

## ENTERED ON GIS

**Name:** EPA Site Visit – Waroona, Bunbury and Kemerton – Kemerton  
Silica Sands  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong

**Comments:**

*Polygon*

Created to match documented study area with high level of accuracy

Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual references with complex boundaries, resulting in minor boundary errors
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*Attributes*

Report Info – Captured without problems

Custodial/Contact – Captured without problems

Content – Captured without problems

TO: EPA members  
FROM: MURRAY HOGARTH *Murray Hogarth 29/8/00*  
SUBJECT: KEMERTON SILICA SANDS — EPA SITE VISIT, 13 SEPTEMBER 2000.  
DATE: 29 AUGUST 2000

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## EPA Briefing

1. The purpose of the site visit will be to familiarise the EPA with the Kemerton Silica Sands project area.

### *Project Background*

#### Original proposal

1. The Kemerton Silica Sand Mining proposal was originally assessed by the EPA in 1994 and subsequently approved subject to environmental conditions. A significant aspect of this assessment was the impact on wetlands covered by the *Environmental Protection (Swan Coastal Plain Lakes) Policy*. The EPA's recommendation of acceptability was based largely on there being a net environmental gain, in that, while some lakes would be destroyed, others would be protected through addition to the conservation estate. | lakes only  
??
2. Figures 1 & 2 show the project area and project layout for the original proposal. Figure 3 shows those areas which are to be added to the conservation estate as a condition of environmental approval (Stages 1 & 2).

#### Changes to the proposal

1. In 1995 the proponent requested approval for mining the "Western Extension". It was determined that this would be assessed under Section 46 of the *Environmental Protection Act 1986*.
2. Due to some interaction with the EPA's assessment of the Kemerton Industrial Area, the proponent deferred the Section 46 assessment in October 1998.
3. Following further information on the significance of vegetation communities in the southern portion of the Western Extension, the proponent reviewed the proposal and decided to alter it to seek approval to mine all of the remaining areas of land which it owned (except the southern portion). The proponent met with the Chairman of the EPA on 28 September 1999 to discuss how this change should be dealt with in the assessment process. The outcomes of this meeting are recorded in letter from the Chairman dated 24 November 1999 (Attachment 1). In summary, it was agreed that a new Section 46 assessment should be initiated, and some guidance was provided on the issues the proponent would need to address.
4. The currently proposed extension is roughly shown as the hatched area in Figure 4. However, it should be noted that this area also includes areas which have been approved for dry mining under the original proposal. 21
5. In the intervening time some additional meetings have been held to clarify criteria which should be used for assessing the biological impact of the proposal.
6. Also, the EPA has reviewed the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*.

## Key Environmental Factors

### Remnant vegetation

1. The area contains remnant vegetation of conservation value. In the EPA's advice on the Kemerton Industrial Area Expansion, the extension area was designated "Conservation value (further investigation)" (Refer to Figure 4). As part of the assessment of the amended proposal the EPA will need to resolve the designation of this area.
2. The area includes a number of flora species listed as Priority flora and another species of conservation significance not presently on CALM's list.
3. In a study carried out for the Kemerton Industrial Area Expansion, the project area was identified as the largest intact area of the "Bassendean Central and South" vegetation complexes. Hence there will need to be an analysis of the impact this proposal would have on the ability to achieve adequate representation of this complex in the conservation estate.

### Wetlands

1. As illustrated in Figure 5, most of the project area is covered by wetlands (either lakes, sumplands or damplands).
2. The EPA's review of the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* recommends extending the areas protected under the policy from just lakes to including a broader definition of wetlands. As a result, most of the project area would become subject to a revised policy. It should be noted that some of the project area is already classified as Category C (conservation) wetlands.
3. WRC has commissioned an evaluation of the wetlands on the Swan Coastal Plain. A draft of this evaluation (prepared by V & C Seminiuk research Group) lists the Kemerton area as one of the outstanding wetlands in the study area. The most relevant extract from the draft report is provided below.

*10) Kemerton wetlands — These wetlands are outstanding because they represent the only well developed and intact wetland system outside of the Yalgorup National Park in the whole study area. The wetlands are hydrologically linked as they are expression of the groundwater table. They are ecologically connected to the surrounding upland, being nodes for water and food for fauna. They represent a variety of vegetation assemblages from low forest to scrub to low heath, and a variety of habitats from seasonally inundated areas to seasonally waterlogged to dry upland areas. The area would make an outstanding wetland park.*

4. This proposal will substantially modify the wetlands in the mined area. Rehabilitation will be difficult and the removal of large quantities of sand will create deep ponds in place of biologically more active shallow wetlands which currently exist.
5. While the original proposal provided some offset against impacts on EPP lakes, this proposal does not currently include any such offsets.

### Recommendations

Subject to EPA member's opinions after viewing the area:

1. The EPA should note that this proposal will have a significant impact on an important wetland system and will therefore require close scrutiny by the EPA during assessment.

