

OUT18/11437

Mr Paul Freeman
Team Leader
Resource & Energy Assessments
NSW Department of Planning and Environment
Email: Paul.Freeman@planning.nsw.gov.au

Dear Mr Freeman

**Hume Coal Project and associated Berrima Rail Project (SSD 7171 and 7172) –
Response to Submissions**

I refer to your email of 25 July 2018 to the Department of Industry (DoI) in respect to the above matter. Comment has been sought from relevant branches of Lands & Water and Department of Primary Industries (DPI). Any further referrals to Department of Industry can be sent by email to landuse.enquiries@dpi.nsw.gov.au.

The Department provides the following recommendations and comments for consideration in assessment of the proposal. Detailed comments are provided in **Attachment A**.

DoI Lands & Water and Natural Resources Access Regulator

The Response to Submissions (RTS) does not satisfactorily address all of the issues raised in the Department's submission on the Environmental Impact Statement (EIS) dated 16 July 2017.

The groundwater model does not meet best practice standards due to the low calibration performance and the inconsistencies between the geological model and the groundwater model. The model relies on the 67th percentile impact prediction, resulting in a 33% chance that predicted impacts could be exceeded. As a result of the high level of uncertainty in the modelling, the fracturing and subsidence predictions may be underestimated, and the proposed activity may result in a greater reduction of water in the aquifer and impact on more water users, and to a greater extent than currently predicted. The project is therefore reasonably likely to require more water entitlement than stated in the RTS and insufficient information has been provided to demonstrate that enough shares can be purchased on the water market to account for the total volume of water taken. It is critical that the modelling be improved to more accurately predict the impacts of the proposal on the quality and quantity of groundwater and surface water sources and to determine the acceptability of that level of impact.

The current prediction of 2m or greater draw down on 94 privately owned bores is unprecedented in similar projects. The Department notes there are practical challenges in successfully implementing a make good strategy over such a large number of bores. Insufficient information has been provided to demonstrate that the proposed approach is logistically viable. The Department is aware of impediments to developing the make good strategy associated with land access and communication with potentially affected water users.

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Information required to determine the application

DoI recommends the Department of Planning & Environment request the following critical information to inform determination of the project. Detailed explanations of the recommendations are provided in Table 1 in Attachment A.

1. Refine and reduce uncertainty in the geological modelling, groundwater modelling and impact predictions, particularly in relation to inconsistencies between the geological and groundwater models, conductivity, fracturing and subsidence predictions, drawdown predictions and data gaps and assumptions. This is required to more accurately predict impacts to water sources and other users, quantify the volumes required to be licensed in each affected water source, confirm that sufficient licensed entitlement can be obtained to account for the volume of take, and to determine the acceptability of such an impact on the water sources and other users. This should rely on the 90th percentile impact predictions, rather than 67th percentile.
2. Further develop the Make Good Strategy to ensure it can viably address the project impacts. This should include confirmation of the ability to make good on alternative water supplies through direct provision of water where this is proposed, source of the water and licences held and logistics of the proposed make good arrangements.
3. Clarify the purpose and capacity of the dams proposed to satisfy the Harvestable Rights exemption and/or the exclusion under Schedule 1 of the Water Management (General) Regulation 2018 of solely preventing contamination of a water source. Where the dams exceed the capacity required to meet this purpose and/or exceed harvestable rights, entitlement must be held in the relevant water source. It is also recommended Harvestable Rights be recalculated to ensure it relates to contiguous landholdings and catchments not associated with an exclusion.

Recommended measures should the project be approved

The Department considers that the information outlined above is critical to inform determination of the project. Should suitable information be provided to demonstrate that impact predictions are appropriately accurate and can be properly managed and mitigated to allow the project to be approved, the following management approach should be implemented to ensure robust modelling, monitoring and management to protect impacted water sources and their dependent assets and communities. Detailed explanations of the recommendations are provided in Table 2 in Attachment A.

1. The proponent should commence consultation with DoI Lands & Water prior to preparation of plans detailed in the following recommendations.
2. Groundwater Modelling and Impact Assessment should be refined in accordance with Attachment A in relation to the following key areas:
 - a. Additional calibration
 - b. Sensitivity and uncertainty analysis
 - c. Data, software and resolution
3. Water licensing
 - a. Provide detailed information of access to required water entitlements and include this within Annual Reviews.

