Government of **Western Australia**
Department of **Water**

Peel Coastal groundwater allocation plan

Statement of response

October 2015

Securing Western Australia's water future

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This statement provides the Department of Water's response to the comments, issues and questions raised in submissions on the *Peel Coastal groundwater allocation plan: for public comment* (Department of Water 2014).

The public comment period

The *Peel Coastal groundwater allocation plan: for public comment* was open for public comment from 18 November 2014 to 27 February 2015.

During the public comment period, the Department of Water sent more than 20 letters to stakeholders to notify them that the plan was open for public comment. Also, 40 copies of the plan were provided to stakeholders.

An invitation to receive a copy of and submit comments on the plan was advertised in the following publications:

- *The West Australian* (14 November 2014).
- *Mandurah Coastal District Times* (19 November 2014).
- *Mandurah Mail* (20 November 2014).

The department held two public workshops and met with representatives from a number of interested parties to brief them on the plan. The department provided copies of the plan to stakeholders at these meetings and upon request.

Completing the plan

The department considered the submissions received through the public comment process to finalise the *Peel Coastal groundwater allocation plan* (Department of Water 2015a).

During the public comment period the following technical reports were completed to support the plan and its implementation:

- *Peel Coastal groundwater allocation plan: methods report* (Department of Water 2015b) (referred to as methods report in this document)
- *Peel Coastal plan area: groundwater-dependent ecosystems report* (Department of Water 2015c) (referred to as 'groundwater dependent ecosystems report' in this document).

The plan and the supporting technical reports are now available on the department's website.

Submissions received

During the comment period, the Department of Water received 10 formal submissions from a range of interest groups (Table 1). We considered all of the comments, issues and questions raised in the submissions when finalising the plan. Our response to the submissions are provided in this statement.

Table 1 Respondents to the plan for public comment

Respondent	**Interest group**
City of Mandurah	Local government
Department of Parks and Wildlife Peel Development Commission WA	Other state departments
Friends of Ramsar Action Group for the Yalgorup Lakes Environment	Community
RPS Group	Consultancy
Peel-Harvey Catchment Council	Natural resource management organisation
Thrombolite Recovery Team	Multidisciplinary recovery team including community groups, state and local agencies
Urban Development Industry Association	Property industry peak body
Water Corporation	Water service provider
Two individuals submitted one response	Individuals
Total	**10 responses**

Comments received and the department's response

The following tables summarise the issues and questions raised through the public submissions and the department's responses. The comments are grouped according to the water allocation issue they relate to.

Table 2 General comments and questions received on the plan

Comment	Department of Water response
Support for the plan and general management approach	
One respondent supported the development of allocation plans to provide certainty in water resource use. Four respondents provided specific comments in support of: i. Limiting increased abstraction to restrict impacts in a drying climate. ii. Identifying the importance of groundwater to the Peel Yalgorup system. iii. Accounting for exempt use volume in the allocation limits. iv. Local licensing policies. v. Using groundwater efficiently and developing suitable alternative supplies. vi. Managing significant risk of abstraction to current users, water quality, important wetlands and impacts of a drying climate. vii. The outcomes and water resource objectives. viii. Groundwater efficiency and smart water use. ix. Department of Water stating domestic bores are not suitable in the plan area. x. The department's adaptive management framework.	We value the support that respondents expressed for the plan and thank them for their submissions and interest in managing water in the Peel Coastal plan area. We will continue to work with stakeholders and the community in managing groundwater resources and facilitating alternative water supplies. In response to item ix, garden bore suitability maps can be accessed on the Perth Groundwater Atlas: www.water.wa.gov.au.
Plan status	
One respondent was not clear about the future status of the plan when the water reform legislation comes into effect.	Section 1.7 of the plan explains how long the plan will remain in effect and when it will be replaced, amended or revoked. This includes under new legislation.

