Coal Free Southern Highlands Inc.

2 October 2018

Executive Director, Resource Assessments and Business Systems
Planning Services
NSW Department of Planning and Environment
Major Project Assessment – Hume Coal Project
GPO Box 39
Sydney NSW 2001
30 June 2017
Attention: Mr Clay Preshaw

CFSH Inc comments regarding Response to Submissions by Hume Coal Pty Ltd, SSD 15-7172

Dear Clay,

We are writing to provide some comments on the response given by Hume Coal Pty Ltd (Hume), a wholly-owned subsidiary of South Korean steel company POSCO, to the submissions from Government Agencies and the community on the EIS for the Hume Project submitted at the end of March 2018 (RTS).

The Hume proposal is for a small, expensive and controversial 'greenfields' mine that is unlikely to be commercially viable. It is located in an historically important Sutton Forest in the Southern Highlands, a vibrant tourism and agricultural mecca, 130 kilometres south of Sydney. The proposed mine will be within the Sydney Water Catchment.

The performance risks Hume is willing to adopt are being shared with the local community in an unprecedented fashion due to the very significant danger to the groundwater in the area. In Hume's RTS, the mine safety and groundwater pollution risks associated with the unproven mining method proposed are not properly addressed. The significant social impacts are also effectively ignored by Hume.

Hume's RTS provides an inadequate response to many of the criticisms made in submissions on the EIS. We have not attempted to address all the issues that we see in the RTS, and in this submission have only focused on the major areas of concern.

To support our arguments, CFSH Inc has commissioned reports from groundwater experts Dr. Steven Pells from PSM Consultants and Mr. Doug Anderson from the UNSW Water Research Laboratory. These reports are attached.

Our brief comments on the principal areas of concern that we have with this project follows. We also attach an Appendix, which examines in more detail Hume's responses to the many significant technical and economic issues that arise from the EIS and the subsequent RTS.

Summary of principal concerns

1. **Risk and Uncertainty:**
   Hume proposes a combination of an untested mining process that impacts a highly productive groundwater system in an environment where the underground conditions are not fully known. Approval of this project can only be made on the assumption that there are no unintended consequences emerging from an extensive list of project uncertainties that have not been fully evaluated or modeled. From an engineering execution perspective, this project is fraught with risk. The impact of getting any one of a number of critical assumptions wrong is potentially catastrophic.

2. **Geology:**
   In its RTS, Hume has, once again, failed to provide evidence to support many of its assumptions particularly relating to the geology of the area to be mined. This is particularly important in the groundwater modelling and erodes the veracity of Hume's conclusions regarding the scale of the groundwater impacts which, in any event, are still very significant.

3. **Modelling Assumptions:**
   Groundwater modelling is an inexact science where the magnitude of the 'expected' impacts can be adjusted by astute 'modification' of modelling assumptions. This process of 'fine-tuning' can be seen via a close inspection of Hume's Model assumptions and how they vary from observed data and evidence. In particular, adding in semi-impervious layers, adjusting storage values and turning off the cell drainage at the completion of a void can have a very significant impact on the results. (See attached reports from PSM Consultants and UNSW WRL)

4. **Groundwater Impacts:**
   Hume admits that 72 landowners with the 94 bores will have the quantity and quality of their groundwater impacted for many decades after Hume has departed from the scene. This is unprecedented. Our analysis, supported by PSM Consultants and the NSW Water Research Laboratory, suggests that many more landowners and bores could be affected much more significantly than Hume's groundwater model predicts. Recent changes to Hume's groundwater model have artificially minimised the water table drawdown impacts of the mine. The proposed 'Make Good' arrangements are impractical and unworkable in many cases.

5. **Emplacement of Coal Washery Rejects:**
   Hume has proposed placing Coal Washery Rejects (CWR) and produced water into the mined-out zones. The analysis of the geochemical impact of CWR is claimed to be covered in two reports (RGS 2016 and RGS 2018) but Hume has not made these documents public. Hume claims that this is a CWR emplacement is routine operation in mines but has not presented any examples of this material being placed in a similar situation in a highly productive aquifer. The EPA embargoes such 'placing CWR under or in water, including groundwater'.

