

Gnangara groundwater allocation plan draft for public comment

2022

This submission starts with brief Recommendations followed by the Questions & Comments in detail.

A concern for the Swan Valley Ratepayers and Residents Association is that the suggestions in this submission while dutifully noted, may not be debated on merit. How can we be ascertained that our responses and arguments are taken seriously?

The Swan Valley Ratepayers and Residents Association welcomes any discussion with DWER regarding the matters raised in this submission to clarify our position.

Recommendations

“There is a general consensus that the existing institutional apparatus surrounding water resource management is inadequate to deal with the challenges of climate uncertainty ...”, a quote from Ananda (2020) which shows the concern amongst scientists regarding water resource management. So hopefully DWER can prove them wrong with the final version of the policies proposed in the draft. To follow on from this, the latest IPCC (2021) reports indicate that the change in climate is faster than expected. This means that targets set by DWER a couple of years ago are too low; water usage and especially abstraction needs to be cut by at least another 25%.

Reading the draft gives the impression that targets are based on what is politically feasible not what is scientifically necessary, in other words is the draft more or less business as usual.

Leadership is needed to make decisions that have a long term impact and not just tinkering around the edges. We expected the draft to be a real bold plan, a 10 year view is too short it needs to be at least 25 years. This Gnangara plan must take the direction of the worst-case scenario, if that does not happen future generations will still be better off with a larger water resource. This draft lacks scenarios, so how can a decision maker come to fair judgement when no scenarios are presented? The policy document may lead us in a direction without review that is blindly followed resulting in a scene like *“lemmings over a cliff”*. The policy document

should contain a mechanism to trigger changes to higher targets and to stricter regulations in implementation when there are negative changes encountered by observed facts. We recommend that the draft period be extended to incorporate different scenarios and pathways.

Even though DWER has a deadline to finish this draft into a policy paper the following must be kept in mind. The Swan Valley Ratepayers and Residents Association submission raises many serious issues, some of which will take time to investigate and/or to adjust the policy accordingly, therefore the planned deadline cannot be met. If the time is taken to implement the suggested changes the quality of the policy will be greatly enhanced. Community and special interest groups like the Swan Valley Ratepayers and Residents Association have different expertise and views that they would like to share with the experts at DWER.

The Swan Valley Ratepayers and Residents Association is worried that all departments work like silos on this topic and as a result there is no overarching effort to drastically reduce water consumption. For example, is the Western Australian Planning Commission aware of the DWER targets and vice versa? Especially considering Western Australian Planning Commission's policy and guidelines review for which submission closed on 15 Nov 2021. What mechanisms will be in place to avoid these situations in the future?

Water rights should not be tradeable, an abstraction bore is only location specific. Reasons for water trading to be abolished are described below. The Western Australian Government to buy all water licences at commercial rates and start from scratch. Licence fee to only be annual compliance fees.

As a matter of urgency DWER should pressure the Government and Water Corporation to build another desalination plant to relieve amongst others the Gngangara aquifer system and start planning for more after that. The desalination plants are essential to reduce abstraction from the aquifers, however they should not be a reason for business as usual.

Questions & Comments

Comment #1 Trigger based Scenarios and Pathways

The policy document should contain a mechanism to trigger changes to higher targets and/or to stricter regulations in implementation when there are negative changes encountered by observed facts. In the unlikely event that climate changes are positive the trajectory should not be modified but used as an opportunity to restore the environment. Policies are often adjusted ad hoc when there are changes caused by the unforeseen uncertainties, to avoid this a different

planning paradigm has emerged called “dynamic adaptive policy pathways”. The chair of the Delta Programme ¹ in The Netherlands characterises the issue as follows “... *One of the biggest challenges is dealing with uncertainties in the future climate, but also in population, economy and society. This requires a new way of planning, which we call adaptive delta planning. It seeks to maximise flexibility; keeping options open and avoiding ‘lock-in’ ...*” (Haasnoot, 2013) ². This ‘lock-in’ may easily resulting by going in the wrong direction like *lemmings over a cliff*.

An example of a trigger-based plan, illustration-1 is from a paper covering the Fremantle to Cockburn coastal sea level rise mitigation strategy pathways (Grace & Thompson, 2020). The second illustration is also about strategies and pathways to mitigate sea level rise in The Netherlands (Haasnoot, 2013 & 2018). Both are graphical examples of what could be incorporated in the DWER policy. It should be noted that trigger scenarios are common practice in the defence force when planning campaigns. Ideally the planning and implementation action should be such that tipping points are not reached but that cannot be guaranteed.

Question #1

Does DWER have any legal rights to enforce compliance and what are the penalties for non-compliance? If compliance is not checked what good is this policy? How is DWER implementing this auditing of other departments and stepping in before it is too late? Is DWER able to override policies of other departments? These functions cannot be outsourced - they have to be carried out by DWER!

Question # 2.

Where in the draft is a question to what will happen when crops cannot be grown any more in the Swan valley due to lack of water? What would the economic and social costs be?

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- 1 The Dutch government established a Second Delta Commission for identifying actions to prevent future disasters ... , since expected future climate change and sea-level rises cannot be ignored. First Delta Commission was established after the 1953 flooding disaster that killed 1836 people.
 - 2 Referenced papers can be supplied on request.

