Ulan Mine - Ulan Coal Mine Continued Operations Project -

Water Impacts - The UCML EA does not adequately consider:

- The ecological consequences of groundwater interference on this river and groundwater system that will take **'in excess of 200 years for recovery".** UCML suggests post mining impacts on the water system are adequately offset by catchment inflows from rehabilitated mined areas.

- The cumulative impacts on the base flow of the Goulburn & Talbragar Rivers from past and present Ulan Coal Mine operations (or other mines). The MER report only predict the magnitude and extent of groundwater related impacts likely to arise from the proposed operations, not the cumulative and ongoing impacts of past and present mining on this significant groundwater system.

- That the reduction in Triassic aquifer pressures (from prior mining) has already affected 'The Drip'. Observations over past 20 years suggest a ***significant decrease in water seepage*** during dry periods from this groundwater dependent natural feature.

- Other alternatives to discharging surplus water to local creeks and rivers (e.g. Managed Aquifer Recharge)

- Alternatives to down-dip mining (Ulan No.3 Underground) to avoid water accumulating in goaf and contamination by mine workings

- Cumulative impacts from channel bed leakage from the GR diversion (estimated at 1ML/day) and loss of catchment runoff due to subsidence cracking and resulting increased infiltration/ leakage to groundwater

Recommendations

- Water discharges to streams requires a best practice release strategy to mimic the natural flow regime through high volume 'pulse' releases (e.g. mimics storm event on the catchment). This also provides a flushing mechanism to dilute potential contaminants that may enter the water course as a result of mining (sediments/clays, salts). Water discharge for environmental purposes should be allocated maximum priority in any water management hierarchy.

- UCML consider altering Ulan No. 3 mine plan to allow 'updip' mining (ie from LW 33-27;UW7-4) rather than continue down-dip accumulating problematic groundwater). Mining up-dip would result in significantly less water make; reduce the need for dewatering and thus time frame for aquifer recovery. Also less water management infrastructure and associated costs (Vol 1-2.3.2.1)

- UCML consider reinjection (Managed Aquifer Recharge- MAR) of extracted groundwater to the north-east of the project area (e.g. Curra Creek fault line)

- Offsets that mitigate losses to stream baseflows should be allocated the highest priority in hierarchy of water usage and discharges (Table 5.3 Vol 1)

- Saline wastewater (from water treatment) planned to be used for onsite dust suppression of coal stockpiles and crushing facilities must not result in the contamination of local creeks (monitoring required) or saline soils post mining (5.4.7)

More notes on WATER (MER –Volume 2, Appendix 6

- The Goulburn River is a primary source of high quality surface and groundwater (DECC). The pre-mining water table regime reflects a mounding of groundwater beneath the sandstone ridges (topographic highs) that drains to regional sinks (ie the Goulburn River)
- The overlying Triassic sandstones are regarded as ***'significant regional groundwater stores'*** of drinking quality water
- Mining operations at UCML have already induced change in the hard rock groundwater flow directions and depressurised adjacent and overlying strata.
- Groundwater within the UCML area flow east eventually feeding into the Goulburn River Catchment.
- **Groundwater seepage** into the mine is predicted to peak at **24ML/day** by 2018 with up to 17.5Ml/day of eastern flowing groundwater to be diverted to western catchments
- Complete dewatering of the Triassic strata above the mined panels is predicted with 2m drawdown extending 3-5 klms beyond mine footprint.
- Complete dewatering of the Ulan seam extending 10-20kms (2m drawdown).
- Loss to base flow is predicted to reach 0.52Ml/day for the GR, and 0.38Ml/day from The Talbragar River (not including losses from fractured surficial or perched aquifers).

Assessment and monitoring of the extent of aquifer depressurisation due to mining indicate connected and drainable cracking from the Ulan seam upwards through the entire succession of strata, and the complete dewatering of the overlying (Triassic strata) creating a groundwater sink ***which has attracted flow from surrounding strata and modified pre-mining flow paths***.

Groundwater divide between easterly and westerly groundwater flows lies 4-5 kms to the west ie all the groundwater intercepted in predominately easterly flowing! (Vol 2 – App6, p.3)

MER predicts Open cut voids (includes East pit- saline concentrate) will be back-filled with waste rocks and coal rejects (spoils) will recharge through rainfall and groundwater recovery (in excess of 200 years) **resulting in EC levels greater than 1700-1800 uS/cm** (ie 1000 mg/L). Existing average background levels for Permian Strata = 1151 uS/cm, Triassic strata = 471 uS/cm **Water Quality**