2. It is quite possible that the outcome of the EPA's assessment will be that the proposal cannot be managed to meet the EPA's objectives. The proponent should take this into consideration when deciding whether it wishes to continue to pursue this proposal and outlay the additional resources this will require.

FIGURE 1

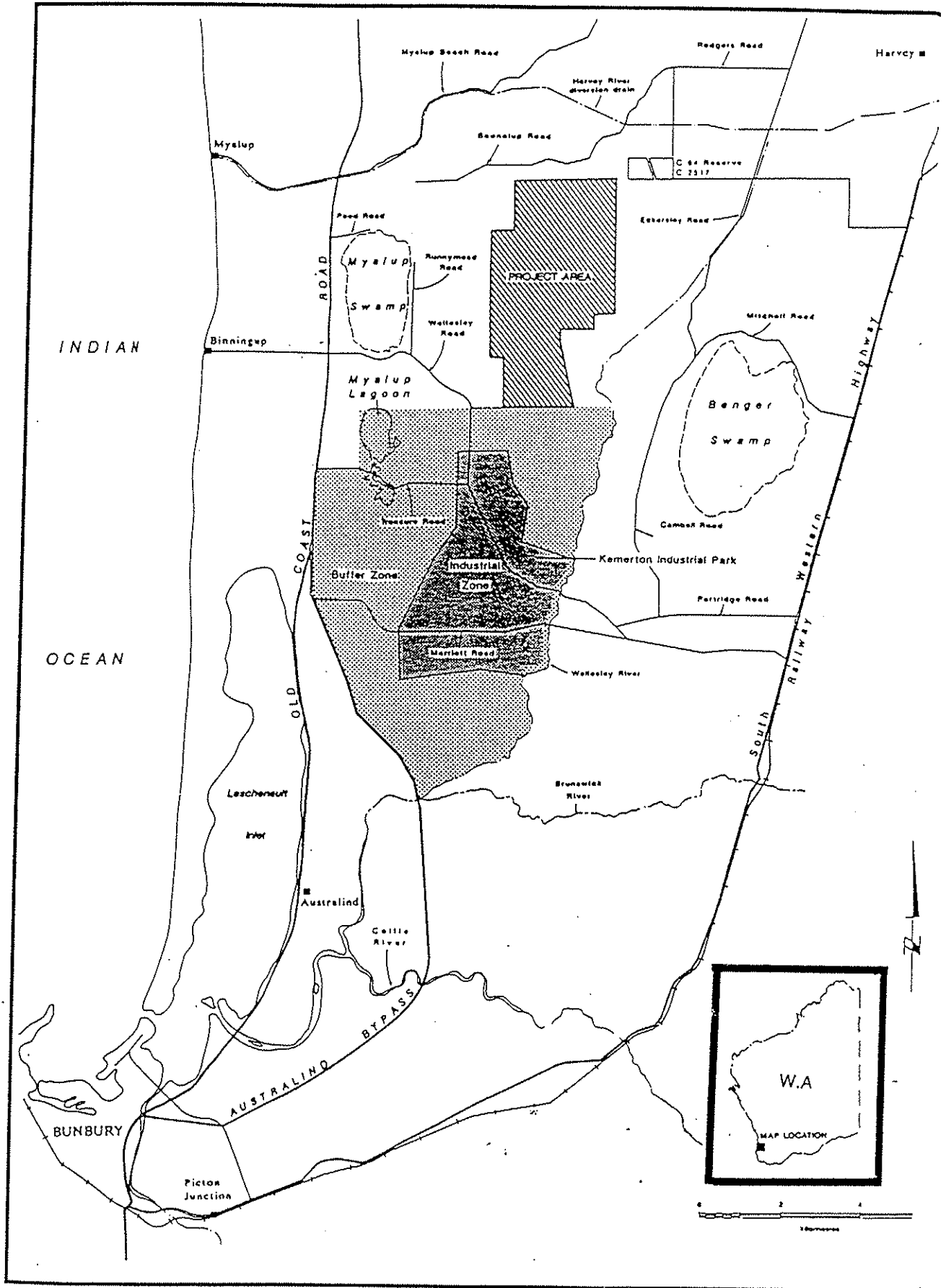


Figure 1. Location of Kemerton Silica Sand Project (Adapted from PER Gwalia 1993b)).

