

ATTACHMENT A:

POLICY FRAMEWORK FOR HUME COAL 'MAKE GOOD' ARRANGEMENTS FOR POTENTIAL MINING IMPACTS TO AFFECTED WATER SUPPLY WORKS

1 Issue

The proposed Hume Coal operations will have more than minimal impact on water supply works near the proposed mine. Minimal impact is defined in the Government's 2012 *Aquifer Interference Policy* (AIP).

This being the case, it is more than likely that the Consent Authority would require Hume Coal, as a condition of any consent to Make Good any impact greater than the minimal impact, as defined by the AIP.

There is no record of the Department of Planning being required to adjudicate on disputes between landholders and mining companies over impacts on groundwater bores.

Standard conditions for mitigating impacts on groundwater systems, including alternate water supply arrangements, are common practice for many mining developments.

Although referred to in the AIP, Make Good is not defined in the Policy or in the legislative framework.

This discussion paper outlines an approach to defining Make Good in the context of the proposed Hume Coal development.

2 Legal and Policy Context

The *Water Management Act 2000* ('the WMA 2000') includes the concept of ensuring "no more than minimal harm" for both the granting of water access licences and the granting of approvals. Aquifer interference approvals are not to be granted unless the Minister is satisfied that adequate arrangements are in force to ensure that no more than minimal harm will be done to any water source, or its dependent ecosystems as a result of its being interfered with during the activities to which the approval relates.

The 'aquifer interference approvals' provisions of the WMA 2000 have not yet been 'turned on'. This is because the relevant Water Management Plans have not been inserted with the operative provisions as required by s32 of the WMA 2000..

Consequently, apart from any development approval conditions under the EP&A Act and the access licence regime, there are not on-going legal instruments on which to place conditions associated with aquifer interference activities, or indeed water supply works, in particular, water bores.

While the aquifer interference approval provisions of the WMA 2000 remain 'uncommenced', the minimal harm test under the WMA 2000 is not activated for the assessment of impacts. However, since the exact same 'minimal harm' rule under the WMA 2000 applies to issuing of licences and water works approvals, it can be argued that 'minimal harm' rules should be satisfied for aquifer interference activities also, since many licences and approvals have been issued in the past.

In conjunction, the NSW government released its *Aquifer Interference Policy* (AIP) in 2012 to establish and objectively define minimal impact considerations as the basis for providing advice, including recommended conditions of consent, to either the gateway process, the Independent Planning Commission or the Minister for Planning.

It is noted that, although 'minimal impact' considerations in the AIP has a similar wording as the 'minimal harm' rule in the WMA 2000, the two tests are separate, and serve different purposes. The 'minimal impact' consideration is under the EP&A Act. It has no relationship with the 'minimal harm' rule in the WMA 2000.

For both the highly productive and less productive groundwater sources, thresholds for key minimal impact considerations are contained in the AIP. These thresholds deal with water table and groundwater pressure drawdown, as well as groundwater and surface water quality changes.

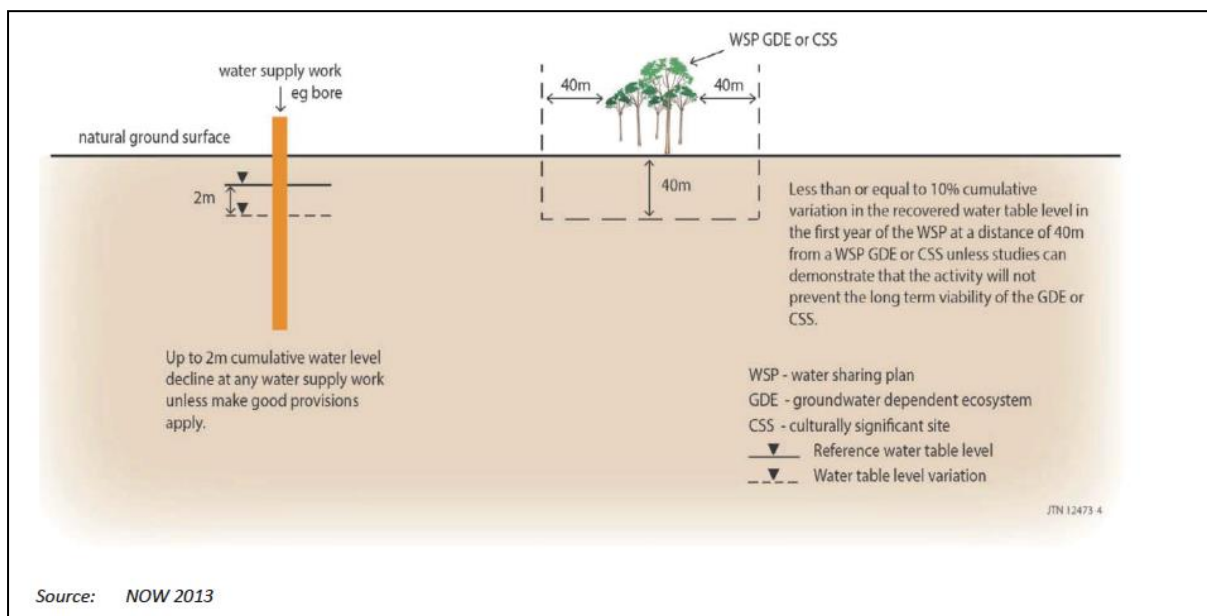
In summary, for the less productive groundwater source within which Hume Coal proposes to operate, minimal impact is defined as:

