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INDEPENDENT PLANNING COMMISSION

MEETING WITH DEPARTMENT OF PLANNING AND ENVIRONMENT

RE: HUME COAL PROJECT AND BERRIMA RAIL PROJECT

PANEL:	**PROF CHRIS FELL** **GEORGE GATES** **ANNELISE TUOR** **GEOFF SHARROCK**
ASSISTING PANEL:	**DAVID KOPPERS** **BRAD JAMES**
DEPARTMENT OF PLANNING AND ENVIRONMENT:	**CLAY PRESHAW** **PAUL FREEMAN** **MANDANA MAZAHERI** **PROF JIM GALVIN**
LOCATION:	**IPC OFFICE** **LEVEL 3, 201 ELIZABETH STREET** **SYDNEY, NEW SOUTH WALES**
DATE:	**10.07 AM, MONDAY, 11 FEBRUARY 2019**

PROF C. FELL: Good morning and welcome. A bit of formality to go through, if you don't mind. Before we begin, I would like to acknowledge traditional owners of the land on which we meet: the Gadigal people of the Eora Nation. I would also like to pay my respects to elders past and present and to the elders from other communities who may be here today. Welcome to the meeting today. Hume Coal Proprietary – the applicant is seeking to construct and operate a new underground coal mine in in the Southern Highlands of New South Wales, near Moss Vale, to allow for the extraction of up to 3.5 million tonnes of run-of-mine coal per year over project life of 23 years, including construction and rehabilitation. My name is Professor Chris Fell. I'm chair of this panel, and joining me are my fellow commissioners Annelise Tuor, Geoff Sharrock, George Gates. The other attendees of the meeting are Clay Preshaw - - -

MR C. PRESHAW: That's me.

PROF FELL: - - - Paul Freeman - - -

MR P. FREEMAN: That's me.

PROF FELL: - - - Mandana Mazaheri and Jim Galvin.

PROF J. GALVIN: That's me.

PROF FELL: Before I continue, I should state all appointed commissioners must have an annual declaration of interest identifying potential conflicts for their appointed role. For the record, we're unaware of any conflicts in relation to our appointment to this panel. In the interests of openness and transparency, to ensure the full capture of information, today's meeting is being recorded, and a full transcript will be produced and made available on the commission's website. This meeting is one part of the commission's process. It is taking place at the preliminary stage of this process and will form one of the several sources of information which the commission will use to complete the task referred to in the Minister's request dated 4th of December 2018.

It is important for the commissioners to ask questions of attendees and to clarify issues whenever we consider it appropriate. If you're asked a question and not in a position to answer, please feel free to take the question on notice, provide any additional information in writing, which we'll then put up on our website. I request that all members here today introduce themselves before speaking for the first time and for all members to ensure that they do not speak over the top of each other, to ensure accuracy of the transcript. We'll now begin. Thank you. I'd first like to ask one question, that is, can we assume that members from Hume have read the documentation associated Response to Submissions? Altogether, there are 600-odd pages of that.

MR PRESHAW: So Clay Preshaw here, director of resource and energy assessments department.

PROF FELL: Indeed.

MR PRESHAW: Look, we have – on this side of the table, there's Mandana and Paul, who are from the department. So the three of us will have read all the relevant documentation, and I think Jim, who's one of our independent experts, he will have read the documents that we included in our terms of reference to him – so probably not all of the documents that you're referring to but all the ones that are relevant to his area of expertise.

PROF FELL: Thank you very much. Now, I'm suggesting a slight deviation from the order that we originally suggested to you.

MR PRESHAW: Yep.

PROF FELL: I'm suggesting that perhaps we do geology and mining first, then followed by perhaps groundwater, then surface water, then economics and social impact. Are you happy about that?

MR PRESHAW: I'm – Clay Preshaw here again. I'm happy with that. We had a list of questions forwarded to us that were questions, as I understand it, that were for – directly for the company to respond to, but they were sent to us as – I guess, for our benefit to understand what the likely areas of questioning are going to be. So we've read those. A lot of those questions, I think, really are for the company to respond to, as opposed for us to directly respond to, but I'm happy to go in whichever order you would like to do it, and we've also, I guess, prepared some indicative sort of slides to inform what we wanted to say. So - - -

PROF FELL: Why don't we suggest that you give presentation as appropriate.

MR PRESHAW: Yep.

PROF FELL: Please understand we have read documentation too, so we're quite familiar with the issues.

MR PRESHAW: Sure.

PROF FELL: But a brief presentation, I think, fellow panel members would find useful.

MR .....: Yep.

MR .....: Definitely.

PROF FELL: So over to you ..... and - - -

MR PRESHAW: Okay. Thank you. So I just start by just having a few introductory words, and then I'll – I'm going to throw it over to Jim to start explaining some things as well. So, first of all, look, this has been a project that has been around for some time – formally within the assessment process for a number of years, but before it even came into the assessment process, there's been – there have been discussions about and meetings about a potential mining project in this area. So it has a long history, probably over 20 years now, and I think it's fair to say throughout that history it has had a significant level of community opposition, and that's certainly what we've seen as this particular project has come into the system.

Look, the process that we're – the project that we now have before us is, I guess, an unconventional mining method called the pine feather method. That is the method that was proposed in this particular project application, but we understand that previous companies that have held the mining lease have considered other options, and, in fact, we know that the company – that Hume Coal has also considered other options.

PROF FELL: Cool.

MR PRESHAW: But, look, it is an unconventional mining method. It's one that I personally haven't dealt with in the, you know, 10 years I've been working at the department, and so it has been a complex and difference assessment process for us, and, given the – you know, the difficulties and the technical complexities involved, we commissioned five different experts. So we've got Jim Galvin here today. We also have Ismet Canbulat, who's another mine engineer subsidence expert, and we have Hugh Middlemis, who is a groundwater expert, and then we also have a noise expert, Renzo Tonin, who provided some advice on noise impacts as well, and then we had an economics expert, Mr Andrew Tessler, from BIS Oxford. So we've only brought today Jim Galvin, because I think if we were to try and get through all the different experts that we have, it would go well beyond the two hours, but if we need to, at another point, come and brief you again and bring other experts, we're totally happy to do that.

PROF FELL: Thank you.

MR PRESHAW: But the reason that we've brought Jim really goes to what I think are the key issues and what have come out in our report as well, which are around, I guess – fundamentally are around the mine design. So groundwater and surface water, I guess, are the key impacts, but they are fundamentally related to the proposed mine method, the pine feather method, and I guess we've been through a learning process at the department with our experts in terms of understanding what that method is and what it means and what the – you know, the potential environmental, social, economic impacts of that method are.

So, look, the department has certainly benefited from getting some basic background from Jim and Ismet on the mining method, and I'm just – I guess what I'm suggesting is that perhaps it would be worthwhile for Jim to run through some of the

key background information around the pine feather method for you as well – some of the information that we probably didn't go into the detail in our report but I think is really, you know, inherently important to understand if you're going to assess the project. Does that make sense? If I kind of throw it over Jim to go through what is pine feather method - - -

PROF FELL: Yes.

MS A. TUOR: That sounds helpful.

MR PRESHAW: - - - and how does that affect - - -

MR SHARROCK: Definitely.

PROF FELL: Yes. Thanks. That's a good idea.

MR PRESHAW: Okay.

MR GATES: Absolutely, yes.

MR PRESHAW: So, look, I think I'll leave it to you, Jim – I know he's got some slides – and I'll let you run it from here.

PROF GALVIN: Okay. Jim Galvin. Look, I'm frankly second-guessing what the Commission's understanding is at the moment. I read the questions that you sent the department, and I'm just gleaned from them that maybe a basic understanding of mining methods would help answer those questions and others. Having said that, I just put quite – quite a few slides together, and if they're not relevant, well, just tell me to move on.

PROF FELL: Sure. Sure.

PROF GALVIN: I'll just try and picks the grains out of it. The starting point, from my perspective, is that the terms of reference I was given from the department included commenting on safety. And that has to take you back to the actual concept of the mine design, if for no other reason than simply Australian Standards for managing risk in the workplace. And in the standard, making sure that you give consideration, at the design stage, to how you will safely operate a working method. And that principle is well embedded in a lot of other documentation that the Australian mining industry references when looking at mining operations. So the safety part had to start at the design stage.

In terms of what is being proposed, let me quickly explain to you the types of mining methods. So traditionally, when we talk of first workings, we're talking of forming up coal pillars on a regular basis, and then leaving them in place to support the overburden. In simple terms, that's first workings. Second workings is where we come back, and, in the case of pillar workings, we either take out some pillars – leave

some and take some out – and that method we call partial extraction; or we totally extract all the pillars, in which we call that total extraction.

Now, why do you do the partial extraction? You do partial extraction because, if you design it properly, you can increase your percentage extraction; you can lower your mining costs, by taking out coal from an area that you don't have to support; you can mine a lot more coal in a given time. But by leaving a regular pattern of pillars between those extraction panels, you can still provide protection to the surface, and you can still restrict surface subsidence. So this partial extraction – the plan I've got up here is Myuna Colliery – and, for example, these panels here are under Lake Macquaries, where you can't afford to have a cave-in to the bottom of the lake, or you'll flood the mine. These panels up here are under the old Wangi Power Station.

So what the proponent is proposing is that their mining method constitutes first workings – so this sort of concept that's shown here. The regulator has come back and said that they consider it to be a form of pillar extraction. I have to say, because it's novel, I am ambivalent on it; but, as you will see in my report, I have a leaning towards it being a form of secondary extraction, or pillar extraction. And that'll come out a little clearer a little bit later.

Now, as – those methods as compared to longwall mining, just quickly – what is longwall mining about? Again, you drive first workings – roadways, to get access; you drive – you block out a block of coal by driving up – typically two roadways. And then, when you get to the end, you join them. And then you totally extract a large, wide block of coal. Now, in this method, as well, you can restrict the width of your longwall, so that you restrict the amount of surface subsidence. In the one I'm showing here, these are very wide panels compared to depth, and you get a large amount of surface subsidence. It is this width of the panel – the width of the excavation – compared to the depth below mining that's determining how much the surface moves in response to the mining.

To give you a feel for dimensions, this is a bord and pillar mine that's subsequently been – the pillars that have been left have been extracted from the surface. And here you see what an underground mine would look like. Now, this is in the Newcastle area. These pillars, at the time that this mine was formed, by law were required to have a minimum width of 10 metres. The law in New South Wales restricts roadway width to five and a half metres, or did at the time this was – this was mind. To give you a feel, this is a Toyota Land Cruiser in here. So that gives you a feel for the scale of the operation. You notice that the pillars are all formed at right angles, with square pillars.

Those pillars, and the – bord and pillar workings anyway today – are formed with a continuous miner, which is simply a cutter drum that rotates, travels up and down; the coal that's cut falls to the ground, and it's conveyed through the throat of the machine and out the back of the machine; and that machine has on board drilling rigs, to periodically stop and put steel rock bolts into the roof to support the roof. There is another version of this method, where the machine will cut out perhaps six

to 15 metres without putting support in, and then it'll be moved out to another place, and a specialised machine will be brought back in, but still to support the roof. So the roof is supported.

And, traditionally, back in the 1950s and earlier, perhaps, we came up with the concept of the shuttle car, where the coal that comes off the back of the continuous miner is loaded into the shuttle car. And this vehicle, while it looks very big, is four-wheel drive, and it's four-wheel steer. So it's capable of turning through those right angles that I showed you on the previous slide. And those pillars were formed with a shuttle car – continuous miner and shuttle car.

Now, that operation is discontinuous, because when the shuttle car leaves to empty the coal at the conveyor belt, things stop. When you have a large – a wide panel, you typically have two shuttle cars working; some mines even use three. And it's a discontinuous operation. And to address that, the mining industry, for – back in the late eighties, nineties – put a lot of effort into having some sort of continuous haulage system behind a shuttle – behind a continuous miner.

