HYDRO ENGINEERING
& CONSULTING PTY LTD

27 July 2020

Director
EMM Consulting
Ground floor, 20 Chandos Street
St Leonards NSW 2065
Attention: Brett McLennan

Brett,

Re: Tahmoor South Project Amendment – Surface Water Impacts

1. INTRODUCTION

1.1 Background

Tahmoor Coal Pty Ltd (Tahmoor Coal) owns and operates the Tahmoor Mine, an existing underground coal mine approximately 80 kilometres (km) south-west of Sydney in the Southern Coalfields of New South Wales (NSW). The mine has been operating since 1979 when product coal was first produced.

Currently, up to three million tonnes (Mt) of run-of-mine (ROM) coal is extracted annually from the mine. Product coal is primarily transported via rail to Port Kembla Coal Terminal, or to Newcastle Port Waratah from time to time, for shipment to both Australian and international markets.

Tahmoor Mine employs close to 400 people.

Mining within the existing Tahmoor North mining area is scheduled for completion by approximately 2022, depending on geological and mining conditions. Without access to a new extraction area by this time, Tahmoor Coal would commence closure of the mine resulting in cessation of the extraction of the coking coal resource. Accordingly, Tahmoor Coal is seeking approval for the Tahmoor South Project, being an extension of underground coal mining at Tahmoor Mine, to the south of Tahmoor Coal's existing mining area (the Project).

Given its significance to the State, the Project is deemed to be State significant development (SSD) under the provisions of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). Under these provisions, the NSW Minister for Planning and Public Spaces, or delegate, is the consent authority for the Project. Approval for the Project is also required from the Commonwealth Minister for the Environment under the provisions of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Following the receipt of updated Secretary's Environmental Assessment Requirements (SEARs) in June 2018, a comprehensive environmental impact statement (EIS) was prepared by AECOM Australia Pty Limited (AECOM 2018) for the Project. The EIS was publicly exhibited between 23 January and 5 March 2019 by the NSW Department of Planning, Industry and Environment (DPIE). In response, 91 submissions were received from the community and community organisations, and 15 responses were received from government agencies and councils.

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On 20 February 2020, a submissions report (AECOM 2020a) was lodged with DPIE which responded to all submissions made during exhibition of the EIS. At the same time (i.e. 20 February 2020) a project amendment report (AECOM 2020b) was lodged with DPIE to document amendments made to the Project in response to the submissions and to reduce potential environmental impacts of the Project.

The amendments documented in the project amendment report included, among other things, changes to the mine plan and the reject emplacement area (REA). The changes to the mine plan included the removal of a longwall in the northern part of the mine (LW109), reconfiguration of the longwall layouts to comprise two series of shorter longwall panels, the reduction of the width of the longwalls, and a reduction in the height of extraction within the longwalls. The changes to the REA included a reduction in the proposed extension area by increasing the height of the REA.

1.2 Amendments to the Project

Tahmoor Coal has now made the decision to make further changes to the Project to further reduce potential environmental impacts, particularly potential subsidence and biodiversity impacts. These amendments include the removal of two longwalls, LW107B and LW108B, further changes to the REA design and small amendments to the layout of the ventilation shafts and associated transmission line easements.

With the removal of LW107B and LW108B the life of mining will be reduced from about 2035 as described in the project amendment report (AECOM 2020b) to about 2032 (i.e. a reduction of about three years).

All other aspects of the Project remain the same as those documented in the project amendment report (AECOM 2020b).

Further details on the proposed amendments to the Project are described in Section 2.

1.3 Purpose of this Report

This report has been prepared by Hydro Engineering & Consulting Pty Ltd (HEC) to consider the current changes to the Project in relation to surface water. This report will be used to support a second project amendment report being prepared by EMM Consulting Pty Ltd on behalf of Tahmoor Coal.

2. AMENDMENTS TO PROJECT

As indicated in Section 1.2, changes are proposed to the Project to further reduce potential environmental impacts, particularly potential subsidence and biodiversity impacts. These amendments include:

- the removal of two longwalls in the southern part of the mine (LW107B and LW108B);
- the containment of the REA within the bounds of the currently approved disturbance footprint; and
- changes to the layout of the ventilation shafts.

The removal of LW107B and LW108B will reduce the estimated production volume of the Project from about:

- 43 million tonnes (Mt) of ROM coal considered in the project amendment report (AECOM 2020b) to 33 Mt;
- 30 Mt of coking coal considered in AECOM (2020b) to 23 Mt; and
- 2 Mt of thermal coal considered in AECOM (2020b) to 1.4 Mt.

The removal of LW107B and LW108B will also lead to a reduction in the volume of rejects from about 11.6 Mt to 9.7 Mt.

The containment of the REA within the currently approved disturbance footprint will ensure that no native vegetation, particularly the Shale Sandstone Transition Forest (SSTF) endangered ecological community, will be required to be cleared for the REA. However, to accommodate the reduced footprint, the height of the REA will be increased by 10 m from a top of reduced level (RL) 310 m that was proposed in the project amendment report (AECOM 2020b) to a top of RL 320 m.

The changes to the layout of the ventilation shafts are aimed at reducing clearing of the SSTF during their construction.

Some surface works, rehabilitation and mine closure would be undertaken after the completion of mining activities.

All other aspects of the Project remain the same as those documented in the project amendment report (AECOM, 2020b).

