Evaluation of mechanisms for releasing unallocated water in Western Australia

Part A: Selection of market instruments

A report prepared for the Department of Water

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<td>DoW</td>
<td>Department of Water</td>
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<tr>
<td>GL</td>
<td>Gigalitres (one billion litres)</td>
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<tr>
<td>IWSS</td>
<td>Integrated Water Supply Scheme</td>
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<tr>
<td>kL</td>
<td>Kilolitres (one thousand litres)</td>
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<td>MJA</td>
<td>Marsden Jacob Associates</td>
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<td>ML</td>
<td>Megalitres (one million litres)</td>
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<td>NWI</td>
<td>National Water Initiative</td>
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<td>RiWI Act</td>
<td>Rights in Water and Irrigation Act, 1914</td>
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1. Introduction

This document provides an outline of the current water allocation release mechanisms used in Western Australia and explores alternative mechanisms, including the advantages and disadvantages of each. The report also provides a decision-making process for determining the most appropriate mechanism to use in any particular instance. We examine potential water releases from the Gnangara groundwater system as a case study to demonstrate the application of the decision-making framework.

The report also provides advice on a number of key implementation issues, including legislation and improving market-based outcomes through information gathering.

This document represents Part A of a two-part report comprising:

- Part A – a review of the market and other mechanisms available to release unallocated water; and
- Part B – a review of the economic value of water and the appropriate price if unallocated water is released through market mechanisms.

1.1. Arrangements in Western Australia

Demand for water resources across Western Australia has increased over time and a number of resources are approaching or have reached full allocation. As water becomes increasingly scarce, the economic value of the resource increases, and the limitations of traditional methods of allocating water to licence holders at no charge become apparent. Traditional approaches do not send an economic signal to users during the initial allocation of water, which may potentially contribute to the inefficient use of the resource.

The release of unallocated water in Western Australia has primarily been on a First In, First Served basis. First In First Served refers to the approach in which water allocations are provided to applicants based on the chronological order of their application. Once a resource is fully allocated, no further allocations are made available.

The First In, First Served principle has been used for many years throughout the State, is well known, generally accepted by the community, and is relatively easy to implement. However, DoW has reported that the principle has not always been implemented on a strict basis and in some circumstances has broken down.

First In, First Served approaches may also be complemented by application queues. Application queues may be used when additional water becomes available after licence applications for a particular water management area are refused. Refused applications are placed in a queue depending on the date they were originally submitted. Refused applicants in the queue are then approached on a First In, First Served basis to access the additional water. If any water is still available after the refused applicants are addressed, applications from other proponents may also be received and assessed.

A second method that has been explored in Western Australia is the Merit Selection approach. Merit Selection refers to a process in which economic, social and cultural criteria are developed and water allocations are awarded based on an assessment of each application against those criteria.

The Merit Selection approach was used by DoW in Gingin with limited success. The main disadvantages of the approach were the difficulty in defining strict criteria for the merit...
selection process and having the right skills and resources to assess the applications against these criteria. A further difficulty was the subjective nature of the criteria, which were open to differing interpretations.

1.2. National Water Initiative

A major driver of reform to the current system of releasing unallocated water is the Intergovernmental Agreement on a National Water Initiative (NWI). Several sections of the NWI refer to the release of unallocated water, the most significant are paragraphs 70 – 72, as detailed below.

<table>
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<tr>
<th>Release of unallocated water</th>
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<tr>
<td>70. Release of unallocated water will be a matter for States and Territories to determine. Any release of unallocated water should be managed in the context of encouraging the sustainable and efficient use of scarce water resources.</td>
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<tr>
<td>71. If a release is justified, generally, it should occur only where alternative ways of meeting water demands, such as through water trading, making use of the unused parts of existing entitlements or by increasing water use efficiency, have been fully explored.</td>
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<tr>
<td>72. To the extent practicable, releases should occur through market-based mechanisms.</td>
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The NWI encourages water to be released through market-based mechanisms (e.g. via auctions or direct water sales). DoW has made several policy statements in documents such as A blueprint for water reform in Western Australia (2006)¹ that it seeks to use market instruments such as auctions to release unallocated water and encourage the efficient use of these resources.

The objective of this report is to examine the various market-based mechanisms available and provide guidance on the most appropriate circumstances in which each might be used.