Comment	Department of Water response
Risks to the aquifer	
One respondent sought clarity on the risks of abstraction for each aquifer.	Increased abstraction of groundwater is likely to increase risks to the aquifer. Specific impacts will depend on local conditions and management of abstraction. Refer to Table 6 in the methods report for more information on our risk assessment for each resource.
Responsibilities for managing impacts	
One respondent recommended that the Department of Water recognise their responsibility as the sole agency for maintaining the groundwater-dependent ecosystem by managing the groundwater resource.	Section 2 explains the responsibilities of the Department of Water. Where necessary and to achieve good outcomes for groundwater dependent ecosystems, we regularly work with other government agencies, proponents and community groups.
Question	
1 One respondent asked why the plan area did not extend north beyond Mandurah.	Groundwater north of Mandurah is managed by the *Rockingham-Stakehill groundwater management plan* (DoW 2007). The Peel Coastal plan area extends along the Swan Coastal Plain from the northern surrounds of Mandurah to just north of Myalup. The boundary of the plan area is further explained in Section 1.2 of the plan.

Table 3 Comments and question on the methods used to set allocation limits

Comment	Department of Water response
Allocation limit	
One respondent requested clarification on the method used to set the allocation limits.	Section 3.2 of the *Peel Coastal groundwater allocation plan: methods report* (Department of Water 2015b) explains how we set the allocation limits in the plan. A summary of the method is provided in Section 3.2 of the plan.
One respondent commented that the allocation limit should be set lower to preserve freshwater discharge into the Peel Yalgorup system and mitigate impacts of the drying climate.	The allocation limits in the Superficial subareas east of the Peel-Yalgorup system have been reduced by 61-77 per cent to cap at current level of use. See Section 3.2 of the methods report, or Section 3.2 of the plan for more information.
One respondent suggested that increased groundwater recharge resulting from changing land use to urban development should make groundwater available in the allocation limits.	Land use change can result in localised groundwater recharge, depending on local hydrogeology. This effect may lessen the impacts of reduced rainfall recharge on the resource, but increases demand for groundwater. Future land use change is not expected to be significant enough to change our risk assessment or the allocation limits.

Comment	Department of Water response
Implications for future development	
Three respondents commented that given the implications for development, the decision to make resources fully allocated should be supported with science and not a risk-based approach with limited monitoring.	The department used the best available science to inform the risk-based assessment and set the new allocation limits. Justification for using this approach is provided in Section 3.2 of the plan. Given the issues we are already observing, such as bores having to be decommissioned due to salinity increases, increasing salinity of the Peel-Yalgorup system and drying climate, the department decided to act in a timely manner to reduce risks from more abstraction. Undertaking new studies would have significantly delayed the positive actions we have taken to protect the productivity of the groundwater resource.
Two respondents commented that fully allocated groundwater resources are likely to constrain development and that clearly identifying alternative water sources is required in the plan, particularly in the northern part of the plan area.	The plan is about managing the natural water resources and their constraints. While it is not designed to solve all water issues, it does provide a clear and transparent position on local groundwater availability. This allows developers and agencies to plan appropriately for their future water needs. There are reasonable alternative water supply options in the plan area, in particular the use of treated wastewater. We are committed to working with proponents to develop alternative sources, provide technical support and help transition to new alternatives where necessary.
One respondent identified that recent growth in the Peel region included several agricultural businesses. Peel is one of the fastest growing regions in Western Australia and this growth will increase pressure on groundwater resources.	During consultation for the plan, no stakeholders identified significant intensification of agricultural activities in the plan area. The plan indicates that any significant increase in water use would unacceptably increase the risk to important values and the resource. Agriculture may expand in the Peel region, but it is likely to be outside the plan area where water resources are available, such as in the Murray groundwater allocation plan area.
One respondent noted that unlicensed use in new subdivisions occurs through transfers or low impact trades.	Unlicensed use, such as domestic bores, do not require transfers or trades. Trades and transfers may be used to obtain access to groundwater for licensed uses, such as irrigation of public open space in new subdivisions.