And this one that I'm showing you here is the one that's working in Australia today. It's a Joy flexible conveyor. So the coal comes off the back of the continuous miner, into the throat of the flexible conveyor, and then it's conveyed back to the main panel belt. Now, whilst that machine there looks that it can turn through 90 degrees, it can't turn through 90 degrees in narrow, five and a half metre wide roadways; it's too tight. So these machines, when you use them, are set up that they mine not 90-degree angle corners, but 70-degree corners. And I'll come back to that in a moment.

The proponent refers to the method they're proposing as similar to Wongawilli pillar extraction. What is Wongawilli pillar extraction? As similar to what the proponent's proposing, you drive a limited number of first-working roadways; then you turn, and you drive one very long roadway out. And then, on the retreat, you take slices of coal when you take out the pillar. The proponent's mining method is proposing, whereas this roadway is fully supported all the way out, they are proposing to use a technology that's been developed for surface mining, where they can send a continuous miner off on its – remotely, with some form of conveyor system behind it, which they haven't identified, but, obviously, some flexible type of conveyor system – that follows the continuous miner, and they're proposing that they drive out for 120 metres. Then they don't extract this ..... here.

They would come back, they leave a four-metre wide pillar and they go back out again. So they're forming a four-metre – four to six metre-wide pillar – three and a half-metre, actually, to six-metre pillar, then a four-metre roadway and so forth. And their method also proposes that on the other side of it that they will drive three roadways instead of two, as shown on this diagram, and they will do a similar thing on the other side of those three roadways. So that's – that sort of relates you to their reference to Wongawilli.

Now, this photograph is from – thank you. This photograph is where Wongawilli method has been practiced using a continuous hauling system. Right. The same type of one I showed you earlier. And I said to you that system can't turn through 90 degrees, so this is a layout where the pillars – everything is based on 70-degree turns so that the flexible conveyor can get around. When they drive a roadway all the way out and support it, on the retreat they turn again through 70 degrees and they again take off slices of coal, and they retreat their way back out again.

MR PRESHAW: Sorry, Jim. Just a question. On that ..... are they supported, did you say, those .....

PROF GALVIN: The run-outs?

MR PRESHAW: Yes.

PROF GALVIN: These long roadways are called run-outs, and they are supported all the way out because you have people working in them. So they're supported all the way out. Now, there are then – people have turned their minds to, "How do we do first workings or second workings where we don't have the expense of putting up so much support? And because we don't have to stop and put support up, we can mine more in a given shift if we're mining for a longer period of time."

This is a method used at Cooranbong Colliery – Cooranbong Colliery, obviously, near the township of Cooranbong, Lake Macquarie – and it is ..... large section of the township of Morisset, in and around Morisset. This is the mining method used there, where this is classed as pillar extraction, partial pillar extraction, so it's second workings, not first. And what they've done is formed up broad pillar workings for all these roadways shown blocked in, plus fully supported. But having formed up big pillars, they have then used the continuous miner and they have gone left and lifted off a slice of coal and then right and lifted off a slice of coal, and they've retreated out of the panel in that manner.

So this is designed, the width – this excavation, not wide enough to cave and cause significant subsidence above the excavation. And the width of the pillar is designed – the pillar is strong enough to support the full weight of the overburden. The depth that this continuous miner can cut in to can vary from difficult from six metres to 15 metres. The reason for that is that sometimes if the roof is very weak, if you cut out more than six metres it will start ..... so you have to stop. If it can stand up for longer and you're using shuttle cars, you can cut up to 15 metres.

The reason that you stop at 15 metres is because whilst the cutting machine is remote-controlled, the shuttle car has a driver on it. If you cut more than 15 metres, the driver then starts to go out on an unsupported roof. So that's the limitation. I have seen – particularly in South Africa – some versions where people cut up to 30 metres, but I'm not aware in an underground environment of cutting out more than 30 metres with a remote-controlled machine before.

Okay. This is another version, similar concept. This is Tasman Mine, which is near – under Mount Sugarloaf, Newcastle area, where they have again gone in and formed up first working square pillars, fully supported roadways. And then on the retreat, they've ..... left and right around the roadways, again making sure that this remnant coal pillar that's left is strong enough to carry the full weight of the overburden. This is another concept. One of the mines – probably my most successful with flexible conveyors today – is Clarence Colliery. There are not very many mines that use flexible conveyors at the moment. And this is their layout at Clarence – or was their layout.

MR PRESHAW: Sorry, Jim, can I just ask there, when you say, "Not many mines use flexible conveyors - - -"

PROF GALVIN: Shuttle cars .....

MR PRESHAW: - - - that means everyone else uses shuttle cars.

PROF GALVIN: Shuttle cars. Yes.

MR PRESHAW: Yes.

PROF GALVIN: Okay. This is when one of their – they've got a number of different mine layouts in first workings. This is the first workings layout. Again, you can see they form up the pillars using 70-degree turn-outs, and then they stub in to the barrier pillar and they leave these stubs unsupported. These roadways are – all the other roadways have to be supported. These ones are unsupported. So on the – you can go in, then get some coal quickly without the cost and the time delay in putting up support.

Now, from there, that's the underground side. I will just move on and show you what the surface method is that this concept proposal is based on. Are there any questions? Do I need to stop at the moment or – I might keep going while we're on a roll.

PROF FELL: Well, keep going. We all know about highwall mining.

PROF GALVIN: All right. So highwall mining, then, is that in the open-cut mines, you get to a point where your overburden to coal ratio becomes too high to make it economic to mine, so you stop mining and you leave a high wall. Highwall mining then says, "Well, why can we not then punch underneath that high wall and take out some of the coal that's under it?

So what this method is based on is working from the surface and sending either a continuous miner, a narrow version of what I showed you already, or very big-diameter auger drills and sending them in to the toe of the high wall, and as that cutting equipment advances, you continue to add modules of some form of conveyor system to convey the coal out.

And that's what this machine in this photograph is, and that's what this front-end loader is doing, is picking up a conveyor module and slotting it in this launching vehicle. So as the continuous miner goes in, you add more conveyors to that vehicle. Now, those conveyors not only perform the function of conveying the coal, they can also be used to help push the machine in to the face, and they can also be used to recover it if it gets – if it's steeply dipping and the floor is slipper or if it gets pinned by a roof fall, you can use that machine.

Here we see a high wall that has been mined with a double row of auger holes, and here we see one that has been cut with a continuous miner. And this is very similar now to what is being proposed underground at Hume. The dimensions are not dissimilar. It's starting to show a four-metre excavation, three and a half-metre wide intervening pillar.

MR GATES: Sorry, Jim. How far do those – do they drive in to the coal mine?

PROF GALVIN: In the surface mine, some of them go up to 300 metres. And if you look at a plan on a surface mine – I may have one with me, I think – what you will see is you get a good run and then, for some reason, you hit a geological feature or something, and then you will get short ones and then you will get a long one again, and so forth. But, certainly, you can get up to 300 metres with that.

All right. And then this is highwall operation. This is Moura Colliery in Queensland, just again to give you a feel of scale. This is a very large dump truck that is wider than the roadway I showed you for the underground workings. This is their launch vehicle. And here we have the conveyor ..... been put on to push the machine in. And the point to be made: you've got a lot of working room. And if this machine gets stuck underground, you can give it a straight pull to pull it back out again. So that's a little bit of highwall mining.

Now, a company that sells a lot of this equipment is Bucyrus. It has, in fact, bought out a number of suppliers, and it's the major – a major player now. And this is just showing their conveyor system. So they're big, robust, heavy steel sections, with twin conveyors. These things hook together. So you add them as segments. And the feature with this design is that if you get a roof fall, there's really nothing to protrude, which means pulling this out, sliding it out – and it's very heavy and robust. You can push it; you can pull it. You could put a big dozer on it and try and pull it out.

This is another type of conveyor system. This is the modules you saw earlier. These, again – quite robust. They pin together. And again, they're launched into the – behind the miner, but again, you can clip on and use them to pull out the machine. And that compares, then, to the conveyor, today, that's being used at Clarence Colliery, the Joy FCT conveyor. This is what it looks like. And the point to note there is, this type of equipment – if it gets a roof fall on it, very vulnerable to damage. If you try and pull that out – it's not designed to be pulled.

MR PRESHAW: So the top conveyor - - -

PROF GALVIN: It's not designed - - -

MR PRESHAW: - - - is the example of a highwall sort of conveyor.

PROF GALVIN: These are highwall conveyors.

MR PRESHAW: And the bottom one is an underground - - -

PROF GALVIN: And this is a flexible – this is an underground flexible conveyor, that can go through a 70-degree bend. One of the things that stops these conveyors being turned too quickly, as well, is, this is a continuous rubber belt. If you try and turn a rubber belt through 90 degrees, it'll want to ride up on you. That's what these rollers here are for: they're to confine the belt in the trough. But there's only so much flex in the belt, so you – that's why you work to 70 degrees. So - - -

MR PRESHAW: So what happens – on the bottom one – you were saying – because rockfalls and all - - -

PROF GALVIN: Well, just look how vulnerable it is to – if a rock falls, get wedged in here, bends this – try to pull this out – you've got all these high points sticking out. So the reason for showing you this is that, in this proposal for Hume, the company claims that this technology is established. And you have to say, well, yeah, components of it are; but in an underground setting, you know, there is no point of reference for it being used before, and in the way that they're proposing to use it; and it's still very – there's a lack of information as to what equipment they're actually going to use.

They don't commit to the type of conveyor; there's no information whether it will be based on this type of flexible conveyor that's currently used underground, or will it be based on some sort of module system? The point being, if you've only got a five and a half metre wide roadway to work with, and you're mining at an angle, and it's a confined space, you don't have very much room to work with underground.

So that sort of – they're the sort of questions that run through my mind, on both the technical feasibility of the method and the safety issues. The company talks about this thing being able to control the continuous miner direction and height and so forth, and this is an example where these trials have been undertaken on the surface, and it has been shown that this thing can steer itself quite accurately. The point to make is that in this case, though, this situation was in a straight line; the machine was not trying to turn through 70 degrees ..... so they're things which I'm not – you just, at the moment, have to have an open mind on, because there's just not a lot of information in the proposal to know how confident you can be - - -

PROF FELL: Just a question on that, if I might. In the response to submissions, they claim a high degree of accuracy; do you believe that is incorrect?

PROF GALVIN: I believe, on the surface, in a surface environment, I don't have reason to doubt it. I'm saying, in an underground environment, where you're trying to turn it – first of all, you've got to turn it through 70 degrees, all right – you're not hitting the wall straight on; you got to – you're at this direction – and the wall is not 50 metres down there; the place you're trying to mine is where Geoff is. You're trying to, from where I am, turn the equipment through 70 degrees.

Then you've got dip. One of the things I asked for, or recommended the department get, is a more detailed plan of their mining sequence, mining direction, what grades they're going to work on. If you're turning – trying to turn through 70 degrees, you've only got a three and a half metre wide pillar, and if you take, you know, half a metre off three and a half metre wide pillar has a much larger impact on stability than taking it off a ten metre wide pillar, like I've shown in earlier slides. So you got to make sure you're pretty muck spot on with your distance between them.

PROF FELL: Sorry.

PROF GALVIN: Then you got - - -

PROF FELL: Sorry. Yes.

PROF GALVIN: - - - your cross-grade. And these machines are 60-, 70-tonne machines minimum. They're wanting to slide on the cross-grade. So you're trying to steer it this way, and it's trying to slide on the cross-grade.

PROF FELL: You certainly made that point in your submission.

PROF GALVIN: Okay. All right.

PROF FELL: But - - -

PROF GALVIN: So they're just considerations.

MR SHARROCK: I have a question, if I may. It's Geoff Sharrock here. Jim, you spoke about the conveyors, and the armoured conveyors, and the systems that you showed there for highwall mining. But the proponent hasn't proposed anything. Do you think that they just haven't gone far enough? Because why couldn't you have one of those Bucyrus conveyors down there?