6. **Mine Safety:**
   There is significant concern regarding the Hume mine plan and the mining processes Hume plans to employ, in particular from the context of mine safety. This is particularly concerning given Hume's proposal to employ unproven methods of extraction in difficult geological conditions with very significant

volumes of groundwater in the Hawkesbury sandstone layer directly above the coal extraction area. These concerns are not adequately addressed in Hume's RTS.

In particular, the safety and reliability of the concept of installing a multitude of concrete bulkheads into potentially unstable rock to contain groundwater flowing into mined voids, 80 to 180 metres underground, has been handled in a dismissive manner in the RTS. This is a vital operation for which failure could lead to catastrophic consequences.

CFSH Inc. has not been given access to the specialist reports commissioned by the DRE from Professors Galvin and Canoblat which we understand address operational issues, mine safety and ground engineering. Access to these reports is critical for the transparency of the EIS evaluation process.

7. Legal issues:

Hume does not address the significant legal hurdles it faces to execute the project:

- Hume has assumed that it will 'drill ahead' of the mining activity particularly in areas that it has been unable to explore due to landowners' success in preventing access to their land under s31 of the Mining Act. This will not be allowed by affected landowners.
- Hume is asking that the project be approved prior to the negotiation of 'Make Good' arrangements for loss of water, and suggests that once the 'certainty 'of approval has been achieved landowners will cooperate with their plans. However the process they propose for resolution of disputes is unfair, unreasonable and unlegislated. Many, if not all, affected landowners will not agree to discussions with Hume in these circumstances.
- The groundwater impacts in Hume's RTS exceed the 'no more than minimal harm' requirement in the Water Management Act 2000 required for the granting of an Access Licence. Hume also concedes that they exceed the 'minimal harm' criteria in the Aquifer Interference Policy.
- It is highly questionable whether Hume's proposal can meet the 'Neutral or Beneficial Effects' requirement under the SEPP (Sydney Drinking Water Catchment) 2011 particularly under 'worst-case' scenarios.
- Hume's proposal to inject Coal Washery Rejects and produced water from mining into the mined-out voids breaches EPA regulations on the emplacement of CWR in groundwater.
- Hume's 'water take', based on the required worst-case scenario, is likely to significantly exceed its water licences in hand.

8. Social Impacts:

The RTS does not address the significant social impacts of this project, which has now been active for over 8 years. Hume's strategy has been to divide the community, denigrate opponents and attempt to force access to land for exploration against the wishes of landowners. They have been resisted with all the force the locals can muster.

Affected landowners in Sutton Forest have survived acrimonious and bullying behavior from Hume over an extended period. There have been numerous legal battles and forced land access arbitration fights over that time. Landowners in a

significant proportion of the licence area have successfully prevented Hume accessing their land for exploration and will not deal with Hume in any circumstances.

The Hume project has been roundly rejected by the Wingecarribee Shire Council, many Southern Highlands residents and many affected business owners.

Without exaggeration, the impact on the community's health and well being caused by the continued aggressive and confrontational behavior of Hume plus the future uncertainty regarding the project has been very significant.

9. Economic Issues:

Hume's economic analysis is misleading and incomplete, and exaggerates the financial benefits that will flow from the project. The RTS has not responded appropriately to the concerns raised in submissions.

CFSH Inc has also not been granted access to the BIS Oxford report commissioned by the government on the project economics, which limits our ability to fully comment on this issue.

However we can clearly say that this project is economically challenged. It is debatable whether it will deliver the stated level of royalties to the NSW government, but we can say with confidence that due to the poor profitability of the project, taxes to the Federal government will be minimal at best. The implementation of routine, prudent tax minimization strategies by POSCO should ensure no company tax is paid.

The poor profitability is a result of the relatively small scale of the project, the limited extraction rate (35%), the short project life and the higher investment requirement of the Hume mine compared to larger, more efficient operators. The complex and unproven mining process will probably result in additional financial impacts.

Significant legal obstacles regarding land access and 'Make Good' arrangements which will delay and/or obstruct the project have not been factored into Hume's economic analysis. Additionally, the external economic impacts on the environment, local businesses and landowners will be very significant and have not been properly considered in the RTS.

Conclusions

The Hume RTS is an attempt to 'paper over' very significant technical, operational, social and legal issues related to the Hume underground coal mine project.

