

Modification 3: Environmental Assessments Summary

April 2019

Modification 3 – application to change our development consent

Bulga Open Cut is preparing to modify our mine approval so we can mine the coal beneath our tailings storage (Modification 3). The key aspects of the modification include:

- Mining will be behind the noise and visual bund and within the existing approved project area
- Relocation of tailings from the Deep Pit (old Saxonvale pit) to an in-pit tailings facility in the north of the mine via pumps and pipes so we can mine the coal underneath
- Mining approximately 64 million tonnes of additional coal over the life of the mine
- The mine life will extend by 4 years to 2039
- Clearing of 20.2 hectares of endangered ecological community, which will be offset. Bulga Coal land close to Broke is being proposed as the potential offset
- Continued use of the East Pit Muster Area (Bulga Optimisation Project construction offices)
- The Bulga Underground approval will be modified to include relocation of the 9 MW power station and associated flares
- Construction would include building of pumps, pipelines and relocation of powerlines, power station and flares.

The environmental and social impact assessments for the modification are mostly complete and this information sheet summarises the results of those assessments. The summary includes social impacts, air quality, noise, biodiversity, rehabilitation & final landform, final void, post-mining land uses, visual impacts, Aboriginal and European heritage, tailings relocation & water, blasting, greenhouse gas and traffic & transport.

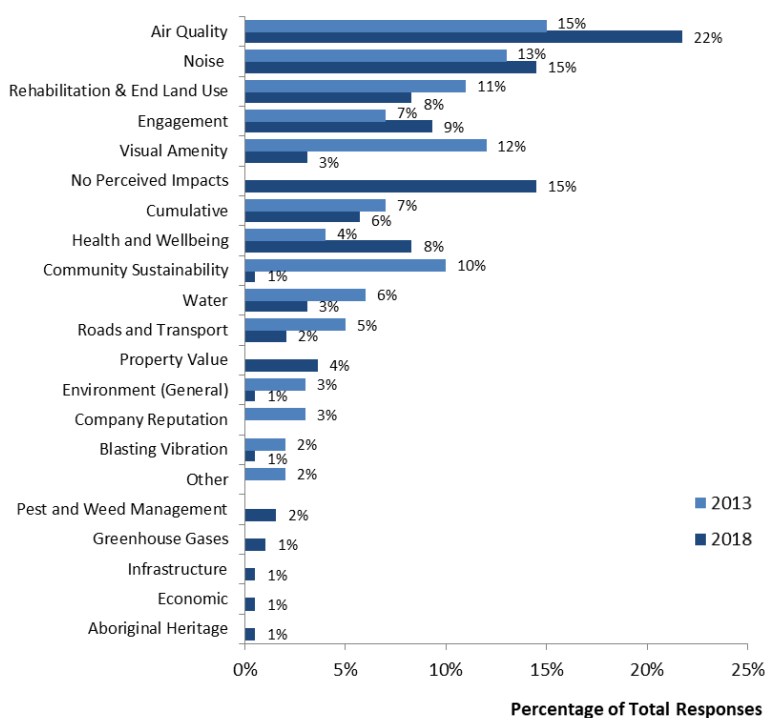
Social impact assessment

A comprehensive Social Impact Assessment (SIA) was undertaken as part of the Bulga Optimisation Project and the SIA has further built on this.

Surveys were completed at the Bulga Coal community barbeques in November 2018 to help understand community perceptions of the existing operations and the proposed modification. 89 residents completed the survey. The issues identified during this engagement phase are relatively comparable to the issues identified in 2013.

