ENVIRONMENTAL REVIEW

- BALDIVIS TOWN CENTRE -

Town Planning Scheme No.1, Amendment No.295

City of Rockingham

Prepared for Developers:

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INVITATION

The City of Rockingham invites people to make a submission on this proposal, known as City of Rockingham Town Planning Scheme 1 Amendment No. 295 (Baldivis Town Centre).

Taylor Woodrow (Estates) Pty Ltd and Mr V. Makucat (the developers) propose to develop Lots 6, 13 and Pt Lot 26, corner of Nairn Road (unconstructed) and Baldivis Road, Baldivis, as the Baldivis Town Centre for a mixture of uses. In accordance with the *Environmental Protection Act 1986* (Section 48a), the developers have prepared an Environmental Review (ER) which describes the proposal and its likely effects on the environment. The ER will be available for public review for a period of forty-two days, commencing on **Tuesday 23rd June 1998** and closing on **Tuesday 4th August 1998**.

Comments from Government agencies and the public will be referred to the EPA by the City of Rockingham, to assist the EPA to prepare an assessment report in which it will make recommendations to Government.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the City of Rockingham will be acknowledged. Submissions will be treated as public documents unless provided and received in confidence (subject to the requirements of the *Freedom of Information Act*), and may be quoted in full or in part in the EPA's report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining a group interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increasing the pool of ideas and information. If you form a small group (up to 10 people) please indicate the names of all the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the ER or the specific proposals. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal more environmentally acceptable.

When making comments on specific proposals in the ER:

- clearly state your point of view
- indicate the source of your information if this is applicable
- suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- Attempt to list points so that issues raised are clear. A summary of your submission is helpful.
- Refer each point to the appropriate section, chapter or recommendation in the ER.
- If you discuss different sections of the ER, keep them distinct and separate, so there is no confusion as to which section you are discussing.
- Attach any factual information you may wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- your name
- your address
- the date
- whether you want your submission to be confidential.

The closing date for submissions is Tuesday 4th August 1998.

Submissions should be addressed to:

City of Rockingham
PO Box 2142
ROCKINGHAM WA 6168

Attention: Mr Peter Monks

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SUMMARY

It is proposed to create the Baldivis Town Centre on Lots 6, 13 and Pt Lot 26, corner of Nairn Road (unconstructed) and Safety Bay Road, Baldivis, within the City of Rockingham. The site is located approximately 10km from the Rockingham City Centre.

The proposed implementation of the proposal and zoning change is now known as City of Rockingham Town Planning Scheme 1 Amendment No. 295. This Environmental Review has been prepared by the developers of the project (Taylor Woodrow (Estates) Pty Ltd and Mr Makucat) on behalf of the City of Rockingham (the proponent for the project), in accordance with the format and instructions provided by the Environmental Protection Authority (EPA) (Appendix A).

This Environmental Review document is available for public comment during the advertised period for City of Rockingham Amendment No. 295.

The site has a total area of 43 ha, has been almost totally cleared of vegetation, and is currently used for grazing and market gardening.

Whilst Tamworth Hill Swamp is located outside of the proposed amendment to the west of the development area, and management of the wetland is beyond the direct control of the developer, a valuable contribution will be made to the protection of the wetland through appropriate project design and management.

Design criteria for the project, which will be finalised at the detailed design stage, are in accordance with the current objectives for:

- The catchment of the Peel-Harvey Estuary (EPA 1997a, Section 2.7.3.1); and
- Water Sensitive Urban Design Guidelines - Best Management Practices (EPA 1997a, Section 3.4.1).

The design objectives of stormwater management adopted for the project are based on the temporary storage of water, with subsequent slow release to groundwater via infiltration. This approach is termed the "storage-orientated approach" preferred by the EPA (EPA, 1997a).

Active management of the local catchment surface water catchment within the amendment area, such as road sweeping and litter collection, and appropriate management of treatment basins and surrounds, will aid the control of potential pollutants.

The hydrological regime of the site, and consequently aquifer recharge, has been dramatically changed from it's former natural balance. This change to the hydrological regime has occurred throughout much of the region. Based on the recharge rates described in the technical literature, water recharge to the local aquifer below the site following development is likely to be decreased compared to current grazing land uses, to more closely resemble the pre-clearing regime. From a regional perspective, and in terms of Tamworth Hill Swamp, the site represents only 43ha of a much larger groundwater recharge catchment.

No subsoil groundwater drainage is proposed within the project area, and consequently no impact on groundwater quantity is anticipated from this mechanism.

The greatest factors contributing to the protection of groundwater quality through the implementation of the project are:

- the control of land use and removal of potentially polluting current practices; and

- the treatment of all stormwater from hard surfaces (roads, carparks etc.) in appropriately designed storage, treatment and infiltration structures for aquifer recharge, or alternatively directly infiltrated in the case of roof catchment (see Section 3.1.2).

Based on the design and management procedures proposed, it can be reasonably concluded that the change in land use from uncontrolled grazing and market gardening to Town Centre has the potential to reduce nutrient loading to the receiving environment.

Dust generation during construction activities will be managed in accordance with industry practice and EPA Interim Policy No. 18, Air Quality Impacts from Development Sites (EPA, 1997b).

Noise generation during construction activities will be managed in accordance with current industry practice and Noise Abatement (Neighbourhood Annoyance) Regulations 1979 (Regulations under the *Noise Abatement Act, 1972*).

The design of the Indicative Development Plan demonstrates compliance with the EPA recommended buffer distance for the CMS high pressure gas pipeline, which traverses the centre of the site on a north-south axis.

Prescriptions for safety during construction phase of the project will be determined in conjunction with CMS Gas Transmission of Australia (CMS), the Department of Minerals and Energy, the City of Rockingham and the EPA, at the detailed design phase of the project.

Based on the results of the archaeological and ethnographic survey of the area, no sites of aboriginal significance have been recorded from the project site.

However, the developer is aware of it's obligations under the *Aboriginal Heritage Act, 1972-1980.* In the event that an aboriginal site, artefacts or other material is uncovered during earthworks, the developer will immediately cease work in that area and contact the Department of Aboriginal Affairs.

A summary of the environmental factors, current situation, proposed changes resulting from the amendment, proposed management and predicted outcomes associated with the implementation of the project are given in the Summary Table on the following page.

The report concludes with Environmental Management Measures for incorporation into the provisions of the Town Planning Scheme Amendment documentation for the project.

SUMMARY TABLE

Environmental Factor	Present State of the Environment	Proposed Change Resulting From Amendment	Proposed Management	Predicted Outcome
TAMWORTH HILL SWAMP				
Buffer	None	Provision of defined buffer	Adoption of recommended buffer	Protection of wetland via buffer
Proposed Management	Plan Proposed (in draft)	Contribution to control of access, fire, and rubbish dumping	In accordance with Management Plan where appropriate and jurisdiction allows	Contribution to implementation of Management Plan
POLLUTION MANAGEMENT				
Nutrient Loading	No control	Reduced loading potential	Removal of potential for broadacre and market garden fertiliser application and stocking	Reduced potential for nutrient loading
Stormwater Treatment	No control	Formalised stormwater treatment system Adoption of Best Management Practices	No direct discharge to wetland Stormwater compensating, infiltration/recharge, nutrient stripping basins	Enhanced storm water treatment Wetland protection
Groundwater Protection	No control	Reduction in potential nutrient loading	Land use control Treatment and infiltration (recharge)	Enhanced groundwater recharge and protection
Construction Dust	N/A	Potential for dust during construction	Adherence to statutory requirements and acceptable standards	Impact within acceptable limits
Construction Noise	N/A	Potential for noise during construction	Adherence to statutory requirements and acceptable standards	Impact within acceptable limits
SOCIAL				
CMS High Pressure Natural Gas Pipeline	Easement and pipeline through site	Development adjacent to easement	Adoption of recommended buffers and design controls Construction safety at detailed design stage of project	Compliance with recommended buffers and controls. Public safety protected. Construction safety maintained.
Heritage	No sites identified	No change	None required. If sites discovered notification to DAA	No impact

1.0 INTRODUCTION

1.1 Background and Objectives of Environmental Investigations

District Structure Plans commissioned for the Baldivis area have identified a proposed location for the Baldivis Town Centre on the junction of Safety Bay Road and Nairn Road. The site is near an exit of a proposed extension to the Kwinana Freeway, and adjacent to Baldivis Road (Figure 1).

The South West Corridor Structure Plan released in 1993 by the then Department of Planning and Urban Development (DPUD, 1993) identified the southern portion of the site for a major commercial, institutional and employment centre, and the northern portion of the site for a mixed business area.

The proposed implementation of the proposal and zoning change is now known as City of Rockingham Town Planning Scheme 1 Amendment No. 295.

The Environmental Protection Authority (EPA) has determined that where a planning scheme or amendment raises significant environmental factors, it shall be subject to assessment under Section 48a of the *Environmental Protection Act ,1986.* The Responsible Authority, in this case the City of Rockingham, is required to produce an Environmental Review addressing the possible environmental impacts of the amendment, and the formulation of proposed management strategies.

The Environmental Review provides information to the EPA, other government agencies and the public, to enable environmental assessment and evaluation of the proposal.

This Environmental Review document is available for public comment during the advertised period for planning Amendment No. 295. The City of Rockingham is required to forward submissions relating to the Environmental Review to the EPA, and respond to the EPA on environmental factors or conditions and procedures which may apply should the proposal be implemented, that are raised in those submissions. Based on the information in the Environmental Review document, the response to the submissions and its own investigations, the EPA will then report to the Minister for the Environment. The Minister for the Environment will provide recommendations for the project to the Minister for Planning.

This Environmental Review has been prepared by the developers of the project (Taylor Woodrow (Estates) Pty Ltd and Mr Makucat) on behalf of the City of Rockingham (the proponent for the rezoning), in accordance with the format and instructions provided by the Environmental Protection Authority (Appendix A).

1.2 The Subject Site

The site which is the subject of the Town Planning Scheme amendment includes Lots 6, 13 and Pt Lot 26, corner of Nairn Road (unconstructed) and Safety Bay Road, Baldivis, within the City of Rockingham (Figure 2). The site is located approximately 10km from the Rockingham City Centre.

