Environmental Protection Authority
Comments on Planning for the Future of the Perth Metropolitan Region

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PLANNING FOR THE FUTURE OF THE PERTH METROPOLITAN REGION

Comments on environmental aspects
by the Environmental Protection Authority
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1. INTRODUCTION

In 1988 the Environmental Protection Authority (EPA) considered the report "Planning For the Future of the Perth Metropolitan Region" that was released by the State Planning Commission following the review of the Corridor Plan for Perth and the Metropolitan Region Scheme. The proposals have not been assessed at a formal level. In responding to the report and its proposals, the EPA notes the following points:

. the report puts forward general rather specific proposals for the future growth of the metropolitan region. It contains a preferred strategy that will be refined through various consultative processes;

. the review process that preceded preparation of the report involved wide community consultation and as indicated above, consultation will continue during the process of finalising the strategy;

. upon finalisation of the future strategy, statutory planning processes will need to occur to put particular proposals into effect. These processes will provide the Authority with a further opportunity to assess such proposals either internally or formally; and

. revision of the planning strategy for the metropolitan region raises many fundamental and complex issues. Although environmental matters are obviously important, resolution of these issues and the inevitable conflicts that will arise will require a whole of Government approach, rather than a series of separate decision-making processes, during finalisation of the planning strategy.

The EPA has, however, considered the environmental issues arising from the preferred strategy put forward in the report "Planning for the Future of the Perth Metropolitan Region". This report reviews those issues.

2. DISCUSSION

The EPA considers that the preferred strategy has a number of positive aspects, including:

- the notion of urban consolidation which, if carefully planned and managed, can produce many environmental benefits;

- recognition of the need to preserve Perth's coast and beaches, rivers and wetlands as a matter of priority; and

- accommodation of many System 6 Recommendation areas, particularly the proposed metropolitan regional parks.

Additionally, relevant environmental issues have generally been identified although, in some instances, these have been considered somewhat superficially. Accordingly, in finalising a planning strategy for the Perth Metropolitan Region, certain environmental issues should receive further attention.

The most significant of the issues relates to water resources, in particular the consequences of urbanisation within groundwater resource areas, but also including the modification of consumption patterns through urban design and the effects of climatic change. The effects of climatic change also need to be considered in other contexts, such as changing water levels in coastal areas and in the Swan-Canning estuarine system. The need for adequate buffer zones relating to pollution and noise emissions and risks and hazards associated with certain industrial operations is another factor that could influence metropolitan form.

These issues, and also matters relating to System 6 areas, regional reserves and natural features of the metropolitan region are discussed below.

3. ENVIRONMENTAL ISSUES

3.1 GROUNDWATER

The groundwater reserves underlying the Swan Coastal Plain represent a major environmental resource for a number of consumptive and non-consumptive purposes, including:

- major public water supply schemes and abstraction for institutional uses (eg by State and Local Government authorities);

- private groundwater abstraction (eg for domestic, commercial and industrial activities, and primary production); and

- maintenance of biophysical environmental features (eg wetlands).

The land and underlying water resources of any region are directly related, particularly in an area like the coastal plain of Perth where the sandy soils provide a generally poor medium for the removal of pollutants from infiltrating waters. The existence of the coastal plain groundwater reserves was recognised as a constraint upon future development during the regional planning review. Nevertheless, the preferred strategy both confirms existing (but not yet developed) urban areas within designated groundwater areas and proposes further such urban areas. While recognising the dilemma that the existing urban areas represent for the planning process, the EPA regards the designation of additional urban areas within the designated 'primary source' groundwater areas (proposed and existing public water supply borefields and their recharge areas) as an environmentally undesirable feature of the preferred strategy.

Although experience has shown that urbanisation contributes to groundwater contamination, under some circumstances such development may represent less of a threat to the underlying groundwater than do certain noxious and nutrient releasing rural land uses that characterise much of Perth's proclaimed groundwater areas. Furthermore, urbanisation is sufficiently capital-intensive to permit the construction and operation of pollution control structures on urban drains. This contention has in fact influenced decisions regarding urban development proposals in some instances. However, the Water Authority's "Land Planning and Groundwater Resource Protection" policy argues against the establishment of urban development within the key groundwater areas ('primary source' areas) because of the potential for groundwater pollution associated with such development.

