

8 December 2004

Ms Laura Todd  
Environment Manager  
Fortescue Metals Group  
50 Kings Park Road  
West Perth WA 6005

Dear Laura

## Potential Impacts on Groundwater Dependent Vegetation

Further to our recent discussions, we provide here an assessment of the potential impacts on groundwater dependent vegetation arising from the proposed Fortescue Metals Group (FMG) Stage B mines and rail proposal.

This assessment has been based on:

- our vegetation type mapping (Biota in prep.);
- rangelands unit mapping (with details as provided by FMG);
- existing groundwater levels and predicted draw-down levels associated with the various components of the Stage B proposal (also provided by FMG); and
- our understanding of recognised phreatophytes (groundwater dependent species) in the region.

I have broken down this assessment by the mine areas comprising the FMG proposal.

### Christmas Creek

The only vegetation type in this mine area that may contain phreatophytic species was:

**Fc4** *Eucalyptus victrix* open woodland over *Acacia coriacea* subsp. *pendens*, *A. aneura*, *Atalaya hemiglauca* low woodland over \**Cenchrus ciliaris* tussock grassland.

This was associated with the main tributary of Christmas Creek itself. *Eucalyptus victrix* is a phreatophytic species, but the extent to which it is phreatophytic is dependent on the local groundwater conditions each individual has become established under (Biota 2002). Current groundwater levels in this area are at approximately 20 – 25 m below surface, and this is likely to be at the limit of eucalypt rooting depth. Some of the *E. victrix* may therefore utilise groundwater for a component of their ecological water requirements. However, modelling indicates that draw downs of only ~1 m are likely to occur in the area of the Fc4 vegetation type. This is likely to be within the typical seasonal and long-term variations in water table depth that the trees experience under natural conditions, and we therefore consider it unlikely that any significant impact would arise from this level of change.

### Mindy Mindy

Only a single vegetation type that may be groundwater dependent occurs in the area to be affected by dewatering at this site. Based on rangelands mapping, this is:

**RGERIV** Active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands.

This vegetation type is likely to have a moderate level of groundwater dependence and is likely to include eucalypts which rely on groundwater for their ecological water requirements.

However, groundwater modelling indicates that a draw down of only 0.5 m is likely to arise from the implementation of the proposed development. Similar to Christmas Creek, this is likely to be within the seasonal and long-term fluctuation range that the keystone tree species in this riverine vegetation type would experience under normal conditions.

### **Mt Lewin**

There were two vegetation type that are potentially sensitive to groundwater change in the area to be affected by the Mt Lewin component of the Stage B proposal:

**Fc 4** *Eucalyptus victrix* open woodland over *Acacia coriacea* subsp. *pendens*, *A. aneura*, *Atalaya hemiglauca* low woodland over \**Cenchrus ciliaris* tussock grassland (a unit mapped as part of surveys for the Stage B proposal; Biota in prep.); and

**11** Flood plains with weakly gilgaied clay soils supporting coolibah woodlands with tussock grass understorey (an AgWA rangelands mapping unit).

The former vegetation type occurred within the main creek at Mt Lewin, whilst the floodplain area occurs in the area to be affected by the borefield. Draw down contours predicted for the area of these vegetation types range between 1 and 5 m, with the current groundwater level at ~15 - 25 m below the surface. The current level of groundwater dependence is likely to be low to moderate in the Fc 4 vegetation type, dependent on the rooting depth of the *E. victrix* associated with this creek. We would expect that the extent of this vegetation type within the area of 1-2 m of draw down would be unaffected by the proposal. Some of the creek line eucalypts in the areas where the groundwater will be drawn down by up to 5 m may be stressed and we would suggest that a properly designed monitoring and management programme be implemented. *E. victrix* occurring in the floodplain area are less likely to be strongly groundwater dependent and therefore at low risk of significant impact from groundwater draw down of a few metres. There would, however, be value in including the affected floodplain vegetation as part of an monitoring programme to confirm this assessment.

None of the FMG Stage B development areas include the two most sensitive phreatophytic species in the region, River Red Gum *Eucalyptus camaldulensis* and Cadjeput *Melaleuca argentea*.

Please contact me should you wish to discuss this summary assessment in more detail.

Yours faithfully,

Biota Environmental Sciences Pty Ltd

Garth Humphreys  
**Ecologist (Director)**

## References

Biota Environmental Sciences (in prep.). Flora and Vegetation the FMG Stage B Mine and Rail Areas. Unpublished report for Fortescue Metals Group, Perth.

Biota Environmental Sciences (2002). Hope Downs Groundwater Dependent Vegetation Monitoring Programme. Unpublished report for Hope Downs Management Services, Perth.