

**Draft South East Corridor Structure Plan; South
East Corridor Metropolitan Region Scheme
Amendment No. 966/13; and Stormwater
Management Strategy and plans for new urban
development at Byford and Mundijong**

**A submission and advice by the Environmental Protection Authority on
the South East Corridor Structure Plan prepared by the Ministry for
Planning, the South East Corridor Metropolitan Region Scheme
Amendment prepared by the Western Australian Planning Commission
and the Stormwater Management Strategy and Plans for New Urban
Development at Byford and Mundijong prepared by the Water Authority
of Western Australia**

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Summary and recommendations

This Bulletin is the Environmental Protection Authority's advice on the:

- *Draft South East Corridor Structure Plan;*
- *Metropolitan Region Scheme Amendment No. 966/33; and*
- *Stormwater Management Strategy and Plans for New Urban Development at Byford and Mundijong.*

During the assessment the Environmental Protection Authority sought expert advice from the Department of Environmental Protection, Ministry for Planning, Water Authority of Western Australia and Shire of Serpentine - Jarrahdale and has concluded that the main environmental topics relating to the reports are:

- avoidance of environmental damage to wetlands of local and regional significance;
- protection of land that has been identified in the System 6 Report as having conservation and recreation value;
- prevention of nutrient enrichment and degradation of the groundwater and the surface water systems from on-site effluent disposal;
- protection of remnant bushland communities identified in the System 6 review;
- management of potential impact of noise, dust and odour from existing poultry farms and piggeries on proposed adjoining landuses;
- management of changes to land use within the catchment to the Peel Harvey Estuarine system to avoid environmental damage particularly in terms of nutrient export; and
- adoption of transport strategies to help meet regional air quality and greenhouse gas emission objectives.

The Environmental Protection Authority has concluded that the planning strategies are environmentally acceptable subject to the summary of recommendations outlined in Table 1.

Table 1

Summary of EPA Recommendations
Environmental Impacts to Wetlands of Regional Significance within the South West Corridor
<ul style="list-style-type: none"> •The South East Corridor Structure Plan should include the need to protect the Environmental Protection Policy lakes located to the east of Forrestdale Lake. •Local structure plans should provide for the protection of the EPP lakes through the inclusion of the lakes and buffer areas in public open space. •Management plans should be prepared for EPP and System 6 lakes prior to the land being subdivided or developed. •Proposals adjacent to or indirectly impacting upon EPP wetlands or land identified in the System 6 report should be referred to the EPA for EIA. •The EPA supports the proposed reservation of M83 as a Parks and Recreation reserve as recommended in the System 6 report.
Environmental Impacts to Wetlands of Local Significance within the South West Corridor
<ul style="list-style-type: none"> •EPA Bulletins 685 and 686 provide guidelines for protection for those wetlands not identified in the EPP or System 6 report. The protection of these wetlands would occur as part of the planning process at a local level. Proposals would normally require referral to the EPA. •Proposals adversely affecting Categories O, C and H lakes (as defined in Bulletins 685 and 686) would most likely be environmentally unacceptable. •Any proposal which is inconsistent with Bulletins 685 or 686 or adversely affects category, C or H wetlands should be referred to the Environmental Protection Authority for formal assessment.
Protect Land Identified as having Conservation and Recreation Value in the System 6 Report
<ul style="list-style-type: none"> •The EPA supports the proposed reservation in the MRS of System 6 areas M83 and M89. •The identification of M80, M84, M85, M86 and M87 as future reserves in the Structure Plan is supported. •The inclusion of M88 in the Private Land Conservation category of the Shire of Serpentine - Jarrahdale Rural Strategy should provide adequate protection. •Proposals adjacent to or indirectly impacting upon land identified in the System 6 report should be referred to the EPA for EIA. •any development proposals involving M88 should be referred to the Environmental Protection Authority for formal assessment.

Waste Water Disposal

- Proposals for on-site waste water disposal including local treatment plants or broad scale use of alternative treatment plants must be referred to the EPA for EIA.

Protect Remnant Bushland Communities Identified in the System 6 Review

- The reservation of Brickwood and Norman 3 sites in the MRS is supported. The WAPC should explore options to revise the boundaries of the Parks and Recreation reserve to be as close as possible to that shown on the maps showing the Threatened or Poorly Reserved Plant Communities Requiring Interim Protection.
- Punrack 1 and Page 30 sites should be identified as local open space in the Structure Plan.
- The significance of the Mundijong remnant bushland should be acknowledged in the Structure Plan and methods explored by the WAPC to reserve these areas for conservation purposes. The remnant bushland is currently located within the Mundijong Road reserve.
- Road construction and batters should not impact on the Mundijong remnant bushland.
- Proposals adjacent to or indirectly affecting land identified in the System 6 review should be referred to the EPA for EIA.

Impact of Noise, Dust and Odour from Existing Poultry Farms and Piggeries on Proposed Adjoining Landuses

- New residential lots should be separated at least 500m from existing poultry farms.
- New residential lots should be separated from piggeries in accordance with the buffer distance recommended in the Environmental Management Guidelines for Animal Based Industries - Piggeries (Department of Agriculture, 1989)
- The onus shall be on the developer to demonstrate that existing poultry farms and piggeries will not affect proposed residential lots.
- If residential areas encroach within the buffer area the poultry farm or piggery should be relocated.

Nutrient Export into the Peel Harvey Estuarine Catchment

- The Stormwater Strategy meets with the EPA's objective to reduce the export of nutrients into the Peel Harvey Inlet.
- The Water Authority of Western Australia should develop a monitoring programme and criteria to measure nutrient levels in the stormwater runoff in accordance with the environmental quality objectives set out in the Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992 prior to the local authority Town Planning Scheme being amended.
- Provisions should be made to implement the following contingency procedures should the Stormwater Management Strategy fail to reduce the export of nutrients:
 - provision of additional detention basins within the multiple use corridors;
 - provision of regional detention basins; and
 - revision of the drainage plan.
- Prior to the land identified as Urban and Urban Deferred in the Structure Plan and MRS Amendment being rezoned for urban purposes in the local authority's Town Planning Scheme, the decision making authorities should adopt an agreed implementation strategy for the multiple use drainage corridors.
- Defer further development if the monitoring of nutrient levels finds that the management strategy is ineffective.

Air Quality and Greenhouse Gas Emissions

- The urban village concept would improve air quality and lower greenhouse gas emissions in comparison to typical urban growth patterns in the Metropolitan Region.

1. Introduction and background

1.1 The purpose of this report

This report is a Strategic Environmental Assessment of the following plans:

- *Draft South East Corridor Structure Plan;*
- *Metropolitan Region Scheme Amendment No. 966/33; and*
- *Stormwater Management Strategy and Plans for New Urban Development at Byford and Mundijong.*

The advice in this Bulletin is provided as a strategic assessment and not as a formal environmental impact assessment under Part IV of that Act. Assessments under Section 16 of the Act do not lead to the setting of legally binding environmental conditions. However, the advice should be used by planning agencies in dealing with environmental issues when drawing up subsequent statutory planning proposals. The EPA will use the advice in the Bulletin when deciding on the level of assessment to be set in these subsequent statutory planning proposals.

Metropolitan Region Scheme Amendment Recommendations

A number of the recommendations contained in this report relate specifically to the Metropolitan Region Scheme Amendment. These recommendations were presented to the Western Australian Planning Commission prior to the publication of this report. It is hoped that the report will be a useful background to the Environmental Protection Authority's recommendations with respect to the Metropolitan Region Scheme.

1.2 Background

1.2.1 Study area

The three reports considered in this Bulletin focus on land development within the Shire of Serpentine-Jarrahdale. The study area is shown in Figure 1.

The existing town sites in the study area are Byford, Mundijong, Serpentine, Jarrahdale and Keysbrook. The Metropolitan Region Scheme Amendment and Stormwater Management Strategy focus predominantly on the towns of Byford and Mundijong.

Natural drainage is a critical issue for urban development in the South - East Corridor. Approximately 75% of the study area is seasonally waterlogged. The natural drainage system comprises the channels, creeks, streams, rivers and wetlands in the area whether permanently wet or seasonally inundated (refer to Figure 3).

Many of the natural drainage lines have been modified and waterlogged areas are artificially drained. The existing Water Authority drainage network was originally constructed to facilitate drainage of agricultural land. A series of major trunk drains now traverse the area considerably modifying the natural drainage of the coastal plain.

The major river in the area is the Serpentine River. There are also a number of small streams including Beenyup, Cardup, Manjedal and Medulla Brooks. These streams generally flow east - west draining into the Serpentine River. Winter rainfall frequently exceeds the capacity of these streams and local flooding results.

1.2.2 Draft South East Corridor Structure Plan

The draft South East Corridor Structure Plan (refer to Figure 2) is a non-statutory document which was released for public comment in November 1994 and will be finalised after the Metropolitan Region Scheme (MRS) Amendment has been adopted.

The structure plan has been prepared to ensure the future development of the corridor is effectively managed and coordinated (SPC 1994). The Structure Plan focuses on accommodating future urban growth in a regional context examining matters such as employment, transport, infrastructure, services, recreation and protection of the environment.

The structure plan is essentially a review of the *Planning Strategy for the South East Corridor Stage B Report* (MRPA 1980). The structure planning for the South East Corridor was initially carried out in two stages (Stage A and Stage B), followed by the release of a consolidated strategy in 1980. The Stage A area covered development areas in Canning, Gosnells and Armadale; Stage B covered the Shire of Serpentine - Jarrahdale.

The recommendations of the *Planning Strategy for the South East Corridor Stage B Report* were confirmed in the *Report of the Review Group to the State Planning Commission on the Corridor Plan* (State Planning Commission 1987) and *METROPLAN* (State Planning Commission 1990).

The structure plan has also been based on the *Shire of Serpentine - Jarrahdale Rural Strategy* (1994) for land outside of the defined townships.

1.2.3 Metropolitan Region Scheme Amendment South East Corridor — south of Armadale

The *Metropolitan Region Scheme (MRS) Amendment* (refer to Figure 4) is part of a program of major amendments to the Metropolitan Region Scheme. The amendment reflects some of the proposals in the *draft South East Corridor Structure Plan* and the *Shire of Serpentine-Jarrahdale Rural Strategy* with the focus being on ensuring that sufficient residential land is available for an anticipated increase in population of 60,000 people in the Byford and Mundijong townships over the next thirty years.

The amendment proposes to rezone land for Urban and Urban Deferred purposes, and reserve land for Parks and Recreation, Public Purposes, Controlled Access Highway and Important Regional Roads.

1.2.4 Stormwater Management Strategy and plans for new urban development at Byford and Mundijong

This Strategy and plans (refer to Figure 5a & 5b) were produced for the Water Authority of Western Australia and the Western Australian Planning Commission as an input to the structure planning process. The purpose of the strategy is to describe a water sensitive stormwater management strategy and design concept for the proposed urban expansion around the towns of Byford and Mundijong.

The soil types of the proposed urban expansion areas of Byford and Mundijong are typically clay over sand. During winter these areas are subject to regular surface inundation with high rates of surface runoff rather than infiltration into the groundwater. If the area is urbanised and drained by conventional means the stormwater is likely to carry high levels of nutrients into the already nutrient enriched Peel - Harvey Estuary. The drainage network would also require significant upgrade to contain peak flows from proposed urban development if conventional drainage is required.

The Stormwater Management Strategy proposes to reduce these impacts by retaining peak storm flows at pre-urban rates and by ensuring that groundwater levels are maintained to protect valuable wetlands and to restrict nutrient movement.

The Strategy, therefore, proposes that stormwater be retained as close as possible to its source, generally by means of detention basins and/or artificial wetlands in a series of linked multiple use stormwater drainage corridors which also serve as recreational and wildlife corridors within the urban area. The width of the corridors will vary according to natural characteristics, but a nominal width of 100 metres will be sought on the major drainage lines.

1.3 Report format

1.3.1 Local and regional key environmental issues

The implementation of the *South East Corridor Structure Plan, Metropolitan Region Scheme Amendment and Stormwater Management Strategy* could cause environmental impacts both locally within the corridor and regionally outside of the corridor. The *Key Environmental Issues* are divided into local and regional issues in the following manner:

(a) Local environmental issues

- avoidance of environmental damage to wetlands of local and regional significance within the South East Corridor;
- protection of land that has been identified in the System 6 report as having conservation and recreation value;
- prevention of nutrient enrichment and degradation of the groundwater and the surface water systems from effluent disposal systems;
- protection of remnant bushland communities identified in the System 6 review;
- management of the potential impact of noise, dust and odour from existing poultry farms and piggeries on proposed adjoining landuses;

(b) Regional environmental issues:

- management of changes to land use within the catchment to the Peel - Harvey Estuarine System are controlled to avoid environmental damage particularly in terms of nutrient export; and
- adoption of transport strategies to help meet regional air quality and greenhouse gas emission objectives.