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- b. Acquire appropriate water entitlement in accordance with the NSW Aquifer Interference Policy (AIP) to account for the maximum of predicted annual water quantities based on 90th percentile predictions prior to commencement of mine activities.
4. Prepare a Construction Environmental Management Plan in consultation with Lands & Water prior to commencement of construction to address potential construction impacts to surface water, groundwater and waterfront land.
5. Prepare a Groundwater Monitoring and Management Plan prior to construction in consultation with Lands & Water. This is to address the minimum requirements in Attachment A.
6. Prepare a Surface Water Monitoring and Management Plan prior to construction in consultation with Lands & Water to address the minimum requirements in Attachment A.
7. Prepare a site water balance to be updated yearly and made available via annual reporting to address the minimum requirements in Attachment A.
8. Prepare a risk management plan for water quality monitoring, management and mitigation associated with water/slurry rejects reinjection to mine voids. This should include water quality treatment to maintain the beneficial use of the Hawkesbury Sandstone where the mine voids are in direct contact.
9. Prepare a Remediation Plan to monitor and address channelization and subsidence monitoring and to protect riverine flows. The ongoing evaluation of risk and mitigation priority should be developed in accordance with Stage 4 of the River Styles Framework.
10. All works on waterfront land should be undertaken in accordance with the “*Guidelines for Controlled Activities on Waterfront Land*” (NRAR, 2018).
11. Continue to refine the Make Good Strategy to ensure it can viably address the project impacts.
12. Develop a Trigger Action Response Plan to address observed exceedances to approved impacts. Where observations exceed predicted impacts, management measures such as scaling back or cessation of mining activities may be required.

Refer to Attachment A for detailed comments and recommendations.

DPI Fisheries

A number of issues raised in the submission to the EIS relating to adequate monitoring and mitigation of impacts to riparian vegetation (as a result of lowered groundwater levels) have not been adequately addressed. The Department provides the following recommendations to address these issues.

- Water Management Plans should be prepared in consultation with DPI Fisheries.
- Annual monitoring should be undertaken where riparian vegetation is deemed to be at **moderate** or **high** risk to enable early detection and management of impacts.


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- The monitoring and management program should be designed to test predictions made in the proposal, specifically that (due to their facultative dependence on groundwater) - no impacts are expected to terrestrial vegetation as a result of groundwater reductions, except in periods of drought.
- The Department does not support the restriction placed on monitoring only within 'periods of extended drought'.
- A response plan should be developed to alleviate impacts, should they be detected, prior to works resulting in changes to groundwater regimes. The plan should establish clear triggers to define how a decline would be considered to be attributable to mine activities in addition to measures to ensure that an independent determination as to the attributable cause will be made.
- The response plan should clearly describe mitigation measures.

DPI Agriculture

The rehabilitation and mine closure plans should aim to rehabilitate land to have a carrying capacity equivalent to non-mined areas. The Department recommends practices similar to those implemented by Princess Pastoral be applied to rehabilitated lands as the project progresses.

Yours sincerely

A handwritten signature in blue ink, appearing to read "Rachel Connell", is enclosed in a light blue rectangular box.

