

9 August 2021

Mr Steve Barry
Planning Director
Independent Planning Commission of NSW

Re: Hume Coal Project and Berrima Rail Project (SSD 7172 and 7171) – Response to additional material provided by DPIE

Dear Mr Barry,

This submission provides a response to the additional material submitted to the Commission by the Department of Planning, Industry and Environment (DPIE) in relation to the Hume Coal Project and the Berrima Rail Project (collectively referred to as the project) in a letter dated 22 July 2021, in which DPIE provided responses to a number of questions as requested by the Commission. Further detail relating to the responses is provided in Attachment A.

1. Rail movements, rail crossings and the impact of train movements

Hume Coal note and agree with DPIE's comments that any residual risks associated with project-related rail movements could be adequately managed through development consent conditions. Hume Coal is committed to preparing detailed road and rail traffic management plans in consultation with rail network operators and emergency service providers, which, as indicated by DPIE, could be required by consent conditions, including a provision for undertaking detailed level crossing safety audits. Hume Coal is also committed to proactively communicating rail movements with the community and will investigate the creation of a web site which shows the GPS location of trains in consultation with ARTC.

Hume Coal also acknowledge, as DPIE notes in their submission, that the rail network operator ARTC has stated the project would improve utilisation of the rail network, and that the capacity requirement of the project could be accommodated within its infrastructure plans.

2. Predicted groundwater drawdown impacts on bores

The Commission requested that DPIE confirm its groundwater concerns with reference to the Aquifer Interference Policy (AIP) and the views of Hume Coal, with particular reference to the predicted groundwater impacts of the recently approved extension to the Tahmoor Mine (the Tahmoor South Project).

DPIE maintain there are four key issues relating to the groundwater impacts of the project; the number of affected landholders, the greenfield nature of the project area, the shallow nature of the mine and the aquifers, and the practicality of making good these impacts in a manner that is acceptable to landholders. Each of these issues is addressed below.

a. Number of affected landholders (impacted bores)

Firstly, Hume Coal note that DPIE recognise the groundwater model prepared for the project is fit for purpose, as agreed by all expert peer reviewers engaged by both DPIE and Hume Coal. The model is therefore deemed suitable to predict the likely impacts of the project in relation to groundwater drawdown.

Hume Coal recognises that the project will impact a number of bores due to groundwater drawdown. Hume Coal has therefore developed a detailed make good strategy which identifies the likely make good measures for every bore predicted

to be impacted. This level of detail goes beyond what has been developed for similar recent developments, such as the Tahmoor South Project, and demonstrates Hume Coal's commitment to ensuring that the implementation of make good measures is technically feasible, as well as its commitment to working with each landowner to implement a mutually agreeable make good solution where required.

In relation to the Tahmoor South Project and the number of bores predicted to be impacted, DPIE note that Tahmoor Mine was first approved in the 1970s, which pre-dates the commencement of the AIP. However, the Tahmoor South Project, which is a large expansion of underground longwall mining at Tahmoor Mine, was approved by the Commission this year, in April 2021, under the same legislative regime that Hume Coal is being assessed under, including the AIP. In recommending approval for the project, DPIE considered both the predicted impacts of Tahmoor South alone, and the cumulative impacts of Tahmoor South with the existing Tahmoor North workings and the neighbouring Bulli Seam Operations (BSO). This is despite Tahmoor Mine first being approved in the 1970s. DPIE were required to consider the cumulative impacts of Tahmoor South under the current legislative planning regime, which includes the impacts of Tahmoor North.

A total of 228 bores are predicted to experience a drawdown in excess of the 2 m drawdown criterion of the AIP as a result of the combined workings from Tahmoor South, Tahmoor North and the BSO; an impact deemed acceptable by DPIE in its approval of the Tahmoor South Project.

In comparison, 84 privately-owned registered bores are predicted to experience a drawdown in excess of the 2 m drawdown criterion of the AIP due to the Hume Coal Project, based on 50th percentile results (as reported for Tahmoor South). This is considerably less than those predicted to be cumulatively impacted by the nearby approved underground mining operations: Tahmoor South, Tahmoor North and BSO. The predicted impact of Hume Coal is not therefore 'unprecedented' as has been described about the project. Hume Coal believes its impacts have been made to seem more significant when compared to other sites. Why does DPIE continue to state that the impacts of Hume on bores is unprecedented when the impacts of Tahmoor South are larger? Why for example is Hume required to get make good agreements signed off prior to approval? How many have other applicants been required to do that either before or after approval?

b. The greenfield nature of the project area

DPIE raise the greenfield nature of the project area as a reason for concern relating to groundwater impacts.

By raising the 'greenfield nature of the project area', DPIE infer that this greenfield nature is one aspect that makes the site unsuitable for the project. However, as explained in Hume Coal's written submission to the Commission, dated 23 July 2021, the suitability of the site for the project is based on a number of factors, including the fact that NSW zoning rules (when considering the order of precedent between relevant State Environmental Planning Policies and Local Environmental Plans) permit underground mining in the project area. Approval by the NSW Government has been granted in this area for exploration activities since the mid-1950s. The fact there has been a granting of the right to explore with the intent to develop a coal mine in the area over a long period of time indicates the area is deemed suitable for coal mining activities, provided environmental impacts can be managed and mitigated. A range of commitments have been made by Hume Coal to mitigate potential impacts on surrounding land uses. When these commitments are applied, the project is unlikely to have significant land use impacts.