- Less than or equal to 10% cumulative variation in the water table, allowing for typical climatic 'post water sharing plan' variations, 40m from any high priority groundwater dependent ecosystem or high priority culturally significant site listed in the schedule of the relevant water sharing plan, unless the proponent can demonstrate to the Minister through studies that a greater variation will not compromise the long-term viability of the dependent ecosystem or significant site.
- Not more than 2m decline in the water table cumulatively at any water supply work unless Make Good provisions apply, and
- 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 2m pressure decline at any water supply work, unless either the proponent can demonstrate to the Minister through studies that a greater decline will not compromise the long-term viability of the water supply work, or Make Good provisions apply.

In the case of the proposed Hume Coal operations, it is pressure head decline that is the most relevant.

References to 'water level' and 'water table level' in the AIP Figure 1 below can equally apply to groundwater pressure head.

Figure 1 *Porous and fractured rock groundwater sources - minimal impact considerations*



To date, the NSW Government has not provided any detail on the nature or extent of the Make Good provisions to which the AIP refers. Despite this, it is more than likely that the Consent Authority would

require, as a condition of any consent, be required to Make Good any impact greater than the minimal impact, as required by the AIP. This has been consistently applied to other mining applications even if no compensatory water supply arrangements were predicted.

This discussion paper aims to provide a framework for the implementation of Make Good provisions to ensure fair dealing between affected landholders and Hume Coal and to provide a framework for managing mitigation of any impacts from the Hume development.

3 Hume Coal Impacts on Private Water Bores

Most of the impacted bores (79%) are predicted to experience a maximum drawdown of less than 15m. The magnitude and timing of the drawdown at each bore depends on its location and depth with respect to the mine workings. Shallower and/or remote bores are predicted to experience smaller drawdown than deeper and/or closer bores. For example, the maximum project drawdown in a bore is 46.7 m, and this is for a deep bore, very close to the mine workings.

With reference to the AIP assessment criteria, 94 landholder bores (not including bores owned by Hume Coal) on 72 properties are predicted to be subject to a project drawdown of 2 m or more which triggers the Level 2 AIP criteria, of 'greater than minimal impact'. This has triggered additional assessment of the model predictions for each individual bore, as required by the AIP.

Nine bores are predicted to be potentially intercepted by mining due to their location being either in the rock within the immediate roof of the mine workings or through the coal seam itself, within the mining footprint.

Table 1 Landholder bores – Summary of Drawdown Statistics

	Revised assessment
Number of bores impacted	94
Maximum drawdown range	2–47 m
Median maximum drawdown	6 m
Number of landholders (properties) with impacted bores	72
Average time for a bore to recover by 75% since impact begins	20 years
Time until all impacted bores recover, after mining starts ⁱ	76 years (50+ years after mining concludes)
Number of bores impacted post-mining ⁱⁱ	54

A more detailed breakdown of the number of bores influenced by the Hume project, the extent of drawdown and relative impacts can be found in Figure 1.

All bores predicted to experience a drawdown of 2 m or greater will be subject to 'Make Good' measures from Hume Coal to account for the potential impacts on bores.

- About a third of these bores may incur additional operational costs associated with a lower groundwater level and will not require any further measures (i.e. will not require bore pump intake deepening or replacement).
- Another third is assessed as potentially needing submersible pump intake depths repositioned for a certain period, depending on the duration of drawdown.
- The final third is assessed as potentially requiring bore replacement.

