Proposed Great Artesian Basin Offset Strategy

Adani – Carmichael Coal Project

FINAL REPORT V2.2 – Adani GAB offset strategy (EPBC Act referral 2010/5736)
Updated responding to Australian Government and DNRM comments

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CSIRO Land and Water
For Adani Mining Pty Ltd
Structure of proposed GAB offset strategy

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1 Introduction – statement of requirements and overview of GAB offset strategy

This report sets out a Great Artesian Basin (GAB) offset strategy design which will meet the Great Artesian Basin (GAB) offset measures which were placed on the Adani Mining Pty Ltd proposed Carmichael Coal Mine under the *Environment Protection and Biodiversity Conservation Act 1999* under EPBC Act referral 2010/5736 and approved variations. The GAB offset strategy is structured as follows. The introductory section presents a summary of the offset requirements (conditions) which this program is intended to meet and the proposed approach to delivering these through an assisted procurement tender approach. In section two we identify the pre-conditions for such an approach to be effective and confirm they are present with respect to the required GAB offset measure. In section three we describe the proposed offset program. Section four outlines the proposed procurement tender approach and section five a monitoring and reporting plan.

1.1 Statement of the offset requirements

Adani Carmichael Coal Mine Project (EPBC 2010/5736) has been conditioned through the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) to implement an annual Great Artesian Basin offset measure. The relevant conditions involve several elements as follows (biodiversity specific elements are omitted). First there is an overarching requirement:

**Biodiversity Offset Strategy and biodiversity funding**

9. To compensate for authorized unavoidable impacts on Matters of National Environmental Significance, the approval holder must submit ... a GAB Offset Strategy to the Minister for approval at least three months prior to commencement of mining operations.

10. Offsets for authorized unavoidable ... water resource impacts must be managed in accordance with the ... GAB Offset Strategy.

There are two ‘general requirements’ which relate to the GAB Offset strategy:

**Condition 11(k):**

“implementation of an annual GAB offset measure, of returning at least 730 megalitres per annum for a minimum five year period from commencement of excavation of the first box cut, to offset the predicted annual water take associated with the action. This offset measure is to achieve a measurable outcome in accordance with one or more of the following principles:

(i) reduce current extraction rates from the GAB to increase hydraulic pressure
(ii) increase pressure in the GAB
(iii) protect and rehabilitate the GAB springs
(iv) other measures consistent with government policies and strategies to protect and manage the GAB.”

**Condition 11(l):**

“the offset measure described in Condition 11(k) is to be developed and delivered in consultation with the Queensland Government department administering the authorisation of the water take.”

The GAB offset strategy also complies with the substance of conditions 11(c) and 11(f) apply which specify a monitoring plan and an outline of how compliance will be reported, although these are not specifically linked to the GAB offset strategy requirement.
Approval condition 12 notes that mining operations must not commence until this strategy is approved by the Minister in writing, and that the approved GAB Offset Strategy must be implemented. This GAB offset strategy may be revised following groundwater flow model reviews required under conditions 22-24.

1.2 GAB offset strategy approach

The proposed program is an assisted procurement tender. The program will directly reduce extraction rates from the GAB by reducing artesian groundwater extraction through capping free flowing artesian bores to reduce flows, and piping artesian bore drains to reduce consumption from capped bores. Offsets are able to be supplied by landholders, bore trusts and community bores from the great artesian basin. A supported competitive tendering approach is presented as the mechanism for systematically selecting amongst the offered offset options. The approach is consistent with and complements the actions undertaken by the Queensland Government under the Great Artesian Basin Sustainability Initiative Stage 4. The program involves:

1. Identifying a suite of ‘free flowing’ bores and related projects and the works required to return groundwater to the GAB by reducing flow rates.
2. Engaging with landholders to identify their willingness to participate and at what price and allow for costing of engineering works and calculation of groundwater return.
3. Identification and contracting of a subset of identified opportunities which will deliver the required groundwater return.
4. Implementation of engineering works and associated performance reporting measures to reduce current extraction rates.
5. Reporting on these works and the water returned to the GAB.

1.3 Consultation with Queensland Government

This offset strategy has been prepared in consultation with the relevant Queensland Government Department as required under condition 11(i). Details of meetings and other consultations such as information provision are available from Adani on request. The GAB offset strategy incorporates specific attention to complementarity with the GABSI program implemented by the Queensland Government across measurement, landholder engagement, approvals and protection of water savings, and reporting.

1.4 Structure of GAB offset strategy

The proposed GAB offset strategy design is structured as follows. The overview describes what is proposed to count as an offset, who would be eligible to supply an offset within the proposed strategy, and a summary of the proposed supported procurement tender approach.

The third section focuses on the mechanics of offset provision. In section three we firstly summarise the availability of water savings from the GAB which can then be applied as offsets. Next a methodology for calculating water savings which form the offset is described, before detailing when other benefits such as distance to the mine site and protection of artesian springs may be used to aid in prioritising investments to deliver the required 730ML per year water returned to the GAB. Finally we set out the process for capturing water savings as offsets.

The process for securing the offsets with landholders is the focus in section four. A supported procurement tender approach is set out incorporating:

- Recruitment of landholders,
• Desktop evaluation and background information to help scope proposals,
• Tendering process incorporating an agreed scope of works, landholder and where necessary additional works quotes,
• Works approval process, and
• Monitoring and reporting of works.