The threat to groundwater from urban development is not from pollution alone. The export of water via drainage schemes needed to render the land suitable for urban development also poses a threat both to the groundwater resource and the broader environment to which the drainage waters are discharged. Pollution and drainage related issues are arising in the South Jandakot area where a major urban cell is proposed, and will also arise if moves to establish urban development on the eastern or western sides of the Gnangara Mound proceed.

The Water Authority's policy does not absolutely preclude the possibility of urban development in groundwater areas. However, it does indicate that such should only proceed if demonstrated to be acceptable through detailed environmental assessment. The EPA endorses this position with respect to "known groundwater areas", but is opposed to urban development in "primary source" areas. The EPA believes that urbanisation in "primary source" areas should not be countenanced.

Both the Water Authority's groundwater protection policy and experience being gained with the South Jandakot area demonstrate that currently accepted development philosophies and practices are not appropriate in areas containing valuable groundwater resources. For example, the typical approach to land drainage is based on lowering the water table and exporting the resultant "waste" water off-site. The way in which domestic gardens and other recreation areas are managed also needs to be revised in view of the threat to groundwater (both in terms of water consumption and pollution) that these elements of urbanisation can represent.

The EPA considers that there can no longer be a presumption that urban development (particularly in its traditional form) will be able to proceed in areas historically thought appropriate for such development. Urbanisation is a form of development that is incompatible with wise management of the groundwater resource for the purposes of public water supply and the maintenance of environmental values. Accordingly, areas of known value for groundwater (both in a public supply, and biophysical environmental sense) should not be designated for urban development unless it is demonstrated through thorough environmental investigations and assessment that such development could proceed without jeopardising groundwater quality and quantity. The likelihood of being able to achieve this objective must be recognised as low if conventional development philosophies and practices are pursued.

Other non-urban forms of development can also contribute to the degradation of groundwater resources and, in addition to urban uses, the Water Authority's policy addresses such activities as rural, special rural, industrial, commercial and transportation. The EPA also addresses industrial activities in the following section of this report.

Within areas that contain valuable groundwater resources, or are important in terms of sustaining such resources (recharge areas for example), the environmental priority for the planning process would be to ensure that land use and development strategies were compatible with maintaining the nominated human and environmental values of the resource. It is therefore incumbent upon the planning system to devise, implement and enforce suitable planning controls that achieve the required degree of water resource protection, and avoid the cumulative costs to society of irreversible resource degradation. Acquisition and permanent protection of key areas such as parkland or conservation reserves should be given serious consideration as the safest and most cost efficient protective mechanism in the long term.

3.2 INDUSTRIAL DEVELOPMENT

In terms of groundwater protection, industrial development can be considered as an adjunct of urbanisation, although of a more severe form because of the high water demand of some industrial activities and the serious pollutants that many industrial activities generate. The transportation and storage of hazardous substances is another facet of industrial development that reinforces its fundamental inappropriateness in areas with valuable groundwater resources.

In addition to the potential of industrial development to affect groundwater resources, other environmental issues associated with such development need to be considered and accommodated in the regional planning strategy.

The Authority recognises that the review process included thorough examination of areas to accommodate industrial development. From the environmental viewpoint, the objective for regional industrial planning should be twofold:

- initially, to identify and allocate areas suitable for industrial development taking into account the biophysical effects of such development and the excluding effects industry has in terms of other uses; and

- secondly, to designate an appropriate "buffer" surrounding areas designated for industry, or any other form of noxious or environmentally impacting activity (eg water treatment plants).

The intention of the buffer is to both protect the industrial area from constraining land uses, and to protect other areas beyond the buffer from the adverse "spillover" effects from the industrial activities. The buffer area could be used to accommodate land uses unlikely to be adversely affected by the spillovers from the industrial area and unlikely to exert any adverse impacts upon the surrounding environment. Buffer areas, (ie the land-take required), should be provided within designated industrial zones and should be borne as a direct cost of industrial land development.

