

REPORT



# EA Application RFI Response Vulcan South

for Vitrinite Pty Ltd

10/03/2023

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# 1 Introduction

Vulcan South (the Project or VS) is a small-scale coal-mining operation proposed by Vitrinite Pty Ltd owner of Qld Coal Aust No.1 Pty Ltd and Queensland Coking Coal Pty Ltd (Vitrinite). A site-specific Environmental Authority (EA) and Progressive Rehabilitation and Closure Plan (PRCP) application (A-EA-NEW-100265025) was lodged on 6 June 2022 with the Department of Environment and Science (DES). The application includes the establishment of an open-cut hard coking coal mine which will extract material via three separate pits over a seven year period on MLA 700073. DES considered the application and informed Mining and Energy Technical Services (METServe) on the 1 August 2022 that further information was required to assess the application. The information request is replicated in **Table 1** below along with responses from Vitrinite.

Selected responses are supported by further technical assessment documents, which are appended to this response. These comprise:

- Appendix A- Air Quality Assessment;
- Appendix B- Noise Impact Assessment;
- Appendix C- The Groundwater Quality and Level Trigger Assessment;
- Appendix D- Groundwater Monitoring Data; and
- Appendix E- Connectivity Assessment.

If the technical assessment document has been included in the PRCP document, reference to the PRCP will be outlined in the table below.



**Table 1 RFI Response Summary – Vulcan South Project**

Document	Item number	Relevant Document Section	Issue	Information Requested	Technical Discipline	Final Response
Site-Specific EA Application	1.1	Supporting Information	The degree to which the Vulcan South Project (VSP) and the Vulcan Complex Project (VCP) are integrated [also referred to as the Vulcan Coal Mine] is not clear. A greater description of the relatedness and integration of the VSP and VCP is required. Further, the justification is required as to why the applicant considered the VSP and VCP as separate projects, requiring separate environmental authorities (EAs).	(a) Provide additional details as to the relatedness and integration between VSP and VCP including how project timeframes may overlap; and (b) Justify why VSP and VCP are considered separate projects, requiring separate environmental authorities (EAs).	General	Vulcan South (VS) and Vulcan Coal Mine (VCM) are independent projects, approximately 10km apart. VS construction is planned to be completed at a similar time to the cessation of activities at VCM. If there is an opportunity to commence the highwall trial during the VS construction period, ROM coal extracted from the trial may be handled through the VCM infrastructure. Dependant on timing, personnel, plant and equipment, may be transferred from VCM to VS.  The VCM is Vitrinite's first mining project and is scaled accordingly from a capital expenditure and operational cost management perspective. The VCM and VS have separate underlying landholders. Land access for each of the projects has required different negotiation pathways and timeframes.
Site-Specific EA Application	1.2	Appendix F, s4.2 Appendix G, 3.2	The number of sensitive receptors is not consistent between Appendix F and Appendix G for air and noise impacts, respectively. Additional justification is required to explain why the sensitive receptors for air and those for noise are not the same.	(a) Justify why the sensitive receptors for impacts to air and those for noise are not the same.	General	As described in Section 4.2 of the Air Quality Assessment ( <b>Appendix A</b> ), commercial sensitive receptors (being the sensitive receptors included in the noise assessment) have been omitted from the air quality modelling assessment intentionally (please see text below) <i>"There are a number of industrial commercial receptors that are located at nearby operating coal mines to the VS that have not been classed as sensitive receptors. These receptors (Processing plant, rail loadouts and remote crib room areas) are located within nearby operational coal mines and are likely to be exposed to dust from their own onsite operations at levels greater than that produced by VS, and therefore, any potential exposure should be attributable to onsite conditions. As such, only receptors designated as residential have been considered for impacts as part of the assessment.</i>  However, for consistency with the noise assessment, all sensitive receptors (including commercial) have been listed in table 3 of the Air Quality Assessment ( <b>Appendix A</b> ).
Site-Specific EA Application	1.3	Appendix G, s4.7	Appendix G, Table 4.2 includes proposed noise limits for sensitive receptors. Additional justification is required to justify the appropriateness of the use of the 'Z' weighted indoor noise level for unbalanced noise emissions (where dBZ – dBA > 15 dB).	(a) Justify why the 'Z' weighted indoor noise level for unbalanced noise emissions is an appropriate indicator of noise impact; and (b) Provide additional details as to the noise emissions from mining operations which would be expected to exhibit an 'unbalanced spectrum'.	Noise	(a) The approach is justified because it references DES's low frequency noise guide document which outlines recommendations regarding low frequency assessments. The referenced limit is for an initial screening of low frequency impacts. (b) Further clarification has been added to Section 4.6 of the Noise Impact Assessment ( <b>Appendix B</b> ) to state what an unbalanced spectrum is with some examples (see below) <i>"An unbalanced frequency spectrum that characteristically shows a general increase in sound pressure level with decrease in frequency. Annoyance due to low frequency noise can be high even though the dBA level measured is relatively low. With regards to mining operations, processing plant including screens and crushers (also potentially associated with diesel engines) are a potential sources of low frequency noise."</i>
Site-Specific EA Application	1.4	Appendix F, s4.41; and Appendix G, s6.2	Appendix G, section 6.2 discusses the significant affect the meteorological conditions may have on noise levels [15 to 20dB(A)] at sensitive receptors due to wind speed, direction, time of day, etc. The meteorological scenarios (as outlined in Table 6.1 Meteorological Scenarios) for the Noise Assessment, provide for a wind speed of zero (0) m/s and two (2) m/s. Further, 2 m/s is described as adverse meteorological conditions. However, there is insufficient justification as to why 2 m/s should be taken as representative of 'worst-case' adverse conditions. The department notes that Appendix F states the annual average wind speed as 2.53 m/s and Figure 8, 9 and 10 describe the range of meteorological conditions at the project. This would suggest the 'worst-case' scenario would be regularly exceeded.	(a) Justify the meteorological scenario taken to be 'worst-case' in terms of noise impact to sensitive receptors; and (b) Pending a response to (a), complete additional modelling under a wind speed parameter which is justifiably representative of the 'worst-case' impact to sensitive receptors.	Noise and general	(a) The adopted meteorological conditions have been accepted by DES in previous EIS Noise Assessments undertaken, hence the use. There is no current DES guideline, however, reference is made to the DES (formerly EHP) Planning for Noise Control Guideline (last official version 2004, and more recently draft 2013). In this document, it allows for the use of default worst-case meteorological parameters for the night period (i.e. F Class Stability, 2 m/s winds), which have been considered in this assessment. See page 8-10 of the Planning for Noise Control guideline. (b) no further modelling is required.
Site-Specific EA Application	1.5	Appendix G, s6.7	Appendix G, section 6.7 discusses a period in which coal is proposed to be transported to a coal washing	(a) Provide additional details as to whether the transportation of coal for washing and	Noise and general	(a) VS ROM coal is proposed to be washed through VS CHPP. If there is an opportunity to commence the highwall trial during the VS construction period, ROM coal extracted from the trial may be handled through