Further, while the Hume Coal Project is a new mine, underground coal mining has been occurring in the local area for over 100 years.

Hume Coal submit therefore that the 'greenfield nature of the area' is not a reason to deem the predicted impacts on groundwater bores as unacceptable. A robust, fit for purpose numerical groundwater model has been developed for the project, and detailed make good measures have been developed for each bore predicted to be drawn down in excess of the 2 m drawdown criterion of the AIP.

It is important to note that the project area has been included in the map in the NSW Government's *Strategic Statement on Coal Exploration and Mining in NSW* which was released in 2020. This map was prepared to identify where areas in NSW are available and excluded from future coal exploration and mining. It clearly shows the project area as being available for mining. What is also important to note is that the map clearly identifies other "greenfield" areas which are and potentially being released for coal exploration under the State's *Strategic Release Framework*.

c. Shallow nature of the mine and aquifers

In their submission, DPIE discuss the predicted impacts of the Tahmoor South Project on privately owned bores compared to Hume Coal, stating that the geology of Tahmoor Mine and Hume Coal are very different and claim this is important from an impact perspective. The respective geology of both mine sites is considered in detail in the numerical groundwater models developed for each project, and is accounted for in the predicted number of bores to be drawn down by more than 2 m. It is therefore unclear why DPIE use this as one of the reasons that the predicted impacts on bores at Tahmoor South are acceptable, while the impacts predicted at Hume Coal are not.

Hume Coal acknowledges that the geology at Tahmoor Mine is significantly different to that at Hume Coal, with effectively the entire Narrabeen Group missing at Hume Coal. However, it would be wrong to assume the same geological characteristics of the Hawkesbury Sandstone apply from one place to the other. What is critical is the magnitudes of permeability of the strata and the work undertaken to obtain that data. The permeability used in the groundwater model for Hume Coal has been accepted by the expert peer reviewers of the model. Notwithstanding, DPIE Water continued to raise issues in their meeting with the Commission, in that they did not consider the permeability to decrease with depth. Further laboratory testing gives greater surety that permeability decreases with depth (see the additional discussion and Figure 1 below). In the transcript between the Commission and DPIE, the expert peer reviewer engaged by DPIE, Dr Hugh Middlemis, states that "it seems to me that DPIE Water are the ones - are the ones suggesting - or making an argument for a certain case, and I don't think the facts justify the argument."

Further, Andrew Druzynski from DPIE Water is recorded in the transcript of the meeting between the Commission and DPIE Water (19/07/2021) as stating that "I don't think we could go so far as to say [the groundwater model is] fit for purpose". This is contrary to the expert peer reviewers' findings, as well as DPIE. Comments from DPIE Water are therefore misleading and should be set aside.

In addition, DPIE's comment that the Hawkesbury Sandstone and the coal seam are "separated by a thin layer (between 0.1 to 4m) of shale" in the Hume Coal project area, is incorrect. This was explained in detail in Hume Coal's *Response to the Independent Planning Commission's Assessment Report dated May 2019* (EMM 2020) (Response Report), which it seems DPIE has not considered.

In Appendix B of the Hume Coal Response Report, there is a section titled Annexure B - "Hume Coal detailed geological report" (Page 384). In this section there are several reports, including a report that a) highlights the presence and thickness variations of the 'interburden', b) investigates behaviour of groundwater bores in the area, c) provides a geophysical log analysis study of the porosity of the Hawkesbury Sandstone undertaken by CoalBed Energy Consultants and d) a study into the interburden strata by Dr. Brian Jones.

Coalbed note that, "The presence of fine-grained low porosity units occur throughout the stratigraphic interval." There is "No evidence to suggest that the highest porosity intervals are closest to the coal seam. They seem to be irregularly distributed throughout the stratigraphic column."

In Dr Jones' report on the "Analysis of the Wongawilli Coal to Hawkesbury Sandstone succession in the Hume Coal Project area", he notes that remnants of the Eckersley Formation and the Burragorang Claystone (volcanic ash deposit) are present and extend up to 8 m thickness and show low permeability values. Following completion of Dr Jones' report, a more detailed testing program was undertaken of core from the interburden. The below figure presents the additional data obtained from this permeability testing, which was provided to the Commission in Annexure B of the Hume Coal Response Report, and strongly demonstrates that permeability decreases with depth.