The final section presents a design for assembling the outcomes of the GAB offset strategy in order to capture the required information for EPBC reporting and monitoring of the offset condition.
2 GAB offset strategy overview

2.1 Proposed offsets options

The GAB offset strategy is to return a minimum of 730Ml per year of flows to the GAB for a minimum five years. The dominant water use in the GAB is for stock and domestic purposes by agriculture (Great Artesian Basin Consultative Council, 2000; Department of Natural Resources and Mines, 2012). Water use is via bores tapping the GAB aquifer, many of which are free flowing, meaning that water flows under pressure from the aquifer, although around two thirds of these have been capped through years of government investment under the Great Artesian Basin Sustainability Initiative (GABSI) which is now entering its fourth and final stage. Approximately 155 GL/year of groundwater is discharged through bores and wells (Smerdon and Davies, 2012). Reducing flows from the basin offers the obvious potential groundwater offset opportunity.

Three options are available for reducing flows and therefore creating an offset returning water to the basin as shown in Figure 2-1 (and Box 1). Where free flowing bores remain their flows may either be eliminated by plugging the bore, or more likely capping it to control future flows and allowing existing uses to be maintained. In many instances water is supplied to stock through open bore drains, often kilometres long, from which the majority of water is lost through infiltration or evaporation rather than consumed by stock as intended. Piping of bore drains eliminates infiltration and minimises evaporation thus significantly reducing water flows from the basin.

Reduce GAB flows through ...

Reduce bore flows (cap bores)

1. Plug bore with no further use possible

Reduce water use (bore already capped)

2. Cap bore to allow future flows to be controlled

3. Reduce consumption by saving infiltration and evaporation from bore drains

Figure 2-1: Potential pathways to reducing flows from Great Artesian Basin

Box 1: Summary of offset options

- **Offset option 1:** Free flowing bores may be plugged with no further use possible. Existing licences amended to reflect changed use conditions.
- **Offset option 2:** Free flowing bores may be capped to allow future flows from the GAB to be controlled. Existing licences amended to reflect changed use conditions.
- **Offset option 3:** Reduce water consumption by implementing piping projects to bores already capped to eliminate evaporation from bore drains. Existing licences amended to reflect changed use conditions – state that bore drains can no longer be legally used.
2.2 Who will supply the offset

Landholders will be asked to supply the offsets by agreeing to either plug, cap or pipe water from their bores. Many bores are free flowing because of the way they are constructed, their age, or other factors such as corrosion (Figure 2-2 shows some of the history surrounding artesian bores). Some bores are owned and managed as community or trust bores which complicates arrangements in these instances, although the offsetting arrangement with no requirement to cost-share may prove attractive in these instances. Landholders will supply the offset but they may not be required to deliver works. Instead they could facilitate access and works would then be directly contracted to suitably qualified sub-contractors as detailed in Section 4.

Within the broader Great Artesian Basin in Queensland, the Department of Natural Resources and Mines estimated that there are approximately 220 rehabilitation and piping projects and 140 piping only projects available. Works are desired closer to the Carmichael mine site. Restricting analysis to the Barcaldine GAB Water Resources Plan Management Area (WRPMA) to provide an indication of projects closer to the mine site there are approximately 50 rehabilitation or rehabilitation and piping projects, and 30 piping only projects available. That is, there are around 80 projects available within approximately 300km which could provide offsets.¹

Approximately half of these potential projects have had some prior analysis or ‘checking’ via some form of mapping by the Queensland Government. Very little flow data is available which would allow an estimate of how many bores will need to be capped to deliver the required offset. Furthermore, flow rates vary dramatically from bore to bore meaning that offset provision may require as few as 5 or more than 20 bores to be capped and piped.

¹ Some Barcaldine WRPMA projects are likely to be undertaken by GABSI4 reducing offset availability.
2.3 What is a procurement tender approach?

The wide variation in the number of projects needed to deliver the offset is further complicated by large differences in project complexity and thus cost. In order to cost-effectively deliver the offset requirement a procurement tender approach will be implemented. The procurement tender approach invites landholders to submit projects to supply offsets, from which a subset are selected which deliver the GAB offset strategy most cost-effectively. Procurement tenders are also known as reverse auctions and have now been widely applied in Australia by governments, NRM groups and NGOs in addressing a wide range of environmental issues (Whitten et al., 2013). The premise for a procurement tender approach is simple – costs of bore remediation works are highly heterogeneous as are the water savings achieved. Costs comprise elements that are delivered by third parties (most works) and landholders (some works, ongoing monitoring and risk, inconvenience). Remediation works also deliver some benefits to landholders (lower maintenance, better secured water supply). It is not possible to estimate the costs to individual landholders in advance and offer each landholder a reasonable price. Instead landholders are asked to submit a bid setting out their requested payment. Works costings can be via landholders or via a separate quote. Those projects which represent better value for money can be selected from tenders offered delivering water savings at a reasonable cost.

The steps in landholder participation are set out in Table 1. The participation process is carefully supported as set out in Figure 2-3, to ensure landholders both understand the process and their
role, and to minimise the cost and complexity of their participation. That is, a successful GAB offset strategy will involve a supported interaction between landholders and the service provider appointed by Adani to ensure that appropriate landholders are identified, supported with good information and advice, so that sound works plans can be designed, costed, and where accepted, implemented to deliver water savings.