FIGURE 2

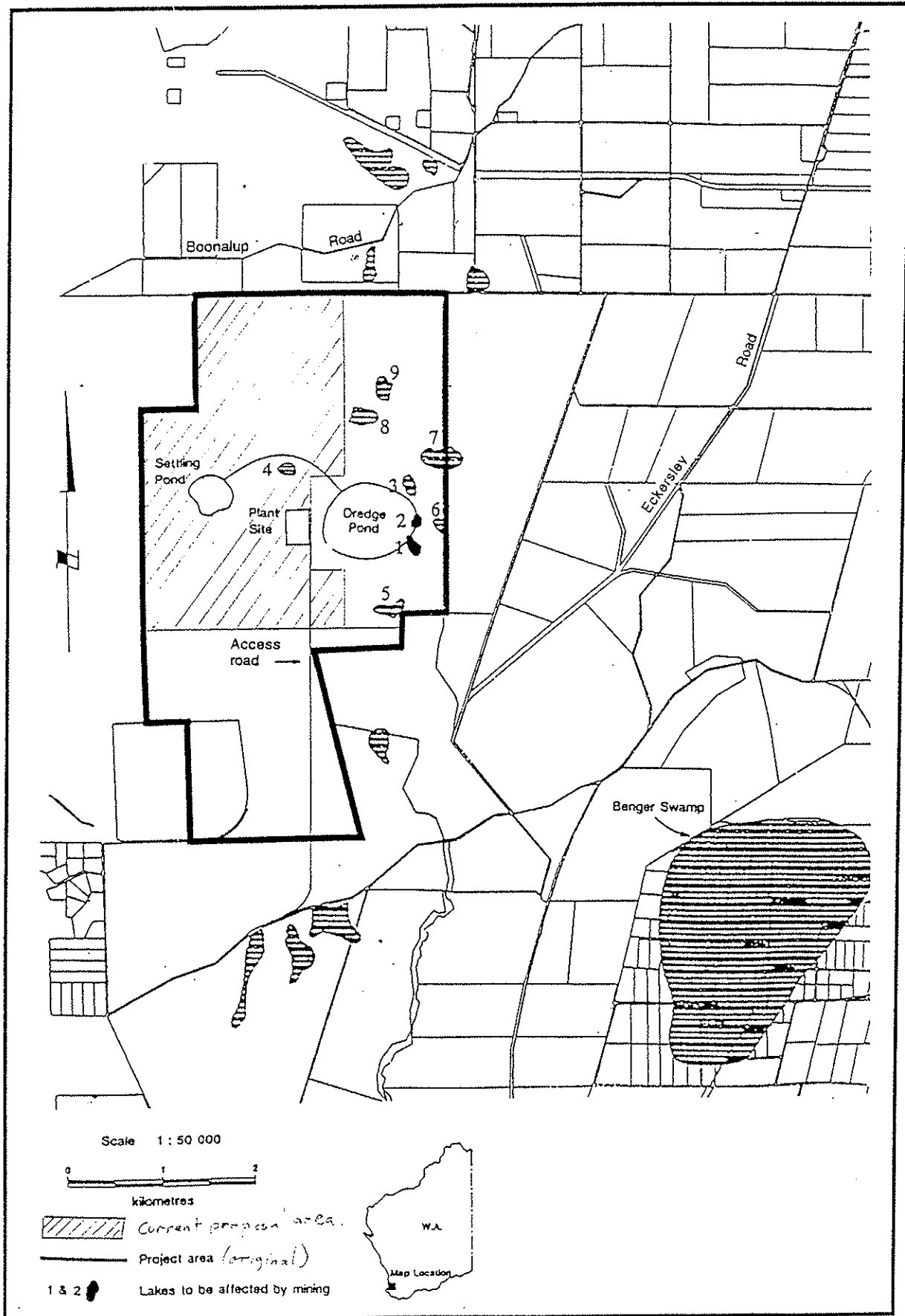
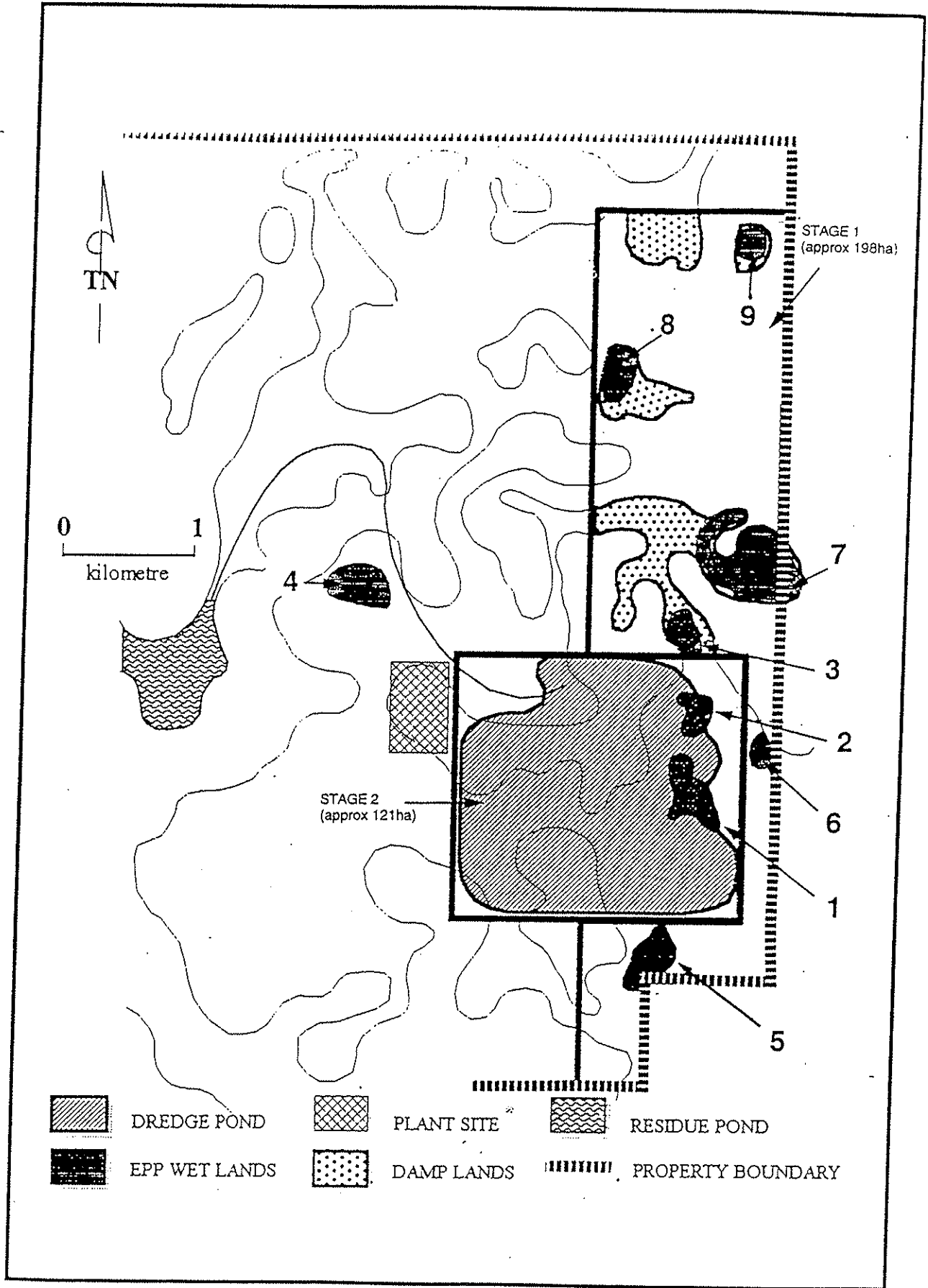