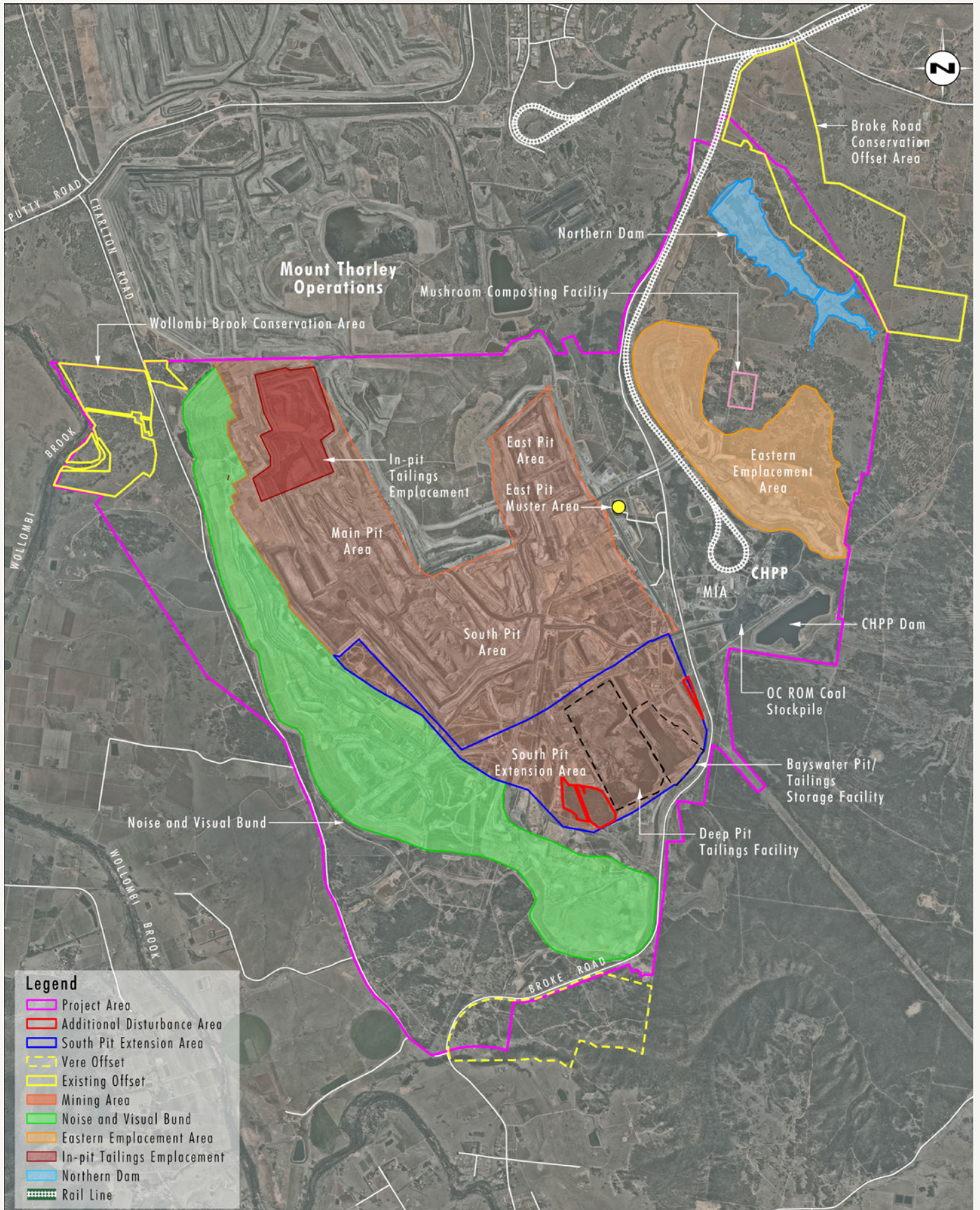
The following graph compares the issues identified during the Bulga Optimisation Project in 2013 to the issues surveyed at the community barbeques in late 2018.