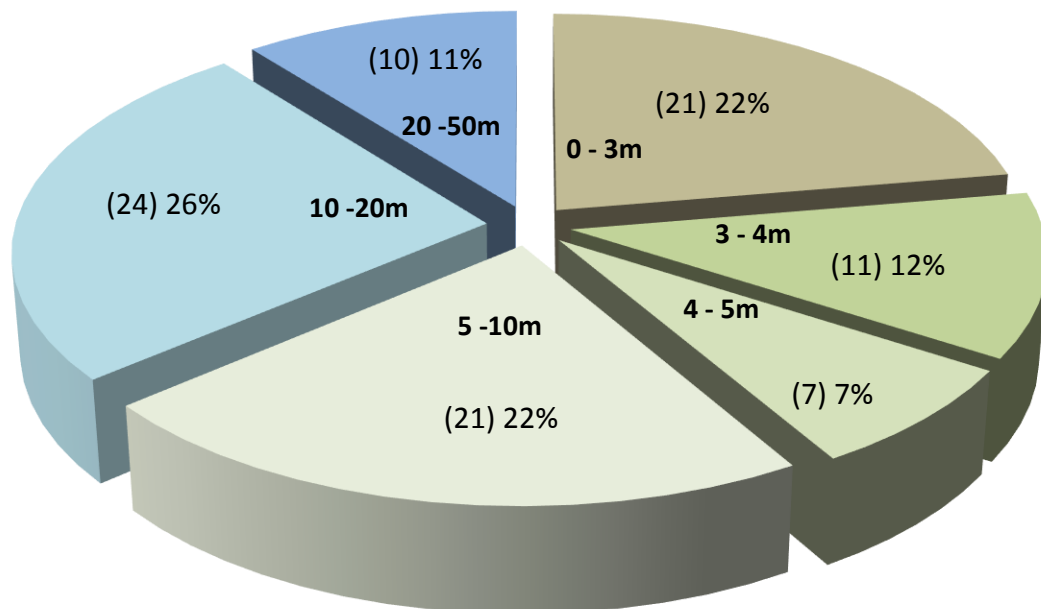
68 percent of all impacted bores are made good with minor measures.

Graphical representations of the 'make good' mitigation measures are to be found in Figures 2 and 4.

The key conclusions concerning bore impacts of the water assessment are:

- No landholder will be without access to a water bore access for the purpose for which the bore is licenced;
- Bore impacts are temporary, reversible and occur at different times over the life of the Hume project; and
- Bore impacts can be mitigated and, where impacts exceed the AIP minimal impact criteria, they can be managed by standard conditions of consent that are common practice for all other mining developments.

Figure 1
Hume Coal Drawdown Influence



Drawdown Ranges - Bore Maintenance - Total Bores = 94

1	2	3	4	5	6
0 - 3m	3 - 4m	4 - 5m	5 - 10m	10 - 20m	20 - 50m
21 Bores	11 Bores	7Bores	21 Bores	24 Bores	10 Bores

Pursuant to the AIP requirements in relation to groundwater quality, the project activities will not result in a lowering of the beneficial use category of the groundwater source beyond 40 m from the activity, provided the mitigation measures are implemented. Cumulative impacts to groundwater quality due to mining activities are not anticipated.

Table 1 presents the distribution of bores predicted to be impacted within 5-year stages. A graphical representation of the timing of bore influence from the Hume project can be found in Figure 2.

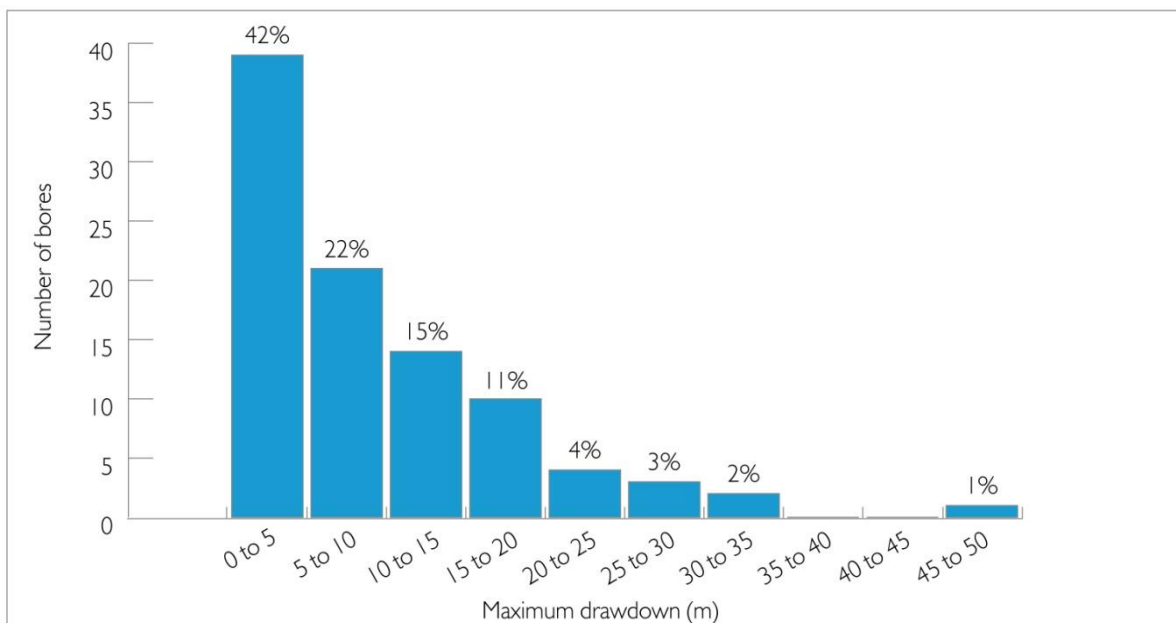
Bores identified in Stage 1 are bores predicted to be first affected by 2 m drawdown within the first 5 years of mining; Stage 2 bores are bores predicted to be first affected within 5-10 years of mining, and so on.