Figure 2. Location of EPP lakes (Adapted from PER (Gwalia 1993b)).

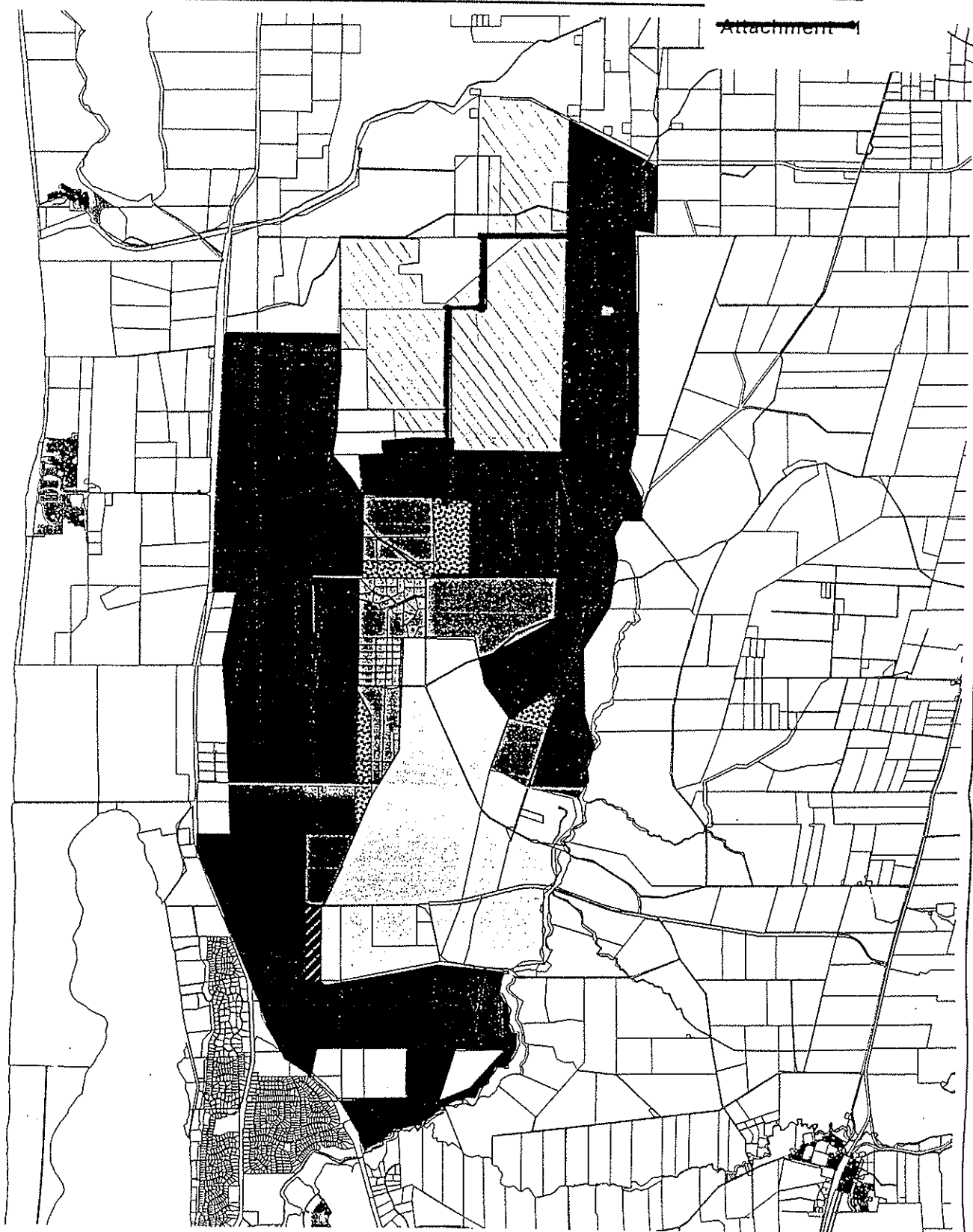
MODIFIED FIGURE 2

FIGURE 3

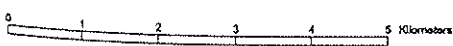


21/1/99

Attachment 1











### KEMERTON INDUSTRIAL EXPANSION PROJECT



1:70000

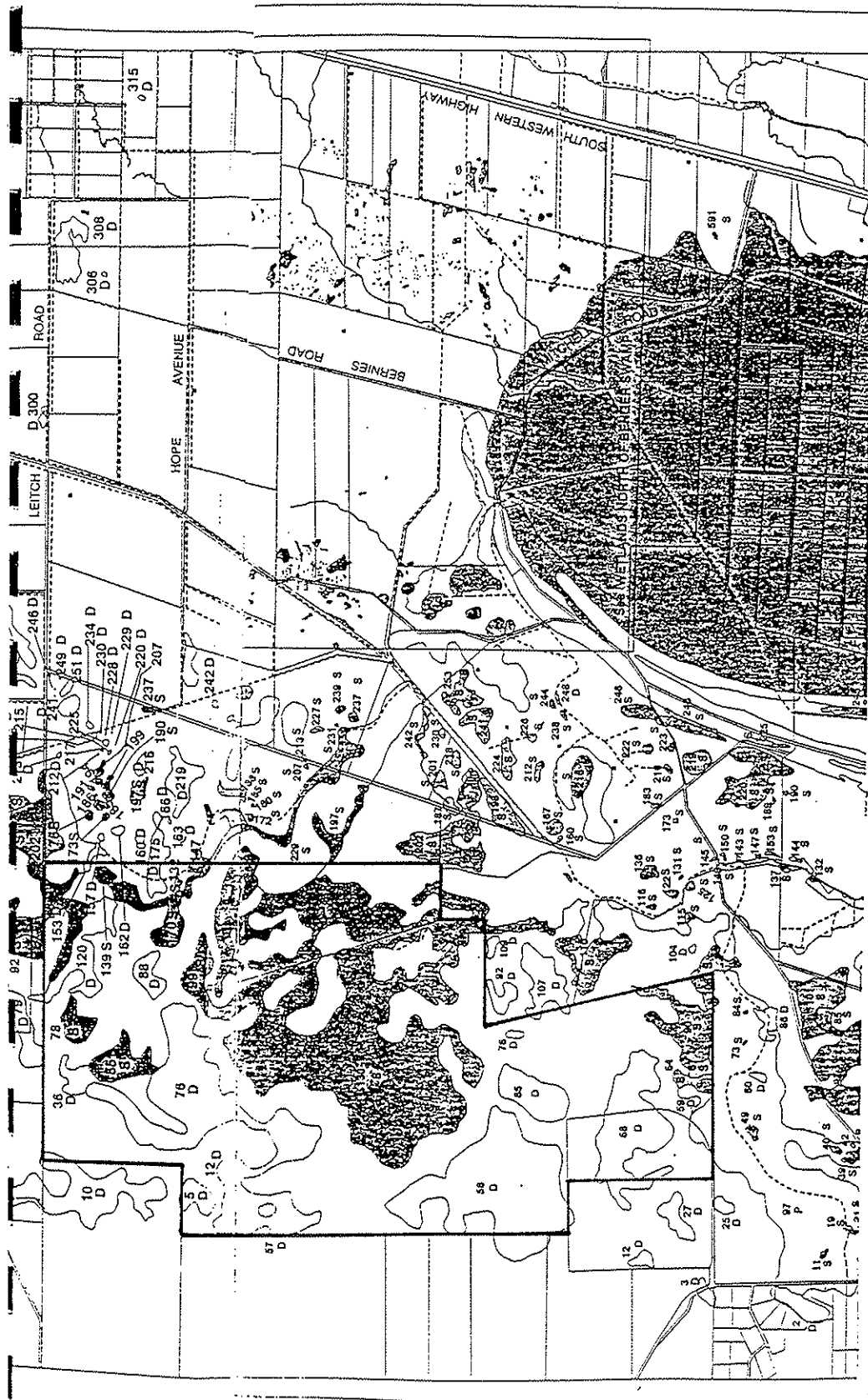
Projection: Australian Map Grid

-  DOLA Cadastre
-  Conservation
-  Conservation value (further investigation)
-  Investigation area for alternative location for wwtp
-  Industrial (existing)
-  Industrial expansion
-  Vegetation buffer
-  Development (other)

This map has been produced using various data from other agencies. No responsibility is accepted for any error or omission.



