



Our ref: DOC20/236184

Senders ref: SSD 8445

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Planning & Assessments
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Dear Mr Freeman

Subject: Tahmoor South Project – Response To Submissions (SSD 8445)

Thank you for your referral of 3 March 2020 requesting comments on the abovementioned Response To Submissions (RTS).

The South East Branch of the Biodiversity and Conservation Division, in consultation with the Policy, Strategy and Science Division, have reviewed the applicant's RTS which included the advice we provided on the EIS to Planning and Assessment on 20 September 2019.

Our comments are detailed at Attachment A, and in summary:

- The proponent did not thoroughly demonstrate at EIS stage how the proposed mine plan met the “avoid” principle of biodiversity assessment, policy and the SEARs. The amended mine plan proposes a considerably smaller surface disturbance footprint for reject emplacement. It also proposes to reduce underground operations through a smaller longwall profile and minor reductions in longwall geometry. The avoidance argument of the amended proposal is therefore significantly improved.
- However, we note there remains some outstanding issues around avoidance of significant features, notably streams and threatened native vegetation for some surface disturbance areas, as detailed at Attachment A (Key Issues 1, 2 & 7). Further amendments to the longwall layout to reduce impacts upon 3rd order streams and sites of Aboriginal cultural heritage at Dog Trap Creek are suggested at Attachment B.
- The amended project now comprises smaller longwall panels, minor reductions in panel widths and height, and deletion of Longwall 109. Notwithstanding, the degree of subsidence is not likely to be significantly reduced by adopting 285m wide longwalls (as opposed to the original 305m width). It therefore remains highly likely that 3rd order streams such as Dog Trap Creek and Tea Tree Hollow will be impacted by the proposed longwall layout and are likely to be fractured and drained.
- We acknowledge significant proposed reductions in clearing of threatened native vegetation, particularly the critically endangered Shale Sandstone Transition Forest (SSTF), for the re-designed reject emplacement area. Hollow-bearing tree surveys have also now been supplied. However, we request further justification for this community, particularly clearing of the strip of SSTF south west of the existing emplacement area, and confirmation that the ventilation shaft sites are proposed to be cleared in their entirety. Assuming this to be the case, we query whether opportunities to avoid further clearing at ventilation shaft sites TSC1 and TSC2 by consolidating infrastructure requirements have been fully explored.
- The EIS assessment of Impacts for Further Consideration has been updated as per our previous request. In particular, the impacts upon *Persoonia bargoensis* to be removed for surface infrastructure has been substantially reduced. We request confirmation of the

extent of impacts upon, and avoidance of, *Grevillea parviflora* in the proposed powerline easement.

- The approach to offset biodiversity impacts in three stages and site selection, as outlined in the biodiversity offset strategy, is supported in principle. We suggest that the conditions of approval include a requirement that impacts must be offset prior to impact. It also appears from surveys of the recent fire affected areas that some of the proposed offset sites have been burnt. This may impact upon the viability of threatened plants that are susceptible to fire, such as *Persoonia bargoensis*, at these sites. Additional threatened species requested to be offset in our previous comments have otherwise been addressed.
- We maintain our recommendation that reductions to the southern extents of Longwalls 101B and 103B would help further protect the Dog Trap Creek site complex from the impacts of subsidence. This would remove longwall mining under an additional three Aboriginal heritage sites comprising rock shelters with art.
- Archaeological test excavation and additional survey has now been conducted in areas of surface infrastructure. No Aboriginal objects were recovered during the test excavations. We also acknowledge that the Aboriginal cultural heritage assessment has now been updated to include test excavations at proposed ventilation shaft site TSC2, as requested.
- Tahmoor Coal has committed to developing a Heritage Management Plan (HMP) in consultation with the Aboriginal community (Registered Aboriginal Parties) and DPIE. We make the following recommendations in relation to the Aboriginal cultural heritage components of the HMP:
 - The impact of changed hydrological patterns in Dog Trap Creek on Aboriginal cultural heritage values should be considered.
 - The HMP should clarify any specific management actions required to address the information provided regarding possible men's business sites.
 - The HMP should include the requirement for any additional impact areas that have not been surveyed to be subject to assessment before any impact occurs.
 - The HMP must explain how impact to the cultural landscape of the Dreaming site will be avoided.
 - The HMP must address the risk of impact to artefact scatters and single stone artefacts from subsidence, mining operations and future remediation works.
 - The HMP must contain detailed processes for avoiding and limiting harm to grinding groove sites.