The Make Good process for each subsequent stage will be implemented every subsequent 5-year period for each bore to be incorporated into the Make Good process prior to the Level 2 impacts occurring.

Table 1: Make Good Bores Within Individual Stages of Mining

Mining Stages	1	2	3	4	5	6	Total
Time when bore first impacted by 2m drawdown	0-5 yrs.	5-10 yrs.	10-15 yrs.	15-20 yrs.	20-25 yrs.	+25 yrs.	
Make good provision							
1. increased pumping costs	-	3	7	9	5	7	31
2. deepen pump	6	9	13	3	2	-	33
3a. replace a stock / domestic bore	5	4	2	2	1	1	15
3b. replace an irrigation bore	5	8	1	1	-	-	15
	16	24	23	15	8	8	94

Figure 2: Timeframe, Depressurisation Impacts of Bores Influenced by Hume Project



The nature of the impacts will differ from bore to bore. Variables include maximum pressure drawdown, bore construction depth, aquifer/s screened, and pump depth (assumed to be at 75% of the borehole depth). The preferred Make Good strategy discussed in the subsequent sections takes into consideration these variables.

The Hume Response to Submissions report provides a Make Good assessment that details each individual bore predicted to experience a drawdown of 2 m or more due to the influence of the project.

The age, construction details and status of individual bores is currently based on the NSW Government bore construction records. Advice from the local community is that regardless of age, bores in the area continue to perform over time, so at this stage no discount for bore age has been applied to the Make Good assessment. However, field verification of the bore status, condition and current use is required as part of the necessary process for Make Good arrangements for individual bores.

Make Good arrangements will remain in place up until groundwater levels have recovered to within 2 m of the original water level prior to mining.

Make Good arrangements are not required for water quality, as water quality impacts are not predicted to change the beneficial use category of the groundwater source and are therefore within minimal impact criteria.

Regarding the AIP's groundwater quality requirements, the project is not anticipated to result in a lowering of the beneficial use category of the groundwater source beyond 40 m from the activity, provided the mitigation measures are adopted.

Monitoring each component of the water management system underpins if, how and when management responses are required. Triggers and thresholds will be developed to provide context on if, how, and when management measures are required as part of the water management plan for the project.

Predicted impacts on other groundwater users such as ecosystems that potentially use groundwater (including watercourses, drainage lines, and swamps that receive baseflow), and on groundwater quality (beneficial use) have been assessed as minimal. In particular, the hydrogeochemical assessment undertaken by Geosyntec for the EIS concluded the project would not result in significant changes to the groundwater chemistry and would not change the beneficial use class.

4 Proposed 'Make Good' Framework

4.1 Guiding Principles

The following principles for a Make Good framework have been adapted and drawn from various sources, including the EP&A Act, the WMA 2000, the 'Make Good' approach adopted by other State jurisdictions, the NSW Government's 2018 *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments*, and the Mining Act 1992.

Accordingly, Hume Coal:

- supports the proper management, development and conservation of natural and artificial resources for the purpose of promoting the social and economic welfare of the community and a better environment;
- recognises and fosters the significant social and economic benefits to New South Wales that result from the efficient development of mineral resources;
- seeks to avoid or minimise the impacts on other water users of the carrying out of aquifer interference activities;
- supports the orderly, efficient and equitable sharing of water from water sources;
- recognises the sharing of water from water sources must protect basic landholder rights;
- will pursue all reasonable and feasible measures to minimise the impacts of its development;
- undertakes to consult and negotiate in good faith directly with individual affected landholders;

- will bear all reasonable costs associated with development and implementation of any Make Good arrangements; and
- will seek to have any Make Good agreements legally binding for at least the duration of the predicted exceedance of the minimal impact criteria.