FIGURE 5



**WETLAND MAP IDENTIFICATION NOS. EG. 12, 320, 678**

Map Identification Numbers have been assigned to each wetland according to their type and method of classification.

Map Identification Numbers less than 300 represent wetlands mapped by the V & C Semantuk Research Group for the Water Authority.

Map Identification Numbers ranging from 301 to 600 have been assigned to basin wetlands (mostly rock pools and dams) and numbers 601 and greater to channel wetlands (rivers, creeks, and artificial channels). Wetlands numbered 301 and greater have been described from complimentary DOLA digital hydrographic mapping.

- WETLAND TYPE**
- L Lake
  - CR Creek
  - S Sunpland
  - D Dampland
  - AL Artificial Lake
  - F Floodplain
  - P Palusplain
  - R River
  - EW Estuary (Waterbody)
  - E Estuary (Peripheral)
  - PS Palustope
- ZONES OF INFLUENCE**
- ..... Zone of Critical Influence 50 metre boundary
  - Zone of Secondary Influence 200 metre boundary
- CHANNEL WETLANDS**
- River (permanently inundated)
  - Creek (seasonally inundated)
  - Artificial channel
  - Gravity or Pressure Drainage Pipes (metro area)
- BOUNDARIES**
- Road Boundary
  - Property Boundary

**BASIN AND FLAT WETLANDS**

- lake (permanently inundated)
- estuary (permanently inundated)
- sunpland, floodplain (seasonally inundated)
- estuary (peripheral)
- dampland, palusplain (seasonally waterlogged)
- other basin wetlands





# Environmental Protection Authority

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Mr Simon Williamson  
Manager - Environment  
Sons of Gwalia Ltd  
16 Parliament Place, PMB 16  
WEST PERTH WA 6872

Dear Mr Williamson

## KEMERTON SILICA SAND PROJECT — OUTCOMES OF MEETING HELD ON 28 SEPTEMBER 1999

I thank you for your presentation of your Company's plans with regard to the proposed Western Extension of the Kemerton Silica Sand Project.

As agreed at that meeting, I provide this summary of the main points discussed:

1. An amended proposal was presented for the Western Extension which included the remaining areas of land owned by Sons Of Gwalia, but excluded the southern portion which contains vegetation communities which could be of regional significance.
2. As the amended proposal was considered a significant change to the Section 46 assessment currently in process, it was noted that there would need to be some notification of stakeholders regarding the amendments and that this could be dealt with in one of two ways. Firstly, as an addendum to the current Section 46 proposal document, or secondly, the amended proposal could be treated as a new Section 46 request. Each of these would require similar notification of stakeholders. I indicated that a limited public release of the new proposal to those government agencies and members of the public which had already provided comment on the current Section 46 proposal would be appropriate. Given the familiarity of these stakeholders with the project, a two week period for public comment was considered adequate.

Please note that although the public release would be limited, it would still be advertised in the Environmental Protection Authority's weekly advertisement in *The West Australian* newspaper. The Authority would still expect the proponent would make copies of the addendum or Section 46 document available to any new enquiries at the standard cost of \$5.00 per copy.

3. It was agreed that initiating a new Section 46 assessment was the preferred method for dealing with the current proposal for the Western Extension. This will allow the EPA to set the form, content, and timing of the environment review process for this assessment in accordance with the discussion summarised in Point 2 above.

In order to initiate this process, Sons of Gwalia will need to write to the Authority withdrawing the previous Section 46 proposal and requesting a new Section 46 amendment. The letter should include a brief description of the amended proposal in support of the request for a new Section 46 assessment.

Through the previous Section 46 process and also the EPA's assessment of the Kemerton Industrial Area Expansion, a number of issues have been raised which will need to be addressed in the new Section 46 environmental review document. These would be in addition to those environmental issues reported on in the previous document.

