern water, including the EP act and the Water Act. So the mining act is not the instrument for management of water issues. Community groups, whether it is the action group or other community groups, are very important in actually raising issues and informing companies and governments about the sorts of issues that need to be addressed in their assessment of the area.

CHAIR—We are pleased to see BHP has stepped up to the plate and come to an arrangement, which is now set, as they say, in stone. Where are you up to with Shenhua, who declined the invitation to appear here today?

Mr Mullard—In what context?

CHAIR—I understand there may be some negotiations.

Mr Mullard—I am not quite sure what you are referring to.

CHAIR—What I am referring to is the fact that BHP has been quite happy, as good corporate citizens, to legally bind themselves from mining the flood plain.

Mr Mullard—Yes.

CHAIR—We would like Shenhua to do the same. My understanding is that they are negotiating for an offset.

Mr Mullard—I think they are commercial matters which you need to raise with Shenhua.

Senator NASH—We would love to!

CHAIR—Can you at least tell us that they are negotiating?

Mr Mullard—They won a tender area. I think they have raised issues regarding the flood plain area, but I am not aware of negotiations regarding that.

CHAIR—So if you are not aware of it, what is your role?

Mr Mullard—I am the executive director.

CHAIR—And you do not know about it?

Mr Mullard—When I say they have raised issues about the flood plain area, I am saying to you that I am not negotiating—

CHAIR—Who is negotiating?

Mr Mullard—I am not aware of who is negotiating with them.

CHAIR—Are you aware there are negotiations?

Mr Mullard—I am aware that they have raised issues but I do not think there are any negotiations.

CHAIR—Do you think it is a bit too sensitive to go any further?

Mr Mullard—I think I have answered the question.

CHAIR—No, you have not.

Mr Mullard—They have raised issues with the government in the sense—

CHAIR—Are you aware of the issues?

Mr Mullard—that they have stated that they will not open-cut mine on the flood plain. They are on the public record.

CHAIR—In return for?

Mr Mullard—Not in return for anything. They made that statement on *Four Corners*.

CHAIR—Are you saying there are no negotiations underway between Shenhua and the government for them to be compensated with other areas in return for not mining the flood plain?

Mr Mullard—I am not aware that there are any discussions with government regarding that. I know they might have raised issues regarding it. But I am not aware of any negotiations.

CHAIR—You have not attended any of the meetings and none of the people that fall under your responsibility have attended the meetings?

Mr Mullard—I have met with Shenhua but we are not negotiating. There is no compensation in terms of what is happening with the flood plain. These are public statements Shenhua is on the record as saying.

CHAIR—My understanding is that there are negotiations.

Mr Mullard—Well, there could be negotiations with other parties that I am not aware of, but—

CHAIR—Thank you very much. What this is really all about is the protection of good farming land. As a principle, do your department and the people you represent agree that it is not wise to mine under agricultural flood plains?

Mr Mullard—My department—that is a matter of government policy.

CHAIR—What is the government's policy?

Mr Mullard—The government policy is that there is a process that we have in place which actually assesses the environmental impacts through the process and that basically then decides the outcome on a case-by-case basis.

CHAIR—So in the case of the establishment, as it has been established on this flood plain, that if it were to be longwall mined the flood plain would collapse, in those circumstances, according to the government policy, would that exclude mining under a flood plain?

Mr Mullard—BHP has agreed to restrict longwall mining.

CHAIR—I am asking what the government policy is.

Mr Mullard—There is not a government policy. As I said, government policy is there is a process that goes through the assessment on a case-by-case basis.

CHAIR—The government policy is not as detailed as to say that if there is a circumstance, which has been established on the Liverpool Plains, whereby if you mine under it there would be subsidence—you do not have that black and white policy?

Mr Mullard—No, it is a case-by-case assessment.

Senator O'BRIEN—You are treading a very narrow line which is bordering on asking the witness to comment on government policy, which you are not allowed to do under standing orders.

CHAIR—I appreciate that remark. You can tell me to butt out whenever you want to. Shenhua have paid \$300 million for an exploration right, which is handy in the government coffers. BHP has paid \$100 million for a similar exploration right. I have asked the question, 'Why the extra money?' and the answer was that they just wanted to make sure they got it. If they insist on mining under the flood plain, is there anything you can do to stop them?

Mr Milham—We cannot pre-empt the process that would be followed. Shenhua, as in the case of any other company, would need to put up a proposal of what they are intending to do and then that proposal will be assessed.

