6 April 2023

Chris Wake
Manager Environmental Services
Environmental Services & Regulation
Department of Environment and Science

Dear Chris,

RE: Aeris Resources Limited– EPML02840015 Progressive Rehabilitation and Closure Plan response to request for information

Background

The application for a Progressive Rehabilitation and Closure Plan (**PRC Plan**) was submitted to the Department of Environment and Science (**DES**) on 28 July 2022 for the Barbara Copper Project. The Project is authorised under Environmental Authority (**EA**) EPML02840015 on Mining Lease (**ML**) ML 90241.

DES has written on 7 August 2022 that further information is required to assess the application (an information request).

This letter provides Aeris Resources Limited (**Aeris**) responses with locations of supporting information to fulfil the information request. New and/or updated documents are:

1. Table 1. Round Oak Responses to DES Request for Information
2. Barbara Copper Project Progressive Rehabilitation and Closure Plan V.2 (2023) with additional / updated Appendices:
    a. ATCW (2023) PRCP Water Management Plan and Water Balance Model
    b. ATCW (2023) PRCP Hydraulic Assessment
    c. WMV Environmental (2023) PRCP Groundwater Technical Report
    d. SGME (2023) Cover Design Supplementary Report
    e. WMV (2023) Final Voids Water Quality
    f. SLR (2023) Rehabilitation Monitoring Program
3. Barbara PRCP Schedule Rev D (2023);
4. Updated spatial information for the Barbara Copper Project, submitted to the DES Spatial Submissions Team on 13 March 2023.

If you have any questions or require further information, please do not hesitate to contact Gemma Brown at gbrown@aerisresources.com.au

