Notes for Feb 11th meeting with the IPC Panel

I am a retired chemical engineer and corporate executive and, more recently, a small scale Southern Highlands cattle farmer. I am also the Vice President of Coal Free Southern Highlands Inc. an organisation set up to oppose to the establishment of the Hume Coal mine. This organisation is supported by a large number of local residents who have been part of a battle that has now gone on for over 8 years.

I have had quite a lot of interaction with Hume Coal over this time, being a community representative on Hume's Water Advisory Group since mid 2012, and in assisting landowners in land access arbitration disputes with the company.

The DPE has recommended that approval for the Hume proposal be refused, and we are clearly very pleased that they reached this conclusion.

As you might expect, Hume's response was not so enthusiastic. The edition of the SHN for December 11th quoted a Hume spokesman as accusing the DPE of 'pandering to the squeaky wheel' and stating that 'a vocal minority had convinced the government there is little support for the project in the region'.

I trust you will have seen the from the number of submissions to the EIS, the 'vocal minority' is in fact a great majority, with the strength of the community feeling being shown through these submissions. You will see more of this at the Public Hearing in Moss Vale on February 26th.

I also hope you will see in today's presentation, that some of the 'squeaky wheels' who have evaluated the technical aspects of the Hume EIS have put forward a strong case that is reflected, at least in part, in the DPE assessment.

Coal Free Southern Highlands has had the benefit of advice from these experts, and a number of others, in formulating its position on the Hume Project, and we thank the IPC and the panel for this opportunity to present these views.

My job today is to provide CFSH's overview of the DPE assessment, and my colleagues will provide specific detail in their area of expertise. They are:

Len Diekman – Consultant Geologist Doug Anderson – Principal Engineer UNSW WRL Dr. Steven Pells – Principal PSM Consultants Dr Bill Ryall - Consulting Environmental Scientist Marylou Potts – Solicitor and legal advisor to CFSH

OVERVIEW

Let me first say, and this will come as no surprise to the panel, that we endorse the conclusions that the DPE have reached in their recommendation to the IPC. This project is not in the public interest and should not be approved.

The DPE has approached their evaluation of this proposal in a diligent and cautious manner. While we were occasionally frustrated with the length of time the process was taking, the recent release of the documentation supporting their conclusions has given us a better understanding of the complex issues they were dealing with.

The DPE has highlighted a number of critical reasons to support their recommendation:

MINE DESIGN

 The mine design, the so-called pinefeather system, is a combination of conventional underground development methods with the high wall mining method that is commonly used in open cut operations. The high wall mining technique has not previously been used in an underground setting in Australia.

The DPE has accepted the view the opinion of their appointed experts, Emeritus Professor Jim Galvin and Professor Ismet Canbulat from the UNSW, that the pinefeather mine design in combination with the plan to impound mine water in the mined voids adjacent to the working area of the mine, poses an inherent safety risk. The NSW Resource Regulator supports this conclusion.

While we claim no expertise in this particular area, those of us with experience in hazardous industrial situations instinctively identify with Professor Galvin's caution on the mining process and his conclusion that a rigorous hazard analysis should have been provided by the proponent. Hume's response to this criticism is that safety issues can be sorted out after approval in the operating mine, a 'suck it and see' approach that has been rejected by the DPE mining experts.

WATER MANAGEMENT

• We also support the conclusion reached by the DPE, supported by the views of their mining experts, that there is considerable uncertainty with Hume's assertion that groundwater produced in the mining process can be contained within the Primary Water Dam and the mined voids.

It is very likely that operational delays with the bulkhead construction and reject emplacement process will result in contaminated mine water being pumped to the surface, increasing the risk of this material flowing into local streams, which in turn flow into the Sydney Water Catchment.

Hume's initial plan was to have an onsite water treatment facility to guard against this eventuality, but this investment has been deleted on the basis that their underground operations will work flawlessly to contain the produced water. This is a courageous assumption when the likely engineering difficulties in bulkhead construction and pumping the reject slurry are taken into account.