Please do not hesitate to contact Mr Chris Page, Senior Team Leader (Planning), via chris.page@environment.nsw.gov.au or 4224 4180.

Yours sincerely



25/3/2020

Michael Saxon

**Director, South East Branch
Biodiversity & Conservation Division
Environment, Energy and Science**

Attachment A - Tahmoor South mine expansion- Response To Submissions - Key Issues EES submission 14 Mar 2019
Attachment B – Suggested amendment to longwalls in vicinity of Dog Trap Creek

Attachment A - Tahmoor South mine expansion- Response To Submissions - Key Issues from EES submission 14 Mar 2019

Issue No.	Description:	Extent and Timing:	EES Recommended action:	RTS Comment:	EES Comment:	Response satisfactory:
1	Avoidance of impacts	Response To Submissions	<ul style="list-style-type: none"> The proponent did not thoroughly demonstrate how the “avoid” principle of biodiversity assessment policy, guidelines and the SEARs were met with regard to the site’s biodiversity constraints. This is particularly critical given the quantum of critically endangered native vegetation and threatened species proposed to be cleared. 	<ul style="list-style-type: none"> Avoidance was initially considered at pre-feasibility stage and then refined in the EIS mine plan. The amended project has further avoided impacts by amended the mining layout as follows: <ul style="list-style-type: none"> reducing longwall cut height and panel width removal of LW109 reconfigured layout to provide two series of shorter longwall panels Reduced subsidence throughout the 	<p>We acknowledge the detail provided in the Amended BAR relating to this key concern, particularly the substantial reductions in the quantum of clearing and impacts to threatened plants. However, further detail is required.</p> <p>We recommend avoidance be addressed for TSC 2 where large numbers of <i>Grevillea parviflora</i> and Shale Sandstone Transition Forest occur (see detail below). Several individuals of <i>Persoonia bargoensis</i> also occur in this area and we query whether any of these individuals will be avoided and protected. We also query whether <i>Grevillea parviflora</i> will be avoided along the power easements.</p> <p>Figures 3.3 and 3.4 of the Project Amendment Report provide a conceptual location for works at the ventilation shafts, however it is not clear how much vegetation will be removed. If total loss is assumed in TSC 1 and 2, we question whether some of the construction phase infrastructure</p>	Partial

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				<p>proposed mine layout</p> <ul style="list-style-type: none"> ○ Significant reductions in the vegetation clearing required for the expanded Reject Emplacement Area (REA) • Alternatives to surface reject emplacement has been further investigated. The undergrounding of goaf as paste, as suggested by EES/EPA, was not considered feasible. • Impacts to threatened species and ecological communities has been reduced, as discussed below. 	<p>required for TSC2 could be co-located with TSC1. This would reduce impacts on vegetation, given that TSC1 occurs in a more disturbed area and is reasonably close by.</p> <p>Figures 3.3. and 3.4 of the Project Amendment Report should be included in the BAR with detail provided on how important biodiversity values were avoided.</p> <p>Polygon boundaries showing infrastructure in Figure 3 of the BAR are not consistent with polygon boundaries in Figure 2.2 of the Project Amendment Report.</p> <p>The BAR should include a spatial comparison of clearing areas as originally proposed, and under the current design. Shapefiles showing original (EA) and current (RTS) clearing areas must be provided to EES for verification prior to approval.</p>	

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2	Biodiversity	Response To Submissions	<ul style="list-style-type: none"> Consideration should be given to reducing the quantum of clearing and resultant impacts of listed threatened entities, with offsets limited to residual impacts only. The proponent should also undertake a hollow-bearing tree survey to quantify impacts to potentially occurring hollow dependent threatened species, and to determine high habitat value site constraints so impacts to these areas can be avoided and/or minimised. 	<ul style="list-style-type: none"> An assessment of hollow bearing trees has been completed. A reduction in native vegetation clearance from 49.2 ha to 37.77 ha. This includes a reduction of clearing for Shale Sandstone Transition Forest TEC from 43.50 ha to 23.57 ha. 14.8 ha of the native vegetation to be cleared includes native mine rehabilitation. 	<p>We acknowledge the significant reduction in clearing of native vegetation. However, as vegetation to be cleared still includes a substantial area of CEEC (Shale Sandstone Transition Forest) we request further detail on avoidance of this community as detailed above.</p> <p>Furthermore, the MNES assessment of Shale Sandstone Transition Forest found a significant impact on this TEC is likely, despite the reduced quantum of clearing.</p> <p>Hollow bearing trees are shown on Figure 17 in the Amended BAR. It is not clear which trees can be retained, and which will be cleared, particularly in the vent shaft areas.</p>	Partial
3	Biodiversity	Response To Submissions	<ul style="list-style-type: none"> Impacts for Further Consideration (IFFC) for <i>Persoonia bargoensis</i> in accordance with s9.2 of the NSW Framework for Biodiversity Assessment (FBA) needs to further 	<ul style="list-style-type: none"> The REA re-design has reduced the clearing of <i>Persoonia bargoensis</i> from 96 individuals to 8 individuals. 	<p>The reduced impact on this IFFC species is noted. However, further detail on avoidance, particularly in ventilation shaft sites, is still recommended as detailed above.</p>	Yes