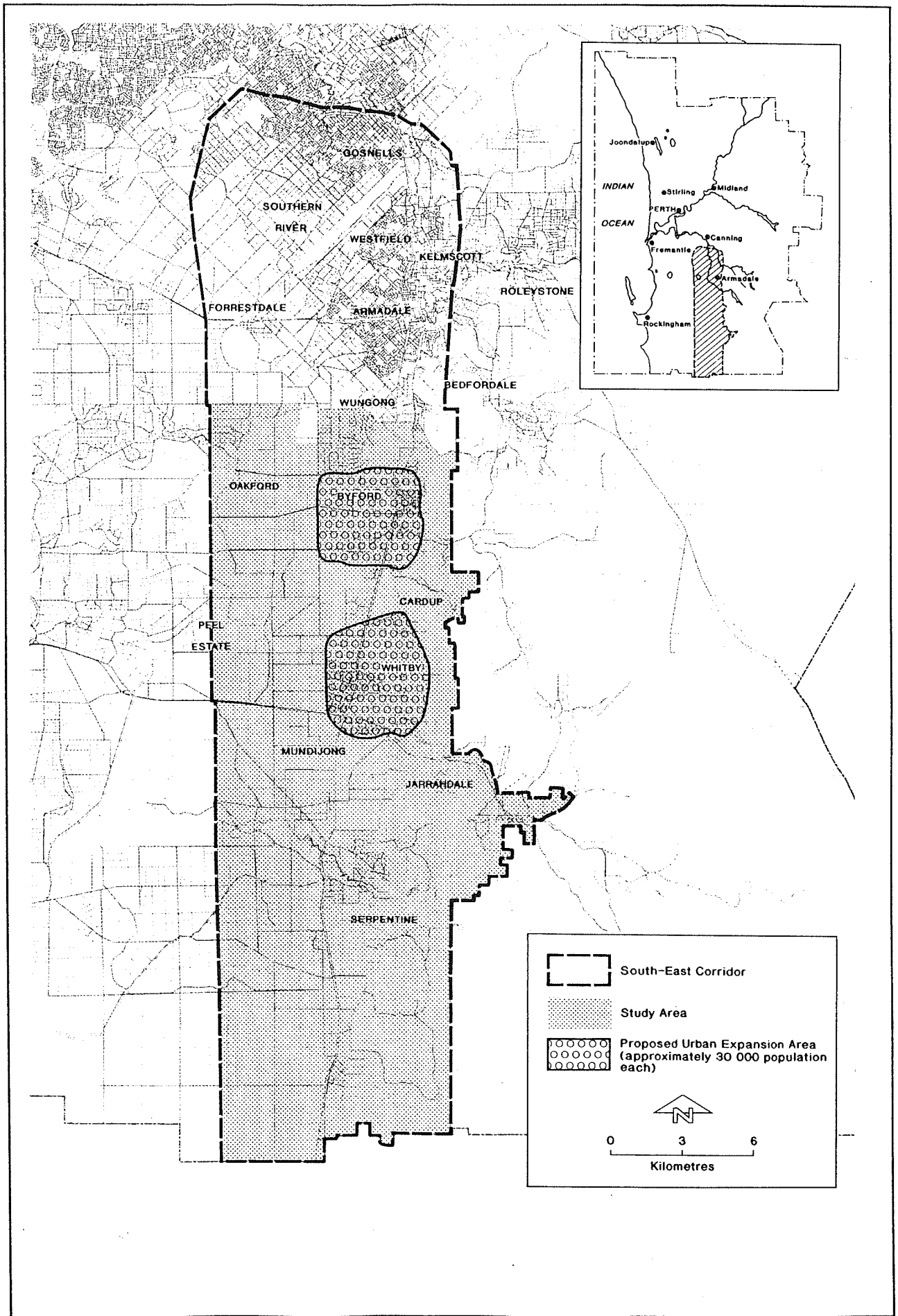


Figure 1. Draft South East Corridor Structure Plan — Study Area Boundary.
 (Source: Department of Planning and Urban Development, 1994)

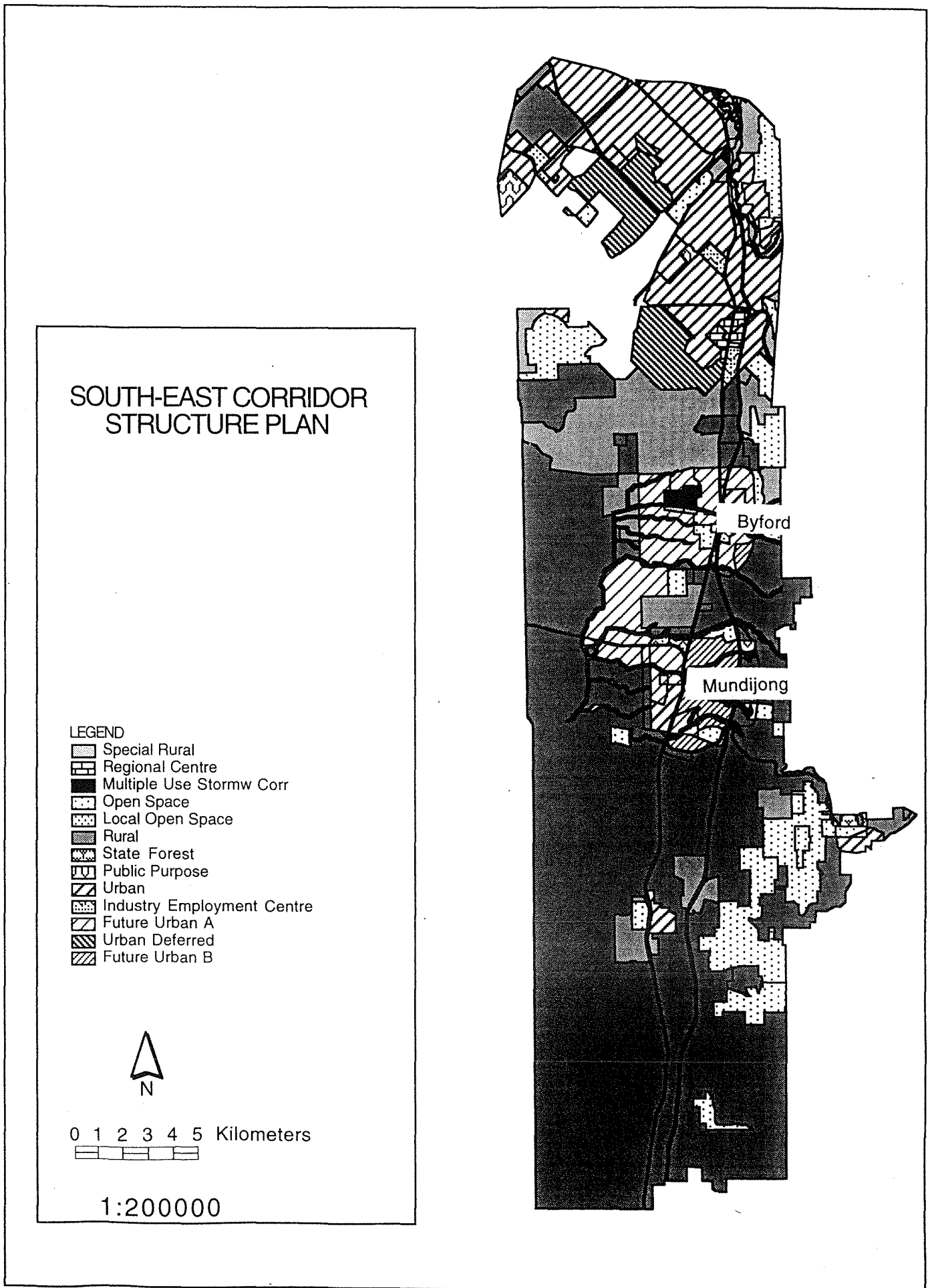


Figure 2. South East Corridor Structure Plan.

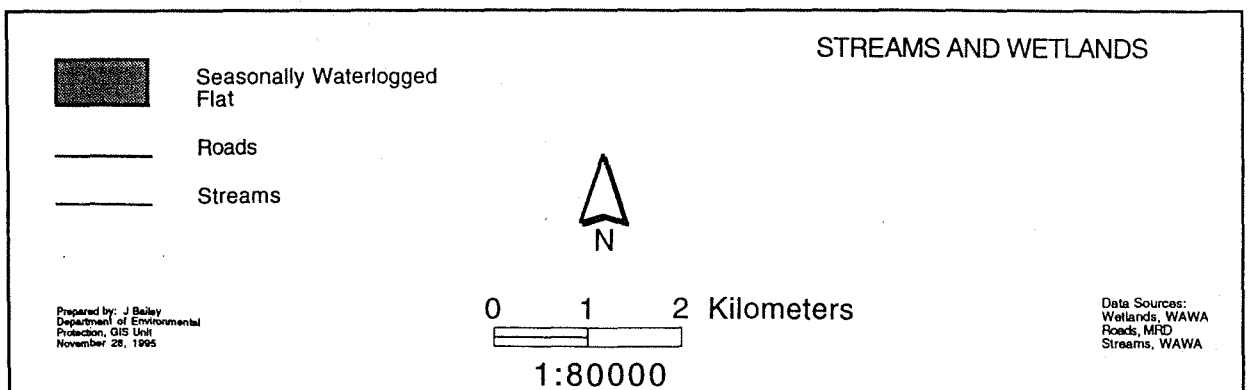
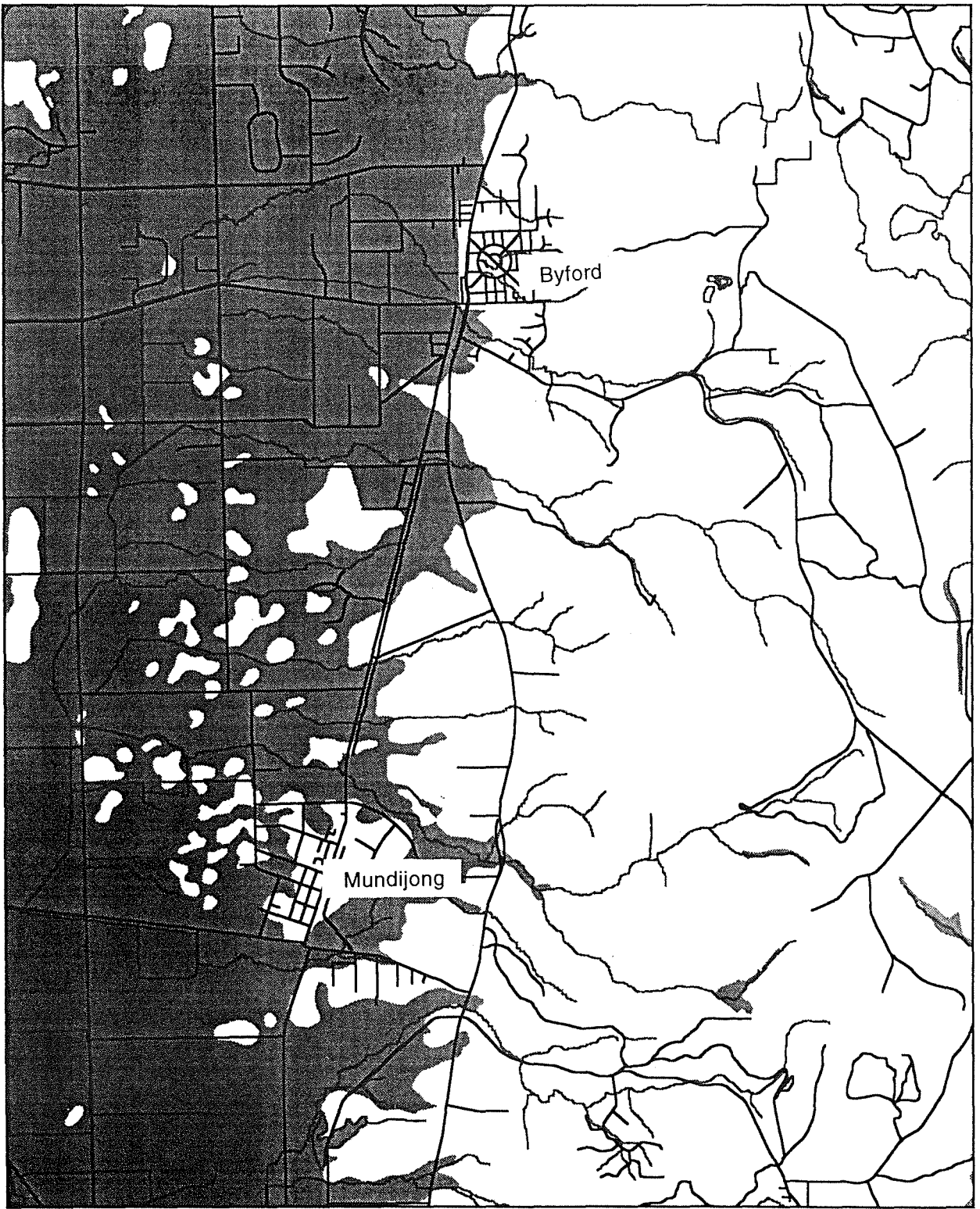


Figure 3. Streams and wetlands.