Regards

Rob Gracey

Rob Gracey
General Manager – Barbara and Mt Colin Mines
Aeris Resources Limited

Table 1. Aeris Responses to DES Information Request

Item	Relevant section	Matter	Information Request	*Aeris Response*
Spatial Data				
1	Spatial data submission	No spatial information has been provided about the nearest sensitive receptors and the Rehabilitation Planning Part does not provide a map of the location.	Provide a shapefile showing the location of the nearest sensitive receptors.	*The nearest senisitive receptor is West Leichardt Station Homestead. This location has been included in the spatial files (submitted by email 13.03.2023) and map with its locations is provided in the PRCP. Refer to Figure 2-22 in PRCP Section 2.2.15.*
Rehabiltation Planning Part				
2	Section 4 Post Mining Land use Section 2.2.7 - Soil Section 4.1.3 – Considerations in determining PMLU	All three Soil Mapping Units of the site are discussed and despite fertility/nutrient issues the soils appear to have more than sufficient depth for PMLUs and the requirements specified in Table 6-6. The shallow soil resources are a major factor in determining the PMLU and the need to import soil is also discussed in the proposed PRCP. While the land suitability for the project area was determined to be Land Suitability Class 4 (marginally suitable for proposed use), the PMLU assigned Land Suitability Class 5 (unsuitable land with extreme limitations). Grazing has been carried out on the land within the project area in the past. It is unclear how Land Suitability Class 5 will support the PMLU of low intensity grazing. The same soil management units have been designated and distinguished as land suitability Class 4 in Table 4.2, and land suitability Class 5 in Table 4-3 in which grazing is unsuitable.	Provide an updated Rehabilitation Planning Part that demonstrates how a land suitability class 5 is suitable for the PMLU of low intensity cattle grazing.	*Land Suitability is Class 4, all soil management units on the site were assessed as having a suitability class 4 for grazing. This information was considered when proposing the PMLUs for the Project Area. Land will be returned to be a pre-mining land use of low intensity grazing in alignment with a Land Suitability Class 4 as identified in Table 4.2. No cropping will be undertaken in the area. Refer to PRCP Section 4.1.3*
3	Section 4 Post Mining Land Use Section 6.1.1 – North and South	It is unclear how the pit designs facilitate water storage and use for the PMLU. For example, the water level in the South Pit is more than 100m below from the pit rim.	Describe how the pit voids will achieve the PMLU of stock water storage considering the final design and dimensions of the pits as well as the location and design of the abandonment bunds.	*The Infrastructure agreement with the landholder specifies the retainment of the HDPE pipes between the mine pits and the sediment dam that are being retained to transfer water from the pits to the surface dam as required. The entry ramp to each of the pits is via locked gates which provides the landholder flexibility in how he chooses to directly access and pump the water for the livestock (i.e. direct access down the ramp, pump to dam or holding tank and trough). It is Aeris understanding that water will be pumped via HDPE pipes from the pits to the sediment dam to be used for livestock watering. Water quality for livestock has been further discussed in se ction 6.1.4.2 in the PRCP.*
4	6.5.2 Waste Rock Dumps	Section 6.5.2 states that the WRD has been capped to be water shedding and a 5m thick NAF material barrier has been placed followed by a compacted rock layer of 500 mm nominal thickness. Section 6.5.2 later states a cover design was developed in 2022 based on trials and the preferred cover may have an unacceptable rate of seepage (PDF page 101). Figure 6-24 provides a Preferred cover design and shows a 1m thick layer of rock which section 6.5.2 describes as coarse waste rock. It is unclear how coarsewaste rock will provide an infiltration storage layer. Section 6.5.2.2 indicates trials are being undertaken to determine cover system design. Hence, a final proposed cover system and nominated performance objectives are not provided. The schedule indicates the WRD is yet to achieve RMs1-4. RM5 which requires the installation of a cover and reshaping the WRD is listed as occurring after RM4 (surface preparation), is not proposed to commence until 2027 and is expected to take 5 years to complete. Further, criteria that reflect the installation of the cover system and associated monitoring infrastructure is not included. The rainfall and overland studies indicate that the cover material is very rocky, with very little sand, clay or organic matter present (Table 1, Appendix O). It is unclear if the cover material used in the study is meant to represent the surface layer (0.3m crushed waste rock) specified for the Trial 3 cover design. The studies demonstrated that the coarse nature of the waste rock resulted in no overland surface flows but with corresponding high infiltration rates. The trial used plots and flumes set at 20% gradients which do not mimic the steeper slopes present on the waste rock landform. No runoff was collected from plots during rainfall simulation and no rills developed during overland flow simulations. This resulted in no values for interrill erodibility, rill erodibility and critical shear being derived from the studies for use in WEPP. Trial 3 cover design involves a 0.3m layer of fine waste rock applied to the landform surface and overlying a 1m ISL of coarse waste rock which in-turn overlies a 0.3m RPL of fine waste rock. Preparation of the plots used for the study presented in Appendix O involved compacting waste rock material to a density of 1.5t/m3 intended to reflect a trafficked landform. No information is presented in the PRC Plan to demonstrate that this reflects the likely compaction to be achieved on the landform batters (especially the angle of repose batter). Data presented in Appendix W indicates the Trial 3 cover design has a limited capacity to store infiltration in the ISL. Consequently, the low rates of overland flow and high infiltration rates demonstrated during the [illegible]	Provide an updated Rehabilitation Planning Part that includes: 4(a) Provide additional evidence (e.g. through representative sampling) that demonstrates 5m of NAF material is capping the WRD including on batters. Provide further information to demonstrate the final cover system will achieve long term structural stability, considering the matters raised. This is likely to require additional overland flow and rainfall studies at higher gradients which better replicate the final landform to either demonstrate no rill development or to provide derived values for updated erosion modelling. Consideration should be given to whether WEPP is the most appropriate model to demonstrate erosional stability of this high-risk landform given that other models (such as SIBERIA or CAESAR-Lisflood) will model landform evolution, consider features or points on the landform which may become unstable and determine landform sustainability over long time periods. Include additional information to demonstrate the suitability of the cover design to support vegetative growth, which in-turn informs the erosional stability of the landform and integrity of the RPL. Provide an updated PRCP Schedule that: 4(b) Provides for the progression of milestones in chronological order, 4(c) Includes criteria to reflect the installation of the cover system and the installation of monitoring infrastructure.	*4(a) Remote sensing imagery has been completed indicating the current NAF cover overlaying the PAF cell demonstrating its encapsulation / no surface exposure of the PAF material. This shows the current end of mine constructed waste rock dump prior to the proposed cover system. Th e NAF cover depth (excluding the proposed cover system) ranges from 2.5 - +7.0m thickness. The imagery is over the surface of the encapsulated PAF cell. The remainder of the WRD, including the batters, has been constructed with NAF material. Refer to section 6.5.2 in the PRCP.* *In response to the preferred cover design refer to Cover Design Supplementary Report (SGME 2023). In summary the SGME erosion assessment provides an analysis of future stability for the WRD and shows that it poses a very-low erosion risk. For this reason, and the reasons given in the report, LEM assessment is not needed.* *4(b) The PRCP schedule has been amended to reflect a more logical ordering of milestones.* *4(c) PRCP schedule now specifically states the installation of monitoring infrastructure during the installation of a cover system.*