Comparison of Bulga Optimisation Project 2013 Predicted Impacts and Existing Operational Impacts 2018



Source: Umwelt (2018) Note: 2013 n =149; 2018 n=86, multiple responses allowed

Modification 3

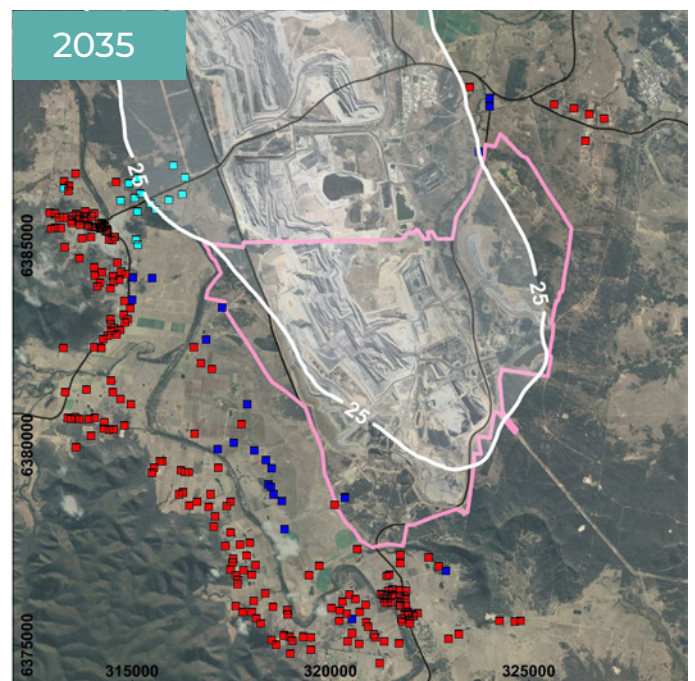
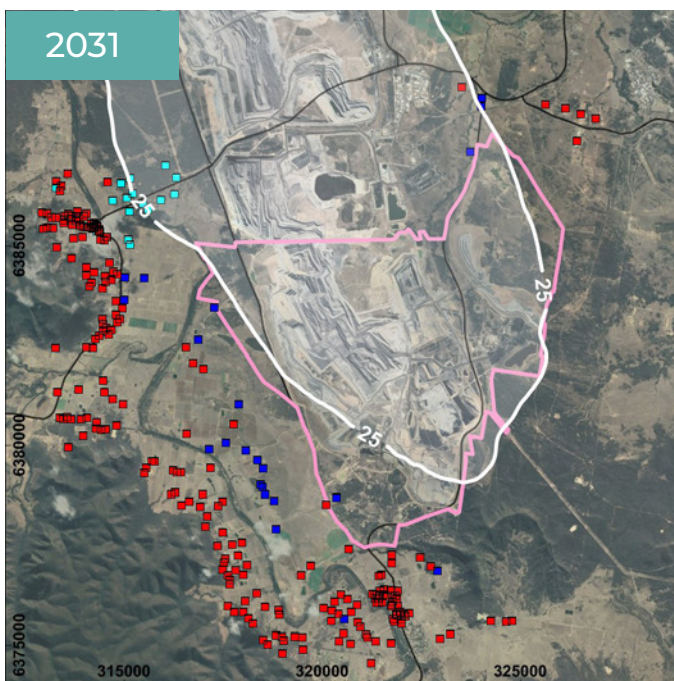
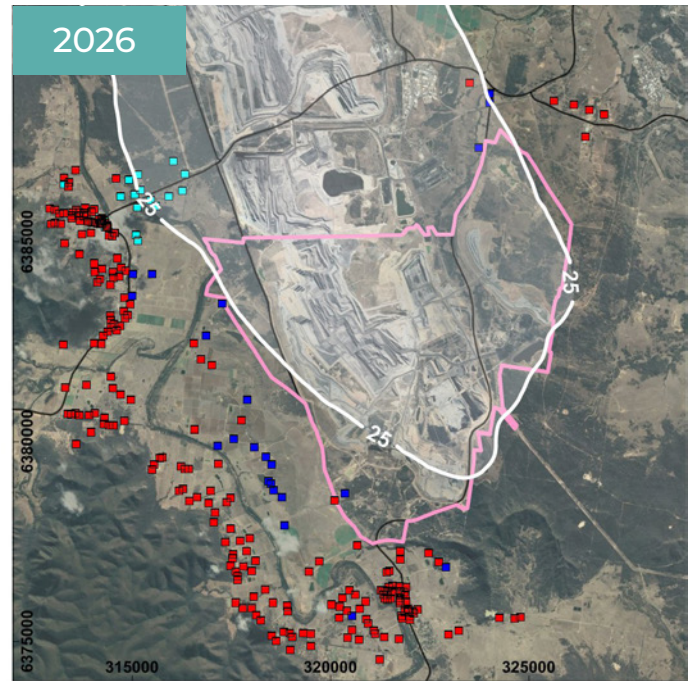
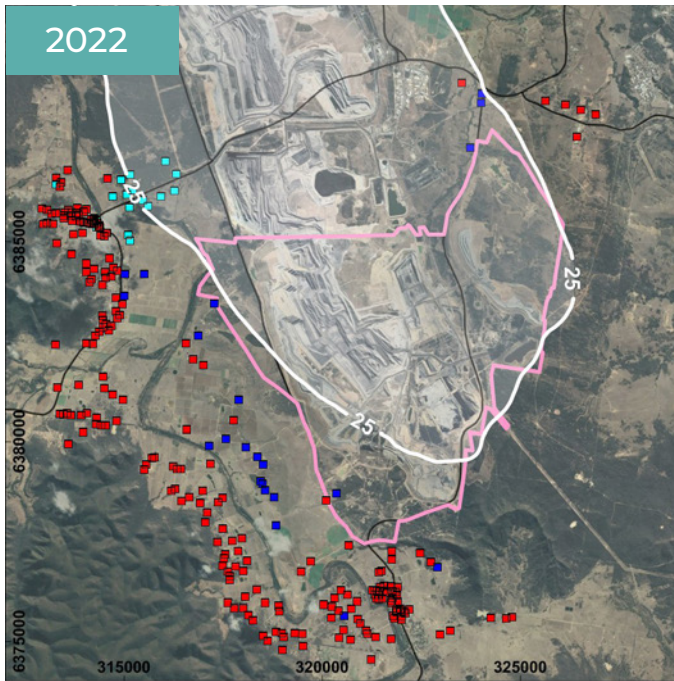


