

# Impacts of Coal Mining on Aquatic Ecosystems

There are concerns that open-cut coal mining activities in the Fitzroy River catchment are resulting in changes to water quality, and potentially leading to impacts on aquatic communities on a local and catchment scale. With this in mind, the Australian Coal Association provided research funding to BMT WBM to investigate the impact of variations in water quality on the ecology of the Fitzroy River catchment.

The specific objective of the proposed study was to develop an understanding of the aquatic ecosystem health of waterways potentially affected by mining, using fish and aquatic macroinvertebrates as biological indicators. The bio-indicator approach has the ability to detect natural and human changes in physio-chemical conditions over time, and provides a basis for *directly* evaluating the flow-on effects of water quality to aquatic ecosystems.

The study involved a staged process comprising data review, targeted field sampling and detailed analyses. Sampling was undertaken following standard protocols within a variety of land use zones, and a variety of stations sampled at each zone during wet and dry seasons. These stations represented (i) reference stations (i.e. areas unaffected by mining, including relatively pristine areas and areas influenced by clearing/grazing); and (ii) areas affected by mining.

Reference site data was supplemented by data from previous studies in the region and then compared to data from putatively impacted locations to determine the possible impacts of mining on aquatic ecosystems. Putatively impacted locations included areas situated within mine sites, as well as at varying distances downstream of mine sites to determine the possible extent of downstream impacts. By adopting this approach, the impacts of mining were evaluated separately from impacts of other land uses, most importantly from grazing.

## Client

Australian Coal Association

## Date

2001 - 2003

## Services & Expertise Provided

Provide an understanding of the key impacting processes associated with mining activities (with a focus on water quality) on waterway health;

Develop a set of key biological indicators and sampling protocols to assess water way health; and

Provide a waterway health assessment adjacent to several mine sites using this set of bio-indicators, and assess possible linkages with mining activities.



*Dragonfly larvae*