Table 1. Aeris Responses to DES Information Request

5	Appendix W: Cover Design – Waste Rock Dump Section 2.2 Cover column trials	Section 1.3.3 Waste rock dump cover system provides three (3) potential cover system designs incorporating waste rock, waste rock with added fines and clay (growth medium soil). Matric suction and soil water sensors were installed within the cover systems to monitor soil hydraulic properties and to generate input data for running the soil water flow model HYDRUS. A key outcome from the column trials and modelling was to evaluate cover design performance in terms of minimising expected seepage. Important information relating to these sensors were not provided such as: (a) calibration of the sensors over a range of waste rock/soil moisture contents to provide site-specific and waste rock/soil specific information; (b) installation protocol to demonstrate the sensors are installed correctly; (c) the relationship between water tension and moisture content measured in-situ to demonstrate this relationship covers the range of moisture conditions normally determined for the soil moisture characteristic (SMC). A comparison of the SMC for the waste rock and soil materials (Appendix E of the Report (Appendix W)) shows a disparity between the measured, in-situ data and that predicted by Fredlund and Xing (1994). Section 2.2 HYDRUS modelling provides a description of the set-up and running of the one-dimensional (1-D) form of HYDRUS. This form of model can be used to simulate the laboratory-based column study but to realistically mimic field cover design, a two-dimensional (2-D) form of HYDRUS would be more appropriate. Information on the model set-up does not state (a) the upper (e.g. atmospheric, constant head, constant flux) and lower (e.g. free drainage, zero flux) initial boundary conditions; (b) constants for each material (waste rock and soil) that describe the hydraulic characteristics in particular the SMC and hydraulic conductivity (K(h)); (c) the actual infiltration and evaporation rates which are used to predict the water balance. The report states a potential evaporation rate of between 0.0045 and 0.0048 m/d and it is assumed this rate is constant over the model period. This is most likely not to occur as soil cover surface layer dries out and evaporation becomes water-supply limited. Other mechanisms should be used to better quantity evaporation losses within the model. Section 2.3.3.2b Saturated hydraulic conductivity of the growth media is stated as 0.0004 m/day or 5.1 x 10-9 m/s. This is an extremely low value and is reflective of a highly compacted clay layer rather than growth media. This hydraulic conductivity would result in a very low rainfall infiltration and encourage runoff. Using this value, HYDRUS would be expected to predict very low seepage/drainage rates. Section 3.1.3 The composite waste rock sample was Class 3 indicating that remoulded waste rock (heavily trafficked) at the plastic limit will disperse in water. The	5a) Provide details on the calibration and installation of the moisture tension and water content sensors. Provide the fitting parameters for the measured, in-situ data and for the predicted SMC. Confirm these parameters against published data and values generated by soil water retention software such as RETC. 5(b)Provide the initial upper and lower boundary conditions used to run HYDRUS. 5(c) Provide a better estimate of bare soil evaporation and its (seasonal) fluctuation over the simulation period. 5(d) Provide reasoning and validation why the saturated hydraulic conductivity of the growth medium soil was set as 5.1 x 10-9 m/s and re-model the water balance using HYDRUS using appropriate values. 5(e) Provide comment and model simulation outcomes on the potential decline in surface infiltration with aggregate dispersion. 5(f) Present the cover column water balance in graphical format for each parameter (rainfall, evaporation, storage, drainage) as a function of time. 5(g) Present the water balance predicted by HYDRUS in graphical format for each parameter (rainfall, evaporation, storage, drainage) as a function of time. Provide a graphical comparison of measured and modelled water balance outcomes. 5(h) Provide a statistical comparison of model efficiency against the measured data. 5(i) Provide a detailed discussion/interpretation of the water balance for the three cover scenarios, with supporting documentation from the published literature. 5(j) If any assumptions or input data are found to not reflect the cover system design study, modelling is to be repeated and if	*Refer to new Appendix V Cover Design Supplementary Report (SGME 2023):* *5a) VWC sensors were not calibrated because the EC was expected to be below 10,000 µS/cm (Campbell 2000). Calibration functions are in Figure 5 and Figure 6 for NAF waste rock. Installation of sensors is described in Section 3.1.2.Laboratory and in situ SWCCs are described in Section 2.4.3 and Section 4.1.3.2a respectively. SWCCs are compared to typical SWCC from Mercer et al (2019). It is not uncommon for in situ SWCCs to be different to typical and / or laboratory defined SWCCs (Williams & Rohde 2009). Laboratory drying SWCCs, generally obtained using reconstituted samples from a saturated state, will destroy the effects of any structure and cementation that exist in situ, and are generally not representative of in situ conditions. Material uniformity and construction control can also have a very large influence on field SWCC data.* *5b) Refer to section 4.1.3. of the report.