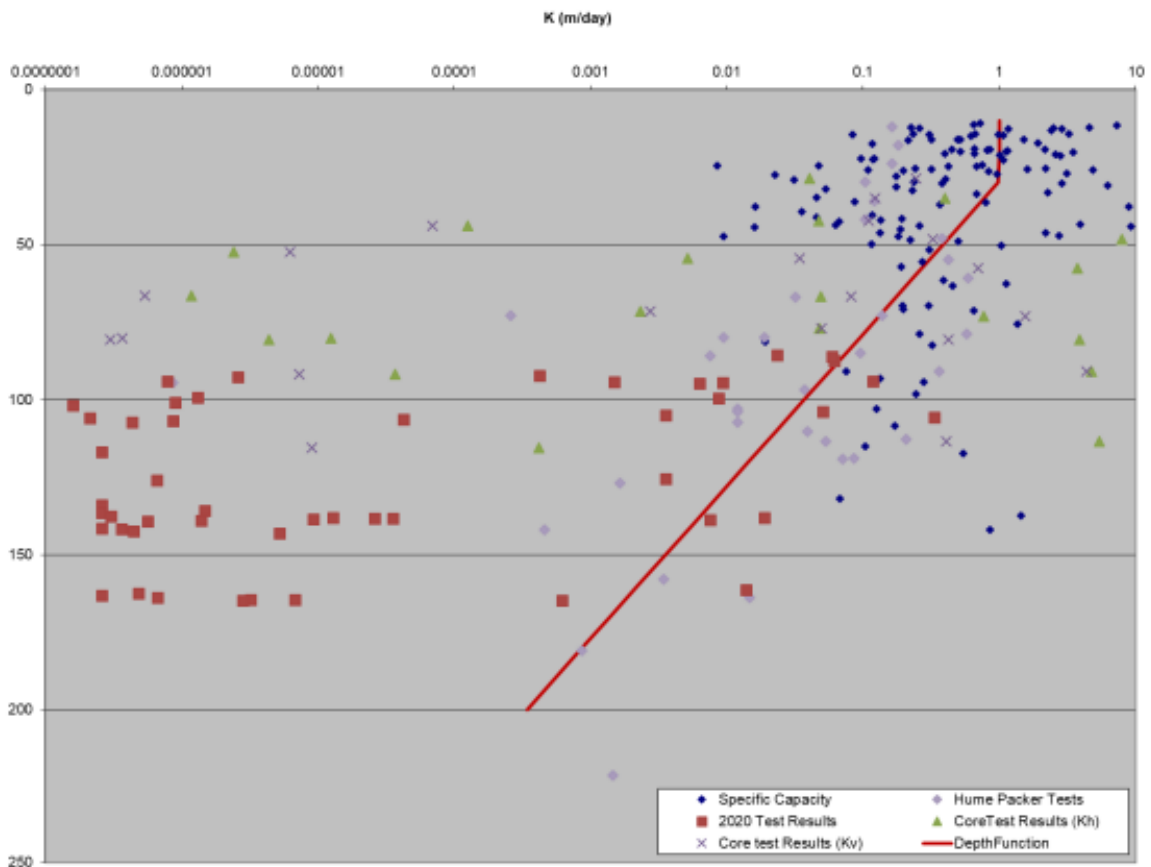


Figure 1 – Permeability data for Hume Coal including 2020 data (red squares).

Further evidence of the presence of the interburden is provided in photograph below, which once again highlights that the 'interburden thickness' is greater than the 4 m maximum thickness claimed by DPIE. This core belongs to the WB Clarke Core Library at Londonderry from bore DDH6 – drilled in the 1980's.



Photograph 10. DDH6 Boxes 37, 38 & 39. Approx. 5.0m of Burraborang Claystone throughout top box +. Underlain by the UNM3 which grades into the top of Wongawilli Coal.

Plate 1 – Core log from bore DDH6 – drilled in the 1980’s – in the Hume Coal Project Area

Hume believes that ample evidence has been provided to DPIE to suggest that the groundwater model is conservative, and the actual drawdown and bore impacts will be lower than modelled.

Finally, one issue DPIE fail to recognise is that the Hume Coal Project is not a longwall mine, like Tahmoor South, and will not develop a goaf. In contrast to Figure 4 in DPIE’s letter to the Commission (dated 22 July 2021), the Hume Coal mining system will not experience a ‘caved zone’ and will not develop a ‘fractured zone’, and therefore will not have a goaf. It is therefore inappropriate to simply say that Hume Coal is shallower without understanding the bigger picture. There is a critical difference between the mining systems and the scale of subsidence related impacts, including the impacts on bores and the subsequent required magnitude of make good measures, between Tahmoor South and Hume Coal, irrespective of the geology present.

d. Practicality of make good

Hume Coal has been proactive from the start of project planning in communicating with landowners potentially impacted by the project. Many landowners have become involved with the baseline monitoring of bores that Hume Coal undertakes.

As Hume Coal has repeatedly stated, it is committed to implementing mutually agreeable make good measures with each landholder where a bore is predicted to be drawn down by more than 2 m, in accordance with the AIP. In their latest submission to the Commission DPIE state that the practicality of implementing make good measures in a manner that is acceptable to landholders is the issue. However, DPIE concede that landholders would likely prefer to wait until the project is determined. In the transcript of the meeting between the Commission and DPIE (dated 29 June 2021), in response to the question by Mr Wilson from the Commission, "So whether you agreed to it now or after is probably neither here or there?", to which Steve O'Donoghue from DPIE replies, "a lot of landholders would, you know, probably prefer to wait till there's a decision on the Project." It is therefore unclear why DPIE continue to raise the implementation of make good agreements as part of 'the issue', when they agree it is something that can be agreed upon post-determination. Hume Coal has repeatedly demonstrated, and DPIE agrees, that the implementation of make good measures is technically feasible. In the absence of a determination, it is difficult to move forward with negotiations with landholders; however, Hume Coal is committed to actively engaging with landholders upon receipt of an approval for the project, which would provide certainty for both Hume Coal and landholders.

Finally, there is no indication in the documentation publicly available for the Tahmoor South Project that any make good agreements were required to be entered into by the DPIE for Tahmoor Mine with landholders prior to determination, or if any consultation was carried out with landholders predicted to be impacted by groundwater drawdown. To the best of Hume's knowledge, Tahmoor Coal's make good arrangements are being managed like all other mines; through conditions of consent. To the contrary, Hume Coal has been engaging with landholders prior to the release of the EIS in 2017.