PROF GALVIN: Because at the moment, they're too big to fit in that environment.

MR SHARROCK: Okay.

PROF GALVIN: Now, if they make up small modules, technically, it's quite feasible. The point is that – history attests to the fact that these sort of new technologies, in an underground environment – you just don't get them off the shelf. It's highly unusual they work the first time. There's – there's, you know, many

years, usually, of trying to develop the concept, prove it, modify it. And they don't always end up working, anyway. So, in looking at this proposal, one of the basic questions to me is, will it end up proving to be technically feasible? And that's why I asked for being directed towards other operations in the world where it's been used. And there are none. So there will be a learning curve, if it – in any event.

MR SHARROCK: And one other question, if I may. In the conveyor that you showed, the conventional conveyor, if you like, that can bend – if something goes wrong, if there's a big rockfall there, you have to send people in, under unsupported ground.

PROF GALVIN: Well, you – you don't have a lot of width, because there's only a four-metre roadway. You can't support the ground, because the conveyor's taking up a lot of it. So you could get down the side, but you still can't get over the top of it. The proponent's response has been – and, I mean, in underground mining, we do this anyway – is, "Well, we could drive a new supported tunnel up to where it's trapped, and then we could turn and we could try and salvage it that way." And, I mean, that is done underground. In the worst case, they have replied that they will just leave the equipment. You know, there's a limit to how many times you can leave that sort of equipment but – yes, I mean, anything – miners are – miners solve problems; there's no doubt about it. But the economics of it becomes an important consideration.

PROF FELL: But surely that's a risk that's taken by the proponent?

PROF GALVIN: That's - - -

PROF FELL: Right?

PROF GALVIN: Yes.

PROF FELL: And it could come down to just your opinion, as an experienced mining engineer, and their opinion, as an experienced mining engineer.

PROF GALVIN: Yes.

PROF FELL: Could you touch on the safety aspects, because I think that's something that came out. Is it fundamentally unsafe, to the extent where a resource regulator mightn't grant a licence? That's, I think, the essence of the issue. I mean - - -

PROF GALVIN: Okay. So let me - - -

PROF FELL: Sorry. I jumped ahead.

PROF GALVIN: Start at a high level. In terms of – their layout relies on – their layout relies on limiting the width of their subpanels, and leaving very large pillars

between these major panels. And I know, from a rock mechanics perspective, if the geology is as they predict, the roof strata should have not too much trouble spanning from here to here, to here, to here; and so surface subsidence is not an issue. You will get some, but it can – it is not a – not really a concern for – for the surface.

So the question then is, well, what about – so the proponent says, "We are leaving small pillars between these punches." And the way I would look at them is, they're temporary support to keep the roof up between big pillar to big pillar. And then we get to the question, well, does it matter if they fail or not? And from a subsidence point of view, it doesn't. From a mine safety point of view – and this is now based on my practical experience, from working in pillars and managing them – I think – I think, it is an important issue, and it's one that I think is the one that causes the method to be considered a form of pillar extraction rather than first workings, where, to me, this is – this is the pillar, and then these long punches are a way of partially extracting that pillar.

Now, these pillars are quite narrow, compared to traditional Australian experience, where legislation, up until recently, has always said, minimum of 10 metres width. South Africans – I've worked in South Africa – would mine down to four metres, okay? Where you have to be very careful, then, is, first of all, a very small change in conditions, with a narrow pillar, has a – can have a very large effect on the response of the ground. So if I have a three and a half metre pillar, and I take half a metre off it, the strength of that pillar does not decrease in direct proportion, that is, three and a half to three. The way rock works, there's an accelerating decrease in strength.

So I get concerned that these – and then you got the confined workspace, where men have to be working in and around the entrance to each of these entries. So I get concerned that, if some of these pillars should start to yield – they don't have to fail; they don't have to fault; and I'll show you what I mean in a moment, with a photo – if simply they start to give a little bit, and the roof cracks, and I have someone standing under there, that there's a risk of exposure to a roof fall.

Then you've got to visualise what's being proposed. Because we have a roadway – say it's this room – the width of this room – it's not much wider than this. And then, every three and a half metres – it's shallow depth to start with – every three and a half metres, they're putting a four-metre hole into the solid. So we've got these little three and a half metre wide columns, for a long way, all the way down these roadways here, okay?

You have people standing in intersections – and intersections are where we get most of our falls – where if I'm standing here, and there is a punch there, there's no mention in the proposal – and I don't see practically how they can do it – that they're actually going to support that entrance to that roadway. Whereas normally, we would take our roof support in our intersection, we'd make sure that it went down the roadway, and we'd support it across properly, okay, there's no – there's no mention of that. So that's a concern. The pillars yielding are a concern. And I might just

deal with that now, because I see, in your questions, you're asking about modelling, and I have a couple of slides here that - - -

PROF FELL: Can I – can I just stop for a second.

PROF GALVIN: Yes.

PROF FELL: Your original report – review – discussed the width of the pillar, and then it was followed up by a meeting of the experts, when it was determined that the single pillar wasn't a major question; and I thought that that really put paid to the two reviews that had been done, and the suggestion was, you would ask Professor – Emeritus Professor Heasley to actually do a three-dimensional study; and that had all to do with the overburden's ability to sustain the width, if I understand correctly. And that came out saying, "Yes, it's going to work okay." So can you interpret for me the safety issues, given you had that reassurance from Heasley.

PROF GALVIN: Okay. So Professor Heasley's work did not focus on safety.

PROF FELL: Sorry?

PROF GALVIN: It did not focus on safety.

PROF FELL: No, I know it's not - - -

PROF GALVIN: It focused on surface - - -

PROF FELL: - - - focused on safety, but it's put an overlay on safety. You're saying a roof fall can happen - - -

PROF GALVIN: Yes. Yes.

PROF FELL: - - - and that can happen because a pillar - - -

PROF GALVIN: A pillar yields.

PROF FELL: - - - partially collapses, and you - - -

PROF GALVIN: Yes.

PROF FELL: - - - get a – drop the roof. He – I'm not trying to put words in - - -

PROF GALVIN: No.

PROF FELL: - - - his mouth, or your mouth, but surely, if the overburden's providing a substantial component of the loading – sorry if I'm looking at - - -

PROF GALVIN: I'm about to tell you.

PROF FELL: That, in some way, gives you the protection you might be looking for.

PROF GALVIN: Professor Fell, behind you, around us, there are some columns, and there's some panels in the roof above us.

PROF FELL: I understand the concept, Professor Galvin.

PROF GALVIN: If those pillars move – if they yield a little bit we may not notice on the surface, but there's every chance that that panel above your head can drop and hit you on the head. So if the pillars yield – or the immediate roof – the immediate roof is my concern, okay? That the rock is fractured, it moves and you start to loosen it, and a block of rock falls from the roof - - -

PROF FELL: But haven't you roof-bolted anyway?

PROF GALVIN: No. There's this – there's a roof bolt at this roadway, to start with, but when they've driven these punctures – they have not bolted – roof bolted those punctures. Okay?

MR PRESHAW: So it is – just on that, is it fair to say that the drive – the unsupported nature of those drive is a very unique aspect of this proposal, not supporting those punctures underground?

PROF GALVIN: The analogy – if you understand pillar extraction – let me go back and show you where – it might save a lot of – okay. Show you a picture of pillar extraction. Okay. So here – the analogy is that you have a continuous miner going down there. You have a conveyor train following it. We are leaving lots of small pillars in-between here. This roadway is supported, but none of this area in here is supported. These are 120 metres long now. None of that is supported other than by moving these small pillars, and the concern is that if these small pillars start to yield, and they – yielding could be 60 metres up the roadway; more than likely it will be, because that's where you're getting the midspan.

So you're getting the maximum load – the concern is it starts to yield up there – one starts to yield, the ones around it start to yield, and the next ones start to yield, and you would have an instability that progresses from there out to here and into your workplace, where support from your workplace is simply that little five metres of roof. And a fall coming from those small pillars can – and we know from experience – overrun roof support in that roadway. That roof support system in the roadway is not designed to be stopping a fall breaking off, a fall that's coming into that work area. It's not designed to stop and break it off. So - - -

PROF FELL: Well, if the proponent were nervous about that situation, is there anything they can do, like roof-bolting things, to actually solve the problem? I mean, is it a complete no, or is it yes, we can engineer it?

PROF GALVIN: Yes. No, no. so what the mines do in these situations – like, we're faced with these situations – if you – Geoff will understand this and he can explain to you later – but we want to recover longwall equipment that was basically working in the ..... to recover it. What do we do? We put lots of very long cables up; six metre, eight metre, ten metre-long cables up, and we put a lot of cables up into the roof. We inject products into the roof. There's things we do. In this case they took it out - - -

PROF FELL: I still don't get what you're talking about.

PROF GALVIN: In this case, what – in pillar extraction – and if the regulator classifies it as pillar extraction I daresay that they may insist on this – we have the very large mobile hydraulic supports – break line supports. And as we retreat we walk them out beside us and that protects the workplace. The issue in this case, however – and, again, it's a vague area in the submission – in the report – is that in normal secondary extraction, once you've come out you don't go back in again.

So in this case here you do everything on the retreat. In this particular case, the proponent – from my reading of the report – is then saying we're then going to go back in and we're going to fill some of these drives with stowage; we're also going to flood them. This area, this roadway that they're mining the coal from, would seem from their application that they are still requiring people to go back in there to enable them to put in their stowage and so forth.

Now, they may plan to go back in and resupport it. I don't know, it's silent on it. Now, the issue with – to close that out with the modelling – just so you understand – is this, that there has been a lot of work done over decades on pillar strength, when there's a number of formulas and they all are in the same ballpark in terms of how strong a small pillar is. Okay. In - - -

PROF FELL: I think you can assume we actually have read the argument about that, okay?

PROF GALVIN: Okay.

PROF FELL: So we accept that there's some disagreement between the experts on this question. My understanding – and please stop me if I'm wrong here – but really it's whether the above structure will give you a measure of support and solve that problem for you to some extent. I mean, think of – is it – is what we're seeing a disagreement between experienced mining engineers on what you can do?

PROF GALVIN: It is a disagreement. Everyone has agreed – and Professor Heasley's model has done this – you can take out all those weak pillars and you will not have a concern about the surface substance. You will get more – but that's not - - -

PROF FELL: Yes. I think that's well accepted.

PROF GALVIN: Where we're not – where we're very disaligned is the safety implications.

PROF FELL: Yes.

PROF GALVIN: And that is simply because if – we know from experience, theory, that ..... if I have a small pillar and I load it up to a point – once it reaches that point it quickly unloads, squashes out, and then the roof can follow. Whether it does to not depends how stiff the roof is. That's well known. Where the disagreement in the modelling comes is that the model only does what you tell it to do, and the model has been based on the pillar not behaving in an unloading pattern at all, but as perfectly plastic, which means that it loads up to this point and then it continues to hold the load – you can squash it and squash it and squash it and it behaves plastically, and it doesn't unload – it continues to carry the load.

So you have an infinite – you have a pillar you just can't fail. And Professor Heasley, early on, has decided, well, these pillars can't fail, okay, so I will use a plastic model. And the basis for him deciding that they can't fail, I suggest, is that the pillar strength formula that is used in the model is not appropriate for very slender pillars. He's – his formula assumes that because they're rectangular the longer they get the stronger they get. And that is true if they're of a particular width, but it's not true in a very slender. Something that's very slender, you can make it as long as you like; it's not going to get stronger. So there's – it's a safety issue.

PROF FELL: So the issue – yes. I think we picked that up; it is a safety issue ..... it's not a problem. So the issue for us here is can the safety issue be engineered around? All right. And that – I guess our question is we would infer from the DPE report that it's terminal – in fact, it's not possible for the resource regulator to be able to move towards saying this is okay.