Rachel Connell
Executive Director Water
LANDS & WATER DIVISION

6 November 2018

**Hume Coal Project and associated Berrima Rail Project (SSD 7171 and 7172) –
Response to Submissions**

Detailed Water Comments

Table 1: Detailed Comments – Information Required to Determine the Application

Recommendation	Detailed Comments
<p><i>Recommendation 1</i> Refine and reduce uncertainty in the geological modelling, groundwater modelling and impact predictions, particularly in relation to inconsistencies between the geological and groundwater models, conductivity, fracturing and subsidence predictions, drawdown predictions and data gaps and assumptions. This is required to more accurately predict impacts to water sources and other users, quantify the volumes required to be licensed in each affected water source, confirm that sufficient licensed entitlement can be obtained to account for the volume of take, and to determine the acceptability of such an impact on the water sources and other users. This should rely on the 90th percentile impact predictions, rather than 67th percentile.</p>	<p><i>Geological Modelling</i> The geological model is used as a basis for the groundwater model, and as such its level of accuracy impacts the development of the groundwater model and the predictions of impacts on drawdown and baseflow losses. The role played by geological features such as faults, volcanic intrusions and joints is critical to the prediction of impacts, and the depth of fracturing in the Hawkesbury Sandstone. DoI Water concurs with the view of Canbulat (2017) and Galvin (2017) that sandstone could be fractured across the whole profile.</p> <p><i>Impact Prediction through groundwater modelling</i> The groundwater model in its current form does not provide a reliable order of magnitude prediction of drawdown impacts for the following reasons:</p> <ul style="list-style-type: none"> • The groundwater model should reflect the conceptual geological model, however there are discrepancies in the representation of the direct connectivity between the two models. • The groundwater model assumes a decrease of hydraulic conductivity with depth, however this is not informed by the geological model and appears to be inconsistent with data presented in the EIS and RTS documents. The model appears to concentrate on the lower hydraulic conductivity observations and disregard the higher values. <p><i>Subsidence</i> Additional independent information is required to understand the following:</p> <ul style="list-style-type: none"> • The height of cracking above the target coal seams • The impact of pillar failure in terms of added subsidence • The cracking profile below creeks, and • How these will change over time during and post-mining.

This recommendation should be addressed by the following:

Modelling & Impact Assessment

- a. Clarification on apparent inconsistency on the thickness of the interburden between the geological model and the groundwater numerical model.
- b. Clarification on predictions in fracturing of formations over the mined areas, particularly the lower part of the Hawkesbury Sandstone.
- c. Update of contour maps of hydraulic conductivity as presented in the updated groundwater model to include location points for the data points considered for each layer.
- d. Clear identification of data gaps, interpolations and assumptions made to predict impacts.
- e. Details of surface water and groundwater licences held to date (including licence number, volume and ownership).
- f. Further clarification and analysis in regards to the groundwater model to confirm the magnitude of groundwater impact drawdown and increase the confidence in the impact predictions. This includes:
 - Rerun the uncertainty analysis of the groundwater model to include the whole range of observations.
 - Update the groundwater model if required to reflect the outcome of subsidence expert advice.
 - Obtain an independent review of the revised numerical model (HydroSimulations, 2018) since it is a significant rework of the previous version in the EIS. (Note: DoI Water is aware that DPE has engaged an independent groundwater expert to review the latest model work. DoI Water has not had access to this document in the preparation of this advice).
 - Resulting from the above model analysis complete an update of impacts on groundwater and surface water sources and bores using the 90th percentile. Where additional entitlement is required confirm the ability to acquire this entitlement. Make good provisions will need to be revisited, and provisions be included for surface water users and the environment where applicable. Consideration should also be given to enable affected bore users to have the ability to negotiate the form of the make good provision and legal fees to be covered by the proponent.

Recommendations 2 and 3: No additional comment.

Table 2: Detailed Recommendations should the project be approved

Recommendation	Detailed Comments
<i>Recommendation 1: Consultation</i> – no further comment.	
<p><i>Recommendation 2</i> Groundwater Modelling and Impact Assessment should be refined in relation to the following key areas:</p> <ul style="list-style-type: none"> a. Additional calibration b. Sensitivity and uncertainty analysis c. Data, software and resolution 	<p>Groundwater Modelling and Impact Assessment</p> <p>Significant improvements have been made to the model during the RTS process, however issues remain which may significantly affect the order of magnitude of drawdown and resulting impacts to groundwater and surface water resources and users. The following is recommended to improve modelling:</p> <p><i>Additional Calibration</i></p> <ul style="list-style-type: none"> a. Calibrate the model on a 2-year basis initially. Model upgrade and calibration can then be spaced further if DoI Water is satisfied of the reliability of the model predictions. b. Calibrate the model to achieve residuals of less than 2 m for a majority of the bores. c. Use the private bores as calibration targets. d. Audit and update the groundwater quality models every five years for the life of the project. e. The groundwater model should be revised during the life of the project and post mining and be translated to the surface water component. Risk to groundwater and surface water should be reviewed on a regular basis following model updates. The outcomes of these updates are to be reflected in the water monitoring and management program. f. Annual reports to demonstrate the validity of the QA/QC. <p><i>Sensitivity and Uncertainty Analysis</i></p> <ul style="list-style-type: none"> g. Perform thorough sensitivity and uncertainty analysis <ul style="list-style-type: none"> i. with KV values varied in the range 0.01 – 5 m/day, to depths of about 160 m for all layers down to and including the Wongawilli seam ii. that varies the percentage rainfall applied. <p><i>Data, Software and Resolution</i></p> <ul style="list-style-type: none"> h. Compile all geological and hydrogeological data into software such as Leapfrog to create a 3D conceptual model of the site that includes all structural features and intrusions. i. Adopt a higher resolution, more efficient grid or mesh into the model in the vicinity of mining and features such as faults or inflow areas or wells and use more numerical layers for the Hawkesbury Sandstone and where contrasts in hydraulic parameters are expected or significant curvature of the water table are likely to occur. j. Construct a MIKE SHE model to minimise uncertainty and gain understanding about the recharge and