Table 1: Steps in landholder participation

<table>
<thead>
<tr>
<th>Steps in landholder participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contacted / receive information about GAB offset strategy</td>
</tr>
<tr>
<td>2. Register interest / communicate process details</td>
</tr>
<tr>
<td>3. Preparatory information identified</td>
</tr>
<tr>
<td>4. Formalise an agreed works plan</td>
</tr>
<tr>
<td>5. Calculate and submit tender</td>
</tr>
<tr>
<td>6. Contract offer received (or unsuccessful notification)</td>
</tr>
<tr>
<td>7. Works undertaken</td>
</tr>
<tr>
<td>8. Participate in monitoring.</td>
</tr>
</tbody>
</table>

Figure 2-3: Steps in landholder participation as a design guide for environmental procurement auctions

Source: (Whitten et al., 2013)

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In summary the GAB offset strategy involves the following elements which is set out in more detail in Section 3:

i. Landholder opportunity to nominate works that present water saving opportunities: this will involve a combination of an open expression of interest combined with targeted invitations to prospective tenderers and consultation with local government and indigenous communities.

ii. Negotiation of agreed workplans which include elements to reduce water extraction (GAB water savings), monitor pressure, protect nearby springs, and maintain consistency with other GAB strategies.

iii. A process for identifying and ranking opportunities: based upon the primary preference of providing a quantified groundwater offset (building on Qld GABSI accepted measurement methodologies) located within the Great Artesian Basin, a secondary preference of protecting GAB springs, and if necessary a third preference of being located closer to the Carmichael Mine Site.

iv. Project management and implementation support to ensure works approvals and construction standards are met, and facilitate licence modifications as required.

v. Collect appropriate monitoring evidence that the offset has been maintained for the period required and support GAB pressure monitoring. This forms the practical element associated with a broader requirement to make available data as relevant to support monitoring and compliance.
3 Mechanics of GAB offset strategy

3.1 Availability of water savings from GAB

The Australian Government in collaboration with each of the state governments of the GAB have been funding the Great Artesian Basin Sustainability Initiative (GABSI) since 1999 (Department of Natural Resources and Mines, 2014). The purpose of GABSI is to accelerate work to repair uncontrolled artesian bores and replace open bore drains to save flow and increase pressure in the GAB to ensure long term sustainability of this vital water resource (SKM, 2013; Great Artesian Basin Coordinating Committee, 2013). Since the GABSI program commenced, over 650 bores have been controlled, almost 20,000 kilometres of bore drains eliminated, and over 30,000 kilometres of piping installed (GABCC 2014, SKM 2014). These works have resulted in an estimated water savings of over 200,000 ML per annum (GABCC 2013, SKM 2014). Despite GABSI efforts, including the most recent and final funding under GABSI stage 4, there are still hundreds of free-flowing bores, including high-flowing and reflowing bores, and a significant number of these are located near springs protected under the Environment Protection and Biodiversity Conservation Act 1999 (Great Artesian Basin Coordinating Committee, 2013). In addition, there remain thousands of kilometres of flowing bore drains across the GAB.

To ensure that water savings are genuine and in addition to the legal management requirements of landholders we propose to model overall eligibility for water savings to be considered an offset closely on the Queensland GABSI program as follows:

- Uncontrolled bores drilled in 1954 (or prior)
- Uncontrolled bores drilled after 1954 and in Queensland Government designated corrosive areas (constructed of steel casing)
- Legal and existing bore drains.

In Queensland, approximately 250 (now reduced to 220) bores are still to be rehabilitated and approximately 5500km of bore drains to be replaced with piping (Great Artesian Basin Coordinating Committee, 2013). A potential water savings to the GAB of 75,000 ML per annum could be achieved if the works are completed. A significant number of these are located relatively close to the Carmichael Mine Site as shown in Figure 3-1. Table 2 summarised the remaining projects in Queensland along with those closest to the mine site (from DNRM database).

Table 2: Remaining potential water savings in Queensland and in the vicinity of Carmichael Mine Site

<table>
<thead>
<tr>
<th>Project type*+</th>
<th>Potential Projects within Barcaldine GAB WRP area</th>
</tr>
</thead>
<tbody>
<tr>
<td>370 - Bore and piping projects</td>
<td>46 - Barcaldine WRP management area</td>
</tr>
<tr>
<td>236 - Rehab/rehab and piping projects</td>
<td></td>
</tr>
<tr>
<td>134 – Piping projects (bore controlled)</td>
<td>28 - Barcaldine WRP management area</td>
</tr>
</tbody>
</table>

* Approximately half of the projects have been ‘checked’ via some form of mapping
+ ~74 potential projects <300km from mine site
Figure 3-1: GAB bores and status in Queensland

Source: Created from Queensland Government Groundwater Database 2015
3.2 Calculation of groundwater savings to be applied as an offset

Water savings available from each of the three project types set out in Figure 2-1 are proposed to be calculated using the same methodology as is applied in the Queensland GABSI program. The reasons for this are:

- The Queensland GABSI team has already spent considerable time identifying the relative water savings available from various investments in order to ensure their own investments represent the most cost-effective options available. The Queensland Government estimates used in GABSI4 represent conservative estimates of the potential water savings. Thus it offers a transparent and tested methodology for calculating water savings which is likely to be lower than actual water savings achieved.
- The Australian Government has accepted the Queensland Government’s methodology for calculating water savings.
- Use of the existing Queensland approach avoids confusion across programs.

The estimates of savings under the Queensland Government GABSI stage 4 program for each potential project type are as follows:

- Plug bore: Offset available (ML/yr) = total flow saved per yr.
- Bore capped (but not piped): Offset available (ML/yr) = measured flow volume per yr / 3
- Cap and pipe or pipe only (bore already controlled): Offset available (ML/yr) = 0.866 of measured flow per yr

The total water saved and available for an offset is therefore the sum of the individual “plug”, “cap” and “pipe” projects as completed. The total projects completed must deliver aggregate water savings equal to or exceeding 730ML per year.