The groundwater modelling, and the related development of the conceptual geological model, is highly questionable. Even with Hume's clear attempt to minimize groundwater 'take' in its groundwater modelling, landowners bore impacts are unprecedented for a coal mine anywhere in NSW.

Hume does not present evidence to support the geological assumptions that drive its groundwater model. In fact, Hume's assumptions fly in the face of historical bore data and local evidence. It appears that Hume's model results are intentionally 'reverse engineered' to minimize projected impacts.

The project is highly controversial in the Southern Highlands. Affected landowners in Sutton Forest are strong opposed as are many community members. Social impacts over the past 8 years of the project's life have been significant and will be exacerbated if the project is approved.

Hume is asking for early approval of the project before land access and 'Make Good' arrangements for landowner bore impacts are put in place. Hume has proposed a process for dealing with groundwater disputes that will force reluctant landowners into the courts. Many, if not all, affected landowners will categorically refuse to deal with Hume in these circumstances.

In addition, the 'Make Good' arrangements proposed to resolve groundwater disputes are impractical in a number of cases and unworkable for large irrigation licence holders.

The projects economics are also dubious at best particularly given the relatively small scale of the mine, the limited potential returns to the state and the significant impacts on local landowners and businesses.

We submit that this project should be rejected.

Yours sincerely,

Peter Martin
President

Alan Lindsay
Vice President

APPENDIX: Detailed RTS Concerns

Groundwater Modelling

1. The RTS presents the 3rd iteration of the Hume groundwater model:

    - **First Model:** Parsons Brinckerhoff prepared the first for the Preliminary Environmental Assessment in 2015. The resultant water take was too high and would have created water licensing problems.

    - **Second Model:** Undertaken by Coffey Geotechnics guided by Dr Noel Merrick who had been engaged as a peer reviewer in late 2012. An addition peer reviewer, Dr Hans Kalf was also engaged. Around 15 months later the reworked model was complete and ready for submission with the EIS. Both Dr Merrick and Dr Kalf declared the model to be 'fit for purpose'. *(This model was widely criticised by Federal and State Govt. agencies and in expert reports produced for the community. Back to the drawing board.)*

    - **Third Model:** Undertaken by peer reviewer Dr Merrick. Coffey Geotechnics apparently withdrew, as did Dr Kalf. The results of Dr Merrick's work have now been unveiled after 13 months effort as part of the RTS.

2. **Hume has not provided sufficient evidence to support the geology assumed by Dr Merrick**, which largely drives the results of the model. The basic geological assumptions and the resultant conceptual model are claimed to be unchanged, but some elements of the model have been modified without supporting data to justify the changes (see attached reports). We suspect that this has been undertaken to produce a better outcome for Hume.

3. The **lack of sensitivity studies** in the EIS has been addressed with a complex Monte Carlo analysis, however the result of this work is an unrealistically narrow set of outcomes. Groundwater modelling is not an exact science, especially when the model is driven by suspect data.

4. **The NSW DPE appointed Mr Hugh Middlemis, a South Australian based hydrogeologist, to evaluate the EIS work** and he has continued to the evaluate the work done by Dr Merrick. Mr Middlemis provides glowing support for the revised model, which is quoted on numerous occasions in the RTS as being the endorsement of the 'NSW Independent Peer Reviewer'. **We believe that the independence of Mr Middlemis is in question** given his close collaborative relationship with Dr Merrick on groundwater modelling issues over several decades.

5. Mr Middlemis, by his own admission at a meeting on November 16th, 2017, **has only reviewed the structure of the Merrick model and not the geological data** that led to the development of the conceptual geology. This is a fundamental weakness in his advice as the geology is critical in determining groundwater impacts, and the geology in this case is a major area of dispute.

The Uncertainties in the Conceptual Geological Model

The Hume RTS still **fails to justify the critical assumptions that underpin the conceptual geological model** despite numerous criticisms raised in submissions on the EIS. The attached papers from Dr Steven Pells and Mr Doug Anderson will address this matter in more detail, but comments some of the more general issues follow:

1. The RTS criticises comments by the IESC and Pells/Anderson saying that they were made without a full understanding of the geology in the mine area. Hume, makes this statement while continuing to **shield the data they used from public scrutiny,** hiding behind the veil of 'Commercial in Confidence'.