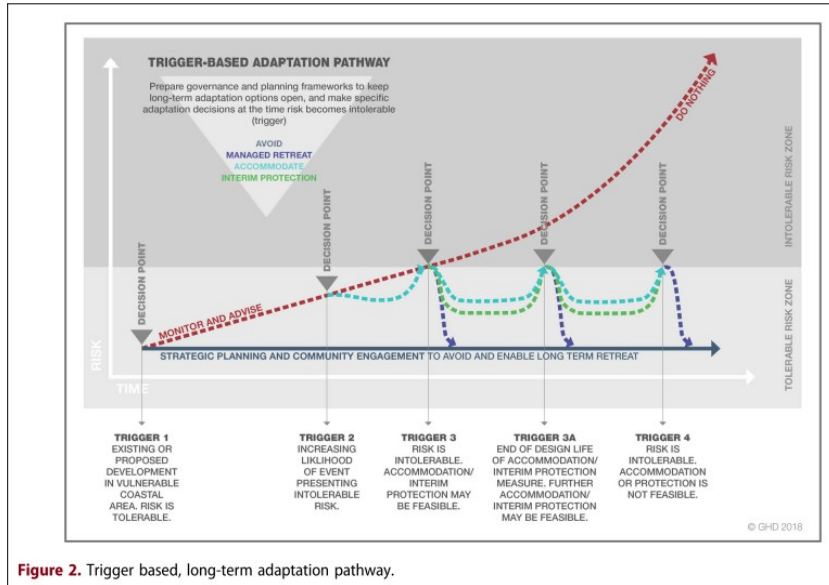


Figure 2. Trigger based, long-term adaptation pathway.

Illustration-1. A trigger based strategic planning scheme for south of Perth coastal adaption to sealevel rises. Copied from Grace & Thompson (2020).

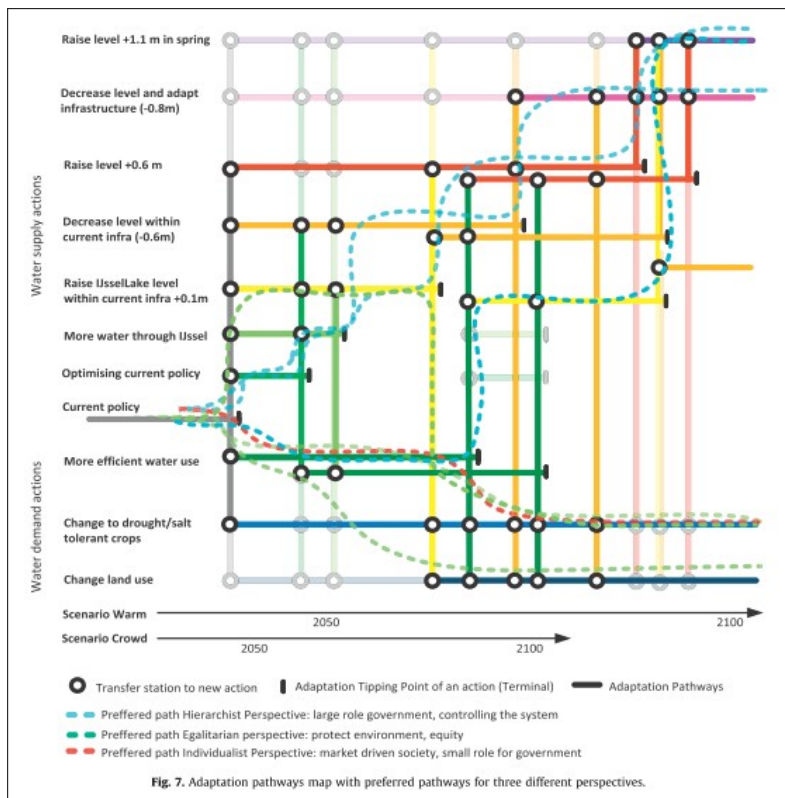


Illustration-2. An example from Haasnoot et al. (2013) where all the pathways are modelled and then used to create a preferred path depending on the viewpoint.

Comment #2 Cooperative and Collaborative Engagements

It is common knowledge that to have a successful organisation diversity is paramount. For organisations like DWER this diversity includes using the expertise of community organisations. World renowned success of the Dutch cycling infrastructure planning and implementation is based on cooperation between various layers of government and community organisations like the Dutch equivalent of the RAC³ and cyclists groups (Dekker, 2020). For that reason, we suggest that there is an ongoing collaboration between industry and stakeholder representatives. Not necessarily as formal committees but easy access for these groups to have an avenue to access the department and vice versa, especially when trigger points are used⁴. It would be useful if regular workshops were held where DWER informs and gets informed by stakeholders, and then can discuss these issues. In total it will result in better outcomes.

Question #3 Handling of submission

How will the comments and questions in this submission especially the ones not strictly related to issues mentioned in the draft policy be handled? Will they just be ignored, noted or given consideration with discussion possibly even involving senior staff?