3.3 Targeting and prioritisation of projects for investment

In determining which projects are to be invested in to deliver the required water savings as an offset the offset conditions and mine owner preferences will also be taken into account by limiting eligibility, targeting preferred project or landholder characteristics, and prioritising particular project attributes. Initially local government will be approached in advance of the landholder component of the GAB offset strategy to identify whether there are eligible community projects which should be considered prior to approaching private landholders.

Eligibility for offsets is proposed to be limited initially to bores (and bore drains) within the Eromanga formation of the GAB and north of the Surat Basin.

Landholders who meet the following preferred elements will be targeted for participation in the GAB offset strategy:

- Proximity to mine site (<300km initially targeted)
- Works near springs
- Additional targeting may arise from consultation with local indigenous groups
Finally, for those projects identified for consideration in the reverse tender specific prioritisation weights will be applied. Works within 50km of a spring complex will have a 30% additional weighting for prioritisation purposes consistent with the GABSI 4 prioritisation of GAB springs. The Barcaldine Spring Supergroup is largely located within the area targeted for projects and includes a number of EPBC and non-EPBC listed springs (Figure 3-2). The Barcaldine Springs Supergroup includes the identified at risk Doongmabulla Springs. The relevant GAB recharge formation is the Moolayember formation. The additional springs weighting and distance from the mine site being less than 300km will ensure bores tapping this formation are prioritised. That is, the proposed methodology targets and prioritises bores in the immediate vicinity of the springs which are likely to tap into the same aquifer is the best way to manage impacts. We do not propose to prioritise between listed and non-listed springs as non-listed springs are also likely to have high environmental value. There is no additional weighting for monitoring or metering as they will be compulsory (see Section 4.5). If Works more than 300km from the mine site are required these will be penalised by 30% in the tender process.

The proposed prioritisation metric is:

\[
\text{Benefits index} = \frac{\text{Offset available ML} \times \text{springs} \times \text{location}}{\text{Bid cost}}
\]

Where the weightings are:

- If < 50km from springs: \( \text{springs} = 1.3 \)
- If >300km from mine site: \( \text{location} = 0.7 \)

And

\[
\text{Bid cost} = \sum (\text{landholder price} + \text{works quote})
\]

Where: landholder may supply both or works quote may be separately sourced.

Proposals would be prioritised for investment by ADANI in order of benefits index\(^3\) until the aggregate sum of water savings to the GAB available as an offset is at least 730ML per year. Cost is included as a denominator to allow Adani to identify the least cost set of offsets delivering the weighted benefits index (but not strictly the least cost of delivering the offset volume required).

\(^3\) Subject to total cost minimisation on last bid.
3.4 Use of groundwater savings as an offset

Use of water savings as an offset requires that they are legally protected and cannot be accessed by landholders in the future. This is also a key element of the GASBI program. There are two main legislative instruments which govern bore rehabilitation works and water use entitlements: the Sustainable Planning Act 2009; and the Water Act 2000. Development permits are required for the construction or rehabilitation of uncontrolled bores under the provisions of the Sustainable Planning Act 2009. The development permits issued contain relevant information about the bore construction standards that must be met or maintained by the bore owner. For example, bores that are located in an identified corrosive area must be constructed with an inert casing to ensure long term integrity of the bore is maintained.
A water licence is issued under the provisions of the *Water Act 2000* to take and use water from a bore. For water being taken and used in a bore drain, the water licence contains special conditions that allow the bore owner to distribute water on identified land parcels. The licence conditions are amended following landholder participation in GABSI remediation works of the bore and removal of bore drains through installation of piping projects. The amended licences then contain conditions that state a bore owner can no longer use bore drains but instead can only distribute the water on identified land parcels using pipelines to tanks and troughs. The water licences and associated conditions are recorded on the Water Management System (WMS) within the Department of Natural Resources and Mines. The WMS is a system that allows for the tracking of licence considerations, for example, new applications, amendments, renewals, expiry, transfer, trading etc. The ‘protection’ of the water saved by the rehabilitation of an uncontrolled bore and/or the piping of a bore drain is achieved through the GAB Water Resource Plan. This legislation has strict rules governing ‘the new take of water’ from the Basin which ensures the water is valued and protected. The contracting approaches under the GABSI arrangements provide a reasonable degree of assurance and an acceptable template for legal provision of an offset.
4 A supported procurement tender

In order to deliver the required 730ML per annum of water savings to the GAB a number of bore and drain networks will need to be capped and piped, with the exact number dependent on the water savings available from each project. As set out in Table 2 there are more than seventy potentially eligible projects within 300km of the proposed Carmichael mine site, each offering the potential for an unknown water saving, and some of which are almost certainly within 50km of an identified spring within the Barcaldine Spring supergroup.

Landholders will be approached to develop proposals for offset investment by Adani is through a supported procurement tender. The tendering approach offers the potential to select a suite of projects from those offered which delivers water savings cost-effectively, and prioritises those projects which also deliver environmental benefits through the protection of GAB springs. Each of the elements in Table 3 is briefly described in the remainder of this section. The majority of the steps are supported through a ‘service provider’ who would be engaged by Adani. The service provider, or potentially several providers, will require key skills including:

- Landholder contact and communication exploring opportunities
- Assisting in the scoping and preparation of proposed works plans
- Facilitating landholder tenders including the possibility of sourcing third party engineering works quotes
- Assisting in the coordination of the tendering process, particularly where landholder and works elements present a combined offer
- Contract and works management

A synopsis of the proposed procurement tender approach is shown in Figure 4-1

Table 3: Supporting landholder participation to deliver water savings from offset purchaser perspective