SOUTH EAST CORRIDOR - SOUTH OF ARMADALE METROPOLITAN REGION SCHEME AMENDMENT

**CURRENT
METROPOLITAN
REGION SCHEME
FEBRUARY 1995)**

Figure 1

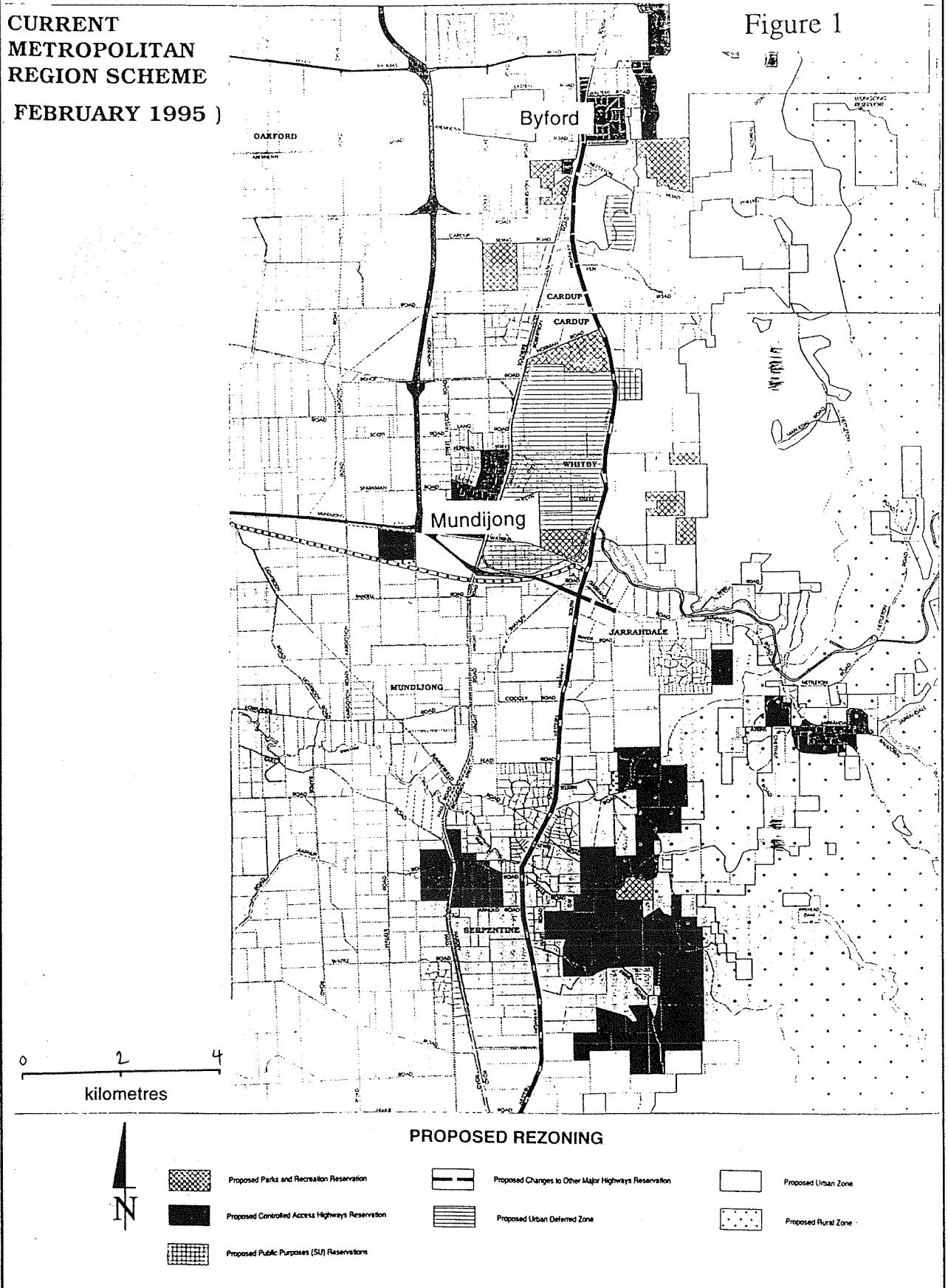


Figure 4. South of Armadale Metropolitan Region Scheme Amendment.

Figure 5a. Stormwater Management Plan – Byford. (Source: Evangelisti and Associates, 1994)

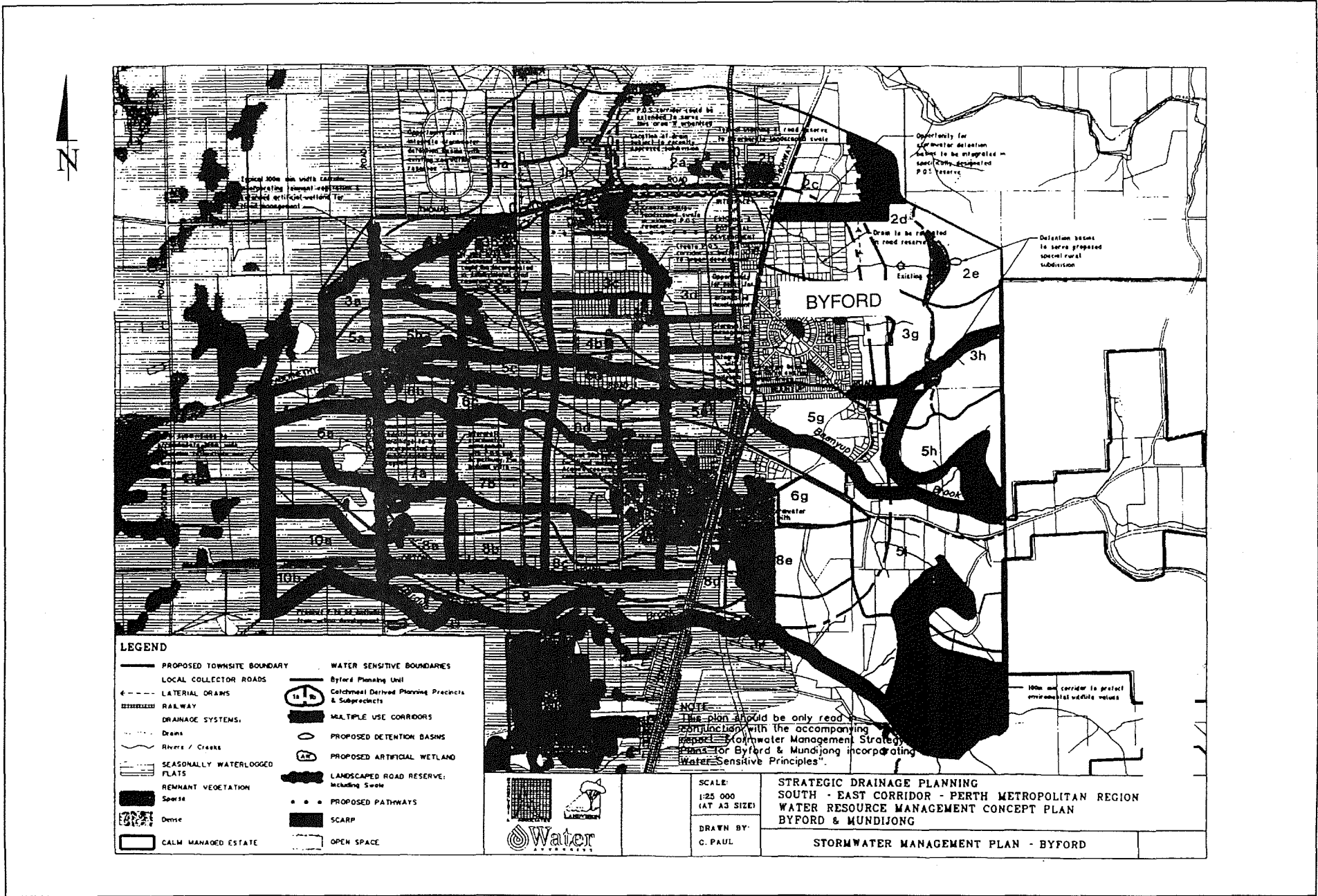
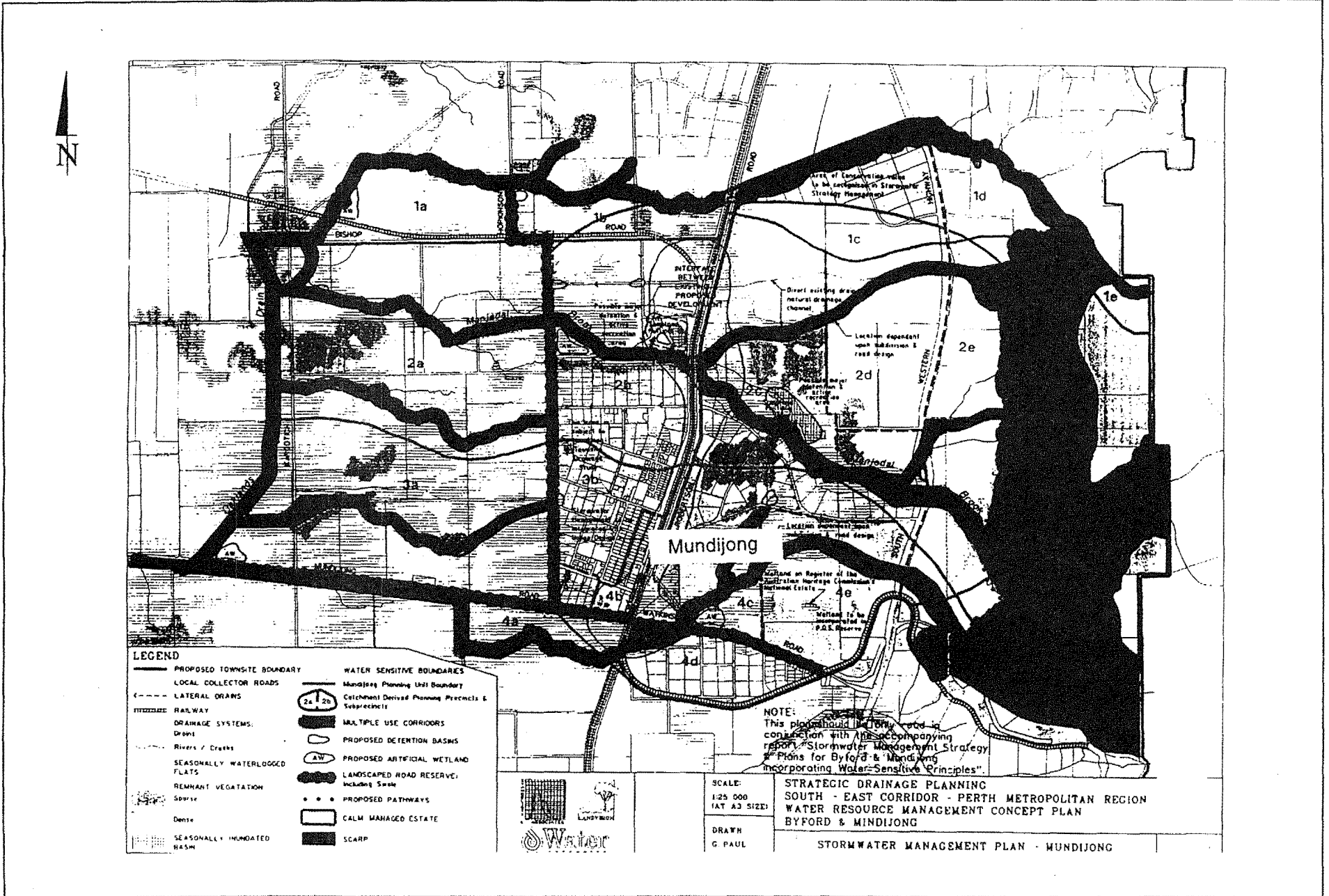


Figure 5b. Stormwater Management Plan - Mundijong. (Source : Evangelisti and Associates, 1994)



2. Strategic environmental impact assessment method

2.1 Assessment framework

The strategic environmental assessment process involves assessment at at two levels - local and regional.

Local key environmental issues

In general terms, local issues relate to allocating land a particular use and deals with environmental impacts at a local level. Evaluation involves checking the acceptability of the impact of that use against existing Environmental Protection Authority criteria and policy. For example land with regionally significant native vegetation should have these values protected and not zoned for incompatible purposes.

Regional key environmental issues

The regional issues are often more difficult to assess. They usually involve generalised impacts which are not specific and extend beyond the boundaries of the study area. Two examples are transport planning and nutrient management. Vehicles generate emissions which in conjunction with other man-induced emissions have been predicted to influence global climatic patterns (greenhouse gases). Nutrients produced in one area often travel large distances before reaching the final receiving body. The environmental effects of nutrient export can adversely impact wetlands often far removed from the source of the nutrients.

2.2 Steps in the procedure of strategic environmental assessment

The purpose of the strategic environmental assessment is to advise upon the environmental acceptability of the MRS Amendment, Structure Plan and Stormwater Management Strategy and:

- (a) recommend which aspects of those plans should be revised to make them environmentally acceptable; and
- (b) identify which specific proposals or projects are likely to require future assessment by the Environmental Protection Authority.

The flow chart shown in Appendix 1 outlines the broad methodology used in this report.

Section 2 describes the method of assessment and the structure of the report.

Section 3 outlines relevant Environmental Protection Authority documents and policies as a means of establishing the policy framework for assessing the MRS Amendment, Structure Plan and Stormwater Management Strategy.

Section 4 sets out the evaluation of the local key issues and Section 5 sets out the regional key issues. In each sub section the objectives and framework are defined and the likely effect of the MRS Amendment, Structure Plan and Stormwater Management Strategy in relation to the issue are described. The Environmental Protection Authority analysis and recommendations with respect to identified issues are contained in this section.

The Environmental Protection Authority's conclusions and advice on the issues raised in this Bulletin are contained in Section 6.

Where an aspect of the reports if implemented would have unacceptable environmental impacts the Environmental Protection Authority has advised how that matter should be addressed and whether future assessment by the Authority is required at a later stage in the planning process.

Limitations

This evaluation has been undertaken using information currently available. The information has been provided by the government agencies and consultancies preparing the reports, by Department of Environmental Protection officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies, and by contributions from Environmental Protection Authority members. The Environmental Protection Authority recognises that further studies and research may affect the conclusions.