The site has a total area of approximately 43 ha, has been almost totally cleared of vegetation, and is currently used for grazing (about 39 ha) and market gardening (3.9 ha).

Tamworth Hill Swamp is located west of the site, separated by the road reserve for the unconstructed Nairn Road. The eastern third of the site is located within the surface water catchment of the Peel-Harvey Estuary.

The CMS Gas Transmission of Australia (CMS) high pressure natural gas pipeline passes through the site on an approximate north-south alignment, within a 20m metre wide easement.

1.3 The Development Proposal

The Indicative Development Plan for the proposed Baldivis Town Centre is shown in Figure 3. The project will include the following components:

- Full servicing, including reticulated sewage;
- Appropriate design and development/planning controls regarding the CMS gas pipeline;
- Incorporation of water sensitive urban design principles;
- An efficient stormwater treatment and infiltration system incorporating water sensitive urban design;
- A Core Retail Precinct;
- A Commercial Use Precinct;
- A Mixed Use Precinct;
- Community Use sites (including a Town Square and 2 other sites);
- A Residential Precinct; and
- Areas of open space.

A more detailed description of the project and account of the relevant planning issues are contained in the Town Planning Scheme amendment documentation accompanying this document, or alternatively available for viewing at the City of Rockingham Council offices.

1.4 Need for the Scheme Amendment

In June 1990 the City of Rockingham approved the Baldivis Structure Plan to progress the residential development known as Settlers Hills Estate. In accordance with the governments South West Corridor Structure Plan, the Baldivis Structure Plan reflected the location of the proposed Baldivis Town Centre.

The City of Rockingham Retail Structure Plan (Statement of Planning Policy No. 6) was prepared as part of the review of the City of Rockingham Town Planning Scheme No. 1 to from the basis for zoning and land use recommendations proposed within the Scheme. As a result of the review, the Retail Structure Plan recommends a District Centre site in accordance the principles of the Metropolitan Centres policy within Baldivis, at the intersection of Safety Bay and Nairn Roads (the subject site).

The Baldivis Town Centre proposes the creation of a District Centre to service the Baldivis Urban Corridor (north and south) between Kerosene Lane and Sixty Eight Road, Baldivis. Smaller neighbourhood centres are also proposed throughout the surrounding residential estates at a future time.

The subject site is currently zoned as "Urban" under the Metropolitan Region Scheme, and "Rural" under the City of Rockingham Town Planning Scheme No. 1. In order to progress the development of the site as proposed, it is necessary to rezone the site by an amendment to the Town Planning Scheme.

Following extensive consultation between the developers and the City of Rockingham, and the formulation of the of the Baldivis Town Centre Indicative Development Plan and the Baldivis Town Centre Policy, Council initiated Amendment No. 295.

2.0 THE EXISTING ENVIRONMENT

2.1 Physical Environment

2.1.1 Topography, Landform and Soils

The site is consists of two low hills and an undulating plain (Figure 2). A low hill dominates the south-east of the site, with an elevation of approximately 18.5 mAHD, falling gently towards the north, east and west. The lower ridges of a second small hill exist in the central north of the site, with it's crest located beyond the site to the north. Two natural low points exist, one in the north-east of the site at 6 mAHD and one on the central western boundary at approximately 5 mAHD.

The site is situated on the Bassendean and Spearwood Dune landform systems, and comprises predominantly moderately deep siliceous grey and yellow-brown sands. These soils are characteristically free-draining, subject to the position of the water table, which in this case is relatively deep being between 1 and 14m below surface (see Section 2.1.3).

2.1.2 Surface Hydrology and Wetlands

The site is well drained by both surface and subsurface processes as a result of its porous surface soils. Infiltration of winter rainfall appears to occur very readily over the whole site. Consequently no drainage lines or winter-wet areas occur within the proposed development area.

The surface water catchment of the site will be divided by it's topography (Figure 2), with approximately two-thirds of the site draining to the west, and the remainder to the east.

Tamworth Hill Swamp is a seasonal wetland (sumpland) which occurs west of the site, but is separated from the amendment area by the proposed Nairn Road alignment. Hill *et al.* (1996) have assigned a "Conservation" management category to the wetland, which is part of the Stakehill suite extending between Kwinana and Mandurah (Figure 4).

The Environmental Protection (Swan Coastal Plain Lakes) Policy Approval Order 1992 identifies Tamworth Hill Swamp as requiring protection to maintain its environmental values.

Wetlands included within the Policy are afforded protection against disturbance or alteration to their hydrological regime.

A draft management plan has been formulated for Tamworth Hill Swamp (WAPC, 1997) as a component of the broader Rockingham Parks framework (see Section 3.1.1).

A small wetland also exists approximately 200m south-east of the site, separated by Baldivis Road (Figure 4). This wetland (sumpland) mainly consists of seasonally inundated farmland, and has been assigned "multiple use" by Hill *et al.* (1996) as a proposed management category. Wetlands in this category are significantly degraded, possessing few natural attributes and limited human use interest. This wetland is a component of the high water table farmland, termed "dampland" or waterlogged palusplain, which is expansive in the area east of Baldivis Road.

2.1.3 Groundwater Hydrology

In general, the regional aquifer is recharged from rainfall which is distributed, on an annual basis, fairly evenly across the coastal plain during the winter months. The water table is highest in August-October, and lowest in March-May.

The sandy surface layers of the site are very permeable, and recharge is the principal process during rainfall events. No evidence of groundwater (or previous groundwater presence) can be identified over the surface of the site.

Water and Rivers Commission mapping indicates that maximum groundwater levels of the unconfined aquifer below the site are in the vicinity of 4 - 4.5m AHD. The topography of the site is predominantly 10 - 15 mAHD, and up to 18.5 mAHD on the hill in the south-east and about 5 mAHD in the lowest areas. Consequently, the separation distance between the ground surface and maximum groundwater levels ranges from about 1 - 14m. Over the majority of the development area separation distances are approximately 5 - 10m. Although separation distance will vary depending on seasonal and annual climatic influences, it can be concluded that the site does not exhibit a high water table.

Groundwater movement through the sandy soils beneath the site will vary in velocity and direction depending upon seasonal influences. During winter, localised recharge through the sandy soils of the site, together with discharge from the Stakehill Mound to the south, will cause groundwater movement to the north-west, west and east (see Davidson, 1995). In summer, when little or no recharge occurs and any localised winter mounding of the water

table dissipates, groundwater movement will be to the west and north west in accordance with regional flow characteristics.

The site is located within the Water Corporation's Stakehill Groundwater Area. Groundwater management for the area includes licensing for groundwater abstraction under certain circumstances, such as where large water volumes are required for irrigation.

2.2 Biological Environment

2.2.1 Vegetation

The vegetation over the majority of the site has been removed for farming activities, predominantly grazing but also for market gardening (Figure 5). Consequently, only isolated examples of remnant native vegetation remain, consisting mostly of solitary trees confined to the south-west and north-east corners of the site.

A large proportion of the vegetation within and around Tamworth Hill Swamp is in good condition. However, a well defined vegetation boundary exists on the eastern margin of the wetland due to clearing for farming activities. A portion of the northern section of the wetland has also been cleared and filled for grazing (Figure 5).

2.3 Social Environment

2.3.1 CMS High Pressure Gas Pipeline

The CMS high pressure natural gas pipeline traverses the site in an approximate north-south alignment (Figure 2), within an existing 20 m wide easement.

Development controls and design criteria to address landuse and risk management are presented in Section 3.

2.3.2 Heritage

An archaeological and ethnographical survey of the proposed Settlers Hills residential subdivision, the proposed Baldivis Town Centre site, and surrounding area was conducted by O'Connor and Quartermaine in 1992.

Results of the investigation indicate that no ethnographic or archaeological sites have previously recorded from the site, and that none were discovered during the course of the surveys.

3.0 ENVIRONMENTAL ISSUES AND MANAGEMENT

3.1 Tamworth Hill Swamp

Tamworth Hill Swamp is located outside of the proposed amendment and development area, and management of the wetland is beyond of the direct control of the developer. However, a valuable contribution can be made to the protection of the wetlands hydrological regime and water quality through appropriate project design and water management, as described below.

3.1.1 Buffers and Management

The EPA objective for this proposal is listed as maintenance of the integrity, functions and environmental values of Tamworth Hill Swamp through management of adequate buffers to ensure long-term health and viability (Appendix A).

The Western Australian Planning Commission has prepared a draft management plan for Tamworth Hill Swamp (WAPC, 1997). The plan proposes that the swamp be treated as a conservation area and it's vegetation be protected by fencing (Figure 6). Additionally, the plan recommends that measures should be implemented to ensure any run-off into the swamp is of acceptable quality. The developer endorses both of these recommendations.

The EPA has formulated a policy regarding adequate horizontal separation distances between wetlands and various land uses (EPA 1997a, Section 2.3). The policy recommends a "dryland" buffer of at least 50m between, or topographically 1 mAHD higher than, the farthest extent of wetland vegetation and the development area, which ever is the greater. This buffer coincides with the "critical zone of influence" of Hill *et al.* (1996).

In this case, the vegetation on the eastern margin of the wetland can be clearly defined due to previous clearing for farming. The application of a 1 mAHD buffer would extend only approximately 15m eastwards from the vegetation line, and consequently the alternative buffer of 50m must be applied. The distance from the vegetation line in closest proximity to the development area boundary (central west) is 80m, which includes the Nairn Road road reserve. Consequently, the 80m buffer which will exist following development will comply with the requirements of the EPA.

Small areas of the site are also within a 200m "secondary zone of influence" to Tamworth Hill Swamp and the small unnamed sumpland to the east as defined by Hill *et al.* (1997) (Figure 6). This secondary zone is intended to provide a framework to determine an appropriate upland vegetation buffer to wetlands, and does not include the vegetation of the wetland itself (Balla, 1994). In this case, native vegetation within the site has been removed for farming, and consequently an upland native or remnant vegetation buffer is not available.

The EPA also recommends an "intensive land use" buffer of 300m for "upstream" market gardens to protect wetlands from potentially polluted groundwater movement. The market garden within the north-west corner of the site is therefore an existing land use currently located within the recommended buffer zone. However, the market garden will cease operation when development of the site commences, removing the conflicting land use.