PROF GALVIN: If you're prepared to spend the money you can mine it safely. You will need to put a lot of – you will need to spend a lot of money to put the support in. It will slow the operation down significantly. It really goes to the economics of the operation.

MR PRESHAW: I mean - - -

MR SHARROCK: So – Geoff Sharrock here. May I ask you a couple of questions related to that, please, Jim, and that is that you've had the technical dialogue with the proponent. We have not done that and some of our questions are not really naïve, but they're to explore things. So you've had the dialogue with them. A little while ago, you mentioned what about those intersections, why can't they be supported? I mean, is that something that you've put to the proponent, and if so what was their response?

PROF GALVIN: No. We haven't put that specific issue to the proponent.

MR SHARROCK: Okay. Okay.

PROF GALVIN: We have discussed safety. The proponent – and I will defer to Clay on this, but my understanding was the department – that the proponent had a view that safety wasn't – shouldn't be part of the assessment at this stage, and it normally would not be. So we didn't delve into it too much further. I will just go back to my opening slide. My terms of reference were the comment on safety, and that goes to the actual risk presented by the concept.

MR SHARROCK: Yes. Well, a number of people mention in the reports that we've read – and that is that "we want some more detailed information", and the proponent says "well, you don't normally get that at this stage". But I think you made that point, Jim, and others have, that this is very unusual. Why not do it this time? So I will be very interested to ask the proponent why that is so. I'm also very worried about the fact they've done a lot of risk assessment but none are presented.

PROF GALVIN: Yeah. Well, I haven't seen it, and - - -

MR PRESHAW: And we haven't seen it either.

MR SHARROCK: I'm – you know, I foreshadow that I will ask the proponent that. I mean, are they hiding something, or do we not know that? Yeah. So – I mean, the experts' meeting, which you went to - - -

PROF GALVIN: Yes.

MR SHARROCK: - - - which is some time ago – and there's been a lot of work done before – that was after 2D modelling, before 3D modelling, wasn't it? But there were still a number of unresolved issues, and there was a list of things to do. You know, has there been a follow-up since then? I don't mean another experts' meeting, but a lot of these things are not resolved, are they? They're differences of opinion – of technical opinion, really.

PROF GALVIN: The experts' meeting resolved that – from a regional stability point of view, you know, people were much on the same page. When we wanted to get down to the finer detail of how the pillars behaved in the workplace, that we needed 3D modelling, by the time the experts' panel – committee met, the company had already commissioned the 3D modelling, and on the day it presented some of the outcomes at that time. Subsequently, they've then released two reports with those modelling outcomes, and they're the reports that Professor Canbulat and my supplementary reports have taken into account, and, from my perspective, you know, the safety aspects of the behaviour of those small pillars remains unresolved.

MR SHARROCK: Okay. Okay. I noticed in your presentation you showed us the layout of Cooranbong and of Clarence. The proponent consider any layouts like that or mining that method?

PROF GALVIN: You'd need to ask the proponent. The proponent has said that they've looked at lots of methods, and, I mean, I'm sure they did.

MR PRESHAW: Yeah.

PROF GALVIN: You'd – would need to – the proponent has had regard to Clarence in arguing that pillars less than 10 metres are used in mining, and there's no argument with that. The point is that in every case that I'm aware of, they're used in pillar extraction. The method doesn't qualify as first working, but it qualifies as pillar extraction, and that then raises the issue, well, what is the regulator's view of - - -

MR SHARROCK: Yeah. Well, we have, in some of the reports, the regulator's view, don't we, and that we regard it as second workings and it would not be approved, but what I don't understand in that – and you might be able to help me in this - - -

PROF GALVIN: Well, I don't think the regulator's - - -

MR SHARROCK: Would they go there and seek approval, take them underground and then get approval if it's safe?

PROF GALVIN: So just need to correct the record there. In recent years, the legislation has changed. In your day and my days, mine managers, we had to get approval. That has gone now. You just – there are certain things that classify as high-risk activities, and you have to notify the regulator. The legislation is silent, then, on what happens.

MR SHARROCK: Okay. Okay.

PROF GALVIN: However, obviously, common – the regulator then has to – if they're concerned that this may present a risk to health and safety, they will come back to the proponent. Okay. After that, it's the regulator's – well, what do they want? I would say to you that, you know, things like the use of brake line supports, cable bolts supporting the entrances to lifts, they're all things that the regulator may ask the proponent to consider.

MR SHARROCK: And they're cost, cost, cost.

PROF GALVIN: Well, the regulator's not worried about the cost.

MR SHARROCK: I know.

PROF GALVIN: It's just health and safety. The process would be to demonstrate to the regulator, by risk assessment, that the risks are at an acceptable level, and it's now – the difference in the legislation – it's up to the owner of the risk to decide how to manage it and no longer be dictated to by the regulator.

PROF FELL: If I can just look at the particulars of this case. The regulator commented on the RtS – or, effectively, after, basically, these issues were raised – and did not say – their – if I might say, their comment was pretty bland and did not say, "We see a problem coming." They said, "Yes. You're – it's a secondary extraction process," and simply you would have to follow the rules for that but didn't go on to say, "We're worried about that." I was a little surprised, I have to say, that the department didn't seek further information from a totally independent person, because we had the headbutting exercise between the reviewers – or the experts, if you like – without that being resolved, and I wondered why perhaps – now, I don't know whether Professor Graun would be appropriate because he's a hard-rock man, but to go out to somebody else and actually seek clarification on the safety issue. Everybody seems perfectly happy subsidence is not a problem.

PROF GALVIN: Yep.

PROF FELL: A 3D model has demonstrated that beyond question, but the question of mine safety because of roof falls because single piers or – sorry – may not support properly is, I think, an issue still on the table, but I'm not hearing from the regulator that it's flashing red lights all over the place. Have I got that right or not?

MR PRESHAW: Well, two things I'd say in response to that. One is that the resource regulator and the division of resource and geoscience were aware that we had two independent experts involved already in terms of mine design and engineering, etcetera: Jim and Ismet. I think the division of resource and geoscience is – refers directly to that fact and in – and says, "We're not going to comment any further beyond what the department's expert advice is saying."

The resource regulator may not have said that explicitly, but we've had conversations where they've essentially said, "Your independent expert advice from Jim Galvin and Ismet Canbulat can comment on safety," and so when you say did we get expert advice, why did we not get more expert advice, I guess we could've got another person to provide advice on safety, but both Jim and Ismet were explicitly required to provide that independent advice to us as part of their terms of reference, so I guess we were – are relying on their advice for safety.

PROF FELL: Well, I guess I was just looking at procedural fairness of the whole exercise - - -

MR PRESHAW: Yeah.

PROF FELL: - - - if you like: that you have made a pronouncement - - -

MR PRESHAW: Right.

PROF FELL: - - - based – and the resource regulator hasn't said, "Guys, this is a major issue."

MR PRESHAW: I mean – so that's the second thing. The first thing I was going to say is – I guess in summary – is we did get expert advice, and Jim and Ismet is our advice. If someone wanted to get further advice, we could certainly go to another person - - -

PROF FELL: But - - -

MR PRESHAW: - - - but the second thing I'd say - - -

PROF FELL: Yeah. Sorry.

MR PRESHAW: - - - in relation to your other question - - -

PROF FELL: Go on.

MR PRESHAW: - - - is – why did the resource regulator not say more. I think that they've said what they think is relevant at this point in the process. So their role is very much under the Work Health and Safety Act or – and/or the Mining Act. When we're asking for advice about, you know, what sort of mining is this, they'll tell us they think it's secondary extraction, but to – for them to go beyond that would be very unusual, and I guess they didn't feel it was their role, at this point in time through the assessment process - - -

PROF FELL: Well - - -

MR PRESHAW: - - - to give any further advice.

PROF FELL: That – I can understand that point, but I compared the advice the resource regulator gave with the advice given by EPA and DoI Water, and they were singly more prescriptive.

MR PRESHAW: Yep.

PROF FELL: So presumably they were much more prepared to actually accept their role – future role, if you like - - -

MR PRESHAW: Yeah.

PROF FELL: - - - and they weren't saying, "No, we can't do this." They said, "If it is approved, these are the things you have to do."

MR PRESHAW: Yeah.

PROF FELL: So you can understand - - -

MR PRESHAW: I mean, I understand - - -

PROF FELL: - - - for a person who's looking at the process - - -

MR PRESHAW: Sure.

PROF FELL: - - - I sort of get a bit worried about - - -

MR PRESHAW: I understand – I understand the thrust of what you're saying, and the advice from the resource regulator was, I would say, not uncommon in its length and detail, and so, really, in some ways, the question – we could put the question to the resource regulator, you know - - -

PROF FELL: Well, I guess - - -

MR PRESHAW: - - - are there other things that they would - - -

PROF FELL: Yeah.

MR PRESHAW: - - - they would like to say. They generally do not provide any further information on that sort of advice.

PROF FELL: Yeah. Maybe there's been informal advice passed between the resource regulator and the department, but it hasn't been put on the formal record. Is that possible?

MR PRESHAW: I would say that what's in their advice is, as far as we understand, they've got concerns. They think it's a high-risk activity. They think it's secondary workings, not first workings.

PROF FELL: Well - - -

MR PRESHAW: And, really, beyond that, they wanted to rely – they were aware that we had our own expert advice, and so they were happy for us to rely on that.

MS TUOR: But isn't the – sort of – the conclusion that would be drawn by them classifying it as high-risk activity secondary workings would be, as I understand from what you're saying, that the information provided now would not necessarily satisfy those – the high-risk category, that you've identified that further things would need to be done: in particular, further supporting of the intersections and the roof area, etcetera, etcetera. So that potentially can be done, but, in the proposal that's currently before us, now that it's been identified as high-risk, that's not included as part of the proposal, and it could be at a later stage, but then there are further implications in terms of the time that the work would take, the cost, etcetera, etcetera, which then could have flow-on effects in the assessment of the economic viability of the project.

PROF GALVIN: So - - -

MS TUOR: Is that a correct summary?

PROF GALVIN: It's Jim; if I can answer that. I think – I'm in the same position as the regulator; the regulator's in the same position as me. You need to put it in the context of how the legislation is now – is now framed. Some years ago, everything was prescribed: the roadway should be five and a half metres minimum, so forth and so on; a maximum width.

That has changed: the legislation today is framed in a risk management framework, which says that the coal operator shall base the operation of a mine on a risk assessment basis, and where possible eliminate risk, mitigate it, or control it. And the onus is on the coal owner to demonstrate to the regulator that the risks have been properly assessed, and controls have been devised, and that the controls are likely to be effective.

Now, all that I'm pointing out is that I have concerns, at this – with the information available at the moment, I am concerned that there are risks associated with this method, and I have not been provided with any information, or sufficient information to understand, has the proponent properly identified those risks? and are the – do I consider the controls likely to be effective in managing that risk?

PROF FELL: Well - - -

PROF GALVIN: And the regulator's in exactly the same spot. So the legislation says, "By the way, we don't trust you on all these issues. Some things are so critical, we are going to define them as a high-risk activity, and you specifically have to come back to us with what you're going to do about it." And this particular proposal, as to the size of the pillars, puts it into a high-risk category, from my perspective. And now the regulator has said, "Well, furthermore, we believe it classifies as pillar extraction," which is also a high-risk activity.

PROF FELL: Would it help the regulator in making the determination if the risk analysis that was conducted by the proponent was made available?

PROF GALVIN: Yes.

PROF FELL: Okay. My next question would be, the proponent has provided the CVs, or effectively the – of the mining engineers that have been employed. Have you any reason to question any of those as being skilled people in their discipline? I don't know whether we can put this on public record, but it's - - -

PROF GALVIN: I can answer it on the public record.

PROF FELL: Mmm?