Comment	Department of Water response
Questions:	
1. If the trends show an increase in rainfall, would allocation limits also increase?	Not unless a long term trend is established, and this is unlikely during the life of the plan, as it would take a long period for a new trend to become evident.
2. Will groundwater be available into the future?	Yes, but only through improving water use efficiency and trading or transferring licensed entitlements. See Section 4.2 of the plan for additional information.
3. Has the allocation limit left no groundwater for future development?	No. Future developments may be able to access groundwater through trading and transferring water licence entitlements. Managed aquifer recharge is also a potential alternative water source. See Section 4.2 of the plan for additional information.
4. Is a risk-based approach used to set allocation limits the best method, or will another method provide a better estimate?	Yes. A risk-based approach is the best method, given the information available and risks of delayed action. We describe the reasons for choosing a risk-based approach in Section 3.2 of the plan.
5. Can the changes to allocation limits focus on the significant areas (e.g. Lake Clifton thrombolites) rather than impact groundwater availability across the entire plan area? Are the risks of abstraction the same for all aquifers?	The allocation limits are set to manage the potential risks to use and groundwater-dependent ecosystems for each individual subarea and resource. See Section 3.2 of the methods report for the risk assessment of each subarea.
6. What are the risks of increasing abstraction?	Any increase to abstraction is likely to increase salinity, affect users and influence groundwater inflow to Ramsar wetlands . See Section 2.5 of the methods report and Section 3.3 of the plan for more information.
7. Why is 0 kL/yr allocated for some resources, and can't these subareas be licensed to take groundwater?	For most Leederville resources there is no current use and no plans for any further development. We set the allocation limit at 0kL/yr as it is unlikely we will support additional abstraction in these resources given our assessment of risks to existing users. See Section 3.2 of the methods report for a description of our Leederville risk assessment. Section 4.2 of the plan explains meeting water demand in fully allocated areas.

Comment	Department of Water response
8. Can additional monitoring and mitigation be used to show if more groundwater is available?	Consistent with our risk assessment we do not support increased abstraction in the plan area unless it is associated with a managed aquifer recharge scheme consistent with *Operational policy 1.01 — Managed aquifer recharge in Western Australia* (Department of Water 2011). As stated in the plan, there are options for accessing water through improved water use efficiency, trades and transfers and alternative water sources. More monitoring would not be likely to change our risk assessment. See Section 4.2 for information of accessing water in fully allocated areas and managed aquifer recharge.
9. Was the 11 GL allocation limit set because climate or salinity trends indicate a period when the aquifer will not be fit for use?	No. The allocation limits are set to minimise the effects of climate and salinity on use and ensure the long term productivity of the resource. Our monitoring program will track any changes over time and allow us to manage it sustainably.
10. Do the impacts of salinity relate to the reduced allocation limit of 11 GL for the plan area?	Yes. The impacts of salinity were considered in the risk assessment process for setting the allocation limits. See Section 3.2 of the methods report and Section 3.3 of the plan for more information.
11. Why is the allocation limit different between the Mandurah and Falcon subareas?	Allocation limits were set to avoid any additional risk to users and dependent values. As a result the limits were set at the current level of use, which are different for the two subareas. See Section 3.2 of the plan for more information.

Table 4 Comments and question on exempt use

Comment	Department of Water response
Accounting for domestic bore use	
Three respondents noted that domestic bore volumes contribute to a large proportion of the allocation limit; consequently domestic bores may contribute to groundwater level declines.	Noted. This plan included estimates of exempt use in the allocation limits. While the use is low, this is an important step in understanding and managing groundwater resources.

Comment	Department of Water response
Managing domestic bores	
One respondent highlighted that regulating domestic bores is needed to reduce impacts of irrigation flushing contaminants into groundwater and affecting downstream groundwater-dependant ecosystems.	Any regulation of domestic bores would relate to volume used, and is unlikely to change how domestic or agricultural chemicals are managed. Water quality (nutrient) management is beyond the scope of the plan. A number of other references are provided in Section 1.1.
One respondent commented that regulating domestic bores would provide additional water in the allocation limit and requested that the department review regulating domestic bores. In addition, the number of domestic bores will increase when rural land is rezoned to urban.	The department regulates water use from domestic bores through the winter sprinkler ban and summer restrictions. We have accounted for a possible small increase in domestic bores from land use changes in the Island Point subarea. See Section 3.2 of the plan and Appendix A of the methods report for more information.
One respondent suggested that the Department of Water should not permit any new bores in the plan area.	The department does not anticipate any significant increase in domestic bores in the plan area. The small increase in domestic bore use that may occur in the Island Point subarea due to rezoning has been accounted for.
Questions	
1. How does the Department of Water estimate groundwater use from domestic bores?	Our method for accounting for domestic bores is presented in Appendix A of the methods report.
2. How will the Department of Water monitor abstraction from domestic bores?	The department monitors groundwater levels across the plan area. We will assess this information through regular evaluations against the plan's objectives. Should it show that domestic bores are affecting water resources or environmental values, we will adapt our management in consultation with other agencies and the community.
3. How does the Department of Water regulate domestic bores?	Our legislative requirements for regulating domestic bores are explained in Section 4.1 of the plan. Watering restrictions for domestic bores (watering days and times, irrigation methods, winter sprinkler ban) are applied through the *Water Agencies (Water Use) By-Laws 2010*. Together with the Water Corporation, we follow up on reports of using water outside the restrictions and, under these by-laws, a fine of $500 may apply. The department also provides advice to planning agencies and developers, consistent with our garden bore suitability maps available from www.water.wa.gov.au.

