

PEMBROKE

Olive Downs Coking Coal Project

Additional Information to the
Environmental Impact Statement

Section 21

**Impact Avoidance
and Minimisation**

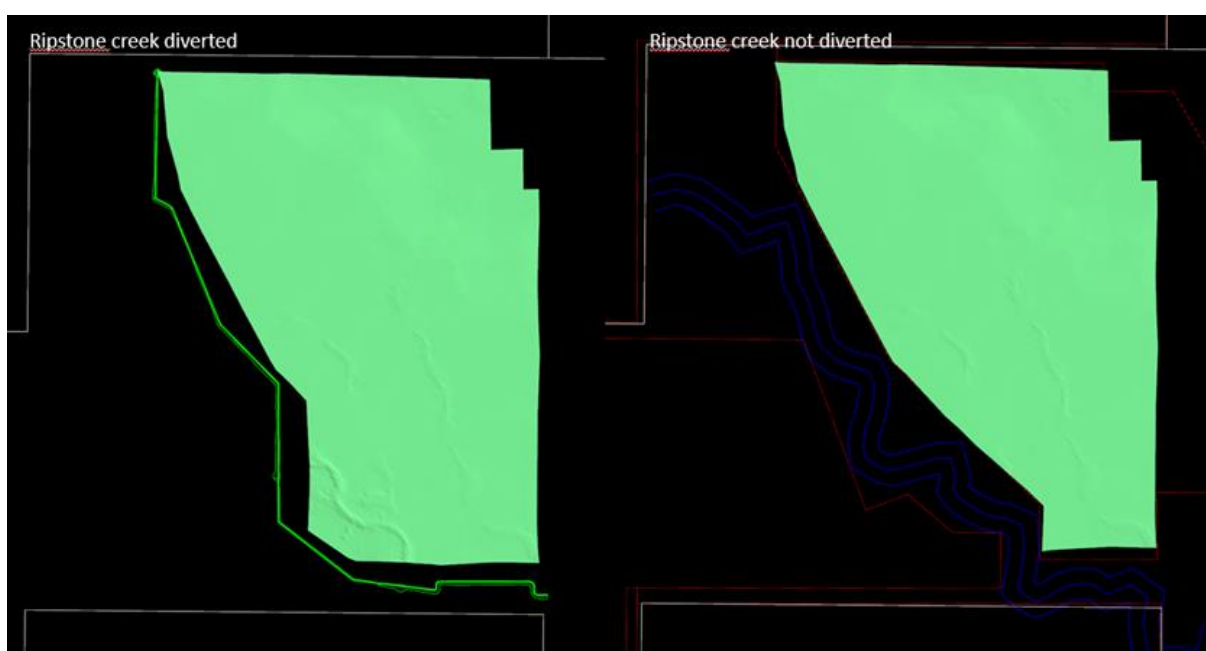
21 IMPACT AVOIDANCE AND MINIMISATION

1. Describe the economic and operational impacts to the project of not diverting Ripstone Creek

The principal economic cost of avoiding Ripstone Creek centres around the loss of product coal. Avoiding Ripstone Creek would necessitate the reduction in extent of mining the ODS9 open cut pit (ODS9).

An assessment of the potential loss of ROM coal has confirmed that approximately 3 million tonnes of ROM coal would remain in-situ, as shown on Figure 21-1.

**Figure 21-1
ODS9 Design with and without the Proposed Ripstone Creek Diversion**



Reducing the extent of ODS9 would impact the efficient extraction of the coal resource in ODS9, which would have flow on effects to other parts of the mining operation. In particular, as the width of the southern part of the pit would be reduced, the available space for active mining in this area would be reduced. This would reduce the rate of mining and therefore reduce the rate of production in this pit. To maintain the Project's proposed production profile, the mining intensity within other parts of the mine would have to be increased to account for the reduction in production from ODS9. This would require larger areas of the open cut pits to remain open (to accommodate the additional mining fleet required to sustain a higher intensity) and would therefore require larger out of pit waste rock emplacement areas as there would be less space for in-pit waste rock emplacement, increasing the overall disturbance footprint of the Project.

The Ripstone Creek diversion has been designed, as far as practicable, to replicate the natural hydraulic behaviour of the existing section of Ripstone Creek that is proposed to be diverted (Section 20). Geomorphic and riparian features of the existing section of Ripstone Creek will be replicated in the diversion, maintaining the environmental values of the existing reach. The diversion will have been constructed and the vegetation allowed to establish prior to the existing section of Ripstone Creek being diverted. A biodiversity offset for the impacted section of Ripstone Creek, as well as the disturbance associated with the construction of the diversion, is proposed as part of the Project.