4.2 Policy Rationale

There is an established policy platform used by the NSW Government to guide the assessment of the potential impacts of mining, petroleum and extractive industry projects in NSW and to provide for voluntary mitigation measures.

Mitigation arrangements for noise and air quality impacts through the *Voluntary Land Acquisition and Mitigation Policy (2018) VLAMP* is a proven framework for assessing the net benefits of major projects against the relevant economic, social and environmental impacts of the development.

The policy rationale provided for in the Voluntary Acquisition and Mitigation policy for noise and air quality is an appropriate guide for implementation of the AIP voluntary Make Good arrangements, given the lack of a mechanism in the AIP.

It should be noted that development impacts requiring noise and dust mitigation are required where those impacts are permanent and usually present for the life of the project. However, in contrast depressurisation impacts on water bores are temporary, reversible and occur at different stages during the project life.

In general terms, the same policy mitigation framework underpinning VLAMP can be applicable to impacts on water bores from mining impacts, but limited to the adoption of feasible avoidance or mitigation measures; namely:

“These policies and guidelines include assessment criteria to protect the amenity, health and safety of people. They typically require applicants to implement all reasonable and feasible avoidance and/or mitigation measures to minimise the impacts of a development.

In some circumstances, it may not be possible to comply with these assessment criteria even with the implementation of all reasonable and feasible avoidance and/or mitigation measures. This can occur with large resource projects.....where the resources are at a fixed location..

However, it is important to recognise that:

- *Not all exceedances of the relevant assessment criteria equate to unacceptable impacts;*
- *Consent authorities may decide that it is in the public interest to allow the development to proceed, even though there would be exceedances of the relevant assessment criteria, because of the broader social and economic benefits of the development; and*
- *Some landowners may be prepared to accept higher impacts on their land, subject to entering suitable negotiated agreements with applicants, which may include the payment of compensation.”*

(Voluntary Land Acquisition and Mitigation Policy - SSD Mining, Petroleum and Extractive Industry Developments | September 2018 | Page 5)

4.3 Proposed Make Good Measures

The revised Water Assessment outlines potential strategies for potential Make Good measures to provide landholders with a reasonable quantity and quality of water that fits with the bore’s authorised use, including:

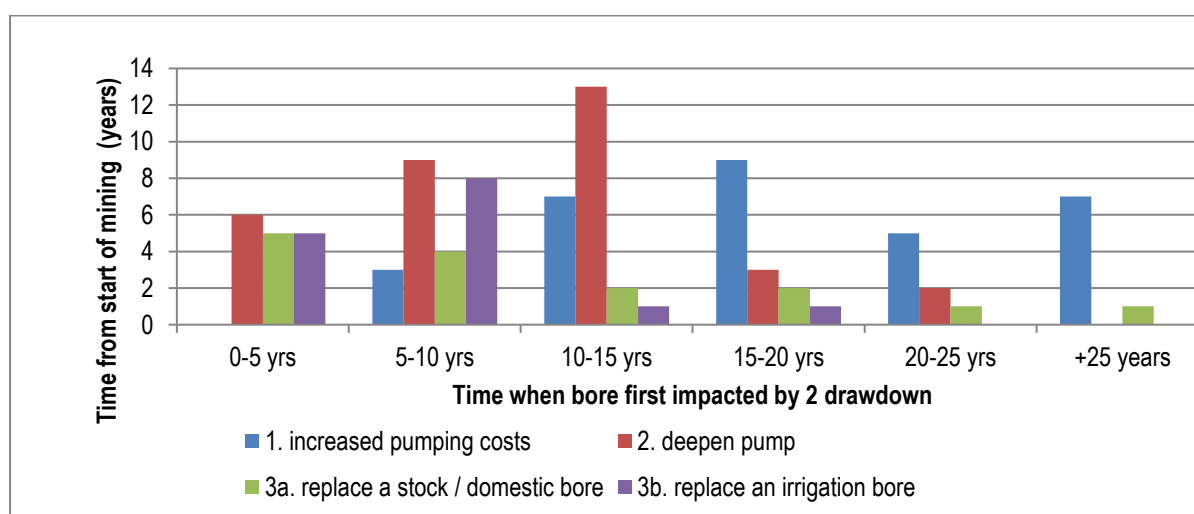
- making a financial contribution for increased pumping costs (increased power consumption) because of a lower water level;

- adding a rising main to lower the pump intake in the bore;
- supplying new headworks and piping to create a more efficient system;
- changing the pump so that it is better suited to or more efficient with a decreased water level in the bore;
- deepening the bore to allow it to tap a deeper part of the aquifer;
- reconditioning the bore to improve its hydraulic efficiency;
- drilling a new bore to a different depth or wider diameter;
- drilling a new bore in a different location on the property;
- plan to monitor the water bore, for example, by periodically assessing it to determine if/when impacts occur;
- any commercial arrangement suitable to the water bore owner and Hume Coal.

