Idemitsu Australia Resources

Boggabri Coal Mine - Project Approval Modification Environmental Assessment (MOD 5)

Response to Submissions Report

2 May 2016

PARSONS BRINCKERHOFF

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Abbreviations

BCM	Boggabri Coal Mine
Boggabri Coal	Boggabri Coal Operations Pty Limited
BOS	Biodiversity Offset Strategy
BSAL	Biophysical Strategic Agricultural Land
CCC	Community Consultative Committee
CWA	Country Women's Association
DoE	Department of the Environment
DP&E	Department of Planning and Environment (NSW)
DPI Water	Department of Primary Industries Water (NSW)
EA	Environmental Assessment
EPA	Environment Protection Authority (NSW)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPL	Environment Protection Licence
FM Act	*Fisheries Management Act 1994* (NSW)
ha	Hectares
Idemitsu	Idemitsu Australia Resources Pty Ltd
MCC	Maules Creek Coal Mine
MIA	Mine Infrastructure Area
MOD	Modification
OEH	Office of Environment and Heritage (NSW)
Project Approval	Project Approval (PA 09_0182)
SEPP	State Environmental Planning Policy
TCM	Tarrawonga Coal Mine
TSC Act	*Threatened Species Conservation Act 1995* (NSW)
WAL	Water Access Licence
WMA	*Water Management Act 2000* (NSW)
WMP	Water Management Plan
WMS	Water Management Strategy

1. Introduction and background

1.1 Purpose

This response to submissions report relates to public submissions received during the public exhibition period of the 'Boggabri Coal Mine – Project Approval Modification Environmental Assessment (MOD 5), 20 November 2015' (the MOD 5 EA).

The MOD 5 EA was prepared to support an application under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify the Project Approval (PA 09_0182) to include additional activities and ancillary infrastructure required as part of ongoing operations at the Boggabri Coal Mine (BCM). These include conversion of existing groundwater test bores to operational production bores and the installation of ancillary infrastructure located on properties adjacent to the mine.

The MOD 5 EA was placed on public exhibition and submissions relating to the proposal and the MOD 5 EA were received by the Department of Planning and Environment (DP&E) and provided to Boggabri Coal (the proponent). This report summarises the issues raised in submissions (Section 2) received during the public exhibition period and responds to each of these issues (Section 3).

1.2 The proposal

The project approval in July 2012 allowed for the continuation of the BCM and associated infrastructure for a further 21 years with increased production. Detailed design of a number of components of the Boggabri Coal Project has progressed since the project was approved. These ongoing development and design activities have identified a number of adjustments and additions to previously approved operations that are required to ensure efficient continuous operation.

The proposed modification is sought to obtain approval for the establishment and operation of additional or altered project components comprising:

- two production bores (Cooboobindi and Victoria Park) to supply water for use in coal process and mining operations, these would complement the existing two production bores used for the BCM
- four contingency production bores (Roma, Belleview 1, Belleview 2 and Heathcliffe), that would supply water for use at the mine when an existing water supply source is not available (such as when a production bore is offline for maintenance)
- ancillary infrastructure required for the bores, such as powerlines, access tracks and water transfer pipelines.

Individual components of the modification are summarised in Section 3 of the MOD 5 EA.

1.3 MOD 5 EA display

The MOD 5 EA was subject to public exhibition between 1 December 2015 and 15 December 2015. Hard and soft copies of the MOD 5 EA were displayed at the offices of Narrabri Shire Council, DP&E and the Nature Conservation Council. The MOD 5 EA was also placed on the DP&E website and made available for download.

2. Overview of submissions

2.1 Submissions received

The NSW DP&E received 15 submissions during public exhibition of the MOD 5 EA. Three submissions were received from state government agencies, one from local government, three from community groups and eight from individual members of the public.

Table 2.1 lists the respondents and indicates where the issues noted in each submission have been addressed in this report.

Table 2.1 Respondents

Respondent	Submission no.	Section of this report where issues raised are addressed
NSW Office of Environment and Heritage (OEH)	1	3.1.1
Environment Protection Authority (EPA)	2	3.1.2
Department of Primary Industries (DPI) – DPI Agriculture and DPI Water	3	3.1.3
Narrabri Shire Council	4	3.1.4
Lock the Gate Alliance	5	3.2.1
Maules Creek Country Women's Association (CWA)	6	3.2.2
People for the Plains	7	3.2.3
Aidan Rodstrom	8	3.3.1
Jim Picton	9	3.3.2
Lachlan James	10	3.3.3
Marg McLean	11	3.3.4
Peter Thompson	12	3.3.5
Richard Gillham	13	3.3.6
Roselyn Druce	14	3.3.7
Name withheld	15	3.3.8

3. Response to submissions

3.1 Government agencies

3.1.1 OEH – 15 December 2015 (submission number 1)

OEH Submission on MOD 5

NSW GOVERNMENT | Office of Environment & Heritage

DOC15/504136-1
09_0182 MOD 5

Mr Matthew Riley
A/Senior Planner
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Mr Riley

Boggabri Coal Mine - Modification 5 – Environmental Assessment

Thank you for your email dated 24 September 2015 inviting the Office of Environment and Heritage (OEH) to comment regarding the Environmental Assessment (EA) for the proposed Boggabri Coal Modification 5. OEH notes the proposed modification is sought to establish and operate two production bores, four contingency bores and ancillary infrastructure including power lines, access tracks and pipelines. OEH further notes that some components of this modification are within the biodiversity offsets identified in the Boggabri Coal Project Biodiversity Offset Strategy (BOS).

This proposal is a modification of an approval granted under the now repealed Part 3A of the *Environmental Planning and Assessment Act 1979*. OEH notes that the application for this modification has occurred more than a year after the NSW Biodiversity Offsets Policy for Major Projects became operational. It is OEH's understanding that as Secretary's Environmental Assessment Requirements (SEARs) were not issued for this modification, the DGRs issued in 2009 apply. Therefore, application of the Framework for Biodiversity Assessment (FBA) is not required.

It is OEH's view that the impacts of major projects and their modifications on biodiversity values should be assessed by a reliable and transparent assessment of those values. Identification of the quantity of required offset for unavoidable impacts should therefore be achieved through application of the FBA or the Biobanking Assessment Methodology (BBAM). This has not occurred in the EA, rather the required offset has been calculated using the ratio of offset area to impact area found in the Biodiversity Management Plan for Boggabri Coal approved by the Department of Planning and Environment (DP&E). OEH does not consider this to be a reliable method for the calculation of offsets, however, the proposed clearing required for this modification is minor in size compared to the approved project and application of the FBA or BBAM may not necessarily lead to a substantially different outcome from that proposed. For this modification of the Boggabri Coal Project, OEH is prepared to accept the calculation of required offset using the area ratio as proposed in the EA.

OEH notes that the location of the required offset area, calculated in the EA to be 105.4 hectares, is not identified in the EA but will be incorporated into the revision of the BOS which is occurring concurrently. OEH considers this to be appropriate and recommends that the Department of Planning and Environment (DP&E) include a condition to this effect in the approval, if granted, using the

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vegetation communities and areas listed in Table 6.5 of the EA to require that the vegetation types being cleared are represented in the new offset areas.

Recommendation:

DP&E alter the table in condition 39 of the Boggabri Coal Project consolidated approval to include a further line stating:

Area	Offset Type	Minimum Size (hectares)
Additional modification offset area (Modification 5) Note: Location subject to final approval as part of revised Biodiversity Strategy to be prepared by the Proponent	Existing native vegetation to be protected and enhanced including at least: • 1 ha of Weeping Myall Woodland EEC as listed under the TSC Act; • 1 ha of Plains Grassland or grassland of higher conservation status; • 7 ha of River Red Gum Riparian Woodlands and Forest or riparian woodland/ forest of higher conservation status; • 34 ha of Pilliga Box Grassy Open Forest or open grassy woodland community of higher conservation status.	105

OEH considers that it is appropriate that the measures in the Cultural Heritage Management Plan will be implemented in the management of Aboriginal Cultural Heritage identified in the EA. These include avoidance, consultation with Registered Aboriginal Parties and salvage of artefacts where appropriate.

If you have any questions regarding this matter please contact Terry Mazzer on 02 6883 5302 or email terry.mazzer@environment.nsw.gov.au.

Yours sincerely

15/12/2015

MONICA COLLINS
Director, North Branch
Regional Operations

Issue summary

DP&E to ensure that the current revision of the Biodiversity Offset Strategy (BOS) incorporates the additional required offsets as detailed in Table 6.5 of the EA.

Response

As outlined in Appendix C of the MOD 5 EA, the proposed modification includes impacts to areas outside of the existing Project Approval (09_0182) and will result in new impacts to 18.8 ha of native understorey vegetation and habitat, of which 1.4 ha is listed as a threatened ecological community under the *Fisheries Management Act 1994* (FM Act), *Threatened Species Conservation Act 1995* (TSC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Whilst the majority of impacts associated with the proposal are able to be ameliorated, amendment of the existing BOS will be required. The BOS will be amended to ensure the lands previously identified within the Namoi River Offset Area and subsequently excised for the proposed Project Boundary adjustments of the modification will be replaced by an alternative offset. The quantum of this transfer will comprise up to 7.7 ha of native understorey vegetation and threatened species habitat. In addition, the proposed modification impacts not previously assessed will also be offset in accordance with the final ratio of 5.6:1 specified in the approved BOS and therefore incorporate a minimum of 105.4 ha of native understorey vegetation and threatened species habitat.

As outlined in Section 6.3.3.2, Boggabri Coal is currently revising its BOS in accordance with Condition 43 of PA 09_0182, in consultation with the Department of the Environment (DoE). Boggabri Coal's revised Biodiversity Management Plan and BOS will include refined vegetation mapping resulting from the proposed modification, independent field validation and baseline ecological monitoring as well as the identification and commitments of additional required offsets for MOD 5.

3.1.2 EPA – 3 December 2015 (submission number 2)

EPA Submission on MOD 5

New South Wales Government
Department of Planning
Skip to content
Home > Development Assessments > Major Project Assessments

Environment Protection Authority, Armidale NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Comments on this project

Hi Matt,

I refer to your email below seeking comments on and any recommended conditions of approval for the Boggabri Coal Project - Modification 5 (09_0182 MOD 5) (Narrabri Shire LGA).

The EPA has reviewed the EA for the above modification project. The EPA considers that the current EPL (no. 12407) adequately addresses the predicted impacts regulated by the EPA.

The EPA recommends that should the Modification be approved, that the proponent apply to the EPA to varying condition A2 of the EPL to updating the Project Boundary of the premises.

If you wish to discuss this further, please contact myself on 0459 077 360 or Mr Kharl Turnbull in our Armidale office on 6773 7000.

regards,

Rebecca Scrivener
A/Head Regional Operations Unit - Armidale
North Branch, NSW Environment Protection Authority

Issue summary

The EPA recommends that should the modification be approved, that the proponent apply to the EPA to varying condition A2 of the Environment Protection Licence (EPL) to updating the Project Boundary of the premises.

Response

Boggabri Coal will submit to the NSW EPA an application to vary Environment Protection Licence 12407. The variation application will propose to amend Condition A2 to account for the project boundary adjustments required as a result of MOD 5.

Table 2.3: Schedule of lands – proposed new project area of the MOD 5 EA, identifies those properties that overlie project boundary adjustments resulting from MOD 5. It is worth noting that since preparation of the MOD 5 EA, Boggabri Coal has acquired property within the project area as described further in Section 4.2.

3.1.3 DPI – 16 December 2015 (submission number 3)

DPI Submission on MOD 5

NSW GOVERNMENT | Department of Primary Industries

OUT15/35715

Mr Matthew Riley
Resource Assessments
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Matthew.Riley@planning.nsw.gov.au

Dear Mr Riley,

Boggabri Coal Project (PA 09_0182 Mod 5)
Proposed Modification

I refer to your email dated 30 November 2015 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

Comment has been sought from DPI Water, Fisheries, Agriculture & Lands. Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au. DPI Fisheries and Lands advise no issues. DPI Agriculture and Water comments are provided below.

Comment by DPI Agriculture
DPI Agriculture has reviewed the Environmental Assessment and provides the following recommendations;

- the proponent confirm the existence of mapped BSAL and include mitigation measures in the rehabilitation plan if there are any likely impacts.
- Conduct an assessment to identify the impact of the proposed modification's water requirement on agriculture and propose mitigation measures.
- Finalise the *Leard Forest Mining Precinct Water Management Strategy*, required under the existing consent, incorporating the proposed borefield, before the borefield is permitted to operate.

For further information please contact Helen Squires, Agricultural Resource Management Officer (Tamworth office) on 6763 1270 or at helen.squires@dpi.nsw.gov.au.

Comment by DPI Water
The Department of Primary Industries – Water (DPI Water) has reviewed the Environmental Assessment (EA) for Modification 5.

NSW Department of Primary Industries
Level 48 MLC Centre, 19 Martin Place Sydney NSW 2000
GPO Box 5477, SYDNEY NSW 2001
Tel: 02 9338 6666 Fax: 02 9338 6970 www.dpi.nsw.gov.au ABN: 72 189 919 072

The proposed modification involves the establishment of a borefield consisting of two production bores to supply water for use in the coal process and mining operations and four contingency production bores to supply water for use at the mine when an existing water supply source is not available. The EA outlines there will be an average deficit of 4.7ML/ day during peak production under average weather conditions, with a total shortfall of 1,015 ML under average weather conditions.

DPI Water's comments on Modification 5 are outlined as follows, with more detailed comments included in ATTACHMENT A.

Water Supply and Licencing Requirements

DPI Water has reviewed the modification and outlined the licencing requirements below:

- Boggabri Coal is required to obtain Water Access Licences (WALs) to account for the take of water associated with the proposed borefield. The WALs must be located within the same water source as the bores Boggabri Coal will be using. Currently this appears to be predominately Zone 4 within the Upper Namoi Groundwater Sources (in the Upper and Lower Namoi Groundwater Sources Water Sharing Plan).

  However, Figure 6.2 in the EA identifies the Heathcliffe bore is located in Zone 5, whilst all the other bores are in Zone 4. There is no record currently of Boggabri Coal holding a WAL in Zone 5, therefore they would be required to obtain the appropriate entitlement.

- The WALs do not need to permanently contain the total volume of water that the EA for Modification 5 outlines will be extracted (as the proponent can temporary trade in water on a yearly basis to cover any shortfall in their permanent entitlement) however the proponent must always have sufficient water allocation in their account prior to extracting from these bores. Extracting water with insufficient allocation is an offence under the *Water Management Act 2000* (WMA).

- Whilst the works (groundwater bores) do not require approval under the WMA because they would be subject to an exemption under the *Environmental Planning & Assessment Act 1979*, the works are required to be nominated on the relevant Water Access Licences in accordance with section 71W of the WMA. As the works would not have approvals under the WMA, the proponent will need to liaise with DPI Water to ensure the nomination can occur.

- DPI Water would require all the bores as part of the proposed borefield to be metered to account for the take of water from each Zone. The proponent must ensure safe access to each work and the relevant meter is available to Government officers.

- Section 6.1.3 of the EA outlines the drawdown due to extraction of groundwater is predicted to extend as far as the Namoi River, with drawdown of at least one metre for scenario 1A and drawdown of over two metres under

scenario 1B. The EA states this would reduce the volume of groundwater discharging into the Namoi River and increase river loss into the groundwater within the zone of influence, assuming the river is well-connected to the aquifer. Boggabri Coal will be required to obtain the relevant licences to account for the predicted loss of baseflow to the Namoi River as a result of the proposed borefield operation.

Groundwater Management

The following recommendations are outlined below with more detailed comments in Attachment A.

The following inadequacies in the EA and Appendices should be addressed:

- A full assessment of the proposal against the Aquifer Interference Policy (AIP) is required. The relevant documentation 'Assessing a proposal against the NSW Aquifer Interference Policy' can be found at: http://www.water.nsw.gov.au/water-management/law-and-policy/key-policies/aquifer-interference
- Address inaccuracies regarding details of access licences and share volumes in relevant water sources specifically in Table 2.2 Section 2.3. All entitlements must be accurately documented in the report.
- Ensure all entitlement requirements are addressed. Entitlement is required in all water sources where extraction is planned.
- Include a table listing all monitoring bores, depth screen interval, water source intersected, monitoring regime, and other relevant information.
- Provide DPI Water with bore completion reports and/or DPI Water 'Form As' for all completed and abandoned bores at Cooboobindi, Victoria Park and Roma.
- Provide details of third party bore impact management plan with further clarification around the specifics of 'make good provisions'.
- The minimum distance conditions in the relevant Water Sharing Plan should be incorporated as part of the general licence conditions for the modification.
- Clarification of the groundwater usage data used in the model is required. It appears not all available groundwater usage data was included, this could impact on the accuracy of the model, further explanation is required.
- Clarification on why Groundwater Vistas MODFLOW 2005 was used for the model development instead of USGS Modflow Unstructured Grids as was originally discussed with DPI Water.

DPI Water requires additional information to adequately assess groundwater impacts. Further information on the bore completion reports and pump tests for each bore will be required to be submitted to DPI Water.

Pending provision of further information to assess the impact of the development it may be necessary to include specific conditions as part of the dealing process to assign licences to enable extraction from the bores referenced in this development. These conditions may include restrictions on volumes of water that can be taken from each bore identified, to manage impacts on the river and third parties.

DPI water requests the Department of Planning and Environment liaise further with DPI Water to assist drafting specific conditions of project approval.

Groundwater Model

The report under review summarises the results of the numerical modelling. The groundwater model predicts the extent of drawdown from bore field operations, with consideration of impacts to the aquifer resource, landholder bores and wells, and surface water resources.

DPI Water's review has found no errors or deficiencies in the modelling, including the climate scenarios and cumulative drawdown assessments, that would limit the validity of the results. This modelling is adequate to assess the impacts of the proposed bore field.

Whilst DPI Water considers the model adequate for the purpose of assessing the drawdown impacts of the proposed bore operations, DPI Water requires clarification regarding the groundwater pumping data used in the model. The Parsons Brinckerhoff report refers to only ten pumping bores within the model area, however the DPI Water database has more active bores within the model calibration area. The proponent should clarify which bores and what usage data was used in the model and this should be reconciled with DPI Water's database records.

For further information please contact Christie Jackson, Water Regulation Officer, (Tamworth office) on (02) 6763 1426 or at christie.jackson@dpi.nsw.gov.au.

Yours sincerely

Mitchell Isaacs
Director, Planning Policy & Assessment Advice
16/12/2015

Attachment A

Boggabri Coal Project (PA 09_0182 Mod 5)
Proposed Modification
Detailed Groundwater Comments on Boggabri Coal Mine Modification 5

Groundwater Monitoring

The EA has not referenced all monitoring bores in the area and there is no list of the monitoring bores or any information on the depth, screen interval, lithology and water groundwater sources measured. The documentation provided does not clearly identify if monitoring bores in the alluvium as presented on Figure 6.3, are planned, or have already been drilled. The EA states that an expanded groundwater monitoring program in the alluvium will be developed in consultation with DPI Water should the proposed borefield be approved.

The documentation of the current monitoring program in the EA should be improved.

Aquifer Interference Policy

Although the Aquifer Interference Policy has been discussed in the EA, the proposed development has not been assessed against the AIP Aquifer Interference Assessment Framework 'Assessing a proposal against the NSW Aquifer Interference Policy – step by step guide'.
The EA indicates the impacts are manageable. The EA and Appendix B refers to make good provisions in principle but lacks specifics with respect to individual landholders. The EA refers to developing a borehole monitoring program in conjunction with DPI Water to validate modelling predictions and assess consistency with the AIP. Further detail should be provided on the make good provisions proposed.

Specific comments on Boggabri Coal Mine Modification Environmental Assessment (MOD 5) Main Report

Section 2.3- Existing Approvals p8

Table 2.2 is incorrect. It includes WALs that are not owned by Boggabri Coal and lists WALs that are currently cancelled. WAL 31084 is owned by Whitehaven Coal Pty Ltd and is assigned to Tarrawonga Coal Mine. WAL 14483 and WAL 14495 are both cancelled. Cancelled licences should not be listed.

The EA needs to accurately reflect all licences held by Boggabri Coal Pty Ltd that are assigned only for Boggabri Coal Mine.

Section 2.4 – Environmental Management p9

The environmental management refers to only 14 Boggabri Coal groundwater monitoring bores. The groundwater bores are shown on Figure 2.1. DPI Water has information on more than 14 BCM monitoring bores.

The EA needs to be accurate in the number of monitoring bores reported.

Section 3.1.1 – Site Water Balance pp12 to 15

The volume of groundwater available to Boggabri Coal is incorrectly stated. There is no mention of Boggabri Coal being required to obtain access licences in Upper Namoi Zone 5 (Gin's Leap to Narrabri) Groundwater Source for the Heathcliffe bore.

Inaccuracies in, and inconsistencies between, tables that state details of access licences and share volumes in relevant water sources should be addressed.

Section 4.3.2 – Other NSW legislation pp 22 to 24

Table 4.1 outlines the relevant sections of the *Water Management Act 2000* (WM Act) and Water Sharing Plans in relation to the proposed borefield. The proponent outlines the distance conditions relating to works approvals under the Water Sharing Plan do not apply, as they are exempt from the requirement to obtain a works approval under the *Environmental Planning and Assessment Act 1979*. Whilst the proponent is exempt from the requirement to obtain a works approval therefore the distance conditions do not apply, DPI Water recommends that the relevant distance conditions within Division 2 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* are incorporated when finalising this project.

It is recommended that the minimum distance conditions in the relevant WSP be incorporated as part of the modification.

Section 6 – Environmental Impact Assessment pp 29 to 31

Groundwater monitoring pp 31. The monitoring bores referred to in this section are not listed in a table. Locations of the monitoring bores are shown in Figure 6.3. DPI Water is not aware of all these bores.

A table listing all monitoring bores, depth, screen interval, water source intersected, monitoring regime etc, should be provided in the EA.

APPENDIX A Site Water Balance

Section 4.4.3.1 Groundwater Entitlement pp30

Table 4.4 is incorrect. WAL 29473 is for the Gunnedah - Oxley Basin MDB Groundwater Source and not the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source as indicated on the table. The supplementary licences WAL 14483 and WAL 14495 were cancelled on the 30 June 2015. It is unnecessary to include them in this table.

The total alluvial entitlement of 848 for the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source is incorrect. It should be 706 ML as the WAL 29473 from the Gunnedah - Oxley Basin MDB Groundwater Source has been included in the entitlement sum.

All entitlements have to be accurately documented in the report.

APPENDIX B Drawdown Impact, Assessment of Proposed Borefield Operations
Section 5.2 pp 14 Alluvium Aquifer

Hydraulic properties were determined for bores at Cooboobindi, Victoria Park, Daisymede, Roma, Heathcliffe, Belleview 1 and Belleview 2. DPI Water has information on completed bores at Daisymede, Heathcliffe, Belleview 1 and Belleview 2.

It appears that the production bores have been drilled at Cooboobindi, Victoria Park and Roma, but DPI Water has no record of them being drilled, or of completed bores.

Clarification is required on completed bores for Cooboobindi, Victoria Park and Roma.

Section 5.3.3 Landholder Census pp 18 and Section 7.5.5, pp 29 Groundwater abstraction

The borehole census indicates that more bores have groundwater usage than was used in the model as indicated in section 7.5.5.
The groundwater abstraction says '*Boggabri town water supply bore (0.65 ML/day)*" the Boggabri Town Water Supply bore that has been used in the model has zero usage in the Water

Accounting System data base since the 2008/2009 water year. This needs to be addressed in the model.
The report mentions "*10 irrigation bores with varying metred data available*". DPI Water has more than 10 bores in the model area with historical usage over the calibration period of 2004 to 2014 and more bores are indicated in the landholder census. This needs to be addressed in the model.

Available usage data should be used in the model calibration.

Section 7.2 pp 24 Model software and Complexity

Groundwater Vistas MODFLOW 2005 was use as the modelling platform for this model. At a meeting with Boggabri Coal and the modellers with DPI Water earlier in 2015 it was said that USGS Modflow Unstructured Grids Modelling platform would be used for developing this model.

Clarification is sought on why Groundwater Vistas MODFLOW 2005 was used for the model development instead of USGS Modflow Unstructured Grids as was originally discussed.

End Attachment A

Issue summary

DPI Agriculture recommends that the proponent:

- Confirm the existence of mapped Biophysical Strategic Agricultural Land (BSAL) and include mitigation measures in the rehabilitation plan if there are any likely impacts.
- Conduct an assessment to identify the impact of the proposed modification's water requirement on agriculture and propose mitigation measures.
- Finalise the ***Leard Forest Mining Precinct Water Management Strategy***, required under the existing consent, incorporating the proposed borefield, before the borefield is permitted to operate.

DPI Water requirements:

- Boggabri Coal is required to obtain Water Access Licences (WALs) to account for the take of water associated with the proposed borefield. The WALs must be located within the same water source as the bores Boggabri Coal will be using. Currently this appears to be predominately Zone 4 within the Upper Namoi Groundwater Sources (in the Upper and Lower Namoi Groundwater Sources Water Sharing Plan). However, Figure 6.2 in the EA identifies the Heathcliffe bore is located in Zone 5, whilst all the other bores are in Zone 4**. There is no record currently of Boggabri Coal holding a WAL in Zone 5, therefore they would be required to obtain the appropriate entitlement.**
- The WALs do not need to permanently contain the total volume of water that the EA for Modification 5 outlines will be extracted (as the proponent can temporary trade in water on a yearly basis to cover any shortfall in their permanent entitlement) however the **proponent must always have sufficient water allocation in their account prior to extracting from these bores.** Extracting water with insufficient allocation is an offence under the *Water Management Act 2000* (WMA).
- Whilst the works (groundwater bores) do not require approval under the WMA because they would be subject to an exemption under the *Environmental Planning & Assessment Act 1979*, **the works are required to be nominated on the relevant Water Access Licences in accordance with section 71W of the WMA**. As the works would not have approvals under the WMA, the proponent will need to liaise with DPI Water to ensure the nomination can occur.
- **DPI Water would require all the bores as part of the proposed borefield to be metered to account for the take of water from each Zone**. The proponent must ensure safe access to each work and the relevant meter is available to Government officers.
- Section 6.1.3 of the EA outlines the drawdown due to extraction of groundwater is predicted to extend as far as the Namoi River, with drawdown of at least one metre for scenario 1A and drawdown of over two metres under scenario 1B. The EA states this would reduce the volume of groundwater discharging into the Namoi River and increase river loss into the groundwater within the zone of influence, assuming the river is well-connected to the aquifer. Boggabri Coal will be required to obtain the relevant licences to account for the predicted loss of baseflow to the Namoi River as a result of the proposed borefield operation.

The following recommendations were made to address inadequacies in the EA:

- A **full assessment of the proposal against the Aquifer Interference Policy (AIP) is required**. The relevant documentation 'Assessing a proposal against the NSW Aquifer Interference Policy' can be found at: http://www.water.nsw.gov.au/water-management/law-and-policy/keypolicies/aquifer-interference
- **Address inaccuracies regarding details of access licences and share volumes in relevant water sources specifically in Table 2.2 Section 2.3**. All entitlements must be accurately documented in the report.

- **Ensure all entitlement requirements are addressed**. Entitlement is required in all water sources where extraction is planned.
- Include a table listing all monitoring bores, depth screen interval, water source intersected, monitoring regime, and other relevant information.
- Provide DPI Water with bore completion reports and/or DPI Water 'Form As' for all completed and abandoned bores at Cooboobindi, Victoria Park and Roma.
- Provide details of third party bore impact management plan with further clarification around the specifics of 'make good provisions'.
- The minimum distance conditions in the relevant Water Sharing Plan should be incorporated as part of the general licence conditions for the modification**.**
- **Clarification of the groundwater usage data used in the model is required.** It appears not all available groundwater usage data was included, this could impact on the accuracy of the model. Further explanation is required.
- **Clarification on why Groundwater Vistas MODFLOW 2005 was used for the model development instead of USGS Modflow Unstructured Grids as was originally discussed with DPI Water**. DPI Water requires additional information.

DPI water requests the DP&E liaise further with DPI Water to assist drafting specific conditions of project approval.

Regarding the Groundwater model, DPI request that the proponent clarify which bores and what usage data was used in the model and this should be reconciled with DPI Water's database records.

Response

DPI Agriculture

Issue	Response
Confirm the existence of mapped BSAL and include mitigation measures in the rehabilitation plan if there are any likely impacts.	The MOD 5 project area occurs within Biophysical Strategic Agricultural Land (BSAL) (New England North West Strategic Regional Land Use Plan 2012) of which approximately 34 ha occur within the project area (refer to Figure 3.1). As identified in Section 6.1 of the MOD 5 EA, the proposed borefield is located in an area with agricultural production (cotton and grazing) being the main land use. Under the 2013 Mining State Environmental Planning Policy (SEPP) amendment, the Gateway process applies to the following State Significant Development located wholly or partially on BSAL: ■ State significant mining development that requires a new mining lease ■ extraction of a bulk sample of more than 20,000 tonnes of coal or any mineral ore (i.e. State significant mining exploration activity) ■ State significant petroleum development that requires a new petroleum production lease ■ State significant petroleum exploration activity. However, this does not include development carried out on land outside the area of a proposed mining or production lease. As the proposed borefield involves development outside of Boggabri Coal's mine lease, MOD 5 does not trigger the Gateway process. New areas that form part of the MOD 5 property boundary adjustments will be included in and subject to the rehabilitation requirements of the next revision of Boggabri Coal's Rehabilitation Management Plan.

Issue	Response
Conduct an assessment to identify the impact of the proposed modification's water requirement on agriculture and propose mitigation measures.	Potential drawdown impact of the operation of the proposed borefield on agriculture has been assessed in the MOD 5 EA Appendix B Drawdown Impact Assessment of the Proposed Borefield Operations. Minimal drawdown impacts on active landholder bores during average weather conditions are expected. During extended dryer conditions, drawdown greater than 2m is predicted at some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of pumping from the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable "make good provisions". 'Make good' provisions may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, and/or other compensatory measures.
Finalise the ***Leard Forest Mining Precinct Water Management Strategy***, required under the existing consent, incorporating the proposed borefield, before the borefield is permitted to operate.	The Boggabri, Tarrawonga, Maules Creek (BTM) Complex Water Management Strategy (WMS) has been prepared to address the Project Approval requirement associated with the preparation of a Leard Forest Mining Precinct Water Management Strategy. The BTM Complex WMS received Commonwealth government approval in early 2014 but is yet to receive DP&E approval due to delays in the approval of the MCC Water Management Plan. This WMS is expected to be issued to DP&E for approval in the second quarter of 2016 with finalisation expected to occur later in 2016 but this timing is outside of Boggabri Coal's control.