Industrial land uses may have direct impacts such as loss of vegetation and change of landform. They also have the potential to produce impacts through the pollution of air and water, and from increased noise levels. Industrial developments may produce emissions having a sustained, low impact; but they may also have the possibility of a single, high-impact event with consequent risks to people. These latter impacts are being addressed by risks and hazards assessments within the environmental impact assessment process.

The preferred industrial strategy put forward in the report "Planning for the Future of the Perth Metropolitan Region" does not explicitly address the need to provide protective buffers for areas designated for industry. The need for preparation of an "industrial land policy" which would, among other things, contain "criteria" for minimising the adverse landuse and environmental impacts of industrial development is, however, identified. The EPA endorses the need for such a policy and, in Appendix A to this report, puts forward principles relating to the location, management and control of industry that would provide a sound basis for the environmental component of this policy.

3.3 GREENHOUSE EFFECT

The report "Planning for the Future of the Perth Metropolitan Region" focusses on the environmental quality of the region as a major contributor towards the quality of life available.

The main positive environmental attributes of the Perth Metropolitan Region are identified as the wetlands, groundwater quality, coastal and bushland areas. All of these are affected by climate, especially temperature and rainfall. In addition to this, other attributes such as rural industries are also affected by climate, a fact that needs to be recognised in the planning for such areas.

In the report, these attributes are all described in terms of the present climate, based on past records. A significant concern of the EPA is that there is very little reference to the Greenhouse Effect which may result in a significant change to climate. From information so far produced by research and other organisations, the main environmental values or attributes listed in the report will be affected by such changes.

Current scenarios for the south west of the State show that there are likely to be changes in rainfall and temperature. These changes, although not yet precise, are of concern to various Government agencies. The Water Authority is considering the effect of such changes on future water supplies and groundwater, and wetland quality. Climate changes may also affect coastal processes and the retention of ecosystems within the region. The scenarios also affect rural land uses reliant on particular rainfall and temperature regimes, and availability of groundwater.

In view of the above, the EPA believes that in devising the future planning strategy for Perth, the possible effects of climatic change in terms of the use and management of land need to be considered in much greater depth and at the earliest opportunity. Factors requiring attention in this context include:

- the loss of wetland areas;
- open space planning and management (accommodation and procedures to retain natural ecosystems threatened by climate change);
- water conservation; and
- coastal management.

Other matters which should also be addressed include reducing energy usage at the domestic level (eg low energy house design and recycling of refuse) to reduce the output of greenhouse gases. Initiatives in this direction should also be devised for industry.

3.4 URBAN DESIGN AND RESOURCE CONSUMPTION

The fundamental layout and design of development in the region has meant that there has been a tendency towards excessive use of environmental resources (eg land, water and energy). The EPA supports those aspects of the preferred strategy, whether explicit or implicit, that will help reduce per capita consumption levels of the various resources. To this end the Authority strongly supports the strategy's first steps toward urban consolidation, infill and in the long-term, higher density land use.

The Authority recognises that this will not be achieved quickly, but appreciates that a plan which provides maximum opportunity for the community to live close to a well located series of employment centres is a first step in producing a potentially more energy efficient transportation system and the opportunity for more varied and appropriate urban design.

Water usage and protection of water resources (especially groundwater) are, as already indicated, major environmental issues within the Perth Metropolitan Region. These issues have been addressed elsewhere in this report, including reference to the need for a change in approach towards urban development practices. Appendix B to this report puts forward design criteria for water conservation which provide useful guidance towards the change needed.

The EPA also supports references in the preferred strategy advocating the provision of reticulated sewerage to urban areas currently dependent on septic tank/leach drain disposal systems. This and all other strategies directed towards protection of the region's groundwater and surface water resources are endorsed.