2. We have reviewed the data from 15 drillholes that were completed for Austen & Butta around 1970, of which 9 were in the mine area and the rest in the near vicinity. Most of these **drillholes indicate the presence of coarse sandstone and conglomerate just above the Wongawilli seam.** This data supports the view of Mr Lee, a hydrogeologist who has worked in the Southern Highlands for over 25 years, that the most productive aquifers are located in the lower portion of the Hawkesbury Sandstone near the coal seam.

3. The **parameters chosen by Hume for the layers immediately above the mined coal portray these layers as semi-impervious** when there is ample evidence that this is not the case. In the critique of the Pells/Anderson work by John Ross of EMM, he concludes that the only way that the Pells model could be correct is if there were fractures in the strata immediately above the mineable coal layer.

   Pells and Anderson, and others we have consulted, believe that **fracturing just above the coal seam is likely to be present**, and this show through in locations with high bore yields. However, the combination of **conglomerate and coarse sandstone above the coal seam**, as is evident from the core analysis of the Austen and Butta drillholes, is also an important contributor.

4. Our understanding from a recent meeting with **DoI Water is that it has not been provided with the detailed geological data.** They are relying on an assurance from Hume that the geological data that forms the basis of the model has been correctly interpreted. It is difficult to understand how this agency could do their job effectively without direct access to this information.

5. The **confusion over the role of the 'interburden' in the conceptual geological model remains an issue**. In the EIS this layer, Layer 8, is said to average 4 metres thickness over the mine area, with a minimum thickness of 0.1 metres in any model cell. The data in the EIS refutes this analysis.

   The RTS attempts to redefine this situation. It now describes 'interburden' as being the material from the bottom of the Hawkesbury Sandstone to the top of working section of the coal seam. A new chart of this redefined 'interburden' is included in the RTS. In substantial parts of the mine area, the thickness of this redefined 'interburden' is in the range 1-2 metres and, by inspection, the average thickness of this material is far less than average 8 metres recorded in the EIS to which is said to be largely comparable.

6. Some inferences can be drawn from **the seismic testing** Hume provided in 2012 to support the relinquishment of part of their exploration area. This data, which stopped at the boundary of the revised exploration area, has been enhanced and analysed by Dr John Conolly, consultant geologist, who has extensive experience in this work.

   Dr Conolly's analysis showed significant vertical fracturing in the relinquished area, which will undoubtedly carry on to some degree into the mine area. The core photographs that were also included in the relinquishment report support this conclusion.

   Any seismic data within the mine area should be released to allow similar analysis to take place.

   Dr Conolly, and others, have also pointed out that the Southern Highlands has experienced reasonably frequent earth tremors over the years, and while these events are relatively minor, and probably would not threaten the existence of a mine, they certainly have had the capability of increasing the degree of fracturing within the Hawkesbury Sandstone and other strata.

7. The Hume Project is on **the very edge of the Southern Coal Field, and as such will incorporate irregular and variable geology that only becomes more stable as the coal seam moves deeper to the east and north.** This is clear from information presented in the EIS and the RTS, which describes the variable nature of the thickness of the interburden (totally absent over much of the mine area) and of the upper portion of the Wongawilli seam. The 2012 relinquishment report also describes the deep weathering of the strata profile that is unlikely to stop at the boundary of the mine area.

   The opinions of Mr Lee and Dr Conolly, supported by the data from the Austen & Butta exploration drilling, strongly contradict the Hume contention that that a series of stable, semi impervious layers of sandstone/'interburden/poor quality' coal exist above the mined coal seam to minimise GW flow into the void.

   The conceptual geology adopted by Hume is critical to the evaluation of the impact of this project. Their interpretation is strongly disputed by the consultants advising CFSH Inc and we call on the company to release the data that they believe supports their position.

8. The **RTS justifies the selection of the hydrogeological parameters in the GW model by stating they have been benchmarked against data from the Berrima Colliery** and other mines in the Southern Coal in the Southern Coal Fields. Drillhole geological data from the Berrima mine is scarce, as little appears to have been documented until recent times. The most reliable evaluation is one undertaken by John Lee on a borehole on the Eagle Rock property, which sits above the Berrima mine, where the gamma log clearly showed potentially productive sandstone immediately above the coal seam.