In terms of management of the adjacent Tamworth Hill Swamp, a number of benefits due to the implementation of the amendment may be identified. These can be summarised as:

- Fire Control - roads constructed within or adjacent to the amendment area, particularly Nairn Road, will act as firebreaks and aid formalised access; hydrants will be established within the project area and will be available for fire-fighting purposes.
- Rubbish Control - Provision of rubbish bins and regular emptying in the vicinity of the wetland, with increased Local Authority presence.

The construction of Nairn Road adjacent to the western boundary of the site (by Main Roads) will provide a definitive boundary for the eastern side of Tamworth Hill Swamp, and allow the opportunity for rehabilitation of native vegetation between the current wetland "boundary" and the road reserve by the management authority. The management plan for the wetland proposes that the wetland be fenced, which will effectively control pedestrian access and protect existing vegetation.

3.1.2 Surface Water Quality

The EPA surface water quality objective for the project is to maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance, are protected (Appendix A).

Within the development area, stormwater will be generated from impervious surfaces such as roads and carparks, and additionally from roof areas within the built environment. Management of stormwater is an important component of the project, and the Indicative Development Plan has been designed based on current Best Management Practices (BMP's).

The design criteria described below, which will be finalised at the detailed design stage of the project, are in accordance with the current objectives for:

- The catchment of the Peel-Harvey Estuary (EPA 1997a, Section 2.7.3.1); and
- Water Sensitive Urban Design Guidelines Best Management Practices (EPA 1997a, Section 3.4.1).

Although these guidelines have been formulated predominantly for urban development, they are also applicable to the mixed business and retail uses planned for the Baldivis Town Centre.

The design objectives of stormwater management adopted for the project are based on the temporary storage of water, with subsequent slow release to groundwater via infiltration. This approach is termed the "storage-orientated approach" preferred by the EPA (EPA, 1997a).

The stormwater system for the project will include the following strategies and design components:

- containment of water from all storm events on-site, and consequently no direct discharge of stormwater to any wetland, specifically Tamworth Hill Swamp;
- collection and treatment of the "first flush" stormwater event annually (which is known to potentially contain the highest concentration of contaminants);
- design for containment of 1 in 100 year 24 hr storm in carpark areas within the project area, with dissipation to the local aquifer through an underground piped system;
- treatment of stormwater from all other storm events (including 1 in 10 yr storm event) within on-site basins designed using contemporary criteria;

- drainage from car parks will not be directed into the treatment system, but infiltrated through localised side-entry pits and gullies to promote aquifer recharge through a piped dissipation system;

- infiltration of collected and treated stormwater from basins as recharge to the local aquifer; and

- infiltration of roof rainfall run-off through localised soakage structures.

Two areas have been identified for the location of stormwater drainage/infiltration basins utilising natural low points in the site's topography. Most of the site will grade to the central west to a basin proposed near the main access to Nairn Drive, with an area of 8,200m^2 and design volume of 16,900m^3. A second, smaller catchment will drain to a basin the north-east corner of the site adjacent to Baldivis Road, with an area of 3,100m^2 and design volume of 4,400m^3.

Active management of the local catchment surface water catchment within the amendment area, such as road sweeping and litter collection by the local authority, and appropriate management of treatment basins and surrounds (initially by the developer), will aid the control of potential pollutants.

3.1.3 Groundwater Protection

3.1.3.1 Quantity

The EPA objective for the project is to maintain the quantity of groundwater so that existing and potential uses, including ecosystem maintenance, are protected.

To address the issue of maintenance of groundwater quantity below the site, it is appropriate to consider historical and current land uses, together with potential changes following development.

The native vegetation which originally existed over the site has been extensively cleared for farming. Compared to the scenario when deeper rooted native vegetation previously existed over the site, rainfall now rapidly infiltrates the sandy soils with little uptake by the shallow-rooted pasture species.

Sharma and Craig (1988) have estimated that between 50% and 60% of direct rainfall recharges the aquifer (water table) below pasture land, compared to only 12% of rainfall over native bushland (Sharma and Pionke, 1984). The hydrological regime of the site, and consequently aquifer recharge, has therefore been substantially changed from it's former natural balance. This change to the hydrological regime has occurred throughout much of the region.

In the urban areas of Perth, rainfall recharge is enhanced by hard surface catchment areas, such as roofs, carparks and roads. Stormwater is collected for disposal in soakwells and stormwater basins, such as those proposed under Best Management Practices in this project.

Cargeeg *et al.* (1987) estimated that about 21% of rainfall recharges the aquifer in Perth urban areas. This recharge estimate may be considered similar to the retail, mixed business and residential land uses proposed for the Baldivis Town Centre. Some recharge also occurs through the irrigation of gardens and parklands from imported (scheme) water, or from groundwater bores. In this instance, groundwater abstraction for grass or parkland watering on a large scale will require licensing from the Water Corporation.

Based on the recharge rates described above from the technical literature, water recharge to the local aquifer below the site following development is likely to be decreased compared to current grazing land uses, to more closely resemble the pre-clearing regime. It is also important to note that from a regional perspective, and in terms of Tamworth Hill Swamp, the site represents only 43ha of a much larger groundwater recharge catchment.

Infiltration of stormwater treated in the infiltration basins will be distributed to two locations within the site to avoid localised recharge concentration. Furthermore, stormwater from roof areas will be recharged to the local aquifer throughout the site via soakwells.

No subsoil groundwater drainage is proposed within the project area, and consequently no impact on groundwater quantity is anticipated from this mechanism.

3.1.3.2 Quality

The EPA objective for this proposal and groundwater quality is to maintain and protect existing and potential uses, including ecosystem maintenance (Appendix A).

The greatest factors contributing to the protection of groundwater quality through the implementation of the project are:

- the control of land use and removal of potentially polluting current practices; and
- the treatment of all stormwater generated on the site from hard surface in appropriately designed structures for aquifer recharge, or alternatively directly infiltrated in the case of roof catchment (see Section 3.1.2).

The current Rural zoning allows the potential for uncontrolled, broadscale application of nutrients to the existing pasture, nutrient inputs from stock, and potential for nutrient and chemical loading from intensive horticulture (the market garden). A comparison of potential loadings is presented in Section 3.1.4.

The Jandakot Land Use and Water Management Strategy (JLUWMS) was formulated by the then Department of Planning and Urban Development (DPUD, 1992). The objective of the Strategy is the protection of the Jandakot Groundwater Mound, including public drinking water supplies (a Priority 2 Area) and ecosystem maintenance, through land use control.

The study considered the potential impact on groundwater from various land uses (Table 1).

TABLE 1
Potential Impact on Groundwater from Different Land Uses
(Adapted from DPUD, 1992).

LAND USE	POTENTIAL POLLUTION RISK
Industrial	High
Special Rural	Low to Moderate
Rural	High
Intensive Animal Husbandry	High
Urban (Residential)	Low to Moderate
Commercial	Low, Moderate to High[1]
Active Recreation Areas	Moderate to High

Note[1]: Dependent on chemical storage and disposal of wastes.

The JLUWMS study concluded that rural land uses present a high potential impact to groundwater quality, similarly to industrial and intensive animal husbandry land uses. Conversely, mixed business and retail land uses (commercial but without chemical storage or light industrial uses) were considered to have low potential for impact, and urban residential low to moderate (depending largely upon the method of sewage disposal).

In the analysis of potential impacts to groundwater quality, it is also relevant to consider that the concentration of stormwater from hard surfaces within the project area to infiltration basins may have the potential to cause point-source pollution to groundwater from nutrients, metals and pesticides.

In this respect, Appleyard (1993) investigated the impact of stormwater basins on groundwater quality in the Perth Metropolitan region. Groundwater quality near basins receiving stormwater water from a light industrial area, medium density residential area, and a major highway and new residential area up and down-gradient from the basin was measured.

The study concluded that for basins receiving stormwater from all land use types, concentrations of toxic metals, nutrients, pesticides and phenolic compounds in groundwater near the basins were very low, and generally well within not only ecosystem maintenance guidelines, but within Australian Drinking Water Guidelines. Consequently, it is reasonable to assume that recharge water from the basins in the proposed amendment area will produce water of similar quality.

3.1.4 Nutrient Loading

The EPA guidelines for the preparation of the Environmental Review identified existing and potential loading of nutrients following the change in land use as a result of the amendment as requiring documentation.

It is therefore relevant to consider the broadacre potential of the 43ha site for farming and market gardening, compared to the mixed business, retail and residential uses proposed. A simple nutrient loading comparison is therefore provided for this purpose, with potential loadings for each land use summarised in Table 2.

Approximately 39 ha of the site is available to grazing, with a total carrying capacity of approximately 195 sheep (English, 1989). At Western Australian Department of Agriculture broadscale fertiliser application rates (Hillman, 1990), there is the potential for a contribution

TABLE 2

COMPARATIVE POTENTIAL NUTRIENT APPLICATIONS

Parameter	Land Use		
Fertiliser Application Rates (kg/ha/annum)	#Pasture	*Market Garden	†Private and Public Lawns
Phosphorus (P)	13.5	280	30
Nitrogen (N)	25.2	1050	100
Applied Area (ha)	39	3.9	Ø4.3
Potential Loadings			
P (kg/annum)	527	1092	129
N (kg/annum)	983	4,095	430

Sources:
#Western Australian Department of Agriculture (Hillman, 1990)
*Fertiliser application rates of McPharlin and Luke (1989)
†Fertiliser application rates of Sharma *et al.* (1992)
Ø4.3ha assumes 10% of total site area at urban lawn fertilisation rates following development

of 527 kg/phosphorus (P)/year and 983 kg/nitrogen (N)/year, without allowance for nutrient contribution from stock.

Nutrient loading from intensive market gardening occurs over 3.9 ha of the site at present, although the operator is licensed to cultivate up to 5 ha for this purpose. Fertiliser application rates for this land use is considerably higher than traditional rural grazing.

Both organic (fowl manure) and inorganic fertilisers are applied at high rates to irrigated vegetables on the coastal sands to maximise yields. Rates of application vary according to crop type and previous soil use, and maximum application rates of 280 kg P/ha/year and 1050 kg N/ha/year have been recorded as typical by McPharlin and Luke (1989). Assuming that the existing 3.9 ha of the site continued to be utilised for market gardening, 1092 kg/P/year and 4,095 kg/N/year would potentially be applied to the garden.