<table>
<thead>
<tr>
<th>Steps in landholder participation</th>
<th>Delivered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicate with target landholders about GAB offset strategy</td>
<td>Service provider</td>
</tr>
<tr>
<td>2. Identify interested landholder parties</td>
<td>Service provider</td>
</tr>
<tr>
<td>3. Desktop analysis of proposed works</td>
<td>Service provider</td>
</tr>
<tr>
<td>4. Agreed scope of works (from which groundwater offset can be calculated)</td>
<td>Service provider</td>
</tr>
<tr>
<td>5. Receive and bundle tenders for works</td>
<td>Service provider/Adani</td>
</tr>
<tr>
<td>6. Rank offers by benefit index and make contract offers</td>
<td>Adani</td>
</tr>
<tr>
<td>7. Contracts and works scheduling</td>
<td>Service provider</td>
</tr>
<tr>
<td>8. Support / seek works approvals</td>
<td>Service provider/Adani</td>
</tr>
<tr>
<td>9. Ensure works delivered</td>
<td>Service provider</td>
</tr>
<tr>
<td>10. Monitor and communicate landholder performance</td>
<td>Service provider/Adani</td>
</tr>
</tbody>
</table>
Figure 4-1: GAB offset strategy implementation model of engagement with landholders

4.1 Engaging with landholders to identify interested parties

Previous use of procurement tender approaches with private landholders have relied upon a combination of voluntary self-nominated entry and individual contacts. Reliance on voluntary self-nominated entry will be difficult for the GAB offset strategy because there have already been three large scale GABSI investments in Queensland. This is backed by Queensland GABSI staff reporting that GABSI4 is “moving into higher hanging fruit” and due to the voluntary nature of the program, these bores are more difficult to progress due to a lack of landholder participation. Some landholders may have been deterred from Queensland Government GABSI programs due to the requirement for co-investment. Although the GAB offset strategy has been designed to avoid competition between GABSI and offsets, the absence of a cost-share requirement may prove particularly attractive to landholders, especially as much of the region has recently been in drought and landholders may find it difficult to co-invest in GABSI programs. Nevertheless, GABSI communications are likely to support participation in the GAB offset strategy as landholders will almost certainly have already received information about the GABSI indicating that their bore(s) are eligible for funding (see Box 2). Complementing the GABSI approach, an active support program is proposed to support groundwater offsets and is likely to be necessary to attract landholders to the Adani GAB offset strategy.
Box 2: Summary of Queensland Government GABSI stage 4 program engagement with landholders

**GABSI Stage 4 – Landholder Engagement Process**

**Who can apply?**

Any bore owner can make a submission for government financial assistance under the GABSI in Queensland.

**What projects are eligible for financial assistance?**

The water efficiency projects to be targeted under the GABSI are:

A. Rehabilitation of legal uncontrollable flowing bores; and / or
B. Piping of a legal bore drain
C. Rehabilitation of a bore previously rehabilitated under earlier programs where there has been a critical infrastructure failure.

**Priority Setting**

It should be noted that Queensland will be competing against other states for the Commonwealth funding under GABSI Stage 4. The Queensland Government will select projects based on the following weightings:

- Value for money (60% weighting):
- Benefits to springs (30% weighting):
- Monitoring (10% weighting):

**The Process:**

1. The applicant:

   Obtains Department certification in terms of eligibility of the bore for financial assistance under the GABSI. For piping only projects the bore must meet the minimum standards for the construction and reconditioning of water bores that intersect the sediments of artesian basins in Queensland. For rehabilitation of an eligible bore the applicant prepares a bore rehabilitation proposal (certified by Class 3 driller). The applicant is required to survey the winter extent of the bore drain. If required, the applicant may propose work to bring the bore up to the construction standards (certified by Class 3 driller). The applicant engages a consultant to develop a piping design to replace the bore drain and must also meet their obligations under the Aboriginal Cultural Heritage Act 2003 and the Vegetation Management Act 1999. In addition, they must have the piping design and proposed construction certified by an RPEQ. The applicant lodges the submission with the Department.

2. The Department:

   a. Considers the submission, and seeks additional information as required.
   b. If the submission is supported by the Department:
      i. The applicant is notified; and,
      ii. It is forwarded to the Commonwealth

3. The Commonwealth notifies the Department that the submission has been approved / not approved.
4. The Department notifies the applicant that the submission has been approved / not approved. If the submission is approved, an ‘Agreement for the project to be carried out under the GABSI’ will be provided to the applicant.
5. The applicant:

   a. Signs the Agreement and returns it to the Department.
   b. Delivers the project as outlined in the submission.
   c. Provides all disbursement information to the Department
6. The Department disburses the government financial assistance to the applicant
7. The Department reports to the Commonwealth that the approved projects have been completed
8. The Commonwealth provides payment of their contribution to the State

**Source:** (Department of Natural Resources and Mines, 2015)
The proposed Adani Carmichael Mine groundwater offset landholder recruitment process involves the following elements:

- A communications program promoting the scheme within initial target zone (<300km from the Carmichael mine site) targeting local newspapers, radio, and landholder networks
- Letters to individual landholders of bores listed in the DNRM database detailing the GAB offset strategy and opportunity
- Voluntary expression of interest (EOI) phase
- Approaches to individual landholders to supplement voluntary EOIs and ensure sufficient proposals to deliver the offset cost-effectively.

Individual landholders can be identified and contacted from a publicly available list of eligible bores under the GABSI program which can be accessed from DNRM Queensland. The DNRM list includes basic information on bores likely to be eligible for different project types (piping / rehab / piping and rehab); including previous investments. It is unlikely sufficient voluntary self-nominated EOIs will be received as detailed above. Hence, individual landholders are likely to be contacted to request a discussion of the opportunity (obviously landholders who decline the approach would not be further approached).