Comment #3 Greywater

Setting up a full *greywater* system in most urban developments is not realistic because it is quite expensive and at times complicated. Also, on smaller blocks it is not warranted or feasible to have enough space to reticulate all the greywater, especially with multilevel infill. Therefore, why not have a “**greytank**” that is a septic tank for greywater only. Water from a standard greywater system that is not used up by plants will percolate down to the superficial aquifer, it will help replenish the superficial aquifer. Water in the “**greytank**” would do the same, and there should be no objection to this plan. The benefits of greywater are twofold, more water for the aquifer and less water to be treated by Water Corporation. We suggest that the concept of “greytank” be included in the policy.

Question # page viii

..., lower groundwater levels have caused visible drying and health declines in wetlands such as lakes Nowergup, Gnangara, Mariginiup and Jandabup⁵.

Research shows that these wetlands are affected by a drying climate and an anthropogenic lowering of the water table (Appleyard & Cook, 2009). What is suggested about mitigation?

3 Resp: ANWB and Fietsersbond.

4 It should be noted that staff at DWER were very helpful providing us with digital map data.

5 *Text in italics in questions & comments copied from the draft document.*

Comment # page viii (page 18 Table 1.4.) ... *along the Swan River (Derbarl Yerrigan) and the coast, declining groundwater recharge has caused saline water to move inland and reduced water quality in some bores. Acid-forming soils have been exposed above the watertable, making lakes Mariginiup and Gnangara acidic and increasing the acidity in Mussel Pool in Whiteman Park.*

This problem is likely to increase not only due to drying climate but also sea level rises. Total dissolved solids increase from 250 mg/L near the centre of the Superficial Aquifer to 1000 mg/L, nearly brackish, close to the coast (Appleyard & Cook, 2009). The first step in mitigation is to ban any water bores in the coastal dune corridors and along the Swan River. The second step is to locate recharge injection bores in the coastal dune corridors and along the Swan River to ensure the freshwater wedges/buffers keep topped up (illustration-3), a process called Managed Aquifer Recharges (Page, 2018). These buffers should slow freshwater inflow to the sea and so stop the lowering of the watertable and so avoiding saline intrusion. These injection bores could in part be fed with water that is currently dumped in the ocean as the example of illustration-4 shows (McFarlane, 2019; Stuyfzand, 2018). See also Comment # page 18 table 1.4.

Question # page ix

To achieve these objectives, we need to reduce the annual groundwater abstraction rate by 54 gigalitres during the next decade. This is about a 19 per cent change in total annual abstraction across the Gnangara groundwater system

This should be absolute minimum based on a pessimistic scenario, need to aim higher as indicated in the introduction the abstraction reduction should be greater.

The Gnangara groundwater system is a shared resource. The abstraction reductions in this plan will be shared across Gnangara groundwater users. For most licensed users this will be a 10 per cent reduction from 2028, although the reduction for public water supply will be 27 per cent. The sprinkler roster for domestic garden bore use in the Perth/Mandurah area will be aligned with the two-days-a-week sprinkler roster for scheme water users.

As pointed out before no new bores and reduce the number near coast and river. We agree with the rostering for garden bores but why only garden bores? Will there be timeslots when watering is prohibited, let say between 8am and 4pm? What about the many 2ha plus lots for equestrian pursuits where it appears sprinklers are used daily during the middle of day? Some agricultural crops may be adversely affected by using sprinklers during the night, but that cannot be said for grass in the equestrian industry. Are there no rules in place here, why not? How achievable is the scheme? Is there a limited time or volume for sprinkler use, or will

people water more on the rostered days and so the target cannot be reached? How will this be monitored?

Question # page x

... a 10 per cent reduction for the agriculture and horticulture sectors (5.4 GL/year) ...

Has water wastage been established for these sectors and how does wastage occur or is any wastage the result of poor outdated regulation? How has this figure been derived?

In a drying climate food production will become more difficult, therefore water should be available to this sector to ensure food security! Without doubt any wastage is to be avoided.

Question # page x *no reductions for schools and hospitals, as well as a small number of other specified purposes and locations. Why? It is important to have greenery around schools but that does not mean reticulated gardens. Only watering of sporting greens needed, the rest of property covered waterwise gardens with lots of trees.*

Comment # page x *... provide assistance to householders to make their gardens more waterwise, including incentives to invest in smart irrigation technology and spring sprinkler system check-ups.*

Ban reticulated grassed road verges, both private and public, like the extensive grassed areas in Aveley. Help to compensate for lost greens with establishing low natives and trees. The latter increase the value of properties (Pandit, 2013). All this is very important for the Swan Valley since it is surrounded by urban developments.

Question # page xi

... advise land developers in Perth's new growth areas on opportunities to access tradeable water entitlements, water sensitive urban design and, where needed, options for additional water supplies ...

Water is essential for all life therefore it is a public good and should not be used as a tradeable commodity. Water like any other natural resource has a value associated with it (Haavardsholm, 2015), however that should not be a reason for water trading. The results of water trading in the Murray-Darling Basin are a prime example where the impact of water trading is so large that the whole management of the Basin has become a disaster. It is acknowledged the settings in eastern Australia are very different but promoting water trading here in WA may create different distortions and unforeseen consequences which would be difficult to rectify; and possibly leaving a trail of environmental damage.