Sharma *et al.* (1992) provided average nutrient application rates for domestic and public lawns. For comparative purposes, if we assume that 10% of the whole site is fertilised at domestic lawn rates, potential loadings are 129 kg/P/year and 430 kg/N/year (the project will be sewered therefore potential nutrients from this source will be exported from the site).

However, Gerritse *et al.* (1988) estimated that about 80 kg/ha/year of nitrogen is applied as fertiliser to gardens and parks in the Perth Metropolitan area, therefore the assumption of 100 kg/N/ha may be an overestimate, but is nonetheless used in this comparison.

The total potential nutrient loading for existing rural uses (farming and market gardening) is therefore estimated as 1619 kg/P/year and 5,078 kg/N/year, without a stock contribution, compared to 129 kg/P/year and 430 kg/N/year for 10% of the site fertilised at domestic/public lawn rates. This equates to approximately 8% and 8.5% of the current potential P and N loadings respectively, ie. a potential loading reduction of more than 90%. Even if site was 20% lawn (ie 8.6ha) and fertilised at the domestic/public rates of Sharma *et al.* (1992), potential nutrient loading following development would be equivalent to substantially less than 20% of that possible under uncontrolled rural practices.

It is important to reiterate that the proposed project constitutes a predominantly built environment, with hard surfaces which require no fertilisation, and that the whole project is connected to a reticulated sewer system which exports potential nutrient loadings from this source.

In view of these findings and the design and management procedures proposed, it is reasonably concluded that the change in land use from uncontrolled grazing and market gardening to Town Centre has the potential to reduce nutrient loading to the receiving environment.

3.2 Construction Management

3.2.1 Dust

Dust generation during construction activities will be managed in accordance with industry practice and EPA Interim Policy No. 18, Air Quality Impacts from Development Sites (EPA, 1997b).

Dust control measures such as water suppression, wind fencing and surface stabilisation techniques will be implemented in order to maintain dust levels below acceptable levels.

3.2.2 Noise

Noise generation during construction activities will be managed in accordance with industry practice and Noise Abatement (Neighbourhood Annoyance) Regulations 1979 (Regulations under the *Noise Abatement Act, 1972*).

3.3 CMS High Pressure Gas Pipeline

The CMS high pressure pipeline traverses the centre of the site on an approximate north-south alignment within a 20 m wide easement. The risk to public safety in relation to the location of the pipeline through a residential subdivision has previously been quantitatively assessed (Stratex-EWI Pty Ltd, 1994), in accordance with EPA risk criteria. The risk assessment was prepared to assess the level of risk to which a future resident would be exposed due to the presence of pipeline near the resident's land and dwelling.

In residential zones where residents are deemed to be present 24 hours a day and unshielded by any structure, a risk level of one in a million or less deaths per year (1×10^{-6}) is considered so small as to be acceptable. In sensitive land uses such as hospitals, schools, child minding facilities and aged care, a risk level of one half to one in a million or less deaths per year (5×10^{-7} to 1×10^{-6}) is considered so small as to be acceptable.

Based on the outcome of the study, the EPA has advised that an acceptable buffer distance to development is 32m each side of the centreline of the pipeline for residential development ie. a total of 64m, including the existing easement. This buffer distance assumes that recommended safety measures are implemented.

The design of the Indicative Development Plan demonstrates compliance with the EPA recommended buffer distance (Figure 3). For commercial and retail land use the occupancy rate is lower, therefore associated risk to occupants is also lower. However, the 32m buffer has been adopted for the length of the alignment throughout the site. There is a greater buffer of 96m each side of the easement centreline required for more sensitive uses, such as Aged and Child Care (Hames Sharley, 1997), which has also been adopted.

No conflicting landuses are proposed in proximity to the pipeline, with the existing easement and buffer proposed for parks and car parking.

Prescriptions for safety during construction phase of the project will be determined in conjunction with CMS, the Department of Minerals and Energy, the City of Rockingham and the EPA, at the detailed design phase of the project.

3.4 Heritage

Based on the results of the archaeological and ethnographic survey of the area, no sites of aboriginal significance have been recorded from the project site.

However, the developer is aware of obligations under the *Aboriginal Heritage Act, 1972-1980.* In the event that an aboriginal site, artefacts or other material is uncovered during earthworks, the developer will immediately cease work in that area and contact the Department of Aboriginal Affairs.

4.0 CONCLUSIONS

It is concluded that the implementation of the proposed Indicative Development Plan for the creation of the Baldivis Town Centre will result in the following environmental outcomes:

- the removal of existing, uncontrolled rural landuses which have the potential for broadscale nutrient and chemical application through pasture maintenance, stock grazing and market gardening;

- a significant contribution to the long-term protection and management of Tamworth Hill Swamp through buffer implementation and water quality and quantity control;

- achievement of surface water quality objectives through adoption and implementation of water sensitive design and Best Management Practices for stormwater treatment;

- achievement of groundwater quality and quantity objectives through controlled land use and adoption and implementation of water sensitive design and Best Management Practices for stormwater treatment and infiltration;

- adoption of the EPA required buffer to the CMS high pressure gas pipeline, together with appropriate project design to avoid conflicting land uses;

- containment of any dust and noise levels generated to within acceptable standards during construction;

- no sites of aboriginal significance have been recorded from the project site, however in the event that one is discovered work will cease and the Department of Aboriginal Affairs will be contacted immediately.

5.0 ENVIRONMENTAL MANAGEMENT MEASURES

The following Environmental Management Measures are incorporated into the provisions of the Town Planning Scheme documentation for the project, as described below.

" Inserting Clause 3.8.8 as follows:

Environmental Protection Authority Requirements

In considering applications for development within the Baldivis Town Centre, in accordance with requirements of the Environmental Protection Authority, Council shall require:

a) Stormwater disposal to be designed in accordance with water sensitive design to ensure:

- containment of water from a 1 in 100 year 24 hour storm event on-site, with no direct discharge of stormwater to any wetland, specifically Tamworth Hill Swamp;
- treatment of stormwater from all other storm events (including a 1 in 10 year) within on-site basins, with infiltration of collected and treated stormwater from the basins to the local aquifer as recharge;
- collection and treatment of the "first flush" stormwater event within the on-site basins annually;
- drainage from car parks not be directed into the treatment systems, but infiltrated through localised side entry pits and gullies to promote local aquifer recharge through a piped dissipation system, including a 1 in 100 year 24 hour storm event; and
- infiltration of roof rainfall run-off through localised soakage structures;

to the satisfaction of the City of Rockingham.

b) The applicant be mindful of the Environmental Protection Authority's dust and noise control guidelines for development sites during the construction period.

c) The following facilities are prohibited within the gas pipeline easement:

- Fences;
- Stormwater basins and swimming pools;
- Storage of material, equipment etc;
- Camping, caravans etc;
- Barbecues (permanent or temporary);
- The lighting of fires except for controlled burning off;
- Explosives, inflammables, corrosives (including storage of LPG and fuel oil);
- Garbage, land fill, refuse disposal; and
- Service stations, fuel lines and storage.

Cycleways, walking tracks, and footpaths are permitted within the gas pipeline easement subject to the same general restrictions as for roads.

d) Minimum safety standards required by CMS and set out in the Petroleum Pipelines Act 1969-70 and the Australian Pipeline Code AS 2885.

e) Development setbacks to the gas pipeline are as follows:

- 32m - Development Buffer from the centre of the pipe (excluding roads, car parking and landscaping);

- 96m - Sensitive Uses Buffer from the centre of the pipe (ie. Aged and Child Care);

to the satisfaction of the Environmental Protection Authority and City of Rockingham. "

6.0 REFERENCES

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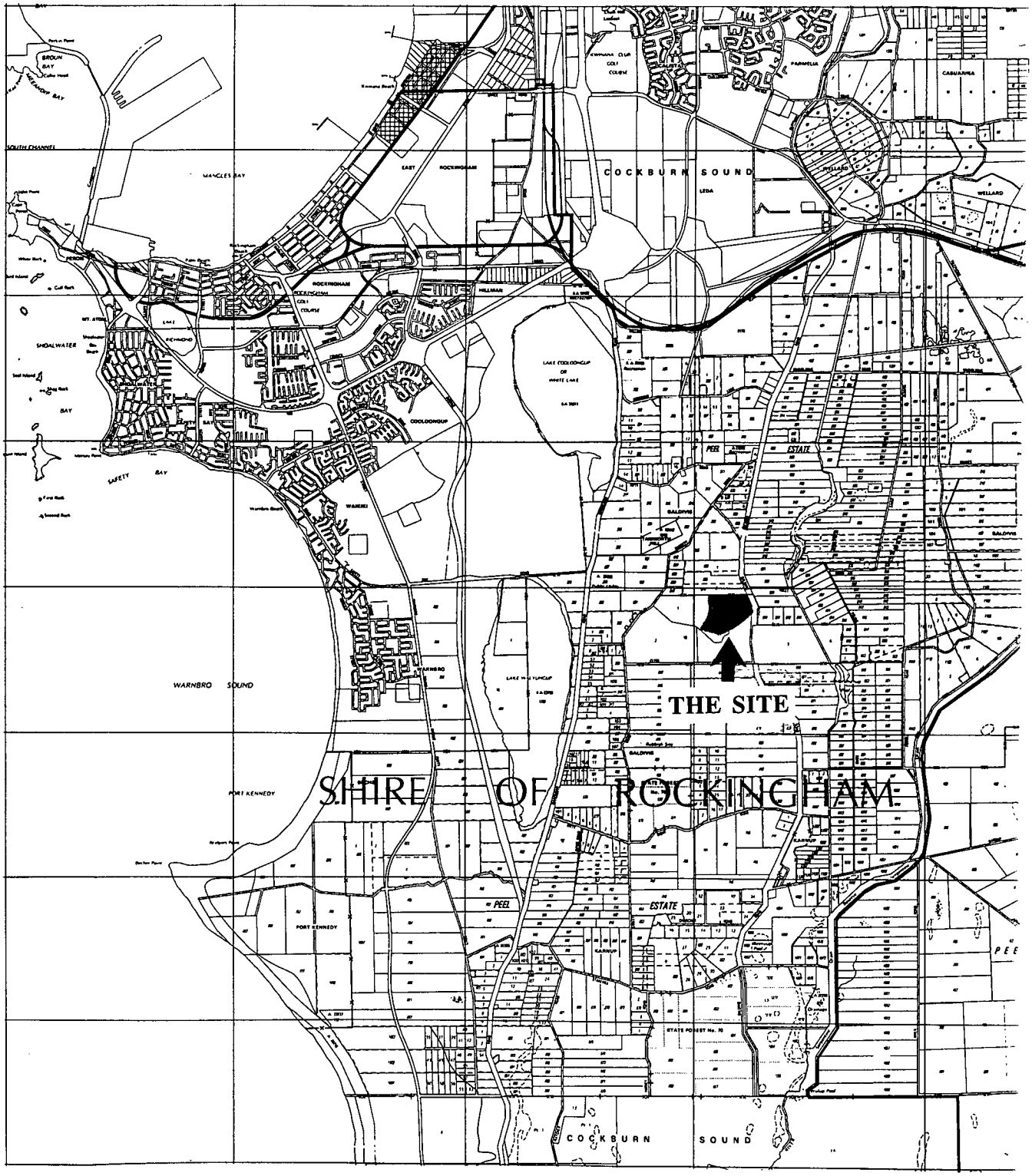
FIGURES