Landholders considering an expression of interest would be provided with an opportunity to discuss their offset potential, and summary material setting out the offset process, tendering approach, and support available to them to assist with their participation. Additional detail on the necessary information is provided in the implementation plan.

**Outcome:** A list of landholders who have expressed interest in offsetting progressing to scope proposed works

### 4.2 Desktop analysis and steps to agreed scope of proposed works

The proposed support steps available to landholders are:

1. One-on-one meeting with landholders to explain the GAB offset strategy and the assistance available (this may be the same as in 4.1 or in addition). Discussions would include landholder’s property management plans and information to tailor the pre-feasibility design where possible to maximise the property management outcomes and identify the benefits of participating in the strategy

2. A desktop analysis of bore condition and options available including a pre-feasibility design. This step will set out the options available, any on-site data collection that is necessary for quotes to be provided or tenders evaluated and as possible the likely scale of water savings.

3. If required on-site data collection would be undertaken, with the landholder’s agreement to progress to a scope of works. Where on-site collection is involved it will usually involve

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4 The initial target zone would be expanded if expressions of interest are considered unlikely to deliver the required groundwater offsets.

either a bore condition assessment and/or an estimate of flow rate where no post 1999 data is available (the GABSI assessment cut-off).

4. A scope of works is agreed and recorded. The scope of works allows for costings to be prepared. A second one-on-one meeting may be available at this point to conclude agreed project scope.

The proposed scope of works can be difficult for landholders to identify and cost. In particular, bore rehabilitation works require a detailed knowledge of the likely condition of bores and the potential for works to succeed. Costings will therefore require specialist quotes from appropriately qualified drilling contractors. GABSI initiatives in Queensland and elsewhere offer support to landholders in order to draw up a proposed works plan which can then be costed for implementation. In Queensland under GABSI Phase 3 and previous rounds of funding, state government (DNRM) would meet with landholders to explain the process and the subsidies available for bore rehabilitation. As part of this process DNRM provided a pre-design feasibility assessment which identified the indicative approach and relative costs associated with bore rehabilitation works. Under GABSI Phase 4 however it is proposed that landholders drive their own projects at all stages, including sourcing quotes from contractors, with DNRM conducting review and assessment before seeking Commonwealth approval to fund proposals.

DNRM have acknowledged the importance of face to face engagement with landholders under previous GABSI rounds in terms of getting landholders on board. Given the positive feedback from previous funding rounds, and that the GABSI Phase 4 arrangements are driven primarily by a lack of delivery support funding, the proposed GAB offset strategy adopts a model similar to the previous landholder assistance model to maximise the uptake of bore rehabilitation.

Bore rehabilitation works are dependent on factors such as the age, condition, previous construction materials and expertise, local conditions and other factors. Knowledge of these varies from bore to bore and is recorded in the DNRM database where available. In many instances a geophysical assessment of factors such as bore condition and flow rates will be required before works can be properly scoped and the potential for water savings evaluated. For example, pre-works flow estimates under GABSI accept flow measurements recorded since 30 June 1999, or the department or an independent third party measurement of the flow rate (Department of Natural Resources and Mines, 2015). In order to facilitate competition in the tender the service provider would continue to complete pre-feasibility assessments until a target of 1100Ml per year of potential savings were identified, or if this was not possible a second tender may be held.

The pre-feasibility assessment, the ‘desktop evaluation’, assembles the known information and identifies what would need to be collected in any site visit. Following any additional required data collection landholders would have the option of a second face-to-face discussion in finalising an agreed works plan. Works plans would need to meet the requirements of the ‘Minimum standards for the construction and reconditioning of water bores that intersect the sediments of artesian basins in Queensland’ (Department of Natural Resources and Mines, 2015).

Landholders will specify the payment (contribution) they require for the works to be undertaken and there is neither a requirement nor an intention that landholders would contribute towards works (although they may choose to do so where they provide benefits to their enterprise). Adani’s GAB offset strategy design incorporates landholders having the option of either: 1) preparing all costings themselves; or 2) for the service provider to source quotes for specific
elements of the proposed works (for example bore rehabilitation works) to be managed independently by Adani or their representative and landholders to specify any additional payment they would require for the project to be undertaken (covering for example ancillary costs, access and inconvenience and so on). Allowing Adani to independently manage some works elements could allow costs to be reduced through bundled contracts, such as a package of works in the region, or use of existing contracting arrangements.

**Outcome:** A set of defined projects for progressing to costing. Projects will be required to comply with the minimum project standards set out in Table 4. The likely water savings and nature of works involved will be known at this point and the GAB offset strategy adjusted accordingly.

**Table 4: Minimum project standards**

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Ongoing monitoring provisions</th>
<th>Change to licence provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plug</strong></td>
<td>No ongoing monitoring – plugged bores are inoperable (zero flows).</td>
<td>Licence cancelled.</td>
</tr>
<tr>
<td><strong>Cap only</strong></td>
<td>Pressure monitoring and water metering installed.</td>
<td>No modification to licence.</td>
</tr>
<tr>
<td><strong>Cap and Pipe or pipe only</strong></td>
<td>Pressure monitoring and water metering installed.</td>
<td>Licence change to remove provision allowing for open bore drains.</td>
</tr>
</tbody>
</table>