	<p>groundwater – surface water interactions. This model would also constrain the water balance components to reasonable physical basis, decreasing uncertainty and providing useful inputs to the groundwater model.</p> <p>k. Use FEFLOW coupled or loosely linked to MIKE SHE as an alternative to MODFLOW based codes to enable modelling of the multiple water tables present on site. Alternatively loosely link the MODFLOW model to MIKE SHE to achieve a decrease in uncertainty.</p> <p>l. Commence monitoring of meteorology, including evaporation and soil moisture on site</p> <p>m. All hydraulic parameters are expected to be spatially variable and maps and tables showing the expected range specifically for each for specific yield, specific storage, K_V and K_H must be provided.</p> <p>n. The 3D modelling and report quality should be improved and include layer elevations for each unit and also their thickness. Multiple cross-sections in a variety of orientations with comparisons to borelogs must be provided.</p> <p>o. The number of model varieties produced results in some confusion. It is recommended that the improved Modified EIS USG-T model be adopted as the current official model for the project and discussion about previous models cease.</p> <p>p. Clarification of the basis upon which the EVT rates and depth are set, and to link this to an actual physical process occurring on site and supported by evidence.</p>
<p><i>Recommendation 3:</i> Water licensing</p> <p>a. Provide detailed information of access to required water entitlements and include this within Annual Reviews.</p> <p>b. Acquire appropriate water entitlement in accordance with the NSW Aquifer Interference Policy (AIP) to account for the maximum of predicted annual water quantities based on 90th percentile predictions prior to commencement of mine activities.</p>	<p>Water Licences</p> <p><i>Groundwater</i></p> <p>Current predictions for water licensing requirements are based on the 67th percentile prediction and should be based on the 90th percentile prediction. Use of the 90th percentile prediction will increase the volume of water required to be licensed from impacted water sources.</p> <p>a. The groundwater model has been revised and these results have been used to revise the surface water modelling. Sensitivity and uncertainty analysis has been completed to support the revised results. This has resulted in the following maximum take that requires licensing based on the 67th percentile predictions:</p> <ul style="list-style-type: none"> I. 2059ML/yr in yr 17 in the Nepean Management Zone 1 II. 7.1ML/yr in yr 25 in Nepean Management Zone 2 III. 6.5ML/yr in yr 72 in Sydney Basin South

IV. 19ML/yr in yr 21 in Medway Rivulet Mgt Zone

- b. Based on the revised modelling predictions for the 67thtile the proponent currently holds adequate entitlement in the Medway Rivulet Mgt Zone and the Sydney Basin South groundwater source.
- c. 150ML is required to be obtained in the Nepean Management Zone 1 water source and 3 ML is required to be obtained in Nepean Management Zone 2. The additional entitlement is required to address a predicted shortfall in years 17 to 21. There are 12428 shares in Management Zone 1 however the NSW Water Register shows only 1 trade occurred in the previous water year.
- d. The RTS states there is no legal requirement to hold all entitlement prior to commencement of activities. Whilst this is not stated in legislation it is stated in the AIP and provides a key indication of the ability of the project to comply with relevant legislation throughout its life. The key issue for Lands and Water is that there is a viable pathway to obtain the entitlement. If the 90thtile is used the entitlement requirements are likely to increase by at least 180ML in the groundwater source.
- e. The RTS has confirmed the Primary Water Dam is to be a turkeys nest dam, and as it is in the Harvestable Rights Zone it is excluded from being considered within the properties harvestable right calculations.
- f. The RTS refers to obtaining additional water from registered bores if the groundwater and surface water sources are insufficient, and for potable water supply. Detail on these bores must be provided.