3. ASSESSMENT OF AMENDMENTS TO THE PROJECT

3.1 Summary of Predicted Impacts

The following surface water related impacts have been identified in the Tahmoor South Amended Project Surface Water Impact Assessment (SWIA) report (HEC, 2020a).

1. Reduced downstream streamflows due to increased catchment excision by the pit top catchments.
2. Increased flows due to controlled discharges and overflows from the mine water management system.
3. Loss of surface flow in streams to subsidence induced fracturing – underflow.
4. Loss of surface flow in streams to groundwater – baseflow reduction. This includes the cumulative effect of the Project, consumptive groundwater extraction and the effects of other existing mining projects.
5. Reduced flows due to trapping of runoff in subsidence depressions.
6. Potential impacts to streamflow and pool water level within the Wirrimbirra Sanctuary.
7. Potential impacts to the hydrology of Thirlmere Lakes.
8. Potential to change erosion and sediment deposition patterns in creeks overlying longwalls caused by changes in flow velocity and bed shear stress due to subsidence.
9. Changed flood levels in creeks or overland flow paths overlying longwalls caused by changes in stream geometry due to subsidence.
10. Potential water quality impacts of water releases from the pit top area.
11. Potential impacts to groundwater quality due to underground water storage.
12. Liberation of contaminants from subsidence induced fracturing in watercourses.
13. Changes to chemical characteristics of surface flow due to changes in baseflow.
14. Contamination of surface waters by gas drainage.

These predicted impacts are considered in light of the additional changes proposed to the Project in the following sub-sections.

3.2 Reduced Flow in Tahmoor South Area Watercourses Due to Catchment Excision

3.2.1 Reject Emplacement Area

Catchment runoff intercepted within the pit top water management system would reduce catchment yield to downstream watercourses. The total catchment of the REA reporting to the water management system as at December 2018 was estimated as part of the Tahmoor South Amended Project Water Management System and Site Water Balance (WMS/SWB - HEC, 2020b) as approximately 59 hectares (ha). This area was estimated to increase to approximately 63 ha by mid-2020 and to increase slightly in size thereafter to a maximum of 69 ha - refer Figure 7 to Figure 12 in HEC (2020b). Figure 12 from HEC (2020b) is reproduced as Figure 1 below. The maximum catchment area excised represents approximately 0.5% of the catchment area of the Bargo River at its confluence with the Nepean River.