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			<p>demonstrate that the local population will not be put at risk of extinction or have its viability significantly reduced as a result of this development.</p> <ul style="list-style-type: none"> In the absence of further surveying, the eastern pygmy possum should also be assumed present and included as a species to be offset. 	<ul style="list-style-type: none"> The amended BAR has been updated to include statement regarding IFFC for <i>Persoonia bargoensis</i> and <i>Grevillea parviflora</i>. Eastern pygmy-possum has been assumed present and included as a species to be offset. Impacts on Koala habitat has been significantly reduced in the redesigned REA. 		
4	Biodiversity offsets	Response To Submissions	<ul style="list-style-type: none"> Further development of the Biodiversity Offset Strategy (BOS) is required to demonstrate that required offsetting, after all avoidance measures have been applied, can be achieved. 	<ul style="list-style-type: none"> The required offsets have been significantly reduced due to the amended project layout. The SSTF credit shortfall (HN556) 	<p>Conditions of consent will need to address staging, timing of establishment of BSAs and credit retirement as well as payment to the fund.</p> <p>We support in principle the site selection of offsets presented to date. We note that full field assessment under the BAM has</p>	Yes

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			<ul style="list-style-type: none"> Further clarification regarding some species not identified to be offset as described at Attachment A must also be addressed. 	<p>has been reduced from 1,847 to 532 credits, of which 82 credits relates to Stage 1 of the offset package. HN556 credits are currently available on the market (3710 credits currently listed).</p> <ul style="list-style-type: none"> Like-for-like offsets are required for HN556 as it is a MNES offset requirement. The reduced shortfall is proposed to be sourced from the BioBanking Public Register. There is a shortfall of 82 credits in the non-threatened vegetation type Red Bloodwood 	<p>not occurred as yet. Preliminary surveys have been done to determine if required PCTs and threatened biodiversity are present.</p> <p>However, the proponent will need to consider if the 2019-20 bushfires have impacted the proposed stewardship sites, particularly for entities that are vulnerable to fire (eg. <i>Persoonia bargoensis</i>). Further detail on obtaining credits for HN556 (PCT 1395) is also required.</p> <p>Detail on individual species is discussed below:</p> <ul style="list-style-type: none"> Koala: Addressed in 5.7.6 of the RTS and amended BAR. Area of impacted habitat reduced from 43.5 ha to 17.26 ha. Eastern pygmy possum: Addressed in 5.7.6 of the RTS and amended BAR. EPP to be assumed present and offset. Large-eared pied bat: Addressed in 5.7.6 of the RTS and amended BAR. Eastern cave bat to be offset as well 	

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				<p>(HN564) which can be made up by payments into the BCT Fund.</p> <ul style="list-style-type: none"> The remaining species identified to be offset have been addressed or are no longer required due to the reduced footprint. Table 28 provides an overview of proposed Stewardship sites. Table 30 provides detail of individual sites including potential credits available. 	<ul style="list-style-type: none"> Red-crowned toadlet: offsets no longer required as the 20mm subsidence impact area has changed as a result of amendments to mine plan. The 20mm subsidence impact area now mostly avoids Hornes Creek where the toadlet was originally recorded and impacts are therefore considered unlikely. Cumberland land snail: None recorded, therefore no offsets required. <i>Pomaderris brunnea</i>: Table 5.6. EIS stated 40 <i>P. brunnea</i> were to be cleared. This has been reduced to 1 in the amended project. <p>There were minor issues with credit calculations and updates requested at EIS stage. The credit calculator was re-run to reflect the amended footprint and the proponent must submit the case for EES to review prior to approval.</p> <p>The proponent noted that offset site surveys were carried out in accordance with the BAM.</p>	