¹ Water Reform Implementation Committee A blueprint for water reform in Western Australia (December 2006)
2. Market instruments for releasing allocated water

This section provides a brief description of each of the approaches that have been reviewed by DoW and the primary advantages and disadvantages of each method. Methods examined include:

- First In, First Served / Application Queue;
- Merit Selection;
- Auction / Tender;
- Direct Sale.

We note that many of the advantages, disadvantages and legislative issues associated with each option in the Western Australian context have been drawn directly from previous analysis by DoW.

A number of other market based instruments (MBI’s) associated with natural resources have been developed in recent years, however these relate more closely to land conservation. Examples include environmental offsets and conservation tenders (in which private landowners enter ‘bids’ to receive funds to undertake management actions and to relinquish certain property rights). These issues are typically more complex than water markets due to inconsistent measurement mechanisms (i.e. metrics) and compliance regimes.

More common MBI’s include taxes, grants and subsidies. Each of these methods use financial incentives to encourage certain behaviours over others. Taxes are less relevant for the release of unallocated water as these MBI’s are typically added to the cost of an existing product or service to discourage use. Grants and subsidies are also not relevant as these are designed primarily to encourage behaviours and activities that would not otherwise occur.

2.1. First in First Served

First In, First Served refers to a process in which water allocations are provided to applicants based on the chronological order of their application. Once a resource is fully allocated, no further allocations are made available. The First In, First Served approach may also be complemented by application queues, in which applications are placed in a queue if they are refused because the resource is fully allocated. If additional water becomes available at a later date these applicants are approached on a First In, First Served basis to access any additional water.

Advantages of the First In, First Served approach include:

- it has been used for many years in Western Australia and is well tested with appropriate supporting processes and systems;
- the approach has relatively broad (but not universal) acceptance by the community and industry;
- officers are well versed in implementing this approach;
- the approach is already used and requires no lead time or change to existing legislation; and
- the approach is also used by other government agencies when granting similar approvals (e.g. mining leases, development approvals).
Disadvantages include:

- the approach does not take into account the economic, social or environmental consequences of allocating scarce resources to one user over another. Low value uses can effectively “block” higher value uses that may require water after the resource has been fully allocated;
- no value is placed on water until the resource is fully allocated. This may encourage over-investment in inefficient or low value water use applications. Water trading may occur once the resource is fully allocated, however the market can be slow to redirect water to the highest value use if the initial user makes substantial capital investments to utilise the water or uses access rights to stifle the development of competitors;
- the approach favours those that can apply most rapidly rather than those with the highest value use for the resource;
- DoW reports that the approach is not implemented on a strict basis;
- First In, First Served is not a market based mechanism and therefore will only conform with paragraph 72 of the NWI where application of a market based approach is not practicable;
- the First In, First Served approach has the potential to allow stockpiling of water for speculative purposes. Western Australia has a significant advantage over other jurisdictions in that DoW’s water allocation policies require allocated water to be used within a reasonable timeframe, thereby minimising this particular concern.

The First In, First Served approach is simple to administer and has relatively broad support from the community but does not recognise the value of scarce water resources. In situations where water is abundant, the First In, First Served approach has significant merit compared with more administratively complex approaches. In this situation, water is available for all uses and does not require a price or other selection process to direct it to the highest value use.

Conversely, in situations where water availability is limited, methods that are capable of directing water to higher value uses will be preferable to the First In, First Served approach provided they can be feasibly and practically implemented.

2.2. Merit selection

Merit Selection refers to a process in which criteria are developed to assess economic, social, cultural and other issues, and water allocations are awarded based on the respective merits of each application.

Advantages of the Merit Selection process include:

- licence applications are assessed against a number of criteria, potentially including social and environmental criteria in addition to economic criteria;
- the process may in concept be perceived as more equitable and justifiable than the First In, First Served approach or approaches that take into account only economic considerations;
- the Merit Selection approach can build on lessons learned from previous trials in WA.

Disadvantages include:
- the process is likely to be time consuming and open to interpretation. Differences in interpretation may leave DoW open to resource intensive appeal processes;
- the selection process does not take into account licence applications that may be received in the future. The process may require staged releases or the withholding of entitlements until all anticipated applications are received;
- the approach may in practice be perceived as inequitable if applicants disagree with the criteria or the method of assessing and ranking applications based on those criteria;
- DoW has limited resources with which to assess the veracity and comprehensiveness of each application;
- DoW officers may not have the appropriate social, environmental and economic skills to assess the applications against some criteria. This shortcoming could, to some extent, be overcome through training, the creation of new specialists in the department or by obtaining advice from external consultants;
- different criteria may need to be developed for different areas of the State, increasing the complexities of implementation; and
- to undertake this option in a robust manner could potentially be more complex and costly than other approaches.

