27 June 2017
Executive Director Resource Assessments and Business Systems
Planning Services
Department of Planning and Environment
GPO Box 39 SYDNEY NSW 2001

To Whom it May Concern,
RE: HUME COAL PROJECT EIS SSD 15_7172

I write to you with regard to the above referenced project. I now reside in the Southern Highlands of NSW after nearly 40 years of experience in the mining industry. My experience (refer below) is most relevant in relation to considering the strengths, weaknesses, opportunities and threats associated with the Hume Coal Project. I am a strong supporter of the mining industry. As a local resident early on I was invited to meet with Hume Coal management in their office due to my significant coal mining, mine development and corporate experience, where I was asked to be on the Community Liaison Committee. Following that discussion I declined the opportunity as:

- Firstly, I could not see how the Company could safely mine the coal located beneath a world class acquifer exhibiting extraordinary transmissivities, without the Company;
    - Risking the lives of its personnel; or
    - Pumping the acquifer dry over an increasingly large area as the mine progressed through its 19 year proposed initial mine life. I have invested several million dollars in the area and hold two commercial water licences of 130 ML total capacity. The uniqueness of this acquifer allows me to be licenced to pump 6 litres per second on a continuous basis without impact. The flow rates are phenomenal. There are operating commercial bores that have much greater flow rates than ours. This world class acquifer is at risk if mining beneath it was to proceed. There are no other acquifers of such quality that could replace this unique southern highlands water supply.
- Secondly, coal is a commodity. If we consider the competitiveness of this proposed coal operation on the world market then very simply two fundamental parameters allow a coal mine to remain competitive:
    - Mining Method determining percentage of the mineable coal recovered, and
    - Ratio of development tonnes to operational tonnes of coal won.

  These two key parameters are totally independent of the quality of the coal when determining mine competitiveness. It does not matter whether it is coking or steaming coal product in terms of where the operation sits on the cost competitiveness curve. Typically coal mining methods and their mine recoveries are as follows:

Mining Method	Mineable Coal Reserve Recovery	Ratio Development Tonnes to Operational Tonnes Mined
Opencut	90-95%	Not applicable
Underground-Longwall	80-85%	Very Low
Underground-Bord and Pillar/Wongawilli	60-66%	Moderate
Pine Feather (Hume)	35%	High

The proposed Pine Feather method has no competitive advantage operationally when mining a global commodity such as coal and competing with the rest of the world.
No commercially viable brown fields underground mining method exists in Australia today that could mine the coal competitively in a world market without GOAFING the overlying sequence and thereby increasing the Mineable Coal Reserve Recovery Factor in line with more efficient mining methods referred to in the above table. With respect to the proponent's project it is not practical to GOAF the sequence due to the overlying world class acquifer and hence their unique proposed Pine Feather mining method is by definition economically uncompetitive.

Development tonnes are very expensive to produce compared to operational tonnes. The proposed mine design does not pass first base when considering this ratio, despite the proposed method being practically feasible as a mining method when considered independent of environmental and operational risks.

- Thirdly, geological structural considerations are very important in a mine setting such as that proposed by Hume Coal. The Great Dividing Range is a tectonic regime within which the Hume Coal Project is located. The risks associated with this geological setting have been ignored by Hume Coal. In any coal operation there are zones of structural weakness. In my significant eastern Australian coal operational experience this area has been a significant compressional tectonic environment which leads to substantial:

    - Low angle reverse thrust faults; and
    - potential transcurrent faults.

Neither of these styles of faulting are readily detectable by broad scale drilling or geophysics that have been undertaken by the project proponent. Both these styles of faulting, but particularly low angle reverse thrust faults, will form conduits to the surface and intersect the acquifer. The project proponent confirms the hydraulic link between the acquifer and coal seam in its statement in ES4.9 Subsidence of the EIS. Where these faults (including normal faults) intersect the coal seam and are therefore hydraulically linked to the acquifer hydraulic pressures of 100-200 PSI will be intersected if the acquifer is not drained. If the acquifer is not drained this will lead to a situation similar to the Browns Creek Gold Mine (NSW) when at 2.30am on 23 December 1999 a single shot fired (no explosives used in a coal

mine) within a drive connected the mine to a large acquifer and 4,000 litres per second of water ingress caused the:

- Mine to shut immediately through flooding with loss of all subsurface infrastructure and mobile equipment; and
- Company to declare bankruptcy.

Thankfully the event happened when minimal workforce (night shift Christmas time) were underground but the mine has never reopened. I view the Hume Coal project as being of identical risk, but worse still is that the project proponent irresponsibly proposes that the work force operates below the overlying acquifer and down dip of the water and slurry filled workings. By working below slurry filled workings should a major flooding event occur as the mine life progresses then the open mine void at depth is minimal to hold water ingress as the upper workings have been infilled and cemented off, exacerbating the risk to the workforce.