4.3 The tendering approach

The tendering approach is intended to allow for the proposed works for each bore to be compared in order to identify the set that deliver the required groundwater offset, including environmental co-benefits to groundwater springs, most cost-effectively. Although the approach seems different to that under GABSI it is similar. Under GABSI Stage 4, landholders send a submission including quotes to DNRM who assess the submission and send to Commonwealth for sign off and funding as set out in Box 3 below.
The Adani offsets works costings will often comprise two elements: a landholder component and an engineering works component. The landholder component would, at a minimum, comprise the payment that the landholder required in order to facilitate access to allow works on their property, any ancillary works that they require Adani to pay for, and to provide ongoing pressure monitoring for a minimum of five years. The bore engineering works component would comprise the required bore rehabilitation works component. Piping of bore drains and associated infrastructure could be costed either by landholders or as part of engineering works. Note that for contractual and costing simplicity we suggest that Adani guarantee bore rehabilitation engineering and related works for five years where they are delivered independently of the landholder. Landholders could opt to present a single comprehensive quote, or project costings would need to be assembled from landholder and engineering works quotes on a project by project basis. Landholders will continue to receive the benefits from remediated bores and associated works beyond the five year period and are thus likely to maintain works into the future as is the case for GABSI investments.

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6 Landholders would be expected to maintain works beyond the 5 year contract period. This is consistent with both the private benefits to their enterprise of improved infrastructure and the Queensland Government GABSI program.
Evaluation of tenders would proceed as detailed in section 3.3, with the benefits index ranking projects, and projects being recommended for contracting until the target of 730ML per year is achieved. Projects recommended for implementation would be informed and proceed to contract. A second set of projects may be wait listed in the event that a recommended project does not proceed. A final set of projects would be rejected as too expensive and appropriate feedback provided to landholders.

**Outcome:** A set of prioritised projects for progressing to contract and implementation.

### 4.4 Contracting and project implementation

Once a project is recommended the following process will be undertaken:

5. Landholder receives a letter indicating the project has been accepted along with a contract offer.

6. Works approval processes

7. Works implementation

8. License amendments or other changes as required

Contracting arrangements serve several roles in the GAB offset strategy: they confirm landholders’ agreement to progress project implementation; they set out the payment and other arrangements to landholders and Adani; and they form part of the process of legally recognising the water savings water that result will become an offset against EPBC conditions. Contractual arrangements under GABSI vary across the States, but in each case, the landholders are required to sign a contract to proceed with works, after the pre-feasibility design. The agreements typically outline conditions, contributions, timeframes and required works and funding. Government staff assist in the contractual arrangements and work closely with landholders. Similar contract support and advice will be provided in this GAB offset strategy, with contracts expected to cover elements such as terms and conditions, required adherence to standards of construction, access arrangements, time-frame to complete works, payment timing and methods, reporting requirements for works and thereafter. Separate contracts will obviously be required if Adani or their agent is managing engineering works.

Works approvals and development permits will be obtained for all projects under the provisions of the *Sustainable Planning Act 2009*. In addition, water use entitlements following post bore remediation works will be governed by the conditions specified by the department within the water permits/licences issued under the provisions of the *Water Act 2000*. Prospective landholders must also meet their obligations under the *Aboriginal Cultural Heritage Act 2003* and the *Vegetation Management Act 1999*. Piping design and proposed construction must be certified by a Registered Professional Engineer of Queensland (RPEQ).

In order for water savings to be considered an offset legal protection will be secured by amending bore licences to state that bore drains can no longer be legally used (as per GABSI programs). A similar requirement that bores are maintained for a minimum of five years will meet the requirement of a saving of 730ML per year for five years. Documentation of these agreements will be consolidated and submitted to the Australian Government as evidence that the required EPBC condition has been met.
Outcome: Works approvals received, projects implemented, water savings captured and recorded in licence variations. Data and material for initial offset condition having been met will be available from this step.

4.5 Ongoing reporting and monitoring

Landholders would be required to provide for at least five years:

9. An annual report indicating the condition of the works
10. Access if required for monitoring, maintenance or related activities
11. Participation in bore pressure and water use monitoring

As indicated above water savings requirements are required to be in place for a minimum of a five year period from the ‘first box cut’. Landholders will need to demonstrate that works remain operational across the initial five year period and report bore pressure and metered water use. Demonstration will be via an annual report indicating that the bore status remains operational, provision of the bore pressure and water use data, along with a date stamped photograph of the site and works.

The objective of increasing pressure in the GAB will take some time to deliver and would be achieved in the context of a wider investment in GAB sustainability. GAB pressure testing generally indicates that pressures in the GAB are stable or increasing (SKM, 2014). Under GABSI stage 4 landholders are encouraged to conduct their own independent water pressure monitoring, while pressure monitoring under previous GABSI programs has been optional and at landholder expense with consequent low uptake. Where landholders nominate to monitor their bore pressure under GABSI stage 4 arrangements, they are obliged to conduct pressure monitoring on a monthly basis until 2017 and provide the results to DNRM as part of the conditions of the grant (Department of Natural Resources and Mines, 2015). Landholders are required to test the bore pressure within 7 days of project completion and within the last 7 days of each month until 30 June 2017 (Department of Natural Resources and Mines, 2015). To ensure consistency, the department will provide a template for landholders to populate, along with guidelines for pressure monitoring equipment. The results are to be posted to the department within 7 days of the test being completed.

The GAB offset strategy would require all participating landholders to participate in pressure monitoring and water use metering over an initial five year period and supply the data to Adani in a form consistent with Queensland Government GABSI approaches. In keeping with current government protocols, landholders participating in the Adani GAB offset strategy would also be required to log data at the same intervals as prescribed under GABSI stage 4; however, the mode of how the information is to be reported may differ to increase convenience and accuracy (e.g. phone app, email, live data stream). Adani will analyse the data and provide an annual summary to the Australian and Queensland Governments for the bores counted as offsets under this strategy as well as supply the raw data to Queensland for inclusion within the wider GAB monitoring program.