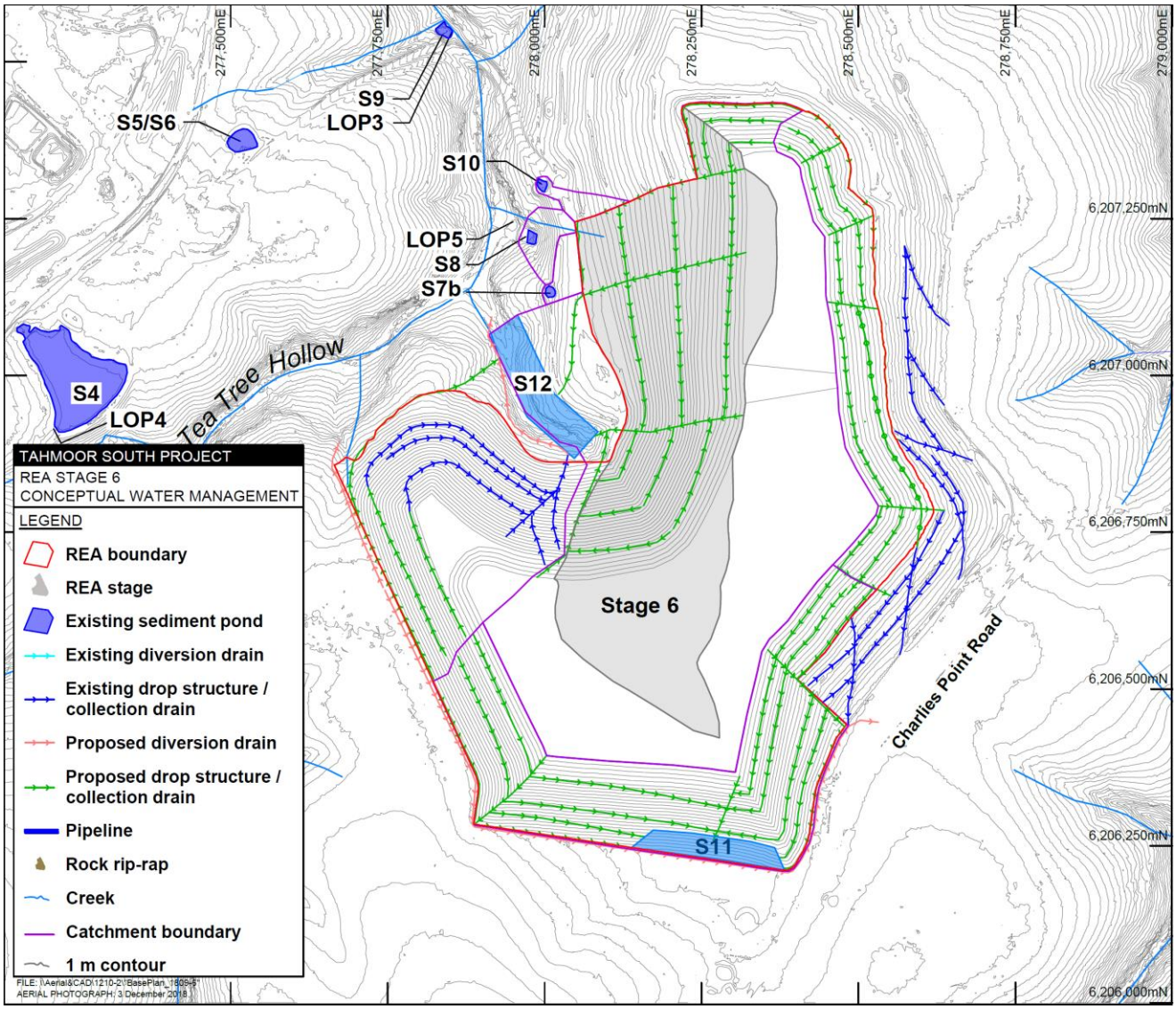

Figure 1 REA Stage 6 Conceptual Water Management System - Tahmoor South Amended Project Water Management System and Site Water Balance (HEC, 2020b)

As indicated in Section 2 above, as part of the further Project amendments now proposed, the REA is to be contained within the bounds of the currently approved disturbance footprint. The revised Stage 6 REA layout and conceptual water management system is shown in Figure 2.

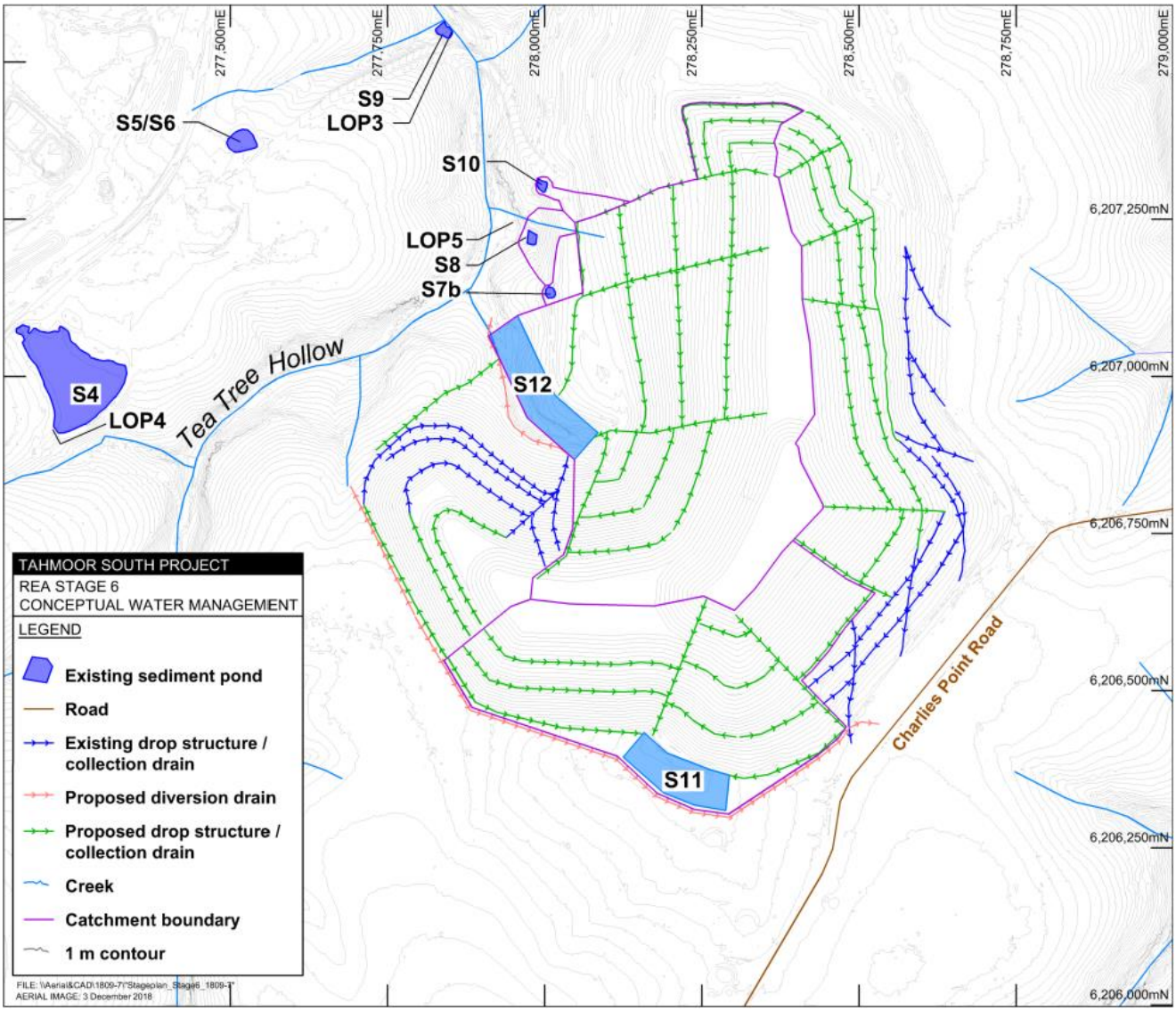

Figure 2 Proposed Revised REA Stage 6 Conceptual Water Management System

The total catchment of the Stage 6 REA reporting to the site water management system in Figure 2 is estimated to be approximately 45 ha. This compares with a total catchment area of the Stage 6 REA reporting to the site water management system of approximately 56 ha for the system shown in Figure 1. Therefore there is a decrease in the catchment area reporting to the site water management system for the proposed amended Project when compared with catchment areas reported in HEC (2020a). As such, there should be a lesser reduction in catchment yield as a result of the proposed amended development of the REA when compared with HEC (2020a).

