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GSS task force
Department of Water
PO Box K822
Perth WA 6842

GNANGARA SUSTAINABILITY STRATEGY

Submission by Urban Bushland Council **:** Ms Mary Gray
President, Urban Bushland Council WA Inc
PO Box 326 West Perth WA 6872
Tel 9420 7207 Fax 9420 7208
ubc@iinet.nat.au

GENERAL COMMENTS

The UBC welcomes the GSS and believes it is a very important document in a process which calls for ongoing research, proper funding and real government commitment into the future. There are some excellent initiatives that we support. We also submit there are some significant omissions and some fundamental flaws which need to be addressed.
We call for some amendments.
The objectives need to be rewritten and based on sound principles of science and ESD.
We call for a new statutory managing authority.

EXECUTIVE SUMMARY

Data on volumes abstrated: The lack of data on actual volumes abstracted by all private users, licensed and unlicensed, is a major weakness of the strategy.

Water quality: Consideration of groundwater quality and acidification and impact on vegetation health has not been included and should be included in a revised draft.

Wetlands There is almost no consideration of wetlands in the GSS and this is an omission that needs to be included. The landscape concept of *'Perth – city of wetlands'* has not been considered yet the community values its wetlands very highly.

Burning to increase yield: The UBC is alarmed by, and objects strongly to, the proposal to regularly burn Banksia Woodlands. They are already burned too often and biodiversity, soil and water quality all suffer. Prescribed burning should be removed from the GSS.

Carnaby's Cockatoo: Replacement feeding habitat for Carnaby's needs to be replanted immediately in large areas so that it can be productive *before* pines are harvested and this icon species dies out. This issue needs to be included in the summary.

Ministerial conditions: The UBC objects strongly to the dismissive approach to the many breaches of Ministerial conditions. Because the Water Corporation has breached so many conditions consistently in recent years, the attitude is the conditions need to change so that over abstraction regardless of the fact that it is at the expense of natural ecosystems can continue unabated. This is both outrageous and unacceptable.
It also highlights the absence of any appropriate regulatory authority or laws in controlling and managing the publicly owned groundwater resource and its dependent ecosystems: the Banksia Woodlands and wetlands of the Gnangara Mound.
To further entrench the dismissive approach, consideration of water and soil quality especially related to acidification on the Mound has not been included in the recommendations. Yet the need for the Water Corporation to increasingly treat acidified water for potable supply is likely to become a significant issue calling for more sophisticated and costly treatment. This we submit is a fatal flaw in the GSS.
Notably also the WA Health Department is not included as one of the agencies in the 'across government initiative' of the GSS.
The principles of prevention and precaution seem to be lost in the push for developers and the water corporation to get all they want cheaply.
Notably the EPA has produced a number of reports concerning breaches of conditions and the associated environmental issues on the Gnangara Mound but they are not listed as references in section 8. The UBC believes that they should be included and the advice used in the GSS. Issues of environmental protection are critically important to the GSS.

Pine removal We agree that removal of 22,000 ha pines will be a significant land use change affecting groundwater recharge. But the impact of the subsequent loss of feeding habitat for the endangered Carnaby's Cockatoos is not mentioned in the summary and should be. Replacement of feeding habitat *before pine removal* should be part of the strategy. So this process needs to be taking place now.
Removal of pines will also cause degradation of the surface soil profile. Removal of the vegetation removes most of the soil organic matter resulting in loss of buffering capacity and thus increases acidity in the soil profile.
The issue of soil and groundwater *quality* is a serious omission in the summary.

Tradeoffs We support the highest value (human) use or primary use of Gnangara groundwater being public water supply. Given the likely decline in the quantity of groundwater available for future abstraction; the over allocation already existing today; and the primacy of use for potable supply, we submit that it follows that competing uses which could be transferred elsewhere should indeed be removed and transferred elsewhere. This applies especially to horticultural uses which we note remain largely unmetered and are thus free of cost to these producers. This is fundamentally inequitable and we suggest morally wrong. The UBC believes that all private (industrial, commercial and domestic) users of groundwater should pay per unit volume abstracted.