SCALE 1:100,000

FIGURE 1

SITE LOCALITY

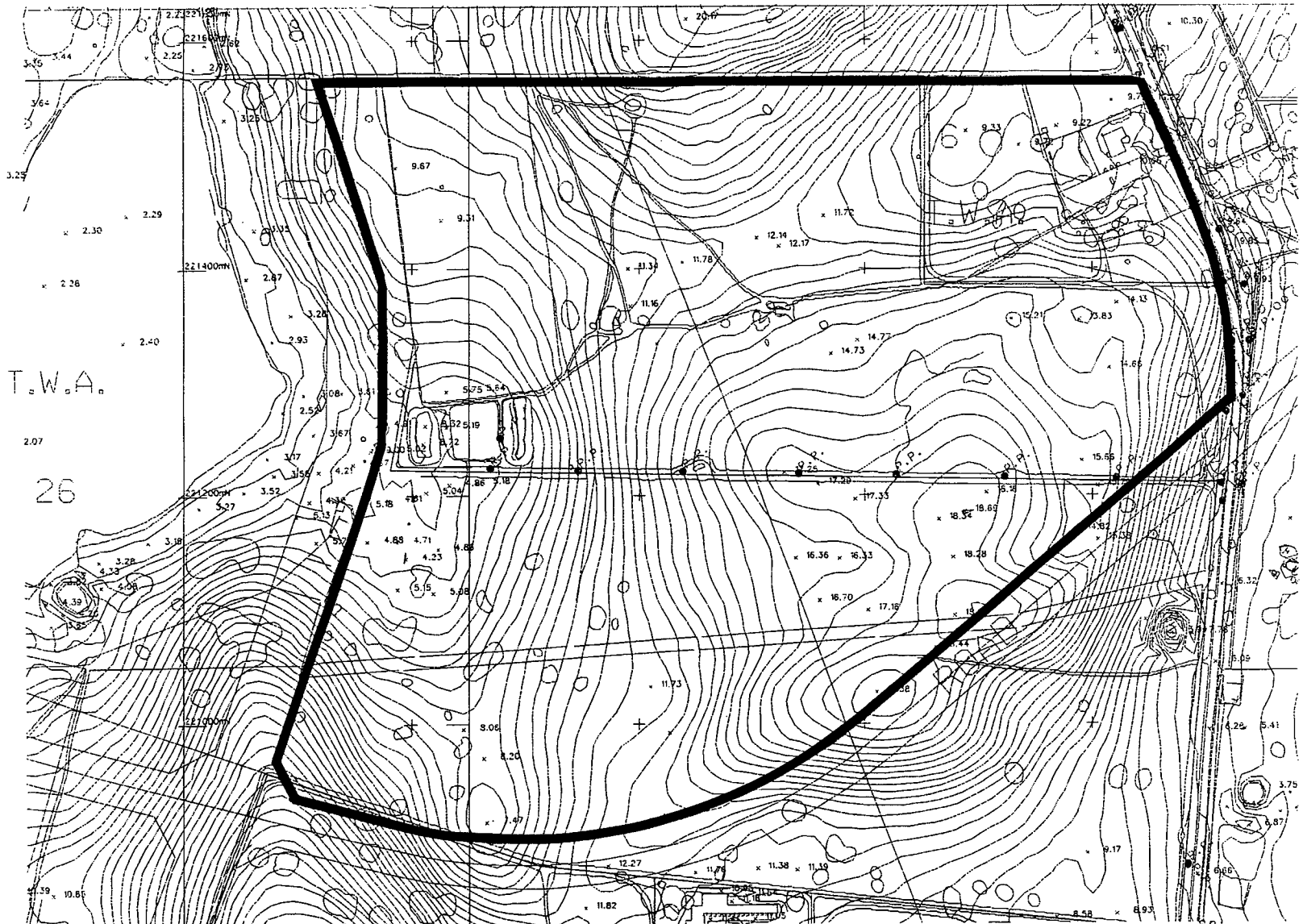


FIGURE 2

SITE PLAN AND TOPOGRAPHY

BOWMAN BISHAW GORHAM
ENVIRONMENTAL MANAGEMENT CONSULTANTS

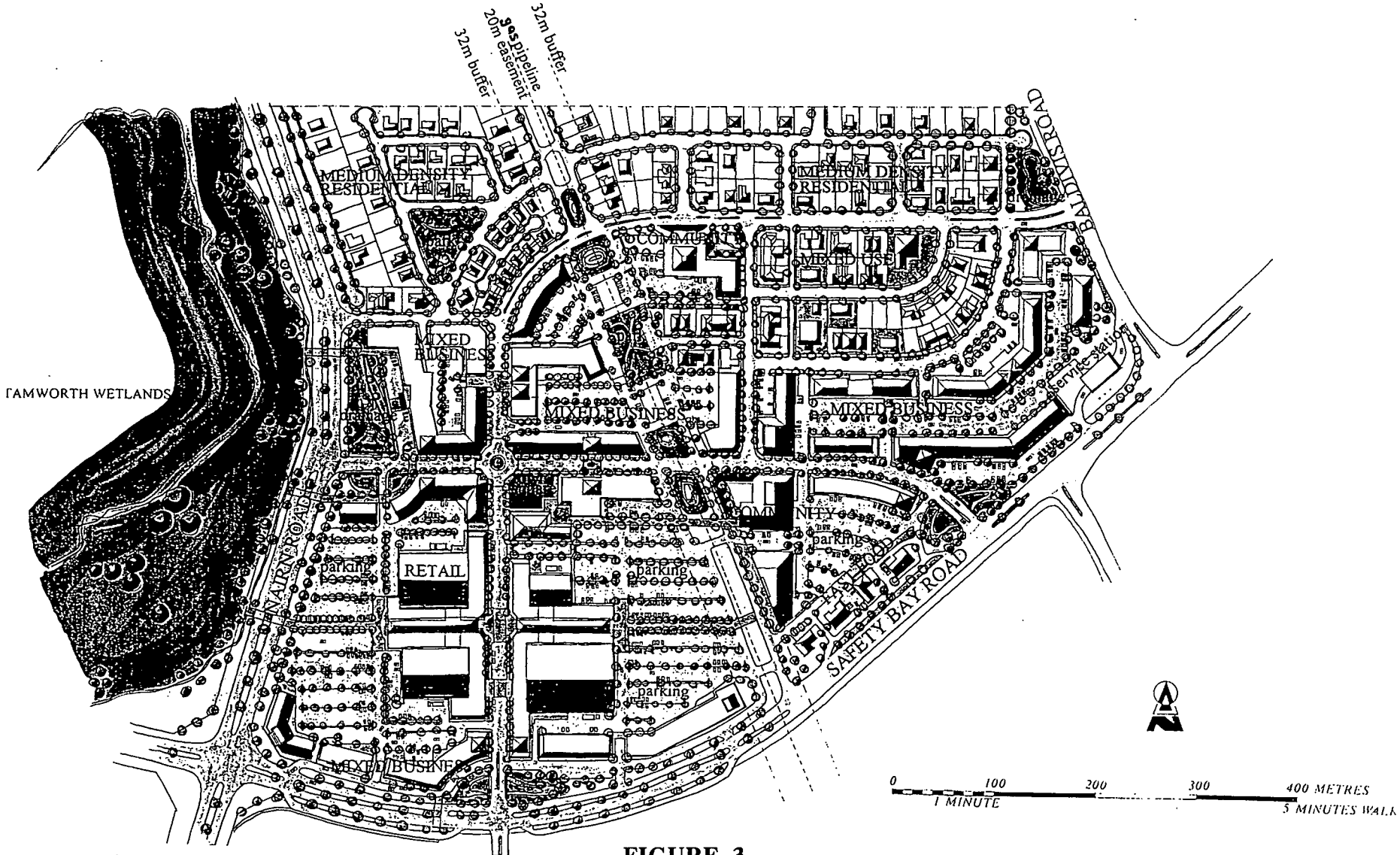


FIGURE 3

INDICATIVE DEVELOPMENT PLAN

BALDIVIS TOWN CENTRE

(AFTER HAMES SHARLEY)