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			and load out facility located on the Peak Downs Highway. It is noted this proposal does not appear to be discussed elsewhere in the Supporting Information.	loading is still proposed; and (b) Provide additional details as to whether impacts to environmental values from coal haulage are constrained to noise/the acoustic environment. If additional impacts are identified, provide additional details of said impacts.		the VCM infrastructure or potentially transported to a facility along the Peak Downs Highway (north of VS). The Noise Impact Assessment ( <b>Appendix B</b> ) has been amended to reflect that this movement of ROM coal to an off-site CHPP is a potential rather than a certain outcome. (b) Given the nature of the haul route, noise is the most likely element that could be impacted by the Haul truck route and therefore, this is the only environmental factor included in this scenario. Other technical assessments did not determine that a potential haul road would have any measurable impacts, such as the Terrestrial Ecology and Air quality assessment.
Site-Specific EA Application	1.6	Appendix F, s7	The department notes that as per Appendix 7, section 6.2, compliance with the 24-hour average ground level concentration of PM10 air quality objective (AQO) can only be maintained with 'proactive mitigation measures' and periods of ceased operations. Appendix F, section 7 provides brief details the proposed mitigation measures to be employed to reduce impacts to the environmental values of air. The department recognises the following are proposed: -an air quality management plan; -water application on all major haul routes within the VS domain; and -progressive rehabilitation of areas that have been mined. However, this does not sufficiently describe the 'proactive mitigation measures' and periods of ceased operations.	(a) Provide additional details of all proposed mitigation measures to be implemented to comply with the AQOs. This should include measures identified as proactive for the purposes of compliance with the 24-hour average concentration of PM10; and (b) Provide additional details of the circumstances under which operations are to cease to maintain AQOs, and the nature and extent to which operations will cease (i.e. complete shutdown, partial, CHPP, etc.)	Air quality	(a) Sensitive receptors located directly adjacent to the VS operations are most at risk of being impacted by air quality. The sensitivity of these receptors is anticipated to be reduced through an agreement with the landholder before the project proceeds. They will need to be managed as they are located within or in very close proximity to the mine footprint. Dust management and mitigation measures will still be implemented at VS so that the operation complies with air quality objectives at remaining sensitive receptors. (b) Further analysis into shutdown protocols are now described in Table 14, Table 15 and Section 6.2 in the Air Quality Assessment ( <b>Appendix A</b> ). However, given the above statement, shutdowns will likely not be a requirement.
Site-Specific EA Application	1.7	Appendix G, s8.1 and 8.2	Appendix G, section 8.1 and 8.2 suggests that several mitigation and management measures may be employed to achieve indoor acoustic quality objectives (i.e. noise quality objectives [NQOs]). However, it is unclear which, if any, of these measures are proposed to be implemented to prevent or minimise impacts the acoustic environment.	(a) Provide additional details of the full extent of proposed mitigation measures to be implemented to comply with the NQOs – with specific regard to indoor noise limits; and (b) Provide additional details of the circumstances under which operations are to cease to maintain NQOs, and the nature and extent to which operations will cease (i.e. complete shutdown, partial, CHPP, etc.)	Noise	(a) All the sensitive receptors at most risk to noise are dwellings directly adjacent to the mining operations. These sensitive receptors will be acquired by Vitrinite through an agreement with the landholder before the project proceeds. These receptors will need to be acquired as they are located within or in very close proximity to the mine footprint. Noise management and mitigation measures will still be implemented at VS so that the operation complies with noise quality objectives. (b) Analysis into shutdowns due to exceedances have been documented in Table 8.1 and discussed further in Section 8.3 ( <b>Appendix B</b> ).
Site-Specific EA Application	1.8	Appendix A, 5.3	Appendix A, section 5.3 contends that 'surface water' (i.e. non-mine affected water [MAW]) should include surface water run-off that has come into contact with areas disturbed by mining operations including out-of-pit waste rock emplacements. Additionally, it is argued that whilst this surface water may have a high sediment load, it will remain compliant with water quality objectives (WQOs). The department notes that the applicant proposes to manage this surface water via sediment removal at sediment dams prior to any release. However, additional evidence is required to support the determination that any surface water released will be compliant with the WQOs for the receiving waters.	(a) Provide additional details, including maps of the 'areas disturbed by mining operations' proposed to produce 'surface water' as opposed to MAW. (b) Provide additional evidence to support the proposed management of 'surface water'. Evidence in the form of water quality monitoring data from the VCP and/or an appropriate analogous site/s is permissible. (c) Provide additional details of the management measures to be employed to prevent the contamination of surface water with coal, carbonaceous material and other contaminants. Where surface water becomes contaminated,	Surface Water	Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).

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			<p>The applicant must demonstrate that this water can be managed appropriately and will not cause environmental harm to the receiving environment if released.</p> <p>Further, it is unclear how areas disturbed by mining operations could be effectively managed to prevent the contamination of surface water with coal, carbonaceous material or other contaminants. Coal and carbonaceous material would likely be present on haul road surfaces, laydowns and the exposed surfaces of out-of-pit waste rock dump.</p>	provide additional details as to how this is proposed to be managed and monitored.		
Site-Specific EA Application	1.9	Appendix A, s9.2	<p>Section 2.1.2.2 Release source – waste water from the relevant activity of the department’s guideline – ‘Reef discharge standards for industrial activities’ (Version 1.02) [ESR/2021/5627] specifies when section 41AA of the Environmental Protection Regulation 2019 (EP Reg) applies.</p> <p>Assuming that surface water is justifiably determined to contain sediment only, and no coal, carbonaceous material or other contaminants, section 41AA does not apply. The department notes that nitrogen may also be relevant where blasting is carried out.</p> <p>However, regardless of this determination, appropriate erosion and sediment control measures will be conditioned through the pending environmental authority to prevent as much sediment as is practical from entering the Great Barrier Reef catchment waters.</p> <p>The applicant is advised to propose an updated Erosion and Sediment Control Plan (ESCP) that is robust and effective in minimising contributions of total suspended sediment (TSS) and dissolved inorganic nitrogen (DIN) to support the aim of reducing end-of-basin fine-sediment and DIN loads.</p>	<p>(a) Confirm potential sources of DIN for the project.</p> <p>(b) Update the contents and requirements of the proposed ESCP.</p> <p>As a minimum, the ESCP should include:</p> <ul style="list-style-type: none"> <li>(i) an assessment of the size and characteristics of all catchment areas; and</li> <li>(ii) an assessment of relevant properties of soils and waste materials; and</li> <li>(iii) identification of receiving waters environmental values, water quality objectives and management intent; and</li> <li>(iv) specification of minimum design criteria for erosion and sediment control structures to achieve the management intent of receiving waters; and</li> <li>(v) locations and descriptions of all erosion and sediment control measures; and</li> <li>(vi) an audit schedule to ensure erosion and sediment control measures are maintained.</li> </ul>	Surface Water and general	Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).
Site-Specific EA Application	1.100	Appendix A, s7.3.10	<p>Appendix A, section 7.3.10 includes an assessment of the effects of releases from sediment dams on the water quality of receiving waters.</p> <p>However, these scenarios only account for the electrical conductivity and release flow rate from sediment dams.</p> <p>It is unclear why TSS or other relevant WQOs have not been included in the modelled scenarios.</p>	<p>(a) Justify why the ‘worst-case’ scenario modelling for impacts to receiving waters only includes EC and flow rate; and</p> <p>(b) Pending the response to (a), provide additional modelling that accounts for key contaminants including TSS and heavy metals – selenium, arsenic and molybdenum.</p>	Surface Water and general	Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).
Site-Specific EA Application	1.11	Section 5.8.4 and Appendix H	<p>The geochemical assessment recommends several mitigation and management measures to minimise the risk of environmental harm to the receiving environment from mine resource, materials and waste.</p> <p>It is unclear if the recommendations are proposed to be implemented, and how these</p>	<p>(a) Confirm the measures to be implemented as recommended by the geochemical assessment; and</p> <p>(b) Provide additional details of how the measures will be employed. This should include details of monitoring and management practices to be employed, timeframes, methodology and parameters for confirmatory testing of material; and</p>	Geochemical	<p>(a) The Geochemical assessment (Appendix H of the PRCP) has been updated to ensure that all management measures will be adopted and complied with by Vitritine.</p> <p>(b) RGS has updated the Geochemical Assessment of Waste Rock, Coal Reject and Coal Technical Report to provide additional information on how the recommended mitigation and management measures will be implemented and how coal rejects (co-disposed coarse rejects and tailings) will be placed in the in-pit and ex-pit waste rock emplacement areas. Please refer to section 5.4 as well as table E1 of the Geochemical assessment (located in Appendix H of the PRCP).</p>