3. Policy framework

The following is a list of relevant Environmental Protection Authority documents and policies which set the broad framework to assess the reports the subject of this Bulletin.

3.1 Previous EPA policies

Environmental Protection (Swan Coastal Plain Lakes) Policy 1992

The purpose of this policy is to protect the environmental values of lakes on the Swan Coastal Plain and identify those lakes to which the policy applies. The policy prohibits filling, mining, drainage into or out of, and effluent discharge into lakes without specific authorisation.

Environmental Protection (Peel-Harvey Estuary) Policy 1992

The purpose of this policy is:

- to set out environmental quality objectives for the Estuary which, if achieved, should rehabilitate the Estuary and protect the Estuary from further degradation; and
- to outline the means by which the environmental quality objectives for the Estuary are to be achieved and maintained.

Environmental Codes of Practice for the Poultry Industry and Piggeries (DEP 1991, 1991)

The Codes are intended to encourage an environmental ethic within the industry. Of particular relevance to this Bulletin are the recommended buffers to abutting landuses which may be affected by the odours produced by poultry farms and piggeries.

A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area (Bulletin 686)

The objectives of Bulletin 686 (EPA, 1993) are to:

- outline broad management objectives for wetlands on the Swan Coastal Plain in the near Perth region; and
- provide an evaluation method so that individual wetlands can be allocated a specific management category.

Perth Photochemical Smog Study (1995)

A study of Perth's air quality verifying that the city is on the threshold of a significant air quality problem.

Strategy for the Protection of Lakes and Wetlands of the Swan Coastal Plain (Bulletin 685)

The purpose of Bulletin 685 (EPA, 1993) is to clearly define the current position taken by the Environmental Protection Authority about the protection and management of lakes and wetlands on the Swan Coastal Plain.

System 6 Report (1983)

The System 6 report contains the recommendations of the Environmental Protection Authority for reserving land for the purposes of conservation and recreation in and around the Perth Metropolitan Region.

Threatened or Poorly Reserved Plant Communities Requiring Interim Protection (Interim Plan)

This is the interim plan produced in 1994 as part of the review of the System 6. Areas of remnant bushland on the Swan Coastal Plain that contain plant communities which are considered to be threatened or poorly reserved are identified for inclusion as System 6 areas.

3.2 Previous EPA assessments

The *Shire of Serpentine Jarrahdale Rural Strategy (Shire of Serpentine - Jarrahdale)* was informally assessed by the Environmental Protection Authority.

The Draft South East Corridor Structure Plan reinforces the intent of the Rural Strategy by confining urban expansion around Byford and Mundijong and recommending a significant rural corridor between these two urban areas.

3.3 Other government agency policies

The following is a list of documents produced by other government agencies which also form the framework to assess the reports the subject of this Bulletin.

Environmental and Landscape Audit of the South West, North West, North East, South East and Foothills Corridors, Perth Metropolitan Area - Stage 4 Interim Report The South East Corridor Study (V & C Semeniuk Research Group, 1993)

This report presents the results and recommendations for the environmental audit for the South East Corridor and provides an outline of the procedures and justification for the recommendation.

Revised Greenhouse Strategy for Western Australia 1994 (Greenhouse Coordination Council, 1994).

The Western Australian Government first established the Greenhouse Coordination Council in 1989 following a major greenhouse conference. This document reviews the 1991 Greenhouse Strategy for Western Australia with reference to developments in science and policy at the local, national and international level.

Jandakot Land Use and Water Management Strategy (Western Australian Planning Commission, 1995)

The strategy establishes the physical and policy framework for the long term planning, management and development of land over the Jandakot water mound.

Metropolitan Rural Policy . A Policy Statement For Rural Land In The Perth Metropolitan Region (Department of Planning and Urban Development, 1994)

This policy provides a framework for the future planning of Perth's rural areas.

Proposals for the Jandakot Botanic Park (Ministry for Planning, 1995)

The purpose of this report is to provide protection to the banksia vegetation and wetlands around Jandakot .

Statement of Planning Policy No 2 The Peel Harvey Coastal Plain Catchment (Western Australian Planning Commission, 1992)

This policy ensures that land use changes within the Peel - Harvey Estuarine System likely to cause environmental damage to the estuary are brought under planning control based on the objectives and principles of the Environmental Protection (Swan Coastal Plain Lakes) Policy.

4. Evaluation of key site specific environmental issues in the South East Corridor

4.1 Wetlands with regional significance

4.1.1 Objective

The Environmental Protection Authority's objective is to ensure that the proposed land use changes within the *South East Corridor Structure Plan, Metropolitan Region Scheme Amendment* and *Stormwater Management Strategy* do not cause environmental damage to wetlands of regional significance.

4.1.2 Evaluation framework

Policy framework

The Environmental Protection Authority is concerned with the filling, draining, mining and polluting of the following regionally significant wetlands:

- lakes nominated for protection in the Environmental Protection (Swan Coastal Plain Lakes) Policy gazetted in December 1992;
- representative wetland areas recommended for protection in the System 6 report, other conservation reserves, areas recommended for reservation by the Department of Conservation and Land Management, and regional open space set aside for conservation;
- wetlands with rare vegetation communities not adequately represented in reserves, or rare flora and fauna (and their habitats); and
- wetlands recognised by international agreement because of their importance primarily for waterbirds and their habitats.

Environmental Protection (Swan Coastal Plain Lakes) Policy 1992

The *Environmental Protection (Swan Coastal Plain Lakes) Policy* (Lakes EPP), was proclaimed following extensive consultation with community groups and private landholders. The Lakes EPP prohibits unauthorised filling, mining, drainage or effluent discharge into nominated lakes. Lakes listed in the policy have the highest level of protection under the Environmental Protection Act and there is a presumption against approving developments that are likely to breach the intent of the policy. Authorisation under the Environmental Protection Act to disturb an EPP lake generally requires the approval of the Minister for the Environment, on advice from the Environmental Protection Authority, after a proposal has been assessed.

There are a number of EPP lakes within the study area, in the vicinity of Forrestdale Lake (refer to Figure 6).

System 6 Wetland Areas

In 1972, the Environmental Protection Authority established the *Conservation Through Reserves Committee* to make recommendations for the reservation of land for conservation and recreation purposes. The State was divided into 12 regions or Systems with the most intensively used areas in and around the Perth metropolitan area known as System 6 (Environmental Protection Authority, 1983 a & b).

There are two System 6 wetland areas contained within the study area. These are M95 (Forrestdale Lake), and M83 south of Byford which contains a wetland and remnant bushland (refer to Figure 7).

Rare Flora and Fauna and International Agreements

There are no other wetlands with the South East Corridor that contain known rare species of flora and fauna, or wetlands that form part of an international agreement such as RAMSAR that have not already been identified in System 6 or in the Lakes policy.

Planning proposal

The majority of the EPP lakes in the South East Corridor are included within the existing Parks and Recreation reserve around Forrestdale Lake. However, there are a number of EPP lakes to the east of Forrestdale Lake located within an area identified as Urban Deferred in the Structure Plan. The Urban Deferred zoning implies that this area would eventually be zoned Urban in the MRS.

The Metropolitan Region Scheme provides adequate protection to the two wetlands that have been identified in the System 6 Report. Forrestdale Lake (M95) is currently reserved for Parks and Recreation purposes and it is proposed to reserve M83 for Parks and Recreation as part of the current Metropolitan Region Scheme Amendment.

4.1.3 EPA evaluation

The EPP wetlands east of Forrestdale Lake, are within an area identified as Urban Deferred in the Structure Plan. It is considered that compliance with the EPP policy would provide adequate protection to these lakes from the impacts of future urban development in the area. Nevertheless, the Structure Plan should also reinforce the need to protect these lakes. Local structure plans should provide for the protection of the EPP lakes through the inclusion of the lakes and buffer areas in public open space.

Management plans should also be prepared prior to the land being subdivided or developed.

The System 6 wetlands within the study area are adequately protected by existing and proposed reserves. The management of landuses adjacent to these wetlands may require referral to the Environmental Protection Authority for environmental impact assessment.

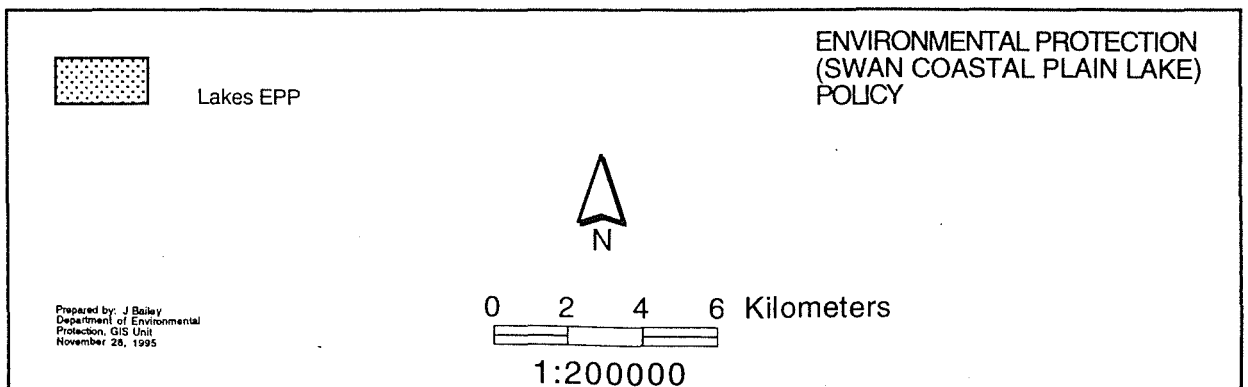
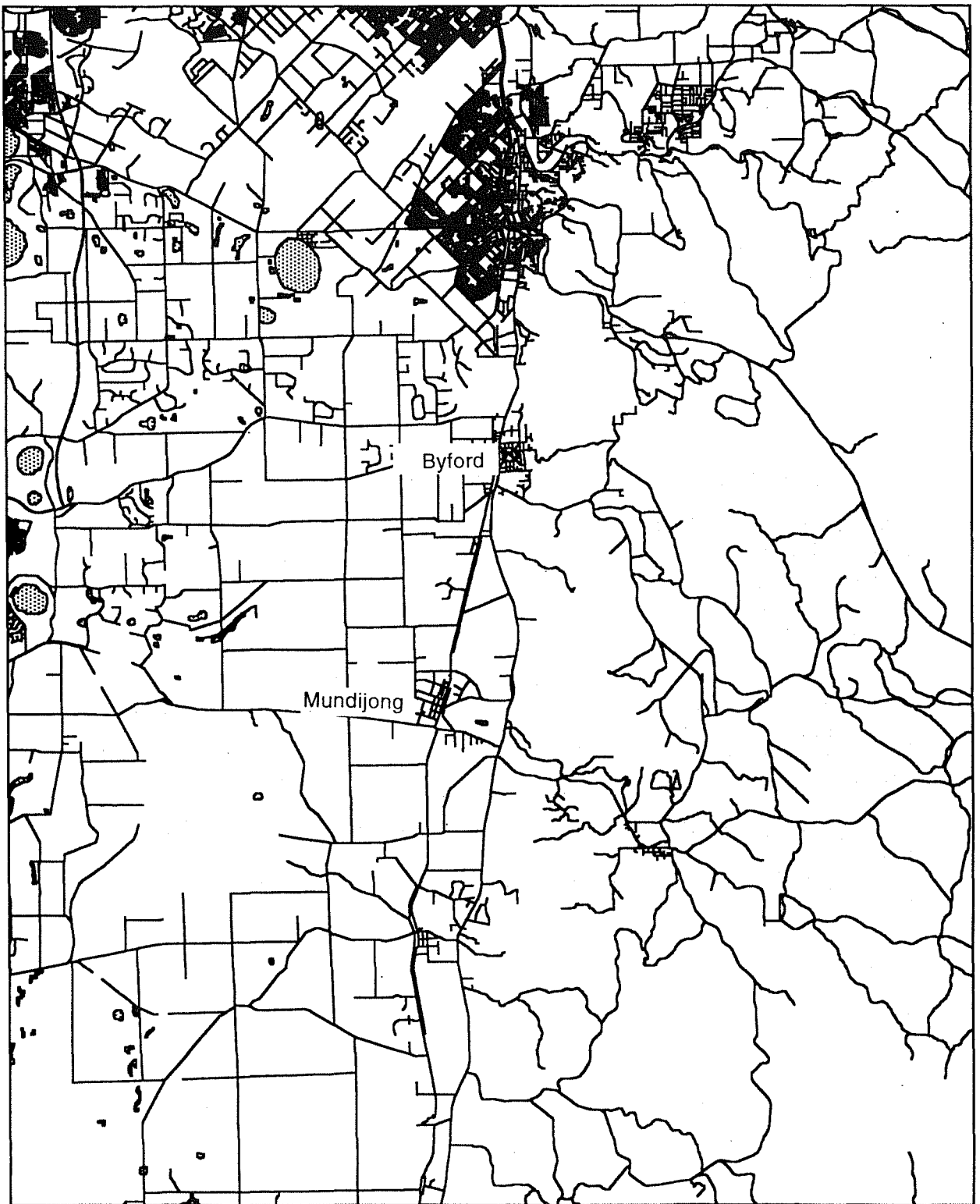


Figure 6. Environmental Protection (Swan Coastal Plain Lake) Policy.

