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From: Dr Noel Merrick

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Re: Metropolitan Mine – Groundwater Transect Bore T3 Investigation Report

Our Ref: HS2018/64

1. Introduction

Metropolitan Coal has requested that HydroSimulations undertake an investigation into an exceedance of the Level 3 groundwater trigger level measured at groundwater transect bore T3. The investigation below provides an assessment against the relevant performance measure in Project Approval 08_0149 and provides recommendations in relation to the triggers.

2. Background

Groundwater monitoring results at the Metropolitan Mine are assessed against performance indicators using the Trigger Action Response Plan (Table 19) detailed in the Longwalls 301-303 Water Management Plan.

An exceedance of the Level 3 trigger and performance indicator, *The water level at bore T3 is greater than 171.8 m*, was identified for bore T3 in April 2018 (**Figure 1**). The exact date T3 went into Level 3 trigger was 21 April 2018.

3. Performance Measure Assessment

In accordance with the Trigger Action Response Plan, an investigation has been conducted and an assessment made against the following performance measure:

Negligible leakage from the Woronora Reservoir.

The performance indicators are designed to provide an early warning for assessment of negligible leakage from the Woronora Reservoir. Leakage from the Woronora Reservoir to the surrounding groundwater environment would occur if there is a reversal of hydraulic gradient (i.e. when the water table in surrounding piezometers is below the water level in the Woronora Reservoir).

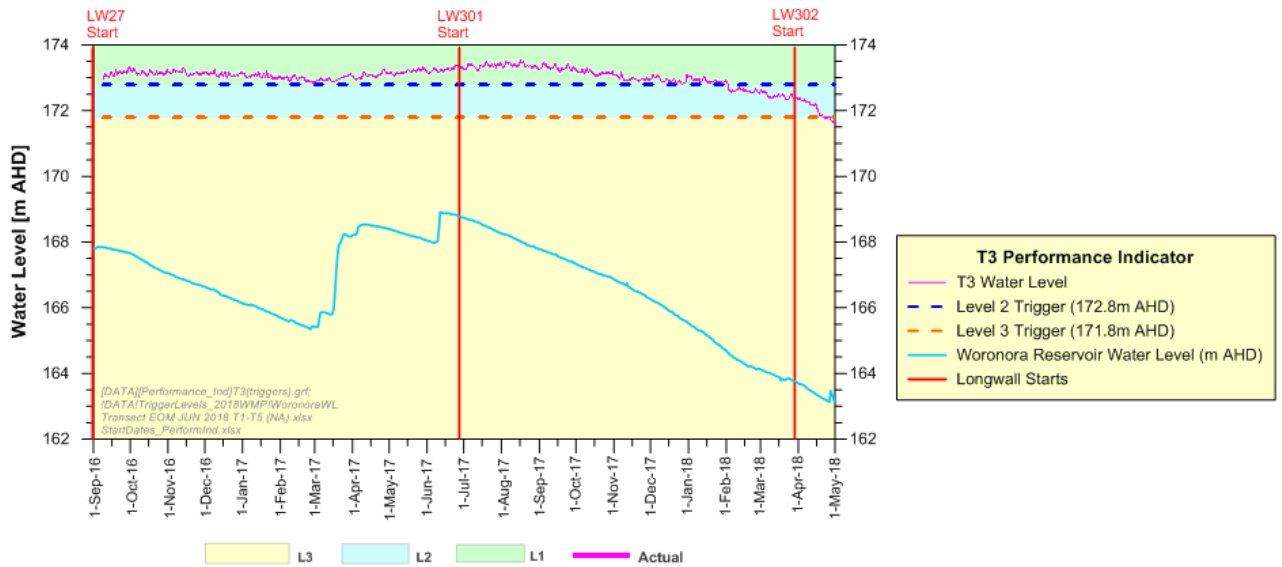


Figure 1 Groundwater Level at Bore T3

The groundwater level at groundwater transect bore T3 is presented in **Figure 1**. The Woronora Reservoir water level is also shown on **Figure 1**. The Woronora Reservoir water levels have been declining since June 2017. **Figure 1** indicates there has not been a reversal of gradient from Bore T3 to the Woronora Reservoir as the water table at Bore T3 remains above the Woronora Reservoir water level. WaterNSW water level data for the Woronora Reservoir indicates that the actual Woronora Reservoir water level was approximately 8.44 metres below the measured water table at Bore T3 as at 30 April 2018.

