Upper Hunter Mining Dialogue

Final and Temporary Rehabilitation Principles and Commitments

2021 Results and Commentary

REPORT BY THE BLOOMFIELD GROUP
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NSW MINING Upper Hunter Mining Dialogue

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Final and Temporary Rehabilitation Principles and Commitments

Introduction

The nine coal producing companies of the Upper Hunter, through the Upper Hunter Mining Dialogue (the Dialogue), have agreed to this set of principles and commitments regarding final and temporary rehabilitation. The Rehabilitation Principles and Commitments have been developed with advice and guidance from the Dialogue's Joint Environment Working Group, which comprises industry, local and state government, interest groups, and community stakeholders.

The Upper Hunter Mining Dialogue has two goals regarding land management:

- *Goal 1 - To decrease the time that disturbed areas are left without final or temporary cover, recognising that different mining operations are at different points in rehabilitation.*

- *Goal 2 - To achieve a consistent level of best practice, quality, integrated rehabilitation – both within the industry and with future land uses - across the Upper Hunter and to be a responsible steward of the land.*

The primary focus of the Rehabilitation Principles and Commitments is to contribute to Goal 1. Several other projects are underway to progress Goal 1. The industry participants in the UHMD acknowledge the importance of clear goals for rehabilitation developed through consultation with community and regulators, continuing to improve rehabilitation techniques and sharing innovative and successful rehabilitation techniques within the industry. Projects under Goal 2 focus on continuous improvement of rehabilitation practices.

Principles and Commitments

The Upper Hunter coal producers will publicly report against the Principles and Commitments on an annual basis. The reporting will be aggregated by the NSW Minerals Council and shared with the community. Table 1 sets out the six principles and provides a description of how each will be reported against. Contextual information is also sought from industry regarding variations in their annual reporting, as well as an opportunity to provide commentary on their future rehabilitation targets for the years ahead.

Table 1 – Principles and Commitments

Principle	Reporting
Principle 1 – Include rehabilitation planning in mine planning	*Narrative* – how has this been done in the last period
Planning for rehabilitation should be integrated into the mine planning process and should include allocating adequate and dedicated resources to achieve the planned rehabilitation outcomes.	At Rix's Creek Mine (RCM), rehabilitation is integrated into the mine planning process, with specific targets and commitments outlined within the Mining Operation Plan (MOP). Weekly mine production meetings hold space for active communication where upcoming rehabilitation requirements and designs are discussed with the site management team so the necessary resources can be allocated to ensure that RCM's rehabilitation targets are achieved in accordance with MOP commitments. During all stages of the rehabilitation process, the environmental department, mine planners, surveyors and production personnel work cohesively to ensure that the progressive rehabilitation is achieved to a best practice standard.
Principle 2 – Undertake progressive rehabilitation	*Narrative* – how has this been implemented in the last twelve months
Companies should undertake rehabilitation progressively, with the objective of ensuring that rehabilitation is as close as possible to active mining.	During 2021, RCM rehabilitation was carried out to all areas shaped to final landform design to ensured rehabilitation is as close as possible to the active mining areas. The integration of final GPS landform design into each overburden dump bulldozer assists this process. This will continue during 2022.
Principle 3 – Minimise time that disturbed areas are left without vegetation	*Narrative* – how has this been implemented in the last twelve months
Companies should actively seek to minimise the time that land is left without cover during mining. This should include: ▪ *Taking steps to ensure that rehabilitation is commenced within 12 months of land becoming available for rehabilitation* ▪ *Utilising methods of temporary rehabilitation[1], such as aerial seeding of over burden and other disturbed areas where permanent rehabilitation has not commenced.*	In rehabilitation areas designated for trees over pasture, a pasture cover crop is generally sown into the rehabilitated area in the first instance to stabilise the ground and minimise erosion. A tractor with a mulching implement later slashes the established cover crop area before using ripper tines attachment to rip strips along the slope of the rehabilitated area and leaving intermittent strips of pasture cover crop intact. The strips that are ripped by the Tractor are sown with tree seed. This process works very well in minimising erosion and

[1] Temporary rehabilitation describes reshaping, revegetation and other rehabilitation techniques that are used for purposes other than final rehabilitation. This includes such initiatives as seeding overburden emplacement areas to reduce erosion, which are only temporary.