* *5c) Potential evaporation has been estimated in the model using the Penman (1948) method with medians from SILO data. Actual evapotranspiration is calculated in the model using the modified Wlison-Penmen equation (Wilson et al 1994).The preferred cover does not include soil because there is limited supply of soil available for rehabilitation work. Model validation presented in this report is limited to the preferred cover since DES has not questioned the outcome of the SGME (2022 report).* *Validation of the model is in Section 4.2.1* *5(d) NAF waste rock chemistry indicates that it is stable and not prone to either slaking or dispersion (Table 6). Further the NAF waste rock is well graded which will limit the potential for particle redistribution after placement (Section 2.4.1). Therefore, while there may be some mechanical redistribution of fines within the cover (ie 'washing in'), it is not expected to occur to an extent that it would alter the cover performance.* *5(f)The column trial water balance is in Section 3.2.2. of the report.* *5(g) The SVFlux water balance is in Section 4.2.1. of the report.* *5(h) Graphical comparison is in Section 4.2.1. of the report.* *The process to design the cover has complied with the PRC plan guidelines, statistical comparison of the model is not a requirement.* *5(i) Future performance of the preferred cover is in Table 10. How the cover performs against other industry examples is discussed in Section 4.2.3.* *5(j) The verified model in SVFlux supports the HYDRUS results; noting that, performance under wet year conditions in the SVFlux model has resulted in better performance because of the inclusion of an actual evaporation rate in the model.*
6	Section 4.2.3 Ancillary Infrastructure, roads and ROM Pad PRCP Schedule RA2 and RA3	The Rehabilitation Planning Part and the schedule indicates contaminated material will be removed from the ROM and infrastructure areas. However, it is unclear where this material will be placed. According to the PRCP Schedule, the WRD will be capped and assumed to be not available for additional waste disposal. The residual voids will be used for stock watering so the disposal of contaminated material is unlikely to result in the land being able to support the PMLU.	6(a) Provide an updated Rehabilitation Planning Part that includes information regarding where contaminated material from the ROM and infrastructure areas will be disposed. 6(b) Provide an updated PRCP Schedule that considers the consequential timing of rehabilitation activities to achieve a stable condition.	*(a) Small amounts of identified contaminated hydrocarbon material from the LIA will be removed from site by a licensed contractor for disposal at an appropriately licensed waste facility. ROM material will be blended with recovered haul road material and relocated to the WRD prior to the emplacement of the cover system (below).* *(b) The Schedule has been updated to reflect the sequential timing of the rehabilitation activities.*
7	Section 4.2.2 Waste Rock Dump Section 4.2.3 Ancillary Infrastructure, roads and ROM Pad	Section 4.2.2 states the WRD sediment dam will be retained post closure. No information is provided regarding the ROM dam that is authorised in the EA. The water management section does not provide detail regarding the remedial actions that will be undertaken to remove contaminants and ensure the structure is suitable for the PMLU.	Provide an updated Rehabilitation Planning Part that includes information regarding how the dam will be decommissioned to achieve a safe and stable condition is not provided.	*Retention of the WRD Dam for use by the landowner will be achieved by removing sediment, the liner will be in good order and able to meet its performance (i.e. tears repaired and weeds removed), pumping equipment and pvc pipes in good working order and three strand fencing to preclude stock entry as agreed with the landown er. Refer to section 4.2.3 and 6.10.2 in the PRCP.*
8	4.2.3 Ancillary infrastructure, roads and ROM pad 6.5 Landform and cover design	The landform section does not provide designs of the final landform including the ROM, dams, safety bunds, roads and culverts. The final design, footprint and height of the ROM is not provided and it is unclear how it will be suitable for the PMLU of low intensity grazing. The design and location of the safety bunds is not provided. It is unclear how these bunds will interact with surface water flow and remain stable in the long term.	Provide an updated Rehabilitation Planning Part that includes information regarding: - the designs of the landforms to remain on site, - how the landforms are suitable for the PMLU and will achieve a stable condition.	*The rehabilitation of the ROM Pad includes the removal of all current material to pre-mining conditions, refer to section 6.10.1 of the PRCP, shaping, ripping and revegetation would occur.* *Refer to response 9 for further information on the safety controls around voids (bund and fencing), design and interactions with surface waters. The safety control locations around voids are shown in Figure 6.42 in the PRCP.* *NAF material, used during site construction, will be recovered from the haul road for reuse as cover material on the WRD and to reduce the extenet of upstream ponding within gulies. The post closure formation height of the haul road at crossings is provided in section 3.5 of Appendix S Hydraulic Assessment (ATCW 2023) .* *Culverts (circualr steel pipes) will be retained beneath the haul road with details provided in section 3.9 and Appendix C of Appendix S Hydraulic Assessment. The culverts will be maintained in good working order prior to relinquishment. Sections 6.10 has been updated to reflect the above in the PRCP.*