4.2 Wetlands with local significance

4.2.1 Objectives

A significant proportion of the land in the South East Corridor is subject to inundation and is considered to be wetland. These wetlands are not identified in the Lakes Policy or the System 6 Report, but are recognised as having local significance. The Environmental Protection Authority's objectives with regard to these wetlands are:

- to ensure that the proposed land use changes within the *Structure Plan, Metropolitan Region Scheme Amendment and Stormwater Management Strategy* are assessed to avoid and minimise environmental damage to wetlands of local significance within the framework of the Environmental Protection Authority's report *A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area. (Bulletin 686)* : and
- to prevent the export of nutrients into wetlands.

4.2.2 Evaluation framework

Policy framework

Strategy for the Protection of Lakes and Wetlands of the Swan Coastal Plain (Bulletin 685); and *A Guide to Wetland Management in the Perth and near Perth Swan Coastal Plain Area (Bulletin 686)*.

The Environmental Protection Authority considers that local wetlands should be protected and managed in accordance with the principles outlined in Environmental Protection Authority Bulletins 685 and 686.

There are five management categories identified in Bulletin 686 which are based on the importance of wetlands in terms of natural ecosystems and human use. Proposals which adversely affect wetlands categorised as either Conservation and Recreation (Category O), Conservation (Category C) or High Conservation (Category H) would likely be considered environmentally unacceptable.

Many of the wetlands in the Shire of Serpentine-Jarrahdale have been cleared of natural vegetation and the water levels and quality have been altered (Department of Planning and Urban Development 1994). Bulletin 686 also recommends how wetlands that have been substantially modified and have no significant human use should be managed. These wetlands are categorised as Resource Enhancement (Category R) or Multiple Use (Category M).

Planning proposal

There are many wetlands of local significance within the study area. However, these wetlands have not been identified in the Structure Plan or MRS Amendment as it is not generally the role of regional structure plans or the Metropolitan Region Scheme to provide protection to these lakes. It is the role of local structure plans and town planning schemes to identify areas of local significance warranting management and protection. The Environmental Protection Authority considers that these wetlands can be managed under the guidelines of Bulletins 685 and 686 through the preparation of local structure plans, subsequent rezonings and subdivisions.

The *Landscape and Environmental Audit for the South East Corridor* identified all natural channels as significant for conservation. Many of the channels have been identified as multiple use stormwater corridors in the *Stormwater Management Strategy* and the *Structure Plan*. The Western Australian Planning Commission has recommended that the channels be protected through reservation in the local town planning scheme in accordance with the Structure Plan. Further reference is made to this matter in Section 5.1.2.

4.2.3 EPA evaluation

The Environmental Protection Authority considers that :

- the *Strategy for the Protection of Lakes and Wetlands of the Swan Coastal Plain (Bulletin 685)* and *A Guide to Wetland Management in the Perth and near Perth Swan Coastal Plain Area (Bulletin 686)* provide the basis for adequate protection to lakes of local significance;
- implementation of Bulletin 685 and 686 should occur through local structure plans and zoning and subdivision controls.
- proposals which adversely affect wetlands categorised as either Conservation and Recreation (Category O), Conservation (Category C) or High Conservation (Category H) should be considered environmentally unacceptable; and
- any proposal which is inconsistent with Bulletins 685 or 686 or adversely affects category), C or H wetlands should be referred to the Environmental Protection Authority for formal assessment.

4.3 System 6 areas (other than wetlands)

4.3.1 Objectives

The Environmental Protection Authority's objective is to protect land that has been identified in the System 6 Report as having regional conservation and recreation value.

4.3.2 Evaluation framework

Policy framework

System 6 Areas (other than wetlands)

There are seven System 6 (other than wetlands) areas within the study area (refer to Figure 7). These areas are M80 (Darling Scarp), M83 (Mundijong), M84 (Gooralong), M85 (Serpentine National Park), M87 (Serpentine), M88 (Keysbrook) and M89 (East of Keysbrook).

Planning proposal

There are no proposed land use changes within the boundaries of the System 6 areas in either the Structure Plan or MRS amendment.

The Structure Plan provides for the future reservation of four System 6 areas for Parks and Recreation purposes. These areas are M80, M84, M85, M87.

Two of the System 6 areas (M83 and M89) are included in Metropolitan Region Scheme amendment as Parks and Recreation reserves.

M88 has not been recommended for future inclusion in a Parks and Recreation reserve in the Structure Plan or MRS amendment. This land has been included in the *Private Land Conservation* category of the *Shire of Serpentine - Jarrahdale Local Rural Strategy*. Private land identified for conservation in the Rural Strategy is not intended for acquisition by the Local Authority or the State Government. The general aim is to encourage and make it easier for landowners to protect and manage the conservation values of the property. Any development or land use proposal will be assessed on its compatibility with the conservation values present on the site and approved or rejected accordingly.

4.3.3 EPA evaluation

The Environmental Protection Authority considers that:

- the Structure Plan and proposed Metropolitan Region Scheme Amendment provide satisfactory protection to six of the seven System 6 areas located within the study area;
- inclusion of M88 in the Private Land Conservation category of the Shire of Serpentine - Jarrahdale Local Rural Strategy is capable of providing adequate protection; and
- any development proposals involving M88 should be referred to the Environmental Protection Authority for formal assessment.

4.4 Waste water disposal

4.4.1 Objectives

To prevent nutrient enrichment and degradation of groundwater and surface water systems from on-site effluent disposal.

4.4.2 Evaluation framework

Policy framework

Government Sewerage Policy - Perth Metropolitan Region 1995

The policy requires that :

- all subdivision or density development to be provided with reticulated sewerage, except where certain discretionary provisions may apply; and
- subdivision or density development exceeding R5 in the outer metropolitan area to be subject to the provision of reticulated sewerage.

Guidance Notes from Environmental Protection Authority Reports 1971-1992, Western Australia, Bulletin 625.

This Bulletin advises that on-site effluent disposal should be appropriately located to prevent pollution and nutrient enrichment of groundwater and surface water.

Nutrient rich groundwater would not only pose a risk to public water supplies but could also impact on downstream wetlands.

Nutrients entering the surface drainage system could flow into the Peel - Harvey Estuary.

Planning proposals

Mundijong and Byford are located a considerable distance from existing sewerage infrastructure making it difficult and expensive to provide connection.

The Structure Plan presents a number of options for waste water disposal including:

- the use of local treatment and local land disposal options on a permanent or temporary basis;

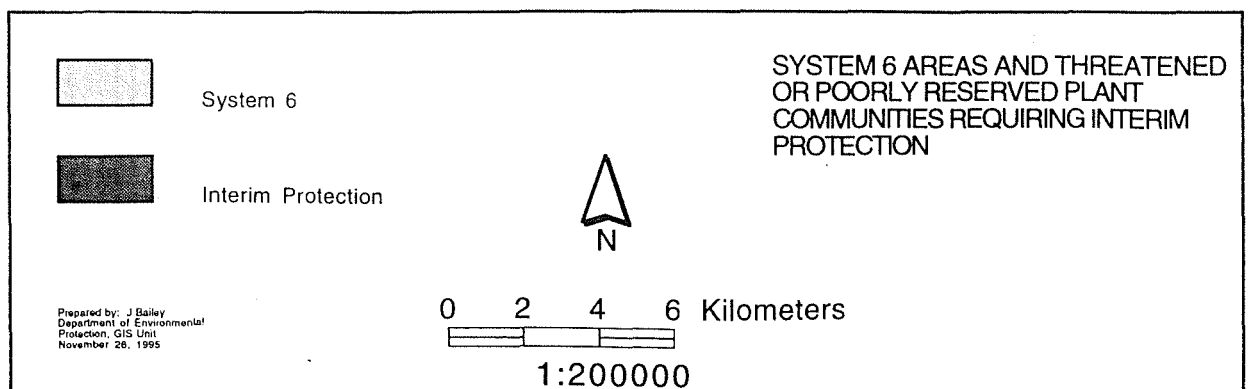
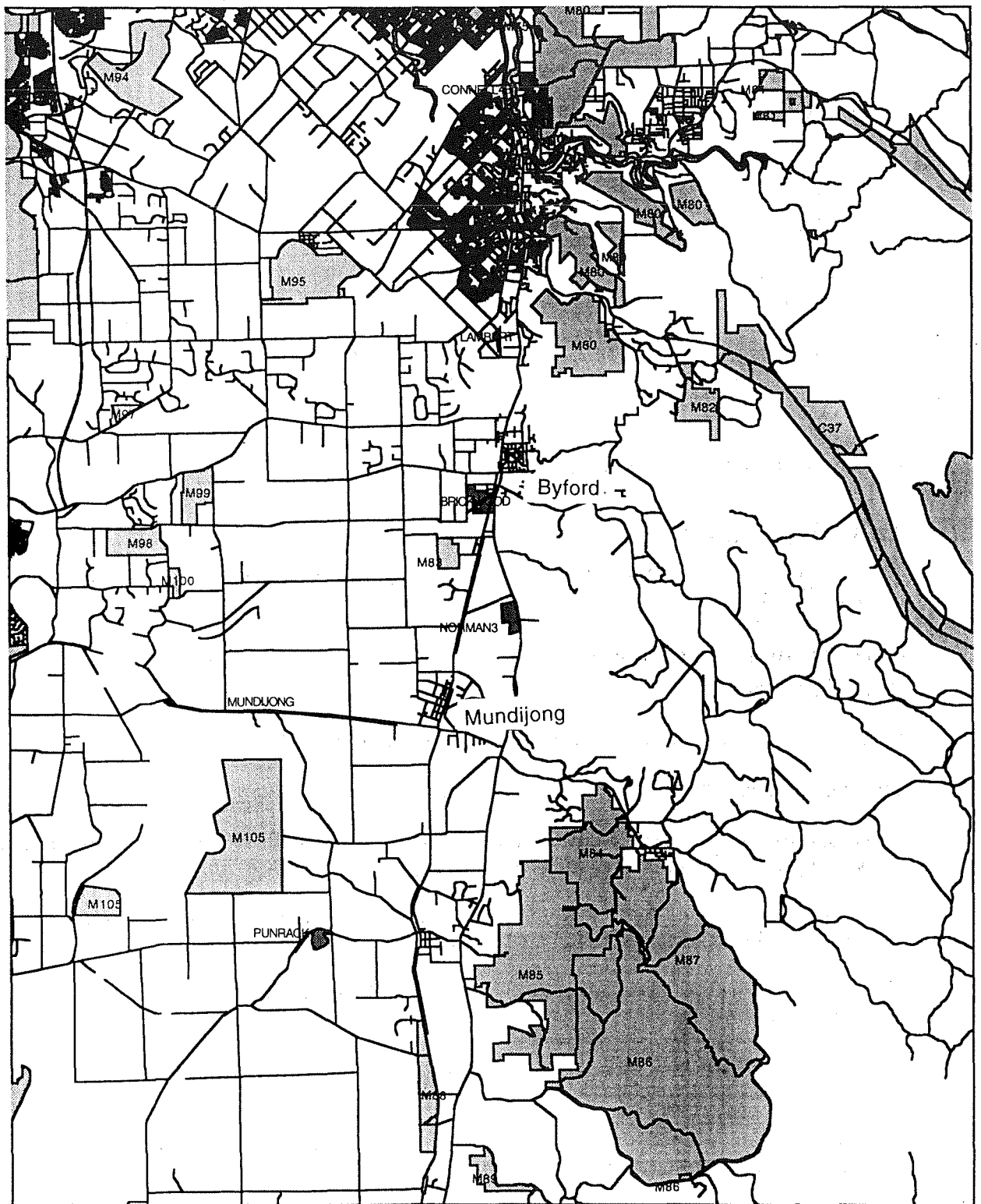


Figure 7. System 6 Areas and Threatened or Poorly Reserved Plant Communities Requiring Interim Protection

- provision of temporary pumping to Wesfield Septage Treatment Plant for on - going pumping to Woodmans Point, pending provision of permanent infrastructure.

The Ministry for Planning and Water Authority of Western Australia have advised that the provision and method of waste water disposal in Byford and Mundijong will be developer driven and dependent on options presented at the time of rezoning and subdivision.

An assessment of the options will be left until the landowners/developers in the area have presented preferred options.

4.4.3 EPA evaluation

It should be stated in the the Structure Plan that any proposals for on-site waste water disposal including local treatment plants or broad scale use of alternative treatment units must be referred to the Environmental Protection Authority for environmental impact assessment.

4.5 Threatened or poorly reserved plant communities requiring interim protection.

4.5.1 Objectives

To protect the remnant bushland communities that have been identified in the update of System 6 Report.

4.5.2 Evaluation framework

Policy framework

Threatened or Poorly Reserved Plant Communities Requiring Interim Protection (Interim Plan) (System Six update)

The System 6 update identifies 36 areas of remnant bushland on the Swan Coastal Plain between Gingin and Dunsborough that contain plant communities which are considered to be threatened or poorly reserved.

Planning proposals

There are five areas of remnant bushland identified in the System 6 review located in the South East Corridor (refer to figure 7). These are known as Brickwood, Norman 3, Mundijong, Punrack 1 and Page 30 (south of M88 outside figure 7 map area).

It is proposed to reserve the majority of Brickwood and Norman 3 for Parks and Recreation purposes in the MRS Amendment.

Punrack1 and Page 30 are not identified as local open space in the Structure Plan. These sites are located outside of the proposed urban areas.

The remnant bushland located in the Mundijong Road reserve is identified in the System 6 review as worthy of retention. It is proposed to reserve Mundijong Road as a Controlled Access Highway in the MRS Amendment which may result in future road construction adversely affecting on this area of remnant bushland.