CHAIR—But it has been established that it would damage the flood plain and hence the food production, which we are interested in. BHP have recognised that. If Shenhua, or anyone else for

that matter, decides not to recognise that—if it is in their better corporate interests to ignore that—then, given that you have already established with BHP a precedent, wouldn't that set a legal precedent for the rest of the miners for you to use to lock out mining on the flood plain?

Mr Mullard—No, it is actually done on a case-by-case assessment of what the impacts will be.

CHAIR—It is the same flood plain. Is there a possibility that Shenhua could still mine under the flood plain if they wanted to?

Mr Mullard—As I said, the process is that they would have to put forward their plan about what they are going to mine and what the impacts would be. If they can demonstrate that they can safely mine in any area then they may, although not necessarily, through the process get approval.

CHAIR—So if they provided evidence that flew in the face of BHP's position and convinced the government that it was not going to hurt the flood plain then you would let the mine under the flood plain?

Mr Mullard—It is not a case of me letting them mine—

CHAIR—No, not you; I am talking about the government

Mr Mullard—It is about the process of assessing what the impacts will be and what conditions will apply to any mining activities. There are mining techniques that do not have any surface impacts.

CHAIR—Could you describe those mining techniques?

Mr Milham—Yes, it could be a tunnel. You could put a tunnel under Sydney and have no surface—

CHAIR—Yes, but we are talking about a commercial coalmine. Are there commercial coalmining techniques other than longwall or open-cut mining—which is the question that Senator Nash asked earlier –which could commercialise mining under the flood plain which we do not know about?

Mr Mullard—I cannot comment on whether it could commercialise mining under the flood plain or not.

CHAIR—Obviously tunnelling is the same as a rabbit warren. You can do that sure enough. But you said there are mining techniques—

Mr Mullard—There are mining techniques whereby—

CHAIR—Commercial mining techniques.

Mr Mullard—Commerciality gets back to the price of coal and what the operational costs are.

Senator NASH—Just following on from that, have you been here all day?

Mr Milham—No.

Senator NASH—Okay. One of the questions I asked earlier of BHP was to try to determine, and this is obviously within the purview of the state government and the legislation, the point at which a mining licence is granted. I am trying to understand if there is an impact that has been determined on the water system, and obviously BHP have said that is a matter then for the minister and the government to determine if they are going to get approval, what criteria do you use to determine if an impact on the environment or on a water system is too great and you then say, 'No, the mining cannot proceed.'

Mr Mullard—We are not the body that actually undertakes that assessment; that is undertaken by the New South Wales Department of Planning.

Senator NASH—Do you know what it is though? Do you have any understanding of what it is?

Mr Mullard—It is actually not a simple equation.

Senator NASH—I am getting that impression.

Mr Mullard—It is actually a very broad assessment of a whole range of issues. Clearly mining has quite a significant local impact. No-one is denying that mining has a significant local impact. Basically the assessment takes into account a whole range of factors such as water, subsidence impacts, dust, noise, lighting and the economic impact on the community. It is a very broad and comprehensive assessment.

Mr Milham—The requirements of the assessment process are set out in those planning instruments that we mentioned in our opening statement. They are very comprehensive. They allow the concerns of different community interest groups to be expressed and to be taken into account. So if, for example, as Senator Heffernan has already outlined, there is a concern about the long-term impacts of longwall mining then that would be heard as part of that process.

Senator NASH—I suppose this is the point I am getting to—there is simply no clear-cut way of determining what a minister would base their decision on. You may potentially have an instance where a mining company such as BHP, as we said earlier, might think there is no significant impact on a water system whereas a community group might think there is. It is becoming very clear—and I know it is difficult to have it—that the criteria upon which the minister is going to base a decision if there are two conflicting views is very, very grey. Would that be correct? Obviously there is no simple way. Maybe I will go to the New South Wales Department of Planning and see if they have a clearer way of putting it. I suppose what I am asking is: is there not the ability then for it to be a ministerial judgement on which way to go in that particular case, rather than basing it on a certain set of facts or criteria? How does the

minister decide between what the mining company says and what a community says in that instance?

Mr Milham—There are no concrete rules. It is not a case of ticking a box or moving down the decision tree.

Senator NASH—And that is the difficulty, isn't it?

Mr Milham—At the today it becomes—

Senator NASH—Subjective.

Mr Milham—A case of weighing up different views and opinions and it becomes a matter of judgement.