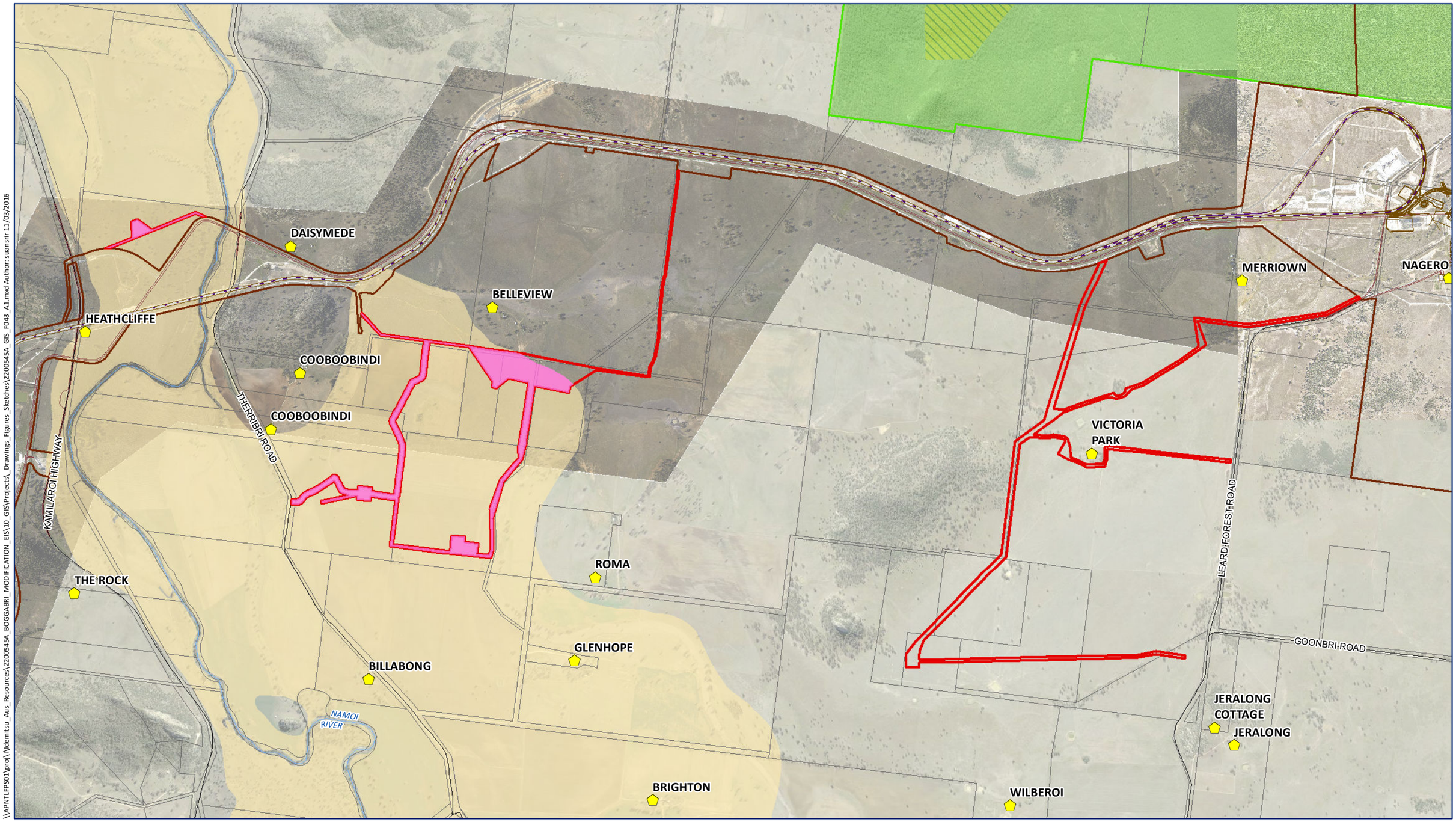

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Figure 3.1
Biophysical Strategic Agricultural Land (BSAL)

DPI Water

Issue	Response
Requirements	
Boggabri Coal is required to obtain Water Access Licences (WALs) to account for the take of water associated with the proposed borefield. The WALs must be located within the same water source as the bores Boggabri Coal will be using. Currently this appears to be predominately Zone 4 within the Upper Namoi Groundwater Sources (in the Upper and Lower Namoi Groundwater Sources Water Sharing Plan). However, Figure 6.2 in the EA identifies the Heathcliffe bore is located in Zone 5, whilst all the other bores are in Zone 4**. There is no record currently of Boggabri Coal holding a WAL in Zone 5, therefore they would be required to obtain the appropriate entitlement.**	Boggabri Coal acknowledges that it is not the holder of a Zone 5 WAL. Should Boggabri Coal wish to pump from the Heathcliffe Bore then, subject to approval of Mod 5, Boggabri Coal will acquire the necessary WAL in Zone 5, prior to extraction. This will be on either a temporary or permanent basis and in accordance with the water trading requirements of the Water Sharing Plan for the Upper and Lower Namoi Groundwater sources.
The WALs do not need to permanently contain the total volume of water that the EA for Modification 5 outlines will be extracted (as the proponent can temporary trade in water on a yearly basis to cover any shortfall in their permanent entitlement) however the **proponent must always have sufficient water allocation in their account prior to extracting from these bores.** Extracting water with insufficient allocation is an offence under the *Water Management Act 2000* (WMA).	Boggabri Coal will ensure that there is sufficient water allocation in its account prior to extracting from the bores.
Whilst the works (groundwater bores) do not require approval under the WMA because they would be subject to an exemption under the *Environmental Planning & Assessment Act 1979*, **the works are required to be nominated on the relevant Water Access Licences in accordance with section 71W of the WMA**. As the works would not have approvals under the WMA, the proponent will need to liaise with DPI Water to ensure the nomination can occur.	DPI's acknowledgment of the exemption is noted. Boggabri Coal will liaise with the DPI Water on how licencing of the works will be achieved.
DPI Water would require all the bores as part of the proposed borefield to be metered to account for the take of water from each Zone. The proponent must ensure safe access to each work and the relevant meter is available to Government officers.	Boggabri Coal will meter all groundwater works in order to account for take of water. Boggabri Coal will ensure safe access to each groundwater supply work subject of MOD 5 and that the relevant meter is available to Government officers.

Issue	Response
Section 6.1.3 of the EA outlines the drawdown due to extraction of groundwater is predicted to extend as far as the Namoi River, with drawdown of at least one metre for scenario 1A and drawdown of over two metres under scenario 1B. The EA states this would reduce the volume of groundwater discharging into the Namoi River and increase river loss into the groundwater within the zone of influence, assuming the river is well-connected to the aquifer. Boggabri Coal will be required to obtain the relevant licences to account for the predicted loss of baseflow to the Namoi River as a result of the proposed borefield operation.	Boggabri Coal note the requirement from DPI Water and will continue discussions with the Department on obtaining relevant licences to account for predicted loss of baseflow from the Namoi River.
Recommendations	
A **full assessment of the proposal against the Aquifer Interference Policy (AIP) is required**. The relevant documentation 'Assessing a proposal against the NSW Aquifer Interference Policy' can be found at: http://www.water.nsw.gov.au/water-management/law-and-policy/keypolicies/aquifer-interference	A full assessment of the proposal against the Aquifer Interference Policy (AIP) Framework has been completed and is attached as Appendix A.
Address inaccuracies regarding details of access licences and share volumes in relevant water sources specifically in Table 2.2 Section 2.3. All entitlements must be accurately documented in the report.	Table B1 in Appendix B of this report accurately details share volumes of Water Access Licences owned by Boggabri Coal.
Ensure all entitlement requirements are addressed. Entitlement is required in all water sources where extraction is planned.	Table B1 in Appendix B of this report accurately details share volumes of Water Access Licences owned by Boggabri Coal.
Include a table listing all monitoring bores, depth screen interval, water source intersected, monitoring regime, and other relevant information.	Details of existing monitoring bores within the mine, borefield area and over a regional perspective have been included in Table C1 in Appendix C.
Provide DPI Water with bore completion reports and/or DPI Water 'Form As' for all completed and abandoned bores at Cooboobindi, Victoria Park and Roma.	Bore completion reports and/or DPI Water 'Form As' for all completed bores at Cooboobindi, Victoria Park and Roma will be provided to DPI Water.
Provide details of third party bore impact management plan with further clarification around the specifics of 'make good provisions'.	The management of 'third party bore impacts' will be documented in a section of the Groundwater Monitoring Plan (to be revised following determination of MOD 5). ■ Make good provisions" are the product of negotiations between Boggabri Coal and owners of groundwater supply works affected by Boggabri Coal groundwater pumping. in accordance with the State Project approval condition schedule 3, condition 34 and the Aquifer Interference Policy which requires: Boggabri Coal to provide a compensatory water supply to any landowner of privately-owned land whose water supply is adversely and directly impacted (other than an impact that is negligible) as a result of the project, in consultation with DPI Water (formerly NOW), and to the satisfaction of the Director-General. Compensatory measures could include enhanced infrastructure or other means such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores. ■ The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent to the loss attributed to the project. Equivalent water supply should be provide

Issue	Response
	(at least on an interim basis) within 24 hours of the loss being identified. ■ If Boggabri Coal and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer to the matter to the Director-General for resolution. ■ If Boggabri Coal is unable to provide an alternative long-term supply of water, then alternative compensation shall be provided to the satisfaction of the Director-General.
The minimum distance conditions in the relevant Water Sharing Plan should be incorporated as part of the general licence conditions for the modification.	The following Water Sharing Plans apply to water sources in the vicinity of the BCM: ■ Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012 ■ Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2003 ■ Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003 ■ Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Source 2011. DPI Water's submission acknowledges that the distance conditions relating to works approvals under these Water Sharing Plans to not apply, as thy are exempt from the requirement to obtain a works approval under the *Environmental Planning and Assessment Act 1979*.
Clarification of the groundwater usage data used in the model is required. It appears not all available groundwater usage data was included, this could impact on the accuracy of the model, further explanation is required.	Clarification of the groundwater usage data used in the model is noted in Appendix D of this report. WSP I Parsons Brinckerhoff re-evaluated groundwater usage data from DPI Water records and concluded that six bores (five irrigation bores and old Boggabri town water supply bore GW032927) were omitted from the model. The steady state groundwater model was updated with the additional bore water usage data and rerun. This updated modelling assessment indicated that the additional water usage from third party bores has minimal influence in the model within the area of operations of the three production bores: Cooboobindi, Daisymede and Victoria Park. There is some disparity in modelled outcomes north of the Heathcliffe contingency bore where there are historic records of notable water usage from irrigation bores GW060075 and GW901836. A recalibration of the model hydraulic properties, and subsequent rerun of the simulated drawdown scenarios is not considered necessary. Recalibration in this northwestern model area is expected to provide slightly lower hydraulic conductivity values as the current simulated groundwater level at monitoring bore GW36056 is underestimated. A zoned lower hydraulic conductivity value in the northwestern area of the model would be expected to reduce the extent of drawdown impacts from Boggabri Coal pumping bores in this area.
Clarification on why Groundwater Vistas MODFLOW 2005 was used for the model development instead of USGS Modflow Unstructured Grids as was originally discussed with DPI Water. DPI Water requires additional information	The reasons the MODFLOW 2005 with NWT solver was used with the Groundwater Vista interface instead of MODFLOW USG is as follows: ■ As discussed in Section 7.7 of the groundwater modelling report (Appendix B) the pilot point calibration process was used for optimizing horizontal hydraulic conductivity (k_x) while keeping the horizontal/vertical K (k_x/k_y) ratio constant for the alluvial aquifer layer in the model. This was applied using the PEST option within Groundwater Vista interface and was considered the best approach for the available dataset and modelling timeframe. It was expected that excessive time would be spent in the calibration process if extra sets of pilot points for optimizing k_y were used and there was uncertainty with the k_x/k_y ratio. ■ At the time of undertaking the model calibration process the MODFLOW Unstructured Grids (USG) and SMS solver were not

Issue	Response
	linked to this PEST function within Groundwater Vista. The combination of MODFLOW 2005 and NWT solver allowed for this calibration method, and at the same time reduce model run times and mass balance error.

3.1.4 Narrabri Shire Council (submission number 4)

Narrabri Shire Council Submission on MOD 5

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Narrabri SHIRE
Heart of the North West

Our Reference: ID338886:TM:MR
Your Reference:
Contact Name: Tony Meppem
Telephone: (02) 6799 6855

16 December 2015

Planning Services
NSW Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

Attention: The Assessing Officer

Dear Sir/Madam

RE: Boggabri Coal Project – Modification No 5

I refer to the abovementioned modification application No. 09_0182 MOD 5 which was on public exhibition for 14 days from 1 December 2015 until 15 December 2015 and previous advice via email that Council did not have a scheduled Council meeting until 3.00pm on the 15th December 2015 and would therefore not be able to meet such a ridiculously short exhibition period.

The matter was considered at the Council meeting and Council resolved to express the following concerns:

1. Council express their concerns on the impact the proposed modification will have on the Leards Forest mining precinct and township of Boggabri and that a cumulative impact regional hydrological model be produced prior to any determination.

2. That the applicant be required in any case to ensure that landholders whose groundwater is proposed to be detrimentally affected be adequately compensated by Boggabri Coal ensuring no negative effects are realised.

3. That Council write to the Department of Planning requesting them to extend the fourteen (14) days for submissions to be lodged regarding significant developments, to thirty (30) days.

If you wish to consult Council further regarding this matter feel free to contact the undersigned on 6799 6855 or via email at tonym@narrabri.nsw.gov.au.

Yours faithfully,

Tony Meppem
ACTING DIRECTOR PLANNING & DEVELOPMENT

Issue summary

- Council express concerns on the impact the proposed modification will have on the Leard Forest mining precinct and township of Boggabri and that a cumulative impact regional hydrological model be produced prior to any determination.
- Council request the applicant be required to ensure that landholders whose groundwater is proposed to detrimentally affected be adequately compensated by Boggabri Coal ensure no negative effects are realised.
- Council request that Department of Planning extend the 14 days for submissions to lodged to 30 days regarding significant developments.

Response

Issue	Response
Council express concerns on the impact the proposed modification will have on the Leard Forest mining precinct and township of Boggabri and that a cumulative impact regional hydrological model be produced prior to any determination.	As outlined in the MOD 5 EA – Section 2 of Appendix B: Drawdown Impact Assessment of Proposed Borefield Operation, the scope of works for the groundwater drawdown impact assessment included the development of a numerical groundwater flow model and simulated borefield operation that included amongst other things assessing the influence of predicted cumulative drawdown impacts from the Boggabri, Tarrawonga and Maules Creek (BTM) mine complex and borefield drawdown assessment on the alluvial aquifer resource. Ten irrigation bores as well as the Boggabri town water supply bore were incorporated into the model and considered as part of the assessment. Cumulative impacts are specifically considered in Section 7.10.5 of Appendix B of the MOD 5 EA. This assessment concluded that the Victoria Park, Belleview and Daisymede bores may experience minor drawdown (<1 m) from mine dewatering over the long-term (as predicted from cumulative mine impacts modelling), which, when compounded with borefield pumping interference, is unlikely to affect the sustainability of pumping rates in these bores, with the possible exception of Daisymede bore. The contribution of long-term pumping from the borefield on cumulative drawdown impacts is estimated to be an additional 1-2m (Scenarios A) and 1-3 m (Scenarios B) drawdown in the alluvium to the east and northeast of the borefield where mine cumulative drawdown is experienced. As outlined in Section 6.1.4 of the MOD 5 EA, Boggabri Coal will operate an expanded groundwater monitoring program designed to monitor the effects of the proposed borefield operations on the alluvial aquifer resource, surface water bodies and regional users. This will be developed in consultation with DPI Water and incorporated into a revised Groundwater Management Plan. It is recommended (Appendix B of the MOD 5 EA) that this monitoring program includes the on-going assessment of the impact from the borefield operations on the alluvial aquifer resource, surface water bodies and regional users.
Council request the applicant be required in any case to ensure that landholders whose groundwater is proposed to detrimentally affected be adequately compensated by Boggabri Coal ensure no negative effects are realised.	Potential drawdown impacts of the proposed borefield modification on any landholder has been assessed in the MOD 5 EA Appendix B Drawdown Impact Assessment of Proposed Borefield Operation. Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m (i.e. 2m-5m) is predicted in some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its

Issue	Response
	extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. 'Make good' provisions may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to 'make good' provisions if drawdown impacts occur, no negative effects are expected to be realised.
Council request that Department of Planning extend the 14 days for submissions to lodged to 30 days regarding significant developments.	Noted. Submission period was in accordance with statutory timeframes.

3.2 Community submissions

3.2.1 Lock the Gate Alliance – 14 December 2015 (submission number 5)

Lock the Gate Alliance Submission on MOD 5

LOCK THE GATE ALLIANCE
AUSTRALIANS WORKING TOGETHER TO PROTECT OUR LAND, WATER, AND FUTURE

Reply to: Georgina Woods
Policy coordinator
PO Box 290
Newcastle 2300

14 December 2015

Submission: Boggabri mine modification 5

Thank you for the opportunity to comment on this proposal.

We object to this modification and urge the Department to refuse it, given the unacceptable additional impact this proposal will have on water users and the environment in the area. Clearly, the original water demand modelling was not fit for purpose and utterly useless.

The fundamental question is: why wasn't a proper site water balance required before a large mine was given approval? Why did the mine not have to have all its water entitlements before the mine expansion could begin? Would the mine have been given approval had the full extent of its water demand, and the effect of this proposed water use on the groundwater, the Namoi River and nearby water users been accurately identified?

Incredibly, the previous water balance modeller assumed:

> *that adequate groundwater / surface water allocations or alternative water sources are available to make up the site water deficit (an infinite supply has been adopted in this model). However where the annual water deficit exceeds Boggabri Coals current water entitlements,* ***it will be necessary for Boggabri Coal to secure additional water to makeup the deficit***[1].

In other places in the Environmental Assessment, the water balance modeller said, *"in the absence of long term stream flow data"* and *"due to the absence of gauged runoff data from the site,"* acknowledging that there is little actual surface water information to be modelled. Assuming an "infinite" supply of water in the modelling for the expansion that was approved in 2012 was clearly an error and the businesses of water users in the area should not be put at risk to correct this mistake.

Furthermore, the ground water modelling was deficient. A Peer Review of the Boggabri Coal Ground Water modelling[2] which is an input to the Water Balance modelling said:

> *Using the MDBC guidelines checklist, the modelling is found to be deficient and/or lacking in the areas of calibration, verification, sensitivity analyses and uncertainty analyses – each to varying degrees. The end result is no demonstration or basis, other than conservative assumptions by the modeller, by which to have any real confidence that what is being provided is the best estimate or even worst case.* ***Therefore, the usefulness of this model is***

[1] Parsons Brinckerhoff, 2010, Continuation of Boggabri Coal Mine Project – Surface Water Assessment
[2] Water Resource Australia, 2011, Review of Continuation of Boggabri Coal Mine Groundwater Assessment

to a large extent unknown as the reader is left to accept a lot of what has been done on faith rather than demonstrated ability.

The shocking reality is that the company had little knowledge as to the water balance due little surface water data and deficient ground water modelling. The one thing they were clear on was that they would have to find more water from somewhere if they were to continue production in all seasons., Despite the Parsons Brinckerhoff modeller admitting that more water would be needed, condition 3.33 of the proponent's development consent for this mine states that, "**the proponent shall ensure it was sufficient water for all stages of the project and, if necessary, adjust the scale of mining operations on site, to match its available water supply.**"

This recommendation was part of a suite of measures recommended by the NSW Office of Water in their submission (see Appendix 1) and was adopted by the Planning Assessment Commission for this mine.

The PAC decision was deliberate and the company as indicated by the water balance assumptions fully understood the implications of the condition. Instead of adopting a precautionary approach or complying with this condition, the company ramped up production and is now seeking a modification in order to access even more water in a semi-arid area with restricted water availability.

Boggabri Coal had full knowledge of the likely shortfall in available water but accepted a condition that they should scale back production, should a shortfall eventuate. The company indicated its acceptance of the decision and acted on it, increasing production and clearing more forest. It follows that the company should be held to that condition, because nothing has changed. Idemtitsu has also failed to fulfil condition 38 of the consent, which requires the development of a Water Management Plan within six months of the consent that includes a Leard Forest Mining Precinct Water Management Strategy developed in conjunction with Whitehaven Coal. The Department of Planning has advised local farmers that this strategy has not been deemed adequate by the Department. In our view, this leaves Idemitsu in breach of their consent, and it certainly adds weight to objections to this modification. The company has not been able to fulfil the commitiments it has already made. No further approvals should be granted until its operation and management plans are up to scratch.

Idemitsu claims this modification is exempt from the water trigger, because the Guidelines for the trigger exempt activities for mines that are "not part of the extraction process." We reject this premise. High volume water demand is part of the impact of coal mining. This modification represents a significant additional impact on a matter of national environmental significance and must be referred for EPBC consideration.

Mining at Boggabri mine began in 2006, and in 2012 the production rate was increased from 5-7mtpa. The application makes clear that the 2012 approval to expand was made without due consideration of the water needs of the project, and that the proponent has now "identified a number of adjustments and additions to previously approved operations that are required to ensure its efficient continuous operation." This is not acceptable. Water is a constrained resource in the locality, and the mine was assessed and given approval on the basis of the water demand and extraction levels identified in the Environmental Assessment.

The 2012 modification should not have been granted, clearly. It is incumbent on the Department of Planning to review the claims made by the company, upon which basis approval was granted. It needs to be determined whether it is only due to the 2012 expansion that this additional water is

needed, or whether the original water impact assessment got the projections badly wrong. To run their approved operation, Idemitsu now claim to need 2,082ML more per year to meet demand in average conditions. In dry conditions, they'll need up to 2,600ML.

To meet the demand that they did not expect they would have, Idemitsu seek approval to modify their consent and create six new bores. Two to supply water for the mine, and four "contingency" to feed the 9.5ML per day the company now finds it needs to run the mine, half of which must be sourced off site.

We note that the company does not have sufficient aquifer water access licences to meet this demand, but claims to be in the process of obtaining them. The Environmental Assessment indicates the company has 848ML of aquifer licences, at full availability. Their Namoi surface water entitlements could yield 229ML per year. The Annual Environmental Report for 2014 reveals that the mine used 1027ML of water for dust suppression last year[3]. This is only 50ML less than the volume represented by all of the water access licences owned by the company. Adding the other water demand, such as the 224ML expected pit inflow, washdown and potable water use, indicates water consumption beyond the water access licences held by the company. This needs to be investigated and clarified before this currently application goes any further.

To fill the annual expected deficit of 1015-1570ML, the company proposes a new borefield, but this will have dramatic and unacceptable consequences for water resources and other water users.

Because the mine is a State Significant Development, still operating under Part3A "transitional arrangements" a water supply work approval is not necessary to construct these bores, but they do need Water Access Licences. They admit they need them for the aquifer, but it appears that they should also need them for the Namoi surface water. As a result of this extra extraction, drawdown will extend to Namoi River itself, with draw down of at least 1m and perhaps over 2m occurring over a 3.8km section of the river. This means there will be lost baseflow to the Namoi, and there will also be loss of surface water into the ground. This is completely unacceptable.

Water in the Maules Creek area and the Murray Darling Basin is highly contentious. Boggabri Coal has discharged mine water into the Namoi and is now short of water. It is our understanding from people from within our network that Maules Creek coal mine is also short of water. Now is the time to stick to commitments upon which the community has had to plan, not reward sloppy modelling and lazy mine planning.

We urge the Department of Planning and DPI Water to adopt a precautionary approach refuse consent for this modification and conduct a thorough audit of Idemitsu (and Whitehaven's) use of and impact on water in the Maules Creek area.

[3] Boggabri Coal Operations Annual Environmental Report 2014. page 51.

Appendix 1.

ATTACHMENT B

MP09_0182 BOGGABRI COAL PROJECT

NSW OFFICE OF WATER RECOMMENDED CONDITIONS OF APPROVAL

NOW's recommended conditions of approval focus on key water management matters related to this proposal.

Water Licencing:

1. The proponent must ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations to match its water supply.
2. The proponent must ensure all monitoring bores are licenced with the NSW Office of Water. All *Form A's* associated with the bores must be submitted to NOW at the time drilling is undertaken.
3. The proponent must account for the 'take' of all water accessed for the development, including all incidental water and all water required for the mine must be appropriately licensed.
4. All water must be obtained and appropriately licenced prior to mining operations commencing.

Groundwater Monitoring:

5. The proponent must develop an extensive groundwater monitoring plan, in consultation with and to the satisfaction of the NSW Office of Water, to take into account the expansion of the current mining operations. The groundwater monitoring plan must monitor the potential impacts of the mine on other aquifers and surrounding users and include appropriate conditions to mitigate any adverse impacts mining may create.

Surface Water Monitoring:

6. The proponent must develop an extensive surface water monitoring plan, in consultation with and to the satisfaction of the NSW Office of Water, to take into account the expansion of the current mining operations. The surface water monitoring plan must also monitor the potential impacts of the mine of watercourses within the mine site.

Mine Management Plans:

7. The proponent must amend current plans associated with the mine including the Groundwater Management Plan, Surface Water Management Plan and Contingency Management Plan, to take in to account the expansion of mining operations to the satisfaction of the NSW Office of Water.

Attachment B Ends
17 February 2011

Issue summary

- Opposing the modification because of its unacceptable additional impact it will have on water users and the environment, questioning the quality of the original water demand modelling.
- Lock the gate put forward the questions:
  - Why a proper site balance wasn't required before a large mine was given approval?
  - Why did the mine not have all its water entitlements before the mine expansion could begin?
  - Would the mine have been given approval had the full extent of it water demand, and the effect of this proposed water use on groundwater, the Namoi River and nearby water users been accurately identified?
- Boggabri coal accepted to condition that if necessary they would adjust the scale of mining operation to match the available water supply, instead of adopting a precautionary principal in a time of lowered water supply, they seeking a modification to access more water in semi-arid area with restricted water access. The company should be held to condition 3.33 of the development consent.
- Highlights that Idemitsu has failed to fulfil condition 38 of the consent, requiring the development of a Water Management Plan that includes a *Leard Forest Mining Precinct Water Management Strategy* in conjunction with Whitehaven Coal. Without these previous commitment being fulfilled no further approvals should be made.

Response

Issue	Response
Opposing the modification because of its unacceptable additional impact it will have on water users and the environment, questioning the quality of the original water demand modelling.	Opposition to Project is noted.
Why a proper site balance wasn't required before a large mine was given approval?	Comment noted. It is beyond the scope of this proposal to comment on requirements of previous stages of the mine development. Schedule 3, Condition 38 (a) of the state Project Approval requires the preparation of a Sit Water Balance (SWB). The SWB attached as Appendix A of the MOD 5 EA has been prepared in fulfilment of the requirements.
Why did the mine not have all its water entitlements before the mine expansion could begin?	Comment noted. Previous assessment of the impacts on water resources including water demand were based on the best available information at that point in time. As outlined in Section 3.1 of the MOD 5 EA, ongoing development at the mine has identified the need for additional water supplies.
Would the mine have been given approval had the full extent of it water demand, and the effect of this proposed water use on groundwater, the Namoi River and nearby water users been accurately identified?	Comment relates to previous approval granted to Boggabri Coal and is not within the scope of the proposed borefield modification.
Boggabri coal accepted the condition that if necessary they would adjust the scale of mining operation to match the available water supply, instead of adopting a precautionary principal in a time of lowered water supply, they seeking a modification to access more water in semi-arid area with restricted water access. The company should be held to condition 3.33 of the development consent.	The objective of MOD 5 is to ensure that Boggabri Coal has a sufficient supply of water for all stages of its operation. As noted in Section 4.7.1 of Appendix A of the MOD 5 EA, Boggabri Coal will continue to assess options to ensure water security for operations and will act proactively to manage water demand. Should extreme conditions eventuate and if deemed necessary, the scale of mining operations on site will be adjusted to match the available water supply.

Issue	Response
Highlights that Idemitsu has failed to fulfil condition 38 of the consent, requiring the development of a Water Management Plan that includes a *Leard Forest Mining Precinct Water Management Strategy* in conjunction with Whitehaven Coal. Without these previous commitment being fulfilled no further approvals should be made.	Boggabri Coals Water Management Plan has the approval of DP&E and the Australian Government Department of the Environment. The BTM Complex Water Management Strategy (WMS) has been prepared to address the Project Approval requirement associated with the preparation of a Leard Forest Mining Precinct Water Management Strategy. The BTM Complex WMS received Commonwealth government approval in early 2014 but is yet to receive DP&E approval due to delays in the approval of the MCC Water Management Plan. This WMS is expected to be issued to DP&E for approval in the second quarter of 2016 with finalisation expected to occur later in 2016 but the timing is outside of Boggabri Coal's control.

3.2.2 Maules Creek CWA – 15 December 2015 (submission number 6)

Maules Creek CWA Submission on MOD 5

Maules Creek CWA submission: Objections to Idemitsu Resources Australia Boggabri Coal mine Project Approval Modification Environmental Assessment (MOD 5) 20 November 2015

1. INTRODUCTION

1.1 Who is Maules Creek CWA

Our Branch was initially formed in 1923. We are local women with a wide network. We are concerned about the present and future health and well being of our community and environment. We believe our community is at risk now and into the future from unsustainable developments.

As country women we are primarily concerned with preserving and fostering the sustainability of rural communities. The advent of coal mining in the Boggabri/Maules Creek regions has caused the loss of 66 farms to mine ownership, replacing active community members and farmers with mine employees and others tenants who have not assumed permanent community commitments such as volunteer fire fighting etc. This has also dramatically reduced the agricultural productivity in the area.

Daily our members are facing serious and undeniable environmental problems - noise and dust - that were predicted in numerous submissions at the time of the Boggabri coal mine expansion approval 09_0182 in 2012. Nevertheless the expansion was approved and now seeks to increase its water extraction by developing a new borefield, and obtaining water licences to aquifer and surface water.

We are very concerned about the impacts of climate change drivers – their emissions and their activities on all the communities in the world. In this instance we are concerned about rural community resilience, rural Australia's water needs, particularly the Great Artesian Basin, specifically our rivers and groundwater and the recharge zones in the North West.

We are also concerned that in light of the world's very recent consensus that fossil fuels must stay in the ground, that all individual Government decisions going forward will be seen as market signals. We believe that all signals going forward from NSW Planning and Environment must reflect the world's call for real climate actions- not just discussions of emissions reductions and carbon credits. Department of Planning and Environment must demonstrate REAL CLIMATE ACTION and put vulnerable communities and environments first as the world transitions to renewable energy.

Companies like Boggabri Coal which submit false modelling to the NSW Government in order to secure planning approval should not be rewarded a mere three years later with the approval of Modification 5 (MOD 5).

2.2 MOD 5 is a high risk modification

We are making a submission because it impacts the ability of this area and the North West to be resilient going forward. The MOD 5 is a new, high risk extension to the Boggabri Coal mine's operations which is being sought by Idemitsu Resources despite the fact that there is no **Leard Forest Mine Precinct Water Management Strategy** as prescribed by condition 38(d) of Major Project Approval 09_0182. MOD 5 has potentially catastrophic, irreversible consequences to the

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groundwater in Zones 5 and 11.

In considering MOD 5, the NSW Government should consider the poor environmental track record of Idemitsu, with some large fines and serious breaches of its approval conditions to date.

These factors should invoke the Precautionary Principle, as required by the legislation.

Despite the PAC's specific requirement that the Leard Forest mining precinct be planned as a whole rather than 3 (or 4 if the Goonbri coal mine project proceeds immediately adjacent to Boggabri Coal in the Leard forest) separate projects, none of the key strategies has been implemented.

It is widely known that the water crisis now affecting Boggabri Coal is impacting on the mine's ability to manage airborne dust and the CWA is reliably informed that dust suppression activities are curtailed due to the water shortage. However, this should not be considered an adequate justification for approving MOD 5.

Previous CWA submission about air quality impacts of Maules Creek and Boggabri extension Major Projects have been vindicated.

2.3 No further modifications until Boggabri Coal complies with existing conditions

Essentially Maules Creek CWA is demanding no further approval of changes to biodiversity offsets or water entitlements until all of the regional strategies are completed and approved in accordance with the Boggabri Coal Major Projects Approval.

2. KEY CONCERNS

2.1 Idemitsu is unable to reliably predict their water consumption

- Mining at Boggabri mine began in 2006, and in 2012 the production rate was increased from 5-7mtpa.
- The application makes clear that the 2012 approval to expand was made without due consideration of the water needs of the project, and that the proponent has now "identified a number of adjustments and additions to previously approved operations that are required to ensure its efficient continuous operation"

2.2 Boggabri Coal are in deficit for half of their water demand

- Idemitsu Boggabri Coal seek approval to modify their consent to create six new bores. Two to supply water for the mine, and four "contingency" bores because they find they need 9.5ML per day to run the mine.
- So far, they have used run-off, pit inflow and Namoi River water, but have a site deficit of 4.7ML per day - half their water demand.

2.3 NSW Govt should not compensate Idemitsu for its flawed modelling of water usage

- During planning stages and in their EA Boggabri Coal dramatically underestimated their water needs and it is not for the NSW Government to carry the burden of this error. Those who are responsible for the flawed modelling should be held accountable and not have their approval conditions changed at the inconvenience of those around the mine.
- If the water usage is so far removed from what was originally proposed by Idemitsu, this suggests the project never was approvable at the outset.

2.4 Boggabri Coal do not have adequate aquifer licences

- We understand from this MOD 5 application that Boggabri Coal do not have aquifer licences to meet their demands. They say they are in the process of obtaining them. Currently, they have 848ML of aquifer licences, at full availability. Their Namoi surface water entitlements could yield them 229ML per year.
- This leaves a deficit of 1,015-1,570ML. And Boggabri Coal want to drill a borefield to supply this. The bores will be on Cooboobindi, Victoria Park, Roma, Daisymede, Heathcliffe, and Belleview. We consider the proposed borefield to be a significant impost on the local groundwater system.
- Boggabri Coal claim to have agreements with the landholders of these properties to construct and operate the bores. Their EA says they are "currently reviewing water access licence availability to enable the borefield to operate at maximum capacity, as may be required during extended dry periods".