GROUNDWATER – MAKE GOOD

 Moving on to groundwater issues, another key driver of the DPE's assessment was their view that the project involved an 'unprecedented' number of groundwater bores being affected by the mining operations, and Hume's proposed 'make good' arrangements were unworkable. The DPE has concluded that the suggested 'make good' process will have an unavoidable adverse impact on the landowner community, as well as creating problems for the DPE itself.

We totally agree, particularly as Hume is asking the IPC to agree to this project prior to negotiations with landowners on legally binding agreements taking place. Hume proposes that these negotiations be based on their groundwater model and their interpretation of impacts on the water table caused by others. As Darryl Kerrigan from the film 'The Castle' might have said, 'tell 'em they're dreaming' if they believe that landowners, who greatly value their access to the groundwater resource, would lock themselves into this sort of arrangement.

• Marylou will have more to say on the legal aspects of 'make good' later in our presentation today.

PROJECT ECONOMICS

• The DPE also engaged an expert to evaluate the claims made in the EIS for the economic contribution from this project. It was no surprise to us that BIS Oxford Economics concluded that the economic benefits from this mine were considerably lower than stated in the EIS, \$127 mm against Hume's figure of \$295 mm.

We support the conclusions reached by BIS Oxford, and we are grateful for their detailed analysis, but in some areas we would go even further. I will elaborate on this later.

OUR DIFFERENCES WITH THE DPE ASSESSMENT

So it is clear that we are on common ground with the DPE on many important aspects of their assessment, and we appreciate the contribution that they have made to the evaluation of this proposal in engaging these mining and economics experts.

However, there are several aspects of the DPE analysis where our views differ, particularly relating to the groundwater model developed by Hume and I would like to go through these now. To understand our concerns it is necessary to look closely at the geological uncertainties in the mine area.

UNCERTAIN GEOLOGY

• The geological interpretation of the mine area is very contentious. Our experts' views and many years of practical experience with groundwater in the Southern Highlands, is at odds with the conceptual geology put forward by Hume and the resultant groundwater modelling.

 We question the lack of pumping test data in the Hume GW work. The company has undertaken just 2 pumping tests within the mine area; one was of 7 days duration, pumping at 20 litres/sec, clearly demonstrating the potential of the aquifer. The other was in the Belanglo area and of just 1-day duration. Why no more? We suspect that Hume didn't like the results they were obtaining.

There were references to other pumping tests in the EIS but these were in the Berrima Colliery area, and very short term, one being of just 1hour duration. Rather than the broader view of permeability that comes with pumping tests, Hume has instead has relied of more localised testing methods.

- Hume has recent and historical drilling data that they claim backs their analysis, but withhold it on 'commercial and confidential' grounds.
- However it is clear from their actions that they consider this data to be insufficient. Hume made extensive efforts to obtain more information by drilling in an area of the mine where data was scarce, as can be seen from this chart from their 2014 application for permission to drill 90 drill holes in the area.

(Show slide on 2014 REF exploration program)

The DRE refused this request, but after Hume reduced their request to 70 holes, 25 now and 45 later, permission for the first 25 was granted. Following a drawn out process of land access arbitration, 5 of the affected landowners took the matter to the Land and Environment court in a hearing before Commissioner Dixon.

Hume argued strongly for the importance of obtaining this data as shown in this brief quote from the Commissioner's decision

"As explained by Mr Doyle, Hume's Coal Exploration Manager, the exploration licence authorises the drilling of 20 exploration holes on land that is located in or around the Golden Vale Road, Sutton Forest. The location of the proposed drill hole coincides with a significant scarcity of information within the currently defined areas of lower confidence in the resource. Targeting those areas will allow data on geological structures and coal quality to be gathered. This information will, in turn, allow a conclusion to be made about the likely safety of the working environment and product quality."

 Hume was successful in the initial hearing, but lost the case on appeal, losing their ability to enforce access to these properties. The company then reversed their position on the importance of this additional drilling data, declared that no further data was required and proceeded with the development of the EIS.

Clearly geological uncertainty in this area of the mine remains, but apparently for Hume, mine safety and data on the resource have become optional considerations when the required land access cannot be obtained.