In summary, the Merit Selection approach is the only one of the four water allocation methods under examination that can account for all of the social, environmental and economic consequences of allocating a water resource. Unfortunately, the process suffers from numerous practical implementation problems, including the difficulty in establishing criteria and the subjective and technically complex nature of the assessments required.

Due to the difficulties in implementing the Merit Selection method, the approach is likely to be limited only to those situations in which specific social or environmental issues must be addressed. If social and environmental issues are adequately addressed through regulation or other mechanisms then approaches that address only the highest value economic use of the resource (i.e. direct sale or auction) may be more appropriate.

**Legislative issues**

A merit selection process has previously been initiated in Western Australia and could continue to be developed based on the criteria under Section 7(2) of the RiWI Act.

DoW has advised that market-based mechanisms are likely to be required for releasing unallocated water under the proposed WRM Bill. The Merit Selection approach is not considered a market based mechanism.

### 2.3. Auctions and Tenders

**Auctions** and **Tenders** involve a competitive process in which bids are sought from the market. Under an auction or tender process, water would be allocated to the highest bidders. There are many variations of an auction/tender model. For example, bidders may be required to pay either their bid price or the lowest successful bid price depending on the format and objectives of the auction.

**Auctions** are systems in which participants actively bid against each other and may make multiple bids for the same water allocation. In a **Tender** process participants may only enter one bid for each water allocation in a round, although multiple rounds may be required if the full volume of water is not allocated in the first round.
Under both Auction and Tender systems DoW would have the opportunity to set a minimum or reserve price below which water would not be released to the market.

Advantages of Auctions and Tenders include:

- auctions and tenders are relatively well understood within the community, provided the process is kept simple;
- the process has been trialled in other States;
- the process assists in directing water to the highest economic value use;
- the process encourages water efficiency and reuse where these are economically justified;
- the competitive process reveals information about the economic value of water to each user that could not be obtained by any other method;
- the approach does not require significant research or knowledge about water use values, so may be faster to administer than most other approaches (excluding First In, First Served);
- the approach is consistent with the principles of the NWI; and
- the process would provide funds that could contribute to water resource management costs or be directed to other uses by the State Government.

Disadvantages include:

- DoW may be open to criticism if water allocation limits are increased (or water becomes available as a result of recouping water or expired licences) after previously ‘limited’ resources were auctioned, potentially diminishing the value of the resource to previous purchasers;
- it does not take into account the value to future water users. This may be overcome through staged auctions processes or setting a reserve value based on the expected value to future users;
- an auction or tender process would require the development of new processes and systems within DoW;
- ad hoc auctions and tenders are typically time consuming and expensive to administer;
- auctions and tenders may be perceived as unfairly excluding small farms and other low value water users from gaining a water allocation (which is implied by the objective of directing water to the highest value use); and
- it may take several years before an auction or tender process could be implemented.

Provided other social and environmental issues are adequately addressed through regulation or other mechanisms, auctions and tender processes provide the most accurate means of allocating water to the highest value use if all existing and future water users are able to participate in the auction or tender.

Auctions and tenders are relatively expensive to administer and therefore direct sales may be preferred if costs are prohibitive.

Legislative issues

DoW cannot currently undertake auctions or tenders without the drafting of complex regulations to overcome some of the inherent complexities of the RiWI Act.
It is anticipated that both auctions and tenders could be implemented under the proposed WRM Bill.

2.4. **Direct Sale**

With a *Direct Sale*, DoW would nominate a fixed price for water, which would be valid over a specified timeframe. Potential water users could assess the value of water for their own purposes and, if their value was sufficiently high, could obtain a water entitlement by paying the nominated price (in addition to meeting other application conditions required by DoW).

For detailed examples of the process for setting *Direct Sale* prices, see Part B of this report.

**Advantages of Direct Sale** include:

- the process can be more easily applied over time. Proponents can apply at any time rather than being required to apply only when an auction or tender process is announced. Future users are more easily accommodated as multiple auction or tender rounds are not required;
- the process assists in directing water to the highest economic value use;
- the process encourages water efficiency and reuse where these are less costly than purchasing water; and
- *Direct Sale* would be consistent with the principles of the NWI; and
- the process would provide funds that could contribute to water resource management costs or be directed to other uses by the State Government.