Air quality

- The estimated annual air emissions for the modification are lower than those estimated for our current approval.
- There are no private residences that are predicted to experience exceedances of annual average $PM_{2.5}$, Total Suspended Particles (TSP) or dust deposition criteria at any stage of the modification.
- One property (residence 1A) is predicted to exceed the new annual average ($25 \mu\text{g}/\text{m}^3$) criteria for PM_{10}

concentrations in one or more future years. This exceedance is associated with the change in criteria (from $30 \mu\text{g}/\text{m}^3$ to $25 \mu\text{g}/\text{m}^3$) and not an increase in PM_{10} dust emissions from the modification. The contribution of Bulga Coal to the annual average PM_{10} concentrations at property 1A is predicted to be up to, and in the order of, $7 \mu\text{g}/\text{m}^3$ (in 2022).

The figures below show the predicted annual average PM_{10} concentrations due to all sources (cumulative) in 2022, 2026, 2031 and 2035.



— Project Area
■ Private Residence
■ Bulga Coal Owned Residence
■ Other Mine Owned Residence

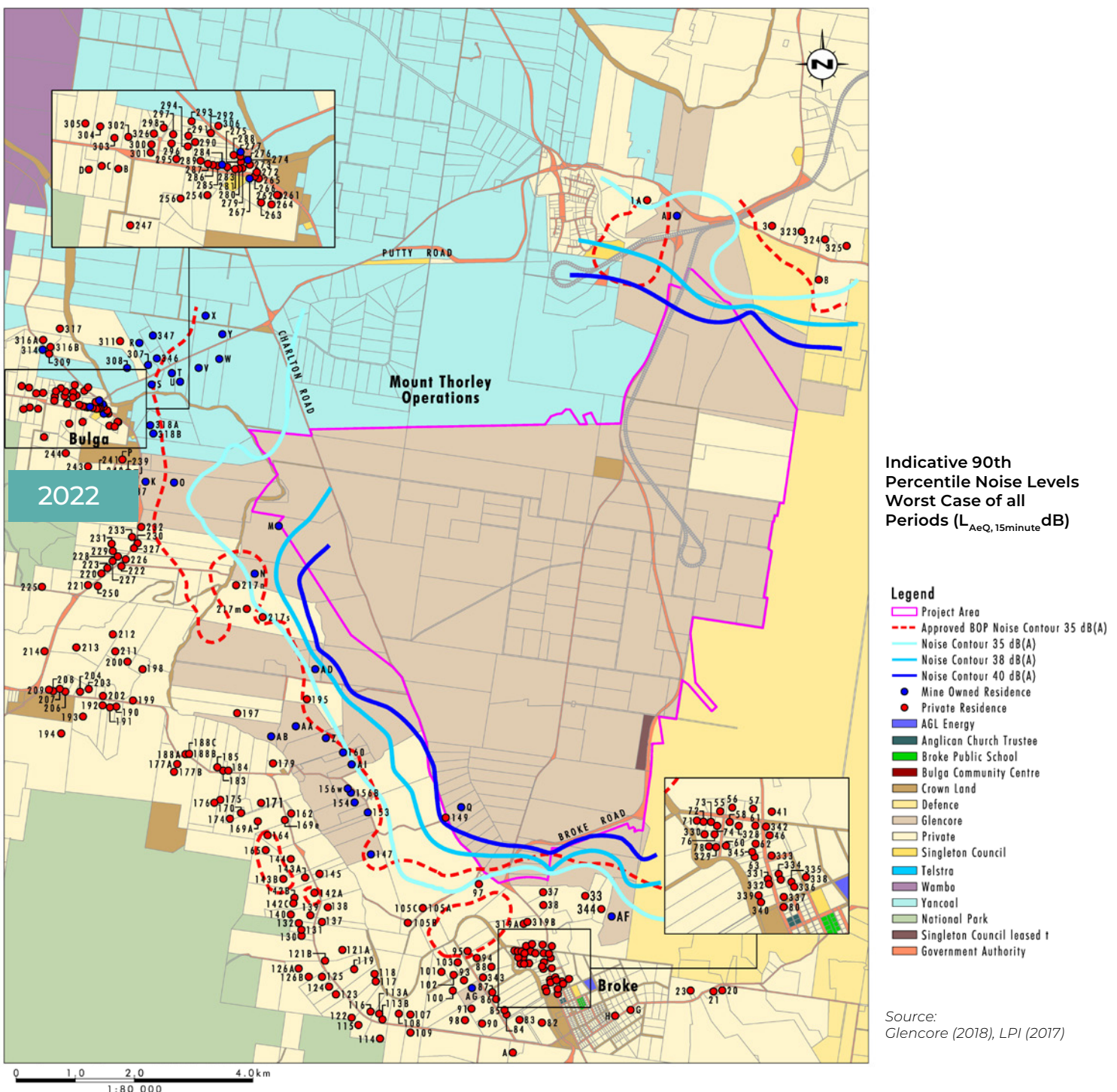
Concentrations in $\mu\text{g}/\text{m}^3$

Noise

- The noise will be managed within our currently approved limits. If required we will continue to modify our operations by either shutting down equipment or moving to shielded work locations to remain within the noise criteria.
- The noise has been modelled to represent realistic worst case operating conditions over the mine life in 2022, 2026, 2031 and 2035.
- No additional receptors are predicted to be impacted by noise impacts that require additional mitigation or acquisition rights, in accordance with the government Voluntary Land Acquisition and Mitigation Policy.
- Sleep disturbance model predictions are less than the criterion of $L_{AeQ,15\text{minute}} 45$ dB for all receptors. As such, there is no sleep disturbance impact predicted.

- There are very limited construction activities and any noise impacts will be managed to comply with the approved noise limits.