PROF GALVIN: I can answer it on the public record. I take the CVs as read, but also make the Commission aware that pillar extraction is the most hazardous form of

underground mining that there is. The most hazardous by a long way. And I would suggest that the Commission looks at the CVs of the persons concerned, and – to determine if they've had practical experience in pillar extraction. For many - - -

PROF FELL: Well, that's a very helpful comment, I believe.

MR SHARROCK: It is.

PROF FELL: And, secondly, presumably, the company would have to employ people that do have this expertise, if they were going to press ahead.

PROF GALVIN: If it's classified, now, as pillar extraction, they would need expertise in pillar extraction, yes.

PROF FELL: Yes, that's a helpful comment. Thank you. Look, I'm very conscious we've really given it a lot on the mining method.

MR PRESHAW: Yes.

PROF FELL: I think there are two residual questions.

MR PRESHAW: Sure.

PROF FELL: Can you shove a slurry back into the mine? And, secondly, can you put water back into the mine, or does that freak you out? Have I got it correct? I think – quickly handle those, because we really ought to be talking groundwater, and ..... a bit of a break. But - - -

PROF GALVIN: Okay. I can answer both of those quickly, if you like. Yes, it is feasible to put slurry in the mine, and it's done quite often. In my – at the time I did my report, I said, I was unaware of any mine that deliberately put water back underground. I've now been made aware of one case, in Queensland, where mine water is deliberately stored in – I think it's Southern Colliery. And they have – and they've had an incident where one of the bulkheads let go, and that water went down and flooded their lower dip mine workings. So there is a precedent for putting water in the workings, and - - -

PROF FELL: And I think one of the questions we were going to ask was about up-dip, down-dip, and that sort of stuff. If it has to be up-dip, can that be done satisfactorily? Can you store water up-dip? I think I've got the words right, haven't I?

PROF GALVIN: You can store – you can store water up-dip.

PROF FELL: Okay.

MR GATES: Can I – can I ask you – it's George here.

PROF GALVIN: Yes.

MR GATES: Jim, can this mine be run so that water is only stored down-dip?

PROF GALVIN: I need to see a better mine plan than what's provided in that EIS to understand which direction they're mining, and when do they intend to mine the panels, how big are the pillars in between the panels. It – really, anything in mining is feasible if you're prepared to throw the money at it. The issue is, the bulkheads control the catastrophic risk of an inrush. Storing water in workings anyway, and working down-dip of them – if you have fractures in the floor, geological features that run through the flooded workings into the current working place, seepage can so forth can be an absolute pain in the bum; that's a working cost. But it's something – you still have to be convinced that there is not another way of having a uncontrolled inflow - - -

PROF FELL: Sorry ..... George.

PROF GALVIN: - - - through those features.

PROF FELL: We have to have a – put that as a general question to both yourselves and the proponent, so - - -

PROF GALVIN: The company has given – the response to my queries – the company has given it a lot of thought. They are mining the panels up-dip, so that the mouth of the panel – if a bulkhead failed, there's only a limited amount of water that can come out of that panel before the throat of the panel is higher than - - -

PROF FELL: The water level.

PROF GALVIN: Can't get out. I would like to see more detailed plan, but in our response to the questions in a meeting, I think they've given it a lot of thought.

PROF FELL: Thank you. Are there any other questions on mining method?

MS TUOR: No.

MR SHARROCK: I have one brief one on geology. Right through the reports, we see that there's not enough geological knowledge there. And I'm just wondering why the company didn't get more geological data, drill more holes. I suspect – and it's my job to ask the questions, not answer them – but I suspect one of the reasons might be, it might have been impossible to get access to properties

MR PRESHAW: Yes.

MR SHARROCK: And if that's the case, do you think that will go on for ever?

MR PRESHAW: So I can answer some of that question, and the company did experience, I guess, unusual difficulty in getting land access. And, early in the process, a number of years ago, they were trying to get access, for different reasons: partly for drilling; partly for doing soil surveys, to determine whether it was biophysical strategic agricultural land, BSAL. And they couldn't get access to a large portion of the land that they wanted to get access to at that time. And there was essentially a blockade from local residents to stop them getting onto a lot of the land.

That ultimately ended up – without going into great detail – and you can look it up – but it ultimately ended up in a court case, in which essentially the court held that they couldn't get access to the land in and around significant improvements, and the definition of "significant improvements" was actually interpreted differently than it had been before, in a broader sense. And so there's still a lot of land – as a result of that court case, and of the interpretation of what a "significant improvement is" – there's a lot of land that they can't get access to, because it's privately held, and they're not allowed. And if the landowner doesn't want them on, they can't get there.

So I would say, in my experience, that there's an unusually large amount of land that they haven't been able to access for drilling, or for doing the soil surveys. So we – on a related but relevant note, we had a lot of difficulty, at the point of determining whether the land was BSAL, in terms of whether they had enough soil samples. We ended up getting our own independent expert to provide advice on that. Ultimately, the determination was that, despite some uncertainties, it was "unlikely" that there was going to be BSAL on any of the land; but it was actually quite difficult to make that determination, and that's why we needed expert advice on that.

So the answer is, to me, they have less – one of the reasons they have less geological data is squarely because of the land access issues they have. To be fair – I'm sure you'll ask the question to them – they insist, and they've confirmed in various documents, that they have enough – they have "adequate" data, and that they've managed to work around what they originally planned to do by finding other data. So they maintain that position very firmly, as I understand it.

PROF FELL: Slightly different question. You mention that you've applied the precautionary principle to the assessment of the mining method. In their response to submissions, they gave quite a long description of what the terms of reference for the precautionary principle were. Do you, in hindsight, having read that, feel that you have a strong case for applying the precautionary principle?

MR PRESHAW: So, I guess – when we use the words "precautionary principle" in the report, we weren't only referring to the mining method; we're referring to the project as a whole. So that's just - - -

PROF FELL: Well, you refer - - -

MR PRESHAW: - - - a minor point of clarification.

PROF FELL: - - - particularly – well, I needn't cite it, but:

Reliability and accuracy of predictions about pillar instability and other geotechnical issues –

which is what we've been focusing on - - -

MR PRESHAW: Yes.

PROF FELL: - - - it goes on to say:

…adopted a precautionary –

so, I mean - - -

MR PRESHAW: Yes, I mean – I guess, there's two things there. Like, the word "precautionary" is often used in our reports in the broader sense, in the definition – in the normal definition of the word. Like, "We've just taken a cautious approach."

MR SHARROCK: I understand.

MR PRESHAW: So there might be situations in the report – so there might be statements in the report where we say "a precautionary approach", and that's probably using that word in its more generic sense. But, certainly, when we evaluated the project as a whole, we did consider the precautionary principle, as we are required to, in terms of ecologically sustainable development; and we thought that it is triggered - - -

PROF FELL: So - - -

MR PRESHAW: - - - when considering it as a whole. So when we've said "precautionary approach", that may not be referring directly to the principle, the precautionary principle, which is really, you know, a broader thing – a case-law kind of consideration - - -

PROF FELL: My understanding – just an overview of the whole thing – is that you don't like the mining method; it could cause problems; as a result of that, you can't put the water underground, but you can put it on top, and might cause environmental problems.

MR PRESHAW: Look - - -

PROF FELL: And the second arm, if you like, of your argument is, lots of bores have their heads dropped; that's a big problem, because it's going to cause a lot of commotion in the area, and we don't like that. Now, my understanding of precautionary principle is, you have to demonstrate actual potential impact.

MR PRESHAW: So, in response to the first part of what you said, I would agree that, to me, the main – the biggest issue with this project is the impact on the groundwater. So that would be the primary concern for us. And that's partly in relation to the number of bores - - -

PROF FELL: Well, I guess we better spend some time talking about it.

MR PRESHAW: That's right, yes. But it is – but the reason – part of the reason they have such an impact on the groundwater is related to the mining, and the underground – the nature of underground mining, so I felt the mining method is – I think the mining method is still relevant to that. But I would say, the primary reason that we – you know – the primary issue we have with the project is the groundwater impacts; but there are related issues to mine design, that could relate – which could cause surface water impacts, as well. So that's probably – I would probably flip it, in the way that you've said - - -

PROF FELL: Well, that's – yes, well, that's very helpful.

MR PRESHAW: But they're both major concerns - - -

PROF FELL: We understand what you've - - -

MR PRESHAW: - - - from the department's perspective.

PROF FELL: - - - written in your .....

MR PRESHAW: Yes.

PROF FELL: Okay. Thank you.

MR PRESHAW: Yes. And if I could just comment, broadly, just for a minute, on, sort of, the – I guess – the thrust of where we've been going today. So, to me, there's been – we've had a lot of discussion already about the, like, technical details of the mining – of the mining method, and the proposed impoundment of water, etcetera; and there has been a lot of technical debate, through this whole process, this assessment process. That's partly the reason it's been so difficult and complex. It's – but – you know, experts at ten paces, disagreeing on fundamental things.

And so we can have technical discussions, technical debates, till the cows come home. But at the end of the day, the department has a job to do, and we've had to assess what's before us. And so, when you start to get into the technical debates, you can come up with lots of hypothetical questions – "What if they did this? What if they did that? Can they fix it by doing this, that and the other?" And you can easily end up in the sort of scenario where you're trying to fix their own project, or repair the problems with their project.

And to an extent the department does try and, you know, consider options that will improve the project, or make it approvable, but at the end of the day, we have to assess what's before us. And there's a lot of things in this project that we probably need more information on, or they could consider doing other things with. But we're not in a position to second-guess those sorts of things. So, I guess – I just wanted to make that point - - -

PROF FELL: But you - - -

MR PRESHAW: - - - at the outset.

PROF FELL: You take the additional step of actually saying the project should not be approved.

MR PRESHAW: Based on the information, yes.

PROF FELL: I think it's very important for you to indicate why you have said that.

MR PRESHAW: Yes.

PROF FELL: I mean – and you've said that "precaution" just means "cautious". So, you know, what – it's important, I think, we understand, if you like - - -

MR PRESHAW: Sure.

PROF FELL: - - - what has driven you to this decision.

MR PRESHAW: Sure.

PROF FELL: Which - - -

MS TUOR: So can I just – my understanding of what you said about the precautionary principle was not that it just means "cautious". It was within certain paragraphs you may have - - -

MR PRESHAW: Yes.

MS TUOR: - - - used the sort of normal word of "cautious". But in your actual conclusion - - -

MR PRESHAW: Yes.

MS TUOR: - - - overall, you've applied the precautionary principle in the legal sense of the two-threshold question. Is that correct?

MR PRESHAW: That's correct, yes.

MS TUOR: I've understood it correctly?

MR PRESHAW: So where the word "precautionary" is used not with the word "principle", it's probably just in the generic sense of the word. But where it's used with "precautionary principle" together, that's when we're referring to the legal test, I guess, which is one of the considerations, but it's not the only consideration.

PROF FELL: Can we please go on to groundwater.

MR PRESHAW: Sure.

PROF FELL: I've got to give George .....

MR GATES: Look, there's 10 highly qualified people looked at groundwater.

MR PRESHAW: Yes.

MR GATES: And I certainly acknowledge that the model has come a long way and the – certainly the uncertainty analysis was very useful. I suppose I would disqualify that a little bit by saying the uncertainty analysis still uses a model, the model has some level of errors through it, you know. So those levels of errors carry into the uncertainty analysis, you know. That's just the way things are. But having said that, I think the model has greatly improved. If you look at the inflow assessments, they're lineball with other mines that are – Dendrobium, for instance, Berrima nearby, you know, similar geologies. You can always make arguments that there isn't enough geological detail in these groundwater models, but where do you stop before you make an assessment, you know?

So I'm happy to take the model as it is and do my assessment on the model, and whether it's a class 1 model, or 2 or 3, and then we've had, you know, an independent assessment saying it has got aspects of all three of those classes, and your individual expert had a lot to do with writing those classes, so he understands, you know, what was the intent of the classification. I guess if more modelling was to be done, then we would be in the same position. You know, we would have one or two more bores affected, slightly more water going into the mine or slightly less water going into the mine. So I think there's enough information there for us to do our assessment. But we haven't heard from the public yet with our public meeting, so hold that in reserve.