2.5 Boggabri Coal now seeks additional surface water entitlement

- Further to the aquifer licences they do not have, Boggabri Coal now seeks to obtain additional surface water entitlements - Water Access Licences.
- Boggabri Coal admit they need Water Access Licences for the aquifer, but it seems they should also need them for the Namoi surface water. As a result of this extra extraction, drawdown will extend to the Namoi River itself, with draw down of at least 1m and perhaps over 2m occurring

over a 3.8km section of the river. This means there will be lost baseflow to the Namoi, and we believe that there will also be loss of surface water into the ground.

2.6 Listed endangered aquatic ecological community at risk by Idemitsu's own admission

- Endangered aquatic ecological community: Proposed modification study area occurs on the floodplains of the Namoi River and the community of River Red Gum woodlands and forests and riparian vegetation along this river. The aquatic ecological community in the natural drainage system of the lower land catchment of the Darling River is listed as endangered under s 220FB the *Fisheries Management Act 1994.* (APPENDIX C, p 29ff, especially at Par 4.1.2.3)

2.7 No reference is made in MOD 5 to Key Threatening Processes affecting aquatic EC's

- Boggabri Coal fails to mention at par 5.6 of Appendix C under the subject **"Key threatening processes" (KTPs)** that MOD 5 poses KTPs to an ecological community listed under *Fisheries Management Act.* We call on the Dept of Planning to establish whether this is an accidental omission, or whether Idemitsu regards MOD not to constitute threats to the survival, abundance or evolutionary development of the ecological community. Certainly no evidence was presented in the Environmental Assessment for MOD 5 one way or another. Either way, this is not a precautionary approach to managing a listed endangered ecological community.

- We refer the proponent and the Dept of Planning to Sch 6 of the *Fisheries Management Act* which lists KTPs as including:

  "Degradation of native riparian vegetation along New South Wales water courses" (admitted by the Proponent and by Niche Environmental Consultants in Appendix C)

  and

  "Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams" which is unambiguously what will occur under MOD 5.

2.8 Changes to Boggabri Biodiversity Management Plan and Offset strategy being sought in isolation from regional strategy

- Construction of the MOD 5 pipeline and wells will cause loss of vegetation and habitat and will remove 7.7 ha of native understory vegetation within previously identified offsets (APPENDIX C, P 43 PAR 5.2 "Modification areas within offsets")

- Due to the fact that Whitehaven Coal and Idemitsu Resources have failed to deliver an acceptable **Leard Forest Mine Precinct Biodiversity Strategy** (also known as the "**Regional Biodiversity Strategy**"), the proposed removal of 7.7 ha of habitat is being sought in isolation of other vegetation loss currently underway following piecemeal approval by the Dept of Planning, including:

(i) Revised Maules Creek coal mine Biodiversity Strategy dated March 2015, approved October 2015 which is substituting higher biodiversity value property Blue Range for lesser biodiversity properties Oakleigh and Rose Glass;

(ii) Therribri Rd upgrade by Whitehaven Coal in conjunction with Narrabri Shire Council, which has decimated large swathes of vegetation in Harparary and on the banks of the Namoi River crossing, as well as Aboriginal heritage.

2.9 Water trigger under EPC Act (Commonwealth)

- Despite the protestations of Idemitsu, this MOD 5 most definitely requires assessment under the water trigger introduced by the *Environment Protection and Biodiversity Conservation Amendment Act 2013 (Commonwealth)*.

- The definitions of large coal mining development in the *EPBC Act* (under which the Boggabri Coal expansion was assessed for its biodiversity impacts) require the significance of the impacts of an action to be considered with other developments, whether past, present or reasonably foreseeable.

- As shown below, the Leard Forest Coal Mine Precinct has failed abysmally, and cumulative impacts are proceeding without the intended strategic planning. In an area of high water use, such as the North Eastern tip of the Liverpool Plains agricultural area, this would be more likely to involve a **significant impact on a water resource**.

- Furthermore, the question of whether the associated water impacts of CSG and open cut coal mines come within the Water Trigger is the subject of legal action right now and no decision of MOD 5 should be made until this matter has been decided (*People for the Plains v Santos*).

3. OVERRIDING CONSIDERATIONS

Maules Creek CWA believes the following overriding considerations must be considered by the authorities in their assessment of MOD 5.

3.1 PRECAUTIONARY PRINCIPLE

The precautionary principle is a decision-making mechanism which emerged in the late 1980s and 1990s with an emphasis on anticipating and predicting harm from planned activities which involve serious or irreversible damage to the environment. In Australia the definition given in the intergovernmental agreement on the environment in 1992 by all heads of government in Australia, has been employed in New South Wales environmental and planning legislation.

The *Environmental and Planning Assessment Act 1979* states that the determining authority has a duty to consider environmental impact. Section 111 provides that:

"For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account **to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity**." [Emphasis added]

Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* further defines the responsibility of the Secretary, Department of Planning and other consent authorities or determining authorities including in the case of state significant projects, the Minister for Planning:

> (4) The principles of ecologically sustainable development are as follows:
>
> (a) the ***precautionary principle***, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
>
> (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
>
> (ii) an assessment of the risk-weighted consequences of various options,

(b) ***inter-generational equity***, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) ***conservation of biological diversity and ecological integrity***, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.

The question is how precautionary should the NSW Government be in determining whether Idemitsu Resources should be allowed access to new bore fields with unknown and potentially catastrophic impacts on the Namoi River catchment?

An element of "careful evaluation" is adequacy of information. It is the opinion of the Maules Creek CWA that MOD 5 does not provide the decision-makers with the requisite information to make a "careful evaluation" within the intent of the New South Wales planning laws.

We say that intergenerational equity has been entirely disregarded in both the planning and regulation of the Leard Forest precinct coal mines, evidenced by the fact that the mines are being allowed to proceed apace and even to modify their consent conditions to the detriment of the environment and to the detriment of intergenerational equity, in the absence of key strategic plans (discussed below).

We believe that it is preferential to apply the Precautionary Principle; as has been applied to local farmers since 2006 over 5 years- with the use of a Section 234 clause on groundwater extraction (*Water Act 1989*).

3.2 ENVIRONMENTAL TRACK RECORD OF NON-COMPLIANCE BY IDEMITSU RESOURCES

In successive years since the Boggabri Coal extension approval, the proponent has been found guilty of successive environmental breaches relating to waste water, illegal clearing of woodland, and emplacement of overburden contrary to its conditions.

Importantly, **these breaches of conditions were not self-reported, which is critical element of self-regulation**.

A summary of offences is below:

November 2013

$3,000 fine for polluting a tributary of the Namoi River, no "significant environmental harm" but "Boggabri Coal failed to install the necessary controls"

NSW EPA Media release 7 November 2013:
http://www.epa.nsw.gov.au/epamedia/EPAMedia13110701.htm

August 2014

The NSW Land and Environment Court supported findings by Department of Planning and Environment inspectors, that Boggabri Coal had stockpiled about 90,000 square metres of excavated material from their open cut coal mine at a disused quarry site outside the mine's boundary.

Boggabri representatives from mine operator Idemitsu pleaded guilty to the offence and was fined $82,500, and was also ordered to pay legal costs of $38,000.

As reported in Australian Mining magazine, 27 August 2014:

http://www.australianmining.com.au/news/coal-mine-fined-for-stockpiling-without-permission

October 2015

Boggabri Coal received two penalty notices for $3000 each, firstly for "the clearing of 7.7 hectares of native vegetation outside the approved disturbance boundary," and then received its second fine for not notifying the DPE of the clearing incident.

This involved removing the understorey, and not the larger trees, as is proposed in MOD 5.

As reported in Australian Mining magazine, 1 October 2015:
http://www.australianmining.com.au/news/coal-miners-hit-with-fines

Boggabri Coal was ordered by the DPE to provide an Action Plan for the restoration of the illegally cleared vegetation, but the deadline of 31st October was missed, and it is not known if the company has yet provided the Dept of Planning the requisite Action Plan. We request the Dept of Planning to provide the community with their proposed actions following the failure of Idemitsu to comply with the request for a remedial action plan.

Key factors to be considered in relation to compliance by the proponent include:

(i) Only a small fraction of breaches and non-compliances are ever fined or prosecuted, due to evidentiary obstacles or the successful negotiation by the errant proponent. This is well known to the NSW EPA and Dept of Planning, which are only able to proceed where there is unlikely to be a costly appeal against the fine or prosecution.

(ii) Boggabri Coal did not self-report its breaches, but waited for the breaches to come to the attention of the Dept of Planning.

(iii) The relevant Dept of Planning compliance officer is based in Singleton, and the NSW EPA in Armidale. Even with proposed merging of coal mine compliance functions at Armidale- which is foreshadowed, this is a drive of some hours distance and limits the effectiveness of the compliance officers.

(iv) In any case, even when conducting spot audits with no prior notice, compliance officers experience delays between their arrival and induction on site and the inspection which allows time for last-minute corrections to be made by the miner.

(v) Lack of capacity by the Dept of Planning and the EPA to properly regulate the MOD 5 bore fields must be a factor taken into account in considering this modification.

3.3 LEARD FOREST MINE PRECINCT WATER MANAGEMENT STRATEGY

This is required under Sch 3,condition 38(d) of the Boggabri Coal Project Approval.

The precinct-wide Leard Forest Mining Precinct Water Management Strategy is supposed to incorporate the impacts of all three mines currently operating in and adjacent to the Leard State Forest, namely Whitehaven Coal's Tarrawonga and Maules Creek Mines and the Boggabri coal mine.

However, nearly 4 years after approval of the Boggabri mine, this Strategy has never been developed.

The Boggabri Coal Water Management Plan dated February 2014 (the most recent available) provides no commentary on the regional strategy, but refers to it in Table 2-2, p 13 with a note that: "The Leard Forest Mining Precinct Water Management Strategy is being developed in stages and will be subject to ongoing review dependent upon the determination and commencement of other mining projects in the area."

Considering 4 years have lapsed since the approval, this statement is pure bunkum.

A community representative on the Boggabri Coal Community Consultative Committee informed the Maules Creek CWA that they have not ever considered the regional strategy.

Given that cumulative impacts are not only likely, but were foreshadowed by the PAC, the Department of Planning has failed in its duty by allowing four years to lapse and still no regional water strategy for the Leard coal mines. With the lodgment of MOD 5, the time has come for the Department to demand the regional strategy be urgently fast-tracked before it makes a decision on MOD 5.

3.4 LEARD FOREST MINE PRECINCT BIODIVERSITY STRATEGY - "REGIONAL STRATEGY"

This Strategy was due in 2013 and still has not been finalised. The Scoping study for the regional Strategy was lodged in May 2013, however was found to be extremely lacking in key information.

Comments from the Office of Environment and Heritage (OEH) dated 9 July 2013 go so far as to state "it remains unclear what the purpose of the regional biodiversity strategy is meant to be." (ref Stage 1 Scoping Report, Comments from OEH – 9 July 2013, p. 1).

Without a regional strategy in place, the prospect of disturbing 7.7 ha of native understory vegetation is unacceptable. This is especially so, when the vegetation is on land which forms part of Boggabri Coal's biodiversity offset areas.

The purported regional strategy was even said to contain some misleading information – referring at p 7, figure 2, the OEH said "the offset properties delineated on the figure is slightly misleading – only parts of some of these properties form the actual biodiversity offsets." The Scoping Report was vague and lacking in numerous other requirements, such as lacking a communications plan as per condition 40 EE (bog bright) and condition 40 1E (Maules Creek).

The purpose of the regional biodiversity strategy was set out by the New South Wales Planning Assessment Commission (PAC): "The strategy will need to set out the long-term framework of management, monitoring and land use security to be applied consistently across all biodiversity conservation areas in the region." (PAC 2012)

However, Idemitsu's own failures to properly predict its water usage a mere three years after the Boggabri coal extension approval, is causing it to revise its land use requirements with distinct cumulative impacts on regional biodiversity.

Clearly there is a need for the long-term framework, and MOD 5 should not be approved until the framework has been properly consulted and approved.

3.5 LACK OF COMMITMENT OF WHITEHAVEN & IDEMITSU TO WORK TOGETHER AS A PRECINCT

The management of cumulative impacts on the water table and biodiversity depends on the ability of Whitehaven Coal and Idemitsu Resources to work cooperatively and to balance their own corporate needs in the interests of minimising cumulative impacts.

Schedule 5, condition 6 of the Boggabri Coal approval is titled "**Management of cumulative impacts**" and states:

> "In conjunction with the owners of the nearby mines in the Leard Forest Mining Precinct, the Proponent shall use its best endeavours to minimise the cumulative impact of the project on the surrounding area to the satisfaction of the Director-General."

However, we have observed that the "best endeavours" of Whitehaven Coal and Idemitsu resources do not favour the interests of minimising cumulative impacts.

As an example, we refer to the failure of the two companies to arrive at a mutually satisfactory agreement on the use by Whitehaven of the Boggabri haul road despite protracted negotiations.

The result is there for all to see at Therribri Rd and the Namoi River crossing, where Whitehaven Coal has decimated woodland in the course of widening the road, an intensification of the mining activities that would not have been necessary if the companies were able to cooperate.

It if it were demonstrated that the companies did use their best endeavours to manage cumulative impacts, this points to a failure of the test of best endeavours in achieving sustainable development.

The following pictures illustrate the results of the lack of cooperation between Idemitsu and Whitehaven Coal. Here we see incremental loss of vegetation including endangered ecological community, and no concern for cumulative impacts.

Figure 3.1 Eucalyptus populnea woodland damage caused during road widening by Whitehaven Coal.

Figure 3.2 Eucalyptus populnea woodland damage caused during road widening by Whitehaven

Coal

Figure 3.3 Myall Woodland Endangered Ecological Community damaged due to road widening by Whitehaven Coal, unable to reach agreement on using Boggabri haul road.

To conclude this point, if there had been a Regional Biodiversity Strategy in place as stipulated by the approval conditions of both the Boggabri extension and the Maules Creek mine, it would have satisfied other OEH requirements provided in the response of 9 July 2013 referred to above.

3.5 MOD 5 must be referred to Commonwealth under Water Trigger

Significant Impact Guidelines for the Water Trigger may be found at https://www.environment.gov.au/resource/significant-impact-guidelines-13-coal-seam-gas-and-large-coal-mining-developments-impacts

The Guidelines state that an action is likely to have a "significant impact" on a water resource if there is a:

> "real or not remote chance or possibility that it will directly or indirectly result in a change to:
> - the hydrology of a water resource; or
> - the water quality of a water resource,

> that is of sufficient scale or intensity as to reduce the current or future utility of the water resource for third party users, including environmental and other public benefit outcomes, or to create a material risk of such reduction in utility occurring."

Maules Creek CWA believes the opinion of Idemitsu and Boggabri Coal, who are in deficit for half of their daily water requirements due to their own incompetent predictions, is of no credibility in predicting the risk of a "real or not remote chance or possibility" that MOD 5 will have irreversible impacts of the kind the Water Trigger was legislated to address.

Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted. It also depends upon the intensity, duration, magnitude and geographic extent of the impacts. More information on what amounts a significant impact is at Significant Impact Guidelines 1.1: Matters of National Environmental Significance. A significant impact on water resources may be caused by one development action relating to coal seam gas or large coal mine, or the cumulative impact of such actions.

However, Idemitsu states in the MOD 5 EA Main text (at par 4.2, p 21)

> "Under guidelines actions approved under Part 9 of the EPBC Act prior to 22 June 2013 are exempt from the water resource triggers. *The impacts to water resources from mining at the BCM were approved under Part 9 of the EPBC Act in February 2013* and are therefore exempt from the water triggers of the EPBC Act.
>
> *As the proposed modification does not involve the extraction of coal, it is not considered relevant to the water resource triggers of the EPBC Act.*" [Emphasis added]

We strongly oppose this statement, and wish to address both of the statements contained in the above quote.

Firstly, due to the fact that MOD 5 represents a major expansion of the project that was most definitely not anticipated at the time of the 2013 approval, the impacts cannot be said to have been approved because the volume of the new borefield extraction, both aquifer and surface water, are of such a high percentage above the anticipated usage.

The question is, what would the opinion of consent authorities have been if it had been known in 2012 – 2013 that the water usage would be a full 50% more than what the proponent had put forward in its environmental assessment?

Secondly, the question of whether MOD 5 involves the extraction of coal is the subject of legal proceedings underway in relation to the Santos Pilliga gas project. We support a wider interpretation of the intent of the Water Trigger. There would have been no purpose in legislating the Water Trigger and requiring it to applied to open cut coal mining if it were not for the recognition that massive amounts of water are needed for coal washing and dust suppression at mines. This is obviously a matter for legislating interpretation which is underway and should not be foreshadowed by decisions on MOD 5 in the interim.

Water is essential to the business of extracting open cut coal because management of coal dust is an essential feature of coalmine regulation.

3.6 ADEQUACY OF THE ENVIRONMENTAL ASSESSMENT

The *environmental planning and assessment regulation* 2000, Sch 2 lists the requirements of environmental impact statements. At clause 7 (f), the Regulation states that the environmental impact statement must include economic and social considerations, including the principles and ecologically sustainable development set out in subclause (4):

(4) The principles of ecologically sustainable development are as follows:

(a) the ***precautionary principle***, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

(b) ***inter-generational equity***, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) ***conservation of biological diversity and ecological integrity***, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) ***improved valuation, pricing and incentive mechanisms***, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

MOD 5 is virtually silent on the above.

4. OBJECTIONS TO MOD 5

4.1 INSUFFICIENT CONSULTATION

Changes of this magnitude in the short space of 3 years since approval in the life of a 30 year coal mine suggest that Idemitsu has failed entirely in predicting its water usage and more representation from the broader community is needed to ensure full scrutiny of all of its plans and modifications.

We believe MOD 5 consultation has been too limited for such a Modification to a State Significant Project's Consent Conditions.

Our objection on the ground of insufficient consultation starts with the fact that two weeks is an inappropriately short period for public exhibition and consultation.

The CWA spoke to 2 hydrogeologists who indicated they would have liked to lodge a submission but due to the very short timeframe, and the fact that the lodgment is immediately prior to the Christmas season, they are unable. It would seem, therefore, that the consultation and exhibition period for MOD 5 will suffer from the absence of expertise.

We question why a two-week exhibition period is considered appropriate for such a complex project, especially in the lead up to Christmas when the application is likely to sit idle until public servants returned to work after the New Year.

Also, the complexity, uncertainty and risk associated with MOD 5 warrants thorough consultation within the Boggabri Coal Community Consultative Committee (CCC). This has not occurred.

The following represents the official community consultation process as minuted by Boggabri Coal in their official Community Consultative Committee minutes.

From the Boggabri Coal CCC meeting minutes 19/5/15):

> *Community Rep and farmer (AT): Asked how much water we need*
>
> *Boggabri Coal (HR): 4-8 mega litres a day if we have no rain fall.*

Fragments of information such as these are all that is recorded in the way of community consultation. This is unsatisfactory.

A perusal of the Boggabri CCC minutes on the website reveals questions asked by community members, but does not provide answers to those questions except in broad generalities, nor does minute or attach relevant written responses. In short, community consultation does not even rise to the minimum level required under the NSW Government *Guidelines for the Management of CCC's.*

No recognised environmental group has been participating in the community consultation process as requested by the Dept of Planning, due (according to Idemitsu) to the spurious claim that they advertised repeatedly for such a representative and no one came forth to apply for the role.

In the meantime, other members of the community have requested representation but the barriers are high to entry. This is not the intention of the Guidelines.

An aid in understanding what is expected of community consultation is the OEH's response to the Leard Forest Mine Precinct Regional Strategy, which stated (at p 3):

> "21. Community consultation: Should explore the potential for the information listed to be delivered to a wider component of the community rather than just the CCC."

4.2 MODIFICATION 5 IS A THREAT TO CROP PRODUCTION

From two bores of 4-8 mgl/day to up to 6 bores with 18 megalitires/day available (but needing 9ML) especially in dry times is unacceptable. For local families, the North West is a long term proposition. For mining companies it is only a relatively short term business model.

The amount of groundwater asked for (detailed below from Applicant) and required is too extensive and will threaten the sustainability of local crop production.

Mitigation: "Groundwater users who are impacted by the modification are subject to the 'make good' provisions of the Aquifer Interference Policy, which requires Boggabri Coal to provide access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores. "

"The groundwater users who may be subject to drawdown impacts use their bores for stock watering, with one bore being used intermittently for irrigation. As these users are to be subject to the make good provisions of the aquifer interference policy and will be provided with alternative water supply if drawdown impacts occur, no impacts to their operations are anticipated." Appendix B p 51.

But Maules Creek CWA are concerned whether this works in practice? We refer again to the unpleasant issues raised by Whitehaven Coal's Werris Creek surrounding bores. UNSW Groundwater studies have raised very serious concerns of potential impact from mining on groundwater.

Maules Creek CWA believe that the "Make good" agreement clauses are inadequate in light of the stress currently placed on the Australian landscape and the North West specifically. There is neither the physical opportunity and potential, nor a demonstrated commitment, to "make good" (we remind the Dept of Planning that Boggabri Coal were instructed to prepare a plan to "make good" the illegal clearing that occurred in February 2015, and did not fulfill the 31st October deadline, and to our knowledge some general statements have been made at the Triple C meeting in November but the Plan has not been submitted yet, so promises that Idemitsu will make good are not credible).

As safeguards the mitigation agreement is inequitable- because it removes non-mining landholders certainty and self-sufficiency. Rather it is making them dependent on mining companies ability or the community's ability to attribute the responsibility for impacts. The Werris Creek Mine is currently under review and in dispute with local landholders. The dispute highlight what can happen in terms of determining responsibility in a timely manner. For local water users to have faith in the Planning System, the precautionary principle must apply in the case of this application.

Rather than the application of "Stringent conditions" that simply removes non-mining water users confidence in their ability for certainty in future water accessibility.

BOGGABRI COAL MODIFICATION 5 PG. 16 TABLE 3.5 PROPOSED BOREFIELD

Bore	Operation use	Status	Expected achievable maximum pumping rate1 (ML/day)
Cooboobindi	Production	Test production bore	7-7.5
Victoria Park	Production	Test production bore	3.4
Daisymede	Production	Existing production bore	1

Roma	Contingency	Test production bore	4.5
Heathcliffe	Contingency	Test production bore	1.5
Belleview1	Contingency	Test production bore	1
Belleview 2	Contingency	Test production bore	0.5

(1) Based on field testing (Parsons Brinckerhoff, 2015b)

Maules Creek CWA consider this application presents an uncaring grab at a precious local, shared resource. Boggabri Coal need another 2,082ML per year to meet their demand in average conditions. But in dry conditions, when the landscape is completely parched they are asking the government to give them up to 2,600ML.
According to the Boggabri Coal Modification 5 Application, "The cone of depression will cause water levels in landholder bores (includes concrete lined wells) to decline. For each scenario, the modelled drawdown at affected landholder registered bores was identified. The Aquifer Interference Policy (AIP) quotes a threshold for key minimum impact considerations of 2m for groundwater supply works."

While "Scenario A relates to operation of the borefield under average rainfall conditions (5.7 ML/day total abstraction), while Scenario B simulated an extended dry period during which additional groundwater may be required (up to 9.4 ML/day in total)." Appendix B p 3 .https://majorprojects.affinitylive.com/public/1c25a98f5962d70a97e70c5e2375c26d/03.%20Boggabri%20Coal%20Project%20MOD%205%20EA%20-%20Appendix%20B.pdf

It is the B-scenarios (as detailed in Appendix B), where obviously the concerns are greatest. This is especially so, in the light of unreliable future rainfall and the potential for climate change creating persisting water shortages.

Worst case scenarios due to increased pumping and dry conditions are treated casually, such as the potential of catastrophic impacts on agriculture in the affected areas which rely on aquifers and the replenishment of surface water to their bores:

> "Five shallow, active concrete lined landholder wells would potentially become dry or be subject to reduced supply under all scenarios. These groundwater works are located on the Brighton, Glenhope, Billabong and Nardeeneen properties and use very shallow groundwater that would be drawn down by less than two metres." Appendix B, p 50.

Maules Creek CWA think this undermines the resilience of our community, the environment and it is unacceptable that six active landholder bores or wells would experience a drawdown between two and five metres. Note this does not include unused or abandoned bores and those owned by or leased to Boggabri Coal.

The long term reality is that coal companies will move on. It is the community that will be left with the fall out. This will occur in 27 years, or less if the Boggabri Coal mine becomes a stranded asset due to global energy innovation or other factors. Indeed we are also concerned that when they are gone that "care and maintenance" will prevail and plans to rehabilitate will be foregone. Again, this issue of viability must be considered in the context of a world in transition and not the MOD 5 in isolation.

4.3 CUMULATIVE IMPACTS

We believe that the loss of groundwater undermines the Maules Creek community's ability for resilience in a time of increased climate change. We believe that any increase in Coal mining is not compatible if it requires further interference with groundwater.

The cumulative impact on local water users is negative and not right. According to the Boggabri Coal Modification Application 5, "Cumulative drawdown- Three coal mines operating in the hills over 5km east to northeast of the alluvial borefield (refer to Figure 1.1) have potential to cause drawdown to extend into the alluvium from development of the pit voids. These coal mines are:

■ Maules Creek ■ Tarrawonga ■ Boggabri.

Previous modelled cumulative drawdown impact assessments for the Boggabri, Tarrawonga and Maules Creek coal operations undertaken by Heritage Computing (2012b) and AGE (2011) show drawdown extending into the alluvium at the base of the foothills east to northeast of the borefield (refer to Appendix G for plans).

This is estimated to be an additional groundwater drawdown of 1-2 metres under A Scenarios and 1-3 metres under B Scenarios in the alluvium to the east and northeast of the borefield where mine cumulative drawdown is experienced (refer to Appendix B for further details).

This is not acceptable and poses unnecessary risk at going forward.

4.4 TAILINGS DAMS AND ADEQUATE COMPLIANCE

We are concerned that Boggabri coal Tailings Dams have not been designed for containing groundwater flows. Tailings dams were built to hold water from run off-not to hold ground water.

The local community's awareness of any change to the works on dams at Boggabri Coal are limited to the following exchange at a CCC meeting.

Boggabri coal CCC 3/3/15 minutes: "DM for Boggabri Coal: "Boggabri Coal are increasing the size of 2 sediment dams which will be used to control sediment from cleared areas and water caught as part of this will be used for dust suppression. Water will also be produced by a bore field and harvested from the river."

We question how is an under resourced Armidale EPA to monitor levels in storage dams? As mentioned earlier, we see a lot of breaches with companies complying to notification.

Our concerns are of unacceptable risk. For example:

- The concentrating of water in bottom of dams. The cleaning of tailings, the maintenance of dam structures. We believe best practice determines the sludge is meant to go to landfill. We are concerned about overflows into river at times of flooding.
- As mentioned earlier, dams have ben designed to receive surface water run off only. In flood times pollution of rivers and waterways will occur as has occurred 7/11/13 ihttp://www.abc.net.au/news/2013-11-07/epa-prosecutes-boggabri-coal/5076524 -" **EPA prosecutes Boggabri Coal: Boggabri Coal failed to install the necessary sediment and erosion controls"** said EPA's Gary Daveys.

4.4 TRANSPARENT, INDEPENDENT MONITORING OF GROUNDWATER ECOLOGY

We are concerned about the impacts to groundwater levels towards the Maules Creek Catchment and in Zone 5. We understand that any impacts on Zone 11 particularly from the Heathcliffe bore will potentially put the groundwater ecology at risk.

Our concern is for a fragile aquatic ecosystem and maintaining the health of the semi-permanent groundwater discharge. The following summarises the GDE we value highly and must protect.

"Semi-permanent groundwater discharge from a location in Maules Creek, in the Namoi catchment, keeps flow in the system through most droughts. The water flows downstream for approximately 8 kilometres before being lost back to the groundwater system. These waters are certainly an important groundwater dependent ecosystem (GDE) and may be a biological refuge for stygofauna. Stygofauna are a new classification of animals that live with groundwater systems including alluvial sediment and in limestone groundwater systems.

Stygofauna are generally small invertebrates, with various species of crustacean have been recorded in aquifer systems of Western Australia and New South Wales. Insects, gastropods, and worms found in groundwater systems are also considered to be stygofauna. However, little is currently known about the ecology, life-cycle and significance of stygofauna and so patterns of distribution and endemicity are not known."
http://www.connectedwaters.unsw.edu.au/research/projects/groundwater-dependent-eco-system-studies-maules-creek

4.5 SIMULATED MINE SITE WATER BALANCE

Why wasn't a proper site water balance required before a large mine was given approval?

The "Simulated annual mine site water balance" (at Table 3.2, MOD 5 EA Main text) is impossible to analyse and verify unless raw data is provided showing how the assumptions have been arrived at. The CWA calls on the Dept of Planning to make the assumptions available so that independent analysis can be done to verify the modelling.

Boggabri Expansion Approval 2012 in their Statement of Commitment claimed they had the water balance correct. It now appears clear they have gained an approval using inadequate modelling.

The assessment material makes it clear that the company dramatically underestimated its water needs in the initial assessment. Haul road dust suppression was estimated in the EA for the expansion to be 1.7ML per day, but in fact Boggabri Coal now admits it needs 4ML per day, the same revision has been made for coal washing and dust suppression.

This is not unusual. Look also at the case of Watermark, Liverpool Plains coal project. The DoPE have agreed that they have underestimated their water needs.

Companies shouldn't be given approval when in the Planning stages the government knows their modelling is inadequate and they openly doubt the predictions of water usage.

The Department must follow through on their own position that it is the companies taking the risk. Therefore in this case the DoPE must up hold this position. Their obligation is to the sustainability of Australia and therefore companies should shut down in times where they can't operate under their approved conditions.

4.6 TOXICITY CONCERNS

We have concerns that the waste water is being used on roads could be toxic.

From Boggabri coal CCC 19/5/15 minutes, (community rep and farmer) RG asked "what the bore water was used for."

The Boggabri representative replied that they have "3 sources that they obtain water from – river allocation, rain collection and bore water. Generally they operate on recycled water, before obtaining fresh water from either the river or bore network."

Boggabri coal CCC 11/8/15- Community Rep (GG) asked how and what water is used to control dust.

(DM) for Boggabri Coal: "Water is used by various haul trucks to spray the operating running surface and open areas that could generate dust. "

There are also concerns that coal is not being washed and the potential impacts this has on communities along the coal delivery railway line and in Newcastle. This concern does NOT mean the CWA condones the diversion of water away from agriculture or environmental flows. It merely points out that the mine is not operating in an acceptable way.

4.6 POWER SUPPLY TO NEW BORES

The Boggabri Coal Mine Project Approval Modification EA refers at par 3.3.1 "Power lines and pipelines" to "support poles" being installed into holes bored by a truck mounted augur to depths of up to 5 m. Construction of the power lines will pose impacts which are not fully referred to in the EA. for example, reference is made to the clearing of vegetation, but not to the damaging of vegetation caused by emplacement of overburdened from excavation of trenches.

There also appears to be uncertainty about access to the local power supply network and what would be involved in accessing power.

In response to a question on how the bores would be powered, (HR), a Boggabri Coal representative presenting at the 19 May 2015 CCC meeting, told the community: " it will depend if they can be connected to local power supply network."

It appears that no consideration has been given to the possibility of renewable energy being used.

The CWA is concerned that insufficient detail has been provided about power supply to the proposed bore field as the construction impacts of connecting with local power supply have not been properly considered. Any new power lines could have a cumulative impact on biodiversity and therefore more needs to be known about power supply to the new borefield before approval is given.

More detail is needed about the proposed powering of the bore pumps before decisions are made. The details need to be put out for public exhibition as part of an amended MOD 5 application and openly consulted. It will not suffice for the Dept of Planning to simply impose conditions, as we know from painful experience that the Department is largely unable to enforce its own conditions. (We refer to ongoing controversy concerning noise exceedances at the nearby Maules Creek coal mine.)

4.7 ECONOMIC COST

In terms of opportunity costs, the water has more productive uses- ecological sustainability, climate resilience and food production.

The economic benefits of this to the community and the State would be that non-mining industries have water security and therefore the ability to maintain high needs food and fibre production.

The benefit of this is a local stabilised economy and future sustainable jobs and communities, therefore maintaining healthy places for Australian's to live and work.

Maules Creek CWA believe that it is reasonable that for sustainability of local water supplies to the non-mining community, the mine should shut down if it does not have the water to operate. It should stay within its approval conditions.