A water licence relating to a bore should be site specific. If not needed anymore hand back the licence or let it lapse. Currently most licences have cost a fair bit of money or have that value

if decided to sell. We suggest that the WA Government buys all licenses at current market values. From that point onwards a license is site specific, needs to be metered and requires an annual licensing fee. Should those primary uses be discontinued then the State government to have opportunities to buy back the licences (as they can do with the taxis). Why should the Western Australian Government pay market prices for these commercial licences because the Government created this market by the existing licensing system, so they must solve the problem by paying the owners out. This proposal is not about retrospectively banning residential bores it is about stopping the development of new bores near the coast or Swan River. Licenses may need to be reapplied for when a property changes owner or its purpose of use.

The government may think it is a very expensive exercise, but it is an investment to secure freshwater in the future without which there will be major problems in the future. Also, the metered bores are an asset for DWER because the increase in data collected which can improve the understanding of the aquifers. It may seem as another layer of bureaucracy, as said from a data collection viewpoint it is a necessity.

The notion that water from your own bore is free is an outdated concept and only leads to wastage. Groundwater is a public good and a fee per m³ should be paid. Any pricing mechanism could be based on kiloliters per hectare and may be even fine-tuned by crop type. It should include an automatic adjustment for rainfall levels, i.e., with high rainfall the prices rise and with low rainfall the prices drop. Technology will lead to remote meter readings and so automated collected data distribution of which will be easier.

Developers need to plan their developments as if there will be no access to groundwater and their plans to be assessed accordingly. In that way it will be a sustainable development. A temporary water licence could be given during development for dust suppression and to watering of plants till they are established. It should be noted that developers have only a very short-term views and interests, because when the development is finished, they move on and have no interest in the future and responsibilities of that development. Developers should pay a higher price for water than the agricultural sector and should be subjected to stringent requirements. There should be a mandate not an “*advise land developers in ... water sensitive urban design ...*”. If it is not compulsory developers will go for the easiest, lowest allowed standards and cheapest short-term option (AFR, 2022). Developers need also plant more trees which will increase the property values and cool down the streets (Bolleter, 2016; Kaluarachichi et al., 2020; Pandit, 2013). Developers are to take great care around wetlands because that will increase the value of the properties (Tapsuwa, 2007).

Comment # page xi ... *adjust groundwater subarea boundaries in the Swan Valley and establish water trading rules to support priority agriculture ...*

Even though the document does not specifically mention the Swan Valley Planning Act, it has been considered with creating subareas, this is appreciated.

For water trading rules see comment Question # page xi above.

The heat island effect of the surrounding newly developed suburbs will increase water usage (MacLachlan, 2021). Another reason that residential bores to be banned and estate community bores to be approved only under strict conditions. Both development issues will have an impact on temperatures and superficial aquifer levels in the Swan Valley.

Comment # page 5

... *the shallow, unconfined Superficial aquifer (including the less extensive Mirrabooka aquifer) – 186 GL/year*

It is too dangerous to have extracted so much from the Superficial aquifer because if the water table drops too much it will affect all vegetation (Walden, 2018), with negative consequences as a result.

Injection bores along coast and other places of potential salt intrusion. The fresh water injected ensures the freshwater wedge under the coastal sand dunes stays intact even if groundwater level drops. Illustration-3 shows an altered version of the draft's figure-3 suggesting no abstraction near the coast but injection to mitigate any seawater intrusion. A similar strategy to be used along the Swan River to combat the impact of seawater rises. This concept is for example proven for at least half a century in The Netherlands, where the coastal dunes are used to inject water to both compensate for withdrawal and filtration (Stuyfzand, 2018). A study in Oman shows that water stored in a dam near the coast infiltrated in the superficial aquifer and mitigated the seawater intrusion (Abdalla, 2013). Appleyard & Cook (2009) in their article about management of aquifers in Western Australia extensively reference work done in this field in The Netherlands.

Illustration-4 shows that Water Corporation dumps treated wastewater in the ocean. To divert that water into injection / infiltration bores is not possible for Water Corporation unless the LGA pays, because "*under the Water Corporation Act 1995 they are unable to fund unprofitable schemes unless they receive a community service obligation from the State Government*". That is a waste of a precious resource and DWER should insist that the government changes this legislation and / or DWER should persuade the government that this is a '*community service obligation from the State Government*'. No one can dump waste anywhere because it is cheapest to do so, that is the same for Water Corporation they cannot