Senator O'BRIEN—And this is subject to the courts as well in the way they exercise their powers under the law.

Mr Milham—The judgement is made by the Minister for Planning on those major developments, and those judgements are subject to appeal.

Mr Mullard—I should point out too that quite often for major complex projects the minister will actually convene an expert advisory panel to hear evidence and call for submissions so he can take advice very broadly from experts in the field. As Senator O'Brien has said, any decision of the minister can be subject to appeal through the Land and Environment Court New South Wales.

CHAIR—But at this stage there is no way of guaranteeing that someone in the future will not mine under the Gunnedah flood plains.

Mr Mullard—As I said, there is a case-by-case assessment of each project as it comes forward. So if you are asking if there is a blanket ban on mining then there is not, because it is based on an assessment of the exact type of mining and the mining impacts.

CHAIR—Given the history of that Japanese mine in the Hunter where they got all their environmental planning approvals and started to mine and then discovered the contamination of that dairy farm, which had to have its cows removed, what do you do in a case like that? The horse has bolted, hasn't it?

Mr Mullard—I am not familiar with the exact example you are talking about, but what we are saying is that mining does have local impacts and certainly those impacts can be significant when the operation is underway. Mining does rehabilitate the land and it does mediate the impacts in many respects in terms of dust and noise. If you have an open-cut mine then clearly during the term of that open-cut mine then that land cannot be used for agriculture while the open-cut mining is taking place. But we have plenty of examples in the Hunter Valley where rehabilitation has been very effective, including rehabilitation of class 1 and class 2 land back to class 1 and class 2.

Mr Milham—We would also make the point too—and obviously there was unforeseen outcomes in the particular case you mentioned; and I am not familiar with the particular case you were referring to but it sounds to me like there were unforeseen outcomes—that hopefully the assessment process reveals all those types of outcomes and allows them to be taken into account.

CHAIR—Obviously it did not in that case.

Mr Milham—It did not in that case.

CHAIR—The community is worried, and that is why the mob up at Gunnedah are worried.

Senator NASH—We only have a couple of minutes left so I have a couple of very quick questions. Before the exploration licence was initially granted was there any consideration given to the fact that there had been a 62 per cent reduction in allocation for the water up in the Namoi Valley bringing it down to a sustainable level, so there had been a significant reduction in the water available to farming land anyway. Was that taken into account before you gave the exploration licence?

Mr Mullard—The purpose of an exploration licence is actually to explore further resources. It is not an approval to mine.

Senator NASH—We understand all that.

Mr Mullard—It is irrelevant in terms of the water allocation.

Senator NASH—And that is from the basis of you saying that the exploration licence will have no impact on the community.

Mr Mullard—No, it is on the basis that any allocation required for mining would be a separate consideration of the approvals process.

Senator NASH—I am not talking about the allocation of water for mining; I am talking about any potential impact at the exploration stage that might exist on a region which has obviously had its water capacity lowered significantly.

Mr Mullard—For any drilling operation there is an assessment undertaken of the impact of that drilling operation on the environment, including the water resources in the region.

CHAIR—Have you had complaints about those drilling operations in terms of them not having been capped correctly?

Mr Mullard—We have had issues that have been raised by the community with regard to the drilling operations, and I believe our people have investigated any complaint. If there are any other complaints we will investigate.

CHAIR—And upon investigation they were satisfied there is not a breach?

Mr Mullard—I am not aware of any outstanding issues.

Mr Milham—Senator Nash, just to respond further to your question about water, because the exploration licence does not require a water allocation, they are not an extractive user.

Senator NASH—No, I was not asking from that perspective. But that is fine. Sorry, Mr Milham, we just have not got much time. In your opening statement you said something about mining being unnecessarily excluded from prime agriculture land. I think that is what you said.

Mr Milham—Yes.

Senator NASH—Could you read that out for me again?

Mr Milham—I said if mining was unnecessarily excluded from prime agricultural land it would significantly impact on New South Wales regional economies and the broader state interest.

Senator NASH—What do you think would be the reasons for it to be unnecessarily excluded?

Mr Milham—It would be as a result of a case-by-case assessment process that at the end said, ‘No, we will not approve this mining application.’ That is an assessment process that determines whether or not it is appropriate for the proposed mining activity to take place or to not take place in the state interest.

CHAIR—Thanks very much of your attendance. Once again, we are very grateful.