Table 5 Comments and questions on alternative water sources

Comment	Department of Water response
General comments on alternative water sources	
Two respondents identified that ongoing financial support is needed for research, approvals and implementation of alternative water supplies.	The department expects that the costs of alternative water supplies will primarily be borne by those proponents requiring the water. We may identify funding opportunities if there are significant public good benefits associated with a proposal.
One respondent was concerned that developing alternative sources will increase long-term maintenance costs for local governments. This means that local governments may withhold approvals of developments using alternative water sources.	Developers and local governments will need to consider all possible water source options and their relative costs as early as possible in the land planning approval process. This will ensure that there is agreement on the most cost-effective approach for meeting the demand for water.
One respondent commented that there is no detail in the plan to implement alternative supplies for future urban development in the plan area and asked how the Department of Water intends to support alternative supplies.	The department expects the details of alternative supplies to be investigated by proponents to meet their needs. We will work with stakeholders to implement, and where necessary, facilitate some alternative source options. The use of treated wastewater is already being used as a water source in the plan area. There are significant opportunities to increase wastewater reuse.
Managed aquifer recharge	
One respondent endorsed the Water Corporation infiltrating treated wastewater into the Superficial or Leederville aquifers to support production bores used to irrigate public open space.	Noted. Recycling of treated wastewater through infiltration is a viable alternative source currently supporting local abstraction. Refer to our *Operational policy 1.01 — Managed aquifer recharge in Western Australia* (Department of Water 2011) for more information.
One respondent was unclear on the impacts of a managed aquifer recharge scheme on the allocation limits and how a managed aquifer recharge scheme would be licensed and mapped.	A managed aquifer recharge scheme will not change allocation limits. The managed aquifer recharge volumes are accounted for in a separate category in our water allocation systems. Mapping and licensing of a scheme is described in our *Operational policy 1.01 — Managed aquifer recharge in Western Australia* (Department of Water 2011) for more information.
Licensing managed aquifer recharge according to the Department of Water's *Operational policy 1.01 — Managed aquifer recharge in Western Australia* requires further work to best map the managed aquifer recharge infiltration zones.	Noted. We will, where practical, provide technical support for the mapping of managed aquifer recharge infiltration zones.

Comment	Department of Water response
Licensing managed aquifer recharge	
One respondent commented that the department should support initiatives such as wastewater reuse with flexibility and provide a simplified licensing process.	Agreed. Our licensing process for disposal and recovery of wastewater in aquifers is clearly detailed in *Operational policy 1.01 — Managed aquifer recharge in Western Australia* (Department of Water 2011). The *Guideline for the approval of non-drinking water systems in Western Australia* (Department of Water 2013a) also assists the approvals process for wastewater reuse.
Use of treated wastewater	
Strategically planning a pipeline to deliver treated wastewater is better than an ad hoc planning process.	Noted. Outcomes of strategically planning alternative supplies are likely to enhance benefits for stakeholders rather than an ad hoc approach. We will work with stakeholders as appropriate on this kind of option.
Questions	
1. What at is the Department of Water's position on wastewater reuse?	We support wastewater recycling, and will facilitate recycling projects, as outlined in Section 4.2 of the plan and the *Guideline for the approval of non-drinking water systems in Western Australia* (Department of Water 2013a).
2. How will the Department of Water encourage alternative water source options?	In signalling that there is no additional groundwater available for use, the department has taken a significant step to encourage alternative water source options. Although we are committed to working with stakeholders, it is now primarily up to proponents to identify what alternative water supply options are most effective and efficient for them.
3. Did the Department of Water assess, in detail, any alternative water sources?	No. Treated wastewater is already being used to irrigate public open spaces in the plan area. The Gordon Road, Caddadup and Halls Head wastewater treatment facilities represent a significant opportunity for future water supply, in particular given their geographic spread and the volumes of wastewater they process. Proponents will need to conduct their own detailed assessments of alternative water sources to see what is most appropriate for them.
4. Will the volumes of treated wastewater be available for reuse from the wastewater treatment plants?	About 5 GL of treated wastewater is produced annually in the plan area. The Water Corporation can provide advice on up-to-date and site-specific volumes.

