Progressive Rehabilitation Certification at Oaky Creek Coal Mine: A Case Study

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ABSTRACT

This paper presents the rehabilitation and monitoring methods implemented, progressive rehabilitation certification (PRC) status and key learnings at the Oaky Creek Coal Mine (OCC) in central Queensland. To date, the Progressive Rehabilitation Certification (PRC) (as per the Environmental Protection Act 1994) of 1,475 ha of rehabilitated land has been approved by the Queensland Department of Environment, Tourism, Science and Innovation (DETSI) and 2,338 ha is currently under application.

Coal mining at OCC has occurred through both open cut dragline methods which were utilised between 1982-2006 and underground longwall methods utilised since 1989. Progressive rehabilitation activities have been undertaken throughout this period with approximately 5,550 ha of the 8,700 ha disturbance footprint rehabilitated.

Open cut rehabilitation methods included landform dumping to design and dozer push regrade, burial of less erosion stable and hostile materials, capping with Permian overburden rock mulches, contour ripping, fertilisation and revegetation with native tree and shrub species and local pasture grasses. Topsoiling of less erosion resistant materials and gypsum and/or lime addition was undertaken as required to achieve a native woodland post mining land use (PMLU). Underground rehabilitation methods included ripping or excavation/re-compaction of subsidence cracks, topsoiling, fertilisation and seeding to achieve a grazing PMLU.

The monitoring programs undertaken over the years have used sets of rehabilitation success indicators developed in consultation with the CSIRO and University of Queensland (CSIRO, 1999, and Eskine and Fletcher, 2014), runoff and groundwater quality monitoring methods. In recent years Artificial Intelligence (AI) supported ground truthed high resolution remote sensing capable of identifying individual flora and fauna species, diversity, abundance and cover has been used to verify and support traditional monitoring methods.

Transparent stakeholder engagement including early regulator and landholder consultation has played a crucial role in facilitating the proposed PRC application areas and the integration of rehabilitated lands into broader land use frameworks.