3. Air quality impacts of windblown coal dust from the project site and product coal transport

Hume Coal acknowledges that both the Environment Protection Authority (EPA) and DPIE are satisfied the meteorological data used by Hume Coal in the air quality assessment is both reasonable and conservative, and that the assessment predicts the emissions associated with the project will comply with applicable criteria. Hume Coal also notes that the project has been specifically designed to ensure this is the case. Results of air quality modelling were used throughout an iterative design process to minimise air quality impacts of the project. Most notably, Hume Coal designed the location and orientation of the coal stockpiles to minimise windblown coal dust, committed to covering the wagons of coal trains, and committed to the emplacement of rejects underground, despite the significant cost associated with these commitments. These aspects go towards what Hume has always described that the project has a low environmental impact.

Hume Coal will also develop and implement an Air Quality Management Plan, which will outline mitigation, management and monitoring measures to ensure ongoing compliance with applicable air quality criteria.

4. Voluntary Planning Agreement

Hume Coal attempted to finalise the terms of a Voluntary Planning Agreement (VPA) for a number of years. However, given that Wingecarribee Shire Council refuse to enter into discussions with Hume Coal in relation to the VPA, as would normally be the case for a development like the project, Hume Coal submitted the VPA offer to the Minister for Planning. The VPA offer to Council still stands, and Hume Coal would welcome discussions with Council on this matter.

Notwithstanding, as DPIE notes in its response to the Commission, VPAs are not typically executed prior to a determination being made and that DPIE would recommend a condition that the VPA be entered into with the respective planning authority within a specified timeframe of the commencement of the development. Hume Coal commits to complying with such a condition with the cooperation of Council.

5. Impacts on tourism, agriculture and food production industries

Hume Coal notes that DPIE is generally satisfied the employment and growth associated with the project is unlikely to cause significant adverse social impacts at the LGA level, including on tourism.

Hume Coal also notes and agrees with DPIE's findings that the direct impacts on agricultural production as a result of the project are relatively small.

However, in relation to the potential impacts on agriculture, DPIE raised concerns relating to the impacts on bores, continuing to state that the implementation of the make good strategy is not practical. This issue is addressed in point 2 above, and as stated, Hume Coal does not agree with DPIE's position on this matter, which is inconsistent with how DPIE have assessed and conditioned other coal mining projects in the region.

6. Underground emplacement of rejects

Hume Coal re-iterates that DPIE has not raised any significant concerns with the underground emplacement of rejects.

However, in relation to the concerns DPIE raised regarding the potential for the proposed mining method to affect underground emplacement of rejects, as previously stated by Hume Coal, this concern is unfounded and not consistent with the findings of the independent experts engaged by both DPIE and Hume Coal on this matter. These experts are generally in agreement that the mine design is safe and practical, and agree that the mining method is extremely flexible and detailed plan dimensions can be readily modified to maintain compliance with project objectives. Galvin & Associates Pty Ltd found that the method is amenable to utilising changes in panel and pillar dimensions as engineering controls to "safely deliver target hydrogeological and surface subsidence objectives" (Galvin, 2020).

Notably, emplacing reject material underground reduces the visual and air quality impacts of the project significantly and, despite the significant cost of incorporating this key element into the project design, Hume Coal readily committed to this method of emplacement when raised by DPIE as a requirement for reject disposal, demonstrating Hume Coal's commitment to minimising the impacts of the project on the surrounding environment and community and its attempts to work with the Department.

7. Economics of the Project

A detailed response to BIS Oxford's Economics (BISOE) analysis of the economic impact assessment (EIA) of the project was provided by BAEconomics (who prepared the EIA), as part of Hume Coal's first submission to the Commission (EMM 2020, refer to Appendix H). Notably, DPIE stated in its Assessment Report (June 2021) that there is adequate agreement between the economics experts on the net economic benefits of the project. These benefits are substantial, at \$290 million in net present value (NPV) terms (if employment benefits and taxes are included), with a total estimated net benefit of \$59 to \$80 million (NPV) to local suppliers and employees in the local area.

In relation to the additional information requested of DPIE by the Commission on coal price sensitivity, Hume Coal notes DPIE's statement that it is unlikely the coal price would drop so far as to make the project unviable (ie by 65%). Hume Coal agree this is highly unlikely. DPIE also state that while they don't have the complete data to do the analysis, BISOE state that the economic 'break even' point is 222,000 tonnes per annum (tpa). This is far below the production level for which approval is sought by Hume Coal, being 3.5 million tonnes per annum (Mtpa), and means that for the project to 'break even', production would have to drop by a significant 93% from the 3.5 Mtpa proposed. This is clearly an unrealistic scenario.

8. Conclusion

Hume Coal has designed a low impact mine with strong environmental credentials, as confirmed by comparing the impacts of Hume Coal to other mines. The benefits include low greenhouse gas emissions, no reject stockpiles left on the surface at the end of the mine life, rail wagons will be covered, new diesel locomotives will be used and minimal land clearing will be required by the project.

Hume Coal has the existing water licences to cover 93% of its predicted water take. Regarding the impacts on groundwater bores, Hume Coal stands ready to make good as required.

No coal truck movements are proposed, with product coal to be transported on underutilised rail infrastructure. Air quality impacts are predicted to be within the relevant criteria and will be able to be managed by conditions of consent. A draft VPA has been put forward that can be progressed with Council or the Minister. Impacts on tourism and agriculture will be minimal. The underground emplacement of rejects will have negligible impacts on groundwater. The economics of the

project are extensive, with \$200M earmarked for royalties, between \$200M or \$300M an additional injection into the State, and nearly a Billion dollars in wages over the life of the mine. Local industry, including the Port Kembla Coal Terminal, will benefit both directly and indirectly from the project.