Comment	Department of Water response
5. The community will need to use water efficiently. What education programs is the Department of Water providing?	The department promotes education on water efficiency through licensing and through our collaboration with Water Corporation and local governments. Our water-wise educational material is available on the Water Corporation's website.
6. Is the Cattamarra Coal Measures fully allocated and, if not, is groundwater available?	The Cattamarra Coal Measures were not dealt with in detail in this plan and allocation limits were not set due to their depth, low water quality and the unlikely demand for such a resource. Any applications to use this resource will however be considered by the department where proponents demonstrate that the water is available, there are no impacts to overlying aquifers and the water quality is fit-for-purpose.

Table 6 Comments and questions on trading licence entitlements and licensing

Comment	Department of Water response
Trading water licence entitlements	
One respondent identified that current licensees are unlikely to trade their licence entitlement.	Trading will likely become more attractive as demand increases so will remain an option for proponents that require water.

Comment	Department of Water response
One respondent made several comments to improve water trading. The comments suggested that the Department of Water: i. should improve awareness among licensees that they can trade their licence entitlements ii. needs to improve the water register to support the future demand for trades to identify licensees with unused licence entitlements iii. should simplify water trading arrangements in accordance with the *Proposed Water Resources Management Act* (Department of Water 2009) and S*ecuring Western Australia's Water Future* (Department of Water 2013b) iv. should clarify the commercial arrangements for trading licence entitlements and facilitate relationships between purchaser and the vendor v. should provide support for trades to ensure they are viable.	i. Comprehensive information relating to water trading is available on our website including *Operational policy 5.13: Water entitlement transactions for Western Australia* (Department of Water 2010). ii. The online Water Register contains all the information we are able to legally publish under the *Rights in Water and Irrigation Act 1914*. iii. We make trading as easy as possible under our legislation. *Securing Western Australia's Water Future: Position Paper* (Department of Water 2013b) provides information about our water reforms. Future trading arrangements will be updated as the new legislation progresses. iv. Water trading occurs between the vendor and purchaser. This includes the responsibility for ensuring that the trade is viable and money is exchanged. v. The department's role starts when the trade or transfer of a licence is accepted by both parties. At this stage, we commence an assessment in accordance with *Rights in Water and Irrigation Act 1914*. For more information refer to *Operational policy 5.13: Water entitlement transactions for Western Australia* (Department of Water 2010).
Recouping unused water licence entitlements	
One respondent requested more information on the process of recouping and impacts of recouping on trading unused water licence entitlements.	The department's process for recouping unused water licence entitlements and for trading or transferring licensed water entitlements is detailed in *Statewide policy no. 11 – Management of unused licensed water entitlements* (Water and Rivers Commission 2003) and *Operational policy no. 5.13 – Water entitlement transactions for Western Australia* (Department of Water 2010) respectively.
Local licensing policies	
One respondent commented that a 200 m buffer would not protect groundwater-dependant ecosystems from production bores.	A 200m minimum buffer around groundwater-dependent ecosystems reduces the risk of direct impacts on the riparian zone. It combines with other management measures, including reducing allocation limits, to reduce the risks to groundwater-dependent ecosystems.