The Authority considers that there is a need for suitable guidelines to achieve more environmentally attuned subdivision and urban development in new areas, and adjacent to valuable ecological or scenic, or fragile environments. Such guidelines are urgently needed to improve the general levels of responsiveness of new developments to the environments in which they are set, and to bring about the principal environmental objectives contained in the preferred strategy for the Perth Metropolitan Region.

3.5 SYSTEM 6 AREAS, REGIONAL RESERVES AND NATURAL FEATURES

The report "Planning for the Future of the Perth Metropolitan Region" illustrates a better understanding and assessment of the natural environment of the region than does the earlier Corridor Plan for Perth.

The EPA recognises that recommended System 6 areas are well catered for in the strategic plan, by inclusion in the proposed metropolitan park system. It is further noted that the metropolitan parks proposals reflect the information and findings of the constraints mapping exercise, and therefore place an important and worthwhile emphasis on remnant native vegetation in the region, the main wetland systems, the river systems and the ocean beaches.

The EPA supports the areas proposed for inclusion in the metropolitan parks, and accepts them as an adequate basis for creating functional and ecological linkages. Additionally, however, implementation of the proposed metropolitan parks needs to be accepted as a priority. Although the actual creation of the parks is a long-term strategy, there is a short-term need (acknowledged in the report "Planning for the Future of the Perth Metropolitan Region") to establish a single authority responsible for co-ordinating the overall planning of the parks system.

4. CONCLUSIONS

The EPA is aware of some opposition to aspects of the preferred strategy put forward in the report "Planning for the Future of the Perth Metropolitan Area". This is particularly so in the outer semi-rural sectors where proposals to increase residential densities are viewed unfavourably by existing residents. This opposition is based on a number of concerns, including implications for groundwater resources, and lifestyle issues relating to the character and amenity of the areas involved.

The EPA acknowledges the concerns that have been expressed and has addressed issues relating to the groundwater resources. The lifestyle issues that have also been raised are planning rather than environmental matters and as such, are beyond the scope of the Authority's responsibilities.

Although the preferred strategy put forward in the report "Planning for the Future of the Perth Metropolitan Area" raises a number of environmental issues which, in the Authority's opinion, require further attention, it does contain a range of environmentally positive aspects. As such, the Authority believes that the preferred strategy generally provides a sound basis upon which to build the final proposals for Perth's future directions, subject to the following five areas of consideration.

In examining the outstanding issues, the EPA has endeavoured to provide guidance about what is needed to ensure the environmental acceptability of the strategies adopted for Perth's future growth.

Of the environmental issues arising from the preferred strategy, impact on the groundwater resources of the Swan Coastal Plain is regarded as the most important. In respect of this issue, the EPA concludes as follows:

(i) *There should no longer be a presumption that urban development will be able to proceed in areas of known groundwater resource value. Urbanisation is a form of development that is incompatible with wise management of groundwater resources for environmental and public water supply purposes. As a general rule areas of known groundwater value should not be designated for urban development unless such is demonstrated to be environmentally acceptable.*

In respect of the other environmental issues arising from the preferred strategy, the Authority concludes as follows:

(ii) *The need for an industrial lands policy is endorsed, and this should be prepared as a priority. In preparing this policy, environmental factors will need to be effectively considered. In this regard, the industrial location, management and control principles outlined in Appendix A of this report should be adopted.*

(iii) *The effects of climatic change need to be incorporated into long-term planning strategies. Until these effects are better known, a conservative approach on development proposals that could be adversely affected (eg coastal and estuarine foreshore proposals) should be adopted.*

(iv) *Reducing both the direct and indirect consumption of environmental resources should be an accepted priority of the regional (and more detailed) scale of planning. In this regard, urban design guidelines directed at achieving more environmentally attuned development should be prepared as a priority. Appendix B to this report could provide a useful input to these guidelines.*

(v) *Arrangements to enable implementation of the metropolitan regional parks proposed under the preferred strategy should be put in place as a priority.*

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APPENDIX A

PRINCIPLES OF INDUSTRIAL LOCATION; MANAGEMENT AND CONTROL
(MODIFIED FROM ENVIRONMENTAL PROTECTION AUTHORITY, BULLETIN 257, 1986)

1. PRINCIPLES FOR LOCATION OF INDUSTRY

1.1 Industry which has the potential for adverse impacts on people or on the environment should only be located where its impacts can be assimilated or controlled. This may be achieved by siting within a properly designated and managed "industrial zone", the beneficial use of which is recognised by the community as industrial. In certain instances this may necessitate a remote location.