The project will enable the production of Hard Coking Coal – a rare commodity in New South Wales. This coal is critical for steel manufacturing here and abroad. Steelmaking in turn is critical for the production of infrastructure designed to reduce our dependence on coal for power as we transition to a carbon neutral economy. As demonstrated in the Environmental Impact Statement, the Response to Submissions Report, and additional material provided to DPIE and to the Commission, the project is clearly justified on economic, social and environmental grounds.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Rod Doyle', with a stylized flourish at the end.

Rod Doyle

Project Manager - Hume Coal Project

ISSUE	PAR COMMENT	FAR COMMENT	22/07 LETTER	HUMES COMMENTS	SUMMARY
1) Rail Crossings and Disruptions	The Department considers that any residual rail issues could be adequately managed by including the design and use of the proposed level crossings and railway bridges in the conditions.	The Department's consideration remains the same as in the PAR. The Department's report acknowledges that these residual risks could be adequately managed through conditions.	DPIE confirms typically average 8 train movements (4 round trips). There is ample availability for the Hume Coal Movements. Crossings confirmed. Conditions of consent suggested.	Hume sees the Berrima Rail Project as being achievable and will use underutilised infrastructure. Hume will work with the community and emergency services to minimise operational disruptions. Hume will establish dialogue with emergency services.	Capable of being adequately managed. Hume will work with ARTC to create web site with GPS location of trains.
2a) Predicted drawdowns, most significant for any mining project. HCP impacts are less than other mines. Please confirm the Departments Groundwater concerns.	The project would have significant impacts on a highly productive groundwater aquifer, in particular drawdown impacts at up to 118 privately-owned groundwater bores. The significant groundwater drawdown impacts are unlikely to be able to be reduced further due to the nature of the geology and hydrogeology of the area. The Department has never been in a situation where: (a) there are such a large number of predicted impacts on private bores. Regardless of any uncertainty about the modelling, the predicted drawdown impacts on this aquifer would be the most significant for any mining project that has ever been assessed in NSW. Hume Coal has proposed a strategy to 'make good' on the predicted drawdown impacts. While the proposed make good measures (e.g. deepening pumps or replacing bores) may be feasible from a strictly technical standpoint, the Department considers that make good arrangements are not suitable or practical in this case.	The predicted groundwater drawdown impacts on a large number of groundwater users' bores is unacceptable, as is the practicality of the proposed make good strategy. The proposed groundwater 'make good' strategy, while feasible from a technical standpoint, is not practical for such a large number of affected landholders, and would inevitably result in a large number of negotiations and likely disputes with local landowners, unavoidable delays to the development of the project, and significant disruption to the community. However, the Department maintains that it is the <u>number of affected landholders</u> , the <u>greenfield nature of the project area</u> , the <u>shallow nature of the mine and the aquifers</u> , and the <u>practicality of making good</u> these impacts in a manner that is acceptable to landholders, that is the issue. (FAR para 74) A few comments from the FAR re: Hume's Water Model and its being considered 'fit for purpose'. • Dr Noel Merrick, Dr Frans Kalf, Dr Lloyd Townley and the Department's independent expert Mr Hugh Middlemiss all accept that the groundwater model is 'Class 2' and fit for purpose; • Dr Townley considers that including emplacement of water in the modelling would predict faster recovery after the end of mining and smaller volumes of maximum drawdown in all modelling scenarios; • Dr Townley considers that the range of input parameters used in the sensitivity analysis is sufficient and should not be extended; and • the geological and hydrogeological data for the project is extensive, and that this has been acknowledged by DPIE Water in recent consultation.	DPIE refers to the FAR - Paragraph 73. Para 74 says, The Department maintains that it is the number of affected landholders, the greenfield nature of the project area, the shallow nature of the mine and the aquifers, and the practicality of making good these impacts in a manner that is acceptable to landholders, that is the issue. The DPIE try to explain that the situation is complex. A project with relatively small inflows and drawdown, and short recovery, may have significant impacts where it is located in a region of highly productive water use, many groundwater users, and/or significant environmental constraints. Hume may have similar or less absolute impacts to other contemporary mining projects in relation to inflows drawdown and recovery. The DPIE try and establish the numbers of bores and compares it to other selected projects. It discusses the different geological strata and introduces the longwall goaf at Tahmoor, (but does not compare it to the Pinefeather mining method).	