BOWMAN BISHAW GORHAM
ENVIRONMENTAL MANAGEMENT CONSULTANTS

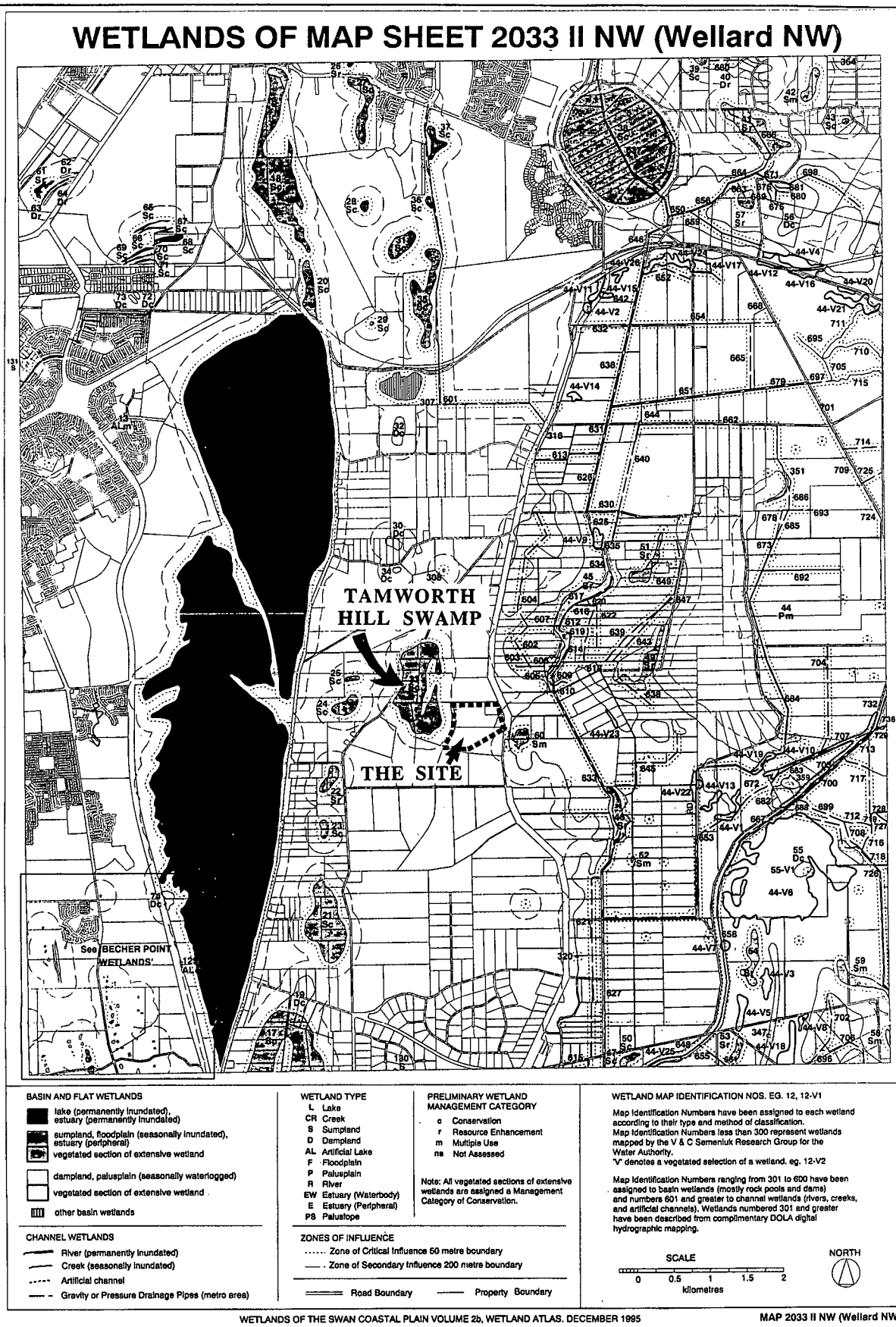


FIGURE 4

BOUNDARIES AND MANAGEMENT CATEGORIES OF TAMWORTH HILL SWAMP AND OTHER SURROUNDING WETLANDS

(AFTER HILL *et al.*, 1996)

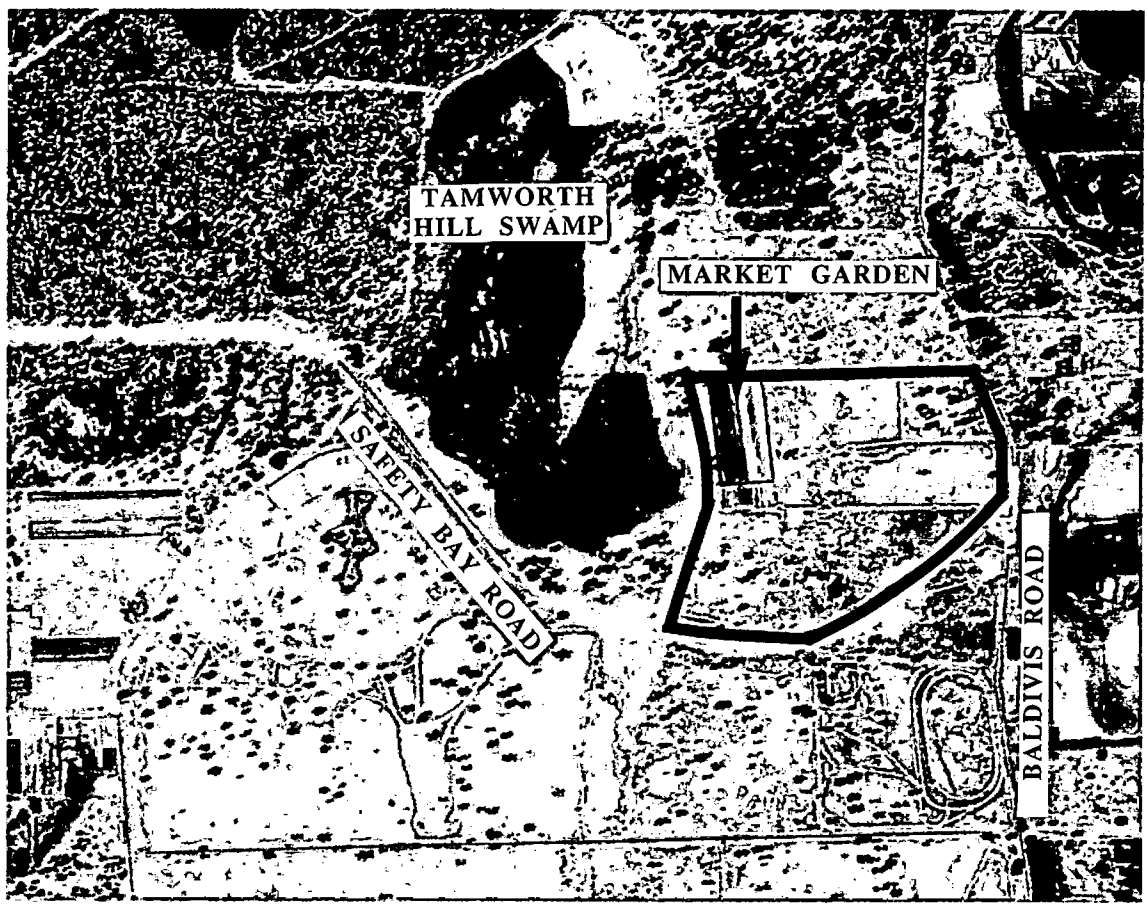


FIGURE 5

AERIAL PHOTOGRAPH OF THE SITE AND SURROUNDS

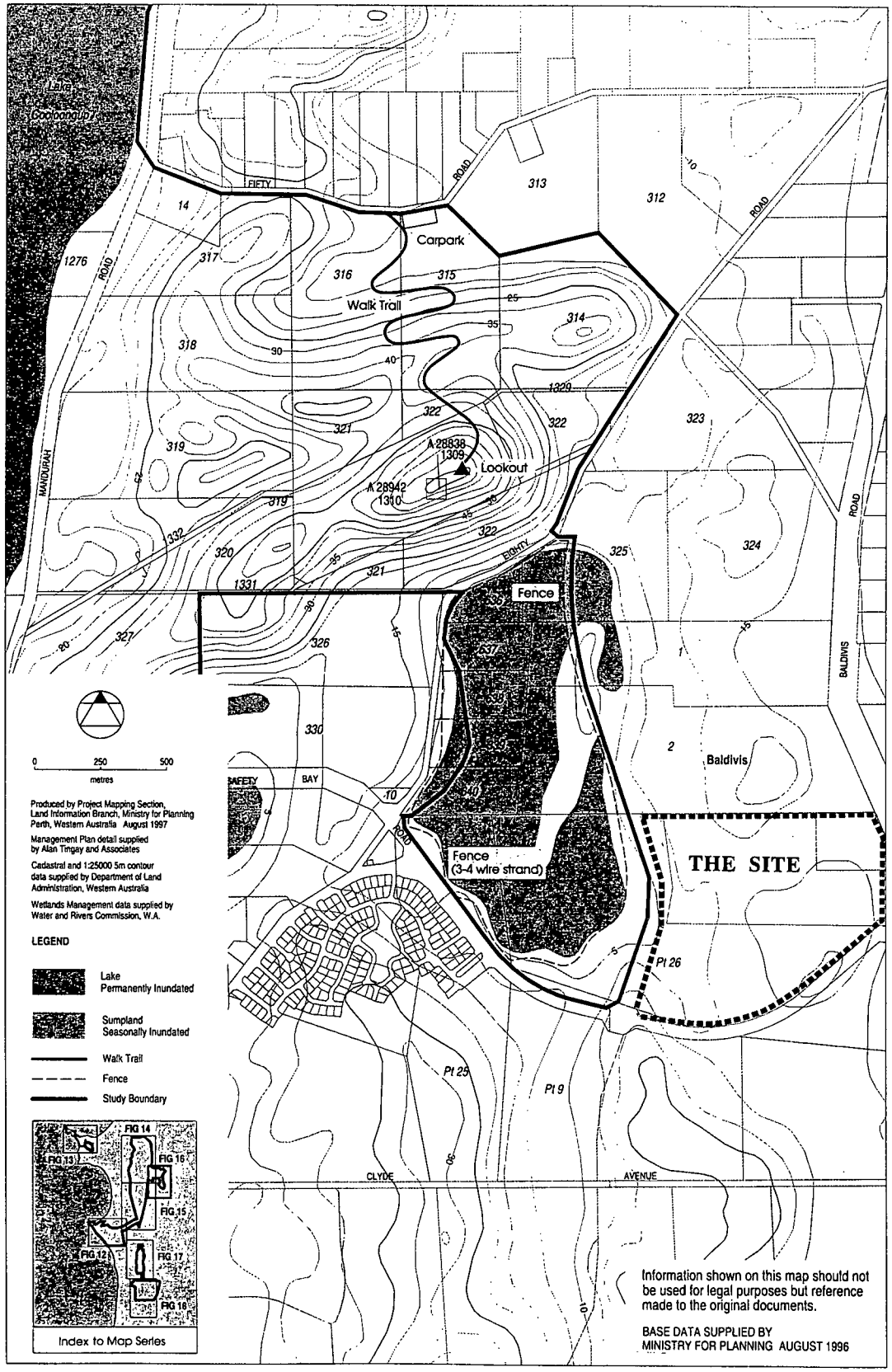


FIGURE 6

MANAGEMENT PLAN FOR TAMWORTH HILL SWAMP

(After WAPC, 1997)