Sustainable farming and tourism are being placed at risk for the sake of a 30 years maximum economic gain by a foreign-owned company, i.e. Idemitsu.

We already have first-hand accounts of tourism operators being requested paddling tours on the Namoi unable to fulfill this demand not purely because of weather factors, but because of the unfair leniency given to coal mining companies to draw unsustainable and unmonitorable amounts of water from the Namoi catchment.

Maules Creek CWA believe that the Dept of Planning should review the requirements of State Significant Development planning in light of the climate crisis.

The mine is a State Significant Development, still operating under Part 3A "transitional arrangements" they do not need a water supply work approval to construct these bores, nor do they need to comply with clause 36 of the Upper and Lower Namoi Water Sharing Plan, which prevents water supply works being constructed within 200m of property boundaries.

However this seems ridiculous in light of Paris Climate Talks and the need to protect as much of Australia as possible from being sterilised against future agriculture or tourism. And indeed encouraging a growth or at minimum maintaining food production as an important step towards food security.

5. CONCLUSION

We are of the view that MOD 5 is not able to be decided on for substantive reasons listed above which are based on information available, plus we believe that the MOD 5 EA does not satisfy the *environmental planning and assessment regulation*, Sch 2.

We now call on the Secretary, Dept of Planning, to abide by Sch 2 and require Idemitsu and Boggabri Coal to provide further particulars before considering MOD 5, as per:

> **12 Environmental assessment requirements for State significant infrastructure**
> In preparing the environmental assessment requirements with respect to an application for State significant infrastructure, the Secretary:
> (a) may require the responsible person to provide further particulars …

In particular, we call on the Secretary to require the applicant to provide:

- Full assessment of the intergenerational impacts of MOD 5, as well as all of the requirements of Sch2, cl (7) (4)

- Immediate ulfilment of the requirement of submitting Regional Water and Biodiversity Strategies – if these cannot be provided within a short term, after years of deliberation, it can be taken that the Leard Forest Mine Precinct is unworkable and alternative regulation of the Leard Forest mines be immediately considered
- Public availability of all assumptions on which MOD 5 modelling is based, to enable expert scrutiny
- Immediate review of the Boggabri CCC, ts membership, the adequacy of its proceedings and observance of accepted meeting practices
- Amend MOD 5 to referred to Key Threatening Processes concerning endangered aquatic ecological communities
- Provide details of proposed power supply, including potential impacts of building powerlines on biodiversity

Maules Creek CWA
15 December, 2015

Issue summary

- Requesting the *Leard Forest Mine Precinct Water Management Strategy* to be developed as prescribed by condition 38.
- The water shortages affecting Boggabri Coal are impacting on the mines ability to manage airborne dust and the CWA is reliably informed that dust suppression activities are curtailed due to water shortages. This is not an adequate justification for approving MOD5. CWA demand no further approvals should be made until all the regional strategies are completed and approved in accordance with the Boggabri Coal Major Projects Approval.
- Key concerns:
  - Idemitsu is unable to reliably predict their water consumption
  - Boggabri Coal are in deficit for half of their water demand
  - NSW Government should not compensate Idemitsu for its flawed modelling of water usage. EA Boggabri Coal dramatically underestimated their water needs, those responsible for this should be held accountable and the original approval; should never have been given.
  - Boggabri Coal do not have adequate aquifer licences to meet their demands. The proposed borefield will have a significant impact on the local groundwater system.
  - Boggabri Coal now have to seek additional surface water entitlement – water access licenses (WAL). Boggabri Coal admit they need WAL for the aquifer, but they should also be required to get one for Namoi surface water.
  - The proposed modification study area occurs on the floodplains of the Namoi River, there is an endangered aquatic ecological community in the natural drainage of this system, the Darling River is listed endangered under s 220FB the *Fisheries Management Act 1994.*
- Why is no reference made in MOD 5 to Key Threatening Processes that the development poses to this endangered ecological community?
- Explain why the changes to Boggabri Biodiversity management Plan and Offset strategy are being sought in isolation from a regional strategy.
- CWA request The Leard Forest Mine Precinct Biodiversity Strategy – this 'regional strategy' was due in 2013 and is still not finalised. The lack of commitment of Whitehaven and Idemitsu to work together as a precinct to manage cumulative impacts should be addressed.
  - MOD 5 requires assessment under the water trigger introduced by the Environment Protection and Biodiversity Conservation Amendment Act 2013 (Commonwealth).
- CWA makes objections to the short period for public exhibition and consultation; stating it is insufficient and thereby will lack the expertise it requires.
- CWA believe there has been insufficient community consultation.
- The modification is a threat to the sustainability of crop production, farming and water supply and groundwater in the area.
- Concerned about the ability of Armidale EPA to monitor levels in storage dams. Concerned about how overflows into rivers at times of flooding will be avoided.
- Concerned about the effect on groundwater ecology, and little acknowledgement.
- Pose the question why a proper site water balance required before a large mine was given approval?
- Concerns that the waste water is being used on roads could be toxic.
- Concerns that coal is not being washed and the potential impacts this has on communities along the coal delivery railway line and in Newcastle.
- Concerned about access to the local power supply network and what would be involved in accessing power i.e. constructing and clearing of vegetation. Will renewable energy be considered?

The CWA is concerned that insufficient detail has been provided about power supply to the proposed borefield as the construction impacts of connecting with local power supply have not been properly considered. Any new power lines could have a cumulative impact on biodiversity and therefore more needs to be known about power supply to the new borefield before approval is given.

Maules Creek CWA believe that the Dept. of Planning should review the requirements of State Significant Development planning in light of the climate crisis.

CWA believe that the MOD 5 EA does not satisfy the *Environmental Planning and Assessment regulation*, Sch 2. CWA call on Dept. of Planning to abide by Sch 2 and require Idemitsu and Boggabri Coal to provide:

- Full assessment of the intergenerational impacts of MOD 5, as well as all of the requirements of Sch2, cl (7) (4)
- Immediate fulfilment of the requirement of submitting Regional Water and Biodiversity Strategies.
- Public availability of all assumptions on which MOD 5 modelling is based, to enable expert scrutiny.
- Immediate review of the Boggabri CCC, its membership, the adequacy of its proceedings and observance of accepted meeting practices.
- Amend MOD 5 to refer to Key Threatening Processes concerning endangered aquatic ecological communities.
- Provide details of proposed power supply, including potential impacts of building powerlines on biodiversity.

Response

Issue	Response
Requesting the *Leard Forest Mine Precinct Water Management Strategy* to be developed as prescribed by condition 38.	The BTM Complex Water Management Strategy (WMS) has been prepared to address the Project Approval requirement associated with the preparation of a Leard Forest Mining Precinct Water Management Strategy. The BTM Complex WMS received Commonwealth government approval in early 2014 but is yet to receive DP&E approval due to delays in the approval of the MCC Water Management Plan. This WMS is expected to be issued to DP&E for approval in the second quarter of 2016 with finalisation expected to occur later in 2016 but the timing is outside of Boggabri Coal's control.
The water shortages affecting Boggabri Coal are impacting on the mines ability to manage airborne dust and the CWA is reliably informed that dust suppression activities are curtailed due to water shortages. This is not an adequate justification for approving MOD5. CWA demand no further approvals should be made until all the regional strategies are completed and approved in accordance with the Boggabri Coal Major Projects Approval.	Noted. Air quality management at BCM is undertaken in accordance with Boggabri Coal's Air Quality and Greenhouse Gas Management Plan. During the 2014 reporting period 1,027.24 ML of water was used for mining operation dust suppression. This represents an increased compared to the 2013 reporting period (745.36 ML) and is attributed to increased efforts at BCM to minimise dust. In addition, the BTM Complex Air Quality Management Strategy is currently subject to standard periodic review by DP&E. The Air Quality Management Strategy describes collective management measures and the implementation of the cumulative air quality management system.
Key concerns: ▪ Idemitsu is unable to reliably predict their water consumption	The Site Water Balance, included as Appendix A to the MOD 5 EA outlines the water requirements for the BCM based on the latest mine plan, infrastructure layouts and more detailed project design/ engineering work that has occurred since 2010. This Site Water Balance forms part of the Water Management Plan for the site and is reviewed annually and updated if any significant changes are made to mining operations including the site water management system.
▪ Boggabri Coal are in deficit for half of their water demand	Noted.
▪ NSW Government should not compensate Idemitsu for its flawed modelling of water usage. During planning stages and in their EA Boggabri Coal dramatically underestimated their water needs and it is not for the NSW Government to carry the burden of this error. Those responsible for this should be held accountable and not	Previous assessment of the impacts on water resources including water demand were based on the best available information at that point in time. In the latest revision of the Site Water Balance (attached as Appendix A to the MOD 5 EA) the site water balance model was revised to reflect the latest mine plan and infrastructure layouts. The site water

Issue	Response
have their approval conditions changed at the inconvenience of those around the mine.	demands were also revised based on more detailed project design and engineering work that has occurred since the 2010 EA. As outlined in Section 3.1 of the MOD 5 EA, ongoing development at the mine has identified the need for additional water supply.
▪ Boggabri Coal do not have adequate aquifer licences to meet their demands. The proposed borefield will have a significant impact on the local groundwater system.	Boggabri Coal will possess sufficient Water Access Licence prior to extracting water from any source in accordance with the requirements of the WMA. The impact of the proposed borefield on local groundwater system has been assessed using predictive numerical modelling as noted in Appendix B of the MOD 5 EA document. The groundwater model determined that the proposed modification has the potential to interfere with groundwater aquifers through drawdown of the alluvial aquifers in the vicinity of the production bores. However, changes in alluvial aquifer water quality were expected to be minimal as a result of basement leakage due to low permeability of the rock. In addition, the Namoi River may be influenced by a reduction in net groundwater discharge, assuming the river is hydraulically well-connected to the aquifer. The calculated loss of baseflow is relatively low compared to average flow in Namoi River at < 0.2% for average flow conditions and < 0.9 % for low flow conditions. This is expected to have very minor changes to water level in the Namoi River. Changes to Namoi River water quality from loss of base flow are expected to be negligible. The alluvial aquifer is the primary source for groundwater take by landholders in the surrounding region. Groundwater users who are impacted by the modification are subject to the “make good” provisions of the Aquifer Interference Policy, which requires Boggabri Coal to limit drawdown impact to owners of groundwater supply works or provide access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores. ‘Make good’ provisions may also include other compensatory measures negotiated between Boggabri Coal and owners of affected groundwater supply works.
▪ Boggabri Coal now have to seek additional surface water entitlement – water access licenses (WAL). Boggabri Coal admit they need WAL for the aquifer, but they should also be required to get one for Namoi surface water.	Boggabri Coal will account for base flow loss from the Namoi River, as a result of the operation of the proposed borefield, by possessing sufficient Water Access Licence to an extent deemed necessary by and to the satisfaction of DPI Water.
▪ The proposed modification study area occurs on the floodplains of the Namoi River, there is an endangered aquatic ecological community in the natural drainage of this system, the Darling River is listed endangered under s 220FB the *Fisheries Management Act 1994.* ▪ Why is no reference made in MOD 5 to Key Threatening Processes that the development poses to this endangered ecological community?	Table 4.1 of Appendix C of the MOD 5 EA evidences that the proposed modification will not involve a significant impact to any threatened species, population or endangered community. The impact to River Red Gum riparian woodlands and forests which occurs on the floodplains of the Namoi River and therefore considered to be part of the Endangered community listed under the FM Act of Natural Drainage System of the Lowland Catchment of the Darling River are identified in Section 5.1 of the MOD 5 EA. The significance of this impact has been assessed as part of the significance assessment provided in Appendix E of Appendix C of the MOD 5 EA. Further information around additional threats associated with water extraction is outlined in Section 4.1 of this report.

Issue	Response
▪ CWA request The Leard Forest Mine Precinct Biodiversity Strategy – this 'regional strategy' was due in 2013 and is still not finalised. The lack of commitment of Whitehaven and Idemitsu to work together as a precinct to manage cumulative impacts should be addressed.	In 2014, the BTM Complex commissioned the Stage 1 Regional Biodiversity Strategy Scoping Report as the first part in development of the regional Biodiversity Strategy. This report is with the DoE for approval and the parties are in the process of preparing the Stage 2 Strategy Development Report.
▪ MOD 5 requires assessment under the water trigger introduced by the Environment Protection and Biodiversity Conservation Amendment Act 2013 (Commonwealth).	Under the EPBC Act, an action which involves a coal seam gas (CSG) development or a large coal mining development now requires approval from the Australian Government Environment Minister if the action has, will have, or is likely to have a significant impact on a water resource. The Australian Government Department of the Environment published the Significant impact guidelines 1.3: Coal seam gas and large coal mining developments- impacts on water resources (the guideline) in December 2013. The core purpose of these guidelines is to assist any person who proposes to take an action which involves a CSG development or a large coal mining development to decide whether the action has or is likely to have a significant impact on a water resource. Section 3.4 of the guidelines notes that the definition of 'large coal mining development' is related to impacts on water resources of activities that are associated with new or modified extraction of coal. The MOD 5 borefield infrastructure is not associated with new or modified extraction of coal and consequently does not fall within the definition of a 'large coal mining development' and therefore the EPBC Amendment Act 2013 does not apply and the approval of the Australian Government Environment Minister is not required in relation to the water trigger.
▪ CWA makes objections to the short period for public exhibition and consultation; stating it is insufficient and thereby will lack the expertise it requires.	Noted. Consultation period has been in accordance with statutory timeframes.
▪ CWA believe there has been insufficient community consultation	Noted. The extent of consultation for the proposed modification is outlined in Section 5.1 of the MOD 5 EA. Section 5.2 also provides details on proposed ongoing stakeholder engagement activities.
▪ The modification is a threat to the sustainability of crop production, farming and water supply and groundwater in the area.	Noted. Impacts to water supply and groundwater in the area have been assessed using predictive numerical modelling as outlined in Appendix B of the MOD 5 EA document. DPI Water's review has found no errors or deficiencies in the modelling, including the climate scenarios and cumulative drawdown assessments, that would limit the validity of the results. This modelling is adequate to assess the impacts of the proposed borefield. MOD 5 is subject to and has been assessed against the requirements of the Aquifer Interference Policy. Privately owned groundwater supply works that are predicted to be impacted by the operation of the proposed borefield will be subject to 'make good' provisions over and above those noted in the Aquifer Interference Policy.
▪ Concerned about the ability of Armidale EPA to monitor levels in storage dams. Concerned about how overflows into rivers at times of flooding will be avoided.	Noted. Comment relates to existing approved operations at the BCM and not within the scope of the proposed borefield modification.

Issue	Response
▪ Concerned about the effect on groundwater ecology, and little acknowledgement.	Potential impacts to groundwater dependent ecosystems have been addressed within Appendix B of the MOD 5 EA document. The operation of the borefield is considered to have low risk to groundwater dependant ecosystems. None of the vegetation communities within the vicinity of the borefield would be considered to be high priority groundwater dependant ecosystems as they are not entirely dependent upon subsurface groundwater for their water requirements. Further commentary on impact to ground water ecology is noted in section 4.1 of this report.
▪ Pose the question why a proper site water balance required before a large mine was given approval?	Noted. Comment relates to existing project approvals. Schedule 3, Condition 38 (a) of the state Project Approval requires the preparation of a SWB. The SWB attached as Appendix A of the MOD 5 EA has been prepared in fulfilment of the requirements.
▪ Concerns that the waste water is being used on roads could be toxic.	Water applied to haul roads is not toxic. As outlined in Section 2.5 of the MOD 5 EA, the BCM water management system has been designed to segregate clean water runoff, dirty water runoff and coal contact water. Dirty water is defined as runoff from disturbed areas within the mine site and includes runoff from overburden emplacements, haul roads and parts of the MIA. While dirty and coal contact water (containing elevated levels of suspended solids and saline) may be used on site for dust suppression this is only being used on disturbed areas of the mine inside catchments that are captured by the coal contact drainage system where risk of offsite discharge is absent and will not result in long term contamination.
▪ Concerns that coal is not being washed and the potential impacts this has on communities along the coal delivery railway line and in Newcastle.	Noted. Comment relates to existing approved operations at the BCM and not within the scope of the proposed borefield modification.
▪ Concerned about access to the local power supply network and what would be involved in accessing power i.e. constructing and clearing of vegetation. Will renewable energy be considered? ▪ The CWA is concerned that insufficient detail has been provided about power supply to the proposed borefield as the construction impacts of connecting with local power supply have not been properly considered. Any new power lines could have a cumulative impact on biodiversity and therefore more needs to be known about power supply to the new borefield before approval is given.	Noted. Location of the proposed bores under the modification and associated information requirements are illustrated in Figure 3.1 of the MOD 5 EA and discussed in Section 3.3. The impact of any vegetation clearing required for this ancillary infrastructure has been discussed in Section 6.6 of the MOD 5 EA and Biodiversity Impact is discussed throughout Appendix C of the MOD 5 EA. As identified in Section 3.3 of the MOD 5 EA, the proposed overhead 11 kV powerlines will connect each bore to existing 11 kV powerlines.
▪ Maules Creek CWA believe that the Dept. of Planning should review the requirements of State Significant Development planning in light of the climate crisis.	Noted.

Issue	Response
▪ CWA believe that the MOD 5 EA does not satisfy the Environmental Planning and Assessment regulation, Sch 2. CWA call on Dept. of Planning to abide by Sch 2 and require Idemitsu and Boggabri Coal to provide: ▪ Full assessment of the intergenerational impacts of MOD 5, as well as all of the requirements of Sch2, cl (7) (4)	Intergenerational impacts assessed as part of the assessment of the proposed modification against the principles of ESD (refer to Table 7.1 of the MOD 5 EA).
▪ Immediate fulfilment of the requirement of submitting Regional Water and Biodiversity Strategies	The BTM Complex Water Management Strategy (WMS) has been prepared to address the Project Approval requirement associated with the preparation of a Leard Forest Mining Precinct Water Management Strategy. The BTM Complex WMS received Commonwealth government approval in early 2014 but is yet to receive DP&E approval due to delays in the approval of the MCC Water Management Plan. This WMS is expected to be issued to DP&E for approval in the second quarter of 2016 with finalisation expected to occur later in 2016 but the timing is outside of Boggabri Coal's control. As outlined in Section 6.3.3.2 of the MOD 5 EA, Boggabri Coal is currently revising its Biodiversity Offset Strategy BOS in accordance with Condition 43 of PA 09_0182, in consultation with the Department of the Environment (DoE). Boggabri Coal's revised Biodiversity Management Plan and BOS will include refined vegetation mapping resulting from the proposed modification, independent field validation and baseline ecological monitoring as well as the identification and commitments of additional required offsets for MOD 5
▪ Public availability of all assumptions on which MOD 5 modelling is based, to enable expert scrutiny	Modelling assumptions for the Site Water Balance and Groundwater assessment are outlined in Appendix A and B of the MOD 5 EA respectively.
▪ Immediate review of the Boggabri CCC, its membership, the adequacy of its proceedings and observance of accepted meeting practices	The Boggabri Coal Community Consultation Committee was established and is operated in accordance with NSW Government Department of Planning Guidelines for establishing and operating community consultative committees for mining projects.
▪ Amend MOD 5 to refer to Key Threatening Processes concerning endangered aquatic ecological communities	Table 4.1 of Appendix C of the MOD 5 EA evidences that, the proposed modification will not involve a significant impact to any threatened species, population or endangered community. The impact to River Red Gum riparian woodlands and forests, which occurs on the floodplains of the Namoi River and therefore considered to be part of the Endangered community listed under the FM Act of Natural Drainage System of the Lowland Catchment of the Darling River, are identified in Section 5.1 of the MOD 5 EA. The significance of this impact has been assessed as part of the significance assessment provided in Appendix E of Appendix C of the MOD 5 EA. Further information around additional threats associated with water extraction is outlined in Section 4.1 of this report.
▪ Provide details of proposed power supply, including potential impacts of building powerlines on biodiversity.	Location of the proposed bores under the modification and associated information requirements are illustrated in Figure 3.1 of the MOD 5 EA and discussed in Section 3.3. The impact of any vegetation clearing required for this ancillary infrastructure has been discussed in Section 6.6 of the MOD 5 EA and Biodiversity Impact is discussed throughout Appendix C of the MOD 5 EA. As identified in Section 3.3 of the MOD 5 EA, the proposed overhead 11 kV powerlines will connect each bore to existing 11 kV powerlines.

3.2.3 People for the Plains – 14 December 2015 (submission number 7)

People for the Plains Submission on MOD 5

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people for the Plains, Boggabri NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Objects to this project

Boggabri Mine Modification 5
14th December, 2015

People for the Plains is a group of residents from North West NSW, based around the town of Narrabri who are interested in transparent and factual information in regards to extractive industries in our region. We host a range of events, some of which have attracted over 1,000 people and we maintain a database of over 400 people. We hold regular meetings and events to discuss the issues surrounding CSG and coal mining in our region.
Thankyou for the opportunity to comment on the Boggabri Mine Modification 5.

We urge the Department to reject this modification due to the improper process used in identifying the demand and seeking the application for this water.

True Demand Should have been Identified and Sought in the EA
The true demand for water by the mine should have been identified in the original water demand model. To have to request this modification three years later indicates either a deliberate intention to mislead local water users and environmental protectors, or else shabby workmanship. Both of which are completely unacceptable for a development of this scale, risking resources of this quality.

Development consent for the mine was provided on the assumption that "the proponent shall ensure it has sufficient water for all stages of the project and, if necessary, adjust the scale of mining operations on site, to match its available water supply." In direct contradiction to this condition, the mine has been operating, discovered it requires more water and is seeking a modification. The proper outcome should be that the scale of the operation is reduced in accordance with the amount of water that it has.

It is clear in the 2012 application that the approval to expand to 7mtpa was made without due consideration of the full water needs of the project, and that the proponent has now "identified a number of adjustments and additions to previously approved operations that are required to ensure its efficient continuous operation." This is not an acceptable way to plan for and utilise our highly valuable and finite water resources.

Proper Fulfilment of Consent Conditions
Furthermore we understand that Idemtitsu has not fulfilled condition 38 of its consent, which required that a Water Management Plan be developed within six months of the consent. This Plan was supposed to include a Leard Forest Mining

Precinct Water Management Strategy to be developed in conjunction with Whitehaven Coal. The Department of Planning has advised local farmers that this strategy has been deemed inadequate by the Department.

We find it unacceptable to allow the development to continue and to seek further modifications in regards to water, when Idemitsu have blatantly breached their consent in this way.

If the company cannot fulfil its existing commitments to water it should not be offered the ability to seek further changes. We demand that no further approvals be granted until Management Plans to a suitable level of detail, have been provided and signed off on by the Department of Planning.

Idemitsu now claim to need 2,082ML more per year to meet the demand in average conditions and up to an extra 2,600ML in dry conditions. We question if the 2012 application should have been granted in the first place but should now certainly be given due scrutiny on the company's assumptions and demands.

Water is a highly constrained resource in our region, and the mine was assessed and given approval on the basis of the water demand and extraction levels identified in the Environmental Assessment. These guidelines must be upheld and this modification rejected.

Part of the Extraction Process
Idemitsu claims this modification is exempt from the water trigger, because the Guidelines for the trigger exempt activities for mines that are "not part of the extraction process."

Clearly the water that Idemitsu is demanding is to assist in their extraction of coal, they are in no other business. The modification will provide significant additional impact on water and therefore is not exempt from the water trigger and must be referred for EPBC consideration.

Impact on other Water Users
We understand that the company does not presently have sufficient aquifer water access licences to meet the additional 2,600ML per year they now say they need to run the mine.

Our members feel concerned about the impact that the acquisition of these licences and the extraction of this water will have on the productive agricultural industry that also seeks to operate (and "co-exist") in the vicinity of the mine. A borefield of 6 new bores and the extraction of an extra 2,082ML p.a. will have drawdown impacts on the existing water users in this zone, the impacts of which have not been appropriately modelled nor discussed with local water users.

If the current trajectory of planning-approval-development continues as we have seen thus far, we have no faith that the mine will not continue to suddenly identify a demand for, acquire more licences, put down more bores and/or pumps and use more and more water without the full and cumulative impact being properly identified, appropriately compensated for and adequately conserved.

We hold grave fears for a finite water source that is supposed to be shared across industries and communities, when full and proper process is not carried out by some of the parties.

We urge the Department of Planning and DPI Water to adopt a precautionary approach and refuse consent for this modification and conduct a thorough audit of Idemitsu (and Whitehaven's) existing use of and impact on water in the Maules Creek area.

Regards

Sally Hunter BBUS
President, P4P

Issue summary

- The true demand for water by the mine should have been identified in the original water demand model. To have to request this modification three years later indicates either a deliberate intention to mislead local water users and environmental protectors, or else shabby workmanship. Both of which are completely unacceptable for a development of this scale, risking resources of this quality. Development consent for the mine was provided on the assumption that "the proponent shall ensure it has sufficient water for all stages of the project and, if necessary, adjust the scale of mining operations on site, to match its available water supply." In direct contradiction to this condition, the mine has been operating, discovered it requires more water and is seeking a modification. The proper outcome should be that the scale of the operation is reduced in accordance with the amount of water that it has.
- Idemitsu has not fulfilled condition 38 of its consent, which required that a Water Management Plan be developed within six months of the consent. This Plan was supposed to include a Leard Forest Mining Precinct Water Management Strategy to be developed in conjunction with Whitehaven Coal. The Department of Planning has advised local farmers that this strategy has been deemed inadequate by the Department. We find it unacceptable to allow the development to continue and to seek further modifications in regards to water, when Idemitsu have blatantly breached their consent in this way.
- Until the *Leard Forest Mine Precinct Water Management Strategy* is provided and approved, no modifications should be approved.
- Idemitsu claims this modification is exempt from the water trigger, because the Guidelines for the trigger exempt activities for mines that are "not part of the extraction process." We argue that the water is to assist in their extraction of coal, and must be referred for EPBC consideration.
- Idemitsu does not currently hold the sufficient water access licenses to meet their additional needs 2,600 ML per day. Highlighting concerns about the draw down impacts these addition bores will have on groundwater, and thereby the ability of the productive agriculture industry and the community to co-exist in this area.

Response

Issue	Response
The true demand for water by the mine should have been identified in the original water demand model. To have to request this modification three years later indicates either a deliberate intention to mislead local water users and environmental protectors, or else shabby workmanship. Both of which are completely unacceptable for a development of this scale, risking resources of this quality. Development consent for the mine was provided on the assumption that "the proponent shall ensure it has sufficient water for all stages of the project and, if necessary, adjust the scale of mining operations on site, to match its available water supply." In direct contradiction to this condition, the mine has been operating, discovered it requires more water and is seeking a modification. The proper outcome should be that the scale of the operation is reduced in accordance with the amount of water that it has.	Boggabri Coal reject the assertion of any intent to mislead stakeholders or poor quality workmanship. Schedule 3, Condition 33 of the project approval requires that Boggabri Coal ensures that it has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations on site, to match its available water supply to the satisfaction of the Director-General. The Site Water Balance included as Appendix A to the MOD 5 EA outlines the water requirements for the BCM based on latest mine plan, infrastructure layouts and more detailed project design/ engineering work that has occurred since 2010. This Site Water Balance forms part of the Water Management Plan for the site and is reviewed annually and updated if any significant changes are made to mining operations, including the site water management system. As outlined in Section 3.1 of the MOD 5 EA, ongoing development at the mine has identified the need for additional water supplies. The Boggabri Coal Surface Water Assessment (Parsons Brinckerhoff 2010) predicted that under normal climatic conditions, the site would have an annual water surplus until its CHPP was established, but move to an annual water deficit when the CHPP became operational in early 2015. Other changes to the site's water use and make have occurred since 2010, such as reduced catchment areas for on-site dams due to changes to mine plans and increased water requirements for dust suppression, as has

Issue	Response
	been required by several pollution reduction programs that have been included in Boggabri Coal's Environmental Protection Licence. Requirements for dust suppression at the site were also increased in 2014 following determination of Project Approval Modification 4 that conditioned the Project Approval so that Boggabri Coal is required to minimise dust emissions on-site. Previous approval conditions required Boggabri Coal to minimise emissions to off-site areas only.
Idemitsu has not fulfilled condition 38 of its consent, which required that a Water Management Plan be developed within six months of the consent. This Plan was supposed to include a Leard Forest Mining Precinct Water Management Strategy to be developed in conjunction with Whitehaven Coal. The Department of Planning has advised local farmers that this strategy has been deemed inadequate by the Department. We find it unacceptable to allow the development to continue and to seek further modifications in regards to water, when Idemitsu have blatantly breached their consent in this way.	A Water Management Plan for the BCM was prepared on 27 April 2012. This WMP is reviewed and updated on an annual basis or when any significant changes are made to mining operations. The current version of the WMP is dated February 2014 and was granted approval by the DP&I in March 2014. The revised version of the WMP was reviewed by regulators (DP&I, EPA and NOW), MCMA and the Community Consultative Committee. The approved WMP was updated to incorporate feedback from regulators and the Community Consultative Committee. The BTM Complex Water Management Strategy (WMS) has been prepared to address the Project Approval requirement associated with the preparation of a Leard Forest Mining Precinct Water Management Strategy. The BTM Complex WMS received Commonwealth government approval in early 2014 but is yet to receive DP&E approval due to delays in the approval of the MCC Water Management Plan. This WMS is expected to be issued to DP&E for approval in the second quarter of 2016 with finalisation expected to occur later in 2016 but the timing is outside of Boggabri Coal's control.
Until the Leard Forest Mine Precinct Water Management Strategy is provided and approved, no modifications should be approved	As above.
Idemitsu claims this modification is exempt from the water trigger, because the Guidelines for the trigger exempt activities for mines that are "not part of the extraction process." We argue that the water is to assist in their extraction of coal, and must be referred for EPBC consideration.	Noted. Under the EPBC Act, an action which involves a CSG development or a large coal mining development now requires approval from the Australian Government Environment Minister if the action has, will have, or is likely to have a significant impact on a water resource. The Australian Government Department of the Environment published the Significant impact guidelines 1.3: Coal seam gas and large coal mining developments- impacts on water resources (the guideline) in December 2013. The core purpose of these guidelines is to assist any person who proposes to take an action which involves a CSG development or a large coal mining development to decide whether the action has or is likely to have a significant impact on a water resource. Section 3.4 of the guidelines notes that the definition of 'large coal mining development' is related to impacts on water resources of activities that are associated with new or modified extraction of coal (our emphasis). The MOD 5 borefield infrastructure is not associated with new or modified extraction of coal and consequently does not fall within the definition of a 'large coal mining development' and therefore the EPBC Amendment Act 2013 does not apply and the approval of the Australian Government Environment Minister is not required in relation to the water trigger.
Idemitsu does not currently hold the sufficient water access licenses to meet their additional needs 2,600ML per day. Highlighting concerns about the draw down impacts these addition bores will have on groundwater, and thereby the ability of the productive agriculture industry and the community to co-exist in this area.	As noted in Table 3.1 of the MOD 5 EA Boggabri Coal's water demand is 9.5 ML/day of which 5.7 ML/day is to be sourced from the proposed borefield during average weather conditions. Boggabri Coal will ensure that there is sufficient water allocation in its account prior to extracting from the bores.

Issue	Response
	Potential drawdown impact of the proposed borefield modification on any landholder has been assessed in the MOD 5 Appendix B Drawdown Impact Assessment. Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m is predicted in some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. Groundwater users who are impacted by the modification are subject to 'make good' provisions that may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to 'make good' provisions if drawdown impacts occur, no negative effects are expected to be realised.

3.3 Public submissions

3.3.1 Aidan Rodstrom – 14 December 2015 (submission number 8)

Aidan Rodstrom Submission on MOD 5

14/December/2015

Matthew Riley

Planning Services

Resource assessments

T: 9228 6339

E: matthew.riley@planning.nsw.gov.au

Dear Mr Matthew Riley

I am writing to you with concern about the Boggabri Coal Operations Pty Ltd proposal to modify its project approval to seek permission to extract groundwater from a site close to my property.

According to the proposed bore field map I am a neighbour next door on which the 2 metre draw down line runs through. The stock and domestic bore which is located on my property is only 10 metres outside the affected area. To me this creates great concern that if my bore (bore license No: 90WA832319) is affected it will heavily impact on my farming operation and also the valuable water supply to my house.

I would appreciate that my concerns are taken seriously an appropriate action by your department is taken to alleviate what I see could result in very serious consequences to my future farming and domestic viability.

I look forward to your early reply.