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					The need for a Biodiversity Management Plan was highlighted at EIS stage. This has been incorporated into the Revised Management Measures for the Amended Project. A requirement to develop the Plan in consultation with EES should be imposed as a condition of consent.	
5	Aboriginal cultural heritage	Response To Submissions	<ul style="list-style-type: none"> Although the proposed longwall layout has largely avoided direct undermining of significant rock shelter artworks along Dog Trap Creek, further assessment of proposed subsidence, hydrology changes and vibration and dust to protect these significant sites should be undertaken. We recommend that the Extent of Longwalls boundary in this area be reconsidered, and that Longwalls 101 and 103 be reduced to provide increased protection to 	<ul style="list-style-type: none"> The EIS assessed significant features along Dog Trap Creek and the longwall layout (particularly LW102-103) was designed to avoid undermining Dog Trap Creek rock shelters. The shelter sites are predicted to experience 90-150mm of vertical subsidence and 250mm of valley closure. Given the setbacks of 135-230m from 	<p>We note the predicted low likelihood of harm to Dog Trap Creek site complex but acknowledge that a level of risk remains.</p> <p>We maintain our recommendation that reducing the length of Longwalls 101 and 103 would provide further protection to the Dog Trap Creek site complex.</p> <p>We note that dust and vibration impacts will continue to be monitored during operation of the project.</p> <p>The impact of changed hydrological patterns in Dog Trap Creek on Aboriginal cultural heritage values should be considered in the HMP.</p>	Partial

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			the Dog Trap Creek site complex.	<p>the closest longwalls, impact likelihood has been assessed by MSEC as low.</p> <ul style="list-style-type: none"> Dust impacts are likely to be very low and ground borne vibration is not expected to be perceptible. 		
6	Aboriginal cultural heritage	Response To Submissions / prior to approval	<ul style="list-style-type: none"> We recommend that the proposed archaeological test excavations for surface infrastructure be undertaken prior to approval. The Heritage Management Plan should also be prepared as soon as possible, ideally prior to project approval, in consultation with the Aboriginal community. 	<ul style="list-style-type: none"> Additional surveys and test excavations have occurred at disturbance footprint TSC2, where site OCS-1 is located. Testing indicated no further subsurface deposits were located at this site. The HMP will be prepared in consultation with 	<p>Results of test excavations must be provided to the AHIMS Register as a site recording form as per Requirement 16a(13) of the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW. This must occur as soon as possible.</p> <p>We note that Glenda Chalker of Cubbitch Barta Native Title Claimants provided comments on the proposed test excavation methodology (EMM 2020). Ms Chalker reiterated the high Aboriginal cultural heritage significance of Dog Trap Creek and commented on the scarred tree and test excavation assessment</p>	Partial

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				<p>the RAPs and DPIE prior to surface disturbance occurring.</p> <ul style="list-style-type: none"> The Dreaming Site and sites 52-2-3968 and 52-2-4194 are outside the 20m contour and will not be harmed (partially as a result of the Amended Project Plan) (Aecom 2020, p.5-112). 	<p>processes. EMM (2020) addressed these comments.</p> <p>The applicant has not addressed the impact of landscape and hydrological changes on the Dreaming site. This could include changes to watercourses, hydrological characteristics of the area and intangible cultural heritage values, notwithstanding the site's location outside the 20m contour. This matter should be updated.</p> <p>We note that the HMP will be prepared prior to ground disturbance occurring. DPIE require the HMP to be prepared in consultation with the Registered Aboriginal Parties and request the opportunity to provide comment on the draft HMP.</p> <p>We recommend the HMP include:</p> <ul style="list-style-type: none"> risk of impact to artefact scatters and single stone artefacts from subsidence, mining operations and future remediation works. Aboriginal cultural heritage survey of land that has not yet been surveyed if future ground 	



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					<p>disturbance works are proposed in those areas.</p> <ul style="list-style-type: none">• impact assessment of changed hydrological patterns in Dog Trap Creek on Aboriginal cultural heritage values• impact to the cultural landscape of the Dreaming site & how these will be avoided.• whether there are specific management actions required to address the information provided by Historical Indigenous Research regarding 'men's business sites' (Niche 2018, p.71).• risk of impact to artefact scatters and single stone artefacts from subsidence, mining operations and future remediation works.• detailed processes for avoiding and limiting harm to grinding groove sites. <p>Site cards must be submitted as soon as possible to comply with section 89A of the National Parks and Wildlife Act 1974. We</p>	