1.2 An "industrial zone" should contain only industry, and should also be separated from residential areas by an appropriate buffer zone.

1.3 The environmental impacts of industry should be restricted to the "industrial zone" and "buffer zone". Excursions of excessive impacts beyond the buffer zone should be rare, and should only result from atypical events (either within the industrial plant or of the environment).

1.4 Land use in the "buffer zone" should be such that it does not impact adversely on residential areas.

1.5 Land use in the "buffer zone" should be sufficiently resilient to withstand impacts from the "industrial zone".

1.6 The location of particular industries within an industrial zone should be such that impacts on other industries fall within prescribed standards for environmental risk and ongoing environmental impact.

2. PRINCIPLES OF PROJECT APPROVAL

2.1 Each new project with the potential for significant environmental impacts, or amendment to any existing project that would increase its environmental impact, should be subject to environmental impact assessment. (In some more remote country areas particular types of developments requiring assessment may be prescribed by the EPA).

2.2 It is the responsibility of the proponent to demonstrate that any proposal will not impose more than an acceptable level of risk or impact to the environment or to the health and wellbeing of the community.

2.3 A proposed new industry, or alteration to an existing industry should be designed to ensure that its environmental performance is appropriate to the prescribed standards for the zone in which it is proposed or located, and for its particular location within that zone.

2.4 Any new industry, or alteration to an existing industry should have adequate management procedures to control performance to specified levels for both the regular operation and for contingency events.

2.5 Whenever a new project is assessed, consideration should also be given to the cumulative impact with existing industries in the region.

3. PRINCIPLES OF ENVIRONMENTAL MANAGEMENT BY INDUSTRY

3.1 New industry should be constructed such that it satisfies both the conditions set at project approval, as well as the general requirements of the zone's beneficial use.

3.2 The operation of any industry should be managed such that it satisfies both the conditions set at project approval, as well as the general requirements of the zone's beneficial use.

3.3 Industry should conduct periodic reviews to ensure that it retains the ongoing capacity to control performance to specified levels for both regular operation and for contingency events. Such reviews should be subject to assessment of their environmental acceptability.

4. PRINCIPLES OF MONITORING AND REGULATION

4.1 Each industry should monitor its environmental impacts to ensure that they do not exceed the standards set for the beneficial use of the area impacted.

4.2 Industry should be required to advise Government of the likely environmental consequences as soon as practicable after the occurrence of any unforeseen event such as an accidental discharge.

4.3 Standards of performance should be enforced such that beneficial use criteria are met.

APPENDIX B

URBAN DESIGN CONSIDERATIONS FOR WATER CONSERVATION

(NOTE: Partly derived from a draft policy for water sensitive residential design - Urban Design for Water Conservation Research Group)

. BROAD OBJECTIVES FOR WATER CONSERVATION IN REGIONAL URBAN DESIGN.

- ensure that the necessary environmental information is obtained and analysed by developers, in order to achieve integration of land and water planning;

- ensure that adequate plans are prepared showing appropriate urban form, density, landscaping and infrastructure necessary to achieve water sensitive design; and

- ensure that developers adequately consider the future management responsibilities, strategies and implications for water sensitive design features.

. ENVIRONMENTAL INFORMATION NEEDS FOR ACHIEVING WATER CONSERVATION OBJECTIVES IN URBAN DESIGN.

The following information should be seen as part of the site evaluation process and will enable design options to be identified on the basis of ongoing water management requirements.