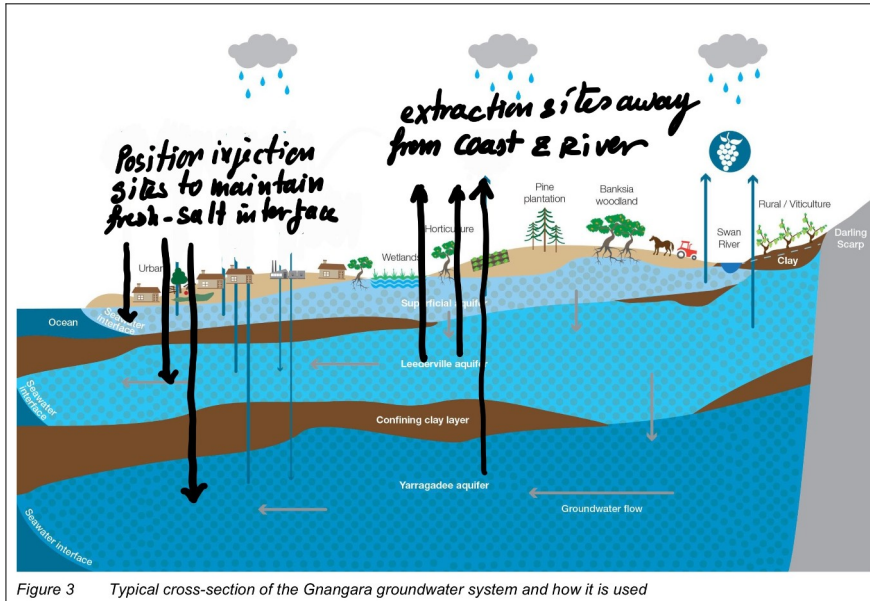


Figure 3 Typical cross-section of the Gngangara groundwater system and how it is used

Illustration-3. Figure 3 from the draft has been modified. No abstraction bores near coast, injection bore next to coast and river. Should water abstraction bores be away from the coast and other areas of potential salt intrusion.



Illustration 4. Shows treated water dumped in the ocean. Copied from Ananda (2020).

dump their waste in this fashion. More fundamental the water that comes from the treatment plant, should not be regarded as ‘waste’ but as a ‘resource’. The fact that their waste is “clean water” and so proper disposal means re-injection of this water. We assume that it would be the same for water drain to the ocean a little to the north from Herdsman Lake.

The central and most elevated part of the Superficial aquifer is known as the Gnangara Mound. The Leederville (up to 550 metres thick) and Yarragadee (up to 2,000 metres thick) are large, deep aquifers present across almost the entire Perth region. These are used mainly for public water supply. Latest research shows the Superficial aquifer is more widely connected to the deeper aquifers than previously thought (DWER 2021a).

There is no reference in the draft how the Leederville & Yarragadee aquifers are getting replenished?

Question # p7.

Declines in hydraulic pressure in the Leederville and Yarragadee aquifers (measured as pressure head in mAHD) has accelerated since the 1980s as groundwater abstraction from them, mostly for public water supply, has increased. Where the deep aquifers are connected to the Superficial aquifer, the reduced pressures have exacerbated declines in Superficial aquifer levels.

How much? There is a need for diagrams to explain this.

Elsewhere, along the Swan River (Derbarl Yerrigan) and the coast, lower groundwater recharge has caused saline water to move inland, making some bores more saline. Acid-forming soils have been exposed above the watertable, making lakes Mariginiup and Gnangara acidic and increasing acidity in Mussel Pool in Whiteman Park.

Even more important to have Pannage wetland, Henley Brook, not be disturbed by proposed Henley Brook Avenue extension south of Park Street.

Comment # p8

Figure 4 More than 1,000 gegalitres of groundwater storage has been lost from the Superficial aquifer since 1980

Declines in hydraulic pressure in the Leederville and Yarragadee aquifers (measured as pressure head in mAHD) has accelerated since the 1980s as groundwater abstraction from them, mostly for public water supply, has increased. Where the deep aquifers are connected to the Superficial aquifer, the reduced pressures have exacerbated declines in Superficial aquifer levels.

As figure 4 from the text (Illustration-4) visually highlights the decline in water storage in the Superficial Aquifer is very worrying and indicate that stronger actions than proposed in the draft are needed.

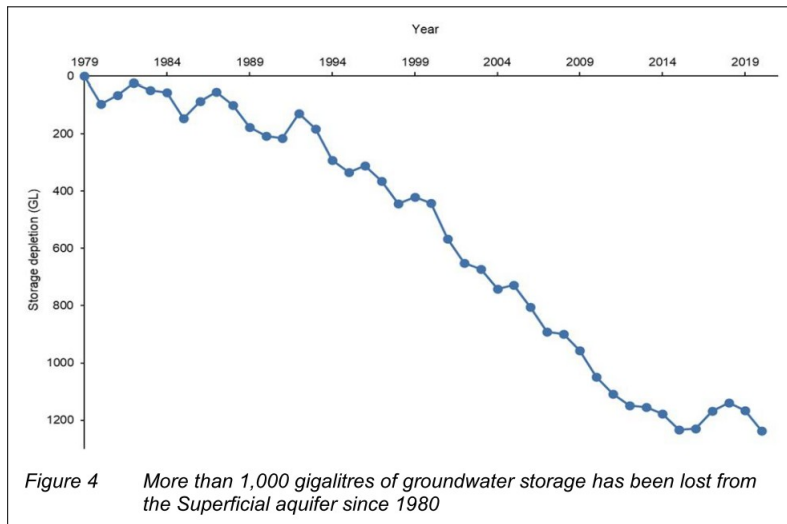


Illustration-4. Figure 4 from the draft visualises the impact of the decline in storage in the Superficial aquifer.

Comment # page 11.2. *Licensing strategy – we then asked representatives from the major water use sectors for their input, including how they thought their industry would respond to reduced groundwater availability.*

See comments Question # page xi

Comment # page 11.2. *The Waterwise Perth Action Plan has nine targets to be achieved by 2030, one of which is to reduce groundwater use by 10 per cent across the Perth-Peel region. Delivery of a new Gnangara groundwater allocation plan is also an action under the Waterwise Perth Action Plan.*

Is the percentage of the current level or is it adjusted for expected population growth levels? Taking the current situation of changing climate into account as outlined by the IPCC (2021) the reduction must be more like 25%.