**Disadvantages include:**

- new systems and processes would need to be developed to support the process;
- determining a price for *Direct Sales* can be difficult when public information regarding the demand or economic value to potential users is limited. In particular, determining the value of water to a small number of high value users (e.g. mining or large industry) will typically be complicated by issues of commercial confidentiality;
- calculation of *Direct Sales* values often rely on the use of average or median prices, which are more readily available than values for individual water users. Calculations based on average or median values will not accurately reflect the range of values across all water users;
- the *Direct Sale* price may change over time as demand and value profiles change. DoW may be open to criticism if prices are changed over time and should manage stakeholder expectations carefully;
- *Direct Sale* may be perceived as unfairly excluding small farms and other low value water users from gaining a water allocation (which is implied by the objective of directing water to the highest value use); and
- it may take several years before a direct sale process could be implemented.

**Legislative issues**

*Direct Sale* of water would require the drafting of regulations to overcome some of the inherent complexities of the RiWI Act. These regulations are likely to be less complex than those required for an auctioning or tendering process.

It is anticipated that *Direct Sales* could be implemented under the proposed WRM Bill.
3. Selection of market instrument

3.1. Objectives
The mechanisms used to release unallocated water must be designed to achieve a number of (sometimes conflicting) objectives including:

a) promoting the sustainable and efficient use of water;

b) directing water to the ‘highest value’ use;

c) ensuring that the costs of implementing the mechanism do not outweigh the benefits;

and

d) addressing all significant externalities and equity issues.

(a) Sustainable and efficient use of water
Paragraph 70 of the NWI states that the any ‘release of unallocated water should be managed in the context of encouraging the sustainable and efficient use of scarce water resources’.

The sustainable use of water, in an environmental sense, will typically be addressed through allocation planning and the development of consumptive allocation limits rather than through the process of allocating water to individual users. The efficient use of scarce water resources may be addressed through market mechanisms by assisting to direct water to the highest value use (see (b) below).

In the unlikely event that allocation plans, combined with DoW imposed licence conditions, do not adequately address all environmental or social sustainability issues, only the Merit Selection process is capable of awarding allocations based on social and environmental criteria.

(b) Directing water to the highest value use
Auctions, Tenders and Direct Sales are capable of assisting to direct water to the highest economic value use. In economic terms, the highest value use is generally reflected by each user’s willingness to pay for water.

If social and environmental criteria are also included in the definition of ‘highest value use’ then only the Merit Selection process will assess value based on all three criteria. In some instances the price or the pricing process can be amended to better accommodate social or environmental issues (see Section 3.2 for more details). In most instances, social and environmental issues will be more appropriately managed through the planning process, licence conditions and the ongoing regulation of consumptive use.

If social and environmental issues are adequately addressed through regulatory and other mechanisms, then the ‘highest value use’ of water will be achieved by allocating water to the highest economic value use. For the remainder of this document, wherever we refer to ‘highest value use’ we are referring specifically to the ‘highest economic value use’.

(c) Costs do not outweigh the benefits
Regardless of the mechanism, the costs of implementing the system should not outweigh the benefits. This consideration is pertinent for processes such as multi-stage auctions, which can be complex to develop and resource intensive to implement. Similarly, a Merit Selection process is likely to require significant resources and external advice to implement in a comprehensive and robust manner.
(d) Significant externalities and equity issues should be addressed

The allocation planning process should ensure that all externalities and equity considerations are adequately addressed. Externalities are those issues that affect individuals or organisations other than those involved in the purchase or sale of an item. In the case of water allocations, this could include downstream users or the general community.

With regard to equity issues, a concern that is frequently raised with the introduction of market-based mechanisms is that smaller and lower-income enterprises may not have the means to compete with wealthier water users and irrigators. This may impact the social framework of a region or may place political pressure on the government. Government will need to carefully consider the social and political impacts of market-based mechanisms and may consider alterations to the price or the pricing process warranted in some circumstances.

3.2. Selecting a mechanism

The most appropriate type of mechanism to use for allocating water will depend on a number of factors, including:

- whether it is expected that the resource will become fully allocated in the foreseeable future;
- whether significant unregulated externalities or equity issues exist;
- whether externalities are most appropriately adjusted for in the price or the pricing process;
- the degree to which there is certainty of demand estimates and an understanding of the value to each user;
- whether there are a large number of users and the degree of variability of value between those users;
- whether the administrative costs of the mechanism would be prohibitively high;
- whether water should be reserved for water users in the future.