When Hume took exception to the language used by DPE at the First Public Hearing, it was about the statement "the unprecedented number " of bores. It seems that the Department continue to move the goalposts. Now the Department is arguing that it is the number of landowners impacted plus the greenfield nature plus other matters. What the Department is saying muddies the waters. Saying Make Good is technically feasible, but not practical. Hume believe that this issue can be assessed as a single issue - drawdown. For a long time the DPIE did not believe that the Water Modelling was satisfactory. In the FAR they have finally come to recognise along with all the water experts that the water model is 'fit for purpose'. That acknowledgement has consequences that the DPIE don't seem to want to accept. It means that the water model is suitable to be used to determine drawdown. That there is confidence in the drawdown predictions. Hume accepts that its licenced water take will cause drawdown. It has proposed Make Good arrangements and will work with landowners to make that happen. DPIE recognise that the Make Good is technically feasible i.e. it can be done. But have fundamentally concerns regarding the practicality of obtaining agreements with landowners. Hume argues that the important thing is whether the impacts can be Made Good and demonstrates that the drawdown impacts are reversible. Hume Coal has put forward methodologies to address each and every bore. While the government has an Aquifer Interference Policy it does not have a Make Good arrangement or policy and DPIE have stated (25/11/19) that they are developing a statement on 'Make Good' to supplement the AIP. It is also worthy of note that Dr Ian Wright, who opposes the Project, said at the First IPC Public Hearing that the area "is the most reliable area of rainfall in the Sydney drinking water catchment."	Ultimately this comes down to delivering solutions to the landowners. Hume have been proactive from the start, we have communicated with all the landowners involved. Many have become involved with the Baseline Monitoring that Hume undertakes. The DPIE make a big issue about Hume not getting landowners to sign up to Make Good. But then recognise that it was unnecessary. Once approvals are in place Hume will resume communications with all landowners.
2b) DPIE groundwater concerns with reference to the AIP, refer to Tahmoor South.	Tahmoor Colliery is not mentioned in the PAR with respect to comparisons of groundwater impacts.	On any of the given predictions, the assessment indicates that the number of affected bores would be significant, with the significant drawdown issues continuing for a number of decades. The only other project with a comparable scale of predicted impacts is the Tahmoor South Coal Project, also in the Southern Coalfields, which was recently approved. Tahmoor South is nominally predicted to cause drawdown impacts of greater than 2 metres on up to 46 groundwater bores. For these reasons and in the absence of Hume Coal obtaining up-front make good agreements with any of the affected groundwater users, the Department maintains that the groundwater drawdown impacts on the local community are not acceptable. (How many agreements did Tahmoor get in place before their approval and support from the DPIE?) However, there are a number of reasons to distinguish the potential drawdown impacts (and associated make good requirements) at Tahmoor South to the Hume Coal Project. In the project area at Hume, the Hawkesbury Sandstone and the coal seam are only separated by a thin layer (between 0.1 to 4m) of shale. The local geology is different to the rest of the Southern Coalfield, as the Narrabeen Group has been eroded out of the sequence, which creates a unique situation where the Hawkesbury Sandstone is very close, or adjacent, to the coal seam. This is a major factor in the predicted high levels of groundwater drawdown.	Only other comparable project is the Tahmoor South Project. (See Table 1) The DPIE present Figure 4, a not to scale drawing to support their argument. Here the depth ranges from 370-430m, and the longwall widths are actually about 305m. (Which means the width is between 70-80% of the height.) The DPIE also present Figure 5 to contrast the stratigraphy between the two mine sites. DPIE acknowledge that the historical operations would have affected 72 bores. (Plus the 46 new impacts for Tahmoor South and in previous presentations to the IPC, the DPIE note that the cumulative impacts would be 228 impacted bores.) The letter states that the Department's Water Group considers that these prediction of 118 for Hume should be seen as a minimum. (The DPIE appear to be inconsistent.)	Hume acknowledges that the geology at Tahmoor is significantly different to that at Hume. Effectively the entire Narrabeen Group is missing at Hume. However, it would also be wrong to assume the same geological characteristics of the Hawkesbury Sandstone from one place to the other. What is critical is the magnitudes of permeability of the strata. The permeability used in Hume's Water Model has been accepted by the industry experts. However, the DPIE Water group still have issues, in that they did not consider the permeability to decrease with depth. Further laboratory testing of core proved that permeability decreased with depth. In the transcript between the IPC and DPIE's water expert Dr Middlemiss says, initially "I don't think it holds water, their argument." And later "it seems to me that DPIE Water are the ones - are the ones suggesting - or making an argument for a certain case, and I don't think the facts justify the argument." Andrew Druzynski (DPIE Water) says in the transcript between the IPC and DPIE Water (19/07/2021), "I don't think we could go so far as to say it's (i.e. the water model is) fit for purpose" Which is contrary to every expert who has reviewed the model, including DPIE's own engaged expert, and now the DPIE itself. Comments from the DPIE Water group are misleading and should be seen as a very low likelihood. Curiously, the DPIE does not refer to the similarities and dissimilarities between the Berrima Colliery and the proposed Hume Coal Project. Geology is very similar and water inflows didn't stop the mine from production for over 100 years. The DPIE have always been adamant that getting agreements in place for the Make Good was essential. It was finally agreed in the transcript between the IPC and the DPIE (29/06/2021) under the question from Mr Wilson, "So whether you agreed to it now or after is probably neither here or there? To which Steve O'Donoghue replies, "a lot of land holders would, you know, probably prefer to wait till there's a decision on the Project." Hume is surprised this is such a sticking point for the DPIE, it begs the question how many up front agreements were secured by Tahmoor South? Tahmoor is considered by DPIE for its future (Tahmoor South) impacts of 46 bores. DPIE