These additional issues are briefly outlined below:

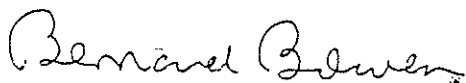
1. Justification of the proposal and alternatives to it will need to be discussed. Given that the proposal is located in a area of remnant vegetation, and hence has some level of conservation value, the case for clearing of this land through mining will need to be argued. Alternative resources should be identified and their development compared with this proposal in terms of environmental impact and value of the development to the state. ✓
2. The regional conservation significance of the remaining Gwalia owned land will need to be discussed in the context of the Draft Kemerton Structure Plan. In the EPA's recent advice on this plan this area was designated "Conservation value (further investigation)". As part of the assessment of the amended proposal the EPA will need to resolve the designation of this area. Therefore the conservation values of this area will need to be discussed in a regional context. ✓

Reference to the findings in the *Report of Biological Survey— Phase 1: Kemerton Industrial Estate* (Muir Environmental, 25 February 1999) would be an appropriate starting point for this discussion. For example, the project area is one of the largest intact areas of the "Bassendeen Central and South" vegetation complexes. Therefore there will need to be an analysis of the impact this proposal would have on the ability to achieve adequate representation of this complex in the conservation estate. ○

3. Potential impacts on, and management of, EPP lakes and Category C wetlands. The amended proposal now surrounds (but does not include) a lake subject to the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*. Therefore indirect impacts on this lake, such as hydrological changes and loss of fringing vegetation will need to be described and management measures proposed. Long term changes due to the formation of a deep lake in an area which is presently a seasonally inundated (Category C) wetland will also need to be addressed with reference to the EPA's previous guidance on wetland management (Bulletins 374, 685, and 686).   
Assess Wetlands and include in Wetlands list. ✓
4. Impacts on vegetation and flora of conservation significance. Both direct effects on vegetation/flora within the mining area and indirect effects on adjacent areas will need to be addressed.
5. Impact on fauna of conservation significance. The rare (Priority 4) freshwater fish *Galaxiella nigrostriata* occurs within the overall project area. Both direct effects through loss of habitat and indirect effect (for example through the introduction of competing fish species as a result of habitat alteration) will need to be addressed. ✓
6. Rehabilitation plans and methods. Assuming that the rehabilitation measures for the existing proposal are to be applied to the extension area, then reference to these measures and a discussion of the final ecosystem which would be created should be provided. Any trial results or other information demonstrating the successfulness of the proposed methods in recreating wetland ecosystems, should also be provided.

Should you wish to further discuss any of the above matters, please contact Murray Hogarth on 9222 7139 in the first instance.

Yours sincerely

A handwritten signature in cursive script that reads "Bernard Bowen".

Bernard Bowen  
CHAIRMAN

24 NOV 1999

Ref: (Murray Hogarth)

## ENTERED ON GIS

**Name:** EPA Site Visit – Waroona, Bunbury and Kemerton – Goyder  
Proposed Sand Extraction Operation  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong

**Comments:**

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# **EPA Site Visit**

**Waroona, Bunbury and Kemerton**

**12 – 13 September 2000**

*Map to visit  
at Kemerton*

# ITINERARY - SITE INSPECTION BUNBURY

12 - 13 SEPTEMBER 2000

Tuesday 12th  
September

- 0830 Depart Perth  
1 x vehicle for 2 days (EPA members) 12-13/9.  
(Bernard will meet EPA at Waroona)  
1 x DEP 4WD vehicle Natalie Thorning (12/9-Waroona only)  
1 x DEP vehicle Anne Barter (12/9-Bunbury WWTP only)  
1 x DEP 4WD Murray Hoggarth (13/9-Kemerton only)  
1 x CEO vehicle-Bryan Jenkins & Mike Rosengren (13/9 only)
- 0945 - 1045 Visit site of Shire of Waroona TPS No7, Amendment No 5, Old Bunbury Rd. Meet on site:  
Consultant Simon Baines, CJB Planners;  
land owners - Gary and Sandra Foales; and  
Shire representative-Graham Catchpole, Mgr, Planning & Dev.  
**DEP Project Officer:** Natalie Thorning
- 1215 Arrive Lighthouse Beach Resort, Bunbury  
(Book in)
- 1230 - 1330 Lunch: at the Lighthouse Beach Resort with Water Corporation representatives- Lindsay Lowe, Chris Elliott, their consultant, Mark Bailey, and DEP South West Regional Manager, Guy Watson
- 1330 -1400 30 minute presentation in hotel boardroom.
- 1415- 1545 Visit Bunbury Waste Water Treatment Plant - Ocean outlet  
with:  
Water Corp representatives-Lindsay Lowe, Project Officer and  
Chris Elliott, Bunbury Business Manager; and  
Consultant-Des Lord.  
**DEP Project Officer:** Anne Barter
- 1600 - 1700 Bunbury Coastal Enhancement Project with:  
South West Development Commission- Don Puncil, CEO; and  
City of Bunbury-Tony Brun, Exec. Manager, City Dev.  
(presentation in Extensions restaurant room)  
**DEP Project Officer:** Marie Ward
- 1900 Dinner (Mancini's restaurant, Victoria Street, Bunbury) -  
Guy Watson will join the EPA for dinner.  
Overnight

Wednesday 13th  
September

- 0800 - 0900 Breakfast  
(Check out of Lighthouse Beach Resort)
- 0930 - 1030 Goyder Proposed Sand Extraction Operation, Kemerton with:  
Proponent- John Goyder; and  
Member for South West Region-Hon Muriel Patterson  
(Meet DEP officers on site.)  
**DEP Project Officer:** Murray Hogarth
- 1040 - 1200 Kemerton Silica Sands with:  
Sons of Gwalia-Phil Scott, Environmental Officer.  
  