   Benchmarking against data from deeper mines is also very questionable, as a thick and stable layer of claystone/siltstone lies between the Hawkesbury Sandstone and the coal. The variable geology that is so clearly apparent in the shallower Hume mine area less likely to be present.

9. Adding to the uncertainty on the geology is the fact that **Hume has been unable to get access to many properties for exploration purposes,** due to the protections offered to landowners under the provisions of the Mining Act 1992. In 2014 Hume had asked for permission to drill 90 holes in a key area of the proposed mine where historical data was limited. Eventually, just 2 of the proposed holes were drilled.

   Despite claiming in Court that this access was essential to evaluate the quality of the resource, better definition of the mine plan and clarity on mine safety issues, Hume then declared that no further exploration was necessary and submitted their EIS. **As a result, the GW model they have produced has a significant geological knowledge gap for a critical part of the mine, further reducing the credibility of their conceptual model and adding to uncertainty**.

10. The EIS also contains a chart detailing the numerous **faults and diatremes**, known and inferred, that occur in the mine area. These are significant uncertainties as far as the accuracy of the GW model is concerned and have the potential to greatly increase the flow of groundwater into the mine.

    The mine plan ignores these anomalies and they are not explicitly recognised in the conceptual geology in the GW model or the data included in the GW model. These matters were raised in submissions but were ignored in the Hume response.

11. There is also the **uncertainty related to the proposed 'pinefeather' mining method and the related emplacement of coal washery rejects into the mined voids.** This form of underground mining, based on the use of remotely controlled continuous mining machines to extract the coal, is novel in the industry and has a number of associated risks. The emplacement process, following closely after the mining operation is likely to produce additional problems related to the pumping of the slurry and the construction of bulkheads.

    The EIS, and by omission, the RTS, assume that this operation flows smoothly and allows the sealing of the mined panels immediately without delay. This is a brave assumption that is likely be in error, creating an uncertainty over the volume of GW intercepted that is not reflected in the modelling.

12. The RTS describes the use of the **Monte Carlo method to undertake sensitivity analyses on the GW model**. This is, of course, a sophisticated technique, but its usefulness is dependent on a realistic assessment of the range of uncertainties that are incorporated in the analysis. In the Hume situation, where the degree of uncertainty has clearly been ignored, this form of analysis is no better than simpler techniques.

    The **volumetric range of intercepted groundwater in the Hume mine is likely to be much greater than calculated by the Hume** model and the authorities are insisting that water licences must be held for a realistic worst case. The acquisition of licences for a volume two, three or more times the output of the current Hume model will be extraordinarily difficult as GW in the water-sharing plan for Nepean Area 1 is fully allocated. Hume's GW modelling would appear to be a clear case of '*reverse engineering*' where the model parameters have been chosen to deliver a result on the level of required GW

licensing that is within their reach.

In summary, the input data for the GW model, as described in the RTS, fails to deal with the compounding uncertainties described above. The modelling almost certainly understates the calculation of the intercepted water and therefore the GW licencing requirement and the impact on landowner bores.

Hume and their advisors are presenting GW modelling as a precise science when the opposite is the reality. In situations of this kind, with extensive uncertainties, a prudent enterprise would apply a significant factor of safety to the output calculations, but this would, of course, create difficulties, if not impossibilities, in water licensing.

The 'Make Good' Process for Landowner Bores

1. The **Hume RTS provides even greater confusion on 'make good' than solutions outlined in the EIS.** The revised GW model produces water table drawdown is significantly less than indicated in the EIS – an average of 47 metres average vs. the EIS figure of 80 metres. This has been achieved within the GW model by turning off the tap in each model drain cell as soon as mining is completed. In addition, it is the view of our groundwater experts that the increases in the specific storage values in the reworked Hume model enhance this effect.

   However GW will continue to drain into the mined void and reduce the water table long after the bulkheads have been put in place. This change to the model distorts the physical reality of the draining of the water table and deliberately understates the impact on landowner bores.

2. The picture becomes even more obscure when dealing with large licence holders who may need an alternate water supply. **There is no mention of the means of supply in the RTS,** but presumably this will involve the transport of water from the mine dam to the affected landowners, to be privately negotiated after project approval. There are issues of contamination that arise here, but in any event, **the means of transportation and its environmental impact need to be publicly aired** prior to any consideration of approval is given to this project.