Yours sincerely

Aidan Rodstrom

Issue summary

- Concerned about the affects the proposed borefield will have on his farming operation and domestic use bore which is located 10 metres outside the affected area.

Response

A groundwater study based on a complex modelling platform that has been calibrated against more than two years of suitable baseline data has been undertaken. This was consistent with Australian Modelling Guidelines. The model predicts that 2m drawdown during extended dry conditions, when increased pumping rates from the proposed borefield are likely, will not occur at the stock and domestic bore on Mr Rodstrom's property.

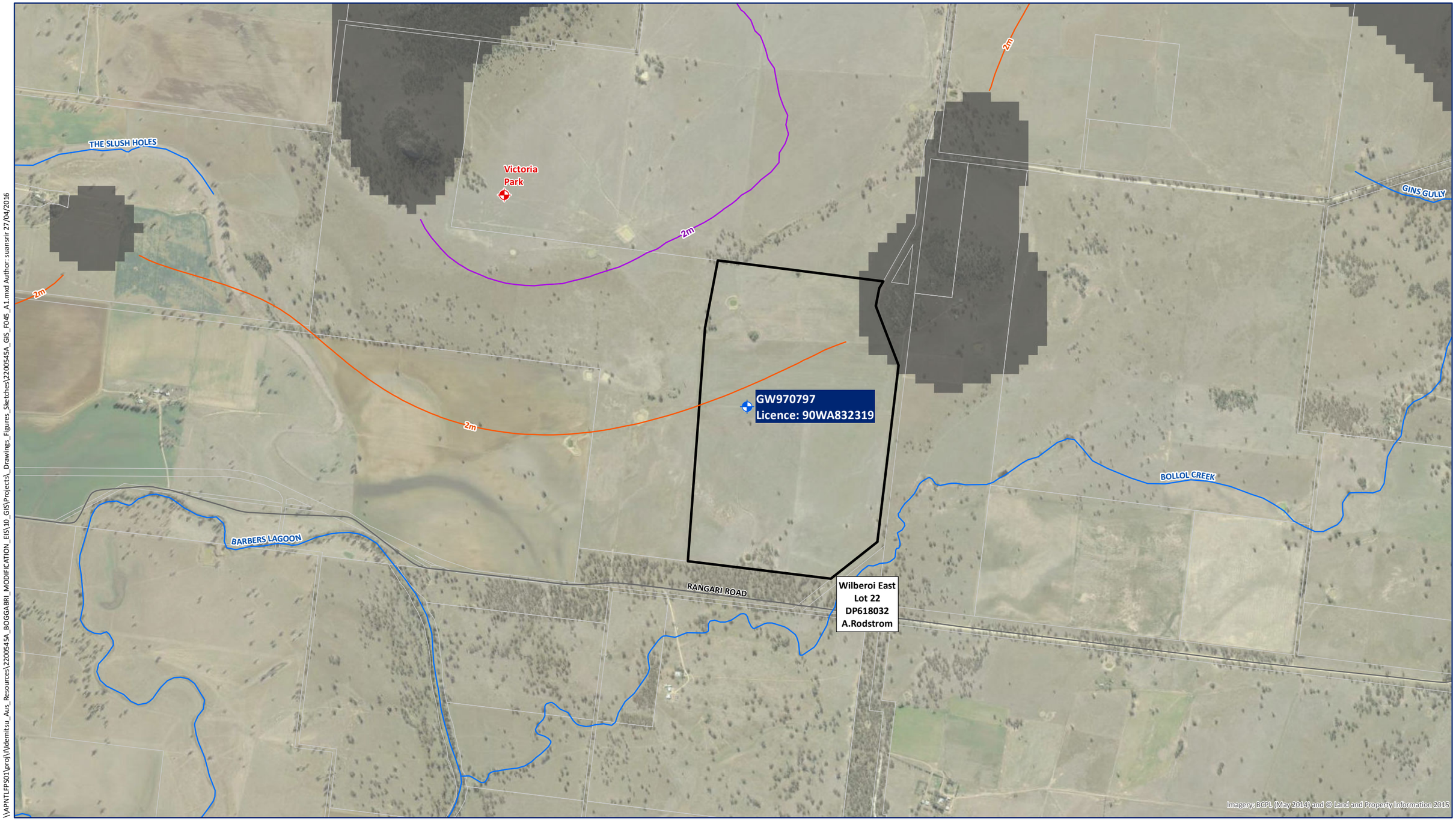
The confidence level of the model in reference to National Water Commission guidelines (2012) is Class 2-3. The modelling platform has been independently reviewed by HydroSimulations and deemed fit for purpose and reliable.

Boggabri Coal undertook a modelling exercise to determine the potential drawdown impact to Mr Rodstrom's stock and domestic bore from various Victoria Park bore extraction regimes. The model determined that during extended dry periods, when an increased extraction rate is likely, 2m draw down will extend to 99m from Mr Rodstrom's bore. The model also determined that during average weather conditions, when lower extraction rates can be expected, 2m drawdown will extend to 996m from Mr Rodstrom's bore. Figure 3.2 illustrates the modelled drawdown extents.

In 2015 and early 2016 Boggabri Coal undertook monitoring of the stock and domestic bore on Mr Rodstrom's property in order to inform future monitoring that may be required to assess the drawdown impact from operation of the proposed borefield.

Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the drawdown effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works.

Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable 'make good provisions'.



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Groundwater bore
Victoria Park
2m drawdown contours - dry conditions
2m drawdown contour - average rainfall
Watercourse
Main Roads
Groundwater model - no alluvial aquifer in this area
Rodstrom property
Lot boundary

0 0.25 0.5 0.75 km

Figure 3.2
Groundwater modelling drawdown contours - Rodstrom property

3.3.2 Jim Picton – (submission number 9)

Jim Picton Submission on MOD 5

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Jim Picton , of Boggabri NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Objects to this project

Regarding the Boggabri Coal application for Constructing 4 Bores we would like to place a submission against this happening as we are immediate neighbours to the East who rely greatly on underground water for stock and personal use. 90 percent of our water usage is from bores and wells and if we were to loose that capacity our buisness would be become redundant as we are sheep and cattle producers.
As we are the only owner/Occupiers immediately to the east of BBC there has been no communication between farmer and mining company.
What water studies have been completed to protect our supply and our livelihood?
We need guarantees that these bores will not effect the capacity and production of the water supply that already exsists.

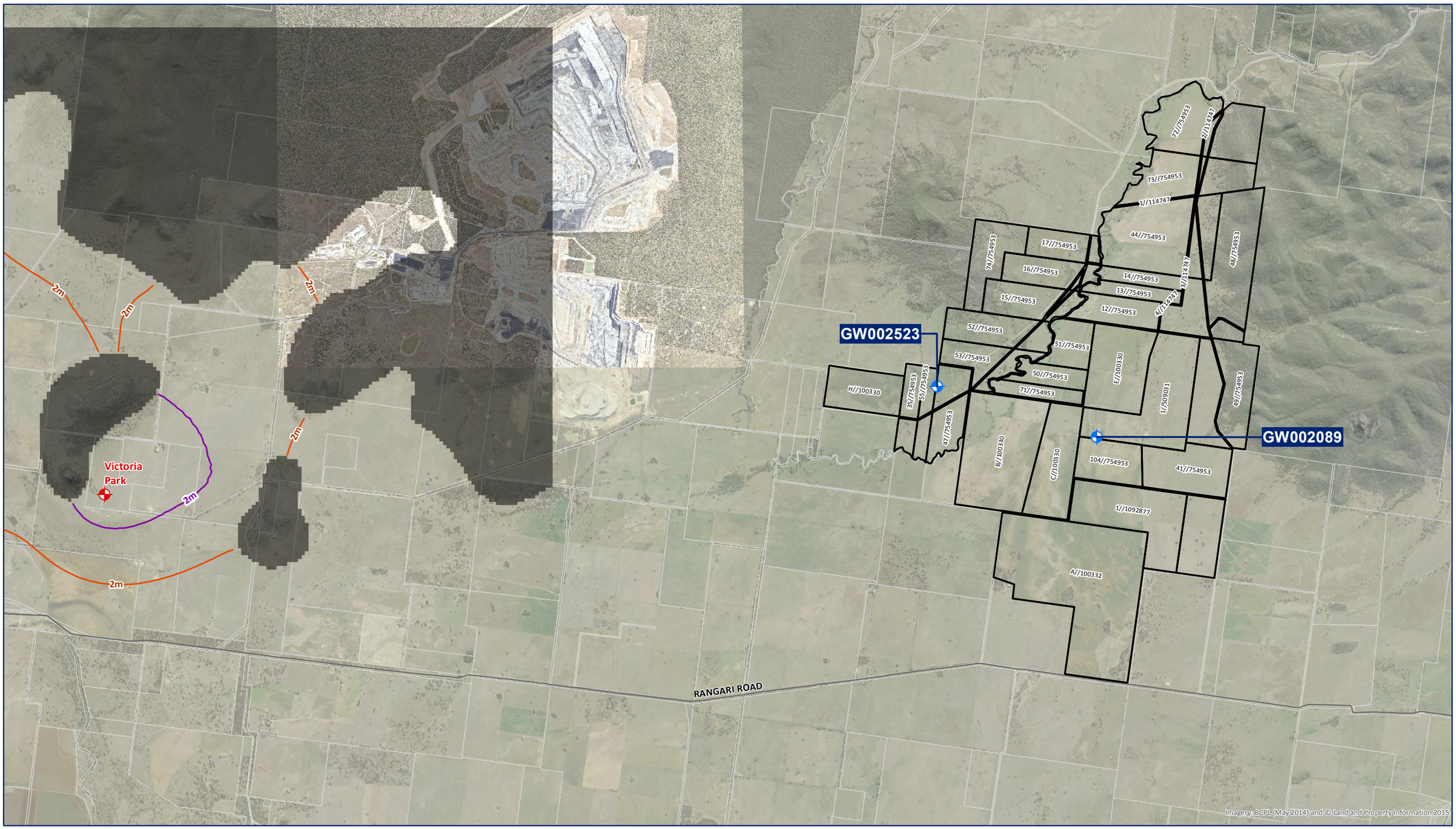
Issue summary

- Concerned about the affects the proposed borefield will have on their farming/business operation and domestic use as they are neighbouring the proposed site to the east. Highlight the lack of communication between farmer and mining company.
- Proposes the question; what water studies have been completed to protect our supply and our livelihood?
- Want guarantees that these bores will not affect the capacity and production of the water supply that already exists.

Response

Issue	Response
Concerned about the affects the proposed borefield will have on their farming/business operation and domestic use as they are neighbouring the proposed site to the east. Highlight the lack of communication between farmer and mining company.	Impacts of groundwater drawdown on surrounding water users was assessed as part of the groundwater assessment undertaken for the modification (refer Section 6.1 and Appendix B Drawdown Impact Assessment of Proposed Borefield Operation of the MOD 5 EA). Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m is predicted in some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Data from a ground water monitoring bore located in the Picton property and bores on neighbouring properties will be used to determine the impact of the operation of the proposed bore field on Mr Picton's ground water supply. The bores inside Mr Picton's property will be included in the next round of hydrocensus monitoring. Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable "make good provisions". Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. Groundwater users who are impacted by the modification are subject to 'make good' provisions that may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to 'make good' provisions if drawdown impacts occur, no negative effects are expected to be realised. Boggabri Coal has undertaken extensive consultation with the owners of groundwater supply works predicted to be impacted by the operation of the proposed borefield. The extent of consultation for the proposed modification is outlined in Section 5.1 of the MOD 5 EA. As noted in Section 5.2 of the MOD 5 EA, Boggabri Coal has committed to further consultation with landholders whose bores or wells may be impacted by the modification. Mr Picton will be included in the borefield consultation process.

Issue	Response
Proposes the question; what water studies have been completed to protect our supply and our livelihood?	A Drawdown Impact Assessment based on a complex modelling platform that has been calibrated against more than 2 years of suitable baseline data and is consistent with Australian Modelling Guidelines has been undertaken. The model predicts that 2m drawdown during extended dry conditions, when increased pumping rates from the proposed borefield are likely, will not occur at any registered bores on Mr Picton's property. Figure 3.3 illustrates the modelled drawdown extents. The confidence level of the model in reference to National Water Commission guidelines (2012) is Class 2–3. The modelling platform has been independently reviewed by HydroSimulations and deemed fit for purpose and reliable. The Drawdown Impact Assessment has been completed in accordance with and assessed against the Aquifer Interference Policy to ensure minimal impact to the supply of water and those upon which their livelihood relies. The Drawdown Impact Assessment has review by DP&E and DPI Water. DPI Water's review has found no errors or deficiencies in the modelling, including the climate scenarios and cumulative drawdown assessments, that would limit the validity of the results. A copy of the Drawdown Impact Assessment is provided in Appendix B and summarised in section 6.1 of the MOD 5 EA.
Want guarantees that these bores will not affect the capacity and production of the water supply that already exists.	Potential drawdown impact of the proposed borefield modification on any landholder has been assessed in the MOD 5 Appendix B Drawdown Impact Assessment of Proposed Borefield Operation. Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m is predicted in some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works in accordance with the Aquifer Interference Policy. Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable "make good provisions". Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. Groundwater users who are impacted by the modification are subject to 'make good' provisions that may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to 'make good' provisions if drawdown impacts occur, no negative effects are expected to be realised.



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Picton property registered bore
BCM bore
2m drawdown contour - average rainfall
2m drawdown contours - dry conditions
Main Roads
Groundwater modelling - no alluvial aquifers in this area
J & R Picton property
Lot boundary

0 0.5 1 1.5 km

Figure 3.3
Groundwater modelling drawdown contours - Picton property

3.3.3 Lachlan James – (submission number 10)

Lachlan James Submission on MOD 5

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Lachlan James , of Gunnedah NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Objects to this project

Please see attached PDF file

- Attachment: Boggabri Coal 2m Drawdown Response Letter Dept Planning.pdf

Dear Dept of Planning and Environment,

Please accept this letter as a response to the proposed establishment of the Boggabri Coal bore field and its implications.

We are not supportive of the establishment of a bore field as outlined in the documents provided as Modification 5. The reasons for this are;

- We have great reservations as to the ability of any hydrological study to accurately (without uncertainty) predict the water drawdown and hence impact on neighbouring properties. The study itself states that 'model predictions are subject to uncertainty' and that there is 'significant uncertainty regarding the properties of the groundwater system in locations where data have not been collected and under conditions not encountered during the monitoring period.'. Given that neither of our two bores listed in the study have been tested, and that there is an additional bore located on our property that is located well within the 2m (average weather) drawdown contour line, is of great concern.
- We believe that the extensive Plains Grass community located in close proximity to the bore field has some interaction with the present groundwater system. The hydrological study includes Plains Grass communities as having potential to have reliance on subsurface groundwater. The study dismisses the importance of these communities. However, as these Plains Grass communities are a major resource for grazing enterprises, any impact on the productive nature of these grasses has a direct and measurable affect on grazing businesses. This is of great concern.
- The mapping provided for ground water dependent ecosystems (Shown in submission as Fig 5.5) depicts a very different representation to that of the visual topography. This figure indicates that the elevated rocky outcrop known as Barber's Pinnacle has a greater potential connectivity to groundwater than the low lying Plains Grass communities. This illustration seems to be erroneous.
- We note that the proposed bores are located within the 200m neighbouring property boundary limits set out in the Namoi Water Sharing Plan and this of concern.
- The water drawdown predictions indicated in the hydrological study show that the groundwater is predicted to be lowered by >2m (at either average weather or dry period scenarios) at all bores located on our property. This is unacceptable as it poses a potential significant impact on our production capacity.
- The make good provisions indicated are not viewed by us as sufficient. It is our view that by the time make good provisions are implemented it is too late. Water is essential to neighbouring businesses and by the time make good provision/s are implemented there would have already been economic loss suffered.

If the Dept of Planning and Environment is to approve the bore field we seek that a condition of the approval be that Boggabri Coal must first gain the consent of neighbouring landholders that are potentially affected by >2m water drawdown (in either average or dry scenarios). We would seek that the Department include a compulsory acquisition clause including neighbouring properties affected by >2m water drawdown (in either average or dry scenarios).

Issue summary

- Reservations regarding the ability of any hydrological study to accurately (without uncertainty) predict the water drawdown and hence impact on neighbouring properties. Given that neither of our two bores listed in the study have been tested, and that there is an additional bore located on our property that is located well within the 2m (average weather) drawdown contour line, is of great concern.
- Concerns regarding the lack of emphasis given the Plains Grass communities located in close proximity to the borefield and their role in the groundwater system.
- Concerns regarding the mapping for groundwater dependent ecosystems not representing the visual topography. Figure 5.5 indicates that the elevated rocky outcrop known as Barber's Pinnacle has a greater potential connectivity to groundwater than the low lying Plains Grass communities.
- Concerned that the proposed bores are located within the 200 m neighbouring property boundary limits set out in the Namoi Water Sharing Plan.
- The water drawdown predictions indicated in the hydrological study show that the groundwater is predicted to be lowered by >2m at all bores located on our property. This is unacceptable as it poses a potential significant impact on our production capacity.
- The 'make good' provisions indicated are not viewed as sufficient. Great economic loss will be suffered before they provisions are implemented.
- Boggabri Coal should be required to gain consent from neighbouring land holders that will be affected by >2m water drawdown. The department include a compulsory acquisition clause including neighbouring properties affected by >2m water drawdown.

Response

Issue	Response
Reservations regarding the ability of any hydrological study to accurately (without uncertainty) predict the water drawdown and hence impact on neighbouring properties. Given that neither of our two bores listed in the study have been tested, and that there is an additional bore located on our property that is located well within the 2m (average weather) drawdown contour line, is of great concern.	The groundwater study is based on a complex modelling platform that has been calibrated against suitable baseline data for greater than 2 years of data and is consistent with Australian Modelling Guidelines. The confidence level of the model in reference to National Water Commission guidelines (2012) is Class 2 – 3. The modelling platform has been independently reviewed by HydroSimulations and deemed fit for purpose and reliable. Potential impact to the two bores noted in Mr James' submission are noted in the MOD 5 Appendix B Drawdown Impact Assessment of Proposed Borefield Operations. In early 2016 Boggabri Coal undertook monitoring of these bores in order to inform future monitoring that may be required to assess the drawdown impact from operation of the proposed borefield. Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m is predicted in some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable "make good provisions".

Issue	Response
	Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. Groundwater users who are impacted by the modification are subject to 'make good' provisions that may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to 'make good' provisions if drawdown impacts occur, no negative effects are expected to be realised.
Concerns regarding the lack of emphasis given the Plains Grass communities located in close proximity to the borefield and their role in the groundwater system.	Plains Grass communities have been noted in the groundwater assessment undertaken for the proposed modification (refer to Appendix B of the MOD 5 EA). Specifically, this assessment documented that the Plains Grassland communities are considered to be primarily associated with perched water tables not likely to be dependent on subsurface groundwater and were therefore not included within the GDE classification. Extraction from the borefield is unlikely to affect the perched systems due to disconnection with underlying alluvial aquifer. In addition, potential impacts to the Plains Grass community were assessed through a significance assessment included in Appendix C of the MOD 5 EA. With regards to groundwater, this assessment concluded that the Plains Grassland is located on the lower lying plains and this community is considered to be associated with shallow perched water tables over impermeable clay lenses rather than groundwater fed by subsurface aquifers. Therefore this community has been classed as having some proportional dependence upon (shallow perched) groundwater. The proposed modification will require only limited excavation and shaping of the upper soil profile and minor alterations to the existing surface water drainage however is unlikely to require groundwater extraction or significant impact on the existing subsurface aquifer and their associated groundwater dependant ecosystems. Therefore it is unlikely that the proposed modification would modify the groundwater levels to such an extent to affect this community's survival.
Concerns regarding the mapping for groundwater dependent ecosystems not representing the visual topography. Figure 5.5 indicates that the elevated rocky outcrop known as Barber's Pinnacle has a greater potential connectivity to groundwater than the low lying Plains Grass communities.	Mapping of groundwater dependant ecosystems is based on the GDE Atlas (Bureau of Meteorology, 2015). Regarding this mapping, the Bureau of Meteorology states that "the GDE Atlas shows general locations where groundwater interaction may occur". This mapping is broad scale, based on existing spatial datasets and is mostly a conservative estimate of groundwater / ecosystem interaction. In this regard, Barber's Pinnacle has been mapped as having low potential for groundwater interaction whilst mapped vegetation on the low lying plain is assigned a moderate potential. As noted above low lying Plains Grass communities is considered to be associated with shallow perched water tables over impermeable clay lenses rather than groundwater fed by surface aquifers.
Concerned that the proposed bores are located within the 200m neighbouring property boundary limits set out in the Namoi Water Sharing Plan.	The following Water Sharing Plans apply to water sources in the vicinity of the BCM: ■ Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012 ■ Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2003 ■ Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003 ■ Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Source 2011. Of note is Clause 36 of the Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003, which outlines that a new water supply works is not permitted within 200 m of a property boundary.

Issue	Response
The water drawdown predictions indicated in the hydrological study show that the groundwater is predicted to be lowered by >2m at all bores located on our property. This is unacceptable as it poses a potential significant impact on our production capacity.	Noted. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. As outlined in Section 5.2 of the MOD 5 EA, Boggabri Coal has committed to further consultation with landowners whose bores or wells may be impacted by the modification.
The 'make good' provisions indicated are not viewed as sufficient. Great economic loss will be suffered before they provisions are implemented.	Groundwater users who are impacted by the modification are subject to 'make good' provisions that may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. As outlined in Section 5.2 of the MOD 5 EA, Boggabri Coal has committed to further consultation with landowners whose bores or wells may be impacted by the modification.
Boggabri Coal should be required to gain consent from neighbouring land holders that will be affected by >2m water drawdown. The department include a compulsory acquisition clause including neighbouring properties affected by >2m water drawdown.	Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable "make good provisions". Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. As noted in Section 5.2 of the MOD 5 EA, Boggabri Coal has committed to further consultation with landholders whose bores or wells may be impacted by the modification.

3.3.4 Marg McLean – (submission number 11)

Marg McLean Submission on MOD 5

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Marg McLean , of singleton NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Objects to this project

This proposed Modification to PA 09_0182 is grossly objectionable. This application becomes a self-evident fact that the original project approval was inappropriate. The impact of the Boggabri Mine on the water resources and land use of the area was required to be assessed. That assessment was obviously manifestly inadequate, presumably because the volume of water required to mine 7 Mtpa of coal was understated.
This proposed borefield EA states that 9.5 ML/day is required; the minutes of the Community Consultative Committee meeting 19 Nov 2015 record a Hamish Russell answering a query that 4 - 8 megalitres a day is needed if there is no rainfall.
Boggabri coal mine borefield EA records a need for another 2,082ML per year to meet their demand in average climatic conditions. In dry conditions, they'll allegedly need up to 2,600ML.
But the water modelling used originally was apparently wildly inaccurate using inaccurate data and the accounting for the climatic conditions of NorthWest NSW in to our uncertain future of global warming remains in doubt.
Boggabri Coal do not currently have aquifer licences to meet their demand. They say they are in the process of obtaining them. Currently, they have only 848ML of aquifer licences, at full availability.
This modification cannot properly be approved.

Issue summary

- Concerned about the current estimates of water that is required for the mine, as it was previously understated. Highlights the modelling originally used was inaccurate.
- Concerned that Boggabri coal does not currently hold the licenses they need to meet their demand.

Response

Issue	Response
Concerned about the current estimates of water that is required for the mine, as it was previously understated. Highlights the modelling originally used was inaccurate.	Previous assessment of the impacts on water resources including water demand were based on the best available information at that point in time. In the latest revision of the Site Water Balance (attached as Appendix A to the MOD 5 EA) the site water balance model was revised to reflect the latest mine plan and infrastructure layouts. The site water demands were also revised based on more detailed project design and engineering work that has occurred since the 2010 EA.
Concerned that Boggabri coal does not currently hold the licenses they need to meet their demand.	Boggabri Coal will possess sufficient Water Access Licence(s) prior to extracting water from any source.

3.3.5 Peter Thompson – (submission number 12)

Peter Thompson Submission on MOD 5

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Peter Thompson , of Coonabarabran NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Objects to this project

I absolutely oppose this proposal. It is outrageous that a coal mine can get approval without its water needs being public and approved. This proposal is not approvable because it will badly degrade the local aquifers and affect flows in the Namoi River.

This coal mine and all its associated works are already causing unacceptable damage to the landscape, the water and the global climate.

Issue summary

- Opposing the modification because of the impact it will have on local aquifers and flows in the Namoi River.
- Opposing the modification because of the unacceptable damage to the landscape, the water and the global climate, the mine and its associated works already causes.

Response

Issue	Response
Opposing the modification because of the impact it will have on local aquifers and flows in the Namoi River.	Noted. Impact of the modification on local aquifers and flows in the Namoi River were addressed in Sections 6.1 and 6.2 and Appendix A and B of the MOD 5 EA. MOD 5 is subject to and has been assessed against the requirements of the Aquifer Interference Policy to ensure minimal impact to local aquifers and the Namoi River. The MOD 5 Drawdown impact assessment has been subject to independent third party review and review by DP&E and DPI Water.
Opposing the modification because of the unacceptable damage to the landscape, the water and the global climate, the mine and its associated works already causes.	Noted. Comment relates to exiting operation as the BCM and is therefore considered to be beyond the scope of this proposed modification.

3.3.6 Richard Gillham – 14 December 2015 – (submission number 13)

Richard Gillham Submission on MOD 5

14th December 2015

David and Richard Gillham

'Glenhope'

Boggabri NSW

2382

Planning Services

Resources Assessments

Matthew Riley,

This submission is regarding Boggabri Coals application to modify its project approval by operating additional ground water bores on farms close to our property.

Our farm 'Glenhope' relies solely on underground water for all stock and domestic purposes. With its predicted drawdown level occurring this would effectively leave us with very little or no bore water at all.

We believe that we would need additional bores drilled and equipped with good quality water before any pumping began by Boggabri Coal to give us a secure water source before any drawdown occurs on our existing bores.

We have had one meeting with a Boggabri Coal representative, Hamish Russel to discuss this issue. He now has to take the results of that meeting back to other mine representatives before they agree as to what they will provide for us. To date we have received no formal written response from Boggabri Coal in relation to our concerns raised.

As this submission is to be due in your office by 15th December 2015 and we have no final agreement with Boggabri Coal on this bore issue to this date, 14th December 2015, we have to say that this approval should not be allowed until we are given secure, good quality bore water.

Your Sincerely,

David Gillham

Richard Gillham

Issue summary

- The predicted drawdown level that is said to occur, will dramatically decrease or leave them with no bore water at all. Boggabri should provide us with a secure water source before works occur. Concerned that no final agreement has occurred between Boggabri Coal and the community (affected neighbours) regarding the issue.

Response

Potential drawdown impact of the proposed borefield modification on any landholder has been assessed in the MOD 5 EA Appendix B Drawdown Impact Assessment of Proposed Borefield Operations.

Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m is predicted in some private bores and wells.

Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works.

Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable “make good provisions”. Agreements will be subject to ‘make good’ provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works.

Groundwater users who are impacted by the modification are subject to ’make good’ provisions that may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures.

Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to ‘make good’ provisions if drawdown impacts occur, no negative effects are expected to be realised.

3.3.7 Roselyn Druce – (submission number 14)

Roselyn Druce Submission on MOD 5

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Roselyn Druce , of Boggabri NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Objects to this project

Submission : Objection to Idemitsu Resources, Boggabri Coal Mine Project Approval Modification Environmental Assessment (Mod 5)

I object to this modification, and I implore the Department to refuse the approval of this modification, on the grounds that should it be approved, there will be impacts that could be far reaching for the many surrounding landholders as well as other people who are reliant on underground water in zones 5 & 11 of the Namoi Catchment.
I find the Exhibition period of this assessment (15days) which entails 697 pages of details far too short to allow for any reasonable person to peruse and comprehend, let alone make comment on. The issue of water is far too important and all stakeholders should be granted the curtesy of more time to respond to such issues.
Concerns:
*A requirement under Section 3, condition 38(b) of the Boggabri Coal Project Approval, there has to be a Leard Forest Mine precinct Water Management Strategy. 4 Years on and this document has not been developed. A clear breach and disregard for the approval process. And this is a management strategy regarding WATER, the very commodity that they wish to increase so that their production output can continue.
* It appears that Boggabri Coal already have agreements with the landholders where the test bores have already been sunk. The issue is that when these six `test' bores become production bores this bore field could very well extract a considerable amount of aquifer water that will impact on neighbours and their livelihood. I don't believe that the Cumulative drawdown by all three mines has been considered, only the `local' drawdown effect by this modification, there by the proponent would consider their approved modification would be more likely to pass all necessary regulations and get approval if only assessed on its stand-alone merits and not from a cumulative perspective.
9.2 of Appendix B - "the modelling predictions indicate that bores and well on neighbouring properties will experience groundwater drawdown exceeding the 2m decline thresh hold as a minimal impact consideration in the AIP".
We know that modelling and predicted figures can't always be relied on and minimal or not, even a 2m drawdown can make the difference between a productive bore and a dry bore, and stock and domestic bores will be impacted by this modification.
* Boggabri Coal still needs to increase their aquifer water licences to meet their demand. (Are landholders considered on an equal basis when they wish to increase their aquifer water licences..? I hope so).
* Approval for the mining operation was initially granted back on 22nd August 1989 and then in 2012 there was an increase from 5mt pa to 7mt pa, clearly the modelling for the water allowance was not sufficient for the dust suppression and mining

operations. Perhaps this was a drastic oversite, or was it a pathway for a positive outcome for the approval of the project to be granted? Clearly this approval should not have been granted given the shortfall in the water needed to enable this increase in production.
*This company finds this modification (5) exempt from the Water Resource Triggers of the EPBC Act., simply because this modification does not involve the `direct extraction of coal'. Yet this water will ultimately be `extracted' from the underground aquifers and used to wash `coal'. Words out-way the `Gateway' process because this modification does not involve `additional mining activities' - drilling a bore to supply water for the coal industry is outside the components of the SRLUP.
*Boggabri Coal already admits that they are deficit half of the water needed to satisfy their production capacity. If there is insufficient water for their demand, then they should cut their production output back, not expect to extract precious water from the Namoi River and the surrounding underground aquifers and put the entire catchment at risk reducing water for Agriculture and domestic use. Boggabri Coal state in their conclusion (7.3) that the modification will result in Environmental impacts including drawdown of alluvial aquifers and reduce inflows to the Namoi River. Expanding its groundwater monitoring program does nothing if there is NO WATER to monitor.
* Matters of National Environmental Significance (MNES) Protection of water resources from CSG development and large Coal Mining Development. I would site this Modification as a significant issue in respect to MNES, especially when the water of a catchment is at stake and is being used by a mining company to suppress dust (which they create) and wash coal. And for that reason again I would request that the department deny this approval.
* We all know that `Offsets' are a contentious issue and in the past the `like for like' properties that have been purchased by mining companies in this district have not in any way compensated for the displacement of fauna or replaced the flora that has been destroyed. Allowing a mining company to clear even more native vegetation, some of which are listed under the TSC Act & EPBC Act is yet another reason to deny this approval.
* There are also predicted impacts to Aboriginal Heritage Sites. I find this a national disgrace that the department would facilitate any disturbance to a heritage site. Especially when so much Aboriginal heritage in the Leard State Forest has already been destroyed. Simply allowing a predominantly foreign owned company to move such Artefacts is un-Australian.
* I am very amused by the comment in their conclusion that they include themselves as beneficiaries of a secure water supply which will resolve their current water deficit. Obviously they don't consider any hardship or loss of income to anyone else other than themselves if the water they extract leaves all others without sustainable supplies.
All of the above reasons show that this Modification 5 to allow Boggabri Coal the approval to extract even more water than they do presently, from our already over allocated reservoirs of both the Namoi River and our underground aquifers is ultimately going to cause much hardship for those that already rely on these water supplies.
Our dry continent cannot sustain this continual abuse by the extractive industries. Destruction of Critically Endangered forests, and now the pillaging of our precious water that should be shared by all, is being handed over without question. These companies expect that approval will be granted whenever they make changes or increase their production, on the basis of a well worded document handed to the department for Approval.
It is up to you the Government, our elected Ministers to stand up and protect what little we have left of our natural environment, and to do this we need you to protect

and secure our water. Inter-generational Equity states that the present generation should ensure that the health, diversity and productivity are maintained or enhanced for the benefit of future generations.
I would ask again that this Modification not be approved in any way, not even by the use of a `Controlled Action'.