The recommended steps in the decision process are summarised in Figure 1, followed by a more detailed explanation of each decision point. The framework has been developed based on first principles analysis, experience with other mechanisms across Australia and an analysis of the five case studies examined in Part B of this report.
Figure 1: Flow Chart for Allocation Mechanism Decisions

- **Is an allocation limit set for the resource?**
  - **Yes**
    - Refer to DoW Operational Policy 5.12
  - **No**
    - **FIRST IN FIRST SERVED**

- **Will resource become fully allocated in the foreseeable future?**
  - **Yes**
    - **STAGED AUCTION**
  - **No**
    - **DIRECT SALE**

- **Are there significant unregulated externalities or equity issues?**
  - **Yes**
    - Are future users expected to have a high value for water use?
      - **Yes**
        - **AUCTION**
      - **No**
        - **STAGED AUCTION or AUCTION WITH RESERVE**
  - **No**
    - Is it appropriate to adjust the price or pricing process for the externalities?
      - **Yes**
        - **FURTHER REGULATION or MERIT SELECTION**
      - **No**
        - Is there a high degree of certainty regarding user demand and value?
          - **Yes**
            - Can information be (cost effectively) improved?
              - **Yes**
                - **STAGED AUCTION or AUCTION WITH RESERVE**
              - **No**
                - Are the incremental costs of ongoing auctions (vs direct sales) prohibitively high?
                  - **Yes**
                    - **STAGED AUCTION or AUCTION WITH RESERVE**
                  - **No**
                    - Are future users expected to have a high value for water use?
                      - **Yes**
                        - **AUCTION**
                      - **No**
                        - **STAGED AUCTION or AUCTION WITH RESERVE**
          - **No**
            - **DIRECT SALE**

Note: The flow chart includes decisions such as 'Is there a high degree of certainty regarding user demand and value?' and 'Are the incremental costs of ongoing auctions (vs direct sales) prohibitively high?' which are part of the decision-making process for choosing the appropriate allocation mechanism.
Will the resource become fully allocated in the foreseeable future?

The first question in the decision making process is whether the resource will become fully allocated in the foreseeable future. The timeframe should equate to the length of time for which water allocation rights are purchased. In the case of permanent water allocations, the relevant timeframe is perpetuity. For practical purposes, DoW may consider a more limited timeframe beyond which the economic value of water is highly uncertain or negligible in present value terms and/or the investment horizon of water users is exceeded (thereby increasing the likelihood of efficient water trading). For most users, this timeframe may be in the order of 10-20 years, but for public planning authorities, the timeframe could extend to 50 years or more.

If the resource is not expected to become fully allocated, then there will be no requirement for market mechanisms to ensure that the water is allocated to the highest economic value use. As shown by the Ord example in Part B, a resource that is not expected to be fully allocated would result in a price of zero under either an auction, tender or a direct sale.

For resources that are not expected to be fully allocated in the foreseeable future, a First In, First Served approach would be adequate and could be undertaken with the least administrative complexity. When using the First In, First Served approach DoW would need to ensure safeguards are in place to prevent one or more users rapidly acquiring all unallocated water rights without providing other users the opportunity to bid for those rights.

If the resource is expected to become fully allocated, then it will be appropriate to consider methods of allocating the scarce resource to the highest value use.

Are there significant unregulated externalities or equity issues?

It is our experience that most social, environmental and equity issues associated with water allocations are most appropriately addressed through health, environmental and economic regulations or alternatively through specific licence conditions imposed on water users or applicants for a water licence. Managing equity issues and social and environmental externalities represents a significant ongoing challenge for the DoW and developing appropriate policies and regulations can be complex. However, managing externalities and equity issues through the water price or by modifying the market mechanism will rarely be appropriate as this approach will distort the market signal, reduce the transparency of any resulting cross subsidy, and will provide a relatively blunt instrument to address the underlying issue.

In most cases, social, environmental and equity issues are more effectively addressed through appropriate regulation or, where the social impacts are economic in nature (e.g. loss of revenue to small farms), through direct and transparent subsidies to the affected parties.

In a limited number of cases, the government may decide that all externalities or equity issues are not adequately addressed through other mechanisms. In these cases the government may respond by adjusting the water price or the pricing process, by implementing additional regulation or by granting water allocations to certain users based on the merit of their application.
Are externalities most appropriately adjusted for in the price or the pricing process?