Surface Water

- a. The RTS has expressed the surface water impacts in terms of maximum volumetric losses as requested. This includes the following:
 - I. Medway Rivulet Mgt Zone impacts are a mean of 433.9ML/yr (0.9%) under wet conditions and 239.1ML/yr (1.6%) under dry conditions.
 - II. Oldbury Ck catchment impacts are a mean of 159.1ML/yr (4.3%) for wet conditions and 71.9ML/yr (4.5%) for dry conditions. Less than 0.05% reductions for other rivers including Lower Wingecarribee (max 72.2ML/yr), Upper Wingecarribee (max 1.4ML/yr), Lower Wollondilly (max 1.5ML/yr), Bundanoon (max 0.4ML/yr) and Nattai River (max 0.06ML/yr).
 - III. Maximum baseflow reduction is 0.982ML/d (359ML/yr) in Medway Rivulet in Yr 19 and the total baseflow reduction from all surface water catchments is 461ML. The average baseflow in Medway Rivulet is 3.3ML/d so the 0.982ML/d reduction represents a 29.7% reduction, however as the average total flow is 131.3ML/d the baseflow reduction is less than 1% of total

flow.

- IV. The revised modelling reassessed the leakage from Medway Dam which calculated an average of 12ML/yr between years 11 and 35 and a peak of approximately 19ML in year 21. The yield reduction to Medway Dam is predicted at a maximum of 278.1ML/yr (0.3%) under wet conditions and 120.9ML/yr under dry conditions.
- b. RTS indicates as flow impacts are small, no compensatory flows are required and there is no requirement in the AIP. However if the yield impacts to Medway Dam and other surface water users impact their operations the requirement for compensatory flows or alternative supplies needs to be addressed. Potential impact to dams that may be spring fed should be assessed.
 - c. Rainfall-runoff impacts from the total 19 year project life are predicted at a minimum of 1388ML for driest years and 4829ML for wettest years.
 - d. All dam storages on site have been designed to accommodate at least the 200yr ARI 72 hour storm runoff volume except for MWD07 which is to have capacity for between 100 and 200 ARI. This is a higher standard than generally adopted and has been used to minimise the potential for releases from SB03 and SB04. All storages proposed are in the Harvestable Right Zone (HR Zone) and/or proposed to be used solely to prevent contamination. However due to the significant capacity they may not be appropriately sized to satisfy the harvestable rights exemption or the requirements for excluded works under Schedule 1 of the Water Management (General) Regulation 2018. Where the dams exceed the capacity required to meet this purpose and/or exceed harvestable rights, entitlement must be held in the relevant water source to account for the volume of water taken. Section 3.1 of the Water Balance Assessment details the purpose of each dam. The RTS refers to the storage volume of the dam on Oldbury Creek as being 40ML which is less than the HR of Hume Coal owned land of 111ML. However this is irrelevant as the dam is not in the HR zone.
 - e. The HR calculation has included the catchment areas of SB03 and SB04, however the dams are considered to be excluded from calculating the dam capacity in the HR zone. Where an exclusion is being applied for the ability to capture runoff from an area, then this same area should not be available for consideration in the HR calculations.
 - f. The RTS indicates the existing dam on Oldbury Creek is not to be raised and that the statement in the EIS was incorrect. The existing access road may be upgraded however this would not result in an increase in the volume stored or spill height. This addresses the EIS response. There is no mention that this dam will be used as a water supply source. If it is then the entitlement currently held will need to be used and the proponent will need to ensure sufficient entitlement is available for surface water take from Medway Dam.