Comment # page 12. *The North West, North East and part of the Central subregional frameworks cover the Gnangara plan area.*

Very strict development requirements for water are needed. That is not what is observed. For example, why are there still large, grassed areas such as at Aveley allowed ⁶ ?

⁶ These areas are not for recreational purposes just for appearance. They should not have been allowed in the first place.

Comment # page 12. *As part of the Waterwise Perth Action Plan, we are working with the Department of Planning, Lands and Heritage (DPLH).*

In the recent “Water Resources Policy & Guidelines 2021 draft by Western Australian Planning Commission” (submissions closed 15 Nov 2021) the potential changes to be made by DWER’s policies were not mentioned. Is DWER aware of the public comment documents of the Western Australian Planning Commission? Their recommendations may not fit what this document tries to achieve. Which ones overwrites? Would the Western Australian Planning Commission have to rewrite their policies and guidelines if not compliant to DWER standards?

Question # page 14

Under the Water Agencies (Powers) Act 1984 4 the Minister for Water has the general functions and powers to conserve, protect and manage the state’s water resources by assessing and planning for the use of water resources.

Do water resources include wetlands or is narrowly defined as abstractable water?

Why were these powers not used to protect Egerton Seepage and is the minister going to use them to stop future developments, including roads affecting wetlands?

Question # page 16 Table 1.1.a

Long-term access to Perth’s lowest cost and largest source of good-quality water is secured.

Lowest cost in the short term because long term externalities are not accounted for. Water Corporation should not be drawing from this superficial aquifer resource since it must be preserved for natural and agricultural purposes. Urban water supply, both domestic and commercial, should come from desalination entirely as soon as possible.

Question # P16 Table 1.1.a *Modest changes now to secure groundwater resources mean less drastic action may be required in the future.*

Is this true? What modelling assumptions have been made? “... Modest changes ...” reads like business as usual. The sentence should read “Drastic changes now to secure groundwater resources mean far less extreme action may be required in the future”. This is more in line with fast changing climate and increased water usage by growing population.

Comment # page 16 Table 1.1.b *Egerton Seepage. The health of ecosystems that previously suffered negative impacts from groundwater level decline is stabilised. At Egerton, in centre Ellenbrook, the regional watertable of the Superficial aquifer intercepts the ground surface, creating a groundwater-dependant ecosystem. ...*

Groundwater that is discharged ... is also important to ensuring the longevity of a number of endangered aquatic macrofauna (HG53, 2011).

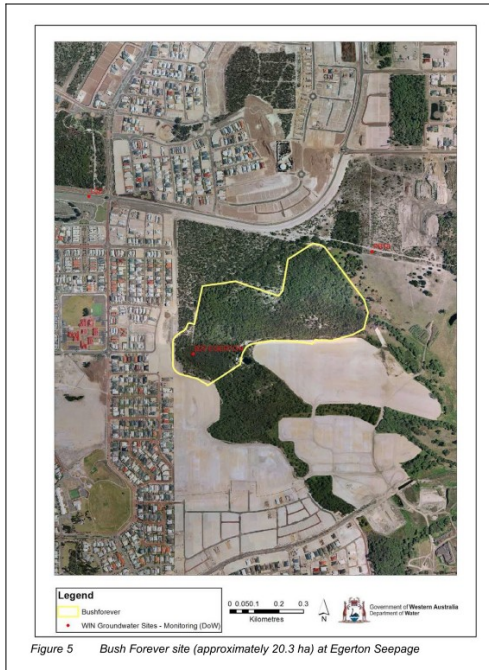


Figure 5 Bush Forever site (approximately 20.3 ha) at Egerton Seepage

Illustration-5. The Bush Forever Egerton Seepage tightly surrounded by urban development. What can be done to preserve this unique environment? Status quo is not good enough. From HG53 (2011).

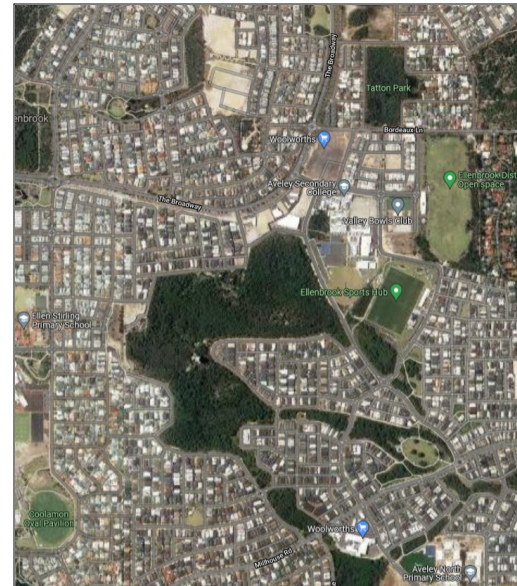


Illustration-6. The image on the right 10 years later shows urban development even more encroaching on to the Egerton Seepage.