3. The RTS proposes an approach to 'make good' that is centred on their GW modelling process. **Hume now propose that the project be approved prior to the company reaching agreement on the 'make good' arrangements for affected bores**. Hume is of the view, clearly implied in the RTS, that once the project is approved, landowners will realise the futility of fighting the deep pockets of the miner and the power of the State, and will put aside their long held and legitimate objections to this project and cooperate with the company on access to their properties and their bores.

   Hume supports this view by reference to a 2007 Wesleyan University study (Duncan et al) which explored the interaction between consumer uncertainty, decision delay and decision value. We suggest Hume's advisors go back and re-read the study, as it has no relevance to the standoff between landowners and the company. **Landowner objections to this project are based on concerns over the impact of the mine on their properties and a total distrust of the company and the in case being put forward in the EIS and the RTS.**

4. The cooperation Hume say approval will deliver, assumes that landowners will either accept Hume's position or will be worn down by the threat of a mandated legal processes. The RTS, and its associated whitewashing of the many uncertainties associated with the project, has **exacerbated landowner distrust and strengthened resolve.**

   The output of the Hume GW model has all the earmarks of being contrived, and it is unlikely to provide the confidence needed for landowners to willingly become part of Hume's 'make good' process or indeed land access demands. The revisions to the model to reduce the water table drawdown show the extent to which Hume is attempting to minimise the impact of the mine.

5. **The plan Hume has put forward to enforce their 'make good' arrangements has no basis in legislation.** Hume propose to offer landowners the choice of either entering into legally binding agreement for resolution of any issues impacting their bore (which may outlast the mine by decades) or face a mirror image of the process used for resolving land access agreements.

   The land access process has proved to be problematic in more closely settled areas, but at least a legal framework exists and the land is a clearly defined entity. This contrasts with the proposed Hume process for 'make good' on lost GW that has no legislative basis and which uses the Hume GW model as a reference point: a model that is clearly open to manipulation and regular change, as we have already seen.

   In the EIS and the RTS Hume point out that landowners and other projects not yet envisaged will also impact the water table, mitigating Hume's responsibility. Given the magnitude of the 'make good' that will be required, the scene is set for conflict as Hume attempts to minimise its responsibilities, with their GW model being central to the argument. It would be a leap into the dark for the landowners who choose to be part of this arrangement.

<u>The Emplacement of Coal Washery Rejects</u>

1. The response to the submissions made regarding the geochemical issues involved in the emplacement of coal washery rejects (CWR) in the underground mined voids is totally inadequate. Dr Chris Jewell and Dr Bill Ryall were both very critical of the work in the EIS and the unavailability of the key background material. **The RTS records that additional work has been done in support of their plan, but once again this work has not been made available for public scrutiny.**

   The reports in question are RGS 2016 and RGS 2018. They are a constant point of reference for Hume in justifying the adequacy of their plan for CWR emplacement. This aspect of the Hume plan is of particular concern to landowners as the CWR, with all of its contamination potential, will remain as part of the aquifer in perpetuity, and the community is entitled to know details of the studies that form the basis of Hume's view.

2. The RTS does not address the point made in a number of submissions that **the material that comprises the CWR is radically altered from its origin state.** Pollutants that would have previously been locked into a crystalline structure are now accessible in an aqueous environment at the base of an aquifer. Hume is proposing to add limestone to offset acidification of the void, but serious

questions need to be answered on long-term effectiveness of the process.

3. **The RTS dismisses concerns that problems will arise in the operational aspects of the CWR emplacement activity**, saying that it is a routine operation in many mines. As far as we are aware, CWR emplacement in mined voids is most common in open cut mines and there is also the example of the Metropolitan Colliery in Helensburgh, where CWR is emplaced underground in old, dry workings well removed from current extraction operations. Hume had the opportunity in the RTS to give examples that are similar to their proposed operation, but chose not to do so – as far as we know there are no other mines emplacing CWR into an aquifer.

4. **The EIS and the RTS pay little attention to the requirements of the EPA regarding CWR**, on the assumption that the exemption that applies to emplacement in mined voids would apply in this case. However in a more general regulation on the use of CWR for civil engineering applications, there is a total embargo on the use of 'CWR under or in water, including groundwater'.