20% reduction We support the reduction of allocations for public supply but question whether 20% is enough given the extensive breaches of Ministerial conditions to date and the vulnerability of the Mound to acidification and degradation of groundwater dependent ecosystems.

Coastal borefields may lead to saltwater intrusion. Water quality in existing and proposed coastal borefields deserves consideration and discussion. Health Department input should be included here and for all potable supply borefields.

We agree that **increasing the proportion of abstraction from confined aquifers** requires further investigation and a precautionary approach.

Private licensed supply We support reduction of allocations but up to a much greater figure of 50%. Further as stated above private supply should not be permitted close to and thus competing with public bores. No private bores should be permitted in P1 areas.
We suggest that the volumes of water abstracted by licensed users is probably greatly in excess of allocations as most are un-metered and free of volumetric charges.
The lack of data on actual volumes abstracted by all private users, licensed and unlicensed, is a major weakness of the strategy.

Carabooda horticulture precinct. Not supported.

1.0 INTRODUCTION

Notably this section states that the Indian Ocean Climate Initiative indicates that lower rainfall and higher temperatures are likely to continue or worsen in the foreseeable future. However this scenario is not used in the base case approach of PRAMS (explained on page 8). The assumptions in the 'base case approach' for PRAMS are based on the averages of parameters between 1997 and 2006, which is inconsistent with the most likely IOCI predictions. This presents a fundamental flaw in PRAMS.

The GSS insists that declining rainfall is the main reason for declining groundwater levels. As there is no reliable data on the volumes of private abstraction, the contribution of abstraction to groundwater decline cannot be reliably determined. In other words the GSS seems to blame falling groundwater levels on lower rainfall thereby absolving the Water Corporation and regulators (DOW, DEC) of responsibility for over-use. This approach is too simplistic, is unrealistic and avoids the political need to measure and reduce all abstraction rates. It is not the precautionary approach.

It is curious and somewhat disturbing that urban development and a major public road on P1 areas were included in the list of issues that the GSS was required to address. The UBC understands that these are not permitted land uses in P1 areas (UWPCA). They are polluting and thus totally unacceptable land uses on a potable water supply catchment (*ie* intake areas to the Mound). We believe they should be removed from the GSS.

The objectives (p3) use vague language with unclear meaning. They seem to be spin for an objective of pleasing everybody. The UBC recommends that they be re-written in plain english with a more scientific basis and with firm commitment of actions that will be carried out.

2. IMPACTS OF DECLINING RAINFALL AND INCREASING DEMAND ON THE GNANGARA GROUNDWATER SYSTEM

The UBC questions the assumption that a drying climate is the *major* cause of falling groundwater levels. Abstraction must also be a significant cause, especially in localised areas.
The scenario where rainfall is 11% drier than for the 1976 - 2006 average (as described on p9) would seem to be a more likely scenario for the base case in PRAMS (rather than business as usual as discussed in 1.0 above).

Notably there is no mention of rainfall patterns associated with lunar-nodal cycles. Under the current cycle, our understanding is that rainfall is expected to decline until ~2030, then increase again due to this natural cycling phenomenon. The impact of human induced changes is an addition to these natural cycles.
We question the assumption that population should or would increase so much. There is neither discussion of per capita consumption, nor the effect of different urban forms on consumption. The 'business as usual' scenario is implied with very high per capita water use and uncontrolled private abstraction.
Under the 11% drier scenario, 'few wetlands will remain' and 'impacts may be hard to reverse'. We fear that general degradation of the vegetation systems on the Swan Coastal Plain is likely but the GSS does not consider this most likely scenario seriously.

3. MANAGING THE ENVIRONMENT UNDER A DRYING CLIMATE

Recommendations supported, especially 5 & 6 with the exception that we do not support urban expansion on the fringes of state forest. We strongly support the introduction of an ***Urban Growth Boundary*** for Perth and a change to a much more compact urban form.