The figure below presents the noise contours in realistic worst case operating conditions in 2022. Subsequent years show similar outcomes. The red dotted line is our current approved noise limits of 35 decibels (Bulga Optimisation Project). The blue lines show the predicted noise contours for the proposed modification. The proposed modification 35 dB(A) noise contours (light blue line) is similar to the approved Bulga Optimisation Project 35 dB(A) noise contours with no privately owned residences moving inside the proposed modification 35 dB(A) noise contour in any of the years.



Biodiversity

Proposed Vere offset area in light blue area as seen from Broke Recreation Ground.



The biodiversity impacts of the proposed modification are being assessed, managed and offset under relevant government guidelines.

The proposed modification will result in a small additional impact of 20.2 hectares consisting of 19.2 hectares of native vegetation communities of which 16.4 hectares is listed as the Commonwealth Central Hunter Valley Eucalypt Forest and Woodland Critically Endangered Ecological Community (CEEC). One State listed endangered ecological community (EEC) will also be impacted, this being the Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions EEC.

This vegetation remains as an island of vegetation within areas already disturbed by mining.

To compensate for the unavoidable loss of ecological values we are committed to providing an appropriate biodiversity mitigation strategy. It is proposed that this will include a biodiversity offset area known as the Vere Offset (154 hectares) which is located between the mine and Broke and has spectacular views over Broke and the surrounding ranges. It contains Aboriginal grinding grooves and has good recreational prospects (bushwalking, bird spotting, mountain bike/horse trails). The offset management plan will propose the area be able to be

used for sympathetic recreational activities.

There is no predicted direct impacts on the Warkworth Sands Endangered Ecological Community.



This wedgetail eagle chick was photographed in the nest at one of our offset properties.

Rehabilitation and Final Landform

As identified in the community surveys, rehabilitation and final land use remains a key concern for local residents. The overall rehabilitation strategy for the proposed modification is consistent with what is currently approved for the Bulga Optimisation Project, including a single void which will remain in the final landform.

The final landform is very similar in character to the approved. Internal dump heights will increase from 150mRL to 160mRL, with select areas to 175mRL to provide topographical relief. This increased height reduces the need to apply for additional out-of-pit emplacement areas which would result in additional land disturbance.

Overburden emplacement visible to the community will be rehabilitated as a priority.

Final Void

The final void is similar to the approved although 60m deeper (was 340m deep and now proposed to be 400m deep) and slightly more to the south east but a similar outcome to the currently approved final void.

There is sufficient head (400mRL) difference for pumped hydro to be a consideration.

The studies are still being completed but preliminary



results indicate that the final void will become a hydraulic sink preventing water from flowing away from the void.

Post Mining Land Uses

The currently approved final land uses are to form replacement tree habitat and some grazing land. Alternative final land uses identified include rural residential, industrial uses or intensive agriculture (e.g. poultry, piggeries, mushroom composting), adventure sport such as mountain bike trails, pumped-hydroelectricity and military training. These potential land uses could provide economic diversity into the future beyond mining. Alternate land uses will be further reviewed through the life of the mine.