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			recommendations would be implemented in practice.	how coal reject and tailings material will be placed within waste rock dumps, including minimum capping depth and general capping design.		
Site-Specific EA Application	1.12	Section 2.6.1	<p>Section 2.6.1 indicates that tailings and rejects will be deposited in ex-pit waste rock dumps. However, the Supporting Information does not provide sufficient detail as to this proposal. Tailings storage ex-pit poses a far greater geotechnical and environmental risk than in-pit disposal. The application does not provide information on the management of tailings which is commensurate to this risk.</p> <p>The application does not provide sufficient detail as to the required characteristics for 'dry tailings' to be stored ex-pit and the management of tailings where characteristics do not meet the required minimum requirements (e.g. excessive moisture within tailings, etc.).</p>	<p>(a) Provide additional details of the structure and geotechnical design, including capping and closure design for the ex-pit tailings storage facility;</p> <p>(b) Provide a risk assessment of the ex-pit disposal of tailings, including risks presented to surface water and groundwater; and</p> <p>(c) Provide additional details as to how tailings disposal will be managed to minimise risk of environmental harm to surface water and groundwater.</p>	Geochemical	<p>(a) Please note there is no ex-pit TSF. There are no traditional wet tailings storage facilities. Small quantities of dry tailings cake is proposed to be stored in the ex-pit dump; however, the majority of dry tailings cake will be stored in pit.</p> <p>Please refer to the geotechnical assessment in Appendix G – of the PRCP for further details on ex-pit design.</p> <p>Landform evolution modelling (LEM) has been undertaken to:</p> <ul style="list-style-type: none"> <li>determine the long-term stability of the rehabilitated landforms and the level of potential environmental risk of emplacing reject materials in the waste rock dumps (WRD); and</li> <li>analyse the future stability of the proposed landform cover designs and justify the reasonability of the targeted landform design objectives as outlined in the PRCP.</li> </ul> <p>The results of the LEM assessment (Appendix F of the PRCP) were used to inform landform rehabilitation design, demonstrate how the results support the current targeted landform rehabilitation objectives and demonstrate the requirements for long term stability of the landforms during closure.</p> <p>For further information on the post closure design, please refer to Section 6.2 of the PRCP.</p> <p>As described in Geochemical Assessment, 1.2.2 and 2.2.2 (Appendix H of PRCP) - Waste rock removal and placement " assessment of waste rock geochemistry has concluded that the waste rock does not propose a significant risk of generating acid, saline or metalliferous drainage. Therefore, no selective handling and treatment measures are proposed. Furthermore, low permeability capping over the dump surface is considered not to be required. "Geochemical analysis has concluded that the waste rock material poses a very low environmental risk to either ex-pit or in-pit waste rock dumps and therefore, a risk assessment together with further mitigation measures have not been included in the assessment. This is further discussed in Section 5.8.4 of the EA Application.</p> <p>Given that Section 2.6.1 or 2-Project Description is to discuss the project rather than impacts, the section has been left as is. Environmental Impacts are (as mentioned) dealt with in Section 5.8.4 and note that waste rock is very low risk.</p> <p>(b) RGS has undertaken a risk assessment of the ex-pit disposal of coal rejects (coarse rejects and tailings), including risks presented to surface water and groundwater, which is located in Table E-1 of the Geochemical Assessment (Appendix H of the PRCP).</p> <p>(c) All risk mitigation and management measures for storing coal rejects (coarse rejects and tailings) in ex-pit waste dumps to minimise the risk of environmental harm to surface water and groundwater is provided in the updated geochemical report (Appendix H of the PRCP) in Section 5.4 and Table E-1. This practice of placing rejects into the ex-pit WRD would only occur early in mine life where there is insufficient capacity to preferentially store these materials within the in-pit emplacement. These management measures have been reviewed and confirmed by Vitritine</p>
Site-Specific EA Application	1.13	Appendix A, s5	<p>The department notes that MAW will be generated in areas disturbed by highwall mining. With reference to Appendix A, Figures 1.9 and 1.10, it is unclear how MAW will be effectively managed so as to prevent releases to the receiving environment and maintain separation of MAW from other waters such as surface run-off. Specifically, Figures 1.9 and 1.10 do not appear to include mine water infrastructure needed to</p>	<p>(a) Provide additional details as to how surface water is to be managed within the extent of areas disturbed for highwall mining, with specific regard to MAW. Clarification should include conceptual drainage plans for all years of active highwall mining before rehabilitation is completed.</p>	Surface Water	<p>Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).</p>



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			manage MAW such as mine water dams – or in place of dams – drains, sumps and/or piping for the conveyance of MAW to a suitable storage.			
Site-Specific EA Application	1.14	Appendix A, s5.5.1	Appendix A, section 5.5.1 discusses the sizing and placement of sediment dams for surface water management. However, this section also explains that runoff from haul roads and access roads is to be captured by sediment basins, before being either released to the receiving environment or returned to the mine water system. Additional justification is required to support the treatment of surface water collected from haul roads as surface water and not MAW.	(a) Provide additional details of water collected from haul roads, including whether this water will be MAW and if said water will be contaminated by coal, carbonaceous material, hydrocarbons, or other contaminants which are predicted to exceed the identified water quality objectives for release (WQOs). (b) Should the response to (a) confirm that water is determined to be MAW, provide updated and/or additional information pertaining to: (i) the proposed surface water management strategy and infrastructure; (ii) updated conceptual drainage plans; and (iii) any further updates to the supporting information necessary to ensure consistency and accuracy (i.e. water balance modelling or water management system assessment).	Surface Water	Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).
Site-Specific EA Application	1.15	Supporting Information	The application refers to and relies upon ‘field-verified’ regional ecosystem (RE) mapping. However, it is not clear if this field verified mapping has been validated and accepted by the Queensland Herbarium.	(a) Provide additional details of the field verified RE mapping; (b) Confirm if any previous mapping submitted by the applicant to the Queensland Herbarium covers the full the extent of the VSP project and has been accepted by the Herbarium; and (c) Provide evidence of acceptance by the Queensland Herbarium and the accepted spatial files.	Ecology	The field-verified mapping for the entire survey area has already been submitted to the QLD Herbarium and was incorporated into version 12 of the certified regional ecosystem mapping. However, there were some minor components of the field-verified mapping that were not incorporated into the regional ecosystem map: 1) The <i>Corymbia aureola</i> and <i>Eucalyptus melanophloia</i> dominated unit that was widespread on rocky sandstone escarpments does not conform to any described regional ecosystem. The herbarium decided to retain it as a variant of 11.10.1, despite it being floristically very different from typical 11.10.1 (dominated by <i>Corymbia citriodora</i> , <i>Corymbia trachyphloia</i> and <i>Eucalyptus crebra</i> ). As both variants were located within the vicinity of VS and they differ greatly in habitat value for fauna (true 11.10.1 contains hollows for Greater Gliders and food tree for Koalas, whereas the <i>C. aureola</i> variant does not), the field-verified mapping presented in the report shows these as separate units. 2) <i>Eucalyptus crebra</i> growing on sandstone foothills was mapped as 11.10.7 in field-verified mapping, but the herbarium preferred to assign either 11.10.1 or 11.5.9 to such units. Again, because these units lacked <i>E. citriodora</i> (a food and den tree for Greater Gliders, and a dominant tree in true 11.10.1), we preferred to retain our original distinction between true 11.10.1 and those lacking <i>E. citriodora</i> (of which 11.10.7 is the closest match). It is important to note that all impact assessments on regulated vegetation presented in the report are based on the updated regulated vegetation map (which already incorporates the vast majority of the field-verified mapping), not the field-verified map. The field-verified map was only used for mapping habitats of threatened fauna and for quantifying impacts to these species. The reason the field-verified map was used for this purpose rather than the certified mapping was primarily because it provided greater distinction between the sub-types of RE 11.10.1 across the study area, which varied in their habitat values.
Site-Specific EA Application	1.16	Appendix B, s7.2	Appendix B, section 7.2 states that “No mitigation measures are currently proposed or required as part of the Project” [with respect to groundwater]. However, it is noted that a selection of management and mitigation measures are proposed in the preceding section 7.1.3. It is unclear if the project does or does not propose	(a) Provide additional details of the management and mitigation measures to be implemented to prevent or minimise impacts to groundwater.	General	As mentioned in Section 7.2 (Appendix B of the PRCP), "Should monitoring and subsequent assessment determine potential impacts, mitigation strategies would be considered commensurate with the level and risk of environmental impact". Therefore, Section 7.1.3 should be regarded as mitigation recommendations that can be implemented should monitoring and assessment determine there are impacts.