• The inadequacy of the geological data is clearly a concern to Professors Galvin and Canbulat, who also refer to the importance of the geological uncertainties in their comments on mine design and safety.

(Show slide on geological faults) (Show idealised mine plan that ignores these geological anomalies)

In the opinion of the mining experts there is considerable risk that these anomalies could lead to substantial sterilization of the coal resource as well as posing a clear threat to mine safety.

THE HUME GW MODEL

 Problems with the uncertainty in the geology have also been reflected in the development of the Hume GW model, which has been through a number of iterations since first being tabled in the Preliminary Economic assessment in June 2015 – at that time the work of consultant Parsons Brinckerhoff.

Coffey Geotechnics were brought in to develop the GW model for the EIS and peer reviewers Dr Noel Merrick and Dr Frans Kalf declared that the model to be 'fit for purpose', and of model class 2 or 3.

However, after criticisms from NSW Govt agencies and our experts, who

rated the EIS model as Class 1, an audit of the model was conducted. Dr Merrick assumed control of the modelling work and undertook further revisions. These included changes to the software and a Monte Carlo analysis of the uncertainties in the model.

• We have concerns with some of the modelling techniques that have been used, but even greater concerns with the basic geological data that underlies the model. If this data is not realistic, no amount of modelling sophistication and statistical technique will provide an appropriate analysis.

In our opinion Hume has based its GW model on conceptual geology that is designed to ensure the calculated numbers for water take and bore drawdown are minimised. The conceptual geology in the Hume model is contrary to the experience of a number of professionals who have worked in the area. Our groundwater experts will elaborate on this in a few moments.

- In their assessment, the DPE has chosen to accept the groundwater model put forward by Hume but with an uncertainty level at the 90% probability point rather than the 67% proposed by Hume. The DPE made this decision to allow their assessment to be progressed, even while acknowledging that the data going into this model is strongly disputed.
- The reasons for adopting the Hume model seem to be purely pragmatic to take the focus of debate away from the geology and put it squarely on the impacts. The Department is then able to conclude, that even using Hume's GW model, the drawdown in landowner bores is so significant that the mechanism for the 'make good' provisions proposed by the company is simply unworkable.

We agree with that conclusion, but we would add that if the uncertainties in the geology are properly taken into account, the licensed water requirement, the number of bore impacted and the extent of the impact will be even greater than shown in the DPE's assessment.

• The arguments that will be put forward now by Len, Doug and Steve will support this case.

Firstly, Len Diekman will provide some insights on the nature of the geology in this far extremity of the Southern Coal Basin.

Doug Anderson will then provide his evaluation of Hume's approach to groundwater modelling and Steve Pells will provide more specific information on his differences with the experts that have worked on the Hume model.

Len gives his presentation, followed by Doug, followed by Steve

• Our other major point of difference with the DPE assessment and the contribution by the EPA, is with the total lack of any acknowledgement of the environmental impact of the emplacement of coal washery rejects in the mine voids - to be part of the aquifer in perpetuity. Bill Ryall will take up this matter.

Bill gives his presentation

• We would like to now briefly talk through some of the important legislative issues that have affected this development proposal, more so than most in the coal industry. These are the land access arrangements and the related issue of 'make good'. Marylou will take you through the key points.

Marylou gives her presentation

• Finally, a few words on the economics of the proposal. We agree with the DPE conclusion that Hume's forecast economic benefit is excessive. The DRE expert, BIS Oxford Economics, has done a thorough job adjusting the Hume calculations to conform to guidelines.

The economic benefit from the project falls from Hume's estimate of \$295 mm NPV to \$127 mm NPV. BIS Oxford has put forward very convincing arguments for this reduction with very little pushback from Hume.

 It is important to note that the BIS Oxford report is an 'economic' assessment of the Hume Project as distinct from a 'financial' assessment which would look specifically at the commercial viability of the venture. The economic assessment considers community concerns such as environmental and social impacts in addition the financial parameters of the enterprise.