In chapter 3 the issue of acid sulphate soils and the impacts on groundwater quality are discussed in the text but are not included in the recommendations. This is a major omission of a very significant feature of the Swan Coastal Plain soils. We strongly recommend that the management of increasing acidity as a result of drying of wetlands and surface soils as well as the issue of disturbance of acid sulphate soils be added.
As the text states, falling groundwater levels are affecting terrestrial ecosystems as well as wetlands (p14). Groundwater and soil quality are very vulnerable to acidification and change as a result of drying. There needs to be a much greater recognition across all agencies of this. The UBC has been concerned about this issue for some years now and we believe that the GSS needs a focus on changes in groundwater quality in addition to the focus on quantity in its recommendations. Considerable research into acidity issues has been carried out under the GSS but this is not reflected in the recommendations

4. MANAGING LAND AND WATER USE UNDER A DRYING CLIMATE

4.1.1 INCREASING RECHARGE WITH RECYCLED WATER

nos 1,2,3 supported.

no 6 not supported. The UBC does not support extension of horticulture at Carabooda now or in the future. This area already places competitive pressure on the Mound meaning that abstraction should be greatly reduced and should certainly not be expanded.

4.1.2 INCREASING RECHARGE THROUGH LAND USE CHANGE AND IMPROVED LAND MANAGEMENT - PUBLIC LAND

Strong objection to recommendation nos 1, 7, 8.
Support nos 2, 5, & 6 (with addition).

Crown land under native vegetation

The UBC objects strongly to prescribed burning of Banksia Woodland and believes it is a highly destructive process. It has no ecological basis nor benefits but rather results in loss of surface soil organic matter, increased weed invasion, loss of fauna, especially reptiles and invertebrates, as well as loss of breeding and feeding habitat for birds. There is already extensive data collected by Ric How and associates (WA Museum) on the issue of fire impacts and this data was presented to the

UBC at our AGM March 2009. Furthermore increased burning increases Greenhouse Gas emissions.

We do not understand how any useful data on the sustainability of biodiversity under various burning regimes can be collected in a relatively short period of the GSS studies (less than 20 - 30 years). Many plant species in Banksia woodland are re-seeders which take up to 15- 20 years to replenish viable soil seed banks after fire. Further the stable recycling of nutrients in a Banksia ecosystem depends on a complex and stable population of decomposing and nutrient fixing microflora (of fungi and bacteria). Invertebrate populations and reptiles etc are also part of this complex system.
Regular burning removes the stable leaf litter layer, invertebrates, microflora and all the ecosystem processes which then have to re-establish. . For example it takes at least seven years for invertebrate populations to build up again.
Removal of organic matter after fire also hastens the acidification process. While there may be increased groundwater recharge it comes at a great cost to the ecosystem. As discussed in the GSS text, leaching of surface soil increases with loss of buffering capacity, and surface soils and groundwater become more acid.

The UBC believes that the GSS focus is primarily on groundwater quantities without adequate integration with groundwater quality issues. We recommend that this be addressed in a revised GSS because it is the health and survival of our unique and diverse ecological communities which are at stake. Without careful control and management, we as a society stand to lose our Banksia woodland and wetland ecosystems, the defining landscape features of the Perth region.

Development in P1 areas illegal
As stated in the text the proposed land uses in recommendations 7 & 8 are not permitted under UWPCA legislation. It is totally unacceptable to remove the proposed areas from P1 and the UBC strongly objects to this. P1 areas have the statutory purpose of protecting groundwater quality and potable supply. These measures were put in place by Government after a very thorough Upper House Select Committee inquiry and report into protection of public groundwater supplies.
Urban development is both a degrading and polluting land use and is unacceptable in a potable water supply (groundwater) catchment area. Aspirations of land developers do not change these facts.

The UWPCA boundary

Carnaby's: Recommendation 6 needs to include a process of replacing Carnaby's feeding habitat *before* pines are cleared. If left until after clearing finishes, it may be too late and the Carnaby population may collapse.

4.1.3 INCREASING RECHARGE THROUGH LAND USE CHANGE AND IMPROVED LAND MANAGEMENT - FREEHOLD LAND

Strong objection to nos 2,3,4. The UBC does not support extension of horticulture at Carabooda now or in the future. We do not support alteration of the UWPCA boundary such that P1 areas are reduced. Land use change from P1 to horticulture does not constitute improved land management. Indeed it results in land degradation and soil and water degradation. Horticulture uses vast volumes of groundwater and competes with potable supply. Potable supply has been given the highest priority so horticulture should not increase but rather it should decrease on the Mound. Thus we do not support no.1 as horticulture cannot be given long term security.
The 800 ha of pine plantation to be cleared should be revegetated with Banksia Woodland species that would have been in that area.

