DEVELOPMENT OF THE GROUNDWATER RESOURCES OF THE GNANGARA MOUND: ERMP

GUIDELINES

ERMP to fulfil the requirements:

1. Promote public understanding of proposal and issues.
2. Enable EPA to give advice to Government.
3. To enable the overall programme to be considered, rather than component by component

1. SUMMARY

2. EXECUTIVE SUMMARY - must be capable of standing alone.

3. INTRODUCTION

3.3 General

a) Role of W.A. Water Authority in providing water for public supply and for managing water resources.

b) Dependence of urban development of NW Corridor on groundwater and time frame for development. Role of the Water Authority.

c) Management philosophy.

- water needs for urban development, including WAWRC input;
- water needs for non-urban uses;
- water needs to protect the environment;
- impact of other uses.

d) Philosophy of progressive environmental review and management. Amplify need for on-going review.

3.1 Objectives

In general.

To provide an overview of demands (public, private and environmental) for groundwater resources of the Gnangara mound superficial aquifer; environmental impacts and management. Multidisciplinary approach to management.

In specific.

To examine the impact of development of the Pinjar and/or Lexia schemes in the context of the above.

Statutory Requirements

1. Water legislation
2. Environment legislation
3. Pollution control legislation.

4. NEED FOR THE DEVELOPMENT

4.1 Implications of deletion of project.

- Needs and benefits of the NW Corridor versus rural, recreational and forest uses.

4.2 The scheme.

- Dependence on groundwater to supply the water needs of NW Corridor. Source development plan related to developmental pressures.

4.3 Alternative strategies.

- Specific needs and time frame for Pinjar and/or Lexia schemes; relative merits of these two schemes and alternatives.

5. EVALUATION OF ALTERNATIVES

Approach at two levels:

a) use of water from Gnangara mound; and

b) relative impacts of Pinjar and/or Lexia shcemes).

- Do nothing option.
- Availability of water from other resources.
- Economic costs of providing water from other resources.
- Environmental costs of reliance on other sources, e.g. modification of forest catchments.

6. DESCRIPTION OF PROPOSAL

- Overall concept: staging.
- Existing schemes.
- Pinjar and/or Lexia schemes as part of the overall scheme - location and layout.

- Construction schedule (Pinjar and/or Lexia).
- Supporting structures, e.g. treatment plants, etc.
- Operation after construction, e.g. sludge disposal, water yields.
- Life of projects.

7. EXISTING ENVIRONMENT (details in Appendix; key issues in report)

General description of the Gnangara Mound in the setting of the coastal plain; appraisal of key physical and ecological systems likely to be affected. Brief resume of current land allocations.

(At both general level and specifically for Lexia and/or Pinjar.)

7 A. PHYSICAL ENVIRONMENT
Emphasis should be relevant to an evaluation of this proposal.

1) Climate

- Rainfall - recharge and determinant of water demand.
- Temperature - determinant of water demand.
- Evaporation - determinant of water demand
  - environmental needs.

Comment briefly on dry seasons and runs of dry years, and extreme wet years and runs of such years. Implications for natural and human environment.

2) Geology

- Physical characteristics as they relate to groundwater behaviour.

3) Landform and Soils

- Land capability (fertility, carrying capacity), as it relates to water use and availability.

4) Hydrology

- Surface drainage;
- wetlands.

7 B. BIOLOGICAL ENVRIONMENT

- Overview of Gnangara mound ecosystem.
  - Native vegetation;
  - wetland vegetation;
  - terrestrial fauna, reliance on freewater and native vegetation;
  - wetland fauna, importance of wetlands in regional context;
  - cave fauna.
- Representation in conservation reserves. Relate vegetation communities to System 6 areas.
- Rare species.
- Specific examination of Pinjar and/or Lexia.

  1) McNess-Neerabup lake axis

  2) Lake Pinjar

  Seasonal tributaries of Ellen Brook and the short-necked tortoise swamps.

7 C. HUMAN ENVIRONMENT

Emphasis should be on matters relevant to an evaluation of this proposal.

1) Land Status and Use

- Past and current land uses; land tenure and zoning, including conservation and recreational aspects. In general terms for Gnangara mound and in specific detail for Pinjar and/or Lexia.
- State forest.

2) Community Attitudes.

- Land use and trends in Wanneroo.
- Trends in landuse - market gardens, intensive culture, hobby farms.

3) Groundwater Usage.

4) Historical and archaeological.

ENVIRONMENTAL IMPACTS

1) Introduction - Implications of groundwater usage.

2) General

For Gnangara mound as a whole:
- effects of natural stresses apart from human induced stress.

3) Physical

4) Biological

- effects of drawdown on native vegetation and forest;
- effects of drawdown on wetlands and caves.

5) Social

- effects on availability of water for other uses;
- pollution control implications, limits imposed on future land use.

Specific

Issues for Pinjar and/or Lexia:

- Lock McNess-Neerabup lake axis;
- Ellen Brook tributaries and tortoise swamps;
- native vegetation;
- limits to availability of water for other uses;
- use of public water supply imposes limits on land use.

ENVIRONMENTAL MANAGEMENT

Discuss W.A. Water Authority approach to management. Outline performance at Wanneroo, Jandakot, Gwelup and Mirrabooka e.g. annual reports.

In accordance with the philosophy of progressive environmental review and management the following management programmes were devised.

1) Site management)
2) Physical environment) describe programmes for
3) Biological environment) management of identified
4) Human environment) impacts.

5) Monitoring programme: WA notes items V, VI, VII;

- water level and water quality;
- establishment of reference sites for biological monitoring, e.g. transects.

6) Model capacity to assist in management: (effect of various management scenarios on water levels.)

- assignment of water for maintenance of environmental quality, the problem and how to address the issue;
- allocation of water for private use, proclamation, licensing, metering?
- land use planning - land uses appropriate for land capabilities and water availability;
- model to be responsive to future monitoring data.

7) Commitment to review operational and environmental monitoring.

10. OTHER AMELIORATING ACTIONS

- such as pumping groundwater for the purpose of maintaining a surface stream or pool;
- re-charge from dams;
- deepening lakes.

11. MANAGEMENT OF CORRECTIVE ACTIONS

- commitment to contingency plans to manage and ameliorate adverse effects;
- commitment by the Water Authority to fulfil its role in managing the water resource, sustain this resource, and all associated environmental aspects identified in this ERMP.

12. CONCLUSION

Monitoring to ensure that impacts are maintained within acceptable limits. Need for land use plans to ensure that the land uses are compatible with resource availability.

13. REFERENCES

14. GLOSSARY

15. APPENDICES

ERMP guidelines.

Relevant supporting technical information.

NB These Guidelines should be used in the context of the attached document 'Notes for the preparation of an ERMP'.

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