also acknowledges that the Northern section of the mine had some 72 impacts on ground water bores. Not to be pedantic, but that number is not only the same order of magnitude as Hume's 84, but within 20% of one another. It would hardly make Hume's impact 'unprecedented'. That term was inflammatory. Hume has always objected to the Department raising the issue of an unprecedented number of bores. The DPIE has not raised the issue of the cumulative ground water bore impacts i.e. the 228 reported to the IPC by the DPIE, in any discussion of the Hume Coal Project. There is a distinct disparity in treatment by the DPIE between Hume and other Projects. But the issue the DPIE fail to recognise is that the Hume Coal Project is not a longwall mine and will not develop a goaf. It doesn't address this issue, it does not present a fair or balanced comparison between the two sites. How can you compare a 305m wide longwall goaf impact to the minimal impacts that the HCP will have as a result of its proposed mining system irrespective to the geology present.	
3) Air quality and windblown coal dust, transport of coal	The Department and EPA consider that air quality could be adequately managed through the following: Include air quality criteria in accordance with EPA's relevant guidelines. Prepare and implement an Air Quality Management Plan, in consultation with EPA.	The Department is satisfied that Hume Coal's air quality assessment is reasonable and conservative, and that the assessment indicates that air quality emissions associated with the project would comply with applicable criteria.	Acknowledged that Hume has proposed a number of measures to minimise emissions. The Department and the EPA are satisfied that the meteorological data used in Hume Coal's air quality assessment is reasonable and conservative and would comply with applicable criteria.	In addition, Hume has designed its coal stockpiles location and orientation to minimise windblown coal dust. Just to set the record straight, Hume did not originally propose to place rejects underground as DPIE state, this was a demand made of Hume by the DPE. However, Hume considered it and adopted the process. It was environmentally sensible, but comes at a significant impost. Hume will implement an Air Quality Management Plan to put systems in place to ensure compliance and monitoring, etc.	Complies with applicable criteria.
4) VPA, other information provided to DPIE, was it publicly exhibited?	The PAR notes that a planning agreement is part of determining development application.	The DPIE note that the HCP will put in place a range of measures to mitigate social impacts during operations, including entering into a voluntary planning agreement (VPA). Hume Coal offered to enter into a VPA with Council, comprising monetary contributions into a community trust of: • \$750,000 initial contribution upon commencement of construction; and • 5 cents per saleable tonne of coal transported from the site each year, which equates to about \$2.1 million over the project life. The DPIE also note that the WSC has not participated in VPA negotiations with Hume Coal.	DPIE note that Hume requested the Minister to enter into a VPA in 2017. DPIE note that this was an unusual practice. The DPIE state that they have not nor are they required to exhibit the VPA. They state that typically VPA's are not executed prior to determination.	Hume were unsuccessful in getting the WSC to discuss the VPA. The WSC had taken an open stance of opposition to the HCP. In 2017, Hume eventually sought the Minister's intervention with regards to the VPA. While the DPIE regard this as unusual, it is an appropriate approach given the lack of traction with the local Council. On the 16/07/2020 the DPIE contacted Hume and requested if Hume, "would be able to provide Hume Coal's letter of offer to the Wingecarribee Shire Council regarding a VPA/road contribution/etc, and their formal response (if available)." Information was provided and further assistance offered should they require any further information that they may not have. No response was given to the offer of assistance.	Hume Coal has stated in an Agency Response to DPIE dated 13 August 2020, that if the Project is approved every attempt will be made to work with the WSC for the benefit of the ratepayers of the district.
5a) Tourism. Quantitative analysis.	Commentary that WSC objected to the Projects and cited tourism as a concern. Raised the issue that the area had moved away from coal mining and relied more on tourism. Many submissions made against the Project raised tourism as a concern.	Maintains position, the site is not suitable for a greenfield coal mine given the rural-residential and small-scale agricultural land use of the area, along with the growing tourism and heritage landscape focus, and the predicted impacts on these land uses. Incompatible with other land users. Considered as a key negative impact.	Acknowledges HCP work undertaken on tourism in specialised report by JSA in RTS. Relates tourism jobs (1,510) against Hume Project (300) - as if its one or the other. DPIE note that JSA concludes that the HCP unlikely to have any significant adverse impacts on tourism and that the area already has existing heavy industrial uses. Quantitative analysis supports JSA conclusions. Nevertheless, DPIE state that they consider the HCP would result in some significant localised impacts in the vicinity of the project area (but do not clarify this statement).	Hume has undertaken the work to demonstrate that impacts to tourism are not likely to be significant. Hume will maintain its relationship with the local Chamber of Commerce and Business Groups eg Destination Southern Highlands to ensure it monitors and encourages tourism during the life of the operation. Hume Coal does not believe its development of the proposal will have an adverse impact on tourism. There is evidence to suggest that mining enhances tourism in areas, such as Mudjee, and the Hunter Valley. JSA (Stubbs) identified the 1510 number for the LGA, but for the local (in proximity to the proposed mine) area to be 196.	The mine is not expected to have a significant impact on tourism.