Extensive urbanisation and the modification of local geomorphology (from 2000) around Egerton were likely to have altered the local hydrogeology and the flow regime at the seepage. The dunes to the west of Egerton Seepage contained Banksia woodlands that were considered to be an important hydrological factor, with the seepage being recharged by groundwater flowing from the west. The removal of native vegetation, the levelling of the dune and urban development resulted in a 1 m watertable rise around the Egerton site since 2000, and the suggestion of localised mounding (HG53, 2011).

Is this “levelling of the dune” a result typical lazy business as usual development? The whole practice by developers of levelling and carting sand in should be reviewed from a hydrological and environmental perspective.

Groundwater levels and water quality at the seepage are also probably affected by the Ellenbrook development that borders the Bush Forever site to the west (HG53, 2011).

The images compared above is another indication there is no cooperation between departments and that other departments do not care about encroaching onto bushforever sites

There are other issues associated with urban development highlighted by issues around Egerton Seepage, like “... its hydrology was now more influenced by an increase in local recharge and runoff as a result of urban development”. What is quality of runoff water, how does it affect the natural environment? The urbanisation is likely to result in “The enhanced nutrient levels at Egerton were likely to favour weed invasion and may alter water quality such that some components of the fauna cannot survive. ... The high levels of nutrients at Egerton may also influence downstream water quality and affect endangered aquatic macrofauna in Ellen Brook.”

Excess nitrogen is a worldwide problem, what can we learn from others mitigating and solving it? What actions are suggested by DWER?

Question # page 17 Table 1.2. *Vegetation communities over shallow groundwater will have experienced a slow transition to species preferring drier soil conditions, with no catastrophic loss of species or habitats.*

What is *catastrophic loss*? Is a near-catastrophic loss a good outcome? Shouldn't the aim be restoring previous levels?

Besides climatic droughts, lowering watertables by abstracting will have the same effect on reducing the potential for carbon sequestration (Dooley et al., 2021; Walden et al., 2018); in other words restoring the wetlands will also help with carbon sequestration.

Comment # page 18 Table 1.4. *The risk of groundwater users being affected by salinity near the coast and along the Swan River (Derbarl Yerrigan) is significantly reduced.*

Seawater intrusion and its resulting increase in salinity are described by Werner (2010).

Salinity increases in the Swan Valley are a risk for its agricultural viability (see illustration-7).

The impact zone represents 25% of the Swan Valley. As the map shows salinity could affect about 55% of the priority Agricultural zone which represent 46% of the Swan Valley. The salinity impact could affect about therefore mitigation of greatest importance! These figures are alarming! The draft document does not provide any actions or targets to mitigate this upcoming problem!

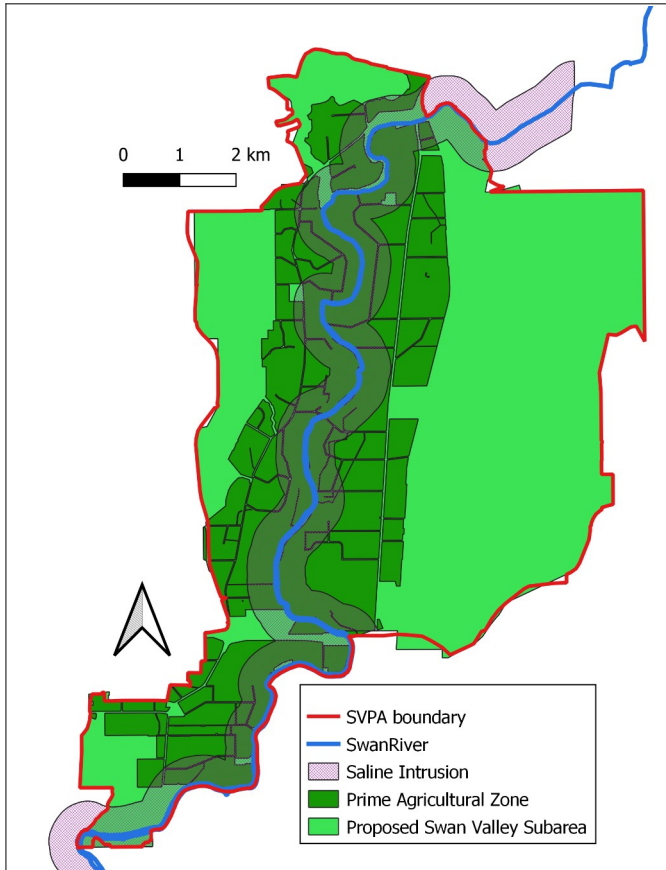


Illustration 7. Potential impact zone saline intrusion in Swan Valley along Swan River. This impact zone represents 25% of the Swan Valley. The Priority Agricultural zone represents about 46% of the Swan Valley. The salinity impact could affect about 55% of the priority Agricultural zone. Based on data from DWER.

Question # Table 1.5.

Acidification risk areas: at and around wetlands including lakes Jandabup, Mariginiup, Egerton Seepage and Mussel Pool in Whiteman Park

Is this also the case for smaller wetlands like the Pannage Wetlands in Henley Brook?