Issue summary

- The exhibition period of this assessment (15 days) which entails 697 pages of details far too short to allow for any reasonable person to peruse and comprehend, let alone make comment on. The issue of water is far too important and all stakeholders should be granted the curtesy of more time to respond to such issues.
- The requirement under Section 3, condition 38(b) of the Boggabri Coal Project Approval, there has to be a *Leard Forest Mine Precinct Water Management Strategy*. 4 Years on and this document has not been developed. A clear breach and disregard for the approval process.
- It appears that Boggabri Coal already have agreements with the landholders where the test bores have already been sunk. The issue is that when these six `test' bores become production bores this borefield could very well extract a considerable amount of aquifer water that will impact on neighbours and their livelihood. Does not believe that the cumulative drawdown by all three mines has been considered.
- Boggabri Coal still needs to increase their aquifer water licences to meet their demand.
- Clearly the original modelling for the water allowance was not sufficient for the dust suppression and mining operations. Perhaps this was a drastic oversite, or was it a pathway for a positive outcome for the approval of the project to be granted?
- This company finds this modification (5) exempt from the Water Resource Triggers of the EPBC Act., simply because this modification does not involve the ‘direct extraction of coal'. Yet this water will ultimately be `extracted' from the underground aquifers and used to wash `coal'.
- Boggabri Coal already admits that they are deficit half of the water needed to satisfy their production capacity. If there is insufficient water for their demand, then they should cut their production output back, not expect to extract precious water from the Namoi River and the surrounding underground aquifers and put the entire catchment at risk reducing water for Agriculture and domestic use.
- Matters of National Environmental Significance (MNES) Protection of water resources from CSG development and large Coal Mining Development. I would site this Modification as a significant issue in respect to MNES, especially when the water of a catchment is at stake and is being used by a mining company to suppress dust (which they create) and wash coal. And for that reason again I would request that the department deny this approval.
- Offsets in the past that have been purchased by mining companies in this district have not in any way compensated for the displacement of fauna or replaced the flora that has been destroyed.
- Predicted impacts to Aboriginal Heritage Sites.

Response

Issue	Response
The exhibition period of this assessment (15 days) which entails 697 pages of details far too short to allow for any reasonable person to peruse and comprehend, let alone make comment on. The issue of water is far too important and all stakeholders should be granted the curtesy of more time to respond to such issues.	The public consultation period was in accordance with statutory timeframes.

Issue	Response
The requirement under Section 3, condition 38(b) of the Boggabri Coal Project Approval, there has to be a Leard Forest Mine Precinct Water Management Strategy. 4 Years on and this document has not been developed. A clear breach and disregard for the approval process.	The BTM Complex Water Management Strategy (WMS) has been prepared to address the Project Approval requirement associated with the preparation of a Leard Forest Mining Precinct Water Management Strategy. The BTM Complex WMS received Commonwealth government approval in early 2014 but is yet to receive DP&E approval due to delays in the approval of the MCC Water Management Plan. This WMS is expected to be issued to DP&E for approval in the second quarter of 2016 with finalisation expected to occur later in 2016 but the timing is outside of Boggabri Coal's control.
It appears that Boggabri Coal already have agreements with the landholders where the test bores have already been sunk. The issue is that when these six `test' bores become production bores this borefield could very well extract a considerable amount of aquifer water that will impact on neighbours and their livelihood. Does not believe that the cumulative drawdown by all three mines has been considered.	Potential drawdown impacts of the proposed borefield modification on any landholder has been assessed in the MOD 5 EA Appendix B Drawdown Impact Assessment of Proposed Borefield Operation. Minimal drawdown impacts on active landholder bores during average weather conditions are expected. However, during extended dry conditions when increased pumping rates from the proposed borefield are likely, drawdown greater than 2m is predicted in some private bores and wells. Boggabri Coal will operate an expanded groundwater monitoring program (following consultation with DPI Water) to monitor the effects of the proposed borefield. The expanded groundwater monitoring program will measure groundwater drawdown levels in the proposed borefield area and identify when Boggabri Coal is required to cease or alter its extraction regime in order to avoid causing drawdown greater than 2m at any privately owned groundwater supply works. Where it is identified that Boggabri Coal groundwater pumping has caused a groundwater drawdown greater than 2m, resulting in a reduction of water availability to the owner of an affected groundwater supply, then Boggabri Coal will enter into negotiations with the affected stakeholder to identify suitable "make good provisions". Agreements will be subject to 'make good' provisions negotiated between Boggabri Coal and the owner of the affected groundwater supply works. 'Make good' provisions may include provision of access to an equivalent supply of water through enhanced infrastructure or other means, such as deepening existing bores, funding extra pumping costs or constructing new pipelines or bores and/or other compensatory measures. Groundwater users predicted to be subject to drawdown impacts use their bores for stock and domestic purposes with a single bore being used for irrigation. As these users will be subject to 'make good' provisions if drawdown impacts occurs, no negative effects are expected to be realised. Cumulative impacts are specifically considered in Section 7.10.5 of Appendix B of the MOD 5 EA. This assessment concluded that the Victoria Park, Belleview and Daisymede bores may experience minor drawdown (<1m) from mine dewatering over the long-term (as predicted from cumulative mine impacts modelling), which, when compounded with borefield pumping interference, is unlikely to affect the sustainability of pumping rates in these bores, with the possible exception of Daisymede bore. The contribution of long-term pumping from the borefield on cumulative drawdown impacts is estimated to be an additional 1-2m (Scenarios A) and 1-3m (Scenarios B) drawdown in the alluvium to the east and northeast of the borefield where mine cumulative drawdown is experienced. As outlined in Section 6.1.4 of the MOD 5 EA, Boggabri Coal will operate an expanded groundwater monitoring program designed to monitor the effects of the proposed borefield operations on the alluvial aquifer resource, surface water bodies and regional

Issue	Response
	users. This will be developed in consultation with DPI Water and incorporated into a revised Groundwater Management Plan. It is recommended (Appendix B of the MOD 5 EA) that this monitoring program includes the on-going assessment of the impact from the borefield operations on the alluvial aquifer resource, surface water bodies and regional users.
Boggabri Coal still needs to increase their aquifer water licences to meet their demand.	Boggabri Coal will possess sufficient Water Access Licence(s) prior to extracting water from any source in accordance with the WMA.
Clearly the original modelling for the water allowance was not sufficient for the dust suppression and mining operations. Perhaps this was a drastic oversite, or was it a pathway for a positive outcome for the approval of the project to be granted?	Previous assessment of the impacts on water resources including water demand were based on the best available information at that point in time. In the latest revision of the Site Water Balance (attached as Appendix A to the MOD 5 EA) the site water balance model was revised to reflect the latest mine plan and infrastructure layouts. The site water demands were also revised based on more detailed project design and engineering work that has occurred since the 2010 EA.
This company finds this modification (5) exempt from the Water Resource Triggers of the EPBC Act., simply because this modification does not involve the `direct extraction of coal'. Yet this water will ultimately be `extracted' from the underground aquifers and used to wash `coal'.	Under the EPBC Act, an action which involves a CSG development or a large coal mining development now requires approval from the Australian Government Environment Minister if the action has, will have, or is likely to have a significant impact on a water resource. The Australian Government Department of the Environment published the Significant impact guidelines 1.3: Coal seam gas and large coal mining developments- impacts on water resources (the guideline) in December 2013. The core purpose of these guidelines is to assist any person who proposes to take an action which involves a CSG development or a large coal mining development to decide whether the action has or is likely to have a significant impact on a water resource. Section 3.4 of the guidelines notes that the definition of 'large coal mining development' is related to impacts on water resources of activities that are associated with new or modified extraction of coal. The MOD 5 borefield infrastructure is not associated with new or modified extraction of coal it is considered to not be defined as a 'large coal mining development' and hence does not fall within the scope of the EPBC Amendment Act 2013 nor require the approval of the Australian Government Environment Minister.
Boggabri Coal already admits that they are deficit half of the water needed to satisfy their production capacity. If there is insufficient water for their demand, then they should cut their production output back, not expect to extract precious water from the Namoi River and the surrounding underground aquifers and put the entire catchment at risk reducing water for Agriculture and domestic use.	Previous assessment of the impacts on water resources including water demand were based on the best available information at that point in time. The Boggabri Coal Surface Water Assessment (Parsons Brinckerhoff 2010) predicted that under normal climatic conditions, the site would have an annual water surplus until its CHPP was established, but move to an annual water deficit when the CHPP became operational. In the latest revision of the Site Water Balance (attached as Appendix A to the MOD 5 EA) the site water balance model was revised to reflect the latest mine plan and infrastructure layouts. The site water demands were also revised based on more detailed project design and engineering work that has occurred since the 2010 EA. The MOD 5 EA provides an assessment of the potential impacts to water resources including the Namoi River, surrounding aquifers and water users as a result of the proposed modification in accordance with the requirements of the Aquifer Interference Policy.

Issue	Response
Matters of National Environmental Significance (MNES) Protection of water resources from CSG development and large Coal Mining Development. I would site this Modification as a significant issue in respect to MNES, especially when the water of a catchment is at stake and is being used by a mining company to suppress dust (which they create) and wash coal. And for that reason again I would request that the department deny this approval.	Under the EPBC Act, an action which involves a CSG development or a large coal mining development now requires approval from the Australian Government Environment Minister if the action has, will have, or is likely to have a significant impact on a water resource. The Australian Government Department of the Environment published the Significant impact guidelines 1.3: Coal seam gas and large coal mining developments- impacts on water resources (the guideline) in December 2013. The core purpose of these guidelines is to assist any person who proposes to take an action which involves a CSG development or a large coal mining development to decide whether the action has or is likely to have a significant impact on a water resource. Section 3.4 of the guidelines notes that the definition of 'large coal mining development' is related to impacts on water resources of activities that are associated with new or modified extraction of coal. The MOD 5 borefield infrastructure is not associated with new or modified extraction of coal it is considered to not be defined as a 'large coal mining development' and hence does not fall within the scope of the EPBC Amendment Act 2013 nor require the approval of the Australian Government Environment Minister.
Offsets in the past that have been purchased by mining companies in this district have not in any way compensated for the displacement of fauna or replaced the flora that has been destroyed.	Noted. Boggabri Coal have developed a comprehensive Biodiversity offset package approved by State and Commonwealth regulators that provides adequate like for like biodiversity offsets for the residual impacts of the Boggabri Coal Project.
Predicted impacts to Aboriginal Heritage Sites.	Noted. Potential impacts to Aboriginal cultural heritage is assessed in section 6.4 and Appendix D of the MOD 5 EA.

3.3.8 Name withheld – (submission number 15)

Name withheld Submission on MOD 5

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(Name withheld) , of Gunnedah NSW, made the following submission on the project:

Boggabri Coal (Mod 5)

Comments on this project

The opportunity cost of MOD 5 is a significant loss of groundwater irrigation capacity for Zone 4 irrigators.
The MOD 5 study area is mainly within Zone 4 yet well outside the mine disturbance area; there is a slight overlapp with the existing project boundary (see Figures 6.2 and 6.3).
Boggabri Coal has been progressively purchasing groundwater WAL's in Zone 4 over a number of years; 2015 purchases have not been listed in the Modification Request - there have been at least 2. This has led to some distortion in the Zone 4 groundwater market.
The mine site is not in Zone 4.
Groundwater is being extracted from Zone 4 and effectively piped and used 'out of Zone' resulting in a net potential recharge deficit for Zone 4.
There is no reference to fate of WALs at end of life of mine; these should be offered for resale back to irrigators.
Productive industry = efficient water use; extractive industry = inefficient water use.

Issue summary

- Opportunity cost of MOD 5 is a significant loss of groundwater irrigation capacity for Zone 4 irrigators. Boggabri Coal has been progressively purchasing groundwater WAL's in Zone 4 over a number of years; 2015 purchases have not been listed in the Modification Request - there have been at least 2. This has led to some distortion in the Zone 4 groundwater market.
- Comments that the mine site is not in Zone 4. Groundwater is being extracted from Zone 4 and effectively piped and used 'out of Zone' resulting in a net potential recharge deficit for Zone 4.
- There is no reference to fate of WALs at end of life of mine; recommending that these should be offered for resale back to irrigators.

Response

Issue	Response
Opportunity cost of MOD 5 is a significant loss of groundwater irrigation capacity for Zone 4 irrigators. Boggabri Coal has been progressively purchasing groundwater WAL's in Zone 4 over a number of years; 2015 purchases have not been listed in the Modification Request - there have been at least 2. This has led to some distortion in the Zone 4 groundwater market.	A revised list of Water Access Licences owned by Boggabri Coal is provided in Table B.1 of Appendix B.
Comments that the mine site is not in Zone 4. Groundwater is being extracted from Zone 4 and effectively piped and used 'out of Zone' resulting in a net potential recharge deficit for Zone 4.	Noted. Impacts to water resources (groundwater and surface water) from the proposed modification have been assessed and the results summarised in the MOD 5 EA (refer to Sections 6.1 and 6.2 and Appendices A and B). Section 89 of the Water Management Act relating to water use approvals confers the right on the holder of a water use approval to use water at a particular location. Ben Hanks Senior Water Regulation Officer Water Regulation North/North Coast Department of Primary Industries Water advised via email on the 8th of April 2016 that: 'Once water is extracted from an authorised water supply work – i.e. a bore in Zone 4 say – you can then use the water in your mine (or wherever)'. The location of the use of this water may be outside the Zone…'
There is no reference to fate of WALs at end of life of mine; recommending that these should be offered for resale back to irrigators	As outlined in Section 3.4 of the MOD 5 EA following completion of the mining operation, the bore sites and ancillary infrastructure will be decommissioned in consultation with affected landholders. If the relevant landholder requests that the bores are to be retained, the production bores and any relevant ancillary infrastructure would be transferred to their ownership. Superfluous water access licences will be sold following the end of the life of the mine.

4. Clarifications

4.1 Impacts to the Darling River

The Fisheries Scientific Committee, established under Part 7A of the *Fisheries Management Act 1994* (the Act), has made a recommendation to list the Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River as an Endangered Ecological Community in Part 3 of Schedule 4 of the Act. In their final recommendation the Fisheries Scientific Committee identified a number of threats to the continued survival of the Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River. The following paragraphs outline further information in response to Point 1 (paragraph 3) and Point 5 of the final recommendation as requested in the Maules Creek CWA submission (number 6 - refer to Section 3.2.2).

Point 1 (Paragraph 3): Water extraction has decreased flows in many parts of the system to levels detrimental to ecosystem functioning. The overall reduced flows cause increased erosion during flood events, with sand slugs developing in the upper reaches of some rivers. These changes decrease the available habitat for the aquatic ecological community and degrade that which remains:

During bore operation the decrease in flow rates to the Namoi River is estimated to be 0.6% to 0.9% of annual river flow in the dry periods with 0.2% loss of average flow in average weather conditions. These relatively minor reductions in flow to the Namoi River are not considered likely to result in any significant change to ecosystem function or the availability of habitat for aquatic ecological communities.

Furthermore, aquatic and terrestrial surveys conducted within and along the Namoi River as part of the EA (Parsons Brinckerhoff, 2010) identified that the riparian vegetation dominated by the tree species River Red Gum is already highly disturbed from clearing, exotic weed incursions, and cattle grazing which has resulted in poor bank stability and erosion of the existing river bank. Therefore a reduction to flow rates of a maximum the 0.9% in dry conditions is unlikely to further reduce the ecosystem function of the aquatic ecological communities or significantly increase bank erosion, greater than already occurs.

Point 5: Some types of agriculture can produce threatening processes to native aquatic animals. The reduction of river flow by water extraction, and pollution through insecticide and fertilizer runoff, are detrimental to aquatic life. This is especially evident during periods of low river flow when demand for irrigation and stock water is highest.

The existing water quality of the Namoi River is already considered to be poor as a result of anthropogenic factors associated with historic surrounding land use practices. This poor water quality has resulted in a decrease in the diversity of aquatic native fauna, supported by the absence of native fish species recorded during the aquatic surveys of the Namoi River for the Boggabri Coal EA (Parsons Brinckerhoff 2010). Whist extraction of water from the groundwater aquifers will result in a reduction in flow rates, the relatively small per cent reduction is considered minor and is unlikely to increase the concentrations of pollution from agriculture practices resulting in significant impacts on aquatic habitat greater than is already occurring.

The below provides a discussion of the potential impact to fauna listed in the final recommendation in the context of aquifer drawdown and baseflow loss predicted in the MOD 5 EA.

Aquatic surveys were conducted in the Namoi River as part of the 2010 EA (Biodiversity Impact Assessment – Parsons Brinckerhoff 2010). Table 4.1 outlines the species listed in the final determination that occur within the Darling River EEC.

Table 4.1 Aquatic species recorded in the Namoi River in 2010

Species/family/order	Common Name
Crustaceans and fish	
Paratya australiensis	Water Shrimp
Retropinna semoni	Australian Smelt
Hypseleotris sp.	Carp Gudgeon
Macroinvertebrates	
Dytiscidae/Coleoptera	Beetles
Hydraeniade/Coleoptera	Beetles
Hydrophilidae/Coleoptera	Beetles
Caenidae/Ephemeroptera	Mayflies
Chironomidae/Diptera	True flies
Corixidae/Hemiptera	True bugs (water boatmen)
Notonectidae/ Hemiptera	True bugs

The Macroinvertebrates have only been identified to Family name and therefore it is assumed that these are listed on the final determination. In relation to groundwater and surface interactions, any decrease in groundwater levels during dry periods may be further impacted from drawdown as a result of pumping of bores and this can potentially result in the water level falling below the river bed. The existing habitat for aquatic species outlined in Table 4.1 is degraded and the habitat for these species would be impacted by the water falling below the river bed. However droughts occur naturally as part of the lifecycle of many invertebrates thus these species have adapted to this occurrence in times of drought. Therefore as a result the removal of a small flow amounts from the Namoi River it is unlikely to be a large contributing factor in the removal of habitat for these aquatic species.

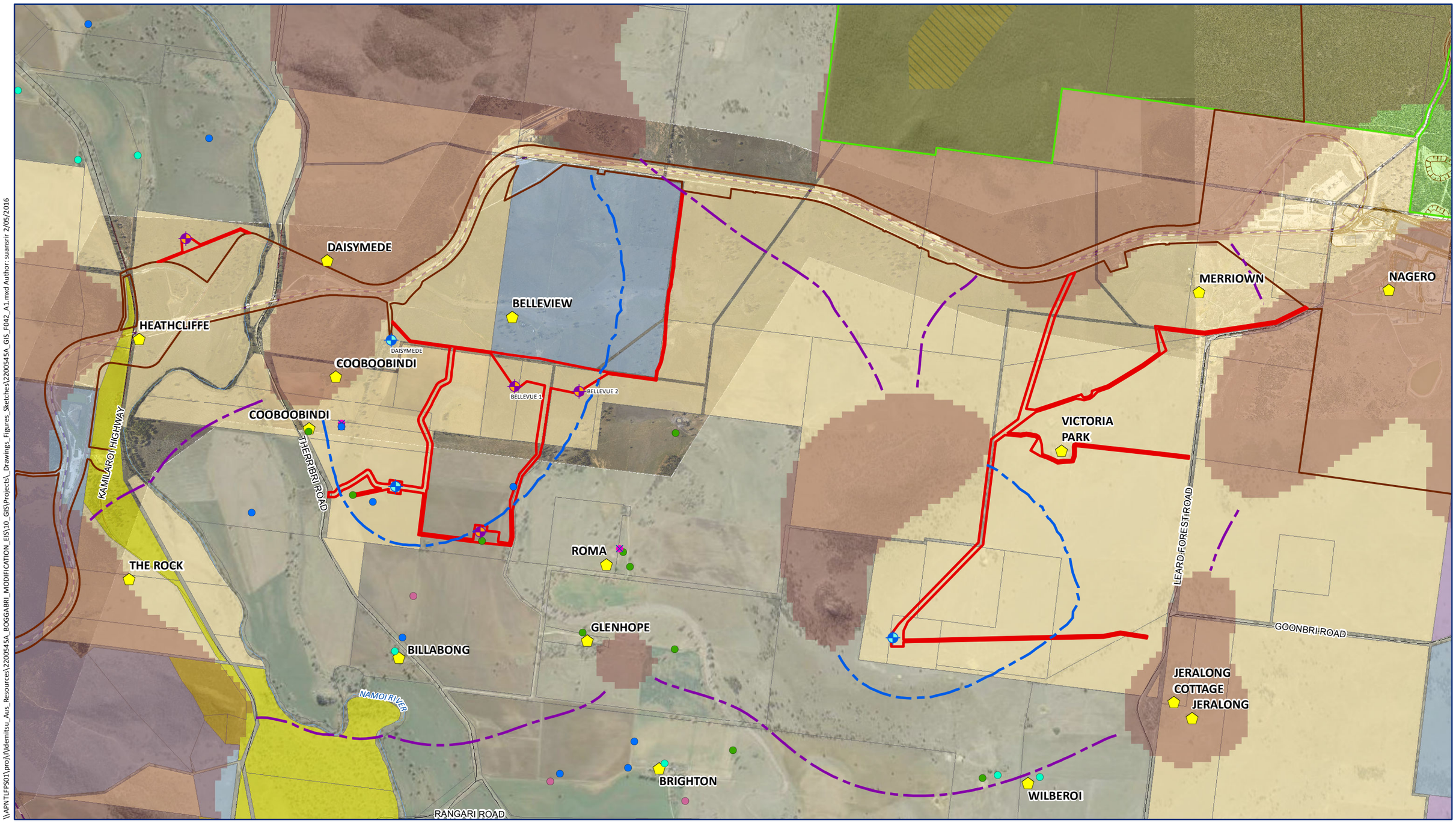
4.2 Changes to landownership since MOD 5 exhibition.

Since the time of preparing the Modification, Boggabri Coal has acquired property in the affected area. Table 4.2 summarises the changes to property ownership.

Table 4.2 Changes to ownership details

Lot	Deposited Plan (DP)	Ownership (MOD 5 EA)	Current Ownership
41	DP754926	RW & A Grover	Boggabri Coal
40	DP754926	RW & A Grover	Boggabri Coal
39	DP754926	RW & A Grover	Boggabri Coal
161	DP754926	RW & A Grover	Boggabri Coal

This revised land ownership is shown in Figure 4.1 along with bore locations and predicted 2m drawdown.



Bores
- Active irrigation bore
- Active stock and domestic bore
- License cancelled
- Not used
- Unknown

- Proposed contingency production bore
- Proposed production bore

Scenario A Groundwater 2m drawdown contours
- Average rainfall period
- Extended dry period
- Groundwater model - no alluvial aquifer in this area

Other data
- Surrounding residences
- Mine infrastructure
- Road
- Rail
- MOD 5 study area
- Boggabri Project Approval Area
- Biodiversity offset corridor
- Boggabri Coal property
- Whitehaven Coal property
- Mine jointly owned property
- Crown land
- Privately owned
- Leard State Forest

0 0.5 1 1.5 km

Figure 4.1
Land ownership

4.3 Changes to CHPP production capacity and water demand since the 2010 EA

Table 4.3 illustrates the various proposed production capacities and water demands of the CHPP noted in management plans, environmental assessments and regulatory instruments since the 2010 Continuation of Boggabri Coal Mine Environmental Assessment.

Table 4.3 Summary of changes to CHPP water demand since 2010 Environmental Assessment

Environmental assessment/regulatory instrument document	Proposed CHPP Processing Scale	Proposed CHPP Water demand
2010 Continuation of Boggabri Coal Mine Project – Environmental Assessment	Nominal plant feed rate of 500 tph[1]	615 ML/y
2010 Continuation of Boggabri Coal Mine Project – Surface Water Assessment	Nothing proposed	In an average rainfall year the largest deficit in any year of operation would be 503 ML. A maximum water demand from vehicle wash down/potable water/dust suppression and CHPP of 1,309 ML.
2012 PA 09_0182 Approval	Nothing proposed	Nothing proposed
2013 Site Water Balance	Peak annual processing rate of 2.0 Mtpa	BCPL estimates CHPP water demand to be approximately 362 ML/y per million tonnes of coal processed in the washery (net of return water). Based on a peak annual processing rate of 2.0 Mtpa, this is equivalent to a peak CHPP demand fo 724 ML/y. this water is required for coal washing, dust suppression and Mine Infrastructure Area wash down.
2014 Site Water Balance	Peak annual processing rate of 2.0 Mtpa	BCPL estimates CHPP water demand to be approximately 362 ML/y per million tonnes of coal processed in the washery (net of return water). Based on a peak annual processing rate of 2.0 Mtpa, this is equivalent to a peak CHPP demand of 724 ML/y. this water is required for coal washing, dust suppression and Mine Infrastructure Area wash down.
2015 MOD 4 Determination	The proponent may process up to 3.5 Mt/y of ROM coal in the CHPP in any calendar year.	Nothing proposed
2015 Site Water Balance	Will process up to 2.0 Mtpa	CHPP water demand of 1,461 ML/y

Notes:
[1] tonnes per hour

4.4 Changes to mine equipment

The capacity and quantity of haul trucks nominated in the Boggabri Coal Mine Air Quality Assessment 2010 was used to estimate the dust emission factor in kilograms per vehicle kilometre travelled and hence guide the number of water carts and amount of water that would be required to suppress airborne dust resulting from truck haulage. Table 3-2 of the continuation of Boggabri Coal Mine Air Quality Assessment 2010 nominated indicative quantities of certain capacity haul trucks. This reproduced as Table 4.4 below.

Table 4.4 Indicative project equipment list 2010

Mining Equipment	Indicative make/model	Year 1	Year 5	Year 10	Year 21
Blasthole Drill	Terex SKF	0	2	2	1
Blasthole Drill	Terex SKS-W	2	6	5	6
Small excavator (<300 t)	Hitachi EX2500	2	3	3	3
Mid Size Excavator (300-500t)	Hitachi EX3600	1	1	1	1
Large excavator (500t +)	Hitachi EX5500	1	2	2	3
150t Haul Trucks	CAT 785C trucks	3	8	8	8
240t Haul Trucks	CAT 793D	11	20	19	26
Ultra Class Truck (363t)	Liebherr T282	0	8	8	9
Water truck	CAT 777F	2	5	4	4
Wheel Dozer	Komatsu WD900	1	3	2	2
Track Dozer	D10T	3	7	7	8
Track Dozer	D11T	3	8	7	9
Front End Loader	Komatsu WA900	0	1	1	1
Grader	CAT 16M	2	6	5	6
Large Electric Rope Shovel	P&H 4100XPC	0	1	1	1

Source: Continuation of Boggabri Coal Mine Air Quality Assessment 2010 (Table 3.2).

Changes in equipment used at the mine since the approval of the 2010 EA now mean that Boggabri Coal is currently using a greater number of heavier trucks in 2016 than were indicatively nominated in the 2010 Air Quality Assessment. Quantities and capacities of haul trucks in operation on site in 2016 are noted in Table 4.5.

As a result of changes in the equipment used, Boggabri Coals haul road dust suppression water demand has increased.

Table 4.5 Summary of equipment list

Mining Equipment	Make	Units
Blasthole Drill	Terex	5
Small excavator (<300 t)	Hitachi/CAT	3
Mid Size Excavator (300-500t)	Hitachi	1
Large excavator (500t +)	Hitachi/CAT/Liebherr	5
130t Haul Trucks	CAT	5
180t Haul Trucks	CAT	8
180t Haul Trucks	Hitachi	5
Ultra Class Truck	Komatsu	24
Water truck	CAT	5
Wheel Dozer	CAT	2

Mining Equipment	Make	Units
Track Dozer	D10T	5
Track Dozer	D11T	7
Track Dozer (CHPP stockpile)	CAT/Komatsu	3
Front End Loader	CAT/Komatsu	4
Grader	CAT 16M	1
Grader	CAT – 24M	3

4.5 Ingress into the pit from the interception of aquifers

AGE Pty Ltd Continuation of Boggabri Coal Mine Groundwater Assessment October 2010 noted in section 6.4.3 that:

> *The rate of groundwater seepage into the open cut pits is difficult to monitor due to mixing with rainfall runoff. At Boggabri Mine volumes of pit seepage into the Jeralong Pit have been estimated by PB (2008) at 0.5ML/day.*
> *(Note: Maules Creek Coal mine impact not included in this assessment)*

A Simultaneous Worst Cast Cumulative Impact Scenario (SWCCIS) review undertaken at the request of the Department of Planning to assess cumulative impacts of known projects in the vicinity of Boggabri Coal Mine determined that:

> *Inflows to the Project void are predicted to rise gradually as the length of the advancing face increases and the mine progresses down-dip. The proposed Maules Creek Coal Project results in a slight reduction in groundwater seepage to the Boggabri Mine Pits, most noticeably when the Maules Creek Coal Project void extends below the elevation of the Boggabri void and the size of the footprint increases after about Year 15. The seepage to the proposed Boggabri Coal Mine Extension reduces from about 1.2ML/day to approximately 0.75ML/day by Year 21, a reduction of up to 37%.*

Anecdotal evidence suggests that the quantity of ground water seepage into the Boggabri Coal Mine pit is vastly less than the quantities estimated in the 2010 Ground Water Assessments, to the point where it is unable to be accurately measured or quantified.

4.6 Boggabri Coal hierarchy of water sourcing

Boggabri Coal prioritises the use of recycled water for use across its operation. In line with this, Boggabri Coal will minimise the take of water from ground water sources by continuing to maximise the use of recycled water. When additional water is required by the mining operation, harvesting of water from onsite dams will be prioritised. In the absence of rainfall events and when extraction exhausts dam supplies Boggabri Coal will utilise its Lower Namoi Regulated River Water Source water access licence during periods when flow from the release of water from Keepit Dam passes its extraction point. Figure 4.2 illustrates the priority placed upon various water sources available to Boggabri Coal.

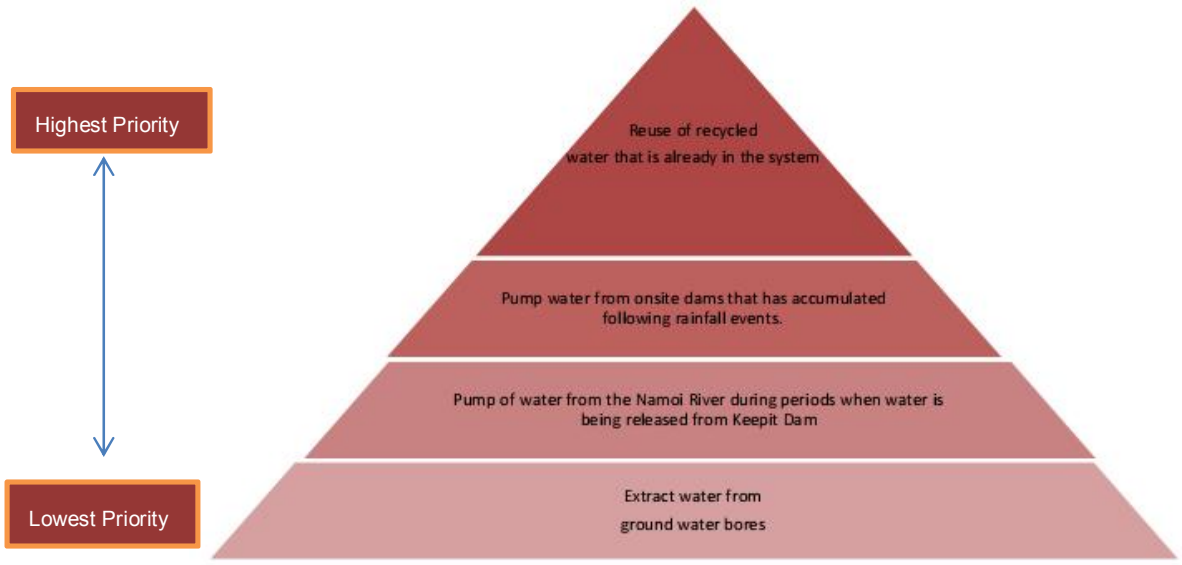


Figure 4.2 Hierarchy of water sourcing

4.7 Trigger action response plan

Boggabri Coal implements a Trigger Action Response Plan (TARP) that nominates management actions that are to occur in response to the amount of water stored in onsite storage dams. The TARP is illustrated in Figure 4.3.