Some of the issues around water quality are interesting. Storing the water back underground, I would have thought, was quite feasible from a water quality point of view. I'm not sure about, you know, how it affects mine safety. But I think that has been dealt with reasonably with your various experts commenting. I'm a little concerned about the mine – what happens if they don't have enough water. I think they're at a disadvantage because there's no return flow policy that allows them to credit for water that they're putting back under the mine. So that's a shame that that

– the government doesn't have that policy, but it doesn't. So they have to hold all the water licences for all the water.

The water sharing plan for this area is due to be renewed in two years time. I'm not sure whether the same extraction limit will apply for the next 10 years. So it would be interesting to know what the thinking there is. So it's just a – you know, there's just that risk element that the extraction limit might change with the new plan. And the other risk area possibly is if the town water supply bores for Sydney get turned on. Now, you would have to have a pretty bad drought for that to happen, and the desal plant is probably going to supply the water, not these bores that were put down. But there's a lot of water being set aside for those bores. If they were ever to be turned on, you know, would that be a significant issue for the mine water?

MR PRESHAW: Okay. Do you want me to just respond to – in general to those things?

MR GATES: Just general .....

MR PRESHAW: Yes. So, look, I think I agree with what you were saying to start with there, which is that at the end of the day, there's probably enough information now with the model to make an assessment. There's – and I'm sure you're meeting with the special interest groups and possibly their experts. They would probably argue that we need more, the model needs to be better and have more data, etcetera, etcetera.

But I think if you read our report, at the end of the day, despite all the uncertainties that still remain, there's enough here now for us to make a reasonable assessment of the impacts of this project. That's partly because I think the impacts, no matter whether you look at the 67th percentile, the 90th percentile or whatever you look at, they're going to be the impacts in terms of the number of bores that will be drilled down.

So at the end of the day, we don't really need to know any more. The company has put forward a number which is already very high in terms of drawn-down bores, and I think we can use that as the basis of a reasonable assessment. And on that, so it's probably worth just – if you've read the report, then you know our position, but it's worth emphasising again that we have not seen the level of impacts on bores that this project would cause, even with the less conservative numbers. Not - - -

MR GATES: Have you looked over the border to Queensland?

MR PRESHAW: We haven't in the - - -

MR GATES: They have a lot of bores that are impacted from - - -

MR PRESHAW: From coal seam gas, yes. So we haven't looked – and they also have a very different policy framework, legislative framework to deal with water-

take and to deal with impacts of the aquifer. So I guess my answer to that is I'm broadly aware of the impacts from coal seam gas on water in Queensland, but my comment would be that it's a very different legislative regime and a very different policy framework.

PROF FELL: Do you feel that a different policy framework necessarily makes it not feasible in New South Wales or, you know, if - - -

MR PRESHAW: So, yes, look - - -

PROF FELL: If, in fact, there was a very good reason to try and change the policy in New South Wales, do you think that's a sensible approach?

MR PRESHAW: Look, I don't think it's probably my position to talk about the general – what the general policy framework is. We can only work with what we've got. But to answer the second part of that, within the current legislative and policy framework, we certainly consider this to not be acceptable in terms of impacts.

MS TUOR: So - - -

MR PRESHAW: In terms of the framework that we currently have, we do not consider this to be acceptable.

MS TUOR: Just so I understand the difference, though, is what you're saying that there's a different policy framework in Queensland being that potentially the policy framework in New South Wales is – has a higher benchmark than the Queensland one?

MR PRESHAW: No, that's - - -

MS TUOR: Or what is it?

MR PRESHAW: Well, look, to be honest, I don't really want to - - -

MS TUOR: Okay.

MR PRESHAW: I don't worry about that because - - -

MS TUOR: Sure.

MR PRESHAW: - - - I don't know the policy framework that well, but I'm just saying it is very different, and I can only really comment on what we're working with here. If - - -

PROF FELL: Yes, I guess I'm going back with this question of precautionary - - -

MR PRESHAW: Yes.

PROF FELL: - - - and if it can be fixed by a policy change and avoid the problems, then, in fact, you're not talking about an ineluctable effect.

MR PRESHAW: Yes. And again, that's sort of – we're sort of getting into the hypothetical area again, where it's – you know, as an assessing officer and a department that's responsible for assessing, we can really only work within the parameters of the framework that we've got right now. But to go a little bit further, we did look at a number of other coalmines across the State of New South Wales.

PROF FELL: Yes, sure.

MR PRESHAW: We didn't include any of the – you know, the data in the report. It's actually very difficult to exactly determine how many bores have been impacted by other mines because the data isn't necessarily collected in the way that we would need to be able to put those numbers on paper. So that's the main reason we didn't do that task. But we did do some sort of back-of-the-envelope sort of estimates, and there's just nothing that compares to having 94 or 118 bores.

MR GATES: Can you comment on their proposed mitigation strategy?

MR PRESHAW: Yes. And so that's – so, basically, everybody accepts that there's this huge number of bores - - -

MR GATES: All right.

MR PRESHAW: - - - that's going to be impacted. No one is denying that. And even the company is not saying - - -

PROF FELL: We even agree with you on that.

MS TUOR: So just on that point, in page 22 of your report you do say that, based on the range of probabilities, the model – whether you've – whatever factors you take into account - - -

MR PRESHAW: Yes.

MS TUOR: - - - it's clear that the level of ..... is very significant across all predictions. So you're – is that a position that is, essentially, agreed across the board in terms of the experts on various sides about significant impact?

MR PRESHAW: Look, I think - - -

MS TUOR: And then it becomes a debate about whether you mitigate that impact? So it's not – it's you go from the sort of avoid to mitigate, and that – the key disagreement becomes one about how you actually mitigate those impacts.

MR PRESHAW: Yes. I think the key disagreement is, you know, can we mitigate the impact. I agree with that.

PROF FELL: Sorry. I missed that.

MR PRESHAW: I think that is the key issue. Can we mitigate, can we make good – that's the question: can we make good?

PROF FELL: Yes, sur.

MS TUOR: Yes. So there's general agreement that there are significant impacts unless you - - -

MR PRESHAW: Look, I don't want to put words in other people's mouth.

MS TUOR: You're okay.

MR PRESHAW: But I – like, I think so would be my – that's my opinion.

PROF FELL: Well, it seems to me the problem is people don't want to speak to the proponent.

MR PRESHAW: Yes.

PROF FELL: And if the proponent were to say, look, I will deliver to you the amount of water that you need, and that's 15 cases – nice pure drinking water standard – would that satisfy? And if people aren't speaking to each other it's pretty hard to get an answer to that. But to the uninformed observer that seems a potential solution, if they want to go that direction.

MR PRESHAW: Yes. And so I think it's relevant, probably here, and we may have touched on it in the report, but I will mention it again. Ordinarily in a circumstance where there's bores that are likely to be impacted by an underground mine or other development, particularly with mining, what we normally see is the proponent and the likely affected landowner coming to some sort of arrangement or agreement before we even get to the point of needing to determine a project. That is completely the normal process. And normally we're talking about a handful, right. Five, maybe 10 in - - -

PROF FELL: Well, 15 in this case, yes.

MR PRESHAW: You know, maybe that many, but in this case we're talking about 70-odd landowners. And the reality is I think everybody accepts they're never going to get all of those landowners to agree. Whether it's before determination or after determination there's going to be a fight with at least some percentage of those people. And that's a situation we haven't encountered before. So I guess that's just – in terms of the ability to make good that is a really relevant point, and it's not

something that we've ever had to encounter before because, ordinarily, the landowners and the proponent can reach an agreement. And usually that's before we even have to make a decision on whether the project should go ahead.

PROF FELL: You made that point clearly, yes, thank you – in your report.

MR PRESHAW: Okay. Yes.

PROF FELL: It - - -

MR PRESHAW: And we can point to – if you wanted examples of that sort of thing we could go back and find you examples of where there are predicted impacts and then there are .....

PROF FELL: But to what extent is that a case for recommending against the proposal?

MR PRESHAW: So then you - - -

PROF FELL: I mean, you're always going to have problems, if you're WestConnex or Light Rail – call it what you will – always be some people who basically reject and don't want it. But governments have the ability to take steps to - - -

MR PRESHAW: Yes. And I think you have to sort of start at the high level, and why do we want people to come to these agreements? Like, why is that an ordinary way of doing things? Well, we've got an aquifer that we're trying to protect. That's what the aquifer interference policy is really there to do. And in this case it's a highly productive aquifer, so it has got – you know, good water that we need to have arrangements in place for. And we've never seen this number of impacts on such a highly productive aquifer, and we have no confidence that the make good – the concept of making good is ever going to work in this scenario with so many different landowners and so many bores affected.

PROF FELL: And that's not technically a – it's not work, it's socially you don't think the mine and the impacted people will get together and make it work.

MR PRESHAW: So – that's right. We don't even know how that process would work if – given that there's such a disparity between the two parties at this stage, we're not even sure how that process would work. The way that it would need to work – if we were to say, well, we want to approve this project, we would then need to put the mechanisms – the framework in place within the conditions to try and ensure that those made good provisions worked out, but we've never actually had to put in such a condition.

PROF FELL: Sure. Let's step back from that problem for one moment. Basically, the total allocation in this water sharing plan is – can I use the word gigalitres rather than megalitres, because that sounds more sensible.

MR PRESHAW: It is apt.

PROF FELL: It's 12 gigalitres, right? The mine itself wants two gigalitres and they've got 90 per cent of that already. How much water are we talking about for the 92 bores that are having problems, as a percentage of the total take? Now, bear in mind this was the Sydney Basin/Nepean, not much, much, much, much larger Sydney Basin proper.

MR PRESHAW: Look, I don't have the answer. I would have to take that one on notice and get back to you. That's a difficult one to answer.

PROF FELL: What I'm trying to get is a balance on the thing.

MR PRESHAW: I think it's relevant to say that there are essentially two parts of the ground river assessment that we've sort of broke it down into. One – we will start with the – what you're getting at, I think. One is the licensing: can they actually get a license to take this water?

PROF FELL: They've done that.

MR PRESHAW: We think so.

PROF FELL: Yes.

MR PRESHAW: Like, there's a little bit of uncertainty. There's a bit more here, maybe, but they probably should be able to get that. So licensing, while that's often a problem for mines, in this case it's probably not. I mean, again, the special interest groups might argue about that, but we generally accept that they can get the license. Then the – that's a total separate issue for us to the impact on the aquifer, and that's where the make good stuff comes in, and really that's what we're interested in.

PROF FELL: Yes. Sure will. Yes. It's .....

MR PRESHAW: So your question about the proportionality of the water take of an individual bore. Look, my sense is that it's probably not a huge amount in the broader scheme of things, but at the end of the day we're interested in the aquifer within the project area and that's what we based our assessment on. But we can certainly come back to you with a broad answer to that question.

PROF FELL: I have a feeling it might somewhere be in there – in the documentation.

MR PRESHAW: Yes. So just to return to what I was saying before, the idea that we could make good – we could force the company to make good on all the impacts to the bores through the commission's consent, it's – it would – it's something that we never had to include as a commission. And - - -

PROF FELL: Can I just check one use – word you use.

MR PRESHAW: Yes.

PROF FELL: You said force the company to make good.

MR PRESHAW: Yes.

PROF FELL: I think the company has already in its documentation said it is highly willing to make good. Okay. So - - -

MR PRESHAW: Yes. I guess it's – we would have to have commissions to ensure that the impacts are made good if you – to change the language.

PROF FELL: Thank you.

MR PRESHAW: And to create such a framework and such a regime with it, as we've gone into in the report - - -

PROF FELL: Is new for New South Wales.