Table 1. Aeris Responses to DES Information Request

9	6.6 Water Management	It is noted that section 4.2.3 of the Rehabilitation Planning Part lists the infrastructure to remain. Figure 6.35 ... the conveyance of water un	9(a) Provide an updated Rehabilitation Planning Part that includes information demonstrating that water management structures including culverts and diversions have been designed and constructed to ensure they will remain stable during high rainfall events and inthe long term. 9(b) Provide an updated Rehabilitation Planning Part that includes further information regarding the design and location of the safety bund around thenorthern pit including information regarding how it influences flood flow inthe immediate area. 9(c) Provide an updated Rehabilitation Planning Part that includes further information regarding the how the safety bunds are designed to remain stable during high rainfall events. 9(d) Provide an updated Rehabilitation Planning Part that includes information regarding how dams that are to be retained for landowner use will be decommissioned to achieve a stable condition. 9(e) Provide an updated Rehabilitation Planning Part that includes information regarding how water will flow across the site once all rehabilitation activities have been undertaken.	*Appendix S, Hydraulic Assessment (ATCW) and Appendix P Water Management Plan and Water Balance Model (ATCW) f or the closure arrangement has been updated in response to the information requested. Section 6.6 in the PRCP has been updated to reflect these updates.* *(a), (b) & (c) In Summary TUFLOW modelling was undertaken on remaining infrastructure (post-closure). Flood mapping was generated for maximum flood depths and maximum velocities for the PMF, 0.1% AEP and 1% AEP design storm events. The North Pit receives flows from a small catchment to the east and the north wall is overtopped in the 1% AEP, 0.1% AEP and PMF design storm events. A section of the abandonment bund at the north of the North Pit will be comprised of a fence due to the limitations of the surrounding topography for access by construction machinery. The final alignment of the fence to the north of the North Pit will intersect the diversion to the north of the North Pit that is to be r etained. Refer to Figure 6.42 in the PRCP . In conjunction with the post closure water balance modelling undertaken by ATCW, the north wall of the North Pit is located within a zone of instability. It was assumed in the hydraulic modelling and water balance modelling that the engineered north wall would be removed upon closure to increase the clean water catchment area reporting to the North Pit to improve the quality of stored water in the Pit for use as a stock water supply. As such, the current North Pit crest height will be reduced from approximately 316.0 m AHD to 313 m AHD. The proposed abandonment bund was modified at the southwest corner of the North Pit to incorporate the existing levee by raising it an additional 2.5 m to at least 322.5 m AHD. Where bunds are to b e constructed the geometry is to be in accordance with typical geometry of 2m height, 5m width at base, 0.5m crest width and side slopes of 1(H):0.5(V).* *(d) Retention of the WRD Dam for use by the landowner will be achieved by removing sediment, the liner will be in good order and able to meet its performance (i.e. tears repaired and weeds removed), pumping equipment and pvc pipes in good working order and three strand fencing to preclude stock entry as agreed with the landowner.* *(e) Refer to sections 4 to 6 of Appendix TSHydraulic assessment (ATCW 2023) for the results of the TUFLOW modelling (flood risk profiles of how water will flow across the site) of the PMF, 1% and 0.1% AEP events once all rehabilitation activities have been undertaken.*
10	2.2.6.1.1 Hydro geochemistry. 6.1 Hydrogeology Appendix Q Water balance and geochemical assessment of pits	Section 2.2.6.1.1 states that the water quality in the pits may become sulphate rich and of low pH but that they will be groundwater sinks. Section 6.6 again states that pits are groundwater sinks and the risk of mobilisation of contaminants is low. Appendix Q (summarised in section 6.1.1) provides the results of pit water modelling and states: - that water rapidly accumulates in both pits. - that while north pit is a net groundwater sink, it will overtop in rainfall events greater than the 95th percentile. - groundwater will move from north pit to south pit due to the difference in elevation between the base of the pits (approximately 80m).Appendix Q indicates the starting water level of the WRD dam is below the base elevation of the dam and that WRD dam spills each year. The modelling indicates there is the potential for release of contaminants from both the WRD dam and the north pit during high rainfall events. Appendix I provides the results of kinetic waste rock analysis and states that PAF is likely to take several years to oxidise and for acid generation to develop. Appendix Q provides water quality modelling for both pits and the WRD dam. It is noted that the mine ceased operation in March 2021 and by June 2022 approximately 9.5 m of water has accumulated in north pit and 20 m of water has accumulated in south pit. It is unclear whether this water has been pumped from the WRD dam or has accumulated from groundwater inflow. While section 5 states sampling was undertaken uniformly it is unclear whether samples were taken from surface water only. Tables 9 and 10 provide water quality results for both north and south pits. These results indicate that while pH remains circum-neutral, water quality is generally deteriorating over time and at times is elevated in fluoride, EC and sulphate. The water quality model does not recognise the potential for stratification or the potential for water quality to change in several years due to the oxidation of PAF material in pit walls (indicated by Appendix I) resulting in iron hydroxy species that can significantly influence pit water quality. The model also does not recognise the potential for water to seep from north pit to south pit resulting in elevated concentrations of contaminants entering south pit through groundwater recharge from north pit. Results for north pit indicate that the water quality may not remain suitable for stock watering. Many parameters included in ANZECC for stock watering are not modelled (including fluoride and EC). The conclusion for north pit provided in section 6.3.4 states that the results are not representative and it is expected that pit water quality would be suitable. Results for south pit indicate water quality will exceed ANZECC stock watering guidelines for TDS and potentially sulphate. Again, it is noted that the modelling does not	Provide an updated Rehabilitation Planning Part that includes information demonstrating the structures to remain for water storage for stock watering will be non-polluting and safe.	*Refer to new Appendix T Water Qualty Assessment of North Pit, South Pit and WRD sediment Dam (WMV 2023) which provides an assessment of applicable water quality guidelines, final void water quality modelling, potential Acid Mine Drainage (AMD) and final void statification. In summary the water quality modelling indicates that the modelled solute concentrations in the North Pit, South Pit and WRD Sediment Dam remain below the applicable ANZECC 2000 Water Quality Guideline values for livestock watering, AMD will not impact long term water quality, the pits generally act as terminal groundwater sinks and seasonal stratification will not adversely affect water quality for livestock watering.* *PRCP Section 2.2.6.1.1 and 6.1 have been updated accordingly. Appendix U Groundwater Technical Report has also been updated to reflect the updated void water balance and long term quality modelling.*