The sizing of sediment ponds S11 and S12 would change as a result of the proposed amended development of the REA. These changes are summarised in Table 1. The sizing calculations have been undertaken in accordance with the Landcom (2004) and DECC (2008) guidelines as described in HEC (2020b).

The water management system in Figure 2 is conceptual only. It will be subject to a detailed design that will be undertaken and documented prior to the height of the REA exceeding its current height limit of RL 300 m.

Table 1 Summary of Proposed Sediment Dams

Sediment Dam	HEC (2020b)		Proposed Amended REA	
	Minimum Required Volume (ML)	Pump Rate (L/s)	Minimum Required Volume (ML)	Pump Rate (L/s)
S11	18.3	30	23.4	40
S12	33.0	60	21.8	35

3.2.2 Changes to Licensed Discharge Volumes

Volumes of licensed discharges from the mine water management system are related to groundwater inflows to underground mining operations, with mine inflows returned to the surface, treated and in part recycled for mine use, with a portion discharged to Tea Tree Hollow via EPL 1389 Licensed Discharge Point 1 (LDP1). Forecast underground groundwater inflow rates for the SWIA were provided by HydroSimulations (2020). The SWIA for the Tahmoor South Amended Project (HEC, 2020a) forecast a transient change in flows in Tea Tree Hollow below LDP1 averaging between an increase of 0.2 ML/d to a decrease of up to 2.6 ML/d.

For the proposed amended Project, from an underground mine groundwater inflow perspective, it is understood that:[1]

- peak groundwater inflow rates are unlikely to change significantly; and
- the duration of groundwater inflow would be reduced by approximately three years due to the reduction in mine life, thereby reducing the total inflow over the active mine life by approximately 1,800 ML.

These effects are expected to directly affect the mine water balance and forecast LDP1 outflows. With reference to Figure 20 in the WMS/SWB report (HEC, 2020b) it may be seen that peak forecast outflows occur from LDP1 in 2033/34 – i.e. two to three years from the end of mine life. With the proposed amended Project to end in about 2032 (refer Section 2), the higher discharge periods from 2033 will no longer occur. Predicted discharges in earlier years are unlikely to change significantly, although there may be some reduction on average due to the reduced REA catchment area (refer Section 3.2.1).

3.3 Loss of Flow in Tahmoor South Area Watercourses Due To Underflow

The impacts of localised diversion of surface flow in upsidence induced subsurface fracture networks include loss of water holding capacity of pools, reduced frequency of pools overflowing and periodic loss of interconnection between pools within the affected reach during dry weather conditions. Potentially such impacts could occur in Tea Tree Hollow and Dog Trap Creek as a result of the Project. LW107B and LW108B underlie the upstream reaches of Dog Trap Creek and its tributaries, therefore Tea Tree Hollow would be unaffected by the proposed removal of these two longwalls. The upstream reaches of Dog Trap Creek and its tributaries have been mapped as first order streams by MSEC (2020). Mapped pools on these streams are located further north and do not overlie LW107B and LW108B. Therefore the potential impact on the upper reaches of Dog Trap Creek and its tributaries of subsidence induced fracturing associated with LW107B and LW108B would have been low. Pending any changes to the detailed subsidence assessment for the remaining longwalls, it is considered unlikely that there would be any change to the potential for underflow occurring in the lower reaches of Dog Trap Creek and its tributaries, from LW106B northwards. Qualitative risks to mapped pools are documented in the SWIA (HEC, 2020a) and remain valid for the proposed amended Project.

[1] Will Minchin, consulting hydrogeologist, Watershed HydroGeo, personal communication, 2 July 2020.

3.4 Reduced Flow in Tahmoor South Area Watercourses due to Baseflow Reduction

Predictions of baseflow reductions for local and regional streams have been provided by HydroSimulations (2020) and are summarised in Table 6 and Table 15 of the SWIA (HEC, 2020a) at the main watercourse monitoring sites, with flow impacts for the individual watercourses quantified across a range of flow rates.

For the proposed amended Project, the following qualitative changes to forecast baseflow reduction for the proposed amended Project have been advised[2]:

- Cow Creek: smaller baseflow reduction;
- Dog Trap Creek: smaller baseflow reduction at headwaters of creek (in vicinity of LW107B and LW108B), otherwise unchanged further downstream; and
- other watercourses: no change to baseflow reduction.

The potential impacts of baseflow reduction to flow and to pools in Dog Trap and Cow Creeks would therefore be less than documented in SWIA (HEC, 2020a), with no change to other watercourses.

3.5 Reduced Flow in Tahmoor South Area Watercourses due to Trapping of Runoff in Subsidence Depressions

The SWIA (HEC, 2020a) identified only one location in which subsidence induced depressions may occur - upstream of the tailgate of LW103B. This is remote from LW107B and LW108B which are to be removed from the proposed amended Project and therefore this predicted impact would be unchanged.

3.6 Potential Impacts to Wirrimbirra Sanctuary

A tributary of Tea Tree Hollow and a small portion of Tea Tree Hollow flow through the Wirrimbirra Sanctuary. A change to the low flow regime in the tributary of Tea Tree Hollow was quantified in the SWIA (HEC, 2020a). This area is remote from LW107B and LW108B and therefore no change to subsidence-related effects are likely. No changes to baseflow reductions are also likely for these streams[3]. Therefore predicted impacts documented in the SWIA (HEC, 2020a) would be unchanged.