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Water Storage/Usage Trigger Action Response Plan

Level 1: >100 days storage

- Water efficiency notifications to be issued weekly (Mon/Tue). Incl: storage levels, TARP level, River pumping regime, weather forecast etc
- Weekly water survey (late in the week)
- Undertake water usage audit (plant, evaporation, workshop, wash down, dust suppression, MIA……)
- Weekly water usage report to be provided by all water users

Level 2: 70 days storage

- Weekly water storage/usage meeting (include contractors)
- Evaporation minimisation measures to be adopted
- Close non-essential roads
- Apply dust suppressing agents
- Allocate 5 Ml/day for use by mining contractor
- Limit non-essential MIA water use
- Request additional river water allocation
- Develop Crisis Management Plan

Level 3: 50 days storage

- Purchase of potable water
- Allocate 4 Ml/day for use by mining contractor
- Enact Crisis Management Plan

Level 4: 20 days storage

- Enact Crisis Management Plan

Figure 4.3 Water storage TARP

4.8 Proposed additional storage dam

During the 2016 tree clearing program Boggabri Coal will clear approximately 10Ha to facilitate the construction of an approximately 1.5 gigalitre water storage dam. The proposed dam will store water pumped from other on site dams and reduce the need to source water from other sources such as the Namoi River or alluvial aquifers.

4.9 Modelled extraction rates and their impact on the closest affected private receiver

Boggabri Coal undertook additional groundwater modelling to determine the maximum extraction rate that could be applied to the Cooboobindi bore without causing more than 2m drawdown impact to any privately owned ground water supply works. The modelling determined that an extraction rate not exceeding 2.4ML per day would avoid causing 2m drawdown at any privately owned ground water supply works.

4.10 Response to DP&E information request

BOGGABRI COAL OPERATIONS PTY LTD

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Ref: 05-115-617
29 April 2016

Stephen Shoesmith
Senior Planning Officer, Resource Assessments
NSW Department of Planning & Environment
23-33 Bridge Street, Sydney NSW 2001
GPO Box 39, Sydney NSW 2001

Dear Stephen

RE: BOGGABRI MOD5 - SUPPLEMENTARY INFORMATION REQUEST

We provide the following information in response to your supplementary information request dated 25 January 2015:

1. *Input data, calculations and formulas used and assumptions applied to produce the water demand outputs noted in Table 4.8 of the Boggabri Coal 2014 Site Water Balance included:*

    - A 218Ml/yr (year 1) and 267 Ml/yr (year 2) construction water demand consisting of an estimated 0.73 ML/day general construction water demand from July 2013 to June 2015 with a peak demand of 2.1 ML/day during September to October 2013. The construction program identified, that from July 2015 onwards construction would be complete and construction water demand would cease.
    - A 91 Ml/yr water demand for the original rail loading facility derived from the metered supply of water. The construction program identified that Boggabri Coal's new Coal Handling Preparation Plant would become operational by July 2015, accordingly water demand for the original rail loading facility from this point is noted as zero.
    - A 555 Ml/yr Haul Rd dust suppression (Year 1- Year 21) water demand based upon an estimated daily usage rate of 1.5Ml/per day for days receiving less than 5mm of rain fall.
    - A 10.7 Ml/yr potable water demand estimated using a usage rate of 100L per person per day by an operational workforce of 294 people.
    - An estimated 8.2Ml/yr vehicle wash down water demand based on historical usage .
    - A 724Ml/yr Coal Handling Preparation Plant (CHPP) water demand based upon an estimated usage of 362 Ml per annum per million tonnes (Mtpa) of coal processed in the CHPP. Boggabri Coals peak processing rate was forecast to be 2.0 Mtpa commencing in 2014. The 2014 Site Water Balance referenced figure 4.2 which provides a detailed makeup of the CHPP water balance. Figure 4.2 is noted in Appendix D of this letter.

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2. *Input data, calculations and formulas used and assumptions applied to produce the water demand outputs noted in Table 4.9 of the Boggabri Coal MOD 5 Water Balance Model included:*

- Construction and rail loading facility water demands remained the same as those noted in Table 4.8 in the 2014 Site Water Balance.
- A 365 Ml/yr MIA and potable water demand consisting of actual and estimated demand based upon a usage rate as noted in Table B of Appendix A.
- A 1,461 Ml/yr Haul Rd dust suppression water demand, calculated by incorporating an expected water usage increase from historical Haul Road dust suppression water usage records. Boggabri Coal estimated that 4Ml of water would be required for Haul Rd dust suppression each day, equating to an annual usage of 1,461Ml. Table A in Appendix A details the information Boggabri Coal used to arrive at this estimation.
- A 1,461 Ml/yr CHPP water demand based upon data provided in the Theiss Sedgman (TSJV) Project Definition Statement (PDS), relevant excerpts of which are noted in Appendix B. The TSJV PDS notes in section 2.2.8 that *'The estimated nominal amount of recovered water the CHPP and MIA will require for operation is 189m³/h'.* Operating at 95% of the year and incorporating a predicted 50% recovery of CPP wash down water, a total water demand for the operation of the CHPP is 1461Ml/yr. Table C in Appendix A details the calculations used by Boggabri Coal to determine an annual water demand output of 1,461Ml for the CHPP.

3. *Input data, calculations/ formulas used and assumptions applied for (actual and forecast) water demand reductions as a result of water efficiency processes identified with MOD 5 EA (Belt Press, CHPP Recycling and Suppression Substances) included:*

- Boggabri Coal relying upon on the assumptions noted in the process flow diagram (see Appendix E) produced by Sedgmen titled 'Coal Handling and Preparation Plant Equipment Flowsheet 500 TPH Nominal Flows' Drawing Number A014-2-1-0006 to determine how much water is forecast to be retained in the tailings/belt press process. The process flow diagram forecast that nominal flow of water recovered by the operation of the belt press filter is 264m³ per hour or 6.3Ml's per day (taken from process flow diagram). It is not standard practice to measure the volume of 'actual' water demand reduction that results from the utilisation of the belt press process.
- A water consumption rate for the Coal Preparation Plant of only 1.44 ML/day as a result of the incorporation of water efficiency processes as noted in the Process Flow Diagram and Table 2-4 of Appendix B.
- Whilst dust suppressing agents are utilised by Boggabri Coal, no water demand reduction has been incorporated. Numerous trials of application of dust suppressing agents undertaken by Boggabri Coal have not resulted in consistent enough water usage reductions to be considered reliable for inclusion in water efficiency demand calculations.

4. *Input data, calculations/ formulas used and assumptions applied showing water demand implications of the air quality PRPs:*

   - The relevant information is summarised in Appendix C. The 'Water Demand Implications' column in the PRP Analysis Table notes that the PRP's have limited implication on Boggabri Coals water demand.

5. *Input data relating to key operational changes for the years* 2014, 2015 and 2016 *that influence water demand.*

   - The relevant information is noted in Table D of Appendix A.

6. *Operational data / forecasts for Years (2015, 2017, 2019, 2022 and 2033) including;*
   - *ROM (t)*
   - *Feed (t)*
   - *Product Coal (t)*
   - *Tailings (t)*
   - *Reject (t)*
   - *Overburden (t)*
   - *Topsoil Stripped (m3)*

   - The relevant information is noted in Table E in Appendix A.

Please contact Environmental Superintendent Mr Daniel Martin on ph 6749 6013 if you require any further information.

Yours sincerely

RBalks.

RAY BALKS
General Manager Operations

Appendix A Tables A, B, C, D, E, F

Table A Haul Road Dust Suppression Water Demand

Year	Haul Road Length (KM's)	Water Used (Ml's)**
2013	12.8	699.424
2014	13.9	1016.15
2015	19.1	1176.37
2016	23.1	1461*

*estimated annual haul road dust suppression water demand

** historical usage records

Table B Mine Infrastructure Area and Potable Water Demand

Water Demand Aspect	Units	Truck Load Capacity	Units	Truck Loads	Ml's/Year
Dust Suppression of MIA Roads	L's	8000	Per/day	15	43.8
Water Demand Aspect	Units	Water Used			
Dust Suppression at ROM Bins	M^3 per hour	1			8.76
Water Demand Aspect	Units	Water Used			
Dust Suppression at Train Load Out Bin	M^3 per hour	3			26.86
Water Demand Aspect					
Dust Suppression for Tree Clearing and Civil Works					146*
Water Demand Aspect					
MIA Truck Wash					96.36*
Water Demand Aspect	Units	Water Used	Units	Number of Employees	
Potable	L's	240	Per year	500	43.8
				Total	**365.58**
*estimate					

Table C. CHPP Water Demand

CHPP Water Demand	m^3p/hr	daily hours	days/ year	L's/	L's/Ml	Ml/year	5% Down time	Recovery*	Annual Demand
CPP Clarified Water Make Up	60	24	365	1000	1000000	526	0.95		499
CHPP Dust Suppression	67	24	365	1000	1000000	587	0.95		558
CHP Wash-down	2	24	365	1000	1000000	18	0.95		17
CPP Wash-down	27	24	365	1000	1000000	237	0.95	0.5	112
MIA Wash-down	18	24	365	1000	1000000	158	0.95		150
Product Stockpile Dust Suppression	15	24	365	1000	1000000	131	0.95		125
								Total Ml/Yr	1461

Source: TSJV Project Definition Statement

*50% of CPP wash down water is recovered

Table D Key Operational Data

Operational Aspect	Unit	2014	2015	2016
Haul Road Lengths	KM's	13.9km	19.1km	23.1km
CHPP Operation		Under Construction	Operational	Operational
BCT Decommissioning		Operational	Decommissioned	Decommissioned
Coal Washery Feed	Mtpa	n/a	2.379	3.5*
# of Excavators		7	7	7*
# of Haul Trucks		42	42	42*
# of Water Carts		5	5	5*
# of Employees		586	608	608*
Waste Material Handled	$Mbcm^3$	47.4	59.2	55.8*
Scale of Tree Clearing	Ha	174.67	134.1	90

*predicted

Table E Operational Data Forecasts

Material	Unit	2015	2017	2019	2022	2033
ROM coal	Mt	7.66	7.7	7.72	7.68	7.43
Coal Feed	Mt	7.41	7.64	7.71	7.67	7.44
Product Coal	Mt	6.63	6.58	6.71	6.72	6.71
Reject (wet)	Mt	0.94	1.06	1	0.95	0.73
Overburden	bcm	58.9	50.1	51.8	49.2	53.9
Topsoil (stripped)	bcm	0.97	0.28	0.14	0.11	0.17

Appendix B Excerpts from the CHPP Project Definition Statement

2.2.8 CHPP Water Consumption

The estimated nominal amount of recovered water the CHPP and MIA will require for operation is 189 m^3/h. This water will be supplied from coal contact pond SD10.

There are a number of operating and environmental factors that will affect the actual water requirements throughout operation. These include:

- Climatic conditions;
- Sizing distribution of feed;
- CPP yields.

Table 2-4 outlines the estimated nominal recovered water requirements below.

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Table 2-4 - CHPP/MIA Recovered Water Requirements

Area	Recovered Water Requirement (m^3/h)
CHPP Dust Suppression	67
CHP Wash-down	2
CPP Wash-down	27*
MIA Wash-down	18
CPP Clarified Water Make-up	60
Product Stockpile Dust Suppression	15**
Total	189

*Approximately 50% recovery of CPP washdown expected.

**Product stockpile dust suppression assumed to be running 15% of annual hours at 100m^3 per spray.

At periods of peak instantaneous consumption the CHPP and MIA can require recovered water at rates of up to 377 m^3/h.

2.2.9 Bore Water Requirements

The nominal amount of bore water (i.e. fresh water, not recovered) necessary for operation of the CHPP requires for processing is NIL. Bore water direct fed to the CHPP will only be used to maintain levels in the Fire Water Tanks.

2.2.10 CPP Water Consumption

This section discusses the estimated CPP net water consumption.

All water required for the operation of the CHPP is derived from sedimentation dam SD10, such water may be sourced from the various site sources including recovered mine water, bore water or surface run off water.

As shown in Table 2-4, the CPP nominally requires 60 m^3/h of clarified water make-up during operation.

This equates to net consumption for the CPP of 120L / ROM tonne.

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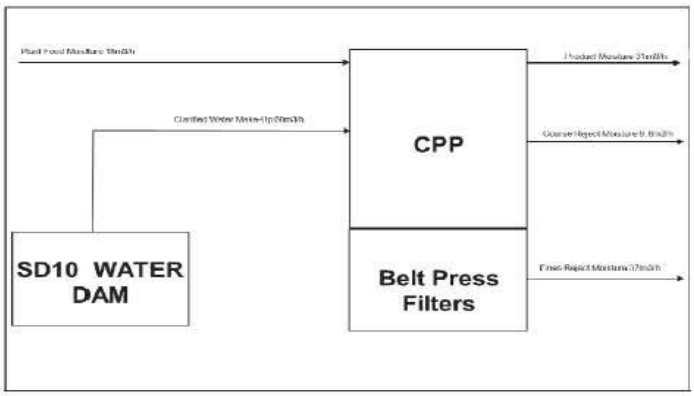

Figure 2-3 – Nominal CHPP Water Balance Schematic

The recovered raw and bore fire water supplied by the client should be non-corrosive and non-scaling. Other bore water quality requirements are detailed in Table 2-5.

Table 2-5 - Required Bore Water Quality

Quality	Unit	Value
pH	-	6.0-8.0
Total Dissolved Solids	ppm	<6000
Total Suspended Solids	ppm	<50

Appendix C PRP Analysis

Title Pollution Reduction Program (PRP)	Dust Generating Activity (Input data & calculations used)	Best Practice – Emission Control Measure (Assumptions Applied)	Water demand implications
Assessment Coal Mine Particulate Matter Best Practice Pollution Reduction Program (Parsons Brinkerhoff, 2012)	**Top Five Dust Generating Activities**		
	Wheel generated dust unsealed roads NPI Emission Estimation Technique Manual for Mining Version 3.1 January 2012 & emission estimates calculated in accordance with US EPA AP42 13.2.2 guidelines).	A 50% emission reduction factor achieved by undertaking 'level 1 watering' i.e. applying 2L/m²/hr. A 75% emission reduction factor achieved by undertaking 'level 2 watering' i.e. applying more than 2L/m²/hr.	The application of 'level 1 watering' would result in a water demand of 12,000Ml per year and are considered excessive and not feasible. The control method has therefore not been incorporated into Boggabri Coal water demand calculations (BC has demonstrated a dust control efficiency of greater than 80% during the application of water at normal rates without the use of additional dust suppressing agents in subsequent PRP's)
	Wind erosion – coal stockpiles NPI Emission Estimation Technique Manual for Mining Version 3.1 January 2012 & emission estimates calculated in accordance with US EPA AP42 13.2.1 guidelines).	Washing of coal loaded onto product stockpiles are subject to the application of water during processing though the CHPP. An 80% emission control factor is applied to the 'wet' coal that is loaded onto the product coal stockpile. Run of Mine (ROM) coal stockpiles achieve an emission control factor of 75% as a result of the installation of windrows.	There is no change to water demand from the application of these best practice emission control measures.

	Load/unloading coal – haul truck NPI Emission Estimation Technique Manual for Mining Version 3.1 January 2012 & emission estimates calculated in accordance with US EPA AP42 13.2.4 guidelines).	Monitoring of meteorological conditions	There is no change to water demand from the application of these best practice emission control measures.
	Wind erosion – exposed areas NPI Emission Estimation Technique Manual for Mining Version 3.1 January 2012, emission estimates calculated in accordance with US EPA AP42 13.2.4 guidelines and table 13.2.5).	The US EPA emission estimation guideline notes a 50% emission reduction factor that could be achieved via surface stabilisation watering.	The 2015 PRP 'assessing erosion of exposed land' determined inactive overburden as stable. Accordingly, there is no implication to water demand to suppress dust emissions.
	Bulldozing coal NPI Emission Estimation Technique Manual for Mining Version 3.1 January 2012, emission estimates calculated in accordance with US EPA AP42 11.9-2 and table 11.9).	Water sprays on product coal stockpiles/work areas applied a 50% emission reduction factor.	15m³ of water per hour has been allocated to Boggabri Coals water demand calculations as result of the use of product stockpile dust suppressing water sprays, resulting in an increase to water demand of 125 Ml per year.

Particulate Matter Control Best Practice - Trial of Best Practice Measures for Disturbing and Handling Overburden (Pacific Environmental, 2014)	Not applicable.	PRP study reports the results of the coal mine industry experience and trials using water foggers and sprays for best practice management measures for disturbing and handling overburden.	There are no water demand implications as the report concluded water spray technologies are unlikely to be practicable for adoption and that altering operations are acknowledged as the most effective methods for controlling dust from overburden handling activities.
Monitoring Results Wheel Generated Dust (Pacific Environmental, 2014)	Wheel generated dust on unsealed roads. Air quality monitoring methods as detailed in ACARP Project (C20023).	Monitoring of emissions following the application of water to suppress dust on road surfaces that: 1. had been subject to the application of dust suppressing agents, and 2. hadn't been subject to dust supressing agents.	There are no water demand implications as monitoring resulted in a dust control efficiency of greater than 80% during the application of water at normal rates without the use of additional dust suppressing agents.
Identification of Adverse Weather Conditions for Overburden Handling (Pacific Environmental, 2014)	Modelling for overburden handling assumed each activity operated simultaneously and an emission rate of Total Suspended Particulate (TSP) of 3000 Tonnes/year. Emission factors for overburden handling were based on US EPA (1987).	No emission control measures were adopted, as the air dispersion modelling for this report did not take into account control measures to identify adverse weather conditions that may result in elevated dust levels.	There are no implications for water demand resulting from the PRP as the report recommended visual and real time monitoring of dust levels during adverse weather conditions.

Coal Mine Wind Erosion of Exposed Land Assessment (Pacific Environmental, 2015)	Stabilised surface determined in accordance with the test methods contained in Rule 403 Implementation Implantation Handbook.	The PRP Coal Mine Wind Erosion Assessment (2015) determined inactive overburden, shaped overburden and rehabilitated land as stable and are not susceptible to wind erosion	The PRP concluded inactive overburden as stable resulting in no additional water demand to suppress dust.

Appendix D 2014 Site Water Balance Figure 4.2

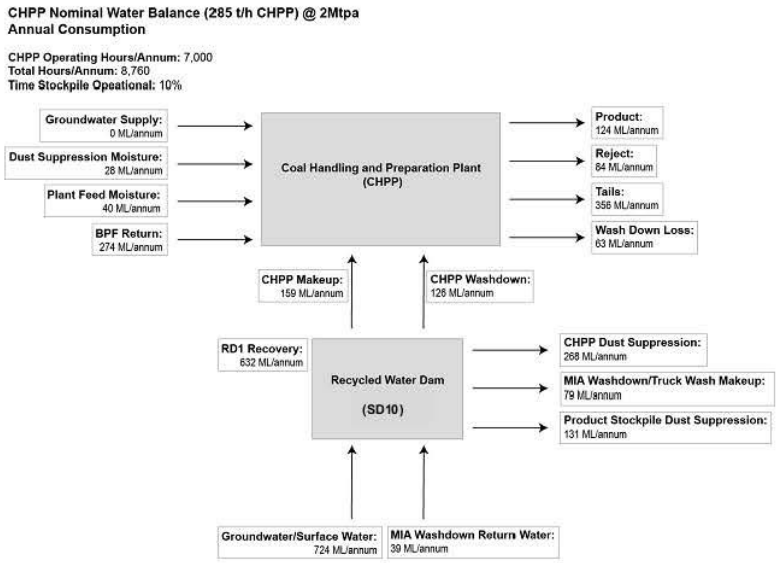

Figure 4.2 Nominal water balance for CHPP based on 2 Mtpa throughput

Note: BPF = Belt Press Filter, 77% of water content of tailings recovered.

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Appendix E 'Coal Handling and Preparation Plant Equipment Flowsheet 500 TPH Nominal Flows' Drawing Number A014-2-1-0006

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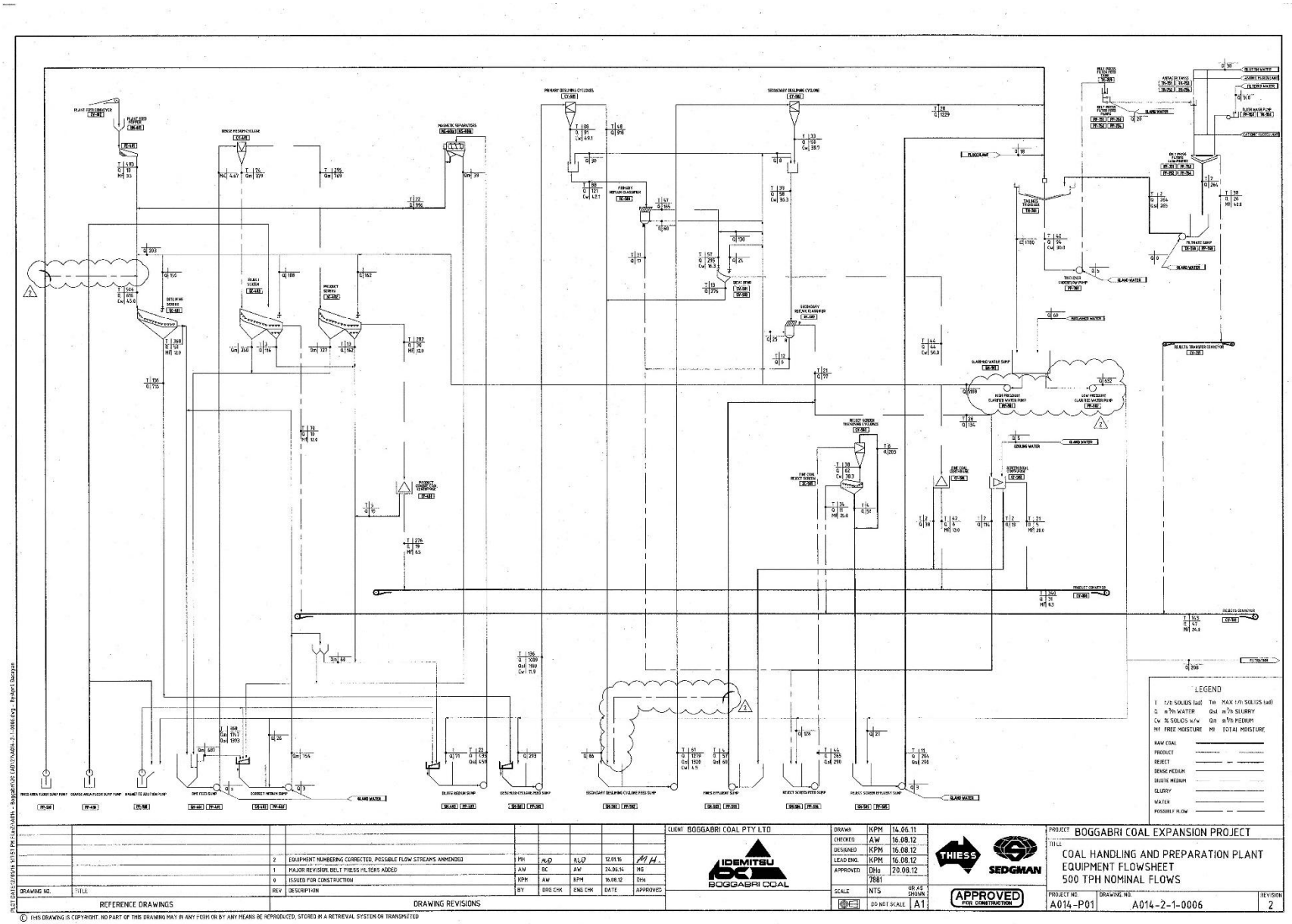
LEGEND
RAW COAL
PRODUCT
REJECT
DENSE MEDIUM
DILUTE MEDIUM
SLURRY
WATER
POSSIBLE FLOW
CLIENT BOGGABRI COAL PTY LTD
IDEMITSU
BOGGABRI COAL
DRAWN KPM 14.06.11
CHECKED AW 16.08.12
DESIGNED KPM 16.08.12
LEAD ENG. KPM 16.08.12
APPROVED DHa 20.08.12
7881
SCALE NTS OR AS SHOWN
DO NOT SCALE A1
THIESS
SEDGMAN
APPROVED FOR CONSTRUCTION
PROJECT BOGGABRI COAL EXPANSION PROJECT
TITLE
COAL HANDLING AND PREPARATION PLANT
EQUIPMENT FLOWSHEET
500 TPH NOMINAL FLOWS
PROJECT NO. A014-P01
DRAWING NO. A014-2-1-0006
REVISION 2
2 EQUIPMENT NUMBERING CORRECTED. POSSIBLE FLOW STREAMS AMMENDED MH MD ALD 12.01.16 MH
1 MAJOR REVISION. BELT PRESS FILTERS ADDED AW BC AW 24.06.14 MG
0 ISSUED FOR CONSTRUCTION KPM AW KPM 16.08.12 DHa
DRAWING NO. TITLE REV DESCRIPTION BY DRG CHK ENG CHK DATE APPROVED
REFERENCE DRAWINGS
DRAWING REVISIONS
© THIS DRAWING IS COPYRIGHT. NO PART OF THIS DRAWING MAY IN ANY FORM OR BY ANY MEANS BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED

Appendix A

Aquifer interference policy assessment

Department of Primary Industries
Office of Water

AQUIFER INTERFERENCE ASSESSMENT FRAMEWORK

Assessing a proposal against the NSW Aquifer Interference Policy – step by step guide

Note for proponents

This is the basic framework which the NSW Office of Water uses to assess project proposals against the **NSW Aquifer Interference Policy (AIP).**

The NSW Aquifer Interference Policy can be downloaded from the NSW Office of Water website (www.water.nsw.gov.au under Water management > Law and policy > Key policies > Aquifer interference).

While you are not required to use this framework, you may find it a useful tool to aid the development of a proposal or an **Environmental Impact Statement (EIS).**

We suggest that you summarise your response to each AIP requirement in the tables following and provide a reference to the section of your EIS that addresses that particular requirement. Using this tool can help to ensure that all necessary factors are considered, and will help you understand the requirements of the AIP.

Table 1. Does the activity require detailed assessment under the AIP?

	Consideration	Response
1	Is the activity defined as an aquifer interference activity?	If **NO,** then no assessment is required under the AIP. If **YES,** continue to Question 2.
2	Is the activity a defined minimal impact aquifer interference activity according to section 3.3 of the AIP?	If **YES**, then no further assessment against this policy is required. Volumetric licensing still required for any water taken, unless exempt. If **NO**, then continue on for a full assessment of the activity.

Note for proponents

Section 3.2 of the AIP defines the framework for assessing impacts. These are addressed here under the following headings:

1. Accounting for or preventing the take of water
2. Addressing the minimal impact considerations
3. Proposed remedial actions where impacts are greater than predicted.

1. Accounting for, or preventing the take of water

Where a proposed activity will take water, adequate arrangements must be in place to account for this water. It is the proponent's responsibility to ensure that the necessary licences are held. These requirements are detailed in Section 2 of the AIP, with the specific considerations in Section 2.1 addressed systematically below.

Where a proponent is unable to demonstrate that they will be able to meet the requirements for the licensing of the take of water, consideration should be given to modification of the proposal to prevent the take of water.

Table 2. Has the proponent:

	AIP requirement	Proponent response	NSW Office of Water comment
1	Described the water source(s) the activity will take water from?	Upper and Lower Namoi alluvial Groundwater Sources Zone 4 (Heathcliffe contingency bore = Zone 5). Indirectly take water (base flow loss and river leakage) from the Lower Namoi Regulated River Water Sources.	
2	Predicted the total amount of water that will be taken from each connected groundwater or surface water source on an annual basis as a result of the activity?	For average rainfall conditions with extraction of 5.7 ML/day from borefield then will directly take 2082 ML/yr from the alluvial groundwater source. The 5.7 ML/day comprises 3 ML/day from Cooboobindi bore; 1.9 ML/day from Victoria Park bore and 0.8ML/day from Daisymede bore. Also there will be indirect take from Namoi River as baseflow loss/river leakage as follows: - Years 1 to 10: - 860 ML/yr; Years 11 to 14: - 965 ML/yr Years 15 to 17: - 975 ML/yr Years 18 to 27: 232 ML/yr (this is recovery following cessation of borefield operations).	
3	Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?	Predicted total amount of water taken following cessation of borefield operations will include 2320 ML of leakage from Namoi River into alluvial aquifer.	
4	Made these predictions in accordance with Section 3.2.3 of the AIP? (refer to Table 3, below)	Yes	

	AIP requirement	Proponent response	NSW Office of Water comment
5	Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?	Based on groundwater modelling predictions and derived from point 2 above: - • Years 1 – 10: 59% aquifer; 41% Namoi River flow loss • Years 11 -14: 54% aquifer; 46% Namoi River flow loss • Years 15 -17: 53% aquifer; 47% Namoi River flow loss • Years 18 to 27: 100% Namoi River flow loss	
6	Described how any licence exemptions might apply?	An Aquifer Interference Approval is not required for the proposed modification as activities subject to approval under Part 3A of EP&A Act are exempt. The works (groundwater bores) do not require approval under the WMA because they would be subject to an exemption under the *Environmental Planning & Assessment Act 1979*, the works are required to be nominated on the relevant Water Access Licences in accordance with section 71W of the WMA.	
7	Described the characteristics of the water requirements?	Mine water requirements are constant seven (7) days a week. Water will be sourced from site surface water in storage dams/ponds, recycling and groundwater supply from existing and proposed bores. During extended dry conditions when no site surface water is available then total water requirements will be sourced from groundwater bores and the Namoi River if available.	

	AIP requirement	Proponent response	NSW Office of Water comment
8	Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?	There is sufficient water entitlements in addition to site surface storages to meet project requirements during average weather conditions. Current available entitlements for groundwater and surface water include: 944 ML/yr from the Upper Namoi Zone 4 groundwater source and 967 ML/yr from Gunnedah Oxley Basin groundwater source and reliability-factored surface water entitlement of 454 ML/yr from Lower Namoi Regulated River source. Furthermore it is feasible for Boggabri Coal under water dealing rules prescribed in the Water Sharing Plans (Namoi and Gunnedah Oxley Basin groundwater sources and Lower Namoi Regulated River sources) to obtain additional water allocations/entitlements during drier periods as follows:- → trade for additional water allocations to be included into their existing access licences, either temporarily or permanently → rent or transfer part or all ownership of access licences from other licence holders. These water dealing rules are subject to local impact considerations of water resources, including reliability-factored surface water entitlements for dry conditions.	
9	Considered the rules of the relevant water sharing plan and if it can meet these rules?	The following Water Sharing Plans apply to water sources in the vicinity of the BCM: • Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012 • Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2003 • Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003 • Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Source 2011. Of note is Clause 36 of the Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003, which outlines that a new water supply works is not permitted within 200 m of a property boundary.	

	AIP requirement	Proponent response	NSW Office of Water comment
		Boggabri Coal will ensure that its ground water supply works comply with the requirements with Clause 36.	
10	Determined how it will obtain the required water?	Borefield comprising three (3) production bores and three (3) contingency (backup) bores within Zone 4 of the Lower Namoi alluvial Groundwater Sources. There is one (1) contingency bore within Zone 5 of the Lower Namoi alluvial Groundwater Sources.	
11	Considered the effect that activation of existing entitlement may have on future available water determinations?	Boggabri Coal will liaise with DPI Water and WaterNSW in relation to the effect of activation of existing entitlement when activation occurs.	
12	Considered actions required both during and post-closure to minimize the risk of inflows to a mine void as a result of flooding?	Not applicable - Mine approval states the pit is required to be free draining and located outside of an area prone to flooding.	
13	Developed a strategy to account for any water taken beyond the life of the operation of the project?	Water taken beyond the life of the project includes baseflow loss or leakage from Namoi River. A strategy will be developed within the revised groundwater management plan in consultation with DPI-Water. Water licensing will consider take from the lower Namoi regulated River source.	
Will uncertainty in the predicted inflows have a significant impact on the environment or other authorised water users? If **YES,** items 14-16 must be addressed.			
14	Considered any potential for causing or enhancing hydraulic connections, and quantified the risk?	Not applicable	
15	Quantified any other uncertainties in the groundwater or surface water impact modelling conducted for the activity?	Not applicable	
16	Considered strategies for monitoring actual and reassessing any predicted take of water throughout the life of the project, and how these requirements will be accounted for?	Not applicable	

Table 3. Determining water predictions in accordance with Section 3.2.3
(complete one row only – consider both during and following completion of activity)

	AIP requirement	Proponent response	NSW Office of Water comment
1	**For the Gateway process**, is the estimate based on a simple modelling platform, using suitable baseline data, that is, fit-for-purpose?		
2	**For State Significant Development or mining or coal seam gas production**, is the estimate based on a complex modelling platform that is: • Calibrated against suitable baseline data, and in the case of a **reliable water source,** over at least two years? • Consistent with the Australian Modelling Guidelines? • Independently reviewed, robust and reliable, and deemed fit-for-purpose?	The estimate is based on a complex modelling platform that has been calibrated against suitable baseline data for greater than 2 years of data and is consistent with Australian Modelling Guidelines. The confidence level of the model in reference to National Water Commission guidelines (2012) is Class 2 – 3. The modelling platform has been independently reviewed by HydroSimulations and has been deemed as fit for purpose and reliable based on the data available for prediction of drawdown impacts.	
3	In all other processes, estimate based on a desk-top analysis that is: • Developed using the available baseline data that has been collected at an appropriate frequency and scale; and • Fit-for-purpose?		