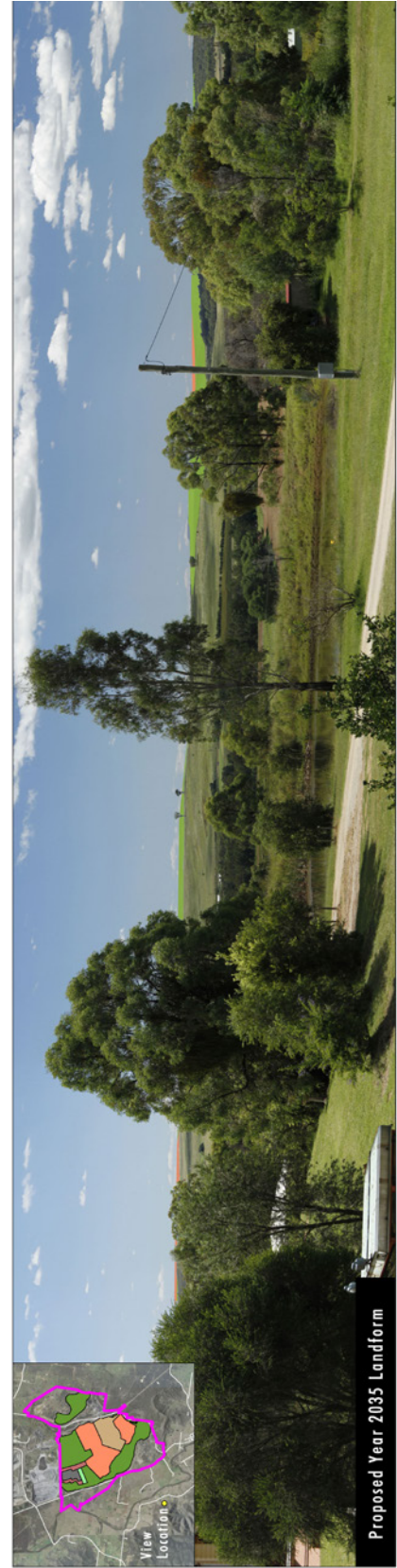
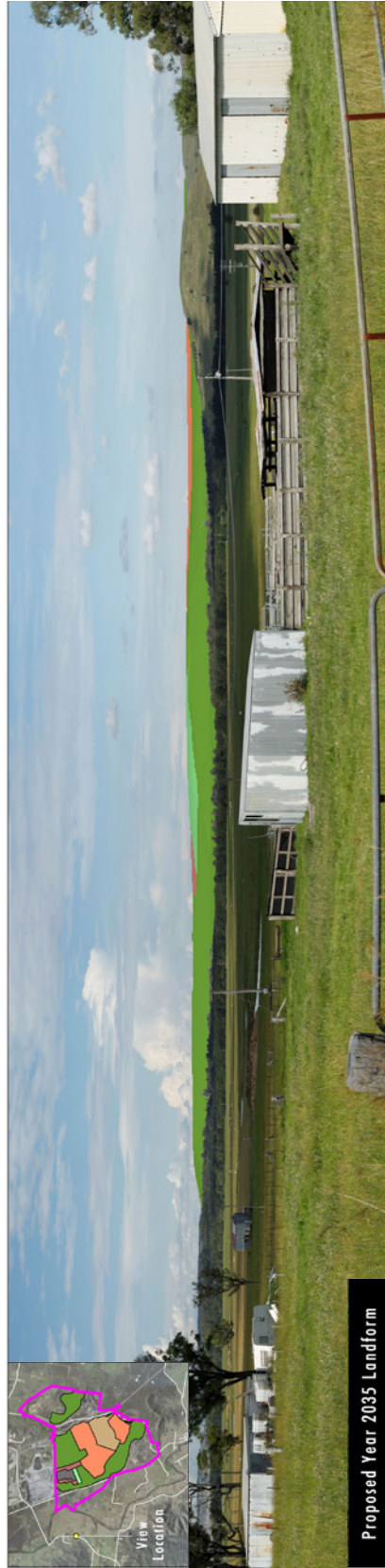
Visual Impacts

Slight increase in internal dump heights.

The Proposed modification will result in-pit emplacement areas increasing in height from 150mRL to 160mRL, with select areas to 175mRL to provide topographical relief. This increased height reduces the need to apply for additional out-of-pit emplacements

areas which would result in additional land disturbance. The Noise and Visual Bund will remain in place and will prevent visual impacts to the south and west of the site. There will be only minor changes to the visibility of the active and inactive overburden areas in some elevated areas most notably from the north-west.

Montages of Upper Bulga, Putty Rd and Catherine Vale for 2035.



- Legend**
- Active Overburden Emplacement Area
 - Inactive Overburden Emplacement Area
 - Rehabilitation Area Temporary
 - Rehabilitation Area



Surface Water

Impacts on water resources associated with the proposed modification are being assessed in detail as part of the SEE. It is not anticipated that the proposed modification will result in significant impacts on downstream water quality, flows, flooding or water users.