	<p>g. Analysis of impacts to flows in Medway Rivulet indicate if the release from Moss Vale STP are maintained there are no zero flow days, however if this ceases the flow regime under 5ML/d may be changed with a predicted increase of zero flow days by 25% under wet climates and 35% under dry climates. This occurs due primarily to the baseflow reduction. In Oldbury Ck, a cease to the releases from Berrima STP would not change the flow regime as the releases are relatively small (0.2ML/d).</p>
<p><i>Recommendation 4:</i> Prepare a Construction Environmental Management Plan in consultation with Lands & Water prior to commencement of construction to address potential construction impacts to surface water, groundwater and waterfront land.</p>	<p>The RTS proposes two water management plans. One for construction and one for operation. The broad concepts provided are adequate, however the detail to address monitoring, management, reporting and contingency requirements will need to be reviewed as part of management plan preparation.</p>
<p><i>Recommendation 5</i> Prepare a Groundwater Monitoring and Management Plan prior to construction in consultation with Lands & Water.</p>	<p>Prepare a Groundwater Monitoring and Management Plan. Key elements include but are not limited to:</p> <ol style="list-style-type: none"> a. Baseline data requirements, including predicted impacted and non-impacted areas, along rivers and both up- and down-stream locations. b. Monitoring regime to include regular and event based monitoring. c. Monitoring installation requirements d. Metering and reporting requirements e. Detail of water licences to account for predicted water take f. Data collection and management requirements g. Data be made public to agencies and the public after Quality Assurance/Quality Control (QA/QC) h. Stakeholder consultation i. Trigger response management j. Plan review requirements k. Monitoring from all existing and proposed monitoring bores continue post closure until at least 75% recovery (pre-mining levels) are reached. l. Ongoing monitoring of impacted landholder bores both during the project and post closure until near recovery. m. In the event a bore or other monitoring installation is made ineffective a replacement is

	<p>required within six months.</p> <ul style="list-style-type: none"> n. Lands and Water should be consulted on the proposed enhancement of the groundwater monitoring network and periodic review of the Groundwater Monitoring and Modelling Plan. o. Nested monitoring bores should be used rather than vibrating wire piezometers, due to the low reliability and the inability to repair vibrating wire piezometers. In addition, no water quality samples can be collected from vibrating wire piezometers. p. The Plan should be implemented to allow for sufficient baseline data acquisition prior to mine construction. q. Risk to groundwater be reviewed following model updates. The outcomes of these updates should be reflected in the water monitoring and impact management program. r. Mitigation options to protect riverine low flows should be included and the need for implementation will be informed by the model impact predictions. s. Passive groundwater inflows should be monitored through the use of sumps and underground pumping systems and reported against water licenses and modelled predictions. t. Annual reports should be prepared and include all historical data. <p>General Comments</p> <ul style="list-style-type: none"> • The injection of mine rejects in the form of limestone amended slurry and excess water from the Primary Water Dam in the mine cavity (sealed panels) has the potential to result in regional contamination of the Hawkesbury Sandstone rendering the groundwater unusable for its current purposes (high value crops and water supply). Additional geochemical modelling has been completed to assess the potential water quality impacts due to the underground rejects emplacement. The assessment indicates the potential for adverse impacts on groundwater and surface water is low as the water quality resulting from the reject emplacement is comparable to the natural groundwater quality of the Wongawilli Coal seam. The requirement to monitor and treat water from the PWD dam should be addressed. • No impacts predicted to high priority GDEs listed in WSPs and impacts to potential GDEs have been assessed as insignificant. • The current groundwater monitoring network is proposed to be enhanced with bores to enhance model verification and to assist in early detection of the timing of impacts to landholder bores. This is supported.
<i>Recommendation 6</i>	Prepare a Surface Water Monitoring and Management Plan prior to construction covering the following

<p>Prepare a Surface Water Monitoring and Management Plan prior to construction in consultation with Lands & Water</p>	<p>minimum requirements:</p> <ol style="list-style-type: none"> a. Baseline data requirements, including predicted impacted and non-impacted areas. b. Monitoring regime to include regular and event based monitoring. c. Monitoring installation requirements d. Metering and reporting requirements e. Detail of water licences to account for predicted water take f. Data collection and management requirements. g. Data be made public to agencies and the public after QA/QC. h. Stakeholder consultation i. Trigger response management j. Plan review requirements <p>General Comments</p> <ul style="list-style-type: none"> • No compensatory flow regime is proposed based on the statement in the RTS that the impact to surface water systems is small. Based on a 1.6% reduction in dry conditions and a 0.9% reduction in wet conditions to the Medway Rivulet Mgt Zone this is supported. This assessment however is assuming the flows from the sewage treatment plants continues and whilst this continues there will be no zero flow days and adequate supplies are available to the users and the environment. This will require ongoing monitoring and review to verify impact predictions and apply mitigation responses where necessary.
<p><i>Recommendation 7</i> Prepare a site water balance to be updated yearly and made available via annual reporting.</p>	<p>Prepare a Site Water Balance to be updated yearly and made available via annual reporting, including details of:</p> <ol style="list-style-type: none"> a. Methodology to calculate inputs and outputs b. Predictions of future input and output requirements c. Plan review requirements d. Trigger response management e. Stakeholder consultation
<p><i>Recommendation 8: Risk Management Plan – no further comment</i></p>	