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11	Section 6.9.2 – Geological stability and Appendix P	Section 6.9.2 provides a description of the abandonment bunds around the North and South Pits. It is stated that the abandonment bunds will be a combination of soil, gates, rocks and will restrict access to the landowner only. The abandonment bunds are further discussed in Appendix P which provides description of the requirements and design of the bunds. The report quoted Western Australian guidelines (DIR, 1997) to determine the setback distance for the bunds from the pit edge. The guidelines recommended 25° for weathered rock. However, the project adopted 30° angle based on measured slope morphology angles from topographic features adjacent to the pits. The DIR 1997 guidelines suggest the minimum dimensions should be 2m height on 5m base. It further recommended unweathered, freely draining, end dumped rockfill should be used. The information provided on the construction of the bunds does not sufficiently demonstrate that the bunds will be safe and stable and the materials used will not cause ongoing pollution. An additional buttress has been proposed to protect the northern pit wall and to prevent ingress of surface water into the pit. The location of the buttress was discussed in general term in the proposed PRCP.	11(a) Provide information on how the design and construction of the bunds meet the best practice and that sufficient setback distance has been provided allowing for any potential pit wall collapse. 11(b) Provide information on where the bund will be located and demonstrate that it has been adequately designed to provide the stability to the north wall, as required to achieve a safe, stable and non-polluting PMLU.	*The description of the safety controls around the potential zone of maximum pit instability (with a setback) has been updated. As per response 9 the North Pit receives flows from a small catchment to the east and the north wall is overtopped in all modelled storm events. A section of the abandonment bund at the north of the North Pit will be comprised of a fence due to the limitations of the surrounding topography for access by construction machinery (steep terrain). The final alignment of the fence to the north of the North Pit will intersect the diversion to the north of the North Pit that is to be retain ed. Refer to Figure 6.42 in Section 6.8.2 of the PRCP, all safety controls will be located outside of the maximum potential zone of instability . The engineered north wall would be removed upon closure to increase the clean water catchment area reporting to the North Pit to improve the quality of stored water in the Pit for use as a stock water supply. As such, the current North Pit crest height will be reduced from approximately 316.0 m AHD to 313 m AHD. The proposed abandonment bund was modified at the southwest corner of the North Pit to incorporate the existing levee by raising it an additional 2.5 m to at least 322.5 m AHD. Where safety bunds are to be constructed the geometry is to be in accordance with 2m height, 5m width at base, 0.5m crest width and side slopes of 1(H):0.5(V). Fencing will be three strand fencing to exclude public and livestock.*
12	Section 8.2.1.1 – Analogue sites	The proposed PRC Plan refers to reference sites for comparison of milestone criteria for the areas to be rehabilitated to native ecosystem or grazing on native pastures. No detail has been provided for the location of the reference sites or their suitability as representative sites for the rehabilitation areas. Without specific locations and information regarding the characteristics of the reference sites, criteria in the PRCP Schedule are not measurable.	Provide information regarding the location of nominated analogue sites, their current condition regarding each of the milestone criteria that will be used for comparison and how the analogue sites are considered suitable for comparison.	*SLR Consulting were engaged to prepare a Rehabiltation Monitoring Program (RMP) which identified six analogue sites represenative of the final rehabilitated landforms in the surrounding landscape. This was completed through a desktop assessment followed by a ground-truthing survey to establish permanent locations for analogue sites and initial rehabiltation monitoring event to provide an indication of their condition. The outcomes of this assessment and design, including location and conditions are presented in section 3 of Appendix W Rehabiltation Monitoring Program (SLR 2023). Section 8.2.1.1 in the PRCP has been updated to reflect this design.*
13	Appendix R – Risk Assessment Risk Nos. 18, 19, and 20	The risk assessment does not consider the following factors that are known to contribute to revegetation failure such as: - Poor seed quality, - Inappropriate seed mix used, - Seeding methods, - Insufficient insect treatment, watering or sheltering young trees, - Insufficient topsoil preparation, - Poor weed hygiene, - Fire, storm damage to young revegetation, - Topsoil handling and quality, and - Below average wet season rainfall or sporadic rainfall during establishment. Without appropriate risk mitigation strategies is it possible that rehabilitation milestones will not be complied with, the land will not achieve a stable condition and may not be suitable for surrender.	Consider the additional risks that could potentially impact on the ability to stable condition address in the risk management matrix.	*Additional risks have been addressed in Appendix R which provides results for the complete Risk assessment undertaken for Barbara. The risks related to seed quality and seeding methods have not been incldued in the PRCP Section 7 Risk Assessment, as the were determined to be of low risk, and only medium to high risks have been included within the chapters of the PRCP report. All risks identified have been assessed and included in the full risk assessment document provided in Appendix R*
14	Rehabilitation Planning Part and PRCP schedule	It is understood that the project has ceased mining and rehabilitation activities on the WRD are proposed to commence in December 2022. However, the construction of the cover system is not proposed to commence until 2027 and only 5 years has been provided to achieve a stable condition. Further, the schedule proposes to undertake milestones 1-4 including surface preparation and placement of growth media before the cover system has been constructed. Similarly, the schedule for RA4 proposes that it will take 10 years to decommission infrastructure by which time, the WRD will have been capped and not available to disposed of contaminated material. Justification for this timing is not provided in the PRC plan and it is unclear how the proposed timing reflects the requirement for each milestone to be achieved as soon as practicable after the land becomes available (s126D(4) of the Environmental Protection Act 1994 and Step 7 of section 4.1 of the PRCP Guideline). The reference map indicates that the WRD dam is located within RA1. However there are no milestone criteria that clearly relate to the WRD dam and the works required to decommission the regulated structure to ensure it remains in a stable condition and can support the proposed PMLU. The rehabilitation planning part does not provide justification for the: - proposed timing of rehabilitation milestones, - proposed order of rehabilitation milestones, or - proposed criteria provided in each of the milestones and how they will achieve, or reflect, a stable condition.	14(a) Review and update the PRCP Schedule to reflect each milestone being achieved as soon as practicable after the land becomes available. 14 (b) Provide an updated Rehabilitation Planning Part that provides justification for the proposed timing, order and criteria proposed for each Rehabilitation Milestone.	*Both the PRCP and Schedule have been updated to meet this request.*
PRCP Schedule				
15	Milestone Criteria Generally	Suggest numbering the milestone criteria for ease of reference.	For ease of reference, use the following format for each criterion: 1. Criterion a. Sub criterion i. Further sub criterion.	*Milestones have been numbered accordingly.*