3.7 Potential Impacts the Hydrology of Thirlmere Lakes

There were no surface impacts associated with potential impacts to the Thirlmere Lakes associated with the amended Project (e.g. due to subsidence). Potential impacts were related to groundwater drawdown. Modelling predicted that average Lake water levels would decrease by between 0.01 m and 0.06 m, with the predicted average number of weeks per decade that the Lakes were without any discernible ponded water rising by between 3 and 5.2 weeks, decreasing with time following the end of mining. The proposed amended Project would result in a very small reduction in groundwater drawdown, but this is unlikely to be discernible or significant[4]. Consequently there is unlikely to be any change to the negligible impacts to the Lakes documented in the SWIA (HEC, 2020a).

[2] Will Minchin, consulting hydrogeologist, Watershed HydroGeo, personal communication, 2 July 2020.
[3] Ibid.
[4] Ibid.

3.8 Changes in Streamflow Velocity and Bed Shear Stress due to Subsidence

Subsidence can result in changes to the vertical and horizontal alignment of overlying watercourses, which in turn can result in changes to the hydraulic characteristics of the watercourses and has the potential to change erosion and sediment deposition patterns. The hydraulic characteristics of Tea Tree Hollow and Dog Trap Creek were assessed using a hydraulic (flood) model, as reported in the SWIA (HEC, 2020a) and the Flood Study (FS) report (HEC, 2020c). Tea Tree Hollow is remote from LW107B and LW108B and therefore no change to subsidence-related effects (including changes to streamflow velocity and bed shear) are likely.

For Dog Trap Creek, predicted changes to flow velocity and bed shear are documented in Figure 63, Figure 64, Figure 69 and Figure 70 of the SWIA (HEC, 2020a). These indicate that changes are predicted from LW107B downstream (i.e. to the north-east). The removal of LW108B (located south-west of LW107B) as part of the proposed amended Project would therefore have no effect on these predictions. The removal of LW107B as part of the proposed amended Project would eliminate the changes in flow velocity and bed shear predicted within the stream reaches directly overlying LW107B. With the removal of LW107B, there is potential for increased flow velocity and bed shear in Dog Trap Creek and its tributaries at the south-western margin of LW106B (i.e. where the creeks flow over the south-western edge of LW106B) – these locations are highlighted (circled) in Figure 3.

Any effect is likely to be localised to these areas, with no additional effects further downstream. These areas could potentially experience localised increased erosion, depending on the specific nature of the bed materials. Suggested management and mitigation measures are given in Section 8.1.3 of the SWIA (HEC, 2020a).