Principle	Reporting
	riling on sloping batters that are designated for tree seed. RCM engage a specialist contractor to apply Hydromulch in areas not accessible to traditional driver operated rehabilitation machinery. Hydromulching is the spraying of a mixture of water, mulch, and suitable seed onto steep slopes to prevent soil erosion and foster growth. This practice will continue in 2022. RCM have previously conducted aerial seeding over disturbed areas for dust mitigation.
Principle 4 – Prioritise areas of rehabilitation and temporary cover to reduce impacts	*Narrative* – how has this been implemented in the last twelve months
Companies should prioritise rehabilitation and temporary cover in those areas where leaving land exposed will have the most impact. The following areas should be considered to have priority: ▪ *Areas that have the greatest impact on visual amenity, such as areas that face townships, residences, or the highway* ▪ *Areas that have the potential to generate dust leaving the site* ▪ *Areas that are important for biodiversity, such as rehabilitation adjoining or providing connectivity to remnant vegetation.*	Rehabilitation and temporary cover is given the highest priority where the area has potential for offsite impacts and areas that are seen by the public every day. This includes tree screens/ bunds, strategic planting of over storey species in areas to fit in with the existing landscape and habitat corridors (remnant or rehabilitation). The undulating shaping of final mine landforms is designed to provide rehabilitated landforms that are reflective of the surrounding visual amenity so that rehabilitated landforms effectively compliment the unmined surrounding landscapes.
Principle 5 – Meet target for rehabilitation progress identified in the Mining Operations Plan	*Quantitative* – report MOP target and actual rehabilitation *Narrative* – explanation of performance
Each company should meet the annual target for rehabilitation quantity (area) set in the Mining Operations Plans for each of its mines.	Rix's Creek Mine Rehabilitation for the 2021 period was 7.1ha of rehabilitation
Principle 6 – Set quality targets for rehabilitation in the Mining Operations Plan and implement a monitoring program to measure performance	*Narrative* – summary of quality targets for the various rehabilitation types; and summary of monitoring program scope and status.
Each company should include quality targets for the various types of rehabilitation in the Mining Operations Plan for each of its mines. A monitoring program to measure the performance of rehabilitation areas against the quality targets should be implemented at each of its mines.	Rehabilitation monitoring is undertaken every two years or bi-annually. The rehabilitation monitoring assessment is conducted by independent environmental consultants that assess the rehabilitation at RCM to the completion criteria outlined in the MOP.

Principle	Reporting
	Rehabilitation Inspections are regularly conducted by RCM personnel. Rehabilitation Inspections from government bodies are also conducted throughout key stages of landform development, growth media development and ecosystem establishment. Inspections provide opportunity to identify any issues with rehabilitation quality. If there is an issue identified relating to quality of rehabilitation a specific rehabilitation JobPack is created that assess the remedial actions required and details the specific task components to rectify the issue and thus ensure a consistent level of best practice, quality, integrated rehabilitation is achieved.

Contextual information

This section provides an opportunity for each company to provide some commentary or contextual information regarding their reported results. Such information could include advice on: - *Any material changes to the site (i.e., expansions, acquisitions, or divested assets); or* - *Why any figures may have changed since the last reporting period?*	The approved final land use of RCM is grazing. To ensure that rehabilitation can support productive and sustainable grazing cattle are grazed on rehabilitated land and RCM continues to monitor and conduct investigative grazing trials and studies to determine that livestock ventures conducted on rehabilitated pastures at RCM are of comparable or higher success to local un-mined pasture land. Grazing trials conducted at RCM have historically been successful. Results demonstrate that it is possible to achieve self-sustaining grazing land post-mine rehabilitation and suggest rehabilitated mined land is capable of grazing over the long term. The methodology used at RCM involves two rehabilitated pasture paddocks to be monitored, with identical monitoring of an adjoining natural pasture site which is grazed in a similar fashion to provide an analogue to which the rehabilitation sites can be compared. Monitoring and comparison with both district practice and cattle grazed on undisturbed natural pasture provide a benchmark for comparison of productive capability. Grazing trials aim to: • Demonstrate that rehabilitated land can sustain a viable cattle grazing enterprise post-mining, while maintaining stable land and vegetation.

	• Demonstrate to key stakeholders the suitability of this rehabilitated land for cattle enterprises in the future. • Develop guidance material for best practice grazing management for the site. In 2020 a Biomix trial was established at the Old North Pit Void rehabilitation site. Biomix is an organic soil amendment made from composting a targeted blend of Biosolids and Recycled Paper Crumble material. The resulting compost is a nutrient rich organic soil amendment which is ready for direct application to land. The Biomix was applied via spreader at a rate of 110 tonnes per hectare to a 5 hectare plot. Biosolids was applied on an adjacent 5 ha plot at a rate of 110 tonnes per hectare. The aim is to determine the suitability of the Biomix as a soil amendment as well as to compare pasture productivity between the Biomix and Biosolid trial areas. 2021 results of this trial have been positive and suggest Biomix is an effective soil ameliorant that will be supportive of establishing effective pasture growth on rehabilitated landfoms.

Future rehabilitation priorities

This section provides an opportunity for each company to provide details on rehabilitation activities at their site/s for the upcoming year.	In 2022 a forecast total of 21.6ha will rehabilitated across RCM in accordance with combined RCM MOP. In addition, a further 12.6ha land will be prepared for rehabilitation to bring the expected total of completed RCM rehabilitation to 840.8ha for the 2022 reporting period. Weed management will be a priority in 2022 to ensure that we reduce the amount of invasive species that have the ability to affect rehabilitation at Rix's Creek Mine. Due to the increased rainfall during 2021, weed infestation remains a recognised challenge that has the potential to affect rehabilitation performance across the site, particularly with widespread occurrence and local infestations of Galenia (Galenia pubescens), and more localised incursions of Prickly Pear (Opuntia spp.), Coolatai grass (Hyperhenia hirta) and Western Australian Wattle (Acacia Saligna). Efforts have been increased to remove Acacia Saligna from previously rehabilitated areas, with secondary weed spraying conducted on areas where Acacia

	Saligna has been removed to prevent re-occurrence of the species. Vertebrate pest management will be continued across site in 2022 in consultation with Hunter Local Land Services and aligning with the Hunter Local Land Services Upper Hunter Autumn Wild Dog and Fox Pest Management Program.