The proposed modification has been designed to convey clean water around mining operations, to maximise water recycling, to reduce external water import and releases, and to segregate, store and reuse mine-impacted water. This approach to water management will minimise adverse effects on water quality from mining operations to downstream waterways.

No new significant water storages are planned as part of the Proposed modification and the existing system of water storages should be adequate with some modifications. Some storages are located within the path of planned open cut operations and would therefore only remain in place for a period of time and may then need to be replaced in order to maintain system function.

Groundwater

The change in the mine pit, most notably the 60m increase in depth, has caused an increase in depressurisation of the deeper coal seam but this has not had any appreciable impacts on the already approved leakage from the alluvial aquifer system to the underlying Permian coal measures.

It is predicted that there will:

- not be an incremental impact on the alluvial aquifer system;
- not be an incremental impact on the potential perched aquifer associated with the Warkworth Sands endangered ecological community;
- not be an incremental impact on any alluvial aquifer groundwater bores.

Blasting

- Any potential impacts associated with blasting activities will be managed so that current blast criteria are met. All blasting will be conducted in accordance with our Blast Management Plan.

Aboriginal & European Heritage

An Aboriginal Cultural Heritage Assessment has been undertaken in collaboration with the Aboriginal community and in accordance with relevant guidelines and principles. Relevant knowledge has been drawn from a comprehensive assessment undertaken in 2013 for the Bulga Optimisation Project, as it covered the proposed disturbance area for the Modification.

A survey of the disturbance area identified two new Aboriginal sites and four previously recorded sites. The 2 new sites were an isolated mudstone core and silcrete flake. The two newly identified sites were unfortunately impacted by construction activity with the incident reported to the Aboriginal community, Department of Planning and Environment and the Office of Environment and Heritage. The previously recorded sites include 2 artefact scatters sites and 2 isolated finds.

The sites located within the proposed disturbance area will be salvaged in accordance with the Aboriginal Cultural Heritage Management Plan.

One item of non-Aboriginal historic heritage is located in the vicinity of the proposed disturbance area. A post and two rail & wire fence approximately 130m in length within the disturbance area will be removed.



Mudstone core found during the survey of the proposed disturbance area.



Greenhouse Gas and Energy

The Statement of Environmental Effects will include a Greenhouse Gas assessment. No change to the annual approved production is proposed, and Bulga Coal will continue to mine similar products, however this will be for the extended period to 2039.

Tailings and Water

The existing Deep Pit tailings will be dredged and pumped up to the Northern Tailings Dam that is located in-pit and augments the existing facility. This will occur between approximately 2022 and 2027.

The tailings relocation has limited community / environmental impacts other than potentially requiring additional draw from the Hunter River. During drier periods additional Hunter River water over our existing licensed allocation may be required. If additional Hunter River allocation is required Bulga Coal will aim to either source licences from within the Glencore group or the open market. Any additional take will be under licence and not impact availability for other users.

Traffic and Transport

The Proposed modification does not plan to increase operational employee numbers therefore traffic volumes are not expected to change.

Construction activities will occur over a limited time period and will require a small additional workforce. Construction activities are expected to occur whilst the Bulga Underground Operations are suspended. This will provide capacity in the local road network to accommodate the construction workforce.

An assessment of the intersection of Broke Road and the access road to the East Pit Muster Area has been undertaken which indicates that the intersection is operating well within the design capacity of the intersection. Traffic flow analysis indicates there are no traffic impacts predicted to be associated with the proposed modification.

Timing

We are compiling our Statement of Environmental Effects (SEE), which are planning to lodge with the Department of Planning & Environment in May. We are seeking your feedback, so if you would like to meet and discuss the modification or anything about our mining activities, please contact:

Ralph Northey
Environment and Community Manager
T: 6570 2539
M: 0418 439 874
ralph.northey@glencore.com.au