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			to implement management and mitigation measures, or if only a selection of management measures are proposed.			
Site-Specific EA Application	1.17	Appendix B, s2.1.3 and s6.2.1	Appendix B, section 2.1.3 identifies the information requirements for applications that involve the exercise of underground water rights. Additionally, section 5.7.1 identifies third-party users of groundwater in the surrounding region. Additionally, section 6.2.1 predicts the proposed pits may have groundwater inflows up to 43 m3 /day. As the proposed resource activity involves the exercise of underground water rights the applicant may have additional obligations under Chapter 3 of the Water Act 2000. An underground water impact report (UWIR) may be required.	(a) Contact the department's Energy and Extractive unit for assistance in determining if a UWIR is required. Email: UndergroundWater@des.qld.gov.au (b) Pending the outcome of (a), advise the business centre of said outcome.	Groundwater	After consultation with the Energy and Extractive unit department, we have determined that a UWIR will be required to be completed prior to Vitrinite exercising their underground water rights. This is currently underway and will be completed prior to commencement of the activity, understanding that the department may take up to 60 business days to process the UWIR after submission.
Site-Specific EA Application	1.18	Section 5.3.1 and spatial files	Section 5.1.3 describes the vegetation communities within the bounds of the proposed disturbance footprint. The disturbance footprint is stated to contain 1,996.6 ha of remnant vegetation, 87 ha of regrowth and a remaining 642.4 ha of cleared pasture. However, this is inconsistent with the area of the disturbance footprint as stated within the main text of the Supporting Information and within the spatial files at only 1,757 ha.	(a) Confirm the quantities of remnant, regrowth and cleared land within the proposed disturbance footprint.	Ecology	The values presented in the Executive Summary are in error (they reflect a previous version of the project) and have now been amended in the EA and Terrestrial Ecology report. The values presented in Section 5.1.1, Section 5.3.1 and the spatial files (i.e., total disturbance footprint of 1,757 ha, of which 1,567.2 ha is to be cleared and the remainder is above highwall panels) are correct. Table 5-1 breaks down this disturbance by vegetation type.
Site-Specific EA Application	1.19	Table 5-4	The application appears to be inconsistent with respect to the identification of, and impacts to, wetlands. Appendix A, section 3, states there are no matters of state environmental significance (MSES) wetlands, wetland values or wetland protection areas identified in or adjacent to the project area. Appendix C, section 4.4.4 states that there are no wetlands or watercourses of high ecological significance are located within the survey area. However, Appendix C, Figure 4-2 identifies a 'natural wetland' within the extent of the project's mining lease area. The wetland does not appear to be identified or discussed elsewhere in the supporting information.	(a) Provide additional details as to the nature of this wetland and the extent of predicted impacts.	Ecology	Please refer to Figure 2-2 which displays the project disturbance footprint, noting that the singular wetland identified on site does not fall within this and is therefore not considered to be impacted.
Site-Specific EA Application	1.200	Appendix B, 5.7.3;	Appendix B, section 5.7.3 states that it is highly unlikely for aquatic groundwater dependent ecosystems (GDEs) to exist within one (1) kilometre of the proposed pits. Further, Appendix B, section 5.8.3 Aquatic ecosystems indicates that groundwater was too deep or saline to support freshwater aquatic ecosystems. However, Appendix D, section 5.6 states that the main stem of Hughes Creek and small areas in the east of the project area is mapped as a potential	(a) Provide additional details with respect to the nature of the potential GDEs associated with Hughes Creek; and (b) Provide additional details as to the extent of ground-truthing undertaken to verify the presence or absence of mapped GDEs.	Aquatic ecology and Groundwater	Please refer to section 5.3.2 of Terrestrial Ecology Assessment (Appendix D of PRCP), which states that "The groundwater quality is unlikely to be significantly altered by Vulcan South and, in any case, all local potentially groundwater-dependent ecosystems occur upgradient (in terms of the groundwater flow, which mimics the surface water drainage pattern from west to east) of potential effects. In summary, no impacts to GDEs are predicted to result from Vulcan South, beyond that which will occur due to vegetation clearing". Please also refer to section 4.1.3.5 (Appendix D of PRCP) which states "there are likely to be some GDEs contained within the project area". Therefore, GDE's are likely to occur as outlined in Appendix B and Appendix D; however, given their location being upgradient of works, no impacts are anticipated and consequently no mitigation measures proposed.

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			aquatic GDE. Further, Appendix B, section 5.7.3 also states that there is an area of mapped terrestrial GDE associated with Hughes Creek.			
Site-Specific EA Application	1.21	Section 5.13	Section 5.13 indicates that regulated waste will be generated on-site. However, insufficient detail is given regarding the regulated wastes expected to be generated on-site, such as tyres, industrial wastes and tailings/rejects. Further, the department considers the disposal of tailings and rejects likely meets the definition regulated waste as defined by the Environmental Protection Regulation 2019 (EP Reg). Resultingly, the proposed activity must include authorisation to carryout environmentally relevant activity (ERA) 60: Waste disposal.	(a) Provide additional details as to the types of wastes expected to be generated on-site. (b) Provide additional details as to the constituent materials and chemical characteristics of waste to be disposed of within waste rock dumps. This should include any chemical inputs to coal processing and tailings generation.	General	<p>a) The wastes expected to be generated as part of the development of VS can be broken down into coal mining wastes, general wastes and regulates wastes.</p> <p>The primary coal mining specific wastes generated by VS will include:</p> <ul style="list-style-type: none"> <li>-waste rock</li> <li>-coarse and fine reject material.</li> </ul> <p>Other sources of waste generation include:</p> <ul style="list-style-type: none"> <li>-used machinery parts and other scrap metal, such as wire cables;</li> <li>-expired diesel and lubricants;</li> <li>-waste oil and filters;</li> <li>-hydrocarbon drums;</li> <li>-sewage;</li> <li>-gaseous emissions;</li> <li>-general waste;</li> <li>-wooden pallets.</li> </ul> <p>b) Processing of coal in the CHPP will involve crushing, sizing, density separation and froth flotation. To undertake this process, Anionic flocculant (dry powder), Cationic flocculant (liquid) and Acrylate polymer materials will be used.</p> <p>Regulated waste is defined under the <i>Environmental Protection Regulation 2019</i> as a waste that—</p> <p>(a) is commercial waste or industrial waste; and</p> <p>(b) is of a type, or contains a constituent of a type, mentioned in schedule 9, part 1, column 1.</p> <p>Flocculants and polymers are not listed in schedule 9, so it is argued tailings and coarse reject materials generated as part of the coal processing at VS do not meet the definition of a regulated waste. As such, environmentally relevant activity (ERA) 60: Waste disposal, is not relevant to VS.</p>
Site-Specific EA Application	1.22	Appendix B, s.5.8.4; s.7.1.2	Appendix B, section 5.8.4 provides preliminary monitoring data for groundwater. It is unclear if interim guidelines have been developed and proposed as part of the application. Further, it is unclear if analytes are appropriate to detect potential contamination to groundwater such as total petroleum hydrocarbons.	(a) Provide additional details as to the proposed interim guidelines for WQO for groundwater; (b) Provide groundwater monitoring data for all analytes and physical parameters; and (c) Provide additional details as to how potential contaminants to groundwater from mining activities will be monitored.	Groundwater	<p>(a) The Groundwater Quality and Level Trigger Assessment has been provided (<b>Appendix C</b>).</p> <p>(b) Groundwater monitoring data has also been attached to this response (<b>Appendix D</b>)</p> <p>(c) VS does not currently require the development of an extensive groundwater water quality monitoring plan at this stage of development.</p> <p>However, a broad overview of potential groundwater monitoring methodology for VS, as derived from the adjacent VCM, which is similar in terms of analytes and the monitoring plan methodology, is provided below.</p> <p>Water quality monitoring</p> <p><i>Purging</i></p> <p>Groundwater samples from monitoring bores are required to be representative and repeatable. To achieve this, the groundwater that is collected for analysis needs to be sourced from the target aquifer and should not be a sample from the column of water within the bore that may be stagnant.</p> <p>The bores should be purged to ensure that three bore volumes of groundwater are removed from the bore prior to collection of the laboratory sample. The field parameters of pH and EC should be monitored during purging to ensure stabilisation of the parameters has occurred. Appropriate purging methods for these bores include hand bailing, 12 volt submersible pumps or inertia pumps.</p> <p>Where three bore volumes of groundwater are unable to be removed from the monitoring bore (in situations</p>