APPENDICES

APPENDIX A

ENVIRONMENTAL REVIEW INSTRUCTIONS FROM THE ENVIRONMENTAL PROTECTION AUTHORITY

Department of Environmental Protection

Head Office:
Westralia Square
141 St Georges Terrace
Perth, Western Australia 6000
Tel (08) 9222 7000 Fax (08) 9322 1598
http://www.environ.wa.gov.au

Postal Address:
PO Box K822
Perth, Western Australia 6842

Chief Executive Officer
City of Rockingham
PO Box 2142
ROCKINGHAM WA 6168

Your Ref
Our Ref TP109/3:109417
Enquiries Wes Horwood

Attention: PETER MONKS

Dear Sir

SCHEME/AMD TITLE: **City of Rockingham TPS 1 Amendment 295, Rezone from 'Rural' To 'Baldivis Town Centre' Zone**

SCHEME/AMD LOCATION: **Lots 6, 13 & Pt Lot 26 Cnr Nairn Road and Safety Bay Road**

LOCALITY: **Baldivis**

Instructions for the above scheme/amendment were issued to you on 14 July 1997. The appeal period on these instructions has now closed and no appeals were received during this time. The instructions issued to you immediately prior to the commencement of the appeal period are the final instructions.

The Environmental Review should focus on the relevant environmental factors and explain how the scheme/amendment meets EPA objectives, as one of the key elements of the environmental impact assessment process is determining whether the scheme/amendment meets EPA objectives. In the event that the EPA objectives cannot be met, alternative objectives should be proposed and the Environmental Review should discuss why the new objective is more appropriate.

To complete your Environmental Review you will need the EPA environmental objectives.

Find enclosed a copy of the updated table of environmental factors in the instructions which contains the environmental objectives for the above scheme/amendment on which you will be expected to base your environmental review document.

Yours faithfully

K J Taylor
DIRECTOR
EVALUATION DIVISION

4 August 1997

cc Water and Rivers Commission, Greg Davies
Ministry for Planning
Taylor Burrell
Taylor Woodrow
CALM, Frank Batini
Conservation Council of WA, Joan Payne
Water Corporation, Frank Knoll
Aboriginal Affairs Dept
DOME, Colin Branch
Main Roads WA, Mark Goldstone
Environment Centre
Vic Malukat

1. Environmental factors relevant to the scheme

CONTENT		SCOPE OF WORK		
Prelim Env'tal Factors	**Site specific factor**	**Work required for the environmental review**	**Objectives**	**Additional comments**
Biophysical				
Wetlands	Tamworth Hill Swamp	As it relates to the impacts which may arise from the development of the Baldivis Town Centre, document the management of adequate buffers to ensure the long term health and viability of Tamworth Hill Swamp.	Maintain the integrity, functions and environmental values of wetlands.	Issues may include, access and fire control, rubbish dumping, accessibility and landscaping.
Pollution Management				
Surface Water Quality Groundwater Quality	Part of the Peel Harvey Catchment. Tamworth Hill Swamp	Investigate potential impacts from the implementation of the Amendment on surface and ground water. Document how stormwater will be managed in relation to Water and River Commission guidelines and employs Best Management Practice with respect to Water Sensitive Urban Design Guidelines. Document how future discharge concentrations and loads of nutrients and pollutants compare with the current levels from the Amendment area.	Maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters (EPA, 1993) [and the NHMRC / ARMCANZ Australian Drinking Water Guidelines - National Water Quality Management Strategy]. Maintain the quantity of groundwater so that existing and potential uses, including ecosystem maintenance, are protected.	

CONTENT		SCOPE OF WORK		
Prelim Env'tal Factors	**Site specific factor**	**Work required for the environmental review**	**Objectives**	**Additional comments**
	Particulates / Dust Noise	Document how dust and noise will be managed on the site during the construction phase.	Ensure that the dust levels generated by the proposal do not adversely impact upon welfare and amenity or cause health problems by meeting statutory requirements and acceptable standards. Protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards.	
Social Surroundings				
Public health and safety (risk and hazard)	Presence of the WANG high pressure natural gas pipeline.	Document development controls and design criteria as they relate to DEP/EPA and DME risk guidelines.	Ensure that risk is managed to meet the EPA's criteria for individual fatality risk off-site and the DME's requirements in respect of public safety.	
	Aboriginal culture and heritage	Document the presence of any significant archaeological and/or ethnographic sites which may be impacted upon.	Ensure that the proposal complies with the requirements of the Aboriginal Heritage Act 1972; and Ensure that changes to the biological and physical environment resulting from the project do not adversely affect cultural associations with the area.	

Environmental Protection Authority

Westralia Square, 141 St Georges Terrace, Perth, Western Australia 6000
Telephone: (09) 222 7000 Facsimile: (09) 322 1598
e-mail: coralie_faulkner@environ.wa.gov.au

Taylor Burrell
PO Box 503
WEST PERTH WA 6872

Your Ref
Our Ref TP109/03
Enquiries Adrian Vlok (9222 7050)
Email adrian_vlok@environ.wa.gov.au

ATTENTION: SAM MONTGOMERY

SCHEME/AMD TITLE:	**CITY OF ROCKINGHAM TPS 1 AMENDMENT 295, REZONE FROM 'RURAL' TO 'BALDIVIS TOWN CENTRE' ZONE**
SCHEME/AMD LOCATION:	**LOTS 6, 13 & PT LOT 26 CNR NAIRN ROAD AND SAFETY BAY ROAD**
LOCALITY:	**BALDIVIS**
RESPONSIBLE AUTHORITY:	**CITY OF ROCKINGHAM**

Please find attached the instructions on the scope and content of the environmental review for the above scheme/scheme amendment which have been forwarded to the responsible authority.

The environmental review is expected to be conducted in accordance with the final instructions. These instructions are not yet final as they are subject to appeal under Section 100 of the Environmental Protection Act, and anyone can appeal against their scope and contents.

If no appeals are received then you will be informed via a letter from the Director of the Evaluation Division of the Department of Environmental Protection (DEP) that these are the final instructions.

If appeals are received and dismissed then you will be notified of this by the Minister Environment and therefore the attached instructions will become the final instructions.

If appeals are received and upheld you will be notified of this by the Minister for Environment and the final instructions will be sent to you shortly afterwards from the Chief Executive Officer of the DEP.

If you wish to appeal, you should lodge your appeal in writing to:

Appeals Convenors Office
c/- Minister for Environment
13th Floor Alendale Square
77 St Georges Tce
PERTH WA 6000

accompanied by the $10.00 appeal fee. To be considered, all appeals on these instructions must be received by the Appeals Convenor by 5.00pm on 25 July 1997 .

Once the final draft of the Environmental Review document has been submitted, the EPA will then decide, within 30 days of the date on which it is received, whether it complies with these instructions. The document will not be released for public review until after the EPA has made this decision and authorised its release. A copy of the Environmental Review document will be sent to you once its release has been authorised.

Yours faithfully

R K Steedman
CHAIRMAN

CITY OF ROCKINGHAM TPS 1 AMENDMENT 295, REZONE FROM 'RURAL' TO 'BALDIVIS TOWN CENTRE' ZONE

LOTS 6, 13 & PT LOT 26 CNR NAIRN ROAD AND SAFETY BAY ROAD, BALDIVIS

ENVIRONMENTAL ASSESSMENT OF PLANNING SCHEMES AND THEIR AMENDMENTS

ENVIRONMENTAL REVIEW INSTRUCTIONS

1. Introduction

The Environmental Protection Act sets out that where a planning scheme, or an amendment to a scheme, is judged to have a significant environmental impact it will be subject to an assessment by the Environmental Protection Authority (EPA) under Section 48A of the Act. These schemes/amendments are being assessed because they raise significant environmental factors.

Where a scheme/amendment is subject to an assessment by the EPA, the responsible authority is required to produce an Environmental Review addressing the environmental factors relevant to the scheme/amendment. The EPA issues instructions for the scope and content of the Environmental Review. Below are the instructions for the above scheme/amendment.

The Environmental Review is then made publicly available with the scheme/amendment document to enable members of the public and relevant agencies to comment on the possible environmental impacts of the scheme/amendment. Additional information on the purpose and functions of environmental assessment of a scheme/amendment is given in Attachment 1.

The scheme that is the subject of this assessment is called *Town Planning Scheme No 1 Amendment No 295*, within the Local Government of the City of Rockingham.

A map showing the location of the scheme is shown as Attachment 2.

2. Instructions

2.1 Status of the instructions

The EPA, in its formulation of the instructions, endeavours to come to an agreement with the Responsible Authority and any other involved agency about the scope and content of the Environmental Review document. The Department of Environmental Protection (DEP) provides services and facilities for the EPA. In many cases the DEP will act for the EPA.

Other parties may also have a view about the contents of the instructions. To accommodate this additional input the instructions are subject to appeal to the Minister for the Environment.

Where an appeal is lodged and upheld, the Chief Executive Officer will issue the final instructions, consistent with the appeal decision. Where no appeals are received or all appeals are dismissed, this document is the final instructions for the preparation of the Environmental Review. The date of issue of this set of instructions by the EPA is 11 July 1997. Appeals must be received by the Minister for the Environment by 25 July 1997.

The EPA, in consultation with the Responsible Authority and the relevant agencies, has identified a list of factors likely to be found to be the "environmental factors relevant to the scheme" and those likely to be found to be "deferred environmental factors". This list is provided to assist with the preparation of the Environmental Review document, but during the course of the preparation of the document other factors may be found also to be relevant, and they should be included in the detailed discussion.

A copy of the form used to identify the environmental factors (the "filtering form") is included as Attachment 4.

Environmental factors identified by the EPA as being relevant to the scheme are shown in the tables which follow Section 2.4.