Proponents should be required to identify:

- the water balance of the locality and its relationship to the regional water body;

- the expected groundwater rise associated with clearing and urbanisation both on and off the subject site;

- the principal landscape components occurring on the site including:

  (i) wetlands, sump lands, damp lands and associated vegetation;

  (ii) streams, gullies and drainage lines;

  (iii) existing or proposed conservation reserves; and

  (iv) areas of remnant vegetation;

- the significance of these components for conservation and recreation and/or drainage and the establishment of criteria to protect their integrity;

- groundwater availability on the site and the present water quality characteristics including nutrient levels; The distribution of soil types and their infiltration characteristics; and

- the extent of buffer zones around wetlands to accommodate flood storage, nutrient stripping, conservation and recreation.

. DESIGN CONSIDERATIONS TOWARD ACHIEVING WATER CONSERVATION

The following design principles are intended to assist the development of design solutions associated with determining an appropriate urban form, density, landscape and infrastructure. The application of these principles will be site specific and will be guided by the evaluation of the environmental information obtained for the site.

- Maximise in situ recharge in situations where run off is unpolluted and soil capacity permits.

- Stormwater drainage systems to be designed in a manner that enhances the environmental quality of the site.

- No direct drainage or stormwater discharge to natural wetland systems. Associated sedimentation traps and vegetation buffers to be designed to achieve nutrient stripping.

- Minimise the negative impact of possible nutrient enrichment.

- Where appropriate public open space should be designed, developed and managed using Xeric landscape principles.

- The boundaries of public open space areas incorporating wetlands to be planned to incorporate vegetation nutrient stripping buffers.

- Urban form and density to be designed in a manner that reduces private open space water demands.

. SPECIFIC DESIGN FEATURES RELEVANT TO WATER CONSERVATION AND WATER HARVESTING PRACTICE. (EXAMPLES ONLY)

- Use of porous pavements for roads and carparks to retain water for slow discharge, and the use of other techniques for water retention.

- Identification of soil types and infiltration characteristics.

- Use of flush edge kerbing on appropriate soil types.

- Use of grassed or vegetated swale drains on the side of the road.

- Increase of unit density by: 1. Reduction of block size to (say) 500 m^2.
  2. Medium density home units.

- Reduction of frontage width to reduce area of road and verge.

- Retention of native vegetation where possible and use of local or water efficient species for landscaping. Zonation of species in the garden by water requirements.

- Identification of volume of recharge basin required on different soils to retain and recharge 80% (say) of all rainfall events for:

  (i) one house and associated impervious areas (eg drives);

  (ii) ten houses and associated impervious areas (including roads);

(iii) one hundred houses and associated urban areas; and

(iv) whole drain catchment.

- Restriction of the area of impermeable surfaces on house blocks to allow for required on site recharge.

- Redirection of all runoff from paved areas into lower garden beds.

- Location of local recharge basins in cul-de-sac ends, roundabouts, local open space. Design of shallow sloped multiple use recharge basins with volume calculations incorporating infiltration ability (eg if grassed x cubic metres volume, if totally landscaped y cubic metres volume). Basins planted with local species to minimise maintenance costs and water requirements.

- Linkage of local recharge basins with grassed or vegetated swale drains. Inclusion in public open space. Integration of drains to carry out drainage functions in very wet years.

- When piped stormwater drains are required use 'leaky pipe' system or alternatively use gully sumps with unsealed base below drain invert level to allow recharge from a significant number (say) 80% of rainfall events.

- For nutrient management of surface runoff, consideration of the opportunities for using nutrient stripping wetlands prior to discharge of stormwater into significant water bodies.

. In Perth, climate amelioration should be considered as an essential part of planning the built environment and can significantly influence water demand and water usage patterns. Some techniques which may be applied include the following:

- Appropriate siting.

- Correct orientation.

- Canopy amelioration (reduction of glare and radiant heat by tree planting).

- Shadow effects.

- Night cooling (by means of designed planting & microjet irrigation).

- Wind channelling.

- Transpirational cooling of air.

- Consideration of the heat-sinks and reflective qualities of paved surfaces and appropriate shading.

- Dust control through planting.