It was determined that the economic benefit of mining this coal out-weighs the cost of the environmental impacts, including the diversion of Ripstone Creek and the rehabilitation works required to replicate the natural hydraulic behaviour of the Ripstone Creek waterway. A net benefit of at least \$11M was calculated when accounting for the value of the coal (i.e. \$36M), the production benefits associated with employment and royalties associated with ODS9 and the cost of the Ripstone Creek diversion (i.e. \$25M).

Given the above, Pembroke proposes to divert Ripstone Creek around ODS9.

Consistent with the Model Mining Conditions, Pembroke is seeking EA conditions (Schedule I of the Proposed EA conditions within Appendix B) which require preparation of a certified Design Plan for the Ripstone Creek diversion. The design of the Ripstone Creek diversion will be in accordance with the DNRM (2014) *Guideline: Works that interfere with water in a watercourse – watercourse diversion*. The DNRM Guideline requires the preparation of an 'Operation and Monitoring Plan' as part of a Design Plan. As outlined in Table 6-2 of the draft EIS, a monitoring strategy for the Ripstone Creek Diversion has also been developed and includes monitoring prior to construction, during operation and for relinquishment. This monitoring strategy will be developed into the 'Operation and Monitoring Plan' as part of the Design Plan.

2. Describe how avoidance and minimisation of impacts on environmental values were considered in the assessment of infrastructure corridor alignments including the rail, water pipeline and ETL corridors.

The design of the Project infrastructure corridors included consideration of land use constraints (such as existing mining tenements and private land holdings) and minimisation of impacts to environmental values. The key constraint to siting the infrastructure corridors is underlying land tenure and Pembroke's ability to gain access to the land. The requirement to gain access to the land meant that certain areas (e.g. mining tenements owned by other companies and some freehold land) were unavailable as potential locations for siting infrastructure.

In particular, the existing Mineral Development Licence (MDL) 183 located to the west of the Project presented a key restriction to the design of the rail spur and water pipeline alignment. The presence of a mining tenement owned by a third party required Pembroke to align the infrastructure corridor outside of and along the northern boundary of MDL 183. Although the corridor available between MDL 183 and the Isaac River is quite narrow, Pembroke has located the infrastructure corridor as far away from the Isaac River as possible (i.e. it is located immediately adjacent to MDL 183) to minimise potential impacts on the riparian corridor and the flooding regime.

Engagement with some landholders, in particular one landholder to the north of the Project along one of the potential ETL corridors, indicated that more direct ETL corridor options would not be feasible. The ETL corridor was subsequently designed to follow roads and easements to minimise interaction with private landholdings.

The design of the infrastructure corridors considered the following objectives:

- minimise impacts to other land holders, by locating the corridors along cadastral boundaries where practicable;
- minimise impact to existing land uses and minimise land disturbance by co-locating the rail spur and part of the water pipeline in the same corridor;
- minimise the impacts to private landholdings and minimise land disturbance by locating the corridors within existing easements and road corridors, where practicable;
- minimise impact to areas of native title;

- minimise impact to existing stock routes;
- minimise impacts to existing flood characteristics; and
- avoid dwellings.

Some alternative alignments considered in the pre-feasibility stage which would have cost less to construct when compared to the alignments presented in the draft EIS were disregarded due to their potential impacts on environmental values (e.g. increasing flood impacts, additional impacts on existing land holders). In particular, the ETL has been designed to follow existing roads and road reserves along the vast majority of the alignment to minimise impacts to private landholdings and reduce the land disturbance and associated vegetation clearance. This results in a significantly longer corridor route than would otherwise be required with a more direct route.

It was recognised that restriction proposed by MDL 183 to the alignment of the rail spur and pipeline resulted in parts of the corridor being located in close proximity to the Isaac River riparian corridor. To minimise potential impacts to habitat and remnant vegetation (including MNES) in this area, the rail spur and water pipeline have been located to maximise the distance from the riparian corridor (i.e. the most suitable habitat for the Koala and the Greater Glider), while also avoiding a small patch of Brigalow TEC which was mapped within the study area.

Consideration of the infrastructure alignments is presented in Sections 2.10.2, 3.4.5, 3.5.5 and 3.6.5 of the draft EIS.