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					also note that the site recorded by EES has been incorporated into the assessment.	
7	Water & subsidence	Response To Submissions	<ul style="list-style-type: none"> It is highly likely that 3rd order streams and tributaries either directly undermined or within close proximity of the new works, including Dog Trap Creek and Tea Tree Hollow, will be impacted as a result of the proposed longwall layout. Consideration should be given to further reducing longwall lengths 101, 103, 104 and redesigning Longwall 109 in this location to further avoid impacts on 3rd order and above streams. 	<ul style="list-style-type: none"> The amended mine plan has considered 3rd order or above streams in a “risk management zone” and avoids significant streams and features. The amended mine plan reduces longwall width, cut height and width of longwalls. LW109 beneath Dog Trap Creek has been removed. Impacts of the project to groundwater and surface water levels of the Thirlmere Lakes are considered to be imperceptible. 	<p>We acknowledge the proposed amended layout and reduced impact through changes to longwall geometry. However, there remains insufficient avoidance of 3rd order and above streams or cumulative impact assessment for loss of water/flow to the Upper Nepean River catchment.</p> <p>It is acknowledged that all 3rd order sections of these streams above longwalls will likely be fractured and drained by the proposed longwall mining.</p> <p>Issues also remain with the hydrological and groundwater models presented in the RTS, as follows:</p> <ul style="list-style-type: none"> Models are poorly calibrated and not validated Modelling provides no error bounds around baseflow losses (likely to be at least as large as the figures provided) Only baseflow loss and not pool fracturing and drainage when 	No

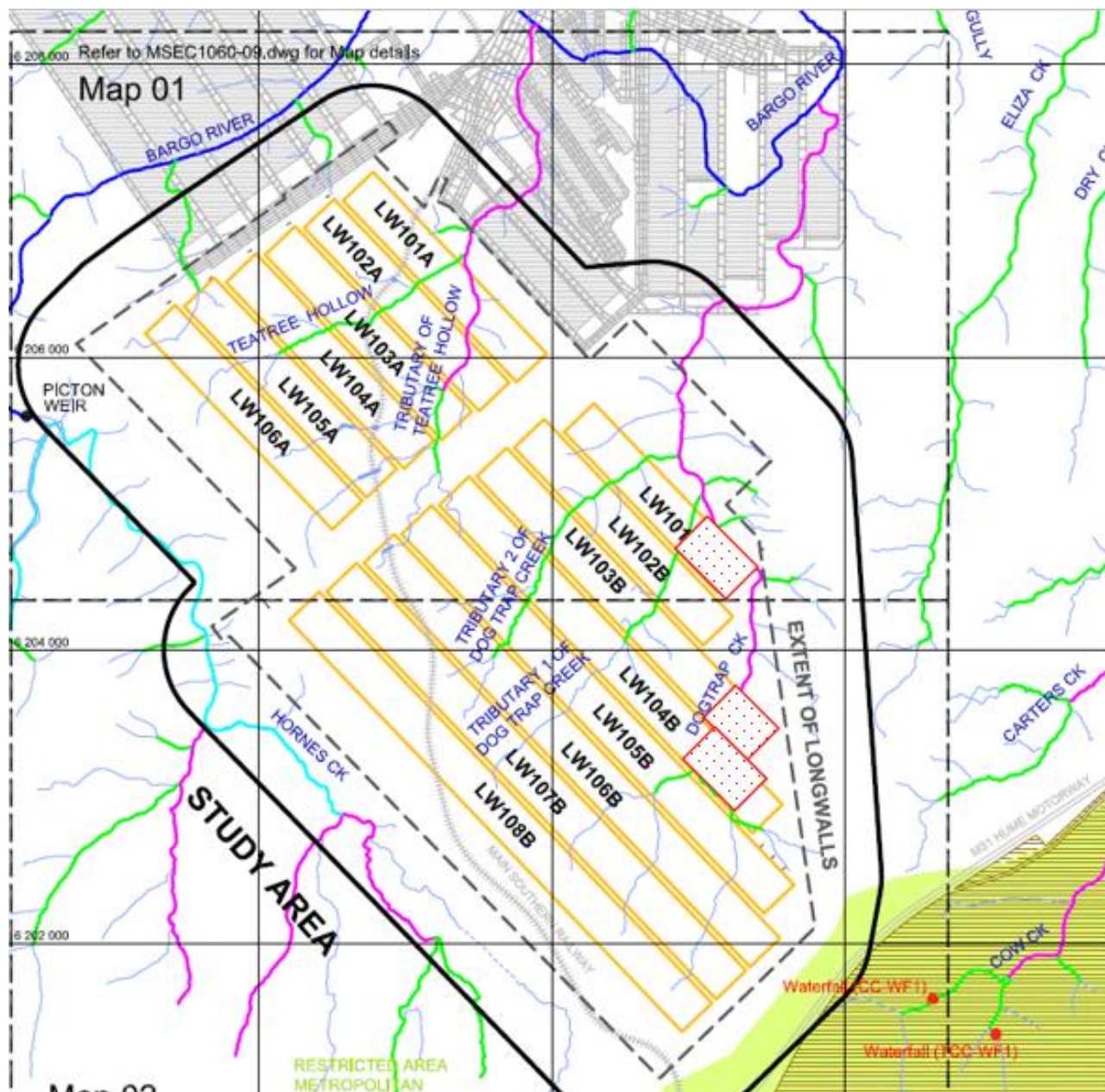
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					<p>modelling flows/water loss are considered</p> <ul style="list-style-type: none"> • The flow assessment does not conform to a BACI design (which would help further demonstrate the inadequacies in conclusions based on the modelling) • Most of the modelling and conclusions for Redbank Creek are based on data collected after the stream had already been impacted by earlier longwalls, invalidating conclusions suggesting lack of impact • Conclusions of baseflow return in Redbank Ck are made without adequate scientific evidence (or peer review of such evidence) - there appears to be both datum and rating curve changes that affect assumptions and conclusions in the modelling • Modelling does not consider nearby reference gauge behaviour (eg Stonequarry Creek; Redbank Ck is a tributary of Stonequarry Creek). 	