The groundwater level at groundwater transect bore T2, which is nearer to the Woronora Reservoir) is presented in **Figure 2**. The hydrographs displayed on **Figure 1** and **Figure 2** show that the declining water levels in bores T3 and T2 are driven by a decline in the reservoir water level due to climatic conditions and dam operations. Accordingly, there has **not** been an exceedance of the performance measure for negligible leakage from the Woronora Reservoir.

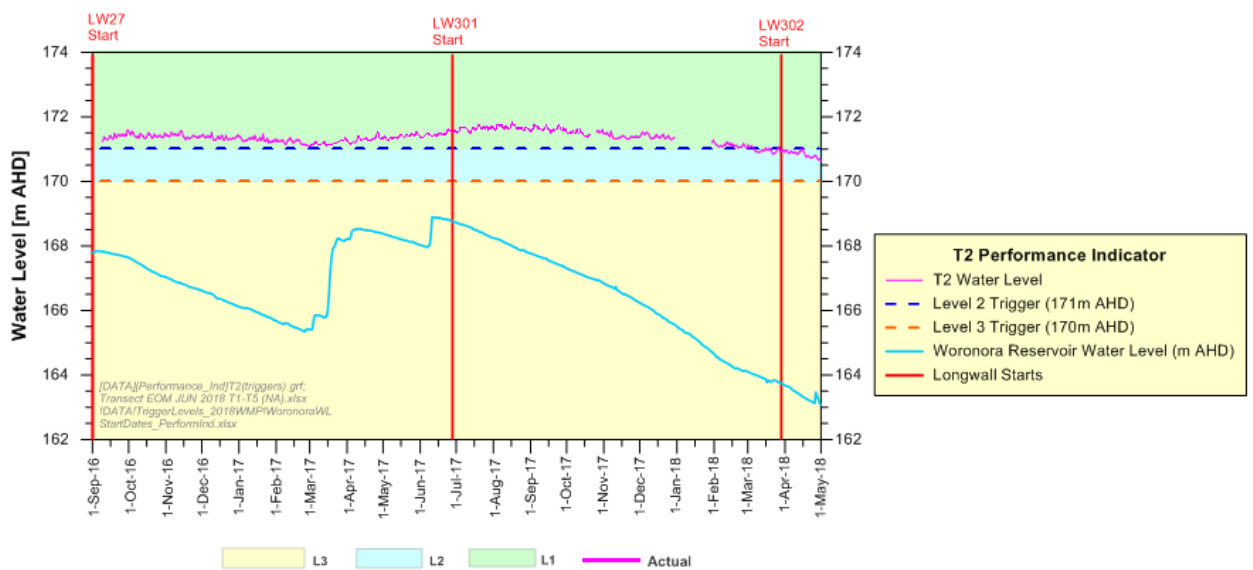


Figure 2 Groundwater Level at Bore T2

4. Conclusion and Recommendations

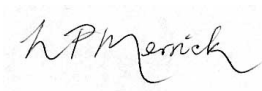
Bores T2 and T3 remain above the Woronora Reservoir water levels. Accordingly, there has not been an exceedance of the performance measure for negligible leakage from the Woronora Reservoir.

The Longwalls 301-303 Water Management Plan requires Metropolitan Coal to consider the need for management measures following the exceedance of a performance indicator. No specific management measures are considered to be required.

Given the strong dependence of bore T2 and bore T3 water levels on reservoir level, there is considered to be no merit in setting any absolute trigger levels at these sites. It is recommended that the bore T2 and bore T3 triggers be either modified to take into consideration changes in the water level of the Woronora Reservoir (due to climate and dam operations) or be removed in the next revision of the Water Management Plan.

It is considered likely that the water levels in bores T2 and T3 will continue to fall if the current dry prevailing climatic conditions continue. If monthly analyses of water levels in bores T2 and T3 indicate the water levels reflect a similar trend to the Woronora Reservoir water levels (i.e. they fall when water levels in the Woronora Reservoir fall) and the water levels in bores T2 and T3 remain above the Woronora Reservoir water level, there is considered to be no need to conduct further assessments against the performance measure, *Negligible leakage from the Woronora Reservoir*.

Yours sincerely



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