

23 February 2024

ABN: 18 008 495 574

Tony Williams
Manager
Minerals Business Centre
Environmental Services and Regulation Division
Department of Environment, Science and Innovation

Ernest Henry Mining Pty Ltd
P +61 7 4769 4500
F +61 7 4769 4555
Zingari Road
Cloncurry QLD 4824

Postal Address
PO Box 527
Cloncurry QLD 4824

Environmental Authority **EPML00899713**

www.evolutionmining.com

Dear Tony,

Ernest Henry Mining Pty Ltd response to Information Request Notice

In relation to the Information Request Notice issued by the Department of Environment, Science and Innovation (the Department) and received by Ernest Henry Mining Pty Ltd on 17 January 2024 Ernest Henry Operation (EHO) provides the following response for the Department to consider in its assessment of the RL 1150m Environmental Authority amendment application (the Application).

Based on the content of the Information Request Notice we understood that the Department is seeking additional advice relating to the following matters;

- Potential impacts of additional tailings storage on groundwater.
- Extent of surface subsidence and the implications for landform rehabilitation.
- Management of long-term pit water level.

Groundwater

In relation to the management of groundwater impact a number of studies have been undertaken over multiple years investigation groundwater at the site to inform management actions to be implemented including the enhancement of tailings drainage to reduce the phreatic head within the TSF.

In relation to the question of whether the pit acts as a groundwater sink for the aquifers found at EHO and therefore the potential for environmental harm to be caused, the application documents and previous work conducted by EHO in relation to the aquifers including the original aquifer condition, impacts arising from mining activities, recorded potentiometric surfaces and the capture and seepage fate have all been addressed in the work conducted by EHO.

Predictions of potentiometric surface drawdown associated with the application have utilised a qualitative comparison of current groundwater level observations with modelled predictions from the regional model to identify if any risk areas can be identified due to expected future groundwater level changes. Comparisons with the AGE seepage assessment model have also been undertaken in work previously provided to the Department.

The consequence of continuation of mining to RL1150 proposed by the Application will result in an increase to the current cone of depression, thereby enhancing pit capture of any seepage that possibly enter the Wallumbilla or Gilbert River Formation by steepening the potentiometric surface. This will reduce the potential for environmental harm associated with offsite release of seepage in these aquifers.

In relation to the potential for any adverse impact of pastoral supply boreholes operated by surrounding landholders due to a deepening of the cone of depression, the predicted reductions in water table arising from the expansion of the cone of depression provided in the Application are minimal, (as demonstrated in Table 6.1 and Figure 6.1 of Appendix C of the SIR. These figures compare predicted (modelled) to actual drawdown seen in boreholes) but if any adverse impact on groundwater supply arises from mining activities, the make good provisions contained in the existing Water Licence issued to EHO under the *Water Act 2000*, will be applied to rectify that adverse impact, including loss of supply.

In relation to the matter of Groundwater Dependent Ecosystems (GDE's), EHO conducted an exhaustive database search of Federal and State Government resources to identify any GDE's in close proximity to the site that could have the potential to be impacted as a consequence of site activities. The outcomes of this work are captured in detail within section 5.4.3.1 of the SIR, and Appendix C (section 4.9.1). This identified that "there are no GDEs within approximately 4 kilometres of the EHO mine lease boundary". The absence of GDE's near EHO is also supported by results obtained through monitoring conducted for the annual Receiving Environment Monitoring Program and ground-based studies undertaken prior to site development as part of the baseline assessment.

EHO has committed significant resources to the investigation of the Tertiary aquifer to resolve various questions before embarking on a mitigation strategy. EHO is now confident that a technically robust solution is being pursued, which will effectively intercept contaminated groundwater located within the Tertiary formation, preventing its movement off site, irrespective of transport methodology and source. This remedial solution will be informed by current and previous work to prevent contaminants leaving the site, including a range of initiatives that are currently underway to optimize the storage, collection and transfer water on the mine site. The intention of this work being to lower the phreatic surface within the TSF and progressively reduce the risk of seepage over time.

In responding to the issue of whether the proposed increase in tailings volume will exacerbate any existing seepage from the TSF to groundwater, EHO can advise that a range of works are currently underway to enhance the recovery of liquid from the TSF. The focus of these works is the lowering of the phreatic surface within the TSF and thereby progressively reducing the risk of seepage leaving the TSF over time. Due to this program of works EHO envisages that irrespective of an overall increase in the amount of tailings contained within the TSF as contemplated by the Application, the delivery of the enhanced dewatering program will both lower the phreatic surface and maintain it at a sustainably low level to minimise the risk of any seepage entering groundwater.

EHO can demonstrate that it is taking all reasonable and practicable measures to prevent or minimize the potential for environmental harm to be caused by undertaking all the studies detailed above and applying best practice environmental management techniques in relation to the outcome of those studies. In relation to the question raised by the Department relating to environmental harm associated with the Tertiary aquifer, it should be noted that as detailed in the SIR, the tertiary aquifer is not utilised for cattle watering and based on EHO's understanding there are no other uses for this aquifer and additionally this groundwater does not report to surface water systems or support GDE's. Therefore, EHO believe that groundwater in the Tertiary formation currently has no assignable environmental value (as defined in section 9 of the *Environmental Protection Act 1994*);

Environmental value is—

(a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or

(b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

Therefore, EHO believes that the contamination of the Tertiary aquifer cannot under the current legislative framework represent a risk of environmental harm (as defined in section 14 of the *Environmental Protection Act 1994*).

Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

Having said this, EHO remains committed to ensuring appropriate groundwater management measures are in place as detailed above.

Subsidence

Due to the extension of underground mining towards the south, there will be additional subsidence associated with the application. This subsidence is conservatively modelled to extend across approximately 6.3% of the Southern Waste Rock Dump (SWRD) based on modelling conducted by Beck consultants (Appendix B of the

SIR). In addition to the Beck modelling further subsidence modelling work is currently being undertaken by ITASCA consultants to refine the predicted subsidence halo. EHO believes that based on the results of modelling conducted by specialist consultants and the predicted impacts of this subsidence, including that on the SWRD, the magnitude of any additional impacts are minimal as any drainage from the subsidence zone will report to the pit. The pit has consistently been predicted to exist as a poor water quality residual storage (non-use management area) as contemplated in the original mine proposal and endorsed in the existing EA. Drainage from the area of the SWRD affected by subsidence which will not change the utility of the pit lake, which as detailed below will not be hydraulic linked with the surrounding groundwater systems.

In relation to the Departments' questions concerning the anticipated magnitude of subsidence, to give a better understanding of the scale of the predicted subsidence throughout the additional 113 Ha area EHO provides the following information. The subsidence seen over the entire area will be gradational, varying from minimal (c.1cm) at the periphery of the zone of subsidence to multiple metres in the centre of the predicted subsidence halo. Modelling conducted by Beck has identified subsidence ranging from negligible to severe over time (at end of mining RL1150 and +100 years) in Appendix B of the SIR (Figure 3-46, 3-47, 3-48 and 3-49). In addition, Beck has identified that beyond the "negligible subsidence impact contour", the SWRD is not forecast to experience any subsidence-related impact. Subsidence will occur progressively and as identified in the modelled results, the final rehabilitation standard required prior to EA surrender of safe, stable and non-polluting will be achieved at the SWRD once subsidence has stabilised. Rehabilitation of the SWRD, as with all mine features, will occur with the EA requirements and the future Progressive Rehabilitation and Closure Plan. Specific metrics assigned to the range of subsidence predicted at the site are detailed in Table 3-1 of Appendix B of the SIR.

Monitoring of subsidence at EHO is undertaken to satisfy the requirements of the EA and also to fulfil the requirements of the *Mining and Quarrying Safety and Health Act 1999*, and *Mining and Quarrying Safety and Health Regulation 2017*, which is documented in the *Ernest Henry Cave Management Plan*, which identifies relevant responsibilities and actions and includes the following provisions in relation to establishing both cave and subsidence movement by the application of various monitoring networks to monitor rock movement in response to caving:

- Numerical modelling for forecasting.
- In-situ deformation and strain monitoring (TDR's, seismic systems and active tomography).
- Laser survey scanning of the south pit wall subsidence zone.
- Surface mapping and visual crack observations.
- Aerial photography.
- GPS and terrestrial survey of critical infrastructure.

In relation to questions raised by the Department regarding the subsidence exclusion zone, this relates to health and safety considerations to prevent workers from accessing the subsidence area through a risk-based approach. The basis for the exclusion zone is further detailed in the SIR on page 46 of Appendix C:

The suggested exclusion zone is defined as the strain-affected zone at the surface plus an additional stand-off of 50 m. We suggest the exclusion zone to be defined on this basis and considering any minimum legislated requirements, with permanent solid rock earth bunds of 1.5 m minimum height as well as regular signage installed so as to restrict vehicle and foot access.

Pit water level

As set out in item 5 of the Information Request Notice, EHO understands that the Department seeks advice on the predicted relationship between the long-term residual pit water level and the surrounding groundwater level. Appendix C of the SIR identifies that post-mining management of the site predicts that the pit lake will be maintained as a groundwater sink to address any potential contamination issues. As described below, the catchment area draining to the pit post mining will be controlled in such a way as to ensure that the final pit water level acts as a groundwater sink.

Further pit water level modelling is currently ongoing, however exclusion of external catchments such as those from the PED/TED/TEDx/NWRD/TSF and the SWRD outside of the subsidence halo in the post mining management regime has indicated that the pit can remain a groundwater sink in perpetuity. Work to identify what magnitude event could result in a situation where the pit temporarily behaves as a groundwater source is ongoing, but it is anticipated that such an occurrence would be extremely unlikely.

TSF Construction

In relation to the request for information to demonstrate the additional load is within the TSF design capacity and consideration of whether a new consequence category assessment should be carried out. EHO can advise that a new consequence category assessment (CCA) will be carried out by a suitably qualified and experienced person in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures and in addition to comply with other TSF operational standards adopted by Evolution, including ANCOLD and GISTM. This CCA will be conducted as required prior to the storage of any additional tailings within the TSF as proposed in the EA amendment.

Should you have any questions following your consideration of this response, please contact Dean Sharpe, Superintendent Environment, at your earliest convenience.

Regards,



Jason Floyd
General Manager
Ernest Henry Operation