Comment	Department of Water response
One respondent suggested the plan might include specific management for issues such as saline up-coning and intrusion.	Saline up-coning and saltwater intrusion were considered when we set allocation limits across the plan area (see Sections 3.2 and 3.3). We will continue to monitor the groundwater resource over time to inform the evaluation process and determine whether or not we need to adapt our management. At a local scale, the impacts of abstraction on both saline up-coning and saltwater intrusion are assessed on a site-by site basis through the licensing assessment. We will apply the local licensing policies in the plan to this process.
Department of Water should monitor production bores to improve estimates of abstraction.	Licensees are responsible for monitoring their abstraction and any potential impacts on the resource. This is managed through licence conditions, which may include a requirement to meter, monitor and report to the department. See Section 4.3 of the plan for more information.
Questions	
1. Will the allocation limit changes affect applications waiting for assessment by the Department of Water?	No. The changes to the allocation limits were enacted when the plan for public comment was released. We accounted for all applications received before this time in setting the allocation limits. Questions on specific applications should be directed to the department's Kwinana Peel regional office. Contact details are available from www.water.wa.gov.au.
2. How will the department encourage trading?	The department encourages trading through our licensing process, by providing information on the online Water Register, and through advice to licensees and stakeholders.
3. What is the definition of trading?	Trading is defined as "Where licenced water entitlement is permanently traded to another person and the water will be taken from another location." (Department of Water 2010)
4. Will the department alert proponents when groundwater water is available?	No. Proponents can check groundwater availability with the online Water Register or with the Kwinana Peel regional office. Contact details are available on www.water.wa.gov.au.
5. What is a 'low impact trade'?	For clarity, we have removed the wording 'low impact trade' from the final plan and replaced it with sustainable trades in accordance with the plan and the *Rights in Water and Irrigation Act 1914*.

Table 7 Comments on the Lake Clifton thrombolite communities and other groundwater-dependent ecosystems

Comment	Department of Water response
Information on groundwater-dependent ecosystems	
One respondent commented that the plan does not adequately describe: • the values of Lake Clifton • that groundwater-dependant ecosystems rely on groundwater levels, groundwater fluxes and groundwater chemistry.	Noted. The values and our current understanding of groundwater-dependent ecosystems are detailed in Section 2.2 of *Peel Coastal groundwater allocation plan: Groundwater-dependant ecosystem report* (see Section *Completing the plan*, page 5).
Understanding the lake systems	
Two respondents noted there is limited information on the lake systems or impacts from regional groundwater changes. However, it is clear that salt levels are increasing in the lakes. This rate of change for salinity in Lake Clifton may be greater than rainfall declines, suggesting that abstraction, as well as drying climate, contributes to increasing salinity of the lake.	The department acknowledges that drying climate, groundwater abstraction and land use changes are contributing to changes in hydrology and increasing salinity in Lake Clifton. Available data suggests a strong link between declining rainfall and increasing salinity. Refer to Section 3.3 of the plan and Section 4.2 of the groundwater-dependent ecosystems report.
Managing changes in water level and quality that support groundwater-dependent ecosystems	
Two respondents commented that the plan did not provide management actions, including managing water level and quality declines, to support the groundwater-dependant ecosystems in a drying climate.	The department's approach to managing groundwater resources and their dependent values in a drying climate was considered throughout the planning, particularly in the outcomes and objectives of the plan, the new allocation limits, licensing policy and in monitoring and evaluation programs. Section 3.2 outlines how we factored the drying climate into setting allocation limits and justifies the significant reductions we've made. Our ongoing and adaptive management approach will respond to regular evaluations against the objectives of the plan.
One respondent commented that the Peel Yalgorup system, including the thrombolites, is highly dependent on groundwater and management of the Peel Coastal groundwater allocation plan.	The plan acknowledges the reliance of the thrombolite community on fresh groundwater throughflow. Refer to Sections 2.1 and 2.2 of the groundwater-dependent ecosystems report for more information.