   The exemption for CWR in mine voids was no doubt developed for open cut mines, and later extended for the Helensburgh situation where GW is not a serious issue. However the Hume proposal involves the emplacement of CWR not only in GW but also in a productive aquifer, and this surely falls under the more general embargo mentioned above.

   This conflict has been drawn to the attention of the EPA, requesting clarification, but as yet we have not received a response.

5. In a number of submissions **there exists a concern over the long-term stability of the underground workings.** The Hume project is unusual in many ways, but particularly for its novel mining method and short operating life of 19 years. The potential for additional contamination and subside impacts occurring after the company has reclaimed their bond and departed are not properly dealt with in the RtS, other than with the statement that no problems will arise. This confidence that is unwarranted in the face of the uncertainties that surround this project.

<u>Economics</u>

1. The Hume RTS maintains the position that the company will generate sufficient profits to pay a substantial amount of company tax over the life of the mine. The EIS and the RTS provide little evidence this will be the case, and the company takes the view that the profitability of the project is a matter for it alone. **However, when all matters that affect Hume's profitability are taken into account any tax on profits that will be paid will be minimal**, and this is an issue that should concern those evaluating the benefits of this project.

   These matters include accumulated pre-approval losses, which in this project are substantial, and the degree of financial leverage that Hume would employ. The loans received by the company would most certainly come from offshore, and in a rising international interest rate environment interest charges of 5% or more on a loan of $300-400 mm or more would substantially impair the ability of the company to pay company tax. These are important matters that have been ignored in the RTS.

2. The **reliability of the mine operation** also needs to be considered, as this will have a material impact on the financial benefits the Hume project will provide.

    - The **production objective of the mine is limited on the upside** given the geological and operational constraints on the mine, particularly the commitment to 35 % resource recovery.

      The EIS has detailed the geological anomalies that could affect the mining operation, many of which have not been examined prior to the submission of the EIS, due to inability to gain property access. These faults and diatremes have the potential to significantly impact production and thereby reduce the projected level of royalties, as well as increasing unit costs and further lowering profitability.

    - **Non-employee costs** are another risk area given the untested nature of the mining operation. There is a high risk of a cost blowout.

    - The **competitive position of the** Hume mine was raised in submissions but was deemed to be unworthy of comment in the RTS. While Hume claims that the design of this mine will have productivity benefits, the fact remains that it is a small mine with high development costs relative to production. It is likely to be 3rd or 4th quartile relative to competitive mines, particularly large longwall or open cut operations.

    - The **upside on coal prices is limited** as a small benefit to Hume would be a bonanza for others and encourage additional production. The coal price downside is a significant risk for Hume, given the history of price movements in the industry. Larger established operations will be more resilient and profitable than the greenfields Hume operation. In these circumstances Hume will be a price taker and the company's financial performance, and its ability to provide the economic benefits set out in the EIS, will be determined by others.

    - As an example of **a larger scale proposal that will be a direct competitor**, an EIS for the Olive Downs project, an open cut coking coal mine near Moranbah in Queensland was recently submitted. This region has a long history of open cut coal mining and therefore has the much of the requisite infrastructure. The mine is expected to start operations in 2020 and will produce an average of around 15 MT/ annum of predominately coking coal for up to 70 years. It is said to require an initial and sustaining investment of $1050 million and will employ an average of just over 1000 personnel. The project has the ringing endorsement of both the Qld Mining minister and the local Mayor and general support in the community.

      By comparison, the Hume Project will produce an average 2.1 MT/annum for 19 years, of which 45% is lower value thermal coal, is forecast to require an initial and sustaining investment of $860 million and will employ 300 people. Clearly, the profitability outlook for each of these mines is radically different, even from this simple comparison of this data.

- Apart from the risks associated with potential environmental impacts of an uneconomic operation, there is the **prospect that the Government will be approached for some form of royalty holiday** should the lack of economic return put pressure on the company and cause it to threaten the shutdown of the mine.

We have based our critique of the economics of the project on Hume's production data and a limited number of data points they have provided in the EIS and RtS. We question the way Hume's financial numbers have been put together and whether the risks with the project have been properly evaluated. The economic benefits of this project have been exaggerated.