MR PRESHAW: - - - is new but, I think, extremely problematic. I think it's inherently problematic, because it would be very difficult to avoid a situation where you end up in an ongoing dispute resolution process, and – the costs of which – you know, to the department, to the government as a whole, to the proponent, to the individual landowners – we're not even sure what that would be, but presumably would be of great cost to all parties involved. And we don't even really have certainty that you would end up with the impact being made good.

PROF FELL: In 200 metres of this site you will be supplying the same amount of water from Sydney water. It's not a big problem even to replace the total bore capacity.

MR PRESHAW: So if you – the table is in the report, and it's in the response submissions, and most of the way that the – from a technical standpoint – I don't think anyone is arguing that technically you can make good. You could if you had access to land, if the landowner let you come on and redrill your bore or drill another hole. But we don't know that that's – they're not – the landowners aren't even letting the company on to get basic geological data and drill holes. So there's no certainty that the landowners are also going to allow - - -

PROF FELL: I guess my point is: is it possible that the department is overreacting to the problem in that were it anywhere else – any other situation than this mine – that could be readily fixed by reticulation of water?

MR PRESHAW: So, firstly - - -

PROF FELL: I mean, how big a problem is it? Is it a big enough problem to act, as you said, as one of the two reasons which are knocking this project back?

MR PRESHAW: So, firstly, I don't think that the department's overreacting. I think this – our response to the level of impact is - - -

PROF FELL: Please forgive me; I'm being a little provocative.

MR PRESHAW: No.

PROF FELL: I'm just trying to understand your thinking.

MR PRESHAW: No, I agree. Look, we don't think it's – we don't think it's overreacting at all. We think that this is an impact that is serious and significant, and that's, as I said, one of the reasons we think the project - - -

PROF FELL: Is the impact serious - - -

MR PRESHAW: - - - as it's currently proposed - - -

PROF FELL: - - - from political reasons, or from – you know – amenity reasons, for the people?

MR PRESHAW: I think the political side of things is not relevant to our assessment; but the impacts on the community are relevant, so the amenity impacts are relevant; and the environmental impacts are relevant, so the impact to the aquifer itself is relevant. So those two aspects, both the social and environmental impacts of the drawdown, are relevant to our assessment. And I think it is a very significant impact. And in – to sort of respond to the other part of what you were asking, in terms of, well, in other areas, could we – we would respond differently to this – I'm not sure that there is an analogy that we – that I could draw to this particular circumstance. We haven't – as I said a number of times – we haven't seen a project like this.

PROF FELL: I'll give you a very good analogy: it has to do with Williamtown and PFAS, where in fact water is being reticulated; people were affected by the groundwater problems. They had bores which they were using; they've now replaced it with townswater reticulation. But can I just go back to one word you used. You used "From a social and environmental viewpoint"; I couldn't quite see where it would fall down with an environmental viewpoint.

MR PRESHAW: So - - -

PROF FELL: Are you talking about ..... fauna, and things like that, or GDEs?

MR PRESHAW: I'm not specifically referencing GDEs, no. I'm just saying, from an environmental standpoint – the aquifer is an environmental feature itself. So the

water under – groundwater is an environmental feature that needs to be assessed. And so that's what I say the aquifer interference policy is there to deal with, an impact on an aquifer. Then that's – there is an environmental impact on the aquifer itself - - -

PROF FELL: There's no question about that, but I gathered that DoI Water has quite clear rules associated with that, and that has to be made good.

MR PRESHAW: And, again, we're not confident that that can be made good.

PROF FELL: Well, we're back at the front end.

MR PRESHAW: So if you can't make good on the impact, then there's a residual impact on the aquifer, which is an environmental impact.

MR GATES: I think, also, your report indicates that, if all the water can't be stored underground, and it has to come up and go into surface storage dams and has to be - - -

MR PRESHAW: Yes.

MR GATES: - - - released, there'll be an environment flow-on impact; and that was one of the possibilities that you foresaw.

PROF FELL: No, I think that's a question for the proponent, quite perfect - - -

MR PRESHAW: Yes. And so that's – I mean, there was a list of things that you mentioned at the beginning, and I was moving to that one. But that's certainly a major concern for us. And I think that is exactly where you get that intersection of groundwater knowledge and experience and the mine design knowledge and experience, because those issues come together in the sense that if there are going to be hazards or risks – safety risks or otherwise – underground, and they can't impound the water in the way they've proposed, well, what are they going to do with that water, temporarily or over the medium to long term?

Suddenly you've got, potentially, a surface water problem; and I think that's explained, to some level, in our report. And the company has not formally proposed any sort of water treatment in its assessment, in its – and in any of its documentation. We understand that at one point, it was part of their conceptual plan, but they've never included that in their report – in their documents, in the EIS documents. So again, it's one of those situations where we can't assess something we haven't got the details on.

PROF FELL: It's a bit catch 22, though. I mean, basically, they will not put that unless they honestly believe that there's a strong risk that there'll be - - -

MR PRESHAW: Yes.

PROF FELL: - - - surface water present to be treated.

MR PRESHAW: Yes.

PROF FELL: I guess we better talk briefly about surface water.

MR PRESHAW: Yes.

PROF FELL: I take it, you people haven't any real worries about surface water, unless the mine water has to be handled on the surface.

MR PRESHAW: I would say that the department, in its assessment, didn't have any major residual concerns.

PROF FELL: Okay.

MR PRESHAW: But certainly, if you read Water New South Wales and the EPAs assessment, they probably have some – what I would call minor residual concerns - - -

PROF FELL: Yes, they - - -

MR PRESHAW: - - - that I think can be dealt with - - -

PROF FELL: Yes.

MR PRESHAW: - - - through appropriate conditions of consent, that would be commensurate with a mining operation of this scale.

PROF FELL: Well, they were concerned about release from sediment ponds - - -

MR PRESHAW: Yes, yes.

PROF FELL: - - - and the non – water that's been in - - -

MR PRESHAW: Yes.

PROF FELL: - - - brief contact with coal – sort of thing – first flush and all that sort of stuff.

MR PRESHAW: I mean, if I could speak freely, like, that's not – that's not a huge issue for us, as it currently stands.

PROF FELL: It's a rats-and-mice job.

MR PRESHAW: Absolutely. And there's a lot of – look, I'm happy to say that I think a lot of the other assessment issues are essentially rats and mice, in that they can probably be dealt with through the appropriate conditions - - -

PROF FELL: Yes. Yes.

MR PRESHAW: - - - if it was to be approved. And that's why we tried - - -

PROF FELL: That's fair enough.

MR PRESHAW: - - - not to focus on all of that stuff in the report.

PROF FELL: Right. Right. Now, I'm conscious – that dispatches surface water, then. We've really been through the things, except the social issues.

MR PRESHAW: If I can just, perhaps, say one thing about surface water, because I have had some experience in that recently, with the assessment and regulation of the Springvale mine, in Lithgow.

PROF FELL: Indeed.

MR PRESHAW: So they have considerable discharges from the mine, and as part of the latest consent, in 2015, the government essentially decided, through the consent, to try and prevent those discharges from occurring. The idea of just installing a water treatment project at that point, when the department and the Planning Assessment Commission put it into the conditions, seemed fairly straightforward, albeit quite expensive. What we're seeing now is that it's actually really difficult, and even more expensive than originally envisaged, and it may well be delayed further than what we originally expected. So I think - - -

PROF FELL: The technology is pretty accepted, I think.

MR PRESHAW: I think so. The idea of reverse osmosis, or, you know, removing the salt, is - - -

PROF FELL: Well, I mean, basically - - -

MR PRESHAW: That's fine.

PROF FELL: Santos are doing it - - -

MR PRESHAW: That's right.

PROF FELL: - - - at Narrabri, very - - -

MR PRESHAW: But the actual, like, scale of that operation is considerable. And the amount of money and construction workers, for example, that are required is

significant. So I would say that, you know, it's not just a simple matter of throwing in a water treatment project, because I think that would have, you know – apart from whatever amenity construction impacts it might have, it would certainly throw the numbers around in terms of the economic benefits or otherwise of the project, as well. So I just wanted to raise that - - -

PROF FELL: Fair enough.

MR PRESHAW: - - - as an issue.

PROF FELL: I'm very conscious – let's talk about the social and economic aspects.

MS TUOR: Well, just in terms of your assessment report, "social" doesn't get a specific heading, even in the issues that are outlined under 6.5, Other Impacts. So it wasn't actually addressed – I mean, it's sort of riddled throughout the report, but it doesn't actually have a, sort of, separate heading, in terms of social impacts. In terms of economic impacts, as I understand it, there's a difference between the independent expert and the proponent's expert of 3.73 million and 1.27 - - -

MR PRESHAW: 373 and - - -

MS TUOR: Yes, 373 and 127. And you sort of explain the difference as to why those figures have arisen. But our understanding is that the applicant's expert says that they do comply with the Treasury guidelines. So, I suppose – could you just explain, a bit more in detail, why there is this difference?

MR PRESHAW: Yes, so it's – it's, again, almost a situation of experts disagreeing as to how guidelines are applied, similarly to under the groundwater assessment issues, where different experts take a different interpretation of the guidelines. That's my basic understanding of why one expert says one and one says the other. So - - -

PROF FELL: But you do make the comment that the return on the mine is not that attractive.

MR PRESHAW: And that's what I was going to say. I mean, even if you accept the company's stance on the benefits, at least in our experience in assessing mines, it's relatively low. Look, that doesn't mean that it should be refused, but I think it's an important consideration when you're weighing up – when you're doing the overall evaluation, when you're balancing up potential impacts, I think you need to consider, well, what are the benefits that they are – even that they are saying are going to stem from the project? And, in our view, the benefits are relatively low, compared to other projects, and in comparison – and more relevantly in comparison to the potential impacts, both on a social and environmental perspective.

So when you – just in terms of the social – I think the social impacts are assessed throughout the report, and, while there may not be a specific heading, certainly

we've considered the community's views very closely, and our engagement with the community has been, you know, as – beyond what we would probably normally do, because of the level of interest in the community.

MS TUOR: Well, just in your assessment of groundwater, to some extent – well, you've said it's – there is a significant impact. Then it becomes the make-good options. Technically, the make-good options can probably be dealt with, but then it becomes an issue of whether you can really implement it due to community concern. So to me, that – it's almost like your argument against the make-good options is the social impact.

MR PRESHAW: It's partly social. It's certainly – I think it's partly social - - -

MS TUOR: Sort of largely social.

MR PRESHAW: - - - and it's partly environmental. Maybe.

MS TUOR: Yeah.

MR PRESHAW: Yeah. I mean, I think it - - -

MS TUOR: I mean, presumably, if - - -

MR PRESHAW: It's partly social, in the sense that the make-good is a – is almost a social issue in a lot of ways. I think the technical – the environmental, technical side of it's probably not up for the debate, but the social side of it is relevant, but if you can't solve the make-good thing, like I said before, then I think you've still got a residual environmental impact on the aquifer.

MS TUOR: So, just hypothetically, if the applicant owned all that land, so you didn't have the impediment - - -

MR PRESHAW: Yeah.

MS TUOR: - - - to actually implementing it - - -

MR PRESHAW: Yeah.

MS TUOR: - - - would the environmental impact be able to be solved?

MR PRESHAW: So that's an interesting question because we've actually – I wasn't necessarily going to raise this. I don't think it's particularly relevant to this project, but we've had a change in advice from the Department of Industry Water in relation to bores that are owned by the proponent. So they still need to – we still need to consider the impacts on those bores under the aquifer interference policy under the legislative framework. We haven't explicitly done either. There are another, I think,

six bores that are owned by the company that are not part of the numbers that are in the report.