Table 1. Aeris Responses to DES Information Request

16	Rehabilitation Milestones	RM2 applies to each rehabilitation area including the pits and the WRD. Criteria for this milestone include the remediation or removal of all contamination. It is unclear how this milestone is to be applied to a permanent feature such as a WRD or pit. Further a criteria requires that the land be determined to be not contaminated. It is unclear how this will be possible for a WRD.	16(a) Provided an updated PRCP Schedule includes criteria that reflect the rehabilitation methodology proposed in the Rehabilitation Planning Part and is required to achieve a stable condition. 16(b) Provide an updated PRCP Schedule that include all water quality parameters and values necessary to demonstrate water in the pits and WRD dam meets ANZECC water quality limits for stock watering.	*(a) The PRCP Schedule has been updated for RM2 (Remediation of Contaminated Land) and to achieve a stabe conditions for the WRD refer to RM12 and RM14* *(b) Water quality criteria for surface water and/or groundwater has been updated based on the updated water quality assessment for water storages meeting ANZECC stock watering (Beef) guidelines (RM11, RM12, and RM13.*
		RM3 does not appear to apply to the WRD dam that is included in RA1. It is anticipated that some land reshaping would be required to decommission the regulated structure (although this is not proposed in the Rehabilitation Planning Part).		*The WRD sediment dam will be retained by the landholder through a signed Landholder Agreement. The Diversion drain to the west of the WRD sediment dam and the diversion drain to the east of the South Pit will be decommissioned and rehabilitated.*
		RM4 proposes that rocky growth media be used. It is unclear how rocky growth media is suitable for achieving a PMLU of cattle grazing. The timing of RM4 in relation to RA2 may not be in sequence with intended activities.		*RM14 captures the placement of cover system and RM4 would occur after that (as one campaign)*
		RM5 does not include, or specify, the implementation of monitoring equipment necessary to demonstrate the objective of the cover system is being achieved and infiltration is not reaching the PAF material. As the cover is essential for ensuring a non-polluting landform is achieved, it should include representative sampling of capping material once placed to demonstrate it does not contain PAF or other contaminated material (Section 4.2.3 states that benign material from ROM will be used as either capping material or regraded and revegetated). Criteria requiring certification that the cover system is constructed according to the specified design is not included. It is noted this is the last rehabilitation milestone prior to achieving a stable condition. However, no criteria are included requiring revegetation and performance requirements for revegetation are not included. It is recommended that criteria be included similar to those recommended for RM7.		*RM14 applies criteria for instrumentation of the cover system.* *RM3 applies criteria for certification as constructed.* *RM5 applies criteria for revegetation and RM8 for achievement of surface requirements and RM12 for achievement of PMLU.*
		RM6 indicates that a fence OR abandonment bund may be used to restrict access. Industry best practice is to use an abandonment bund and fencing and this is proposed in the Rehabilitation Planning Part. This milestone also proposes to transfer the voids to the landholder. As noted above water quality modelling indicates the void water may not be suitable for the PMLU in the long term. If voids were to remain for water storage then water quality parameters and values demonstrating suitability for stock water must be met and maintained forsignificant period of time prior to transferring responsibility for the feature to the landholder.		*The site is located on private land with locked entry gates and will have clear signage at entry points. The landowner requires access to the pits for stock watering. In areas of steep terrain (where thre are physical barriers) and/or interaction with surface water diversions construction of a bund is not practical. Refer to updated RM7 that applies to voids.* *Refer to updated RM11 for void quality guidelines for Livestock based on water quality modelling.*