Comment	Department of Water response
One respondent asked how the department assessed impacts of the drying climate on groundwater-dependent ecosystems without a numerical model. A model may provide better predictions in a drying climate when setting trigger values for groundwater-dependent ecosystems.	The department used measured data and reference levels to assess the risk to groundwater-dependent ecosystems of allowing more, less or the same amount of groundwater to be abstracted (refer to Sections 3.2 and 3.3 of the plan and the groundwater-dependent ecosystem report for details). We will adapt management over time if monitoring identifies that reference levels are being reached. We have identified an action to reviewing water quality monitoring and performance indicators.
One respondent recommended that the Department of Water should investigate historical significant changes in groundwater levels and quality (since 1993) to match current management and meet those historical targets.	Noted. The department has made a strong step in reducing and capping allocation limits through this plan. It is unlikely that this analysis would have greatly changed this outcome.
Two respondents suggested groundwater level declines east of Lake Clifton might be below levels required to maintain the lake's health.	Noted. The department's monitoring data shows a slight decline in groundwater levels to the east of Lake Clifton that may be contributing to increasing salinity levels in the lake. This decline is influenced by: • decreased recharge • increased evaporation • abstraction • changes to land use.
Two respondents provided comments on the information presented in *Figure 4: Effect of rainfall on Lake Clifton salinity levels (CDFM – cumulative derivation from the mean rainfall)*. Specific comments were: i. The presentation of information is misleading. ii. More data is needed. iii. The information should not represent climate as solely responsible for increasing salinity.	i. Noted. We have improved the presentation of Figure 4. ii. We used all the available data from the Department of Parks and Wildlife wetland monitoring dataset. iii. Section 3.3 of the plan was updated to include abstraction as a part of the impact. The graph was only intended to show that there is a strong correlation between the drying climate and salinity levels in Lake Clifton, and the graph has been replaced.
Two respondents commented that the plan should acknowledge habitat decline, resulting from changes to salinity.	Both the plan and the groundwater-dependent ecosystems report acknowledge potential loss of habitat as a result of salinity increases.

Comment	Department of Water response
Questions:	
1. Are the groundwater-dependant ecosystems tolerant to increasing salinity and reduced water levels?	Thrombolites are likely to be impacted by increased salinity and reduced water levels. Our current management will reduce the risk of any increase to abstraction on the thrombolites. We will work with other agencies to monitor and identify management actions where required.
2. Are the long-term impacts of salinity known?	Reports received from licensees indicate groundwater salinity is affecting some areas. Our current understanding is that restricting additional levels of abstraction will minimise salinity risks to Ramsar wetlands and current groundwater users.

Table 8 Comments and questions on monitoring

Comment	Department of Water response
Monitoring program – general comments	
Two respondents commented that monitoring requires an interagency partnership. Monitoring should include groundwater levels, quality and ecological impacts.	Noted. We will include other agencies and licensees, where appropriate, to effectively monitor groundwater resources and their dependent values. To complement our existing water level monitoring, we have identified the need to review and implement a groundwater quality monitoring program in the plan area. See Section 5.1 for more information.
One respondent identified the difficulties in sourcing data for Lake Clifton thrombolites and supported effective storage and provision of data to stakeholders and decision makers.	Noted. The department has significantly improved the ability of external parties and stakeholders to access water information from our databases through our new Water Information Reporting system, accessible via our website. Given that Lake Clifton is located within Yalgorup National Park, the Department of Parks and Wildlife is the main source of information on thrombolite communities.
One respondent commented that it is concerning that the Department of Water has used the current, but limited, monitoring to set allocation limits.	Noted. The new allocation limits were developed making the best use of available hydrogeological, environmental, climate and water use information (both current and projected). Given the issues we are already observing – such as bores having to be decommissioned due to salinity increases and the drying climate – the department decided to act in a timely manner to reduce risks from any more abstraction. Consequently, we use a risk-based approach to set allocation limits at current use. See Section 3.2 of the plan for