BIS Oxford is critical of the lack of transparency in the economic data provided in Hume EIS that prevents them from doing a complete financial assessment of the project and may impact the accuracy of their economic analysis. Hume has once again hidden behind 'commercial sensitivity' in refusing to provide this data. We share BIS Oxford's criticism of this lack of transparency.

COMPETITIVE POSITION

 By today's standards this would be a very small mine, and given the circumstances that it would be operating in, it will be a very expensive mine. It faces the constraints of the Moss Vale - Unanderra rail line and the operating uncertainties of an untested mining system working with significant geological unknowns.

An example of the competition this mine would be up against is the Olive Downs Coking Coal Project near Moranbah in central Queensland. This mine has the support of the Queensland Government, the Isaac Shire Council and a majority of local residents. The preliminary EIS was approved last December, and while a few hurdles remain, the company is scheduling production to commence in 2020.

- The proposed mine is in an established mining area, with much of the support infrastructure it will need. The mine will produce an average of 14 MT per annum of product coal by open cut methods, 97 % metallurgical, for 40 years, and a lower volume for the balance of its 79-year life. The EIS claims a staged investment of around \$1.1 bn (??), and will employ 1400 personnel during its peak production period and an average of 1000 personnel over its operating life.
- In contrast, the Hume Project is scheduled to have 2.1 MT average production for 19 years, a yield of 55% metallurgical coal, an investment of \$860 mm over the life of the mine and average employment of 300.

If coal prices are sufficient for Hume to turn a profit, it will be a bonanza for Olive Downs and most other established coking coalmines. The experience in this industry is that bonanzas are very short lived.

It is a reasonable to ask why Posco continue to pursue a difficult and uncompetitive Hume Coal option rather than negotiating a minor equity position or, at minimum, an offtake arrangement with the likes of Olive Downs to make up for any production they might be expecting from Hume.

CONCLUDING COMMENTS

In our opinion the DPE assessment of the Hume Coal Project has correctly identified a number of problems with this project and has recommended that development approval be denied. Some of the concerns that were put forward to support this conclusion were:

- The opinion of the mining experts engaged by the DPE, that there are inherent problems with the mine design including personnel safety.
- That even using Hume's own groundwater model as a basis for analysis, problems remain with the company's ability to achieve the appropriate licenses for the water take from the mine. Most critically, Hume's proposals to deal with the 'make good' arrangements for an 'unprecedented' number of affected landowner water bores were considered to be unworkable.
- The DPE concluded, based on the advice of their experts that the complexities of the arrangements to store water and coal washery rejects behind bulkheads in mined voids would probably result in more mine water being pumped to the surface than forecast in the EIS.

This could lead to the unplanned release of untreated water into local waterways then into the Sydney Water Catchment and had not been properly evaluated by the proponent. A water treatment plant that was previously part of the mine design had been deleted.

• Hume's claim for economic benefits from the Project was significantly reduced after analysis by a DPE appointed expert. His work has been largely uncontested by Hume.

As indicated in our earlier presentations, we agree with the conclusions reached but consider that they understate the true reality of the potential impact of this mine. Uncertainties abound, and many of those we have raised in the discussions today.

Hume's decision withhold important geological and geochemical information from public scrutiny adds to our suspicions of data manipulation. Their request that the project be approved before critical aspects have been properly developed – mine safety analysis, resource confirmation and make good agreements - demonstrates the lack of substance in this proposal.

Of course some of their problems flow from the inability to gain exploration access to properties in an area where data was incomplete. This access was denied under S31 of the Mining Act 1992, but could scarcely have come as a surprise given the historic correspondence between the various owners of A349 and the DMR that Posco say they have in their possession.

This correspondence dates back to Sept 1994, and refers to increasing rural residential development in the area, anticipated problems gaining land access and alludes to rulings regarding the classification of structures that rank as improvements that may constrain development options.

For all these reasons, we endorse the conclusions reached in the DPE assessment but without backing away from our position that the actual impact of this mine would be worse than the GW modelling basis they have chosen.

We hope that the IPC will reach a similar conclusion.