In some cases, Government may consider it appropriate to adjust the price or the pricing process to account for externalities or equity issues. For example, in Queensland, the government has in some instances isolated a portion of water entitlements specifically for certain agricultural user groups to ensure that these groups have the opportunity to purchase water that might otherwise be unaffordable. As noted earlier, such an approach will distort the market mechanism and should therefore only be considered after an informed and detailed review of alternative options.

Where the externality can be quantified in economic terms (e.g. the impact that a surface water allocation may have on tourism operators that rely on high water levels) the price may potentially be adjusted to reflect the externality and ensure that the value to applicants is equal to or higher than the external economic impacts.

Where it is inappropriate or impractical to adjust the price or the pricing process, externalities or equity issues may be addressed through further regulation or through a limited Merit Selection process. As the allocation of water based on the merit of the application has proven difficult in the past, it is recommended that Merit Selection be applied only for cases in which a clear and compelling case exists to award an allocation of water to certain individuals or groups above higher economic value uses. This process would be conducted on a case by case basis and would relate to a specifically identified externality or equity issue, unlike the more general Merit Selection process previously undertaken by DoW.

Is there a high certainty regarding user demand estimates and value?

The certainty regarding user demand estimates and value will influence whether it is possible to accurately determine a Direct Sale price for water. If demand and value for each user are relatively well known then an estimate can be made of the price water would sell for at auction. See Part B of this report for a more detailed methodology for estimating the Direct Sale value. As demonstrated by the case studies in Part B, the information required for the calculation of a Direct Sale is relatively onerous and is likely to be readily available in only a few instances.

If demand estimates and water values are relatively well known then an auction process will not be required, potentially reducing the administrative cost of the process.

Can information be (cost effectively) improved?

Certainty regarding demand estimates and water use values may be improved by direct feedback from organisations (e.g. market surveys), extrapolation from similar auctions that have been conducted in other locations or through research into the cost of substitutes and alternatives (e.g. water recycling and water efficiency measures).

The costs of information collection can be substantial. If additional information is required, DoW should ensure that the cost of collecting the additional information does not outweigh the benefits obtained by avoiding an auction process. We note that in many instances, the cost of an Auction process may not be significantly greater than the cost of a Direct Sale process and therefore substantial information gathering exercises may not be warranted.
Are future users expected to have a high value for water use?

Where there is uncertainty regarding the demand or value to individual users it may be infeasible to develop a robust Direct Sale price. An auction or tender process may be required to ensure that the value to each user is accurately reflected in the allocation process.

As an auction or tender process can only take place at a specific point in time, it is important to consider the potential value of water to future users that are not yet present to participate in the process. The auction or tender price may be held in stages or may include a reserve price to reflect the value of water to future users. An inherent difficulty in holding water in reserve is determining the appropriate volume or reserve price, particularly as the auction or tender process has in part been required due to a lack of information about the demand or value of water to the market.

Conversely, if future users are unknown or are not expected to have a high value for water, then setting water aside for those users could effectively “block” water from being allocated to a valuable use in the short term.

To the extent possible, DoW should attempt to estimate the value of water to future users to determine whether setting aside allocations for future users is warranted.

Where a speculative project has been flagged for the future (for example a mining project), the proponent will typically be in a better position to assess the potential viability of the project than DoW. In these circumstances, the most accurate method of discovering the economic value of the project would be to allow the proponent to enter a bid for a water allocation. In this way, the project proponent is required to make an assessment of the value of the project on the basis of the likelihood of the project proceeding and the likely value to be obtained from the project. The proponent may also take into account the fact that water could potentially be traded into the market if the project ultimately does not get established.

The time horizon for some speculative projects may be longer than DoW would typically consider, but economic efficiency would require that all bids be considered regardless of the timeframe. For projects with a long-term timeframe, DoW might consider safeguards or mechanisms to avoid the inefficient stockpiling of water allocations. For example, DoW could consider temporarily releasing the successful bidder’s water allocation until the water was required for the project or could develop a regulatory regime (potentially in collaboration with an agency such as the Economic Regulation Authority) to monitor for anti-competitive behaviour.

Are the incremental costs of ongoing auctions (vs direct sales) prohibitively high?

The question of administrative cost is particularly relevant to ongoing or long term multi-stage auctions. These processes are required where water allocations are reserved for gradual release over time and utilise regular auctions that may become administratively resource intensive. Therefore Direct Sale may be preferable to an Auction or Tender, even when the latter processes would reveal more robust information about the economic value of water to individual users.