Outcome: Evidence that offset condition has been met for the five year period, evidence that GAB pressure has been maintained or is increasing.
NOTE: if targets are not met then the steps outlined in 4.1-4.4 would be repeated, including areas more than 300km from the mine site and additional measures to support engagement with landholders. In the unlikely event that repeated tenders do not meet the target then negotiations with individual landholders would be undertaken in order to secure the remaining offset requirement. Queensland Government data clearly indicates that the potential supply is much larger than the required offset.
5 Reporting and monitoring

Adani will report to the Australian Government EPBC approvals area, in a form that delivers a suitable level of confidence, that the offset conditions have been met. The reporting structure will follow that which is required for the Australian Government’s investment in the GABSI initiative, and which is delivered in consultation with the Queensland Government GABSI team to ensure that the consultative approach followed in design is maintained in delivery.

5.1 Proposed reporting

In summary reporting is proposed as follows:

- Proposed offset works report
- Summary of works completion report confirming completion of GAB water saving works.
- Annual reports for the five year period for which water savings are required to be delivered.
- DNRM will assist in identifying the specific aquifer in which proposed and executed works are located (as an aid in identifying pressure increases).

The following reports will be provided as evidence of GAB offset strategy implementation and compliance:

**Proposed offset works report (pre-implementation)**

The proposed offset works report would be prepared immediately following the competitive tender stage (Section 3.3) and comprise a summary of the proposed works and how they meet the aggregate offset condition of 730ML returned to the GAB annually for five years, as well as any environmental or other co-benefits. The report will also identify the GAB aquifer the works relate to where it is known (noting that the absence of detailed mapping means this may not be possible). Should further efforts be required to secure the entire offset then these would be described by supplementary reports as these works are identified and agreed. The report would include copies of the proposed works plans which are recommended for contract. The report would be reviewed by the Queensland Government for consistency with the GABSI program and confirmation of expected water savings.

**Summary of works completion report**

The works completion report would contain evidence that the works had been satisfactorily completed, that bore licensing arrangements had been appropriately modified, and initial pressure test data for each completed work. It would confirm the aggregate water savings estimated via the GABSI methodology from project implementation and that it met the annual 730ML requirement. The report would contain a copy of all licence modifications, be reviewed by the Queensland Government to confirm that water savings were consistent with GABSI methodology, and confirm that all works were implemented according to the required standards and approvals.

**Annual reports**

Each year for the five year period a short report which confirms that water savings have been delivered for that year would be prepared. This report would contain basic compliance reporting as evidence works continue to be maintained and return water to the GAB. It would also
summarise bore pressure data and actual water use data compared to pre-works flows and confirm the 730ML requirement had been met in practice. The report will include acknowledgement that pressure data had been supplied to the Queensland Government. The final report of the series would summarise evidence as to whether GAB pressure had increased as a result of the offset works being implemented and confirm that the actual water savings were at least 730ML. In the unlikely event that actual water savings are measured as less than 730ML given our advice that the GABSI methodology is conservative, further projects would be identified and completed to ensure the 730ML offset requirement is delivered.

In order to assist with assurance as to the quality of the offsets we propose that the Queensland Government review the first two reports, and for annual reports acknowledge receipt of the pressure monitoring data which will form an element in each subsequent annual report.

5.2 Implementation plan

Note that an implementation plan is also being prepared which will inform Adani’s implementation of this GAB offset strategy. It will comprise elements relating to implementation support, encompassing what skills are required in supporting on-ground delivery, additional detail on implementation steps such as soliciting landholder interest, support which will be required for landholders to effectively participate such as workshops or individual advice and support, technical approach to evaluating different landholder proposals, and contracting landholders.

Table 4 provides indicative timing for the above procurement tender approach. The final section presents a design for assembling the outcomes of the GAB offset strategy in order to capture the required information for EPBC reporting and monitoring of the offset condition.
Table 5: Procurement tender approach – GAB Offset strategy implementation timing

<table>
<thead>
<tr>
<th>Steps in GAB offset strategy implementation</th>
<th>Months from GAB Offset Strategy approval and offset strategy commencement</th>
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</thead>
<tbody>
<tr>
<td>1. GAB Offset strategy approved by Minister</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18</td>
</tr>
<tr>
<td>2. Appoint delivery agent</td>
<td></td>
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<tr>
<td>3. Preparation for landholder tender</td>
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<tr>
<td>4a. Pre-tender communication</td>
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<tr>
<td>4b. Recruitment of landholders</td>
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<tr>
<td>5. Desktop evaluation</td>
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<td>6. Tendering process</td>
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<tr>
<td>7. Tender evaluation</td>
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<tr>
<td>8. Contracting with landholders</td>
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<tr>
<td>9. Works approval process</td>
<td></td>
</tr>
<tr>
<td>10. Project management (complete works as</td>
<td></td>
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<tr>
<td>required – bores, channels and infrastructure)</td>
<td></td>
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<tr>
<td>11. Monitoring and reporting - pre-offset GAB withdrawals</td>
<td></td>
</tr>
<tr>
<td>12. Monitoring and reporting GAB offset compliance - continues at least five years</td>
<td></td>
</tr>
<tr>
<td>13. Repeat Steps 3-12 if insufficient offsets achieved in first round.</td>
<td></td>
</tr>
</tbody>
</table>
References


SKM 2013. Great Artesian Basin Sustainability Initiative Phase 3 - Mid Term Review. ACT.


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