		Many criteria in RM7 refer to analogue sites. A description and justification of analogue sites is not provided and therefore these criteria are not measurable. It is recommended that specific and measurable criteria be included that demonstrate the land is on a trajectory to achieve a stable condition including: - Specified strike rates and establishment of vegetation. - Stem densities for vegetation/tree species. - Maintaining the specified species mix for the PMLU. - Specific parameters regarding erosion that can be measured have not been included (e.g. presence of erosion gullies, erosion rates). - Absence of bare topsoil or subsoil. - Criteria regarding surface water quality. -Absence of seepage expressing at the surface.		*Measurable Criteria has been provided based on SLR's Rehabilitation Monitoring Program. Refer to updated RM5, RM6, RM8 and RM9.*
		RM8 only applies to water management structures that are to remain. There are no criteria relating to the levees and diversions: - Being vegetated, - Certified as conforming with design documents and functioning as designed, - Being stable and not showing signs of active erosion, - Do not alter the geomorphology of the receiving environment		*Refer to updated RM1, RM3 and RM10*
		The second criteria in RM9 requires an assessment only and does not provide performance requirements necessary to demonstrate a stable condition has been achieved. Section 4.2.2 states the engineered cover system has been designed to prevent infiltration which could generate acidic conditions and mobilise metals. However, criteria reflecting this outcome have not been provided. The fourth criteria to demonstrate the cover is performing only requires review of data and does not require specific performance requirements which are the basis for the design. Surface and groundwater quality does not include all parameters necessary to demonstrate compliance with ANECC stock water quality limits.		*Refer to updated RA2: RM3, RM14, RM12 and RM13.*
		RM10 does not include criteria requiring the voids to continue to be groundwater sinks and does not include all parameters necessary to demonstrate compliance with ANZECC stock water quality limits.		*Refer to updated RA1: RM11*

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		Criteria proposed in RM9 and RM11 do not provide many aspects required to demonstrate a stable condition has been achieved. For example:For RA2, specific habitat features are present and persisting to support native ecosystem, - For RA2, evidence that fauna is using native ecosystem and is not compromising the integrity of the cover system, - For RA2, the landform continues to comply with design requirements and differential settlement or oxidation of material has not resulted concentration of surface water flow or other impacts that prevent the land from achieving a stable condition, - For RA2, water and oxygen infiltration rates have been proven to be reduced to the extent (a nominated rate or %) that prevents oxidation and seepage, - Vegetation species required to support the PMLU are present (3P plants for grazing PMLU), have required stem densities, are self sustaining and resilient to demonstrate the land has achieved the PMLU, - Weed presence has not impacted the achievement of the PMLU, - Tunnel, gully and rill erosion has not exceeded a specified level, is not occurring and there is no evidence of salt rise or other factors that may impact the ability for the land to maintain a stable condition, - Specified erosion rates have been met and maintained over time, - Specified levels of soil development has occurred and supports the ongoing recruitment of native species, - Soil depth and subsoil depth has not been significantly impacted by erosion or biological processes that may increase infiltration, - Seepage is not present or expressing at the surface, - Surface water quality meets specified values for parameters that reflect environmental values of the receiving environment and sustain the PMLU, - Groundwater monitoring of specific parameters and values at specific locations to demonstrate the land is non-polluting (particularly down gradient from the pits and the WRD), - All slopes have been certified as being geotechnically stable, - Safety infrastructure has been constructed and is maintained, - All infrastructure to remain has been certified by an AQP as being stable and fit for purpose (including culverts).		*RA2 has been updated. Refer to updated RM8, RM12 and RM14.*
17	RA4	The relevant activities nominated for RA4 do not reflect all the structures to remain and are nominated for RA4.	To remove uncertainty, ensure all water management structures are nominated in the schedule for RA4.	*RA4 relevant activities updated to Water infrastructure (retain NP Crk Diversion & Levee, Diversion Northeast of NP, Diversion east of WRD Sediment Dam. Decommission all others).*