4.5.3 EPA evaluation

The Environmental Protection Authority considers that the *Structure Plan* and *Metropolitan Region Scheme Amendment* provide some protection to the remnant bushland areas identified in the System 6 review except for the bushland along Mundijong Road. The significance of this bushland should be acknowledged in the Structure Plan. Road construction and batters should not impact upon the Mundijong remnant bushland and any proposal to construct a road in this area should be referred to the Environmental Protection Authority for assessment prior to construction.

The proposal to reserve a major portion of Brickwood and Norman 3 in the MRS for Parks and Recreation purposes is supported. The Western Australian Planning Commission should explore options to revise the boundaries of the Parks and Recreation reserve to be as close as those shown in the System 6 review.

The Structure Plan should be modified to identify Punrack 1 and Page 30 sites as local open space.

The significance of Mundijong remnant bushland should be acknowledged in the Structure Plan.

Proposals to clear or develop land identified in the System 6 update should be referred to the Environmental Protection Authority for environmental impact assessment.

4.6 Poultry farms and piggeries

4.6.1 Objectives

To avoid potential conflicts over noise, dust and odour between existing poultry farms and piggeries and proposed nearby landuses.

4.6.2 Evaluation framework

Policy framework

Environmental Code of Practice - Poultry Farm. Environmental Protection Authority (1991)

Existing poultry farms can adversely affect adjoining existing and proposed landuses due to the generation of odour, noise, visual amenity, dust and traffic.

The Environmental Protection Authority normally recommends that residential areas be separated from poultry farms by a 500m buffer. Experience in other residential areas shows that where residential development is allowed to proceed within 500 metres of a poultry farm, affected residents may complain about the odour nuisance and other impacts from the poultry operations.

The Code states that residential development should not be permitted within 500m of a poultry farm unless appropriate studies have been carried out, including proper air dispersion modelling and dynamic olfactometry to determine the specific conditions of the site to determine acceptable standards of odour. After site specific studies have been undertaken, the width of the buffer zone could be amended.

Environmental Code of Practice - Piggeries. Environmental Code of Practice (1991)

In a similar manner to poultry farms, piggeries can also have an adverse impact on existing and proposed adjoining landuses due to the generation of odour, noise, visual amenity, dust and traffic. The Environmental Protection Authority recommends that the Department of Agriculture's *Environmental Management Guidelines for Animal Based Industries - Piggeries*.

should be consulted to ensure that the site complies with the recommended minimum separation distances to towns, single residences, waterways and bores.

Environmental Management Guidelines for Animal Based Industries - Piggeries. Department of Agriculture (1989)

The guidelines aim to provide guidance to those involved in the establishment and management of piggeries, to ensure that they can be established and managed in an environmentally acceptable manner. Particular emphasis is given to preventing water pollution.

The guidelines also recommend buffer distances for a number of landuses. Buffer distances vary depending on the size of the piggery and the nature of the adjoining land use.

Poultry Farm Policy No. DC 3.5. Western Australian Planning Commission

This Policy has been prepared by the Commission to assist in determining rezoning, subdivision and development applications for poultry farms. The policy also identifies matters to be taken into account in determining residential and other forms of development in the vicinity of poultry farms.

In considering proposals for the zoning, subdivision and development of land for residential purposes (closer than 500 metres to any existing or approved poultry shed) and rural residential purposes (closer than 300 metres to any existing or approved poultry shed) the Commission and/or local authority may require an assessment to show that the operation of the poultry farm will not adversely affect the amenity of the new residents in the proposed residential and rural/residential area.

Planning proposals

Four poultry farms and piggeries are located in the areas proposed to be zoned Urban or Urban Deferred in the MRS Amendment. These areas are also identified as Urban in the Structure Plan (refer to figure 8).

4.6.3 EPA evaluation

The Environmental Protection Authority considers that the Environmental Codes of Practice for Poultry Farms and Piggeries provide planning agencies with adequate guidelines to ensure that suitable buffer distances are provided between existing poultry farms and proposed urban development.

The poultry farms and piggeries within the proposed urban areas should be separated by at least 500m from residential dwellings.

The Environmental Protection Authority's position is that where residential development is proposed closer than the recommended buffer distances and the poultry farm or piggery is operating to industry standards and/ or licence conditions, the onus should be on the developer of the residential land to show that impacts on future residents would be acceptable. If this can't be demonstrated then the development within the buffer zone should not proceed. If residential areas do encroach within the buffer area the poultry farm or piggery should be relocated.

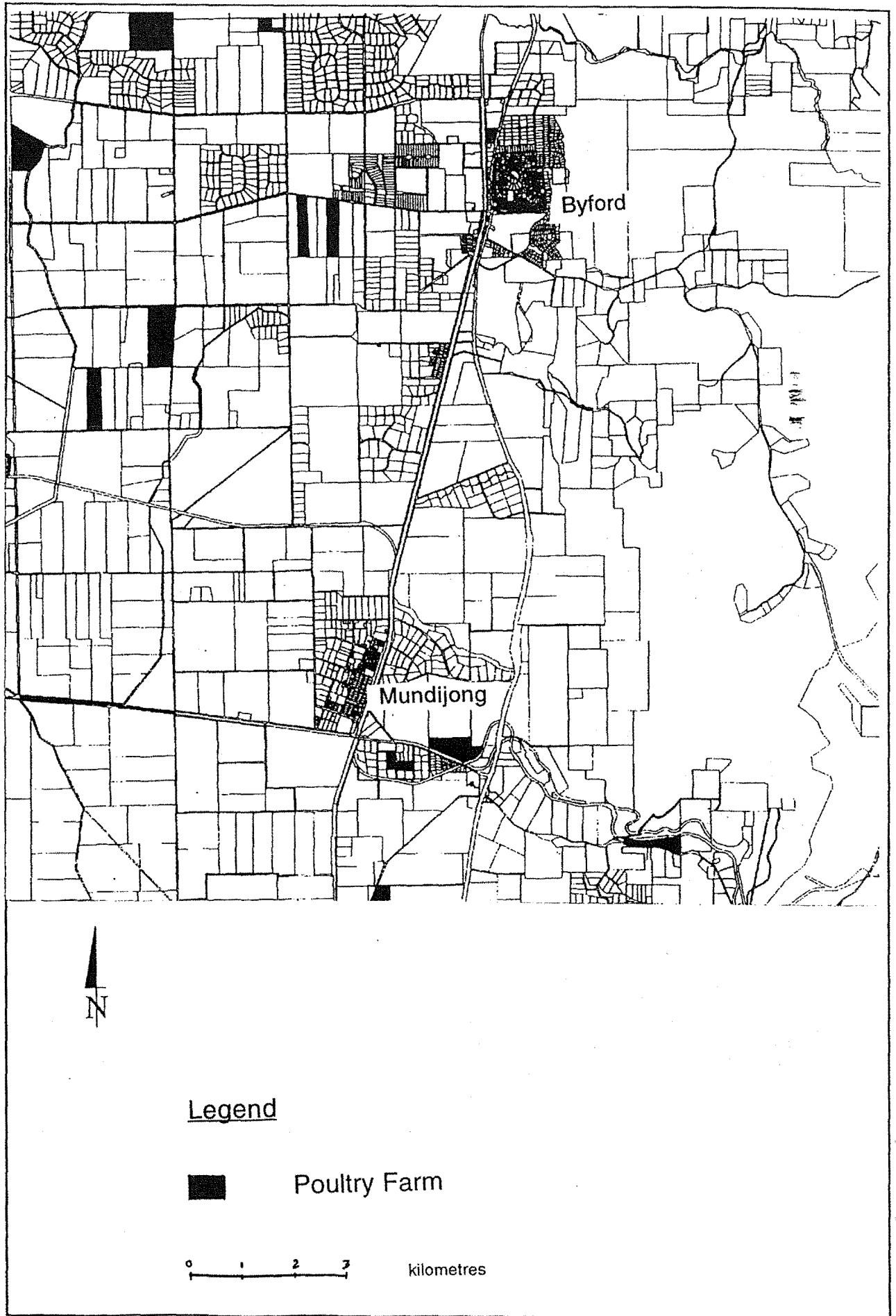


Figure 8. Location of Poultry Farms near Byford and Mundijong.

5. Evaluation of key environmental issues with regional impacts

5.1 Peel - Harvey Coastal Plain Catchment

5.1.1 Objectives

The Environmental Protection Authority's objectives are to:

- ensure that changes to land use within the catchment to the Peel - Harvey Estuarine system (refer to Figure 9) are controlled so as to avoid environmental damage. New rural developments and land use zoning changes in the Peel - Harvey catchment should be evaluated on a catchment basis, with regard to the net effect of such changes on the phosphorus loads of water flowing into the estuary.
- Development should only proceed if it is managed to protect water quality in the catchment.

5.1.2 Evaluation framework

Policy framework

The Peel - Harvey Estuary represents an important aquatic ecosystem in close proximity to Perth. The area supports many different waterbirds and aquatic species as well as providing a recreational environment for the expanding population of the region. The Peel - Harvey Estuary is a wetland of international importance as recognised under the Ramsar international treaty.

The estuary has a history of poor water quality and associated algal blooms. Nutrient enrichment of the waterbody has been caused by the clearing of native vegetation within the catchment, the construction of surface and subsurface drainage and the expansion of landuses that export nutrients (especially phosphorus) to the waterways of the catchment.

The following policies were established to help improve the quality of water in the Estuary and control landuses within the catchment.

Environmental Protection (Peel Inlet - Harvey Estuary) Policy Environmental Protection Authority (1992)

The purpose of this policy is to:

- set out environmental quality objectives for the Estuary which if achieved will rehabilitate the Estuary and protect the Estuary from further degradation; and
- outline the means by which the environmental quality objectives for the estuary are to be achieved and maintained.

Statement of Planning Policy No. 2 - The Peel - Harvey Coastal Plain Catchment State Planning Commission (1992)

The objectives of this policy are to:

- improve the social, economic, ecological, aesthetic and recreational potential of the Peel - Harvey Coastal Plain Catchment;
- ensure that changes to land use within the catchment to the Peel - Harvey Estuarine system are controlled so as to avoid and minimise environmental damage;

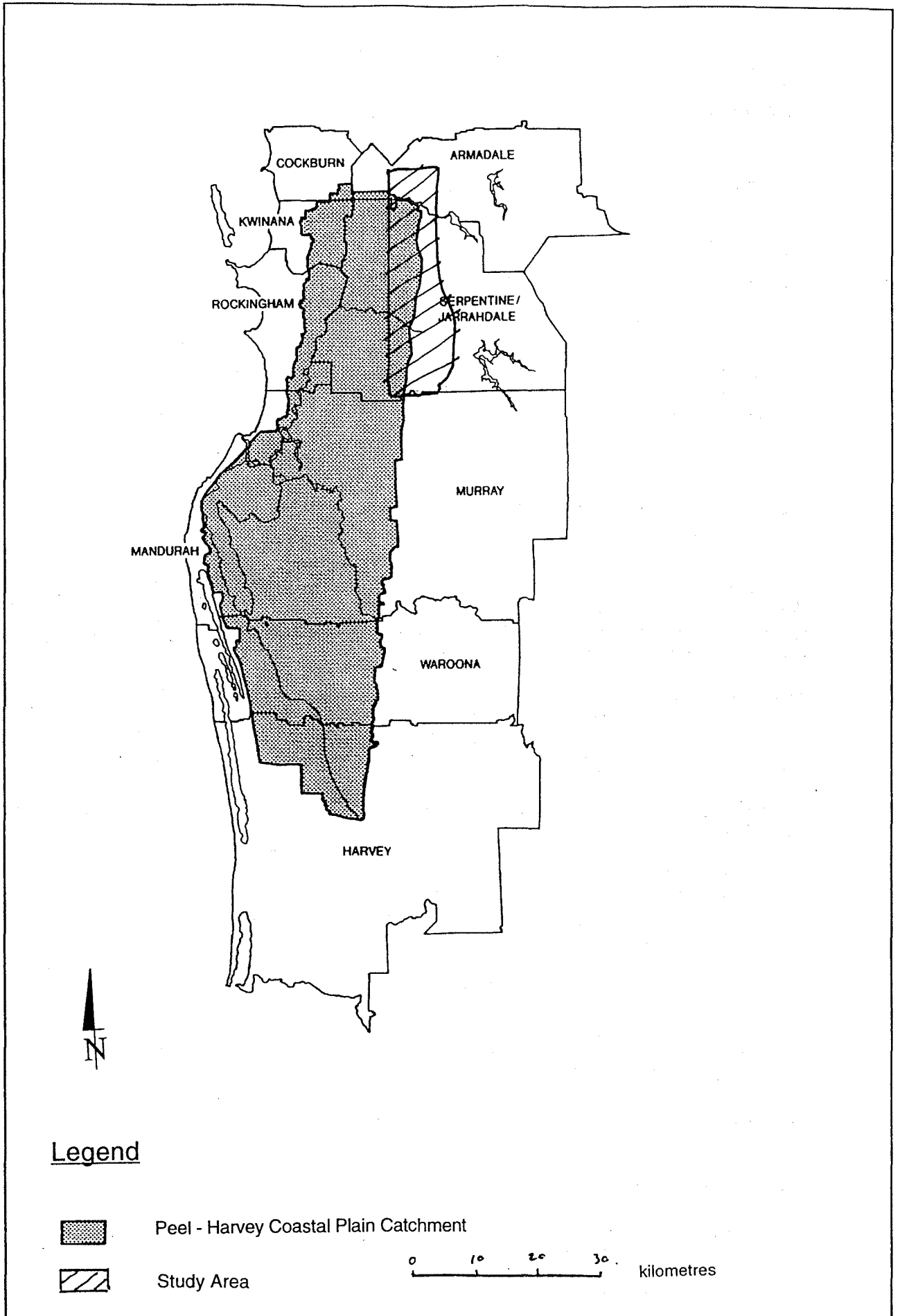


Figure 9. Peel - Harvey Coastal Plain Catchment

- increase high water using vegetation cover within the Peel - Harvey Coastal Plain catchment; and
- prevent landuses likely to result in excessive nutrient export into the drainage system.