[11.43 am]

CRAFTER, Mr Samuel James, Senior Adviser, Public Affairs, Santos Ltd

KELEMEN, Mr Stephen Gyula, Manager, Coal Seam Gas, Santos Ltd

PURTILL, Mr James Anthony, Manager, Community and Environment, Santos Ltd

CHAIR—Welcome. Would you like to make an opening statement?

Mr Crafter—Given time constraints, obviously I will not go into the elaborate opening statement that we have here. Thank you very much for the opportunity to come and discuss our operations with you today. The four key points that we would like to register before we get into a question and answer session is, one, the important role that we see for gas as Australia's next strategic advantage in energy. By way of explanation, the handouts are a map of our acreage position and then just some pictures that reference some of the things that we are talking about and operations that might be useful as we go along. We have made a submission to the energy white paper process that is currently underway, around the real benefits we see for Australia in transitioning to gas-fired power as we move to a lower carbon economy. We see energy security and food production working hand in hand rather than in an either/or situation. The other key things we want to talk about are coal seam gas production and water management, and we also just wanted to highlight the small footprint of the gas industry and our ability to coexist, we believe, with agriculture, and to point out where else we do that.

They are the key points we wanted to register. I think it is apparent that the agriculture sector's demand for energy is forecast to increase, along with the energy demands of the associated transport and storage sectors. So we think there is an increased role for gas in providing that power generation. There is a benefit in the broader process that is involved in food production.

With regard to the water work, we have also been involved in the working group around the Namoi catchment-wide water study. We have also made a commitment to contribute funds to the study. Along the lines of your conversation with BHP, a lot of clarity is not there yet, about amounts and budgets et cetera but we are working with that process.

We will be a part of the stakeholder advisory group. We have put forward our nomination. We have not been accepted yet but there are two spots in that group for representatives of the petroleum industry, so we are hopeful to be one of those representatives. APIA is our industry organisation on the ministerial oversight committee. Whilst the process of developing the terms of reference was long, I think it was very beneficial to have all the people around the table together to nut out the terms of reference and agree a way forward for that water study, which will be a very useful tool for the New South Wales government and for the community and the industry as well.

The other point around water is that our current exploration program in core holes and seismic work that we are doing does not produce any water. Obviously, we drill down through aquifers. We have a range of casings. We can talk to that—one of the pictures outlines the details of that—

but as we move forward into our pilot testing phase and then into production that is where the issue of produced water comes in. So, we—James in particular—can talk to the sorts of things that we are doing to get a beneficial use for that water. Given that we are not there in New South Wales at the moment, the work we are doing is in Queensland but the philosophy of finding a beneficial use for the water is what we really came to demonstrate. Obviously, we will need to tailor that to the circumstances of our operations in New South Wales as we go forward.

The only other point is that our operations in Queensland—and also in the Cooper Basin and in Victoria—have shown that agriculture and gas extraction can coexist successfully. As the population increases there will be multiple uses of land. We think that rather than quarantining land, to meet that demand for food and energy we can work together on the land—especially because in our case, given the size of the footprint of the gas industry, you can have both operating from the same land.

Senator O'BRIEN—You have supplied us with some documentation of your process. Can you tell us about what you say the impact of your process is on any aquifer which the drilling process penetrates?

Mr Kelemen—In front of you are a number of pictures, but essentially when we drill a well we drill through the surface aquifers, we case off and cement behind that to about 200 metres deep and then we drill down through the next lot of strata. Before we get to the coal seams, which are between 400 metres to 1,000 metres deep—so we are quite deep—we have another casing and cement that off. And when we cement the casings off—both the surface casing and the intermediate casing—we pressure test the cement behind the pipe and also get returns to surface to ensure there is integrity in the cement and there is no communication between the various strata. Then when we are down at the intermediate casing we are at the coal—the deep coal, which is well away from the aquifers or the fluvio-aquifers—then we core ahead to do our exploration program.

Senator O'BRIEN—So you just keep drilling until you find—

Mr Kelemen—We are in coal. We core the coal and then we plug and abandon the well.

Mr Crafter—Run through the plug and abandon process.

Mr Kelemen—You just cement back. There are certain criteria to keep the strata separate—not in pressured communication—across the various sections of the well bore and we then plug the well off and cap it at the surface.

Senator O'BRIEN—Can you describe the impact upon each of the aquifer fields that you might strike in that process?

