EASTCOAST FLORA SURVEY
VEGETATION ASSESSMENT & MAPPING

PO Box 216 KOTARA FAIR NSW 2289
Ph. 02 4953 6523
ABN 38 325 015 471

6 April 2016

John Hindmarsh
Environmental Officer
Rix's Creek Pty Limited
via email jhindmarsh@rixs.com.au

Dear John

Re: Changes to the extent of threatened communities and credits, Rix's Creek Continuation Project

As requested, I have outlined below the process which led to the revision of the extent of threatened vegetation (particularly Commonwealth-listed TECs) potentially impacted upon by the proposed expansion to Rix's Creek mine, from 6 ha to 95 ha, and then back down again to 56 ha. In consultation with Colin Driscoll (accredited Biobanking assessor), I have also outlined the reasons for the change in ecosystem credits calculated as part of the Upper Hunter Strategic Assessments (UHSA) process that came about over the course of the project.

Change in threatened communities' extent

The required revision to the extent of threatened vegetation affected by the proposal was primarily due to the differing assessment requirements necessary for State and Commonwealth governments. Over the life of this project, updates to proposed disturbance areas and threatened ecological communities under relevant legislation have meant several revisions to the original project report, and during this process it became evident that each level of government assessed the same vegetation in different ways.

In the original mapping and assessment of significance in 2013, much of the area of interest was former grazing land that, with the removal of cattle, had responded with mass germination and growth of primarily Ironbark (*Eucalyptus crebra*) saplings. Mapping of these lands consequently pulled out the larger trees and groups of trees or remnants as specific vegetation types, with the balance remaining as 'derived native grasslands'. Assessment under NSW legislation, which does not include such areas of derived grassland in determinations of threatened communities, was required only on the larger trees and remnants. This resulted in a potential impact on approximately 1.5 ha of State-listed threatened ecological communities. At that time, there was no Commonwealth listed affecting the land.

During assessments undertaken in 2014 for the UHSA being run and co-ordinated by OEH, derived native grasslands were not specifically included in State-listed threatened communities and consequently did not trigger a significant impact. However, the UHSA did include Matters of National Significance as listed on the EPBC Act 1999, and for which there is now a Commonwealth listing (Central Hunter Valley Eucalypt Forest and Woodland, CHVEFW) occurring on land owned by Rix's Creek. An update of the mapping and assessment to address the Commonwealth listing was completed in October 2015 using the existing mapping, revealing the presence of approximately 6 ha of CHVEFW. As the Commonwealth had already signed off on the proposed expansion, this assessment was considered an academic exercise only.

Problems were detected, however, in the assessment of Commonwealth-listed vegetation, specifically in how the two levels of government view remnant vegetation. Under Commonwealth legislation, the definition of a 'patch' of vegetation is that with a separation distance of 30m between neighbouring 'tree'

species (not the 100m separation used by NSW), which includes saplings > 1m in height (not included in NSW TECs). This meant that much of that regrowth ironbark that was formerly mapped as derived native grasslands required amalgamation into larger 'patches' under the meaning of the EPBC Act. This situation was exacerbated by the period of time that had elapsed between the original mapping of vegetation in 2013, and the subsequent assessment by determining authorities in 2015. During this period, continual growth of sapling eucalypts evidently became more pronounced in aerial imagery, meaning that considerably more vegetation met the requirements of CHVEFW.

Remapping of the CHVEFW, strictly adhering to EPBC guidelines as detailed above, in 2015 revealed approximately 95ha of this community, an increase from the 6ha originally calculated for CHVEFW. The bulk of this was due to the regrowth ironbark that is now obvious in the aerial imagery (+ the required 30m buffers into grasslands), and which effectively fills in the gaps between the more obvious remnant areas. This 95ha of threatened vegetation includes:

- all patches of *Eucalyptus crebra* and/or *Corymbia maculata* and/or *Eucalyptus moluccana* woody vegetation and saplings >1m high, with separation distances of 30m or less between adjacent trees, and where native ground cover is dominant;
- a 30m buffer into surrounding grassland from the outer edge of these patches, as per the EPBC guidelines.

As a consequence of this process, the amount of significant vegetation protected under the Commonwealth increased to 95 ha, and because of the requirements to include Matters of National Significance, also meant assessment of this vegetation in the UHSA and an update of ecosystem credits.

During the project review process in 2016, OEH disputed the method in which the Commonwealth CHVEFW was interpreted for the Continuation project (in particular, how woodland buffers and derived native grasslands were mapped), and a series of discussions and negotiations were begun. These discussions included the relevant officer from the Commonwealth Department of Environment. Because OEH were co-ordinating the UHSA process, it was important that all projects interpreted CHVEFW in a similar way. As a consequence, GIS staff at OEH developed a method which automated the generation of woodland buffers into derived grassland areas, adhering to the guidelines included in the listing advice for CHVEFW. This process involved the following steps (email advice from Paul Hillier, OEH, 14 March 2016):

1. All equivalent PCT polygons from the BCAM assessment are buffered to a distance of 15m using a Euclidean distance function in Spatial Analyst. Polygons are the source and each cell value corresponds to the Euclidean distance from that source polygon (up to 15m only);
2. Create a new raster layer from only those cells that are 15m from the polygons i.e the furtherest cells. This will be essentially the same as a 15m vector buffer function;
3. Reverse the Euclidean distance function now using the furtherest cells (Step2) as the source and restrict the Euclidean buffering direction back towards the original source polygons. This raster result will not cover all the original buffered area (from step 1) as there will be gaps and those gaps are the buffered areas as per the determination requirement. The final layer is created by converting only those gap areas to a layer.
4. The resulting layer was then queried to select patch sizes at or greater than 0.5 ha.

An additional step to this process was also implemented to improve accuracy and provide a more 'natural' flow, whereby 15m buffering around the centre point of areas between woodland patches that are within 30m of each other was incorporated (email from Paul Hillier, OEH, 1 April 2016). Applying this total process to the Rix's Creek Continuation project area revealed **55.93 ha** of CHVEFW (incorporating 16.82 ha of woodland and 39.11 ha of DNG). This is a reduction from the 95 ha last calculated for this EEC. A revised

map showing the distribution of CHVEFW is appended to this letter, and updates Figure 10 in the Rix's Creek EIS ecology report (Appendix I), and also the image showing the revised mapping of CHVEFW which I emailed to you on that date ("CHVEFW revised map v1_18Dec2015.jpg").

Change in Biobanking credits

A change in the number of credits calculated under the UHSA was required following the OEH adequacy review. Specifically, values entered into the Landscape Value Assessment component required revision to reflect updated values resulting from finalisation of the proposed development area. In addition, areas of derived native grassland were included as 'native vegetation cover', when it was later advised by OEH that such areas should not be included. Other discrepancies identified in the OEH adequacy review included minor changes to Connectivity Value and Adjacent Remnant Area components. Final credit calculations were undertaken in consultation with OEH and these numbers have been used to determine credit requirements for the project.

A typographical error in the number of hectares of DNG was also detected late in the assessment process in March 2016. This involved the documentation of 52.2 ha of DNG in Table 8 of the ecology report, instead of 152.2 ha (subsequently amended to 158.4 ha in the most recent mapping). As a consequence, a revision to the credit calculations was required, which was undertaken by OEH in early April 2016. This resulted in 2,742 credits for DNG (up from 917 credits), and with a total credit load of 3,308 credits.

I trust this information adequately explains the changes in assessment.

Regards

Stephen Bell

Attachment **Revised mapping of CHVEFW and associated Derived Native Grasslands (DNG).**