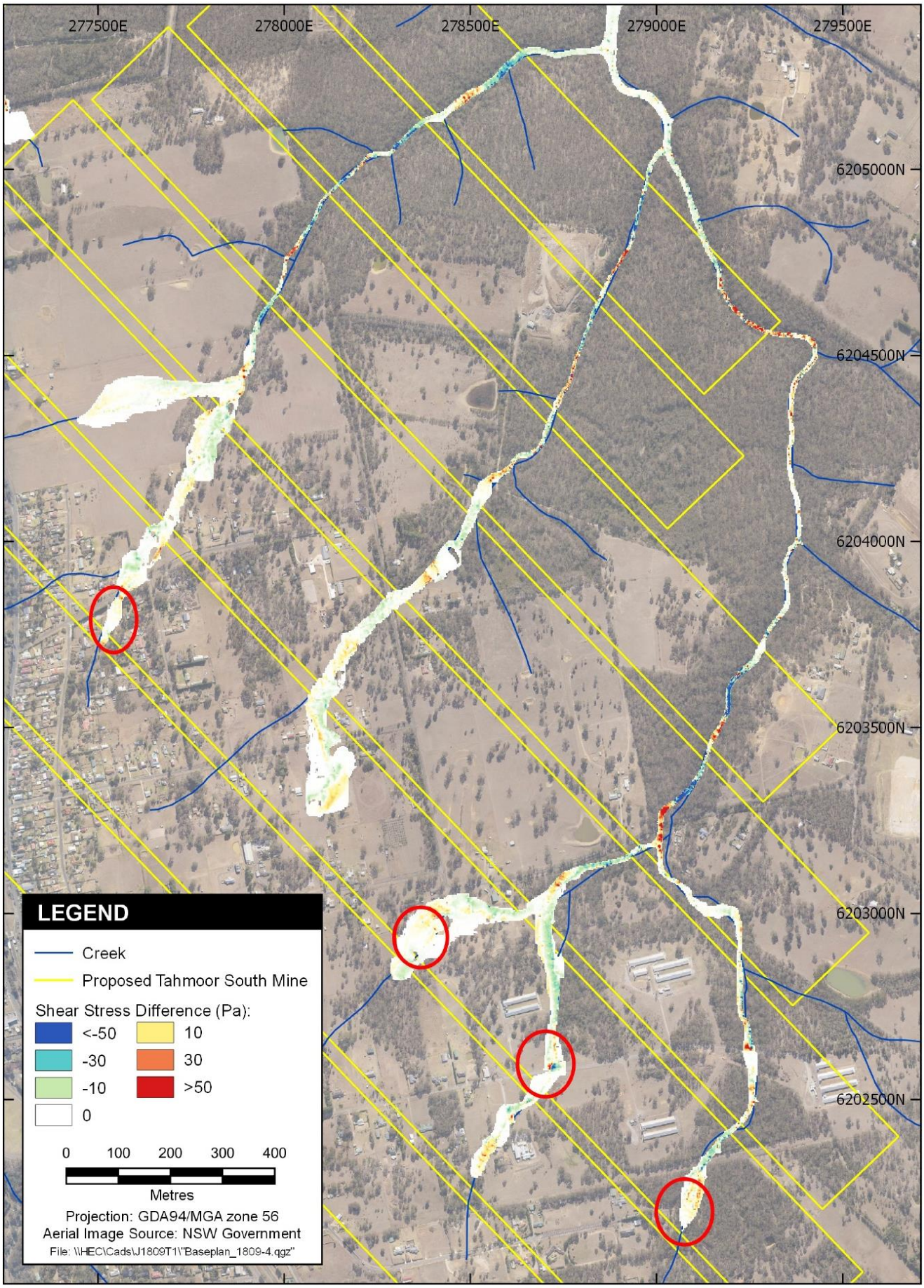

Figure 3 Predicted Change in Bed Shear – Dog Trap Creek (upstream) 50% AEP Event (per HEC, 2020a)

3.9 Changes in Flood Levels due to Subsidence

3.9.1 Creek Flood Levels in Downstream Reaches

Flood modelling of Dog Trap Creek and Tea Tree Hollow was reported in the Project FS report (HEC, 2020c). Predicted flood extents are shown in Figure 4 to Figure 11 of that report. No changes are likely to the predicted flood levels and extents resulting from subsidence-related effects in Tea Tree Hollow, because LW107B and LW108B are located in the headwaters of Dog Trap Creek.

In Dog Trap Creek in the reaches overlying LW107B, only small changes were predicted to flooding extents and these would not occur for the proposed amended Project, with the removal of LW107B. The small changes predicted to flood extents downstream of LW107B would likely remain for the proposed amended Project.

3.9.2 Overland Flow Paths in and near Bargo Township

LW106B, LW107B and LW108B were planned to be mined under the Bargo Township. These areas drain to the headwaters of Tea Tree Hollow and Dog Trap Creek. The layout of proposed longwalls in relation to the Bargo Township is shown in Figure 4 (copied from Figure 12 of the FS report – HEC [2020c]). The locations where existing overland flow paths could be adversely affected by subsidence are shown as numbered circles in Figure 4.

With the removal of LW107B and LW108B as part of the proposed amended Project, the following potentially affected overland flow paths in the headwaters of Dog Trap Creek would no longer be affected: 5, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17. The remaining overland flow paths shown on Figure 4 should remain unchanged in terms of potential effects. These are assessed in the FS report – HEC (2020c). The overall conclusion of the assessment was that, based on subsidence predictions, the predicted subsidence induced tilts are small relative to the natural gradients along potential overland flow paths and any changes to flow along these features is likely to be imperceptible.