Mr Kelemen—In the surface aquifers, we would drill through the first, say, 100 metres with a water based drilling mud containing potassium KCL, potassium chloride, and some other non-toxic polymers for lubrication and to stop swelling. We measure any water loss. We look at returns, and we do not get any water loss. If you get water loss you have a problem and you have to address it. Then we case off. So, as far as we can see—

Senator O'BRIEN—So that is at the points where you enter and exit the aquifer?

Mr Kelemen—We continuously measure fluid loss during the drilling process so, if we do lose fluid, we see it, and we address the problem. Our drilling records—we have only drilled about 15 wells so far—show that we have not lost any fluid over the aquifer areas. It is in balance. The reason for that is that, as we drill, cuttings in the well bore—very fine bits of rock, shale and sandstone—build up around the circumference of the hole, which is about 8½ inches, and plug up the intersection between the aquifer and the well bore. That forms a sort of a barrier. The hole is only open for a couple of days and then you cement it off and make that barrier permanent.

Senator O'BRIEN—It sounds so simple. How far below the surface are you when you do this?

Mr Kelemen—We drill to about 1,400 or 1,500 metres below ground. But the aquifers of importance, the ones used by the pastoralists, the fluvial aquifers, are the shallow aquifers, the ones in the first 100-odd metres.

Senator O'BRIEN—How deep are the aquifers that you are striking above the coal seam?

Mr Kelemen—Above the coal seam there is actually shale. So you have a basin with surface aquifers, and the coal dips down under the basin. We are worrying about the coals at depth—typically between 400 and 1,000-plus metres. Between the coals and the aquifer there are impermeable barriers, typically shale, clay and that sort of material.

CHAIR—Is there going to be leakage? I was at a motel in Coonabarabran the other day and the joint was full of Santos people. Just say you are mining, not exploring, in the Great Artesian Basin. Can you give us an idea how much water you are going to draw out with the gas, what you are going to do with it and the saline et cetera content of that? Is there scientific evidence that you can rely on that there will not be leakage and changed behaviour with the shallower aquifers?

Mr Kelemen—First of all, we are not really mining; in the petroleum business we are drilling. So, after the exploration phase, if we get to a test or production phase, the well bore designs are essentially very similar to the core holes. So you are again drilling well bores, and that is all you are doing, and they are not too different from a water well bore. We have certain criteria to maintain integrity. Again, you drill through your aquifers, you cement off, you measure any fluid losses, you do intermediate casing and you cement off. During the life of those wells, you would, historically, measure the pressure in the production casing and the intermediate casing. You would monitor that pressure for changes and for integrity problems—

CHAIR—So there is a scientific indicator that you can rely on that, because you are creating a vacuum, as it were, in the lower aquifer, if there is connectivity with the shallower aquifer it will show up—

Mr Kelemen—It will show up in a couple of things: pressure monitoring and also your production fluids.

CHAIR—Has that happened?

Mr Kelemen—We have not drilled any production bores in this area, but are you asking whether it has happened historically in the industry?

CHAIR—Anywhere, yes.

Mr Kelemen—Occasionally you get some casing which fails, yes. It might not be aquifer; it might be other sandstone, but—

CHAIR—You are greatly assisting the committee and I thank you for that. But, if you have a shallow aquifer, how can you be confident that the lower aquifer that you are drawing the seam gas out of is not connected somewhere? If you obviously depressurise one then you are going to have changed behaviour in the shallower aquifer.

Mr Kelemen—There are two elements of pressure communication. One would be natural pressure communication through the strata, where it onlaps or subcrops. The second one would be through the well bore. We would monitor that through pressure through the production of fluids. So, in your production of fluids, you monitor by sampling the gas and the water that come out of that well bore. If the water or gas composition changes, if there is gas in different aquifers, you would see that through different composition and then you would investigate what caused that, along with the pressure data. So you have methods, procedures and tests to monitor the integrity of the well. If you do have an integrity breakdown, you repair the well bore. In other words, you have methods of finding out where the leak is. If there is a leak, you perforate the casing and re-cement it—

CHAIR—I apologise, but I am really referring to a geological escape route.

Mr Kelemen—I will get James to address that.

CHAIR—I am not a mechanic.

Mr Purtill—Senator, you are worried about whether connectivity between two aquifers will deplete the upper aquifer.

CHAIR—Yes, because in that particular region of Gunnedah they really have not completed the science on the connectivity between the Namoi aquifer and the Great Artesian Basin. They intersect, and then you are going to be a further intersection of that.