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					<p>We recommend considering further amendments to the layout to reduce the fracture, drainage and permanent impacts to 3rd order streams. These are impacts that have been seen in similar situations with earlier Tahmoor Coal mining, such as impacts to Bargo River, Myrtle Creek, Redbank Creek, and the southern coalfield more generally.</p> <p>For example, avoidance of direct undermining of 3rd order stream sections in Dog Trap Creek could be achieved with relatively minor reductions in longwall extraction at LW101B, LW103B and 104B, as outlined at Attachment B. Reductions at LW101B and 103B would also provide significant benefits for sites of Aboriginal cultural heritage significance, as discussed previously.</p>	
8	Water & subsidence	Response To Submissions	<ul style="list-style-type: none"> The impacts of wastewater discharge into the Bargo River from the expanded project layout, such as in increased salinity and toxicity of discharge, requires further assessment. 	<ul style="list-style-type: none"> The amended proposal includes an upgrade to the wastewater treatment plant, aiming to remove contaminants including salts, 	<p>We note that further information has been supplied regarding the proposed remediation plans, now adopted, for Redbank and Myrtle Creeks. It has not been demonstrated to date that these areas can be successfully remediated.</p>	No

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			<ul style="list-style-type: none"> Successful remediation options to repair damage and consequences of previous mining operations have also not been addressed. 	<p>metals and bicarbonates.</p> <ul style="list-style-type: none"> Corrective management action plan works are proposed for Redbank and Myrtle Creeks. These include proposed pool remediation and rock bar grout curtain wall works carried out in stages. Stage 1 of Myrtle Creek remediation is underway as a trial. This will inform future remediation plans for Teat Tree Hollow and Dog Trap Creek within the expansion project footprint. 	<p>Impacts are therefore likely to be irreversible and remain in perpetuity.</p> <p>The RTS proposed layout will detract considerably from the ecological function of the streams and severely reduce future recreational and cultural experiences in the Crown Land corridor (particularly Charlies Pt walking trails). It will also reduce flows to the Upper Nepean River system.</p>	

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9	Flooding	Response to Submissions	<ul style="list-style-type: none"> Recommend that the flood assessment be updated to address flooding characteristics across the full range of flood events to satisfy the former OEH's suggested SEAR's, rather than depicting the extent of pre and post development conditions only. 	<ul style="list-style-type: none"> The flood assessment has been updated to reflect the full range of flood events in subsidence affected scenarios and limited changes are predicted. 	No further comment provided.	N/A

Attachment B – Suggested amendment to longwalls in vicinity of Dog Trap Creek



Reduction of longwalls
to avoid 3rd order Dogtrap Ck