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						<p>where there is low permeability or a limited water column in the bore) it may be appropriate to either dewater the bore during purging and return the next day to allow for recovery, or install a passive sampling technique such as a hydrasleeve. Hydrasleeves are installed in a number of monitoring bores in the VS Project monitoring network.</p> <p><i>Field parameters and sample collection</i></p> <p>As discussed above, appropriate purging methods for the monitoring bores include hand bailing, 12 volt submersible pumps or inertia pumps. The purging technique will also be used to provide the groundwater sample for field measurements and laboratory analyses.</p> <p>The field parameters are generally monitored and recorded for two reasons:</p> <ul style="list-style-type: none"><li>▪ The monitoring of field parameters during the purging process assists in determining whether or not a stable or representative sample is being purged from the monitoring bore.</li><li>▪ There are several parameters which are affected by atmospheric conditions immediately after sampling. Notably pH should be assessed in the field as the laboratory holding time for pH is six hours, and this is generally breached by the time the sample is received by the laboratory.</li></ul> <p>The field water quality meter should be calibrated daily and in accordance with manufacturer’s instructions. The meter should be calibrated using standard calibration solutions.</p> <p>All laboratory samples should be collected in laboratory supplied sample containers appropriate for the required laboratory parameters. The sample bottles should be clearly labelled with the sample ID and date and time of sampling. The laboratory samples should be accompanied by a Chain of Custody (CoC) form to define the number of, and identity of the samples, the required parameters to be analysed and the persons or companies in control of the samples.</p> <p><i>Field QA/QC</i></p> <p>Field quality control and quality assurance (QA/QC) processes should be in consideration in respect of the following guidelines:</p> <ul style="list-style-type: none"><li>▪ Monitoring and Sampling Manual: Environmental Protection (Water) Policy 2009. Brisbane, Department of Environment and Science (DES, 2018);</li><li>▪ AS/NZ 5667 11 1998 - Water quality sampling. Part 11, guidance on sampling of groundwater (Standards Association of Australia &amp; Standards New Zealand, 1998); and</li><li>▪ Australian Governments Groundwater Sampling and Analysis – A Field Guide (2009:27).</li></ul> <p>Currently a duplicate field sample is collected per monitoring round across the Vulcan Complex Project monitoring network to assess repeatability in the laboratory testing methods.</p> <p><i>Storage/transport of samples</i></p> <p>As discussed above, all laboratory samples should be collected in laboratory supplied sample containers appropriate for the required laboratory parameters. The samples should immediately be stored on ice, or refrigerated, and transported as soon as is reasonably practical to the laboratory for analysis. Samples should remain on ice or refrigerated during storage and transportation.</p> <p>As discussed above, the laboratory samples should be transported under conditions documented in a chain of custody (CoC) form, to define the number of, and identity of the samples, the required parameters to be analysed and the persons or companies in control of the samples. It is important to note the laboratory holding times vary for individual analytes. The holding times represent the maximum time that a sample can be stored for representative analysis of a parameter. Transportation of samples should consider the holding times and the time taken for delivery of the samples to the laboratory from site.</p> <p>Most laboratory sample bottles are plastic, however some parameters require glass bottles. Glass bottles should be packed (e.g. bubble wrap), stored and transported to minimise breakage.</p> <p>Labels showing an adequate amount of information are necessary to prevent misidentification of samples. Paper labels or tags should be avoided, as they are susceptible to destruction when wet. Labels should include the following information, as a minimum:</p> <ul style="list-style-type: none"><li>▪ bore number;</li></ul>



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						<ul style="list-style-type: none"> <li>project name and number;</li> <li>signature or initials of sampler;</li> <li>date and time of sample collection; and</li> <li>type of preservation used.</li> </ul> <p>Labels should be affixed to the sample container prior to or at the time of sampling. The labels should be filled out at the time of sample collection using a marker pen with indelible ink. The exact sample location and type of sample must be recorded on the CoC.</p> <p><i>Laboratory analyses</i> The laboratory undertaking the analytical testing of groundwaters should be accredited by the National Association of Testing Authorities (NATA) for the requested analyses. The laboratory will typically have internal QA/QC protocols which will be reported as part of the analyses.</p>
Site-Specific EA Application	1.23	Section 5.3.5; Section 5.3.6 Appendix C, s5.2	<p>Avoidance and Mitigation of Impacts to Prescribed Environmental Matters.</p> <p>An offset proposal cannot be considered for the application at this time as the department is not satisfied that all reasonable avoidance and mitigation measures have been or will be undertaken to address impacts on prescribed environmental matters (PEMs).</p> <p>The application does not apply the offset policy/framework in such a way that first considers how impacts to PEMs have been demonstrably avoided, then mitigated; before considering the use of offsets. Offsets are intended to only compensate for unavoidable impacts to PEMs. As per section 1.3 of the statutory instrument – ‘Queensland Environmental Offsets Policy’ (Version 1.12) [EPP/2015/1658], all offsets must meet seven (7) offset principles. Principle 2 requires that “impacts must first be avoided, then mitigated, before considering the use of offsets for any remaining impact”.</p> <p>Several PEMs are identified to be part of a contemplated offset proposal. As per section 5.3.5 – Matters of National Environmental Significance (MNES) these include—</p> <ul style="list-style-type: none"> <li>· Threatened ecological communities; <ul style="list-style-type: none"> <li>o 120.3 ha of Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) [endangered]; and</li> </ul> </li> <li>· Threatened species; <ul style="list-style-type: none"> <li>o 1,023.6 ha of Koala (<i>Phascolarctos cinereus</i>) [endangered] habitat, composed of— <ul style="list-style-type: none"> <li>- 21.3 ha of high-quality habitat;</li> <li>- 559.1 ha of moderate-quality habitat; and</li> <li>- 443.2 ha of low-quality habitat; and</li> </ul> </li> <li>o 1,364.1 ha of Squatter Pigeon (<i>Geophaps scripta</i>) [vulnerable]</li> </ul> </li> </ul>	<p>(a) Justify how impacts to each PEM will be or have been avoided in the first instance.</p> <p>(b) Provide additional details as to how impacts to each PEM have been avoided and can be further avoided or minimised to reduce impacts to each matter.</p> <p>(c) Provide further details of how each matter will be mitigated – and why avoidance is not reasonable.</p> <p>(d) Confirm the scale, intensity and duration of impacts to the identified PEMs after the implementation of (a) and (b) – including PEMs of Ornamental Snake, Northern Quoll, Short-Beaked Echidna, Glossy Black-cockatoo and Common Death Adder.</p>	Ecology	<p>As is the case with all resource projects, the location of the Project is determined by the location of the resource and the economics of its extraction. However, VS has strategically been designed to avoid impacts to PEM's where practicable. In which case, the current design is the best-case scenario.</p> <p>Mitigation measures described in the Terrestrial Ecology Assessment (Appendix D of the PRCP) will be implemented as part of the projects PEM's environmental obligations.</p> <p>In accordance with best practice techniques, VS has been strategically positioned to avoid disturbance to as many matters of state and/or national environmental significance as practicable. No protected conservation estates or secured offset areas will be disturbed due to the project.</p> <p>The scale, intensity and duration of impacts to identified PEM's are described in section 5.3 (Appendix D of the PRCP).</p>

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			<p>habitat, composed of—</p> <ul style="list-style-type: none"> <li>- 671.2 ha of foraging habitat (524.3 ha of which is also breeding habitat); and</li> <li>- 692.9 ha of dispersal habitat; and</li> <li>o 71.1 ha of Central Greater Glider (<i>Petauroides armillatus</i>) [vulnerable] habitat;</li> <li>o Ornamental Snake habitat; and</li> <li>o Northern Quoll habitat.</li> </ul> <p>As per section 5.3.6 – Matters of State Environmental Significance (MSES) impacted PEMs also include—</p> <ul style="list-style-type: none"> <li>· Regulated vegetation;</li> <li>o 25.6 ha of regional ecosystem (RE) 11.3.2 [of concern]; and</li> <li>o 58.3 ha of REs 11.3.25, 11.5.3, 11.5.9b, 11.9.2, 11.10.1 and 11.10.3 [located within a defined distance from the defining banks of a relevant watercourse].</li> <li>· Protected wildlife habitat: <ul style="list-style-type: none"> <li>o Short-Beaked Echidna (<i>Tachyglossus aculeatus</i>) [special least concern];</li> <li>o Glossy Black-Cockatoo (<i>Calyptorhynchus lathami</i>) [vulnerable]; and</li> <li>o Common Death Adder (<i>Acanthophis antarcticus</i>) [vulnerable].</li> </ul> </li> </ul> <p>Additional information is required before the department may be satisfied that an offset proposal can be pursued. Particularly, justification is required that clearly demonstrates how the ‘avoid, mitigate, offset’ approach has been provided for each PEM. The applicant must:</p> <ul style="list-style-type: none"> <li>· Demonstrate how impacts to each PEM has been avoided in the first instance. This may include details such as site planning, site selection, etc.;</li> <li>· Where avoidance cannot be reasonably achieved, demonstrate how impacts to each PEM is to be carefully managed and minimised (mitigation measures); and</li> <li>· Where avoidance and mitigation measures cannot be reasonably achieved or implemented, demonstrate how the impacts to each PEM are unavoidable and/or incapable of being completely mitigated.</li> </ul> <p>The department notes that Appendix C, section 5.2 and Table 5-3 contemplate a variety of mitigation measures. However, it is unclear if these measures are proposed to be implemented and the corresponding PEMs to which each measure is aimed to protect.</p>			
Site-Specific EA Application	1.24	Section 5.3.5; · Section 5.3.6; · Appendix C, s5.2	Determining Significant Residual Impact As per the guideline – ‘Significant Residual Impact Guideline’ (2014) [the SRI	(a) Complete an SRI assessment for remaining impacts to PEMs and provide a	Ecology	Section 5.3 of the Terrestrial Ecological Assessment (Appendix D of the PRCP) outlines the residual impacts on protected matters. Relevant sub-sections are listed below: -5.3.1 (Regulated vegetation)