<p><i>Recommendation 9</i> Prepare a Remediation Plan to monitor and address channelization and subsidence monitoring and to protect riverine flows. The ongoing evaluation of risk and mitigation priority should be developed in accordance with Stage 4 of the River Styles Framework.</p>	<p>Prepare a Remediation Plan including</p> <ol style="list-style-type: none"> a. Mitigation options to protect riverine flow b. Concept compensatory flow regime or alternative supply program to address potential impacts on surface water users and the environment, including farm dams, watercourses and Medway Dam. <p>General Comments</p> <p>In regards to potential physical impacts to watercourses the following is proposed which is supported and amended where noted:</p> <ol style="list-style-type: none"> a. As negligible subsidence is predicted, minimal change is predicted to the watercourses and flow. Subsidence monitoring should be included in relation to watercourses. b. Scour protection will be provided at the conveyor crossing pilings, at culverts under road crossing of Medway Rivulet and the discharge points from SB03 and SB04. c. Further geomorphic surveys are proposed to focus on the high fragility reaches with an assessment report prepared and rehabilitation actions if subsidence occurs. d. An assessment of impact to pond levels may be considered at the detailed design phase. This needs to be included. e. It is proposed to include remediation programs for any channelization impacts resulting from mining to prevent further channelization. Recommend this be extended to remediate mining induced channelization impacts. f. A range of erosion and sediment control practices have been proposed which are supported.
<p><i>Recommendation 10: Works on Waterfront Land – no further comment.</i></p>	
<p><i>Recommendation 11</i> Continue to refine the Make Good Strategy to ensure it can viably address the project impacts.</p>	<ol style="list-style-type: none"> a. The revised groundwater model predicts 94 bores will be impacted by more than 2m drawdown. All 94 bores are to be subject to make good measures with initial indications that a third may require additional operating costs, a third may require deepening of pumps and the remaining third may require a bore replacement or an alternative supply. This is yet to be confirmed and requires individual bore assessments based on field inspections. A staged approach is proposed to implement the make good measures due to variations in timing of the impact. The ability to achieve agreed outcomes with affected parties is yet to be confirmed due to many landholders preventing access and refusing to converse with Hume Coal. The viability of providing an alternate water supply for irrigation activities has not been confirmed with 15 irrigation bores identified as requiring replacement.

- b. The make good strategy indicates a review of the WaterNSW database identified an additional 19 approvals for bores, however their existence cannot be confirmed at this stage. There is therefore the potential for the number of impacted bores at Level 2 to increase from 94. The alternative water supply options if required are limited to increasing the potential for surface water capture either in dams or via roof runoff on infrastructure. The viability of these options to meet the demands from irrigation activities for example represents a risk.
- c. A revised version of the make good assessment has been prepared with additional detail on each bore based on data in the NSW government database. Field verification will be required to finalise individual bore assessments and make good measures.
- d. Besides the town water supply at Medway Dam there are no licensed surface water users in the Medway Rivulet catchment downstream of the project site. There are however landholders with basic rights access which may be impacted if the releases from the Moss Vale STP ceases. This however is not proposed. This scenario would need to be considered in future contingency planning and the requirement for compensatory flows and/or alternative supplies. There are dams in the project area with unconfirmed impacts if they are spring fed. This needs to be addressed in the monitoring and mitigation program.
- e. The revised make good strategy indicates that if required Hume Coal proposes to follow the formal dispute resolution pathway outlined for the NSW Land Access Arbitration Framework (DRE 2018). This framework includes the following steps; notice of intent; negotiation, mediation, arbitration and finally at the NSW Land and Environment Court if required. There is no streamlined dispute resolution pathway for make good negotiations, which highlights potential risks and time delays considering the significant objections to the project from affected landholders.

Recommendation 12: Develop a Trigger Action Response Plan – no further comments

END ATTACHMENT A