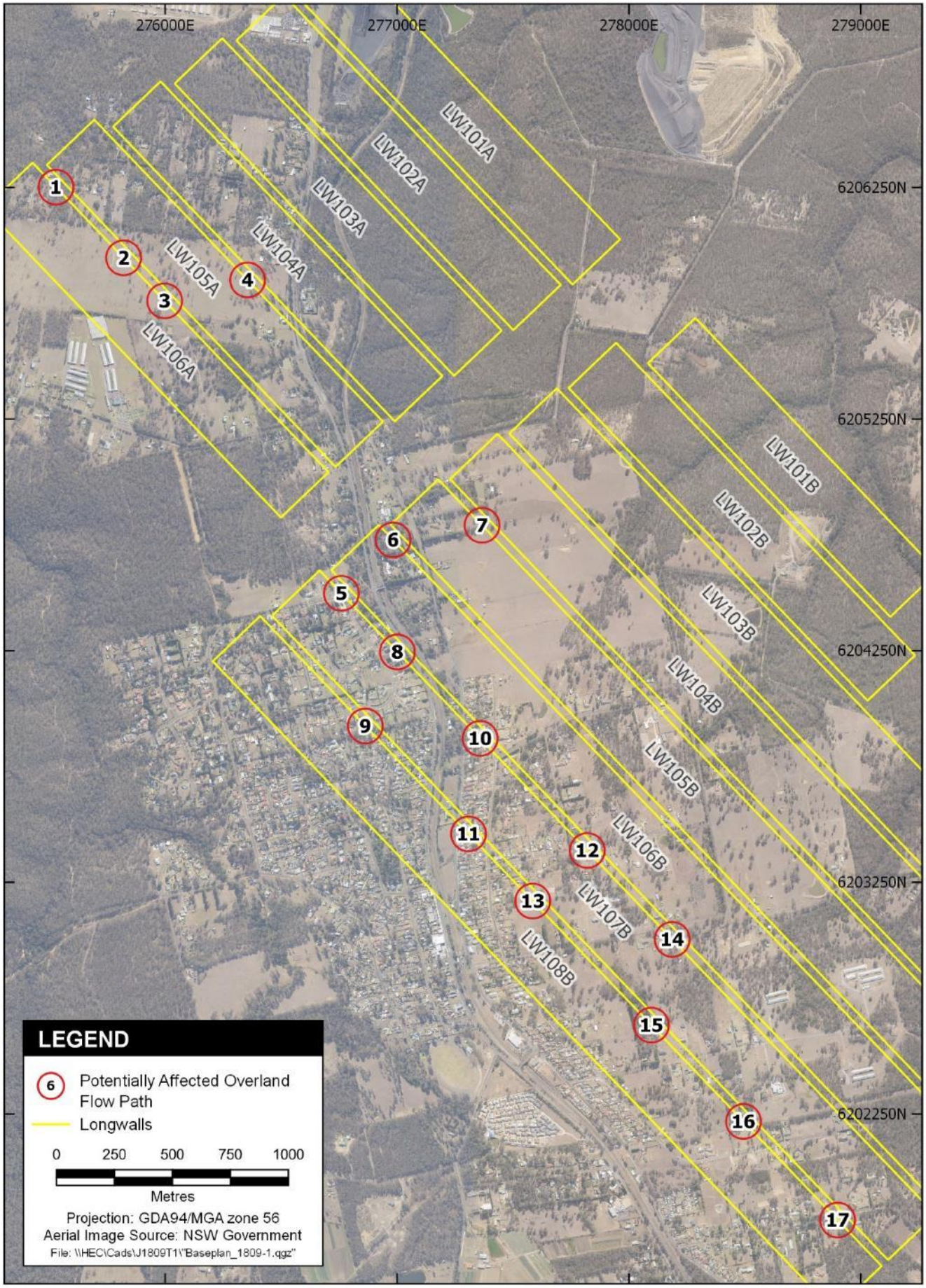

Figure 4 **Proposed Longwall Panel Layout – Bargo Township and Potentially Affected Overland Flow Paths (per HEC, 2020c)**

3.10 Potential Water Quality Impacts of Water Releases from Pit Top Area

Tahmoor Coal are licensed to release treated water from the water management system in accordance with EPL 1389 release limits. As part of Pollution Reduction Program 22, the Waste Water Treatment Plant (WWTP) target water quality is to meet the 95th percentile ANZECC default guideline trigger values for the protection of aquatic ecosystems (ANZG, 2018). The SWIA (HEC, 2020a) concluded that the Project would not result in adverse water quality impacts due to LDP1 releases and overflows from the site water management system.

A key driver of LDP1 releases is underground mine inflow from groundwater. As outlined in Section 3.2, mine water balance modelling (HEC, 2020b) had forecast peak median discharge volumes from LDP1 in 2033/34. With the proposed amended Project shortening the Project life to end in about 2032 (refer Section 2), the higher discharge periods from 2033 will no longer occur. This further reduces the risk of adverse impacts of releases on downstream water quality.

Potential impact of releases from licensed overflow points (LOPs) were also assessed in the SWIA (HEC, 2020a). Given the proposed reduction in the area of the REA for the proposed amended Project, the volumes discharged from the LOPs should decrease, reducing any downstream water quality affects.

3.11 Potential Impacts to Groundwater Quality due to Underground Water Storage

As described in HEC (2020b), it is proposed to develop an underground storage within goafed areas of the Tahmoor North underground mine into which mine dewatering from the Project would be transferred at times when there is insufficient capacity to treat the dewatering stream through the upgraded WWTP. The SWIA (HEC, 2020a) indicated that impacts to groundwater quality due to underground storage were unlikely to occur. The results of water balance modelling in HEC (2020b) included forecast stored volume within the proposed underground water storage (Figure 24 in HEC [2020b]). These volumes were predicted to peak in 2033/34. With the proposed amended Project shortening the Project life to end in about 2032 (refer Section 2), the forecast peak volumes would no longer be reached. Therefore, the risk of any impact on groundwater quality due to the underground water storage would be reduced for the proposed amended Project.

3.12 Liberation of Contaminants from Subsidence Induced Fracturing in Watercourses

Liberation of contaminants can occur from subsidence induced fracturing in watercourses, causing localised and transient increases in iron concentrations and other constituents due to flushing of freshly exposed fractures in the sandstone rocks which contain iron and other mineralisation. As indicated in Section 3.3, the potential impact on the upper reaches of Dog Trap Creek and its tributaries of subsidence induced fracturing associated with LW107B and LW108B, which are proposed to be removed as part of the amended Project, would have been low. It is therefore considered that the risk of liberation of contaminants would be unchanged for the proposed amended Project – that is, potential localised releases of aluminium, iron, manganese and zinc that are transient in nature.

3.13 Changes to Chemical Characteristics of Surface Flow due to Changes in Baseflow

One of the effects of longwall subsidence on watercourses commonly reported is the emergence of ferruginous springs, as described in the SWIA (HEC, 2020a). The removal of LW107B and LW108B as part of the proposed amended Project would reduce the risk of such an impact.

3.14 Contamination of Surface Waters by Gas Drainage

Drainage of strata gas and expression to the surface through surface water has occurred to varying degrees in the Southern Coalfields. Studies of the phenomena have shown that the gas flow does not affect the quality of surface waters that it drains through. The removal of LW107B and LW108B as part of the proposed amended Project would reduce the risk of the occurrence of gas drainage.

3.15 Recommended Monitoring, Mitigation and Management

All monitoring, mitigation and management measures given in the SWIA (HEC, 2020a) remain unchanged for the proposed amended Project.

4. CONCLUSION

Surface water related impacts from the SWIA (HEC, 2020a) are summarised in Table 2 below, together with anticipated changes as a result of the proposed amended Project.