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			<p>guideline], the department may only impose offsets where it is satisfied that the prescribed activity will or is likely to have a 'significant residual impact' (SRI) on a PEM.</p> <p>SRIs are only those impacts to PEMs that—</p> <p>(a) remain despite the implementation of avoidance and mitigation measures;</p> <p>and</p> <p>(b) are 'significant' as guided by an SRI assessment under the SRI guideline.</p> <p>The SRI guideline provides 'significant impact criteria' for identifying a 'significant' impact to PEMs. An SRI assessment must be conducted for each PEM which will be impacted.</p> <p>If the significant impact criteria are exceeded by an impact, then offsets may be considered – and if so, must be considered for the entirety of the impact – not just the component of impact which exceeded the criteria.</p> <p>An SRI assessment must be completed for the following PEMs at a minimum:</p> <ul style="list-style-type: none"> <li>· Regulated vegetation;</li> <li>· Connectivity areas;</li> <li>· Wetlands and watercourses;</li> <li>· Protected wildlife habitat; and</li> <li>· Any additional PEMs identified as being impacted.</li> </ul> <p>Note:</p> <p>When assessing Connectivity areas, the output of the Landscape Fragmentation Tool should be provided to the department as part of the SRI assessment.</p> <p>Also note, if at the time of the application to DES a decision by the Commonwealth has not been made regarding impacts to overlapping PEMs, then DES is required to assess and if a significant residual impact has been identified then impose offset conditions. The applicant can seek to remove the offset requirement from their state approval once a decision has been made at a federal level.</p>	report of said SRI assessment/s to the department.		<p>-5.3.1 (Wetlands and watercourses)</p> <p>-5.3.3 (Wildlife habitat protected under the EPBC Act)</p> <p>-4.4 (Wildlife habitat protected under the NC Act).</p> <p>A Connectivity Assessment (<b>Appendix E</b>) has been provided as part of the response.</p>
Site-Specific EA Application	1.25	<p>Section 5.3.5;</p> <p>· Section 5.3.6;</p> <p>· Appendix C, s5.2</p>	<p>Determining Offsets as a Suitable Outcome</p> <p>Finally, should a significant residual impact remain for any of the above PEMs, the applicant must successfully demonstrate that an offset is a 'suitable outcome'. As per section 3.6 of the 'General guide for the Queensland Environmental Offsets Framework' (V1.03) [EPP/2021/5541] the department must have a high level of confidence that a suitable offset can be selected, designed and managed to achieve a conservation outcome and maintain the viability of the PEMs to be offset.</p>	<p>(a) Provide additional details of the availability and viability of land-based offsets for each impacted matter in order to deliver a conservation outcome.</p> <p>Please note that an available offset area must demonstrate the known sightings of the species and that the landholder is willing and able to implement conservation management to improve the conservation outcome for the species population within the proposed offset area.</p> <p>(b) Pending the response to (a), provide an</p>	Ecology	See offsets strategy (Appendix J of the PRCP)

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				assessment of the area in hectares (ha) of each PEM which is available to be used as an offset in the bioregion and subregion. Areas available for offsets include those which contain the PEM in question, are on freehold or leasehold land, are not already protected, are not at risk from completing land uses (e.g. mining, quarrying or forestry) and are not otherwise inappropriate for use as an offset area. The assessment must include a spreadsheet and shapefiles of lot-on-plans identified as suitable for offsets and available to deliver a conservation outcome.		
Site-Specific EA Application	1.26	Appendix A, s.7.3.7.2; s.9.3.1;	<p>Appendix A contemplates the proposed release of ‘surface water’ via sediment dams. Section 3 of Appendix A identifies the WQO trigger levels for the receiving waters. Further, section 9.3.1 of Appendix A identifies the receiving water contaminant trigger levels. The trigger levels of Table 3.1 and Table 9.3 are compared below.</p> <p>Parameter Table 3.1 Table 9.3  pH 6.5 – 8.5: 6.5 – 8.0  EC [µS/cm] 720 (base flow),250 (high flow) : 1,500  TDS [mg/L] &lt;2,000: ?  TSS [mg/L] &lt;55: ?  Sulfate (SO42-) [mg/L] 25: 1,000  It is unclear in Table 9.3 how levels have been formulated to protect environmental values (EVs) and why interim trigger levels have been developed for parameters with the exception of TDS and TSS. Further, it is unclear how impacts to the receiving waters can be managed and minimised without proposed trigger limits for TDS and TSS.</p>	<p>(a) Provide additional details as to how the proposed levels were formulated.</p> <p>(b) Provide additional details as to how the proposed levels will protect EVs of the receiving waters.</p> <p>(c) Provide additional details as to the formulation of interim trigger levels for TDS and TSS – that will protect the EVs of the receiving waters.</p>	Surface Water Quality	Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).
Site-Specific EA Application	1.27	Appendix A, s9.5	<p>Section 9.5 of Appendix A states that sediment dams will be monitored for a suite of water quality parameters. (i.e. pH, EC, major anions [sulfate, chloride and alkalinity], major cations [sodium, calcium, magnesium and potassium], TDS and a broad suite of soluble metals/metalloids). However, it is unclear if parameters will include those which are necessary to determine ‘surface water’ reporting to sediment dams is not MAW and is otherwise suitable for release. Specifically, parameters to be confirmed include:</p> <ul style="list-style-type: none"> <li>· Dissolved inorganic nitrogen (DIN);</li> <li>· Turbidity (NTU);</li> <li>· TSS;</li> <li>· Total Petroleum Hydrocarbons (TPH); and</li> <li>· Any other proposed parameters required to verify ‘surface water’ is not MAW.</li> </ul>	<p>(a) Provide additional details as to the parameters to be monitored for at sediment dams.</p>	Surface Water Quality	Refer to Appendix A of the Supporting Information and Responses to Surface Water Requests (Appendix I of the PRCP).



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Proposed PRC Plan and Schedule	2.1	Proposed Progressive Rehabilitation and Closure Plan (PRC plan) · s.10.2.2 Proposed Progressive Rehabilitation and Closure Plan Schedule (PRCP schedule) · RA3 Worksheet Supporting Information. · Section 2.1 · Appendix G	<p>The PRC plan, Schedule and Supporting Information for the EA Application appear to be inconsistent with respect to the timing of rehabilitation of highwall mining benches and haul roads. It is unclear if these areas are to be rehabilitated as soon as they become available.</p> <p>Section 2.1 of the Supporting Information describes the highwall mining trial program as being completed within one (1) year of mining operations. Table 2-3 also indicates that mining in the highwall mining areas will cease after the first year of operations.</p> <p>Appendix G, Figures 2.2, 2.3 and 2.4 indicate that the highwall mining area will not be rehabilitated after the first year of mining. Whilst overburden dumps are indicated to be available for rehabilitation, the highwall mining benches and haul roads appear to be omitted.</p> <p>Further, section 10.2.2 of the PRC Plan and the Rehabilitation Area (RA) 3 worksheet of the PRCP schedule indicate that 44.21 ha of land will be rehabilitated in 2025. However, it cannot be discerned if this rehabilitation relates to the highwall mining benches and haul road.</p>	<p>(a) Provide additional details as to when highwall mining benches and haul roads become available for rehabilitation;</p> <p>(b) Pending the response to (a), update the PRC plan and schedule to account for the rehabilitation of the highwall mining benches and haul roads when they become available for rehabilitation; and</p> <p>(c) Update the Supporting Information to be consistent with the PRC plan and schedule.</p>	General	<p>a) Table 10-1 of the PRCP shows that all the Highwall mining area exclusive of the haul road to the Highwall mining area and the magazine (which both form part of the footprint) will be rehabilitated in 2025. Specifically, 20.7 ha of haul road and 10.4 ha of magazine will be rehabilitated in 2032.</p> <p>b) The PRCP and schedule have been updated to account for all rehabilitation required for the highwall mining area.</p> <p>c) No changes are proposed to the site-specific EA Application supporting information document. All updates in regard to the PRCP schedule have been made either in the PRCP or formal PRCP schedule excel spreadsheet.</p>
Proposed PRC Plan and Schedule	2.2	PRC plan PRCP schedule Spatial Files	<p>The PRC plan, schedule and spatial files are not consistent with the proposed post-mining land uses (PMLUs).</p> <p>It is noted that the PRCP schedule proposes the following four (4) PMLUs:</p> <ul style="list-style-type: none"> <li>· Low-intensity cattle grazing;</li> <li>· Low-intensity cattle grazing with habitat for Koalas and Squatter Pigeons;</li> <li>· Low-intensity grazing with habitat for Koalas and Squatter Pigeons;</li> <li>Native Ecosystems; and</li> <li>· Saraji Road.</li> </ul> <p>However, these PMLUs are not consistent across the PRC plan and spatial files. For example, section 4 of the PRC plan refers to three (3) PMLUs:</p> <ul style="list-style-type: none"> <li>· Low-intensity cattle grazing (also provides some habitat for threatened fauna);</li> <li>Public road; and</li> <li>· Railway used for coal transport.</li> </ul> <p>Further, this is inconsistent with Table 5-1 which includes only two (2) PMLUs:</p> <ul style="list-style-type: none"> <li>· Low-intensity cattle grazing; and</li> <li>· Road reserve</li> </ul> <p>Further, the spatial files refer to three PMLUs:</p> <ul style="list-style-type: none"> <li>· ‘GRAZ’ (grazing);</li> <li>· ‘NAT_ECO’ (native ecosystem); and</li> <li>· ‘PERM_INFRA’ (permanent infrastructure).</li> </ul> <p>The proposed PMLUs must be referred to consistently throughout all</p>	<p>(a) Update the PRC plan, schedule and spatial files to use consistent terminology and descriptions of the proposed PMLUs. This should include the instances raised and any other instances within the application documents where the proposed PMLUs are referred to or described. Terminology must be clear as to the type of PMLU including whether the PMLU will include threatened fauna habitat and/or native ecosystem.</p> <p>(b) Update the PRC plan, section 4, to clearly describe each of the proposed PMLUs including relevant indicators of success</p>	General	<p>The PMLU’s have been made consistent throughout the PRCP. The PMLU’s include the following:</p> <ul style="list-style-type: none"> <li>-Low intensity cattle grazing</li> <li>-Low intensity cattle grazing with habitat for threatened fauna</li> <li>-Native ecosystems</li> <li>-Saraji road</li> </ul>