Mr Purtill—Yes. I think I understand the question. Typically, coal seam gas will be present because that aquifer is under pressure. So, by definition, it has to be largely isolated from other aquifers. I will not say it has to be 100 per cent isolated, because, if you look at the environmental impact statement for our work in Queensland, you will find there is a portion of one of our fields, the Fairview field, where there is an intersection between the sandstone aquifer that is drawn on by the agricultural community and the coal seam. Over a prolonged period of depressurisation of that coal seam we will potentially see some impact in bores in that vicinity—we are looking at four bores, in fact.

So I would agree, and it is very important that we understand the regional hydrogeology of our various layers. The fact that there are over 300 metres between the two is a very positive step, but it is early days. We have only drilled 15 core holes in this area. Ultimately, before any type of production scenario, as you have heard before, a hydrogeological model will be developed—we have had three models for our work in Queensland—to start to predict the relationship between potable aquifers and the saline aquifers that we draw upon. I suppose the key thing for the committee to know is that, typically, coal seams are not exploited for any agricultural purpose because of their salinity, which poses other challenges for us when we go into production, of course, but I am sure we will get onto that. But it does mean that the aquifers are not directly competing with any alternative source of groundwater use. We will monitor that. It requires a comprehensive groundwater monitoring program that starts with a baseline. Before you start that activity you model and predict those relationships and ensure you understand the geology. Then you monitor through the life of the production. That is our modus operandi.

CHAIR—Thank you very much for that. In terms of the volume of water you are going to extract, is there a proportionate sum that you could indicate to the committee—how many cubic feet of gas there are for however many cubic feet of water, or however you like to measure it?

Mr Kelemen—There is a big uncertainty range. Until we do our pilot testing the range could be from negligible to very large. We do not know at this point in time.

CHAIR—With coal mining it is between 100 litres per tonne and 1,000 litres per tonne. You face the same.

Mr Kelemen—In some of the fields we are producing there is actually no water, so there is no water in the coal; in other areas there is a lot of water. There could be—

CHAIR—I suspect there will be water up here.

Mr Kelemen—I suspect there will be too.

CHAIR—In terms of dealing with that water, and I do not know whether it is your mine or not, in Queensland where you are taking it to an island somewhere to do something—grow trees with it or something. Is that you fellas?

Mr Purtill—Yes. We have a tree plantation but it is on a property; it is not on an island. It is near Injune in Central Queensland, north of Roma.

CHAIR—It must have been someone else's. They were going to take it offshore.

Mr Purtill—That is one of the ways that we are using the water that is produced from coal seam gas operations.

CHAIR—What sort of salinity level is it—how many parts per million?

Mr Purtill—I can tell you exactly. On average in that field, it is 1,400 ppm.

CHAIR—Would that support a barramundi?

Mr Purtill—No, you would go saltier. But it has been put to us, I assure you. No type of aquaculture would use up enough of the water we produce. We have looked at it. There is nothing wrong with the principle, but it just does not use up enough water.

CHAIR—What is the volume of water? Is it 10,000 megalitres a year, or five megalitres? How much water would you expect from a middle level gas extraction?

Mr Purtill—For the proposed project to supply a three million tonne per annum liquefied natural gas plant—that is a lot of gas; it is nominally 700 terajoules a day—we are looking at a peak water production of around 65 megalitres per day. Let us put that in context. It is across 7,000 square kilometres.

CHAIR—Is that the exploration area that you—

Mr Purtill—No, it is nothing to do with New South Wales. This is in the Queensland context. I will draw on that because that is where we are doing our work. Rather than talk about what might happen in the future, I can highlight to the committee what is happening today.

CHAIR—How do you manage that water? Do you just grow trees?

Mr Purtill—No. We have a variety of strategies. We have what is called an associated water management strategy. We have a suite of principles around how we want that water used. The first principle is that we want beneficial use to come from the water. It obviously must be in environmentally benign. Therefore, depending on the water quality, which is typically about its salinity, there will be a variety of different uses. We will apply water that has been emended for its sodium absorption ratio, its ability to cause erodability in soil. If it has low salinity we will use it for direct application for irrigation purposes, which I am very happy to talk about. Water with higher salinity we put through a reverse osmosis plant. Typically the salinity after reverse osmosis will be between 200 ppm and 500 ppm. And then we have very good quality water.

Senator NASH—I am interested in the steps that you go through to gain access to property to drill.

Mr Crafter—We have a standard agreement. We have some land access people based out in Gunnedah. We make an approach via phone or go and see them.