General provisions of the policy:

- land shall not be rezoned for urban purposes unless certification is received from the Water Authority that arrangements have been made so that connection to an adequate sewerage service, or alternative system satisfactory to the Environmental Protection Authority and Health Department, will be available to all lots in the subdivision;
- proponents shall ensure that proposed changes to land zonings take account of land capability/suitability criteria with regard to the net effect that such changes are likely to have on the nutrient load discharging from the catchment into the Peel - Harvey Estuarine System;
- the retention and rehabilitation of existing remnant vegetation is to be encouraged. Remnant vegetation shall be retained along water courses, or the margins shall be replanted to higher water using vegetation to exert some control on sediment and nutrient movement; and
- subdivision proposals shall make provision for a drainage system which maximises the retention of drainage on site.

Planning proposal

The *Stormwater Management Strategy and Plans for New Urban Development at Byford and Mundijong* report was prepared to provide an improved method of stormwater management and flood protection for future urban development and reduce the export of nutrients to the Peel - Harvey Estuary from this development.

The *Green Towns Local Structure Plan (Hocking 1995)*, *Stormwater Management Strategy and Plans for Byford Mundijong*, *Stormwater Management Plan for Byford and Mundijong* and *Draft Shire of Serpentine and Jarrahdale Mundijong Townsite Drainage Study* have been prepared for the Shire of Serpentine - Jarrahdale to assist in the implementing the Stormwater Management Strategy.

Drainage is an important engineering and environmental consideration in planning for proposed urban growth in Byford and Mundijong, due to the clay soils which result in high rates of run off and waterlogging.

The intention of the Strategy is to restrict the peak rate of stormwater flow and retain nutrient export to pre-urban rates. The Strategy also aims to maintain pre-urban water levels of valuable wetlands and creeks using water sensitive design techniques. The Water Sensitive Design Guidelines (Whelans, 1995) aim to enhance localised on site disposal at individual house and street level and provide temporary storage of stormwater at or near its origin with slow release to groundwater or downstream receiving bodies.

An important component of the *Stormwater Management Strategy* is the use of existing streams as multiple use stormwater drainage corridors (refer to Figure 5a & 5b). The corridors are identified in the *Structure Plan* where it is recommended that the land be reserved in a town planning scheme. The multiple use corridors are not reserved as Parks and Recreation or Public Purposes in the proposed *MRS Amendment*.

The *Stormwater Management Strategy* is aimed at designing a drainage network that will reduce the rate and quantity of stormwater runoff with the aim of reducing the nutrient levels. However, criteria has not been set to measure the quality (nutrient levels) of stormwater runoff and provisions to monitor nutrient levels have not been made.

5.1.3 EPA evaluation

The *Stormwater Management Strategy and Plans for New Urban Development at Byford and Mundijong* and the *Green Towns Local Structure Plan* accord with the Environmental Protection Authority's objective to reduce the export of nutrients into the Peel Harvey Inlet.

The Water Authority of Western Australia should develop a monitoring programme and criteria to measure nutrient levels in the stormwater runoff in accordance with the environmental quality objectives set out in the Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992 prior to the Local Authority's Town Planning Scheme being amended.

Should the *Stormwater Management Strategy* fail to adequately reduce nutrient levels, provisions should be made to implement the following contingency procedures:

- provision of additional detention basins within the multiple use corridors if the *Stormwater Management Strategy* does not reduce nutrient loads to an acceptable level;
- provision of regional detention basins to reduce nutrient levels in the event the multiple use corridors cannot be implemented; and
- defer further development if the monitoring of nutrient levels finds that the management strategy is ineffective.

Prior to the land identified as Urban and Urban Deferred in the Structure Plan and MRS Amendment being rezoned in the local authority's town planning scheme, the Western Australian Planning Commission and Environmental Protection Authority should agree to a process of implementing the multiple use corridors.

5.2 Transport

5.2.1 Objectives

Air quality

The Environmental Protection Authority's objective is to ensure that air quality in Perth does not exceed health and environmental standards.

Greenhouse gas emissions

The Greenhouse Co-ordination Council has proposed the following objectives for urban development:

- to stabilise total private passenger vehicle kilometres in the Perth Metropolitan Region by 2005 through urban planning, provision of public transport, cycleways and walkways.
- to implement programmes in urban planning and energy efficient building with the aim to stabilise residential and commercial energy use per capita and greenhouse gas emissions by the year 2005.

5.2.2 Evaluation framework

Perth Photochemical Smog Study

The Perth Photochemical Smog Study due for completion in late 1995 has confirmed that motor vehicle emissions of hydrocarbons and oxides of nitrogen are the dominant cause of Perth's photochemical smog. Photochemical smog (ozone) levels in the Perth airshed exceed World Health Organisation air quality criteria on about 10 days per year.

Policy framework

Revised Greenhouse Strategy for Western Australia 1994 (Greenhouse Coordination Council)

The pattern of urban and building design has a strong influence on energy use and greenhouse gas emissions. Emissions can be reduced by optimising landuse and transport related factors to reduce car travel, and by optimising dwelling siting and design to reduce heating and cooling related emissions.

The extent to which urban growth in metropolitan and regional areas is in energy efficient forms depends on the extent that concepts such as urban villages are facilitated and encouraged in planning strategies.

The Greenhouse Coordination Council recommends 'erring on the side of caution' or implementing 'no regrets' measures to reduce greenhouse emissions.

Planning proposal

Urban Villages. (Green Towns Local Structure Plan, Hocking 1995)

The Structure Plan proposes to accommodate 60,000 people over the next 25 years in Byford and Mundijong in a series of urban villages (or green towns) which will accommodate around 5,000 people each.

The villages will develop around a primary school, local shopping centre and open space and located adjacent to a bus route to foster a sense of community and reduce car dependence. Neighbourhoods will be clearly delineated by semi-rural development, green spaces and roads (Hocking 1995).

It is intended that these villages will be self sufficient to some extent and will reduce the need to travel long distances to schools, shops community facilities and open space.

Urban villages are more efficient in terms of energy, transport, land use, residential and housing design (Hocking 1995).

5.2.3 EPA evaluation

The South East Corridor Structure Plan is based on the urban village concept. As stated in the Revised Greenhouse Strategy this is considered to be an energy efficient form of urban growth and will help reduce the production of greenhouse gases.

6. Conclusions and recommendations

The Environmental Protection Authority concludes that the *Draft South East Corridor Structure Plan, Metropolitan Region Scheme Amendment No. 966/33*; and *Stormwater Management Strategy and Plans for New Urban Development at Byford and Mundijong* are environmentally acceptable subject to the recommendations listed below.

In reaching this conclusion, the Environmental Protection Authority identified the following main environmental objectives which the proposal should meet; that is to:

- avoid and minimise environmental damage to wetlands of local and regional significance;
- reserve land that has been identified in the System 6 Report as having conservation and recreation value;
- prevent nutrient enrichment and degradation of the groundwater and the surface water systems from on-site effluent disposal;
- protect remnant bushland communities identified in the System 6 review;
- minimise the potential impact of noise, dust and odour from existing poultry farms and piggeries on proposed adjoining landuses;
- ensure changes to land use within the catchment to the Peel Harvey Estuarine system are controlled so as to avoid and minimise environmental damage particularly in terms of nutrient export; and
- ensure suitable transport strategies have been adopted to ensure that air quality and greenhouse gas emissions in the South East Corridor meet health and environmental standards.

Recommendation 1

Wetlands with regional significance

The Environmental Protection Authority advises that:

- the South East Corridor Structure Plan report should refer to the need to protect those lakes east of Forrestdale Lake that are identified in the *Environmental Protection (Swan Coastal Plain Lakes) Policy* ;
- local structure plans should provide for the protection of the EPP lakes through the inclusion of the lakes and buffer areas in public open space;
- management plans should also be prepared and referred to the EPA for environmental impact assessment prior to the land being subdivided or developed;
- it supports the inclusion of M83 as a Parks and Recreation reserve in the Metropolitan Region Scheme Amendment; and
- proposals adjacent to or indirectly impacting EPP wetlands or land identified in the System 6 report should be referred to the Environmental Protection Authority for environmental impact assessment.

Recommendation 2

Wetlands with local significance

The Environmental Protection Authority advises that:

- the *Strategy for the Protection of Lakes and Wetlands of the Swan Coastal Plain (Bulletin 685)*; and *A Guide to Wetland Management in the Perth and near Perth Swan Coastal Plain*

Area (Bulletin 686) provide adequate protection to the lakes not identified in the System 6 report and the Environmental Protection (Swan Coastal Plain) Policy; and

- proposals which significantly affect wetlands identified in Bulletin 686 as either Conservation and Recreation (Category O), Conservation (Category C) or High Conservation (Category H) should be considered environmentally unacceptable.

Prior to urban development occurring in areas likely to impact on a wetland the following work should be completed:

- the wetland and associated dryland buffer should be delineated;
- appropriate zoning or land use controls established for the wetland and buffer area;
- the wetland's management category, as described in Environmental Protection Authority Bulletin 686, should be determined;
- water level and water quality criteria set on a case by case basis; and
- a management plan should be developed consistent with the requirements above.

Any proposal which is inconsistent with Bulletins 685 or 686 or adversely affects category), C or H wetlands should be referred to the Environmental Protection Authority for formal assessment.

Recommendation 3

System 6 Areas (other than wetlands)

The Environmental Protection Authority advises that:

- the proposal to reserve M83 and M89 in the Metropolitan Region Scheme for Parks and Recreation purposes is supported;
- the identification of M80, M84, M85 and M87 in the Structure Plan as future Parks and Recreation reserves is supported;
- it is considered that the inclusion of M88 in the Private Land Conservation category of the Shire of Serpentine - Jarrahdale Local Rural Strategy will provide adequate protection; and
- proposals adjacent to or indirectly impacting land identified in the System 6 report should be referred to the Environmental Protection Authority for environmental impact assessment.
- any development proposals involving M88 should be referred to the Environmental Protection Authority for formal assessment.

Recommendation 4

Sewage

The Environmental Protection Authority advises that:

- any proposals for on-site waster water disposal including local treatment plants or the broad scale use of alternative treatment units (ATU's) must be referred to the Environmental Protection Authority for environmental impact assessment.

Recommendation 5

Threatened or Poorly Reserved Plant Communities Requiring Interim Protection

The Environmental Protection Authority advises that:

- the proposal to reserve Brickwood and Norman 3 in the Metropolitan Region Scheme for Parks and Recreation purposes is supported. The Western Australian Planning Commission (WAPC) should explore options to revise the boundaries of the Parks and Recreation reserve to be as close as possible to that shown on the maps showing the Threatened or Poorly Reserved Plant Communities Requiring Interim Protection;
- the Structure Plan should be modified to identify Punrack 1 and Page 30 as local open space. The significance of the Mundijong remnant bushland should be acknowledged in the Structure Plan and methods to be explored by the WAPC to reserve these areas;
- road construction and batters must not impact on the Mundijong remnant bushland as shown on the maps showing the Threatened or Poorly Reserved Plant Communities Requiring Interim Protection. Construction plans should be referred to the Environmental Protection Authority for assessment prior to construction; and
- proposals affecting land identified in the System 6 review should be referred to the Environmental Protection Authority for environmental impact assessment.

Recommendation 6

Poultry Farms and Piggeries

The Environmental Protection Authority advises that:

- new residential lots should be separated at least 500m from the existing or proposed poultry sheds;
- where residential development is proposed closer than the recommended buffer distances and the industry is operating to industry standards and/ or licence conditions, the onus should be on the developer of the residential land to show that impacts on future residents would be acceptable, otherwise the development should be refused; and
- If residential areas encroach within the buffer area the poultry farm or piggery should be relocated.

Recommendation 7

Peel - Harvey Estuarine Catchment

The Environmental Protection Authority advises that:

- the *Stormwater Management Strategy and Plans for New Urban Development at Byford and Mundijong* and the *Green Towns Local Structure Plan* accord with the Environmental Protection Authority's objective to reduce the export of nutrients into the Peel - Harvey Inlet;
- The Water Authority of Western Australia should develop a monitoring programme and criteria to measure nutrient levels in the stormwater runoff in accordance with the environmental quality objectives set out in the Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992 prior to the Local Authority's Town Planning Scheme being amended;
- Should the Stormwater Management Strategy fail to adequately reduce nutrient levels, provisions should be made to implement the following contingency procedures:
 - provision of additional detention basins will be required within the multiple use corridors if the Stormwater Management Strategy does not reduce nutrient load to an acceptable level; and
 - provision of regional detention basins will be required to reduce nutrient levels in the event that multiple use corridors can not be implemented.