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			documentation and files. This is to ensure clarity as to the exact nature of the PMLUs being proposed and which PMLUs are to be achieved at end-of-minelife.			
<b>Proposed PRC Plan and Schedule</b>	2.3	PRC plan · s.1.2.10 Pre-mining Land Use à Land Suitability Ratings PRCP schedule	The proposed PMLU of “Low-intensity grazing with habitat for Koalas and Squatter Pigeons; Native Ecosystems” (assumed to be equivalent to the PMLU of “NAT_ECO” as per the spatial files) is proposed for the northern portion of MLA700073. However, the department is not satisfied that this proposed PMLU is likely to be achievable. As per section 1.2.10 and Figure 1-38, the pre-mining land suitability for the proposed PMLU has a land suitability of only ‘5’ (i.e. unsuitable land with extreme limitations). With consideration for the pre-mining land use being generally unsuitable for grazing, it is unclear how the applicant proposes to rehabilitate land to a “stable condition” where the PMLU includes grazing.	(a) Provide additional details for the proposed PMLU for the area identified to be “NAT_ECO” as per the spatial files. (b) Provide additional details in terms of rehabilitation milestone criteria that will demonstrate the achievement of a stable condition with a PMLU of “Low-intensity grazing with habitat for Koalas and Squatter Pigeons; Native Ecosystems”.	General	The spatial files have now been updated to clearly represent each of the PMLU’s.
<b>Proposed PRC Plan and Schedule</b>	2.4	PRC plan · s.6.1.6 Surface Water · Appendix A PRCP schedule · Rehabilitation milestones	The department notes sediment dams are proposed to be removed from ‘completely rehabilitated’ catchments to allow run-off to shed to the receiving environment. The catchment of a sediment dam is proposed to be considered ‘rehabilitated’ when water monitoring data of runoff from rehabilitated areas is consistent with natural background conditions. However, the rehabilitation milestones (RMs), including the completion criteria, do not reflect the above proposal. The RMs should be updated to account for the proposed removal of sediment dams. Corresponding completion criteria must be developed in line with the SMART principles.	(a) Update the RMs and corresponding criteria to account for the proposed rehabilitation works; (b) Provide additional details as to how water monitoring data for runoff from rehabilitated areas will be collected; (c) Provide additional details as to how natural background conditions will be determined including the characteristics of water quality; and (d) Pending the responses to the above, update the PRC plan and schedule accordingly.	General	The Rehabilitation Milestones do already include reference to rehabilitation of sediment dams, under RA4, as part of: - Rehabilitation Milestone 2: Remediation of Contaminated Land (Section 9.1.2 - refers to them as sediment dams/ponds) - Rehabilitation Milestone 3: Landform Development and Reshaping/Reprofiling (Section 9.1.3) - Rehabilitation Milestone 4: Surface Preparation (Section 9.1.4) - Rehabilitation Milestone 5: Revegetation (Section 9.1.5) - Rehabilitation Milestone 6: Land Suitable for the Commencement of Grazing (Section 9.1.6) - Rehabilitation Milestone 7: Establishment of Target Vegetation Type (Section 9.1.7) - Rehabilitation Milestone 8: Achievement of a Stable PMLU(Section 9.1.8) Therefore, the milestone criteria has not been updated.  Under RM8, it is outlined how field monitoring programs will assist in providing a stable landscape to support low-intensity cattle grazing, including erosion monitoring and surface water monitoring. Water monitoring data from rehabilitation area runoff is described in Section 1.2.4 of the PRCP "when sediment dam catchments are completely rehabilitated, and water quality monitoring of the runoff has established that it is consistent with natural background conditions, the sediment dam and associated drainage infrastructure will be decommissioned. " as well as briefly in the REMP section, otherwise, please refer to section 6.8 and 9 of the Surface water monitoring program (Appendix A of the PRCP), which discuss baseline monitoring data for water quality at Vulcan South. Given that all the information is provided, the PRCP schedule has not been updated.
<b>Proposed PRC Plan and Schedule</b>	2.5	PRC plan · s.6.2.8	The department recognises that rehabilitation at VCP is proposed to be taken as rehabilitation trials for the VSP. The PRC plan must stand on its own merit and as such, must meet the legislative requirements of the Environmental Protection Act 1994 (EP Act). In accordance with section 126C(1)(j) of the EP Act, if rehabilitation trials are planned, the rehabilitation planning part must state: -the objective of the trial(s) -the trial design including, but not limited to, the	(a) Update the PRC plan to include the necessary information. The additional information should clearly demonstrate how rehabilitation trials at VCP can inform rehabilitation at VSP; and (b) Consider the need for additional or modified trials to support rehabilitation for the native ecosystem PMLU.	General	To be of value, trials need to occur on remediated landforms, this could not occur until 2027. As originally proposed, learnings from Vulcan Coal Mine are anticipated to be far more valuable than a trial at Vulcan South.