Senator NASH—Knock on the door.

Mr Crafter—Yes. Mark Rogers is our guy out there who does most of that work. He is from the area so he knows a lot of people. That makes the process work a lot more easily than if it was someone coming from outside. We have a discussion around the interest from the farmer. If there is interest to have us do an exploration well on the property, we have a standard land access agreement that we use across our business. That is provided to the landowner. We also, I understand, assist with legal costs for the landowner to get a lawyer to go through it from their perspective.

Senator NASH—Is there any cost to the landowner for those legal costs, or do you foot the whole bill?

Mr Kelemen—There is a cap on it. I do not know what the cap is but it is for reasonable legal costs.

Mr Crafter—The intention is to cover the cost. Once there is agreement, there are also negotiations around where on the property the access would be, access to plants and other things that the individual landowner might want to discuss. For example, if we are clearing a pad, they might want it for something else afterwards. There are a whole lot of arrangements that are negotiated on a one-on-one commercial basis with the landowner within the bounds of that standard agreement. Once that agreement is signed off we then go through the process of preparing the lease area as per the agreement and move through the exploration phase.

Senator NASH—Is there a standard value for access to a landholder, or is that negotiated?

Mr Purtill—It is standard for us, but it is not industry standard. We would have parity.

Senator NASH—I am just asking for Santos's perspective.

Mr Purtill—Yes, it is.

Senator NASH—If somebody says they are not particularly interested, do you up the ante?

Mr Purtill—That would be disastrous.

Senator NASH—Okay, so what is on the table is on the table. What happens if there is a particular piece of land you really want to drill in and the landholder says no? Do you just walk away and say, 'Gee, that's a bit of a shame,' or is there a step 2 in the process?

Mr Kelemen—There is a step 2. In the exploration phase we are doing now we have alternative sites to go to. We have preferred drilling sites but, if we cannot get access because we cannot get agreement there, we have got a plan B and a plan C. Our preference is to get agreement with the landowner and prove our worth and the benign impact we will have. Under the legislation there is an arbitration process through the various courts to get access. We have not pursued that at this stage, but if at sometime in the future we have a development plan blocked and we find it difficult, that option is open to us.

Mr Crafter—But if you look at our Queensland operations as an example—

Mr Kelemen—We have never had to do that in Queensland.

Senator NASH—I accept that you have never had to do that, and I hope that you never do, but there is a step 2. Could you just explain that clearly for me again. If the landholder says no, and you really want to go there and drill, how does the arbitration work?

Mr Crafter—It is a formal legal process under the act. I am not a lawyer, but I can give you a summary. I think we issue a notice outlining our desire to enter the property for the purposes of exploration. They have a period of time to come back to us. I think it is a set period of time. It might be 28 days. Then there is another point where the formal selection of an arbitrator kicks off. After that, you enter the arbitration process. As I said, we are not that familiar with it.

Senator NASH—I am very pleased to hear that. That is quite interesting. Having that process in place takes away the ‘No means no’ from the landholder, doesn’t it?

Mr Crafter—It does in that the process has always been there under the Petroleum Act. I suppose where we are coming from is that in our operations in Queensland, which have led to the project that we are talking about and the sizeable dealings with landholders across a wide range of land, we have not had to go down that path. Our practice is really about building relationships with the landowners upfront. From the outset, before we did any exploration we went and engaged a range of community groups, local councils and chambers of commerce. We also had a meeting with the Caroon Coal Action Group. We said: ‘This is what we do and this is what we are coming here to do. We want to engage with the community.’ I think we have had 10 committee information sessions over the last 18 months. We were at AgQuip a couple of weeks ago, where 1,500 people came up and had a chat to us. In general we are trying to engage and work with the community about what we want to try and do. That is what has worked for us in Queensland, so we would like to do that. But is there a fallback process? Yes. Is it our intention to avoid using it at all costs? Yes, it is.

Senator NASH—Okay, that is good. I asked the questions knowing that, in Queensland, you have not had to do it. I was just trying to get an understanding of the process for whoever wants to come in and do it. I find it interesting that, from a landholder perspective, ‘no’ does not actually mean ‘no’, that there is another avenue that companies can use to try and gain access—which makes it very difficult.