Nos 5 & 6 supported.

4.2.1 REDUCING ABSTRACTION FOR PUBLIC WATER SUPPLY

This section should be moved to section 4.1. Reducing use comes logically before other strategies.

no 3 - Groundwater replenishment from Beenyup supported
no 4: Concern about increased abstraction from deep confined aquifers as rate of recharge not known. It seems we are mining deep aquifers and this may have a longterm deliterious effect on the resource and on surface groundwater levels and the ecosystems they support.
no 5 supported

4.2.2 REDUCING ABSTRACTION FOR PRIVATE LICENSED WATER SUPPLY

Some areas are already over-allocated and these allocations need to be reduced. We presume no 1 addresses this.
We suggest abstraction be reduced by at least 50%. But before this can be done effectively, meters will be needed on all licensed bores. We recommend that installation of meters be made an urgent priority (perhaps with some stimulus money) for all bores and that they be read at least twice yearly by a Government Authority (DOW or a new Authority)and that all water be charged on a volume abstracted basis. (We advocate Australian made meters)
Notably it is not known how much water is currently being used by each licensee and we suspect use *greatly exceeds licensed volumes* in most cases where there are no meters.
Licensed users currently enjoy free high quality water and this needs to change as it encourages overuse and abuse of a precious resource. All users are privileged to borrow a public resource and as a matter of equity all should pay per volume used. We suggest this would dramatically reduce use.

no 2: We support radical changes to irrigation techniques.
We also recommend including mulching or organic techniques to markedly increase soil organic matter as this will reduce watering requirements as well as improve soil health and reduce leaching.

4.2.3 REDUCING ABSTRACTION FOR PRIVATE UNLICENSED WATER SUPPLY

No 1 supported only with meters and volumetric charges. As above we recommend that all bores have meters installed at the owners cost and that all pay per unit volume used.
No 2: Restrictions on domestic bore use in gardens should be the same as for restrictions on potable supply. This would facilitate enforcement and is more equitable than the current system.
No 3 supported
No 4 We suggest gardens using greywater or un-irrigated native gardens.
No 5 Monitoring supported. But domestic bore users not likely to change their habits without binding restrictions.

5.0 IMPROVING FUTURE GOVERNANCE OF LAND AND WATER MANAGEMENT

There seems to be no authority with the responsibility of managing the groundwater resource and its quality. The UBC recommends that a new independent Statutory Authority be established with the responsibility for overall control and management of groundwater resources of the Gnangara Mound.
Its powers should include installation and regular reading of meters on all bores; imposing volumetric charges, ability to control volumes abstracted, research and monitor aquifers, restrict or

close bores, monitor and control groundwater quality by remediation, audit and enforce agreed management measures; management of wetlands and groundwater dependent ecosystems and so on. A new Authority would thus address the issues raised in nos 1,2,3,4.

6.0 IMPACTS OF RECOMMENDED LAND AND WATER MANAGEMENT OPTIONS ON THE REGIONAL WATER BALANCE OF THE SYSTEM BY 2030

The UBC recommends that PRAMS makes the following changes:
an 11% rainfall decrease in the base condition,
no conversion of east Wanneroo land to horticulture,
no burning of Banksia Woodland,
50% reduction in all private abstraction
no employment generating commercial use on former pine areas
much more revegetation with local plant species on pine areas
management to maintain wetland assets

7.0 CONCLUSION

Focus is on water balance and groundwater quality and ecosystem health issues are not addressed in the GSS.
The GSS is a complex document and should be implemented with the suggested modifications by government with a clear commitment and proper funding.

GSS APPENDIX 1: ZONE PLANS

General comments

The maps for each zone do not show the P1, P2 and P3 areas. This makes it impossible to comment on land use issues as it is not clear whether the areas discussed are P areas or not.
There is no explanation of the new UWPCAs and whether they are proposed or already approved. On what scientific grounds were they altered? Were changes made to satisfy vested interests of developers or convenient cadastral boundaries? And if so why were such changes permitted?