4.4 Detailed Bore impact Mitigation Strategies

Make Good mitigation measures by type and timing can be found in Figure 4

Figure 4: Water Bore Mitigation Measures by Type and Timing



Mitigation Strategy 1 – Increased Pumping Costs

Provision for paying increased pumping costs or other compensatory measures are to apply to all bores that experience a water level decline that is more than 2 m from the baseline assessment. The lowering of pumps in the borehole has a capital cost, but the lowered water level (not increased pump depth), determines the increased operating costs. Acknowledgement of these costs is incorporated in both the EIS and Revised Water Assessment versions of the Make Good assessment reports.

Mitigation Strategy 2 – Lowering Pump

The lowering of pumps is proposed to maintain supply to overcome the predicted impact to individual bores. The considerations for lowering pumps include:

- the capital cost (i.e. pump column and electrics);

- potential additional capital costs (i.e. should pumps need servicing due to disturbance of the pump during its removal and reinstallation); and
- labour costs (costs associated with the removal and lowering of the pump, and potential additional maintenance costs associated with siltation and sedimentation at the base of the bore should removal be required).

The lowering of pumps will not be practical in all bores. Technical limitations for lowering pumps may occur and this has been incorporated into the strategy of the Make Good assessment. The plan for Make Good at each individual bore is subject to technical feasibility, and in the process of lowering a pump in a bore it may become apparent that the pump cannot be lowered, or that lowering the pump will not resolve the potential reduction in water supply. Alternative solutions will be negotiated at that time with each landholder. This flexibility of approach is required so that the delivery of Make Good (i.e. ongoing water supply for all landholders) can be achieved.

The Make Good strategies that apply to each bore currently are based on the information, knowledge and understanding of publicly held records. Prior to field assessments to confirm the status of individual bores, the strategy for an individual bore (i.e. the logical options based on information at hand) will remain in place.

Mitigation Strategy 3 – Deepening Bore

For some shallow bores that are experiencing mine-induced drawdown and are not fully penetrating in the sandstone aquifer, deepening of the bore may be an option. It is acknowledged that in attempting to deepen some bores it may become apparent that it is not physically possible for various reasons such as: the original hole is not straight, partial or full collapse of bore and/or casing at depth, risk of losing drill equipment to rusted casing at the surface etc. Therefore, for bores identified as being suitable for deepening, the best proposition may be the provision of a new, deeper bore immediately adjacent to the existing bore. This is sometimes the simplest, quickest and most cost-effective solution to deepening an existing bore.

Mitigation Strategy 4 – Replacement Bore

Redrilling of bores will be in accordance with industry best practice and utilise local knowledge of drilling and geological conditions to ensure successful outcomes for replacement bores.

Should a replacement bore need to be moved to a new site distant from an existing site, then consideration of the existing distribution network/power supply and provision for upgrading is included (and this is outlined in the revised Make Good assessment report). In relocating a bore there may be some changes to individual bore yield and this will be measured and considered upon drilling (strategies may be to construct a larger diameter bore, or to construct two bores in place of one).

Additional strategies for ‘Make Good’

Pumping rates in landholder bores may be affected during mining. This has been considered in the Make Good assessment, and, options such as an increased capacity pump, lowering of pumps, a second bore and/or increased water storage facilities at the surface will be incorporated into the Make Good agreement so that the water supply can be maintained at the level previously delivered.