I mean, at the end of the day, six on 118 or six on 94 is not a big difference, really, from our point of view, but if, say, all of them were owned by the bore – by the proponent, we would still need to assess it under the aquifer interference policy. They would still need to make good on their – potentially make good or have some other arrangement. So, look, it's a hypothetical that I'm – it's a difficult one to answer, but they still would need to consider it. I think where you'd probably end up is unless it's impacting people outside of the project area, then I would assume that you could work your way – you could resolve that issue, but obviously that's another hypothetical that we're not in, and there's a - - -

MS TUOR: Yeah. Sure.

MR PRESHAW: There's actually a lot of landowners – now, again, I know it comes – probably comes through strongly in the report, but the number of landowners is actually unusually high and very relevant for this project.

MS TUOR: And, just back on the economic, presumably because even on the applicant's figures the, you know, cost-benefit analysis isn't that great - - -

MR PRESHAW: Yeah.

MS TUOR: - - - that gives a heightened sensitivity to these extra things that could result from concerns that have been raised in terms of what you might need to address safety issues if it's classified - - -

MR PRESHAW: Yeah.

MS TUOR: - - - as high risk and what you might need to do if you have to put in a water - - -

MR PRESHAW: That's it. So - - -

MS TUOR: - - - treatment plant and things. So - - -

MR PRESHAW: Yeah. And so the question around – look, the issue quite often that we see with cost-benefit analysis – and it is just one way to assess economic impacts. It's not the be-all and end-all, but one issue that we often see with it is the level of – or the way that externalities are addressed and the numbers that are put to externalities.

If there are residual environmental impacts of the nature that we have raised, in terms of potentially surface water impacts or not being able to make good on the groundwater impacts, then the externalities in such a cost-benefit analysis would

presumably come up quite significantly and would affect the net present value that they come up with.

So we do touch on that, I think, in the report and say, "Look, that may change things," and we've asked our expert to look at that, and, at the end of the day, he ran a range of different numbers, and there are ways that – you know, if there – some of these impacts do – are – if there are some of these residual impacts, then the net present value could even go below zero in certain scenarios, but, again, it's hypothetical.

MS TUOR: Sure.

MR PRESHAW: And so we have essentially tried to use the range of between 127 and 373, just accept that as something that we can base our assessment on, and, even at the higher level, we think that level of economic benefit still doesn't make the project approvable based on the information that we have before – and I do just want to raise that. I know we're running out of time.

The – and it's sprinkled in in the language of the report, but this assessment is based on the information that we have, based on the project as currently proposed, and the language was very deliberate because there is the possibility that they come back and say, "We'll do a water treatment project," or, "We'll change our mine design and we'll support all the –" like, it's quite possible those things will happen, and it's not unusual that those things would happen.

But I guess it's our conclusion that the things that would need to be changed in this project are so fundamental, in an unusually – an unusual way, that it would really need to change the project to be quite something different from what it is right now. In other circumstances, we'll say to a – you know, a longwall proposal, for example, "Well, why don't you change the design so that you avoid certain features," and so they might cut the longwall short or re-orientate into a different direction.

But, in this case, we're not – it's not a simple matter of, you know, chopping some longwalls here or re-orientating them there. It's – you know, it's potentially building a water treatment project. It's potentially changing your entire proposed mine method. Those sorts of things would require us, probably, I would – if you were to add a water treatment project, or to change your mine design, we would almost certainly need to re-exhibit the whole thing, and start the exhibition process again - - -

PROF FELL: Well, in fact - - -

MR PRESHAW: - - - because those are so fundamental to the project.

PROF FELL: - - - is that not what you're doing? Because we actually come up with a set of key issues, plus recommendations - - -

MR PRESHAW: Yes.

PROF FELL: - - - then goes back to the department for you to do a further assessment, then it comes back to the Independent Planning Commission for a final decision. Will you be making a recommendation, next time we're up, about whether the project should be accepted or not?

MR PRESHAW: So the way that I envisage the process would work, based on how it's worked before, is that the Commission will come back to – will come back with the report, following the public hearings - - -

PROF FELL: That's our job, yes.

MR PRESHAW: - - - with recommendations; and , typically, that – those recommendations just go straight to the company, and they respond as they see fit.

PROF FELL: Sure.

MR PRESHAW: And, I guess, in this scenario, there are two options. One is they respond to those recommendations by changing the project.

PROF FELL: Sure.

MR PRESHAW: One is they don't do anything – they respond, but don't change the project – and we go - - -

PROF FELL: Sure.

MR PRESHAW: And we move to a determination.

PROF FELL: Will it be the same panel within – the same group – within DPE that makes the next assessment?

MR PRESHAW: Well, we would – yes, we would – there'll be the same branch that will assess the recommendations of the Commission and any response from the company.

PROF FELL: Just as a observation, don't you find that a little strange?

MR PRESHAW: I - - -

PROF FELL: The concept - - -

MR PRESHAW: I personally don't find it strange, because I've been working in this space for a long time - - -

PROF FELL: No, I – just from a – well, I'm sort of looking at how - - -

MR PRESHAW: Sure.

PROF FELL: - - - things are assessed out in the world.

MR PRESHAW: Sure.

PROF FELL: And to have the same group come back and take another look at it - - -

MR PRESHAW: Look, I was - - -

MS TUOR: Sorry to interrupt, but potentially it could come back to us, and it would be the same group, as well.

PROF FELL: Well - - -

MS TUOR: I mean, in theory, you're identifying issues that need to be addressed, and if those issues are addressed satisfactorily, then presumably either assessment officers or the determining officers would say, "Well, yes, it's been determined."

PROF FELL: Maybe we should be looking at each other across the table at some future stage, then.

MS TUOR: But I think the main concern, as I understand what you're saying, is that the magnitude, potentially, if we were to accept what you're saying are the issues – which maybe we won't, but if we were to accept what you're saying is the issues – that the magnitude, or the fundamental nature, of those changes would potentially constitute a new project; that it wouldn't be the same application any more. Because, if you introduce a water treatment plant, then you've got a whole lot of new issues that exist that didn't exist before, such as visual impact, etcetera; impact on the heritage significance of that area; those sorts of things, that, at the moment, you've said are satisfactory, but would need to – you'd start at square one with that. So - - -

MR PRESHAW: Look, they would have the option to amend the application. The legislation says that if they amend it, we need to consider whether it needs to be re-exhibited.

MS TUOR: Then would you need new SEARs and things like that, or not?

MR PRESHAW: Potentially you could – we could add to the SEARs, yes.

MS TUOR: Yes.

MR PRESHAW: And we probably would, if there was a water treatment project, for example.

MS TUOR: And you wouldn't be concerned about your timeframes of when you were meant to get applications in?

MR PRESHAW: Well, we – it's not a – yes, we don't need to worry about - - -

PROF FELL: Yes. Annelise's been – that's been a very good clarification. Now, I'm conscious of time. I'd just like to go around the table, on my side firstly, to ask, is there anything further people would like to add? And then on your side.

MR PRESHAW: Sure.

PROF FELL: Okay. So, Annelise, is anything?

MS TUOR: Nothing jumps out right at the moment, but - - -

PROF FELL: Thank you. Geoff?

MR SHARROCK: Yes, just two things. One's a clarification, really, and maybe I've got it wrong. On page 26 of the report, where it's referring to supplementary advice on response to submissions, it refers to an appendix E, and it says that:

This is the appendix prepared by Professor Bruce Hebblewhite.

Well, I've looked at it. There's no Bruce Hebblewhite. It's a report by Pauza in reply to the Galvin and Canbulat reports. Now, maybe I've got it wrong, but could you check that for me?

MR PRESHAW: So I will check - - -

MR SHARROCK: Not this very instant.

MR PRESHAW: I will check it for you. I think the answer, though – and we'll get back to you on it – is, appendix E is called the Applicant's Response to Initial Independent Expert Reports. So my memory of what occurred is that the company responded, and that would have been Alex Pauza - - -

MR SHARROCK: Yes.

MR PRESHAW: - - - and we actually went back to them and said, "Are you going to get his work peer-reviewed?" And they subsequently - - -

MR SHARROCK: Hebblewhite's?

MR PRESHAW: No, we said, "Are you going to get Alex Pauza's work - - -"

MR SHARROCK: Sorry.

MR PRESHAW: "- - - your company's work, peer-reviewed, as you had in the original EIS?" And they said, "That's a good idea. Yes, we will get Bruce – Professor Bruce Hebblewhite to review that." So there should be an appendix E. Maybe it's not there. And we can fix that. There should be both the company's response, prepared by Alex Pauza, and the peer review of - - -

MR SHARROCK: Okay.

MR PRESHAW: - - - that work, by Bruce Hebblewhite.

MR SHARROCK: Yes.

MR PRESHAW: But we'll confirm with you.

MR SHARROCK: Thanks very much. The other one was simply one to Jim. We spent a lot of time on the web pillars. In the – in the experts' meeting, or in any interaction with the proponent, did you say, "What about making them wider?"

PROF GALVIN: That – the width was – in general was discussed. I mean, that was a key issue, that they are very narrow. Look, I – I can only have a general recollection that width was a topical issue, and how they would behave. I – and, Clay, you were present – I'm not sure we even went to the issue of – I think we did – is it pillar extraction, rather than first workings? But the width certainly got an airing, and how they would behave got an airing. But, at that stage, the proponent's modelling was still a work in progress.

MR SHARROCK: That's true. It was before the 3D modelling, wasn't it?

PROF GALVIN: Well, they'd actually presented some of the outcomes of the 3D modelling, and they were having trouble calibrating it at the time, so they didn't - - -

PROF FELL: Thanks, Geoff.

MR SHARROCK: Thanks.

PROF FELL: George?

MR GATES: Look, I just got one on Aboriginal heritage. There seem to me to be quite a few sites there are going to be lost or – do you want to just make a further comment on there, because it just sort of says that it doesn't think the impact is too significant. So – it seemed to me that - - -

MR PRESHAW: Yes.

MR GATES: - - - there may be a group of Aboriginal people that disagree.

MR PRESHAW: So – yes – I'm just having a quick look, to jog my memory. But, essentially, there were a lot of sites identified within the area. There was a lot less sites that were predicted to be disturbed. And from memory – and I'll have to get back to you on this one as well – from memory, the sites that were to be disturbed were – the significance level was not of such a level that it would prevent, you know, that approval. But I'll have to get back to you on that, and have a look. I think it was 20 – 20 would be directly disturbed - - -

MR GATES: Right.

MR PRESHAW: - - - but three only totally disturbed.

MR GATES: Would that be something that we could see on the field trip, or is there not - - -

MR PRESHAW: Yes.

MR GATES: - - - anything to see?

MR PRESHAW: No, you can. Yes, you can see. Generally speaking, Aboriginal heritage sites align with the native – the remnant vegetation and the road reserves, so you can certainly ask – when we went on the site visit, I think we looked at some of the vegetation areas, and they might have pointed out the Aboriginal heritage sites as well.

MR GATES: All right.

PROF FELL: I guess my comment would be, thank you for being so open in your communication. We're both in the same game, and that's doing it right for the State, and it's as well we have ..... I'm conscious a number of your colleagues haven't said a word. You've done a great job. It's over to you, you people, if you'd like to make any comments, or - - -

MR PRESHAW: Look, I – I thought about, sort of, trying to sum it all up. But I think it's clear to me that you've read the report really closely, and read all the documents, so - - -

PROF FELL: Well, yes.

MR PRESHAW: - - - our report is probably shorter and more succinct than it sometimes is, because we wanted to make it really clear what the key issues are. And I can tell from your questions that you've certainly homed in on those questions – on those issues, and so I don't feel the need to sort of repeat what's in the report. I'm comfortable that it speaks for itself.

PROF FELL: Well, all right. Well, look, I will draw the meeting to a close, then. And is there anything special I should be saying, David?

MR D. KOPPERS: No.

PROF FELL: Thank goodness for that. Sorry. Thank you very much for coming. It's been an interesting morning. We've learnt, and it's been very useful to us. Thank you.

RECORDING CONCLUDED **[12.10 pm]**