Table 2 Summary of Proposed Impacts and Changes

Surface Water Related Impact	Change for Proposed Amended Project
Reduced catchment yield due to enlarged REA – equivalent to 0.5% of the catchment area of the Bargo River at its confluence with the Nepean River.	REA is contained within the bounds of the currently approved disturbance footprint. Lower reduction in catchment yield. Sediment ponds S11 and S12 re-sized.
Changes in LDP1 discharges affecting flows in Tea Tree Hollow – a forecast change averaging between an increase of 0.2 ML/d to a decrease of up to 2.6 ML/d.	Peak forecast outflows which were predicted to occur in 2033/34 will no longer occur due to the proposed amended Project ending in about 2032. Predicted discharges in early years are unlikely to change significantly.
Loss of surface flow in undermined watercourses due to underflow. Qualitative risks to mapped pools documented in SWIA.	Unlikely to be any change due to removal of LW107B and LW108B which are located in the upper reaches of Dog Trap Creek and its tributaries, away from mapped pools.
Loss of streamflow due to baseflow reduction. Forecast flow reduction at flow monitoring locations due to Project of 0.05% to 1.3% of mean daily flow.	Smaller baseflow reduction on Cow Creek and upstream Dog Trap Creek; unchanged in other watercourses. The potential impacts of baseflow reduction to flow and to pools in Dog Trap and Cow Creeks would therefore be reduced.
Potential trapping of flow in subsidence induced depressions at one location upstream of the tailgate of LW103B.	Unlikely to be any change due to removal of LW107B and LW108B which are remote from LW103B.
Impact on baseflow in tributary of Tea Tree Hollow within Wirrimbirra Sanctuary. Discernible reduction in low flows – e.g. reducing the probability that flow would be greater than 0.01 ML/day from 80% to 74% of days.	No change likely.
Hydrology of Thirlmere Lakes. Imperceptible (negligible) change to water level and periods without surface water.	No change likely.
Change in flow velocity/bed shear leading to changed erosion and sediment deposition patterns. Small, isolated increases were predicted which have the potential to cause localised increased erosion, depending on the specific nature of the bed materials.	No changes to Tea Tree Hollow or areas overlying LW108B. Removal of LW107B would eliminate the changes in flow velocity and bed shear predicted within the Dog Trap Creek reaches directly overlying. There is potential for increased flow velocity in Dog Trap Creek and its tributaries at the south-western margin of LW106B. Similar management and mitigation measures as those given in the SWIA should apply to these areas.
Subsidence induced changes to flood levels - small changes to flooding extents were predicted.	Removal of LW107B would eliminate the changes to flooding extents predicted within the Dog Trap Creek reaches directly overlying. No changes are likely further downstream or in Tea Tree Hollow.

Table 2 Summary of Proposed Impacts and Changes (Continued)

Surface Water Related Impact	Change for Proposed Amended Project
Potential impacts to overland flow paths in and near Bargo Township - any changes to flow along these features was assessed as likely to be imperceptible.	With removal of LW107B and LW108B, eleven of seventeen potential impact areas would be eliminated.
Water quality impacts of water releases from pit top area. Planned upgrade of the WWTP and pit top water management system results in no predicted adverse impacts.	Reduction of higher LDP1 discharges at end of planned mine life further reduces water quality impact risk. Reduction of REA footprint should also reduce risk due to reduced volumes discharged from LOPs.
Storage of water in underground goaf potentially affecting surrounding groundwater. Given stored water would predominantly be sourced from groundwater, impacts considered unlikely.	Reduction of risk due to lower total underground groundwater inflow as a result of reduced Project life.
Liberation of contaminants from subsidence induced fracturing in watercourses. Localised increases in aluminium, iron, manganese and zinc possible but expected to be transient in nature.	No change likely.
Potential emergence of ferruginous springs. Historically these impacts have generally been found to be temporary and over time have reduced.	Reduced risk due to removal of LW107B and LW108B.
Water quality impact of gas drainage. Gas flow does not affect the quality of surface waters that it drains through.	Reduced risk due to removal of LW107B and LW108B.

Please contact the undersigned if you have any queries.

Yours faithfully,

Tony Marszalek
Director

References:

AECOM (2018). "Tahmoor South Project - Environmental Impact Statement", prepared for Tahmoor Coal Pty Ltd by AECOM Australia Pty Ltd.

AECOM (2020a). "Tahmoor South Project - Response to Submissions", prepared for Tahmoor Coal Pty Ltd by AECOM Australia Pty Ltd.

AECOM (2020b). "Tahmoor South Project - Project Amendment Report", prepared for Tahmoor Coal Pty Ltd by AECOM Australia Pty Ltd.

HEC (2020a). "Tahmoor South Amended Project Surface Water Impact Assessment", prepared for Tahmoor Coal Pty Ltd by Hydro Engineering & Consulting Pty Ltd, Rev 5, Feb.

HEC (2020b). "Tahmoor South Amended Project Water Management System and Site Water Balance", prepared for Tahmoor Coal Pty Ltd by Hydro Engineering & Consulting Pty Ltd, Rev 2, Feb.

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HydroSimulations (2020). "Tahmoor South Amended Project Report: Groundwater Assessment", report HS2019/42 prepared for Tahmoor Coal Pty Ltd by Hydrosimulations / SLR NPM Technical Pty Ltd, Rev 3.0, Feb.

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