Other requirements to be reported on under Section 3.2.3

Table 4. Has the proponent provided details on:

	AIP requirement	Proponent response	NSW Office of Water comment
1	Establishment of baseline groundwater conditions?	Baseline groundwater conditions of registered landholder bores was were determined during a hydrocensus in the proposed borefield region between March-May 2015 and in January 2016. Groundwater conditions were assessed during establishment and test pumping of proposed ground water bores during 2014/15.	
2	A strategy for complying with any water access rules?	Separate Water Access Licences of the same type are to be consolidated into a single licence. Proposed production bores shall be subject to work/use approvals attached to the consolidated WAL. The works are required to be nominated on relevant WALs in accordance to section 71W of the Water Management Act 2000. Accounting of take and complying with water access rules will be via the WaterNSW Water Accounting System.	
3	Potential water level, quality or pressure drawdown impacts on nearby basic landholder rights water users?	Modelling of potential water level impacts on regional basic landholder rights water users has been conducted and discussed in EA MOD 5 Appendix B Drawdown Impact Assessment of Proposed Borefield Operations. Consultation has taken place with potentially affected landholders which includes proposed make good provisions. Water qualities of landholder ground water supplies have been recorded in the hydrocensus, during test pumping evaluation of proposed production bores and additional baseline assessment in January 2016. Potential water level and quality drawdown impacts on nearby basic landholder rights water users will be subject to a monitoring regime that achieves the concurrence of DPI Water and DP&E.	

	AIP requirement	Proponent response	NSW Office of Water comment
4	Potential water level, quality or pressure drawdown impacts on nearby licensed water users in connected groundwater and surface water sources?	As above, and: The Namoi River may be influenced by a reduction in net groundwater discharge, assuming the river is hydraulically well-connected to the aquifer. The calculated loss of baseflow is relatively low compared to average flow in Namoi River at < 0.2% for average flow conditions and < 0.9 % for low flow conditions. This is expected to have very minor changes to water level in the Namoi River. Changes to Namoi River water quality from loss of base flow is expected to be negligible	
5	Potential water level, quality or pressure drawdown impacts on groundwater dependent ecosystems?	Potential impacts have been addressed within EA MOD5 Appendix B Drawdown Impact Assessment of Proposed Borefield Operations. The operation of the borefield is considered to have low risk to groundwater dependant ecosystems. None of the vegetation communities within the vicinity of the borefield would be considered to be high priority groundwater dependant ecosystems as they are not entirely dependent upon subsurface groundwater for their water requirements	
6	Potential for increased saline or contaminated water inflows to aquifers and highly connected river systems?	The alluvial aquifer overlies the Boggabri Volcanics which is of low permeability and is considered an aquitard. Changes in alluvial aquifer water quality is expected to be minimal from basement leakage due to low permeability of the Boggabri Volcanics. There is expected no potential contamination of the Namoi River system	
7	Potential to cause or enhance hydraulic connection between aquifers?	Unlikely occurrence. The alluvial aquifer overlies the Boggabri Volcanics which is of low permeability and considered an aquitard.	
8	Potential for river bank instability, or high wall instability or failure to occur?	The potential for river bank instability is highly unlikely due to calculated baseflow loss being less than 1% of river flow.	
9	Details of the method for disposing of extracted activities (for coal seam gas activities)?	Not applicable	

2. Addressing the minimal impact considerations

Note for proponents

Section 3.2.1 of the AIP describes how aquifer impact assessment should be undertaken.

1. Identify all water sources that will be impacted, referring to the water sources defined in the relevant water sharing plan(s). Assessment against the minimal impact considerations of the AIP should be undertaken for

AQUIFER INTERFERENCE ASSESSMENT FRAMEWORK

Assessing a proposal against the NSW Aquifer Interference Policy – step by step guide

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Note for proponents

Section 3.2 of the AIP defines the framework for assessing impacts. These are addressed here under the following headings:

1. Accounting for or preventing the take of water
2. Addressing the minimal impact considerations
3. Proposed remedial actions where impacts are greater than predicted.

each ground water source.

2. Determine if each water source is defined as ‘highly productive’ or ‘less productive’. If the water source is named in then it is defined as highly productive, all other water sources are defined as less productive.
3. With reference to pages 13-14 of the Aquifer Interference Policy, determine the sub-grouping of each water source (eg alluvial, porous rock, fractured rock, coastal sands).

4. Determine whether the predicted impacts fall within Level 1 or Level 2 of the minimal impact considerations defined in Table 1 of the AIP, for each water source, for each of water table, water pressure, and water quality attributes. The tables below may assist with the assessment. There is a separate table for each sub-grouping of water source – only use the tables that apply to the water source(s) you are assessing, and delete the others.
5. If unable to determine any of these impacts, identify what further information will be required to make this assessment.
6. Where the assessment determines that the impacts fall within the Level 1 impacts, the assessment should be 'Level 1 – Acceptable'
7. Where the assessment falls outside the Level 1 impacts, the assessment should be 'Level 2'. The assessment should further note the reasons the assessment is Level 2, and any additional requirements that are triggered by falling into Level 2.
8. If water table or water pressure assessment is not applicable due to the nature of the water source, the assessment should be recorded as 'N/A – reason for N/A'.

Table 5. Minimal impact considerations – *example tables*

Aquifer	**Alluvial aquifer**
Category	**Highly Productive**

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic post-water sharing plan variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work.	This has been addressed within EA MOD 5 Appendix B Drawdown Impact Assessment of Proposed Borefield Operations
Water pressure A cumulative pressure head decline of not more than 40% of the post-water sharing plan pressure head above the base of the water source to a maximum of a 2 metre decline, at any water supply work. **OR**, for the Lower Murrumbidgee Deep Groundwater Source: A cumulative pressure head decline of not more than 40% of the post-water sharing plan pressure head above the top of the relevant aquifer to a maximum of a 3 metre decline, at any water supply work.	Not applicable
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity. No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity. No mining activity to be below the natural ground surface within 200 metres laterally from the top of high bank or 100 metres vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a reliable water supply. Not more than 10% cumulatively of the three dimensional extent of the alluvial material in this water source to be excavated by mining activities beyond 200 metres laterally from the top of high bank and 100 metres vertically beneath a highly connected surface water source that is defined as a reliable water supply.	Changes in water quality are expected to be minimal. The beneficial use category will not be lowered

Aquifer	**Coastal sands**
Category	**Highly Productive**

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work.	
Water pressure A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	

Aquifer	**Porous Rock – except Great Artesian Basin**
Category	**Highly Productive**

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work.	
Water pressure A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	

Aquifer	Porous Rock – Great Artesian Basin – Eastern Recharge and Southern Recharge
Category	Highly Productive

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work.	
Water pressure Less than 0.2 metre cumulative variation in the groundwater pressure, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. A cumulative pressure level decline of not more than 15 metres, allowing for typical climatic 'post-water sharing plan' variations. The cumulative pressure level decline of no more than 10% of the 2008 pressure level above ground surface at the NSW State border, as agreed between NSW and Queensland.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	

Aquifer	Porous Rock – Great Artesian Basin – Surat, Warrego and Central
Category	Highly Productive

Level 1 Minimal Impact Consideration	Assessment
Water table NOT APPLICABLE	
Water pressure Less than 0.2 metre cumulative variation in the groundwater pressure, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. A cumulative pressure level decline of not more than 30 metres, allowing for typical climatic 'post-water sharing plan' variations. The cumulative pressure level decline of no more than 10% of the 2008 pressure level above ground surface at the NSW State border, as agreed between NSW and Queensland.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	

Aquifer	Fractured Rock
Category	Highly Productive

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem; or • high priority culturally significant site; listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work.	
Water pressure A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	

Aquifer	Alluvial
Category	Less productive

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work unless make good provisions apply	
Water pressure A cumulative pressure head decline of not more than 40% of the 'post-water sharing plan' pressure head above the base of the water source to a maximum of a 2 metre decline, at any water supply work.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity. No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity. No mining activity to be below the natural ground surface within 200 metres laterally from the top of high bank or 100 metres vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a 'reliable water supply'.	

Aquifer	Porous rock or fractured rock
Category	Less productive

Level 1 Minimal Impact Consideration	Assessment
Water table Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 metres from any: • high priority groundwater dependent ecosystem or • high priority culturally significant site listed in the schedule of the relevant water sharing plan. **OR** A maximum of a 2 metre water table decline cumulatively at any water supply work.	
Water pressure A cumulative pressure head decline of not more than a 2 metre decline, at any water supply work.	
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	

3. Proposed remedial actions where impacts are greater than predicted.

Note for proponents

Point 3 of section 3.2 of the AIP provides a basic framework for considerations to consider when assessing a proponent's proposed remedial actions.

Table 6. Has the proponent:

	AIP requirement	Proponent response	NSW Office of Water comment
1	Considered types, scale, and likelihood of unforeseen impacts *during operation*?	The assessment has considered impacts for pumping rates during average weather conditions and also the unlikely worst case scenario of extended dry conditions. The impacts consider regional drawdown on stakeholder bores/wells, groundwater dependant ecosystems and Namoi River surface-groundwater interaction. Scenarios have been simulated for contingency bore operations when production bore fails for assessment of drawdown impacts	
2	Considered types, scale, and likelihood of unforeseen impacts *post closure*?	The assessment has considered residual drawdown impacts following cessation of borefield pumping operations on Namoi River flow with quantification of river flow loss.	
3	Proposed mitigation, prevention or avoidance strategies for each of these potential impacts?	Boggabri Coal will implement groundwater level and quality monitoring program for early warning detection and prevention of potential impacts. This will be described in the groundwater management plan. Boggabri Coal will also develop a trigger action response plan for water level and quality exceedences at monitoring points. Data collected from the monitoring program will be used to validate modelling predictions of drawdown from pumping, and where applicable revise drawdown prediction outputs. An avoidance strategy based on monitoring performance and revised model outputs would be developed and may include alteration of pumping rates and bore scheduling with consideration of contingency bore usage.	

AIP requirement		Proponent response	NSW Office of Water comment
4	Proposed remedial actions should the risk minimization strategies fail?	Boggabri Coal will provide compensatory water supply to any landholder whose water supply is shown to be adversely and directly impacted. Compensatory works may include financial provisions, alternative water supply provisions or other 'make good' provisions.	
5	Considered what further mitigation, prevention, avoidance or remedial actions might be required?	Changes in pump out rates of bores, bore pumping scheduling and consideration of contingency bore usage	
6	Considered what conditions might be appropriate?	Conditions may include limitations on flow rates from production bores and drawdown amount of landholder bores which maybe decided through negotiation on a case by case basis.	

4. Other considerations

Note for proponents

These considerations are not included in the assessment framework outlined within the AIP, however are discussed elsewhere in the document and are useful considerations when assessing a proposal.

Table 7: Has the proponent:

	AIP requirement	Proponent response	NSW Office of Water comment
1	Addressed how it will measure and monitor volumetric take? (page 4 of the AIP)	Volumetric take from groundwater bores will be metered and monitored at a minimum of monthly and provided in the Boggabri Coal annual environmental monitoring review.	
2	Outlined a reporting framework for volumetric take? (page 4 of the AIP)	Reporting will be undertaken using: • Water NSW Water Accounting System, iWAS • Annual Environmental Monitoring Report. This will be described in the groundwater management plant.	

More information

www.water.nsw.gov.au

Published by the NSW Department of Primary Industries.

Reference 12279.1

Appendix B

Boggabri Coal owned water access licences

B1. Boggabri Coal owned water access licences

Holder	Licence Type	AL #	WAL #	Units	Water Source	Works Approval	Name	WAL Certificate
Boggabri Coal Pty Limited	Aquifer	90AL807033	15037	172	Upper Namoi Zone 4	90CA807034	Daiseymede Bore	on file
Boggabri Coal Pty Limited	Aquifer	90AL807125	12767	3	Upper Namoi Zone 4	90CA807126	River block opposite 'The Rock'	on file
Boggabri Coal Pty Limited	Aquifer	90AL819389	24103	275	Upper Namoi Zone 4	90CA807034	Daiseymede Bore	on file
Boggabri Coal Pty Limited	Aquifer	90AL806945	12691	457	Upper Namoi Zone 4	90CA807034	Daiseymede Bore	on file
Boggabri Coal Pty Limited	Aquifer	90AL832290	36547	37	Upper Namoi Zone 4	90CA807018	Callander Property	on file
Boggabri Coal Pty Limited	Aquifer	90AL822527	29473	142	Gunnedah Oxley Basin MDB Groundwater Source	90WA822528	Lovton Bore	on file
Boggabri Coal Pty Limited	Aquifer	90AL822548	29562	700	Gunnedah Oxley Basin MDB Groundwater Source	90WA822528 90CA822549	Lovton Bore and Pit Ingress	on file
Boggabri Coal Pty Limited	Regulated River General Security	90AL801761	2571	51	Lower Namoi River	90CA801763	Namoi River	on file
Boggabri Coal Pty Limited	Supplementary River	90AL801762	2572	5.6	Lower Namoi River	90CA801763	Namoi River	on file

Holder	Licence Type	AL #	WAL #	Units	Water Source	Works Approval	Name	WAL Certificate
Boggabri Coal Pty Limited	Regulated River General Security	90AL801817	2595	243	Lower Namoi River	90CA801819	Namoi River	on file
Boggabri Coal Pty Limited	Supplementary River	90AL801818	2596	26.5	Lower Namoi River	90CA801819	Namoi River	on file
Boggabri Coal Pty Limited	Regulated River General Security	90AL833002	37067	128	Upper Namoi River	n/a	(Hobden Upper) Namoi River	on file
50% Boggabri Coal Pty Limited 50% Whitehaven Coal Mining Limited	Aquifer	90AL827847	31084	250	Gunnedah Oxley Basin MDB Groundwater Source	90WA827848	Tarra	on file

Appendix C

Monitoring bore details

Current Groundwater Monitoring Bores at Boggabri Coal Operations

Monitoring bore	Assigned GW Number	Screened interval (m bgl)	Bore depth (m bgl)	Screened geology	Groundwater Level (mbgl)	Date Measured	Reference Information Source
BCOPL Mine Area monitoring bores							
IBC2102	GW967862	76 - 82	85	Merriown Coal Seam	69.78	29/01/2015	PB (April 2015) Annual groundwater monitoring review
IBC2103	GW967861	53 - 56	59	Jeralong Coal Seam	54.6	29/01/2015	PB (April 2015) Annual groundwater monitoring review
IBC2104	GW967864 ?	79 - 85	87	Braymont Coal Seam	46.7	13/08/2015	GHD (March 2016) Annual groundwater monitoring review
IBC2105	GW967863	151 - 157	160	Merriown Coal Seam	67.4	14/08/2015	GHD (March 2016) Annual groundwater monitoring review
IBC2110	GW967860	91 - 97	100	Boggabri Volcanics	9.55	1/08/2015	GHD (March 2016) Annual groundwater monitoring review
IBC2111	GW969634	36 - 42	45	Boggabri Volcanics (weathered)	9.5	13/08/2015	GHD (March 2016) Annual groundwater monitoring review
IBC2114	NA	77-80	86	Bollol Creek Coal Seam	Dry (mine dewatered)	29/01/2015	PB (April 2015) Annual groundwater monitoring review
IBC2115	GW967857	102.5-108.5	111	Merriown Coal Seam	Dry (mine dewatered)	29/01/2015	PB (April 2015) Annual groundwater monitoring review
IBC2138	GW967856	57.5 - 63.5	66	Merriown Coal Seam	Dry (mine dewatered)	29/01/2015	PB (April 2015) Annual groundwater monitoring review
IBC2139	GW967855	86.8 - 89.8	92	Merriown Coal Seam	Inaccessible	29/01/2015	PB (April 2015) Annual groundwater monitoring review
GW3115	GW003115	0 - 42	na	Boggabri Volcanics (weathered)	22.1	13/08/2015	GHD (March 2016) Annual groundwater monitoring review
MW6	NA	18 - 22	na	Alluvium	6.07	30/11/2015	GHD (March 2016) Annual groundwater monitoring review
BC2181	GW969845	105 - 111	114	Merriown Coal Seam	70.15	14/08/2015	GHD (March 2016) Annual groundwater monitoring review
BC2193	GW969844	87.3 - 93.3	96.3	Braymont Coal Seam	Dry (mine dewatered)	29/01/2015	PB (April 2015) Annual groundwater monitoring review
BCOPL Borefield monitoring bores							
Cooboobindi MB	NA	23 - 89	89	Alluvium (gravel)	9.32	21/05/2015	PB (June 2015) Test pumping assessment of Roma and Cooboobindi production bores
Victoria Park MB (VP01)	GW970868*	34 - 37.5 & 50.5 - 57	60	Alluvium	12.03	17/12/2014	PB (January 2015) Test pumping assessment of Victoria Park and Heathcliffe production bores
Daisymede MB (DM2)	NA	12 - 15	16	alluvium (gravel)	7.08	19/10/2010	PB (November 2010) Boggabri coal mine hydrogeological investigation
Roma MB	NA	30 - 84	84	Alluvium (gravel)	10.01	21/05/2015	PB (June 2015) Test pumping assessment of Roma and Cooboobindi production bores
Belleview 3 MB (BCBF3)	GW970924*	24 - 30	30	Alluvium (gravel)	10.82	21/12/2012	A Fulton (March 2013) Boggabri Coal Groundwater Supply Investigation
Belleview 11 MB (BCBF11)	GW970930*	30 - 36	36	Alluvium (clay/gravel)	8.3	17/01/2013	A Fulton (March 2013) Boggabri Coal Groundwater Supply Investigation
Heathcliffe MB (HC02)	GW970866	16 - 19 & 21 - 26	26	Alluvium	8.12	20/12/2014	PB (January 2015) Test pumping assessment of Victoria Park and Heathcliffe production bores
BTM Cumulative impact monitoring bores within 5 km of borefield							
Reg 6	GW970703	88 - 94	96	Boggabri volcanics	20.13	Sep-15	Maules Creek (September 2015) CCC presentation
Reg 5	GW970683	72.2 - 78.2	78.7	Boggabri volcanics	22.22	Jun-15	Maules Creek (September 2015) CCC presentation
Reg 5a	GW970684	18 - 21	22	Alluvium	18.04	Sep-15	Maules Creek (September 2015) CCC presentation
Reg 14	GW970690	90 - 96	102	Basement	19.54	Sep-15	Maules Creek (September 2015) CCC presentation
Reg 13	GW970685	128 - 132	133	Boggabri volcanics	22.96	Sep-15	Maules Creek (September 2015) CCC presentation
Reg 7A	GW970689	24 - 30	36	Alluvium	7.71	Sep-15	Maules Creek (September 2015) CCC presentation
BCOPL Contingency production bores							
Roma CB	GW971140	18 - 84	84	Alluvium (gravel)	9.72	May-15	PB (June 2015) Test pumping assessment of Roma and Cooboobindi production bores
Belleview 1 CB (BCBF8)	GW970920*	22 - 34	38	Alluvium (gravel/clay)	9.82	Dec-12	A Fulton (March 2013) Boggabri Coal Groundwater Supply Investigation
Belleview 2 CB (BCBF10)	GW970921*	27 - 36	41	Alluvium (gravel/sand/clay)	8.78	Dec-12	A Fulton (March 2013) Boggabri Coal Groundwater Supply Investigation
Heathcliffe CB (HC01)	GW971154*	16.5 - 19.5 & 21.5 - 26.5	29.5	Alluvium (gravel, sand, clay	9.45	Oct-14	PB (January 2015) Test pumping assessment of Victoria Park and Heathcliffe production bores
BCOPL Production Bores							
Cooboobindi PB	GW971139	18 - 89	89	Alluvium (gravel)	9.49	May-15	PB (June 2015) Test pumping assessment of Roma and Cooboobindi production bores
Victoria Park PB (VP02)	GW971155*	34 - 37.5 & 50 - 57	60	Alluvium (gravel/clay)	11.2	Oct-14	PB (January 2015) Test pumping assessment of Victoria Park and Heathcliffe production bores
Daisymede PB (DM1)	GW969665	11.5 - 14.5 & 19 - 22	23	Alluvium (gravel)	7.7	Oct-14	PB (November 2010) Boggabri coal mine hydrogeological investigation
Loveton	GW968046	40 - 46 & 59.5 - 65.5	65.5	Maules Ck Formation (mainly coal seams & fractured sandstone)	10	Nov-06	A Fulton (April 2013) Loveton bore test

Appendix D

Groundwater model data clarification

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MEMO

TO: Hamish Russell

FROM: Dave Whiting

SUBJECT: **EA Mod5 Borefield groundwater model – Amendment of irrigation bore water usage**

OUR REF: 2200555A-RES-MEM-001 RevA.docx

DATE: **21 January 2016**

This memorandum addresses a groundwater model query within the formal response letter from the Department of Primary Industries (DPI) Water on the Environmental Assessment for Modification 5 (MOD 5) dated 16 December 2015. DPI Water request clarification of landholder groundwater usage data in the model domain. This includes what bores and what usage data was applied in the model and this needs to be reconciled with DPI Water's database records. DPI Water expressed concern that discrepancies in groundwater usage data may impact on the validity of model results.

Metered water use from eleven active third party irrigation bores was applied in the model, including the following registered bore numbers: GW970167, GW900106, GW901414, GW057944, GW103405, GW965386, GW900024, GW900743, GW901835, GW026063 and GW042875 (Boggabri town water supply bore). The water use accounting information for these irrigation bores was provided as a spreadsheet by DPI Water on 17 March 2015 (WAMS Call No: 20135). Four other irrigation bores in the model region which are registered on the NOW groundwater database have been inactive for at least 10 years with no DPI Water usage records and include GW022957, GW025856, GW053270 and GW0900014.

WSP I Parsons Brinckerhoff re-evaluated groundwater usage data from DPI Water records and concluded that six bores (five irrigation bores and old Boggabri town water supply bore GW032927) were omitted from the model. Table 1 presents the additional bores and water usage data extracted from the DPI Water records. Figure 1 shows the location of water usage bores.

Table 1. Additional irrigation bore details and usage data

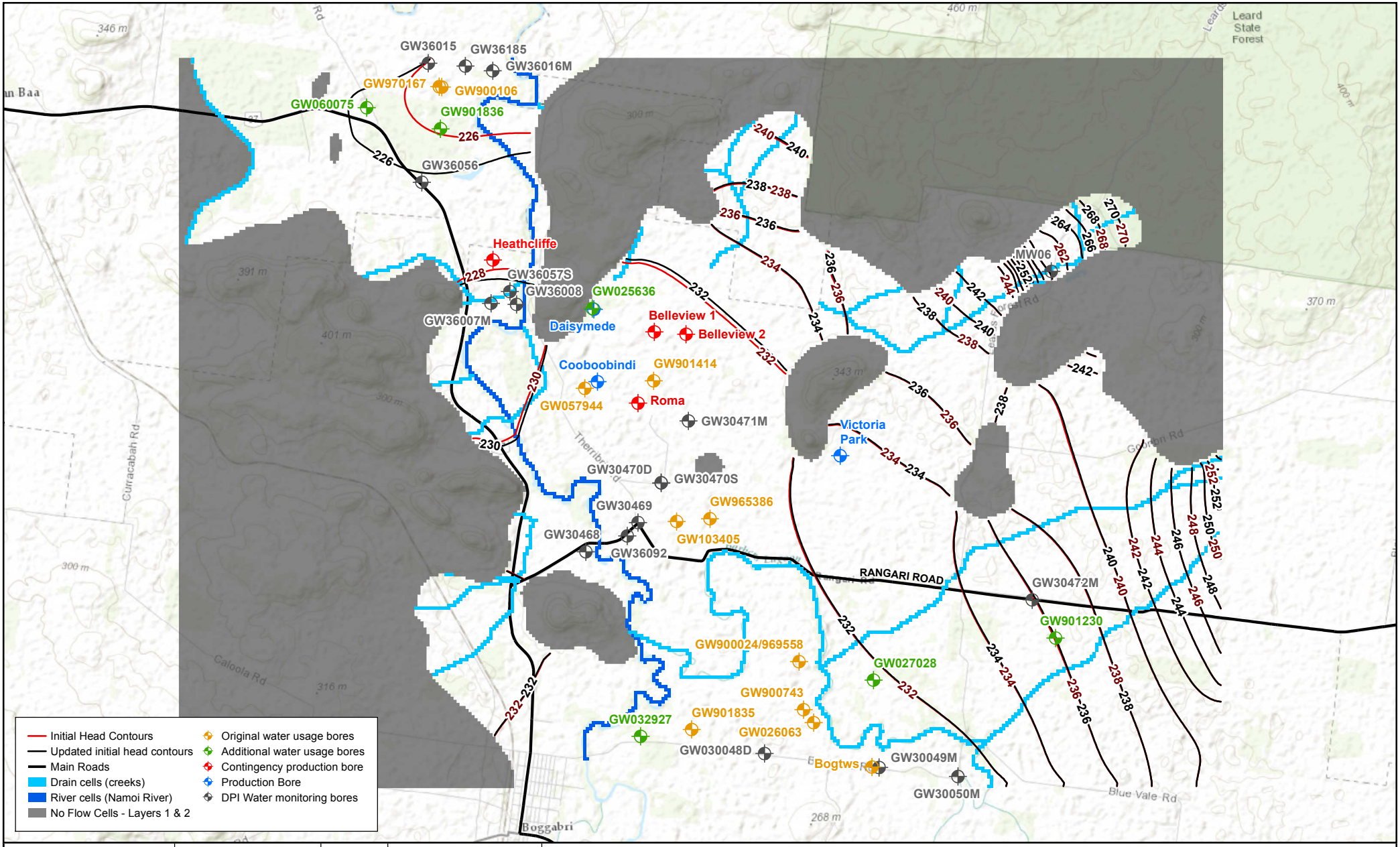
BORE NO	EASTING	NORTHING	PERIOD[A]	TOTAL VOLUME (ML)	AVERAGE ABSTRACTION RATE (m^3/d)[B]
GW025636	217855	6607442	Q2 2007 - Q2 2010	49	45
GW027028	222519	6601284	Q4 2006 - Q2 2013	2	0.82
GW032927	218654	6600351	Q4 2006 - Q2 2007	74.5	490
GW060075	214115	6610773	Q4 2006 - Q2 2013	1244	511
GW969558[c]	221285	6601591	Q1 2012 - Q2 2013	505	1037
GW901230	225537	6601981	Q4 2006 - Q2 2013	266	109
GW901836	215338	6610419	Q4 2006 - Q2 2013	2274	934

Notes:

a) The period of bore water usage is not continuous. There are large data gaps and many zero usage data entries.

b) The average abstraction rate is based on the available DPI Water database record. It is derived from total usage divided by number of days of accounting records.

c) GW900024 was replaced with GW969558 and bore usage data from Q1 2012 is for the replacement bore and was not included in previous model results.



Map: 2200555A_GIS_033_A1_Fig1-1	Author: Lin Guifen
Date: 21/01/2016	Approved by: - Ellen Kwantes

Data source: -

0 750 1,500 m

1:84,000

Coordinate system: WGS 1984 UTM Zone 56S

Scale ratio correct when printed at A4

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Drawdown Impact Assessment of Proposed Borefield Operations, Boggabri Coal Mine

Figure 1

Updated steady state initial heads

MODELLING UPDATE

The steady state groundwater model was updated with the additional bore water usage data and rerun. The simulated groundwater heads were compared to the original model steady state run. The differences between groundwater heads was minimal in the borefield region. The most noticeable disparity in groundwater heads occurred in the northwestern area of the model domain (north of the Heathcliffe contingency bore) with a maximum head difference of 0.9 metres. This is because of water usage from the added irrigation bores: - GW901836 and GW060075 (Refer to Figure 1 showing a comparison of steady state groundwater head contours).

A comparison of mass water balance results of the models in steady state condition outputs indicate for the updated model that there is a slight increase in river outflow and a decrease in baseflow entering the river, predominantly this would occur in the northwestern model domain.

A further transient state assessment was undertaken in the northwestern area of the model where there was disparity in steady state groundwater heads between the original and updated model. The transient model was run with the additional water usage bores. A comparison of the response of observed data versus simulated water level data for four DPI Water monitoring bores located in the northwestern area of the model domain was conducted. The resultant hydrographs (refer to Figure 2) indicate there is minimal difference for the monitoring bores close to the Heathcliffe contingency bore, the greatest difference is at GW36056, approximately 1600 m north of the Heathcliffe contingency bore, located close to additional irrigation bores GW060075 and GW901836.

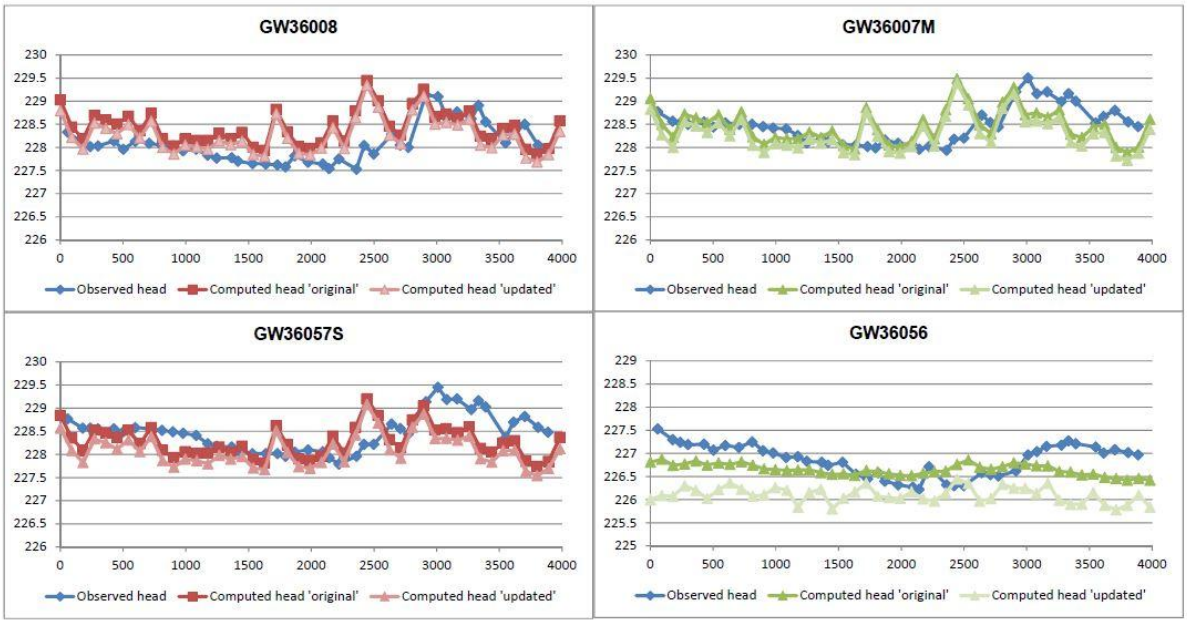

Figure 2. Hydrographs of observed versus simulated groundwater heads in northwestern model domain

CONCLUSION

This updated modelling assessment has indicated that the additional water usage from third party bores has minimal influence in the model within the area of operations of the three production bores: Cooboobindi, Daisymede and Victoria Park. There is some disparity in modelled outcomes north of the Heathcliffe contingency bore where there are historic records of notable water usage from irrigation bores GW060075 and GW901836. A recalibration of the model hydraulic properties, and subsequent rerun of simulated drawdown scenarios is not considered necessary. Recalibration in this northwestern model area is expected to provide slightly lower hydraulic conductivity values as the current simulated groundwater level at monitoring bore GW36056 is underestimated. A zoned lower

hydraulic conductivity value in the northwestern area of the model would be expected to reduce the extent of drawdown impacts from BCOPL pumping bores in this area.

Dave Whiting
Principal hydrogeologist