When the cost of the Auction or Tender process is expected to be high, DoW should explicitly consider the costs and benefits of the process against Direct Sale. We note that in many instances the cost of collecting robust information for a Direct Sale may be equally or more onerous than the cost of administering ongoing Auctions or Tenders.
4. Implementation issues

4.1. Legislative issues

Water releases are currently governed by the Rights in Water and Irrigation Act (1914), which currently limits DoW’s options for releasing water.

Part III of the RiWI Act governs water allocation and is outlined as follows:

1) to provide for the management of water resources, and in particular –
   a) for their sustainable use and development to meet the needs of current and future users
   b) for the protection of their ecosystems and the environment in which water resources are situated, including by the regulation of activities detrimental to them
   c) to promote the orderly, equitable and efficient use of water resources
   d) to foster consultation with member of local communities in the local administration of this Part, and to enable them to participate in that administration
   e) to assist the integration of the management of water resources with the management of other natural resources

Recent legal advice received by the DoW indicates that the Department cannot accept a premium for water in certain circumstances. Broad scale introduction of Auctions, Tenders and Direct Sales cannot be implemented without a regulation. The feasibility of drafting a regulation is being determined by DoW, however it is likely that the process may be complicated and time consuming.

DoW’s proposed Water Resource Management (WRM) Bill will replace the RiWI Act and would allow the use of market-based mechanisms for the release of unallocated water, representing a fundamental shift in water management. Once the Bill is passed, it is expected that all of the water allocation mechanisms contemplated in this report could be implemented.

4.2. Improving certainty for calculation of a Direct Sale price

As noted in Section 3, the primary disadvantage with Direct Sales is that calculating a robust price for water requires very high levels of information. Strategies to improve the level of knowledge about demand and value will therefore be important for calculating a Direct Sale water price.

Three methods for improving knowledge about the market include (but are not limited to):

- market surveys, such as those previously conducted by the Department of Agriculture and Food to establish farm budgets in South West Western Australia. As noted in Part B of this report, the most recent of these surveys appears to provide relatively poor information for determining value to users (e.g. the information indicates an overall negative value of water for agricultural users on the Gnangara Mound) and therefore careful attention should be paid to survey design and cross-
checks to ensure the robustness of the information provided. The use of surveys to elicit willingness to pay for water has not been successful in some other jurisdictions. For example, surveys for the release of water to Queensland irrigators provided high values to encourage development of the scheme, but these results were not replicated in actual sales prices;

- where user demand and value are relatively homogenous, a small scale auction may be used to improve DoW’s understanding of the demand from each category of water user and the value of water to each of those user groups. The information revealed by the small scale auction can then be used to develop a Direct Sale price for the remaining water users;

- an Expression of Interest (EOI) process may also be of assistance in the early stage of the water release process to help gauge the potential short and long term demand from potential users.

4.3. **Allocation procedures**

Charges for water resources may be met with some resistance by potential water users, particularly those with low value uses for the water. It will therefore be important to ensure that all other aspects of the process are undertaken in a professional, objective and equitable manner.

The underpinnings of any effective market release process include:

- the process should be transparent and well documented;
- process should be repeatable and not open to different interpretations;
- entitlement attributes must be well specified;
- sufficient information should be provided to the market through marketing;
- the process should be fair and should ensure that all eligible users can participate equally and have equal access to information.

Water allocation procedures should include a communication strategy to ensure all potential users are aware of the allocation process, the timeframe for applications and the application requirements.

The process should also be designed to maximise the value of water to the community and should avoid ideological charges that attempt to place an artificial value on water. Inappropriate uses of water are better managed through regulation than through distortions of the pricing signal. Inappropriately high charges may cause water users to invest in unnecessarily expensive alternatives or forgo the production of otherwise viable products.
5. **Gnangara Case Study**

In this last section we consider the Gnangara groundwater system as a case study to step through the decision making framework outlined in Section 3.

### 5.1. Background

The Gnangara groundwater system stretches across the northern half of Perth, underlying all areas of the Swan Coastal Plain from the Swan River extending almost as far north as Guilderton and Gingin. The region supports a range of competing uses as well as supplying a substantial portion of Perth’s drinking water supplies.

The Gnangara groundwater system includes a range of water resources including the Superficial, Mirrabooka, Leederville and Yarragadee North aquifers.

Approximately 40% of groundwater abstracted from the Gnangara system is for the Integrated Water Supply Scheme (IWSS) for public water supply, which represents approximately half of the total supply of water to the scheme. DoW allocates groundwater annually to the IWSS using the variable groundwater abstraction rule (VGAR). This rule has a sliding scale where groundwater allocations are based on the total volume stored in IWSS reservoirs at their peak in October of each year. The department has set an average sustainable abstraction target of 120GL per year for the Gnangara and Jandakot systems, which the Water Corporation will aim to achieve by 2012.