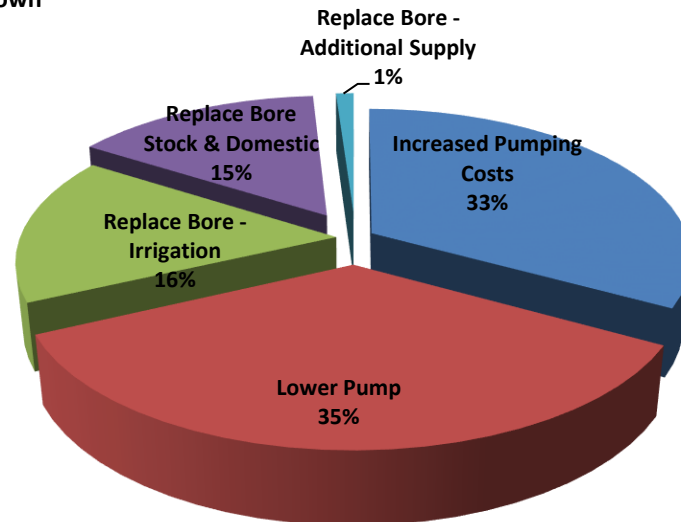
It is also acknowledged that due to the naturally occurring very high iron levels in the groundwater system that iron encrustation of bores may also occur at a higher rate than occurs currently. Provisions for managing iron encrustation in bores that are drawn down significantly can form part of the revised Make Good arrangements, subject to having conducted pre-mining baseline bore assessments.

The combination of potential temporary yield loss and encrustation of bores and pipes may lead to less efficient water distribution networks for some landholders; this is acknowledged and can be incorporated in the revised Make Good arrangements.

Provision of water to properties via tankers is not a key strategy; there are alternative options available that are articulated in more detail in the revised Hume Coal Make Good assessment report.

It is possible that either circumstances are different to what has been assessed, or individual landholders may propose alternative Make Good provisions during negotiations. This is expected and will be considered, providing the costs and logistics are reasonable, and do not exceed those associated with the preferred options outlined above (or what is considered reasonable), and that any such alternative option was legally binding (see below).

Figure 2
Make Good Breakdown

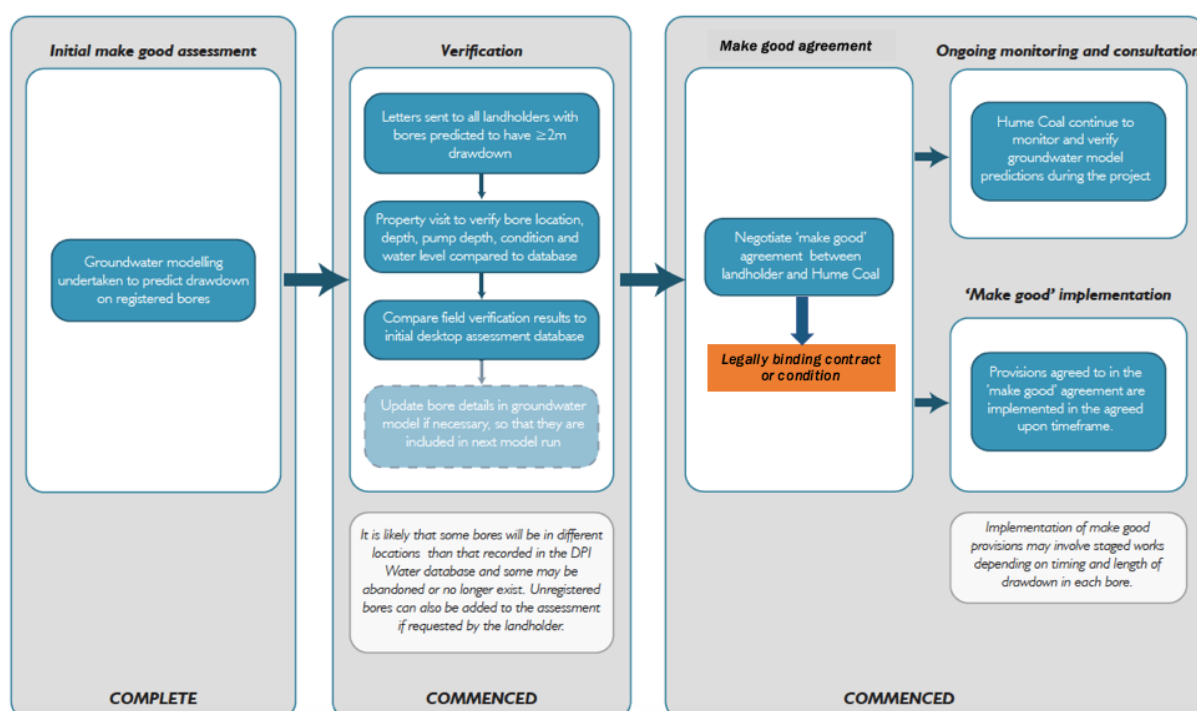


4.5 Proposed Make Good Process

The process to determine Make Good measures outlined in Figure 5. This can be managed through an appropriate condition of consent. It broadly aligns with the approach taken in Queensland, and involves:

- Undertaking an assessment of the likely impacts. This would build on the initial desktop assessment already undertaken and include more detailed individual site and bore/infrastructure assessments as defined in the Hume RTS.
- Negotiate with each landholder, clearly identify the scope of any impacts which are the subject of the agreement, and enter into legally binding Make Good agreement, specifying the measures required to offset any exceedance of the AIP minimal impact criteria, any ongoing monitoring to verify impacts, the circumstances in which the agreement may be varied or re-negotiate deviation of measured pressure decline impacts from those predicted, and dispute resolution mechanisms.
- Implementing and complying with the Make Good agreement.
- Ongoing Monitoring by Hume Coal to verify model predictions.