2.4 General scope of the Environmental Review - Limit of the Environmental Review

The scheme amendment has been initiated to:

i) rezone Lots 6,13 & Pt Lot 26 Cnr Nairn Road & Safety Bay Road from Rural to Baldivis Town Centre zone; and

ii) the subject land is adjacent Tamworth Hill Swamp which is a Conservation Category and Environmental Protection Policy (EPP) wetland. Land immediately west of the amendment area, including Tamworth Hill Swamp is zoned for Parks and Recreation in the Metropolitan Region Scheme (MRS). The amendment area and Tamworth Hill Swamp are within the Peel Harvey Catchment, as defined by the Statement of Planning Policy (SPP). The Western Australian Natural Gas (WANG) pipeline traverses the amendment area.

The EPA has identified some environmental factors which are relevant to the scheme area and should be addressed in the Environmental Review document.

Attachment 1 - Information on the purposes and functions of the environmental assessment of schemes and their amendments

Purpose of the environmental assessment

The purpose of an environmental assessment is to ensure that the scheme takes proper account of the relevant environmental factors. To do this the EPA reports to the Minister for the Environment on the environmental factors relevant to the scheme, recommends environmental conditions under which the scheme may operate and provides other recommendations as it sees fit.

Functions of an Environmental Review

The primary function of the Environmental Review is to provide information about the environmental factors related to the proposed scheme to the EPA to enable it to evaluate the significant effect on the environment of the scheme and provide independent environmental advice to Government.

An additional function of the document is to clearly communicate details of the proposed scheme and its future implications to the public so that the EPA can obtain informed public comment on relevant environmental factors and their areas. Effective public information and involvement is an essential part of environmental impact assessment.

These instructions are issued to assist in identifying matters that should be addressed within the Environmental Review document. However, other relevant matters may arise during the preparation of the Environmental Review document and these should also be included.

The Environmental Review document will be made publicly available during the advertised period for the scheme and submissions from other agencies and the public will be sought. The Responsible Authority is required to forward submissions relating to the Environmental Review to the EPA and respond to the EPA on environmental factors or conditions and procedures which may apply should the proposal be implemented that are raised in those submissions. Based on the information in the Environmental Review document, the response to submissions and its own investigations the EPA will then report to the Minister for the Environment.

Attachment 3 - Availability of the Environmental Review

1. Copies for distribution free of charge

Supplied to DEP:

- Library/Information Centre.....9
- EPA members.....5
- Officers of the DEP (Perth).....5

Distributed by the responsible authority to:

Libraries	• J S Battye Library .....3 • City of Rockingham library .....2 (at least)
Government departments	• Ministry for Planning (Perth) .....2 • Water and Rivers Commission (Perth).....1 • Dept of Conservation and Land Management.....1 • Minerals and Energy .....1 • Water Corporation.....1 • Dept. Minerals and Energy 1
Other	• Conservation Council of WA 1

2. Available for public viewing

At J S Battye Library, City of Rockingham library, City of Rockingham offices and Department of Environmental Protection Library.

3. Recommended cost

In general, the Environmental Review document for Town Planning Schemes would be expected to be similar in length to Consultative Environmental Review (CER) documents, therefore the recommended cost for the document is $5 including postage - the same as recommended for proposals assessed at the level of CER.

Scheme Amendments for much larger proposed developments can be charged at $10 for the main document and $10 for appendices including postage - as recommended for proposals assessed at the level of Public Environmental Review or Environmental Review and Management Program.

4. Advertising

The responsibility for advertising the release and availability of an Environmental Review resides with the responsible authority and is done at their expense under the following guidelines:

Format and content

The format and content of the advertisement should be approved by the DEP before appearing in the media. The advertisement should be compatible with the model advertisement below.

Attachment 4 - Filtering Form used to identify Environmental Factors

INFORMATION FOR USE IN DETERMINING LEVEL OF ASSESSMENT FOR SCHEMES AND SCHEME AMENDMENTS UNDER SECTION 48A

FACTORS	COMMENTS AND POSSIBLE IMPACTS	FACTORS	COMMENTS AND POSSIBLE IMPACTS
SECTION A Does area covered by the scheme/amendment impact on areas of highest conservation value? YES | NO (NO ticked) Please indicate Yes or No by placing a tick in the box. If the answer is 'Yes' please proceed to 1. below; if the answer is 'No' proceed to Section B) 1. Does the area covered by the scheme/amendment include a) land identified for conservation of natural resources (include wetland and dryland areas)? YES | NO or b) land adjacent to an area identified for conservation of natural resources? YES (ticked) | NO Please indicate Yes or No by placing a tick in the boxes. If the answer is 'Yes' please indicate below the appropriate category(s) by ticking the boxes; if the answer is 'No' then proceed to 2.) The area covered by the scheme/amendment involves or is adjacent to:		• Land covered by recommendations for protection in the System 'Red Book' report ☐ • Land vested in NPNCA for the purpose of: conservation of flora and fauna ☐ National Park ☐ Conservation Park ☐ • Other areas recommended for reservation by CALM and endorsed by Govt. for inclusion in CALM's Estate ☐ • land reserved as "Parks and Recreation" under the MRS ☒ • areas managed for multiple use where conservation is one defined use ☐ • areas with rare vegetation communities or assemblages considered by the EPA not adequately represented in secure conservation areas ☐ • land known to contain declared rare flora and fauna ☐	TAMWORTH HILL SWAMP EAP CONSERVATION CAT WETLAND

FACTORS	COMMENTS AND POSSIBLE IMPACTS	FACTORS	COMMENTS AND POSSIBLE IMPACTS
GENERAL COMMENTS ON 2.5		**SECTION B.** **The scheme/amendment involves land-uses and practices as described below which require special management.**	
2.6 Does the area covered by the scheme/amendment include catchments or capture zones (surface and ground water) with special requirements? YES NO (Please indicate Yes or No by placing a tick in the box. If the answer is 'Yes' please indicate below the appropriate category(s) by ticking the boxes; if the answer is 'No' then proceed to B below)		**1. The scheme/amendment involves an industry or land-use which produces one or more of the following off-site impacts:** Gases ☐ Noise ☒ Dust ☒ Odour ☐ Risk ☒ (A brief description of the industry/landuse: _____)	WHEN IMPLEMENTED WATER PIPELINE
The area covered by the scheme/amendment includes: • Lake Clifton ☐ • Lake Forrestdale ☐ • Thompsons Lake ☐		**and it is:** • a new industry/landuse adjacent to or near a new residential area; ☐ • a new industry/landuse adjacent to or near an existing residential area; or ☐ • an existing industry/landuse and a new residential area is planned adjacent to or hear to it ☐	COMMERCIAL LANDUSE ON IT
GENERAL COMMENTS ON 2.6			

INFORMATION FOR USE IN DETERMINING LEVEL OF ASSESSMENT FOR SCHEMES AND SCHEME AMENDMENTS UNDER SECTION 48A

FACTORS	COMMENTS AND POSSIBLE IMPACTS	FACTORS	COMMENTS AND POSSIBLE IMPACTS
GENERAL COMMENTS ON 5		**SECTION C**	
		Is their known controversy or concern within the community regarding the scheme/amendment? ☒ YES ☐ NO	PREVIOUS CONCERNS RE SETTERS AREA DEVELOPMENT + PEAT MINING IE TAMWORTH HILL SWAMP
6. The scheme/amendment allows for one of the following land-uses which requires special management:		**Details (eg known public interest groups; involves popular recreation area):**	
•Horticulture ☐			
•Heavy Industry ☐			
•Marina ☐			
•Aquaculture ☐			
•Industry requiring licencing under Part V of the Environmental Protection Act ☐			
•Other ☐		**SECTION D**	
GENERAL COMMENTS ON 6		**Is the referral documentation adequate for determining level of assessment?** ☒ YES ☐ NO	HAND DELIVERED ODP AFTER REFERAL 20/5/97

RECOMMENDED LEVEL OF ASSESSMENT:

Level 1 Assessment - Not assessed, no advice given	☐
Level 2 Assessment - Not assessed, non-binding advice given	☐
Level 3 Assessment - Assessed, Environmental Review Required	☒

SIGNATURES:

Project Officer(s): [signature] 13/5/97 ______

Director (Evaluation): ______

Manager: [signature] ______

Director (Pollution Prevention): ______
(Where applicable)

Director (Policy): ______
(Where applicable)

EPA Chairman: ______

SUMMARY FOR INCLUSION IN REPORT TO CHAIRMAN:

ENVIRONMENTAL FACTORS	POTENTIAL SIGNIFICANT EFFECTS	ENVIRONMENTAL SIGNIFICANCE	TICK SELECTION
Risk Dust + Noise Surface Water Ground Water Aboriginal Heritage	- WANG pipelines runs through site: significant risk issue given scheme will allow for sensitive land uses - site drains into Tamworth Swamp **MANAGEMENT** - environmental condition required to ensure scheme addresses adequate set backs from pipeline & drainage controls to protect Tamworth swamp	LOW MEDIUM HIGH (circled)	

Attachment 5 - Recommended format for the report

It is recommended that the Environmental Review document have the following sections:

SUMMARY

The document should contain a brief summary of:

- salient features of the scheme;
- brief description of the local receiving environment and potential impacts of the scheme on that environment;
- any environmental monitoring and management programs, safeguards and commitments; and
- a table summarising the above using the headings shown below as a guide.

Environmental factor	Present state of the environment	Proposed change resulting from scheme	Proposed management	Predicted outcome

INTRODUCTION

The document should include an explanation of the following:

- identification of the responsible authority;
- background and objectives of the scheme;
- brief details of the scope and timing of the scheme; and
- relevant statutory requirements and approvals.

NEED FOR THE SCHEME/AMENDMENT

The document should BRIEFLY describe the need for the scheme so the public can understand why it is being proposed at this time. Cross referencing to the main scheme documents would cut down the size of this section.

LOCATION

This section should briefly outline the location of the scheme. A map is essential.

DESCRIPTION OF THE EXISTING ENVIRONMENT

The existing environment should be clearly described including the physical, biological and human environment. The factors identified above should be used as the main heading for this section.

POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT

The factors identified above should be used as the main headings for this section. This section should discuss the relevance of each factor to this level of planning. Where the factor is not considered relevant, the level of planning at which it is appropriate should be identified.

CONCLUSION