These water resources also support a large number of groundwater dependent ecosystems and a range of private industries such as agriculture and horticulture. In the immediate areas surrounding where water is drawn for public water supply, land uses are managed to minimise the potential for ground water contamination.

The Gnangara groundwater system is now almost fully allocated across all areas, implying limited opportunities for new groundwater licence entitlements.

### 5.2. Case study scenario

The case study explores a scenario in which an additional 10 GL could potentially be made available for release to users on the Gnangara system from implementation of the GSS. The case study is considered hypothetical as there is currently no agreed position with regard to the use of the water that would be made available under the GSS. MJA consider it likely that this water would be returned for environmental purposes or would be used to restore the Water Corporation’s historic water entitlements ahead of being made available for a general market release.

We note that the Gnangara system is divided into many management areas, some of which have unallocated water and some which are fully allocated. Each of these management areas have different land uses and water quality issues and therefore the demand for accessing these groundwater resources will not be the same in every case. Due to the limited information available on users in specific management areas, this case study has considered

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2. 15GL/a is estimated to become available in the Gnangara Sustainability Strategy (GSS), Draft for Public Comment (Government of Western Australia, July 2009), less 5GL assumed to be provided for environmental needs.
the Gnangara Mound as one management area and assumed that unallocated groundwater may be extracted from anywhere within the mound. While this assumption is not technically accurate, the case study provides guidance on the issues and general results that would be anticipated for any management area that had proportionally similar supply/demand characteristics to the system in general. As the market release of an additional 10 GL of water is considered a hypothetical scenario, it was considered that more detailed investigation of demand for a specific management area was not warranted at this stage.

5.3. Selecting a mechanism for allocating water resources

To select a mechanism for allocating water resources, we address each of the relevant questions identified in Section 3.2 below. Refer to Figure 1 for guidance on the branching of each decision point.

Will the resource become fully allocated in the foreseeable future?

Water from the Gnangara groundwater system is in high demand and, if available, the full 10 GL could be utilised by the Water Corporation immediately. In addition, demand forecasts provided to DoW by consultants Resource Economics Unit indicate that the 10 GL allocation would be fully utilised to meet agricultural and industrial demand within 13 years.

Decision branch: Yes

Are there significant unregulated externalities or equity issues?

As the question of significant externalities and equity issues cannot be fully assessed from a desktop study, we have assumed for this exercise that externalities have been adequately addressed through existing regulation and licence conditions.

The government may also consider equity issues such as the proportion of water allocated to each user group. For example, some water entitlements have been reduced in the past and therefore it may be appropriate to reinstate previous allocations before new releases are contemplated.

Decision branch: No (we note that in reality these issues may be significant)

Is there a high degree of certainty regarding user demand and value?

A number of exercises have been undertaken to understand demand and the economic value of water for users on the Gnangara system (see for example MJA’s 2006 report Identification of Economic Values Associated with the Groundwater of the Gnangara Mound, prepared for DoW). While the relative order of magnitude of value is relatively well established, the detailed farm survey information underlying the estimates of agricultural use are considered relatively poor (see Part B for more details). Therefore it would be appropriate to gain more accurate market information if possible.

Decision branch: No

Can information be (cost effectively) improved?

In the case of Gnangara, information could be improved a number of ways, including undertaking revised and improved farm surveys or conducting a small scale auction to test the market. Without a detailed review of the costs of such an exercise, it is not possible to
definitively state whether better information could be cost effectively obtained. For the purpose of this exercise, we have assumed that a small scale auction could be conducted to obtain additional information about the broader market and that this would be more cost effective than conducting regular auctions across all users on the Gnangara system.

Assuming that a relatively high level of confidence in the demand and economic value information can be obtained through the small scale auction, the most appropriate market mechanism would therefore be a Direct Sale. This method has the lowest ongoing cost, is the easiest to manage, can accommodate increases in demand relatively easily and can achieve similar outcomes to an Auction or Tender if the price can be determined with relative accuracy.

Importantly, a Direct Sale may require a different price over time as demand and economic values change. DoW would need to ensure that expectations regarding price were well managed and that the process for re-evaluating the price was well understood by all stakeholders.

Decision branch: Yes

Allocation mechanism result: Direct Sale