Mr Crafter—The other thing is that our exploration is across 20,000 square kilometres at the moment. We have done, as we said, 15 core holes and we have a program of 23. We combine that with the seismic data of about 500 kilometres that we have shot over the last 18 months. We are at the stage where we need to analyse that data once the core hole program is finished. From there we will be able to determine where we want to move in terms of our gas area. That is the process, and we are really early on in that process. Then we would go into pilot production around some areas and see if that works. So there are a whole lot of processes along the way. As Stephen said, in the core hole program there is enough flexibility that, if people are not interested, you can move somewhere else.

Senator NASH—Finally, do you look to purchase land at all, or is it just access arrangements?

Mr Crafter—Predominantly it is just access arrangements, but we have purchased some land in Queensland.

Mr Kelemen—We have purchased land where it makes sense to purchase land.

Senator NASH—When would it make sense?

Mr Kelemen—Once you get into production mode you build some compressor stations and plants and those sorts of things. If a landowner is interested in selling and if putting the camps and other bits of processing equipment for water on that land will make it easier for us we might buy it. In Queensland we did purchase the land where we have the tree plantation. Where it

makes viable sense and the land is available for sale, we will buy that. But it is not our first preference, no.

Senator NASH—I assume they are willing sellers also.

Mr Kelemen—They are willing sellers. They have come to us. We have not gone to them. In each case we have purchased land, they have come to us.

CHAIR—You have a well over there and a well over there. What is the size of the hub?

Mr Kelemen—Typically in coal seam gas development after you have done your exploration and pilot program you will come up with a development plan. The wells may be on a square kilometre basis or three-quarters of a kilometre basis, so they have will be 800 metres apart or one kilometre apart. You will hub those wells into a centralised compressor station. So you could have one compressor station every 100 square kilometres, for example, and all the walls will be connected to that centralised compressor station.

Mr Crafter—At that producing stage, the area that is needed on the land would be—correct me I am wrong—about the size of this space.

Mr Kelemen—Each well site will actually be—

CHAIR—I actually have flown over one. I wondered what the pattern was from the air and they told me it was all these gas stations. What proportion of the water has to go through reverse osmosis?

Mr Purtill—For us, we are probably looking at around 75 per cent of the water. But, again, we know more about our Fairview field and our Roma field.

CHAIR—I understand that. In the case of what you know, that would relate to probably 15,000 or 16,000 megs a year, if you are doing 65 megs a day.

Mr Purtill—Yes. I have not done the calculations but it is a lot of water.

CHAIR—Is the water alkaline when it comes out of the reverse osmosis?

Mr Purtill—No. I cannot tell exactly what the pH is, but we are applying it to our winter barley crop. I have pictures here of that. We are probably looking at slightly alkaline—

CHAIR—Is the water coming out of the reverse osmosis suitable for irrigation?

Mr Purtill—Not directly. You will remember I mentioned the sodium absorption ratio. The reverse osmosis removes a lot of those salts, as you know, but it still leaves them in proportion. The water in Fairview has sodium—

CHAIR—Do you blend it to achieve—

Mr Purtil—No. We then add magnesium sulfate.

CHAIR—So you raise the level—

Mr Purtil—We gypsum dose it, and that way it is suitable. So there are two sides—

CHAIR—It comes out alkaline and you reduce the alkalinity with additives.

Mr Purtil—That is it.

CHAIR—Can you provide the pH of the water that comes out the end of your plant?

Mr Purtil—I will take that on notice because the water quality data I have with me is actually about the water as it comes up out of the ground.

CHAIR—What is the level of that?

Mr Purtil—The pH? The mean is 8.7. So it is alkaline as it comes up.

CHAIR—It sure is.

Mr Purtil—We bring it down—

CHAIR—Do you bring it back to 4½?

Mr Purtil—I will have to take that on notice.

CHAIR—I am an old water man.

Mr Purtil—I do not think we bring it down to that level of acidity, but I will check that for you.

CHAIR—We are very grateful to you for making the time and the effort to come here to see us today. If there is any further information you would like to provide to us, we would be grateful to receive it. Obviously I am concerned about the connectivity, especially in view of the adjacency of the Great Artesian Basin and the interconnection between the Namoi aquifer and the Great Artesian Basin. And then we have another complication, which is your extraction. I will read and watch the science with interest as it comes along. Thanks very much.

Mr Kelemen—We will be putting in a submission. We also have some tested lab results from a water sample that was taken. I think that at an earlier hearing in Gunnedah you might have been presented with a sample. We did a sample at the same time, so we will send those results in with our submission just so that you have the information.

CHAIR—Thank you very much.

Committee adjourned at 12.14 pm