5b) Agriculture and Food Production. Quantitative analysis.	<p>Stated that they completed a comprehensive assessment on agriculture (among other things). Introduce the concept of 'small-scale agriculture'. The Department of Primary Industries Agriculture (DPI Agriculture) raised no concerns and recommended that all land should be rehabilitated to a pre-mining state. No BSAL located in area. No reference to food production noted. No discussion of 'productive' farms. Noted 'small scale' agricultural activities. The Department considers that the agricultural impacts would not be significant and could be managed through the following: Include rehabilitation performance criteria. Implement progressive rehabilitation where possible. Proposed Implementation, Rehabilitation & Management Plan</p>	<p>Consider area more widely known for agriculture. Considers the mine unlikely to be compatible with existing land use. Considers mine to have a key negative impact on agriculture. (No mention of BSAL.) (No mention of food production or productivity.)</p>	<p>The Department accepts that direct impacts to agricultural production as a result of the surface infrastructure are relatively small. But say that groundwater impacts could be of more significance. (Ignores benefits of high rainfall in the region). The gross value of agricultural production in 2011 was \$45M. (Area of Wingecarribee LGA is 270,000 Ha. On average this equates to a value of \$167 per hectare per annum.)</p>	<p>Overall the DPIE seem to ignore the existing heavy industry in the area and the industry growth spread from Moss Vale. Ignores the commitment from the HCP to maintain agricultural activities on the proposed mine site. Ignores numerous examples of mining and agriculture working alongside and together, including both open cuts and underground mines. HCP considers the impact of its surface infrastructure will have a minor impact on its agricultural activities and this is borne out with supporting studies. With respect to food production the DPIE have never recognised that the area has significant rainfall (as Dr Wright has identified).</p>	<p>DPI Agriculture raised no concerns. Conditions proposed re: rehabilitation.</p>
6) Rejects emplacement.	<p>Rejects: processed and stored in the temporary surface emplacements within the mine site during operations with the option to reprocess these rejects before pumping them back underground to partially fill the mined-out voids.</p>	<p>Department is satisfied that the temporary surface level emplacement process is reasonable. Department acknowledges Hume Coal's commitment to underground emplacement of all coal rejects by the end of the Project.</p>	<p>Acknowledges Hume's commitment to place all rejects underground by the end of the Project. No significant concerns raised.</p>	<p>Pumping rejects underground considered entirely feasibility. Numerous examples worldwide. Water quality assessed and expert reports presented (leech tests etc - limestone to be added to neutralise pH). Work undertaken by Geosyntex and RGS Environmental. DPIE Water acknowledge this work in the recent transcript with the IPC. Department has not raised concerns re: water quality. No recognition by DPIE, in economic considerations, that this process of reject emplacement comes at significantly more expense than normal process of surface emplacement.</p>	<p>Process practical, removes rejects from surface. Maintains water at acceptable standards.</p>
7) Economics. NPV impact on resource recovery, need to cost contingencies	<p>The Department considers that the project is likely to have some economic benefits for the state of NSW. However, there are differences in opinion and various residual uncertainties about the scale of those benefits. The Department acknowledges that there is a valuable coal resource present. But, considers that the project is likely to have fundamental difficulties in efficiently recovering the coal resource project, particularly due to the shallow depth and the risk of environmental impacts. The Applicant's estimated net economic benefits of \$373 million is relatively low in comparison to many other coal mining projects in the Southern Coalfield and across NSW. Further, the Department considers that the combination of an untested mining method and an unconventional method of impounding large quantities of mine water may result in serious operational safety risks, which may lead to unacceptable surface water impacts and a significant reduction in economic benefits. Benefits don't outweigh the likely adverse impacts on the environment and community.</p>	<p>There is now adequate agreement between the economics experts on the net economic benefits of the project, a net benefit of \$194 million in net present value (NPV) terms, with a range of benefits to the Southern Highlands region, and that sensitivity analysis indicates that the NPV of the project (as designed) would remain positive even when considering a range of potential economic variables. The Department acknowledges that the majority of these potential impacts would be similar to contemporary underground mining projects, and could potentially be managed, mitigated or at least compensated for to achieve an acceptable level of environmental performance if the project was clearly in the public interest. In weighing the merits of the project, the Department acknowledges that it would have a number of benefits, including: <ul style="list-style-type: none"> • producing a high-quality coal resource (55% of which comprises high quality semi-hard coking coal for the steel-making industry) in proximity to existing rail infrastructure, industrial areas and to Port Kembla; • generating some 415 jobs during construction and up to 300 jobs during operations, most of which would be filled from the Wingecarribee Shire and surrounding areas; • significant capital investment value in the project of approximately \$533 million; • generating around \$200 million in royalties and company taxes for NSW; • generating significant economic flow-on benefits for the Southern Highlands; and • providing an estimated net economic benefit to NSW of approximately \$194 million. <ul style="list-style-type: none"> • the project would have relatively low net economic benefits in comparison to many other coal mining projects in the Southern Coalfield and across NSW; The revised EIA concludes that the project would generate a net economic benefit to NSW of \$192 million according to the strict application of the 2015 guidelines, or \$290 million if indirect benefits such as employment benefits and taxes are included based on a broader interpretation of the guidelines. The Department considers that the economic benefits cannot be realised without significant adverse impacts on the environment and the local community, particularly in relation to groundwater impacts. At this stage, the Department does not consider that the economic benefits outweigh the likely adverse impacts on the environment and community. To this end, the Department acknowledges that Hume Coal's sensitivity analysis indicates that the project is likely to remain positive even when considering a range of potential economic variables.</p>	<p>Issues associated with 'break even points'. Issues associated as risk to the Project are described eg low thermal coal prices, pandemic. Sensitivity tests recognised as being required by the guidelines. Coal prices would have to reduce by 65% over the life of mine to be significant and this is considered unlikely.</p>	<p>Concerns re: 'break even points' not featured in PAR nor FAR. Issues associated as risks to the Project are similar for any Coal Mine Project (eg Pandemic) let alone most/all projects. It is noted that if the Treasury Guidelines weren't applied then the benefits to NSW would likely be an additional \$100 M. DPIE does not take into account the costs of Hume's environmental benefits when comparing against other Projects that do not have the same benefits. Covered rail wagons, new diesel locomotives, rejects emplacement, up front make good, GHG emission offsets etc.</p>	<p>Some considerable ground has shifted with regard to DPIE and their position on the economics of the Project. However, they still have underlying concerns regarding impacts of groundwater (among other issues).</p>