Figure 5 Proposed Overall Process for Determining and Managing Make Good Measures



4.6 Legal Status of Make Good Measures

Other mining approvals in NSW have referred to existing Make Good conditions in the form of 'compensatory water supplies'.

There is no reason why Hume Coal should not assume that a very similar condition will be included in the conditions of consent for the project and that the Hume project should be treated no less favourably than other approvals.

For example, the conditions of consent for a coal mine approval approved by the IPC(PAC) on January 1, 2018 provides the Make Good mechanism simply as follows:

Compensatory Water supply

Prior to the commencement of extraction of coal, the Applicant must notify any owner of privately-owned land whose water supply could potentially be affected by the development of their right to a compensatory water supply, if their water supply is adversely and directly impacted as a result of the development.

The Applicant must provide a compensatory water supply to any owner of privately-owned land whose water supply is adversely and directly impacted (other than a negligible impact) as a result of the development, in consultation with CLWD and to the satisfaction of the Secretary.

The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent in quality and volume, to the loss attributed to the development. Equivalent water supply must be provided (at least on an interim basis) within 245 hours of the loss being identified. For resolution.

If the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of those measures, then either party may refer the matter to the Secretary

If the Applicant is unable to provide an alternative long-term supply of water, then the Applicant must provide alternative compensation to the satisfaction of the Secretary.

Note: The burden of proof that any loss of surface water or groundwater access was not due to mining impacts rests with the Applicant.

A robust condition of consent regarding Make Good would be:

- enforceable in a court of law;
- remain in force for the whole of the duration of any exceedance of the relevant AIP criteria attributable to the Hume Coal project;
- provide for any obligations on the landholder regarding the bore to be included as discretionary conditions on the water management work approval by way of s.102 of the WMA 2000;
- provide for the transfer of any future or on-going obligations to the new owner without derogating from the mining company's obligation to Make Good.
- provide for the ability to transfer water bore obligations to a new landowner if the subject property is subsequently sold;
- provide for amendment of any Make Good agreement relating to an irrigation bore if all or part of the aquifer access licence nominating that bore is subsequently sold;
- provide for other amendments to an agreement if:
 - there is a material change in circumstances;
 - the Make Good measures are ineffective; or
 - another effective and more efficient measure is available.
- provide for a process for assessment and agreement making;
- provide for a set of Make Good measures referred to above as Mitigation Measures 1 to 5 as the default measures in the condition of consent if the mining company and a landholder cannot reach an agreement;
- provide that if a landholder refuses to receive the Make Good measures duly determined as appropriate then the mining company ceases to have any further Make Good obligations regarding the water bore.
- provide for alternative dispute resolution mechanisms as an alternative to expensive recourse to the Courts.

There is no record of the Department of Planning & Environment being required to adjudicate on disputes between water bore owners and mining companies where compensatory water supply conditions apply. In the event of disputes there are recognised resolution pathways through alternative dispute resolution, either involving government or not.

Management of Make Good for groundwater impacts apply in other jurisdictions and managed on the basis the impacts are temporary, reversible and occurring a different time throughout the mine life, whilst recognising that no landowner will be left without water.

4.7 Cost Arrangements

Consistent with the approach taken in Queensland, and by the NSW Government in relation to the noise and dust impacts of mining developments, the following would apply in relation to costs:

Hume Coal would bear all reasonable costs associated with:

- Entering into, or amending, any agreement. This may include the costs incurred during the negotiation or preparing of the Make Good agreement including costs associated with:
 - Providing expert advice to landowners to enable them to make informed choices about whether to enter into an agreement, including associated accounting, hydrogeological, legal or valuation adviceⁱ; and
 - Drafting any agreement.
- Implementing the agreed measures, including capital and installation costs and financial compensation for increased operating costs, and other impacts as agreed; and
- Alternative dispute resolution.

February 2019

ⁱ *Commencement of mining means the start of construction of the access drifts not first coal production.*

ⁱⁱ *Post mining means 22 years after commencement of mining and includes rehabilitation.*