Comment	Department of Water response
	more information.
One respondent noted that other data is available that could be used to inform the plan, particularly the *Hydrology Study - Preston Beach Town Site Strategy* (RPS 2012) and the Department of Parks and Wildlife monitoring.	Noted. The department used all available information in developing the plan. This includes local groundwater assessments and other agencies' monitoring.
Increasing monitoring efforts in the plan area	
One respondent commented that the first row in *Table 3: Monitoring in the plan area* is unclear because coastal groundwater levels will be similar to the sea or estuary and monitoring groundwater levels is unlikely to provide useful information.	Noted. This table and Chapter 5 have been updated to reflect this fact. Water quality monitoring and performance indicators will be needed to effectively manage the resource and its dependent values. We have committed to reviewing the water quality monitoring program as well as developing appropriate performance indicators.
One respondent suggested the plan should expand the monitoring of groundwater-dependant ecosystems.	Noted. We acknowledge that groundwater management is critical to support groundwater-dependant ecosystems and this is reflected in the resource objectives. The plan focuses on the monitoring of the groundwater resource as an indicator of ecosystem health. See Section 5.2 of the plan.
Seven respondents provided comments on increasing monitoring. Suggestions include: i. Increasing the number of monitoring bores, particularly around Lake Clifton. ii. Monitoring changes to groundwater salinity. iii. Monitoring water quality, such as nutrients and other contaminants, which may affect groundwater-dependant ecosystems, particularly the thrombolites. iv. Monitoring should identify impacts of climate change. v. Monitoring of production bores to provide better estimates of water use. vi. A local scale investigation to understand processes in Lake Clifton, including a local scale groundwater and ecosystem hydrology model is needed.	i. We will review the monitoring network within the plan area to meet the resource objectives (see Table 4 in the plan). ii. We will enhance water quality monitoring in the plan area as part of implementing this plan. iii. Monitoring and management of water quality (nutrients or contaminants) is beyond the scope of this plan (see Section 1.1 of the plan). iv. Monitoring will identify changes in water levels and salinity. Part of our analysis of the monitoring data will be to assess how much of the changes are due to the drying climate and/or abstraction and/or land use. v. The plan sets out our local licensing policy for metering in Table 2. vi. The priority at this time is to manage allocation and reduce risks of abstraction and drying climate on the aquifer and current users. The need for a model will be reviewed through our annual evaluation process. vii.

Comment	Department of Water response
Questions:	
1 How will the monitoring meet the resource objectives of the plan? Will the ongoing monitoring accurately identify changes to the aquifer and groundwater-dependant ecosystems?	The department will use the monitoring program and performance indicators to identify whether our management of abstraction is being successful in meeting the resource objectives and outcomes set out in the plan. This is the primary purpose of the plan evaluation process identified in Section 6.2 of the plan. We have committed to reviewing our water quality monitoring program to ensure we have an effective monitoring program in the plan area.
2 Given the limited monitoring across the plan area, how can the Department of Water state that there is a thin freshwater lens in the Superficial? The *Hydrology Study: Preston Beach Town Site Strategy* (RPS 2012) shows freshwater is relatively close to the ocean with a steep saline interface.	Noted. The department's current understanding of the hydrogeology in the plan is presented at a regional scale. The overview in the plan is based on groundwater assessments, monitoring data and anecdotal information. There will inevitably be variations in the local hydrogeology.

Where to next?

Where indicated in the tables above, responses were incorporated in the final *Peel Coastal groundwater allocation plan* (Department of Water 2015a). The plan is available from the department's website <www.water.wa.gov.au>.

It outlines how the department will allocate and manage groundwater resources in the Peel Coastal area through licensing, assessment, policy and reporting.

Further information

For licensing information, please contact our regional office:

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107 Breakwater Parade, Mandurah 6210

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For planning information, please contact:

Water Allocation Planning Branch
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Glossary

Abstraction	Withdrawal of water from any surface water or groundwater source of supply.
Allocation limit	The annual volume of water set aside for use from a water resource.
Annual water entitlement	The amount of water specified on a licence issued under Section 5C of the *Rights in Water and Irrigation Act 1914* that can be taken each year (dates specified on the licence).
Groundwater-dependant ecosystem	An ecosystem that is dependent on groundwater for its existence and health.
Licence (or licensed entitlement)	A formal authorisation that entitles the licence holder to take water from a watercourse, wetland or underground source under the *Rights in Water and Irrigation Act 1914.*
Recharge	Water that infiltrates into the soil to replenish the aquifer
Subarea	A subdivision, within a surface or groundwater area, defined to manage water allocation. Subarea boundaries are not proclaimed and can therefore be amended without being gazetted.

Shortened forms

CDFM	Cumulative deviation from the mean

Volumes of water

One litre	1 litre	1 litre	(L)
One thousand litres	1000 litres	1 kilolitre	(kL)
One million litres	1 000 000 litres	1 megalitre	(ML)
One thousand million litres	1 000 000 000 litres	1 gigalitre	(GL)

References and further reading

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