Government approval of such a project sets the mine manager up for criminal conviction upon mine flooding trapping the workforce with likely death and no financial recourse to the company which would be placed in bankruptcy by such an event. The government and community would be left with the site environmental cleanup and memory of deaths from a significant mine catastrophe.

- Fourthly, Hume Coal has been comical in their guarantees of water if the bores of land owners are affected. I am one landowner with 130,000,000 litre annual allocation. The proponents' initial solution was to truck supplies of water to landholders. Assuming a truck holds 30,000 litres and I utilize the annual commercial allocation over a 5 months dry period I would require 4,333 truckloads in this timeframe or 866 trucks per month or around 40 trucks each business day. However, I am only one landowner and there are a substantial number of bores affected during the initial proposed 19 year mine life. What if one wishes to irrigate at night to minimise evaporation rates or vary irrigation times from day to day? The Company also said that they would pipe water to landowners. Where is the water coming from and imagine the water pipe network? These poorly thought out solutions proposed to the public over the last few years reflect the substandard technical competence of this project and Hume's expectation that the project will severely affect the acquifer.
- Fifthly, I expect the mine to be extremely wet, if only in part, but likely throughout given the nature of the sequence and overlying world class acquifer. The placement of slurry tails underground is an expensive and difficult process and made more difficult, more costly and less efficient by a very wet mine from substantial groundwater inflow. I do not believe the risks of underground slurry placement in a mine with substantial groundwater inflows have been sufficiently considered either economically or practically. It is not hard to imagine an areally extensive developed mine with structures connecting to the overlying acquifer having to cope with hundreds if not thousands of litres per second groundwater inflows. I refer to Figure 2.9 p35 of the Executive Summary. From this graph and Section 7.5.1 the average annual supply from groundwater and mine voids is in the order of 440ML/year, equating to 14 litres per second. Given the nature of the overlying acquifer I find this

assumption extraordinarily conservative and untested, especially as the mined area below the acquifer approaches plus 20 square kilometres at year 19 of operations, let alone the acquifer drawdown area being much greater than 20 square kilometres. I believe this conservative estimate is misleading and will have a material negative impact and severely underestimate the groundwater contribution to the water balance of the project. Intersecting only one porous fault structure with plus 100 psi head could easily exceed this 14 litres a second conceptual inflow rate. Where is the detailed risk analysis that determines the point at which the project fails environmentally due to water inflows into the mine. How many geological structures (low angle reverse thrust faults or otherwise) of a given flow rate need to be intersected to environmentally critically damage the project? Given the areal extent of the proposed mine it is not hard to see how the mine inflow rate can cause an overwhelming mine water imbalance.

- Lastly under clause 7.5.6 of the report states that *"There are no potential future projects in the planning process that would influence the assessment of the Hume Coal Project in relation to potential groundwater impacts. Therefore, no cumulative groundwater impacts are predicted."* This is factual misleading. Every landholder who relies on the water has a project in place. Although approved by local planning and the DA has been initiated we have placed our dairy and cheesery development on hold until we see what happens to the mine and our much needed water supply from our bore which is pivotal to the business. We purchased the land because of the soil and 120ML irrigation licence. Ours is one of many local projects that cumulatively outweigh the benefit of a coal mine in the immediate area.

My qualifications relating to these comments are:

- BSc(hons) Coal Project, MBA
- Supervising Geologist coal operations comprising two underground and six open cut coal mines, Queensland
- Senior Coal Consultant, New Zealand
- Project Management Darlot Gold Development, WA
- Minproc Engineers, Involved at a senior technical level in numerous project evaluations worldwide
- General Manager Development and Director Ross Mining NL – Responsible for development of Gold Ridge and redevelopment of Wirralee Gold Projects, Queensland
- Managing Director, Triorigin Minerals Ltd, responsible for formulating the tailings retreatment and potential reopening of Woodlawn Mine, NSW (now Heron Resources)

In conclusion I believe that the EIS is flawed in a number of material ways:

- Placing a workforce down dip of slurry filled workings and beneath an overlying world class acquifer is an unprecedented safety risk not seen in Australia before;
- The key structural geological parameters for this tectonic regime have not been adequately considered and likely have material and critical impact on the water balance of the mine as well as mine safety. The project water balance is materially flawed in that it substantially

underestimates at a conceptual level the ground water inflow into the mine and its associated risks from geological structures that reflect the tectonic setting of the mine;

- Coal is a global commodity and the mining method proposed for this project is the least efficient and competitive of any coal operation in Australia. One must question the rationale and motive of applying for a Mining Licence while proposing an uncompetitive mining method to win a global commodity product from underground.
- Averages for various parameters are quoted many times within the text of the EIS. When dealing with technical parameters and considering risk averages are very misleading and often meaningless.

I object to the mine proceeding based upon the proposed unsafe mining environment, damage to the acquifer, a flawed conceptual water balance that does not consider all factors, a flawed mining method and insufficient geological structural data to assess operational and environmental risk associated with the project.

Yours sincerely,

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