Question # page 20. *When the 2009 Gngangara plan was released, allocation limits were based on an average annual rainfall of 729 mm (Perth Airport rainfall station 1975–2008). Since then, the average has declined to 699 mm (1990–2020) and Perth has had three of the driest years on record – 483 mm in 2010, 578 mm in 2015 and 525 mm in 2019. Groundwater modelling for this plan is based on a climate projection to 2030 that is consistent with the trend in declining rainfall experienced in Perth over the past two decades (Figure 6). Under this projection, the average annual rainfall at 2030 will be 663 mm (Perth Airport rainfall station). Assumed 10% decrease? What about scenarios where there is a 20% or 30% decrease? The report lacks scenarios.*

Question # page 21

The illustration- is a follow-on of question #page 20.

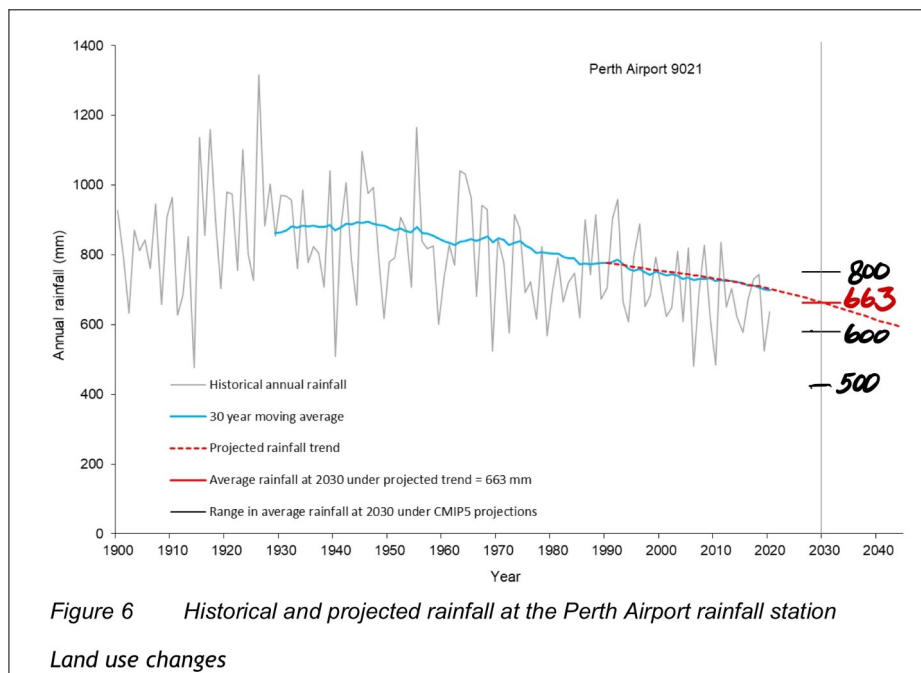


Illustration 8. 800 mm~ + 21%, 600mm ~ -18%, 500mm ~ -30%. These rainfall number would be good bases for various scenarios.

Question # page 26

* Most of this reduction will come in 2028 from changes to groundwater licensed to the Water Corporation for public water supply for the Integrated Water Supply Scheme, totalling 30 GL/year across all aquifers (a 27 per cent reduction) (Section 5.1).

* A further estimated 13.6 GL/year reduction will come from aligning the current three-days-a-week sprinkler roster for domestic garden bores with the two-days-a-week roster for scheme users in the Perth/Mandurah area.

We agree with the rostering for garden bores but why only garden bores? What about the ones from councils, schools and other institutions? Will there be timeslots when watering is prohibited, let's say between 8am and 4pm? What about the many 2ha plus lots for equestrian pursuits where it appears sprinklers are used daily during the middle of day; timers can easily be installed to for night time service. Some agricultural crops maybe adversely affect by using sprinklers during the night, but that cannot be said for grass in the equestrian industry. No rules are in place here, why not? How achievable is this? Is there a limited time or volume for

sprinkler use? Will people use water more on the rostered days and so the target cannot be reached?

Question # page 48

a) Proposed changes to the Superficial aquifer subareas in the Swan Valley b) Priority agriculture zone in the proposed Swan Valley groundwater subarea Figure 9 Proposed Swan Valley groundwater subarea (a) and priority agriculture zone (b).

See question # p18.

Question # page 49

Parks, gardens and recreational areas are an integral part of the Perth lifestyle and are important for active and healthy communities. Local governments, urban developers, schools and sporting clubs typically access the Superficial aquifer to irrigate these areas.

Except for schools and hospitals, this sector's licensed water users will need to reduce their groundwater abstraction by 10 per cent from 2028 to contribute to bringing total and local abstraction from the Gnangara groundwater system down to a more sustainable level.

Why? Only sporting grounds and common grounds used by students should be reticulated and regularly watered. The rest should be native vegetation. What are the reasons for this exemption status?

Question # page 50

Most of the groundwater used to irrigate public open spaces is licensed to local governments. What does that mean? Do LGAs not have to follow the same rules? LGAs should stop verge watering, verges ideally converted to be planted with natives that attract native bees and other fauna. This should also happen to parklets that are not used for recreation. For LGAs there will also be a cost saving not having to mow them regularly. Water use will decrease, and cooling will increase even though the albedo effect is higher. If they use any reticulation it should be subsurface. Above ground sprinklers should be banned since they encourage trying to grow concrete.

Question # page 51

Primary and secondary schools are exempt from reductions in groundwater abstraction.

See comments question # page 49.

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