- Prior to the land identified as Urban and Urban Deferred in the Structure Plan and MRS Amendment being rezoned for urban purposes in the Shire of Serpentine - Jarrahdale Town Planning Scheme, the WAPC, Water Authority of WA, Shire of Serpentine - Jarrahdale and the Environmental Protection Authority should agree to a process of implementing the multiple use stormwater corridors.
- Defer further development if the monitoring of nutrient levels finds that the management strategy is ineffective.

Recommendation 8

Transport

The Environmental Protection Authority advises that:

- the urban village concept makes adequate provision for public transport, walking and cycling. Urban growth based on this concept will not exacerbate air quality or green house emissions to the same extent as typical growth patterns in the Perth Metropolitan area.

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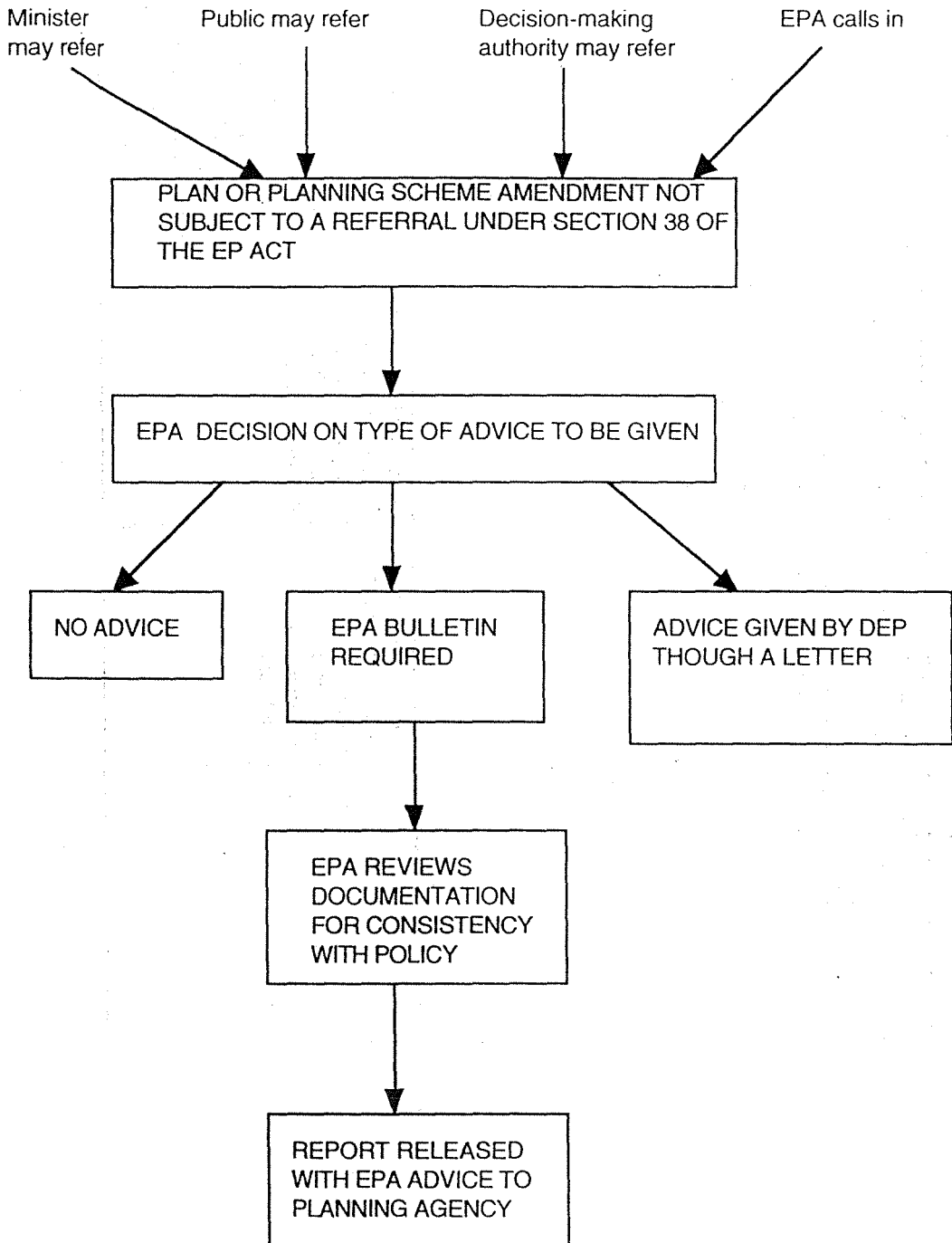
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Appendix 1

Strategic Environmental Assessment Process

Strategic environmental assessment process - assessment of plans, draft plans, statutory planning schemes and amendment to those schemes



There are no appeal rights on EPA decision

There are no appeals on EPA Bulletins

Table 2 Identification of Issues and Summary of EPA Recommendations

Topics	Proposal Characteristic	Identification of Issues	Objectives	Evaluation Framework	EPA Recommendations
<ul style="list-style-type: none"> •Environmental impacts to wetlands of regional significance within the south west corridor 	<ul style="list-style-type: none"> •EPP wetlands east of Forrestdale Lake are within an area identified as Urban Deferred in the Structure Plan. There is potential for environmental from the urban development. •There are a number of System 6 wetlands within the study area. <p>Forrestdale Lake (M95) is currently reserved for Parks and Recreation in the MRS</p> <p>It is proposed reserve M83 for Parks and Recreation as part of the MRS Amendment.</p>	<ul style="list-style-type: none"> •The Structure Plan does not refer to the need to protect or manage EPP wetlands. 	<ul style="list-style-type: none"> •Ensure that proposed land use changes do not cause environmental damage to wetlands of regional significance. 	<ul style="list-style-type: none"> •The EPA is concerned with the filling, draining, mining and polluting of EPP Lakes, System 6 lakes, wetlands with rare vegetation communities and wetlands recognised by international agreements. 	<ul style="list-style-type: none"> •The Structure Plan should refer to the need to protect the EPP lakes to the east of Forrestdale Lake. •Local structure plans should provide for the protection of the EPP lakes through the inclusion of the lakes and buffer areas in the public open space. •Where EPP lakes are affected, management plans should also be prepared and referred to the EPA for EIA prior to the land being subdivided or developed. •The EPA supports the proposed reservation of M83 as recommended in the System 6 report.
<ul style="list-style-type: none"> •Environmental impacts to wetlands of local significance within the south west corridor 	<ul style="list-style-type: none"> •Lakes of local significance have not been identified in the Structure Plan or MRS Amendment. These wetlands can be adequately managed under the guidelines of Bulletin 685 and 686. 	<ul style="list-style-type: none"> •Local wetlands should be managed in accordance with the requirements of Bulletin 685 and 686. 	<ul style="list-style-type: none"> •Ensure that proposed land use changes do not cause environmental damage to wetlands of local significance. 	<ul style="list-style-type: none"> •Local wetlands to be protected and managed in accordance with the principles outlined in Bulletins 685 and 686. 	<ul style="list-style-type: none"> •Bulletins 685 and 686 provide adequate protection to those lakes not EPP lakes or identified in the System 6 report •Proposals affecting Category O, C and H lakes would likely be environmentally unacceptable. •Proposal inconsistent with Bulletins should be referred to the EPA for EIA.

<ul style="list-style-type: none"> •Protect land identified as having conservation and recreation value in the System 6 report 	<ul style="list-style-type: none"> •There are no proposed land use changes within the boundaries of the System 6 area in either the Structure Plan or MRS Amendment. •The Structure Plan provides for the future reservation of four System 6 areas for Parks and Recreation purposes. These areas are M80, M84, M85, M87. •Two of the System 6 areas (M83 and M89) are included in the MRS amendment as Parks and Recreation reserves. •M88 has not been recommended for future reservation. 	<ul style="list-style-type: none"> •M88 has not been recommended for future reservation. 	<ul style="list-style-type: none"> •Land that has been identified in the System 6 report as having conservation and recreation value should be reserved. 	<ul style="list-style-type: none"> •Seven System 6 areas located within the study area. 	<ul style="list-style-type: none"> •The EPA supports the proposed reservation of M83 and M89. •The identification of M80, M84, M85, M86 and M87 as future reserves in the Structure Plan is supported. •The inclusion of M88 in the Private Land Conservation category of the Shire of Serpentine Jarrahdale Rural Strategy will provide adequate protection. •M88 proposals to be referred for EIA. •Proposals adjacent to or indirectly impacting land identified in the System 6 report should be referred to the EPA for EIA.
<ul style="list-style-type: none"> •Waste water disposal 	<ul style="list-style-type: none"> •Byford and Mundijong are located a considerable distance from existing sewerage infrastructure. •A number of options to provide waste water disposal. 	<ul style="list-style-type: none"> •Nutrients entering the surface drainage system could flow into the Peel - Harvey Estuary. 	<ul style="list-style-type: none"> •Prevent nutrient enrichment and degradation of the groundwater and the surface water systems from on-site effluent disposal 	<ul style="list-style-type: none"> •On-site waste water disposal should be appropriately located to prevent pollution and nutrient enrichment of groundwater and surface water. 	<ul style="list-style-type: none"> •Proposals for on-site waste water disposal including local treatment plants or ATU's must be referred to the EPA for EIA.

<ul style="list-style-type: none"> •Protect remnant bushland communities identified in the System 6 review 	<ul style="list-style-type: none"> •There are five areas of remnant bushland identified in the System 6 review located in the South East corridor. •It is proposed to reserve Brickwood and Norman 3 for Parks and Recreation in the MRS Amendment. •Mundijong Road is identified as Controlled Access Highway in the MRS Amendment. 	<ul style="list-style-type: none"> •Punrack 1 and Page 30 are not identified in the Structure Plan or MRS Amendment. 	<ul style="list-style-type: none"> •Reserve remnant bushland communities that have been identified in the update of the System 6 report. 	<ul style="list-style-type: none"> •Five areas of remnant bushland within the study area identified in the System 6 review. 	<ul style="list-style-type: none"> •The reservation of Brickwood and Norman 3 in the MRS is supported. •The WAPC should explore options to revise the boundaries of the Parks and Recreation reserve to be as close as possible to that shown on the Interim Protection Plan. •Punrack 1 and Page 30 should be identified as local open space in the Structure Plan. •Proposals affecting land identified in the System 6 review should be referred to the EPA for EIA. •Road construction and batters must not impact on the Mundijong remnant bushland. Construction plans to be referred to the EPA for EIA
<ul style="list-style-type: none"> •Impact of noise, dust and odour from existing poultry farms and piggeries on proposed adjoining landuses 	<ul style="list-style-type: none"> •Four poultry farms and piggeries are located in the areas proposed to be zoned Urban or Urban Deferred in the MRS Amendment. 	<ul style="list-style-type: none"> •Impact of existing poultry farms and piggeries on proposed residential areas. 	<ul style="list-style-type: none"> •To minimise the impact of noise, dust and odour from existing poultry farms and piggeries on proposed adjoining landuses. 	<ul style="list-style-type: none"> •Environmental Codes of Practice for Poultry Farms and Piggeries. •Environmental Management Guidelines for Animal Based Industries - Piggeries. •WAPC Poultry Farm Policy No. DC 3.5 	<ul style="list-style-type: none"> •New residential lots should be separated at least 500m from existing poultry farms. •The onus is on the developer to demonstrate that existing poultry farms will not impact on proposed residential lots. •Poultry farms and piggeries should be relocated away from future or existing residential areas.

<ul style="list-style-type: none"> •Nutrient export into the Peel - Harvey Estuarine catchment 	<ul style="list-style-type: none"> •The clay soils in the Byford and Mundijong area results in high rates rates of stormwater runoff. 	<ul style="list-style-type: none"> •A drainage strategy will be necessary to control runoff and prevent the export of nutrient tto the the Peel-Harvey Estauary. 	<ul style="list-style-type: none"> •Manage land use changes within the Peel - Harvey Estuarine catchment to avoid and minimise environmental damage in terms of nutrient export. 	<ul style="list-style-type: none"> •Environmental Protection(Peel Harvey Estuary) Policy 1992 •Statement of Planning Policy No. 2 The Peel Harvey Coastal Plain Catchment. 	<ul style="list-style-type: none"> • The Stormwater Strategy and Green Town Local Structure Plan accords with the EPA's objective to reduce the export of nutrients into the Peel Harvey Inlet •Criteria to measure nutrient levels in the stormwater runoff must be adopted by the Water Authority of Western Australia in accordance with the environmental quality objectives set out in the Peel - Harvey Estuary EPP prior to the Town Planning Scheme being amended. •Additional detention basins will be required within the multiple use corridors if the Stormwater Management Strategy does not reduce nutrient loads to an acceptable level. •Regional detention basins will be required to reduce nutrient levels in the event the multiple use corridors can no be implemented. •The decision making authorities must adopt an agreed method of implementing the stormwater management strategy prior to land being rezoned in the local authority's Town Planning Scheme for urban purposes.
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<ul style="list-style-type: none">•Air quality and greenhouse gas emissions	<ul style="list-style-type: none">•The Structure Plan proposes to create urban villages which are intended to encourage pedestrian and bicycle use.		<ul style="list-style-type: none">•Adopt suitable transport strategies to ensure that air quality and greenhouse gas emissions in the South East Corridor meet health and environmental standards	<ul style="list-style-type: none">•Reduce traffic volume and distances travelled in private vehicles.	<ul style="list-style-type: none">•The urban village concept will not exacerbate air quality and greenhouse gas emissions to the same extent as typical urban growth patterns in the Metropolitan Region.
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