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			<p>location, underlying land characteristics and potential issues</p> <p>-the details of how the trial(s) will be carried out</p> <p>-when the trial(s) will commence</p> <p>-the duration of the trial(s)</p> <p>-how the trial(s) will be assessed for success</p> <p>-how the results of the trial(s) will be incorporated into rehabilitation strategies and the development of milestones, and</p> <p>-where the trials have previously been carried out by the applicant.</p> <p>The PRC plan must be updated to include details of the above, with specific regard to how the rehabilitation trials at VCP will be carried out to inform rehabilitation at VSP.</p> <p>Further, it is noted that VSP may require specialised rehabilitation trials when considering the impacts of highwall mining and the PMLU which includes native ecosystem.</p>			
<b>Proposed PRC Plan and Schedule</b>	2.6	PRC plan · Section 6.1.6 Surface Water à Final Landform Drainage · Appendix A, s5.9 · Appendix D	<p>The PRC plan indicates the mine water dams are proposed to be retained post-mining to support the PMLUs.</p> <p>As per section 3.2 Post-mining land use of the statutory guideline – ‘Progressive rehabilitation and closure plans (PRC plans)’ (ESR/2019/4964), infrastructure may be accepted as part of a PMLU where the relevant land holder has agreed through a signed land holder statement declaring that they will accept responsibility for the infrastructure once mining has ceased.</p> <p>All infrastructure to be retained onsite should be safe, stable and not cause environmental harm. If the underlying landholder is also the EA holder (or a parent corporation or a subsidiary corporation) they must justify how the infrastructure will provide a benefit or improvement to the use of the land and/or community once mining has ceased.</p>	<p>(a) Provide additional details as to the mine water dams – or any other infrastructure that will be retained’;</p> <p>(b) Provide evidence of agreement from the underlying landowner to accept said infrastructure post-mining;</p> <p>If the EA holder is the underlying landowner justify why retaining said infrastructure provides a beneficial outcome; and</p> <p>(c) Provide additional details as to the treatment/s for mine water dams that will ensure they are safe, stable, do not cause environmental harm – and are fit for purpose (i.e. free of contaminants, free of silt and sediment, suitable water quality for stock watering, etc.).</p>	General	<p>The water management section (Section 6.1.6) of the PRCP outlines that mine water dams will be decommissioned following rehabilitation of infrastructure areas. This is also described in Section 1.2.4 Final Landform "when sediment dam catchments are completely rehabilitated, and water quality monitoring of the runoff has established that it is consistent with natural background conditions, the sediment dam and associated drainage infrastructure will be decommissioned. "</p> <p>However, a sentence has been added to Section 6.1.2 of the PRCP -<i>Infrastructure to be retained</i>, stating that “Infrastructure that is beneficial to the landholder, pending a written agreement between Vittrinite and the post-mining landholder, will be retained. This may include specific water infrastructure for stock watering purposes.”</p> <p>Discussion of mine affected water dams is provided in Section 5.6.1 of the Surface Water Assessment (Appendix A of PRCP).</p>
<b>Proposed PRC Plan and Schedule</b>	2.7	PRC plan · Section 10.3, Table 10-2 PRCP schedule	<p>The RAs listed against each RM in Table 10-2 are not consistent with the corresponding schedule. Further, it is unclear as to why RM2 is not applicable to RA2.</p>	<p>(a) Update the PRC plan and/or schedule to be consistent; and</p> <p>(b) Justify why remediation of contaminated land is not applicable to RA2. Alternatively, include RM2 against RA2.</p>	General	<p>Table 10-2 has been amended to include RA2 within the RM2. RA5 has also been amended to substitute RM8 with RM9.</p>
<b>Proposed PRC Plan and Schedule</b>	2.8	PRC plan · Section 6.1.3, Table 6-1 · Section 6.1.5, Table 6-2 · Section 10.3, Table 10-2 PRCP schedule · RM4	<p>RM4 includes a milestone criterion (MC) which requires subsoil to be applied to RA2 (in-pit dumps). Note that it excludes RA1 (ex-pit dumps). Further, section 6.1.3 discusses that the application of subsoil will enhance the water holding capacity of soil and provide better conditions for revegetation. Table 6-1 states that RA1 will not receive subsoil treatment due to insufficient quantity of material at an appropriate stage of project development. However, Table 6-2 suggests that there will be a</p>	<p>(a) Update section 6.1.5 and Table 6-2 to clearly outline the predicted quantities of topsoil, subsoil and waste rock available to be used in rehabilitation;</p> <p>(b) Provide further justification to support the lack of subsoil application to ex-pit dumps (noting it is proposed to be applied to in-pit dumps); and</p> <p>(c) Clarification is required as to the feasibility</p>	General	<p>Table 6-2 has been updated to reflect the predicted subsoil and waste rock quantity.</p> <p>As described in the Soil and Land Suitability technical assessment (Appendix C), the vast majority of the subsoil is considered dispersive and acidic, and therefore is not suitable for rehabilitation without management. It is likely that the subsoil; will be mixed with waste rock primarily as a function to fill the void in the land rather than a medium for rehabilitation and plant growth. The most important soil layer for rehabilitation in terms of plant growth is the topsoil layer, which is considered fertile. The project scheduling and design has dictated that the in-pit dumps will need to be rehabilitated first before the ex-pit dumps. It is for this reason that the subsoil will be used to rehabilitate this area prior to ex-pit dumps which may mean there is less available when the ex-pit dump is rehabilitated. Regardless, as described above, topsoil is the most important for rehabilitation of plant species and communities and subsoil is primarily used as a</p>

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			surplus of topsoil material for use in rehabilitation. Clarification is required regarding the predicted quantity of topsoil, subsoil and waste rock for rehabilitation available over the duration of mining operations. Additional clarification is required as to the feasibility of strategic placement of subsoil on ex-pit dumps where supply is limited.	of partial or strategic use of subsoil where supply is limited.		structural mechanism to fill the void. In this way, if there is less subsoil or none at all when the ex-pit dump is rehabilitated, it will likely only have a marginal effect on the completion of the rehabilitation milestone criteria, as topsoil will not be limited. Thus, more topsoil can be used to replace the lacking subsoil. The incidence of surplus topsoil and lacking subsoil has been accounted for in the finalisation of project PMLU's and the associated vegetation types and corresponding root depth and soil depth requirements. Please see above.
Proposed PRC Plan and Schedule	2.9	PRC plan · Section 6.2 PRCP schedule · RM4	The need for soil amelioration is discussed in section 6.2 of the proposed PRC plan. Criteria for soil amelioration have not been included in the proposed PRCP schedule.	(a) Provide a revised PRCP schedule that includes appropriate RM criteria for soil amelioration.	General	Refer to Table 10-2, RM4, which mentions ameliorants: "Remediation of any erosion or subsidence is complete; Growth media (topsoil) has been sourced, carted and spread; Ameliorants to improve or stabilise soils have been added; and Deep ripping has been undertaken. "Ameliorants for soil have also been mentioned in Table 10-3.
Proposed PRC Plan and Schedule	2.100	PRC plan · Section 6.2.3 · Table 5-1 PRCP schedule · RM7 and RM8	The proposed PRCP schedule provides limited milestone criteria to demonstrate achievement of the proposed PMLU of native ecosystem and the habitat features of low intensity grazing with habitat for koalas and squatter pigeons. The proposed PMLU for RA2, RA3 and RA4 incorporates habitat for Koalas and Squatter Pigeons. The proposed PMLU for RA2 includes both grazing and native ecosystem. Section 6.2.3 states habitat for Koalas and Squatter Pigeons can be incorporated into low intensity grazing PMLU and native ecosystem PMLU and habitat for the greater glider can be included in the native ecosystem PMLU. The proposed PRCP schedule includes RM6 for land becoming suitable for the commencement of grazing, RM7 for establishment of target vegetation and RM8 for the achievement of the PMLU to a stable condition. Table 5-1 of the proposed PRC plan refers to completion criteria regarding the prevalence of eucalyptus species, however these have not been incorporated in to the proposed PRCP schedule.	(a) Provide a revised PRCP schedule that includes appropriate RM and milestone criteria to demonstrate the achievement of the proposed PMLU including the provision of habitat for koalas and squatter pigeons.	General	The PRCP schedule has been revised and includes the appropriate rehabilitation milestones to demonstrate the proposed PMLU.  A description of Eucalyptus species inclusion into rehabilitation milestone criteria has been added for RM7 and RM8 of Table 10-3. <i>Eucalyptus crebra</i> and/or <i>Eucalyptus populnea</i> are to constitute 21% of the total basal area of woody vegetation on sand plains. <i>Eucalyptus camaldulensis</i> is to constitute 33% of the total basal area of woody vegetation along Ripstone Creek and North Creek.
Proposed PRC Plan and Schedule	2.11	PRC plan · Table 5-1 PRCP schedule · RM8	The proposed PRCP schedule refers to operational water quality limits contained within the EA for an adjacent site (VCP). Table 5-1 of the proposed PRC plan refers to site specific water quality triggers that will be established to present the most accurate measure of effect on water quality.	(a) Provide revised milestone criteria relating to water quality or further information to justify the proposed water quality criteria in RM8.	General	Table 10-3 has been amended to reference the Surface Water Assessment (Appendix A of PRCP) and Groundwater Assessment (Appendix B of PRCP) for Water Quality Criteria for RM8.
Proposed PRC Plan and Schedule	2.12	tables for RA1, RA2, RA3 and RA5	For rehabilitation tables for RA1, RA2, RA3 and RA4, entries for areas when each milestone is completed by require revision to reflect cumulative areas. The tables must reflect the progression of each portion of each RA through the relevant milestones progressively over time (e.g. currently the table for RA1 depicts progression of 151.4ha through milestones 1 to 5 between 2025 and	(a) Revise cumulative areas achieved in rehabilitation tables for RA1, RA2, RA3 and RA4 to reflect the cumulative area for each milestone achieved as time progresses.	General	The PRCP Schedule now shows progression of the rehabilitation areas over time.



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			2027, however, in 2030 the entire area of the RA (196 ha) is depicted as only being progressed through milestones 1 to 3).			