**DEP Project Officer:** Murray Hogarth
- 1200 - 1300 Giacci Extension to Sand Mining Operation with:  
Consultants-Wolf Martinick and Lance Bosch.  
  
**DEP Project Officer:** Murray Hogarth
- 1315 - 1400 Lunch at Australind
- 1400 - 1500 Shire of Harvey District Planning Scheme Amendment no13,  
Pt Douro with:  
Shire of Harvey-Chadd Hunt, Shire Planner and Scott  
Dandridge, Environmental Health Officer;  
Consultant (GHD)-Derek Westera and Anna Napier; and  
Ministry for Panning-Michael Schramm.  
(Overview of project from foot bridge)  
**DEP Project Officer:** Marie Ward
- 1700 Arrive Perth

## Attendees

### EPA

Bernard Bowen                      Libby Matiske                      Denis Glennon  
Ian LeProvost                      Graeme French

### DEP

Marie Ward, Bunbury Coastal Enhancement Project and Pt Douro (12/9 -13/9)  
Natalie Thorning (Waroona site visit - 12/9/00 only)  
Anne Barter (Bunbury Waste Water Treatment Plant - 12/9/00 only)  
Murray Hogarth - Kemerton sand mining Issues (13/9 only)  
Bryan Jenkins (13/9 only)  
Mike Rosengren (13/9 only)

### DEP South West Regional Office

Guy Watson, Manager Tel:9722 0800                      Mobile:0409 111 370 (12/9 -13/9)

## Proponent Representatives

### *Shire of Waroona TPS No7, Amendment No 5, Old Bunbury Rd -*

- Consultant                      Simon Baines, CJB Planners;
- land owners                      Gary and Sandra Foales; and
- Shire representative                      Graham Catchpole, Mger, Planning & Development.

### *Waste Water treatment Plant, Bunbury -*

- Water Corp representatives                      Lindsay Lowe, Project Officer and Chris Elliott,  
Bunbury Business Manager; and
- Consultant                      Mark Bailey.

### *Bunbury Coastal Enhancement Project -*

- South West Development Commission                      Don Punch, CEO; and
- City of Bunbury                      Tony Brun, Executive. Manager,  
City Development.

### *Goyder Proposed Sand Extraction Operation, Kemerton -*

- Proponent                      John Goyder; and
- Member for South West Region                      Hon Muriel Patterson.

### *Kemerton Silica Sands -*

- Sons of Gwalia                      Phil Scott, Environmental Officer.

### *Giacci Extension to Sand Mining Operation -*

- Consultants                      Wolf Martinick and Lance Bosch.

### *Shire of Harvey District Planning Scheme Amendment no13, Pt Douro -*

- Shire of Harvey                      Chadd Hunt, Shire Planner and Scott Dandridge,  
Environmental Health Officer;
- Consultant (GHD)                      Derek Westera and Anna Napier; and
- Ministry for Panning                      Michael Schramm.

## Contacts

Lighthouse Beach Resort - Tel: 9721 1311      Fax: 9721 3584 (\$72 per room)  
Mancini's Restaurant, Bunbury - Tel: 97219944  
Bryan Jenkins Mobile: 0411 514 413  
Murray Hogarth - Mobile: 0407 474 209  
John Goyder - Mobile: 018 931 023      Home Tel: 9728 1085  
Graeme French mobile phone will be on at all times 0417 920 153

# Goyder Proposed Sand Extraction Operation

## CLEARING OF NATIVE VEGETATION AND SAND EXTRACTION – LOT 42 WELLESLEY ROAD KEMERTON, FRUNDSBERG PTY LTD.

### Background

The proponent is Mr John Goyder (Frundsberg Pty Ltd). The proposal is for land clearing and sand extraction within lot 42 Wellesley Road, Kemerton (see location map, attachment 1). The project site is adjacent to the Giacci proposal (lots 120-122 Old Coast Road –see separate briefing note).

The proposal would target a sand ridge (dune). The quarrying operation would be a load, haul and dump operation. The referral document states that “ the open quarries will generally be no deeper than 25 metres below natural ground level with the bulk of excavation being to depths of less than 10 metres.” Excavation would be to approximately a minimum of 3 metres above the highest natural groundwater level.

Sand resources on the site are in excess of 12 MT. Sand would be extracted over a 20 to 25 year period nominally at a rate of 0.5 MTpa

The deepest part of the sand ridge (and therefore resource) is located within the eastern one third of the property. The referral document notes that this part of the property is within the proposed “Industrial Core” while the balance of the property is within the “Proposed Buffer” as specified by the Kemerton Land Use Study. (DEP will bring detailed maps to assist with discussions on site). ✓

The total area of land to be disturbed during the first 5 years is estimated to be 125 hectares. The proponent states that the vegetation in the area is primarily jarrah woodland. M

The area is to be rehabilitated to native vegetation and returned to pastoral use.

The proposal has been referred to the EPA by the proponent and also by the Shire of Harvey.

### Environmental issues

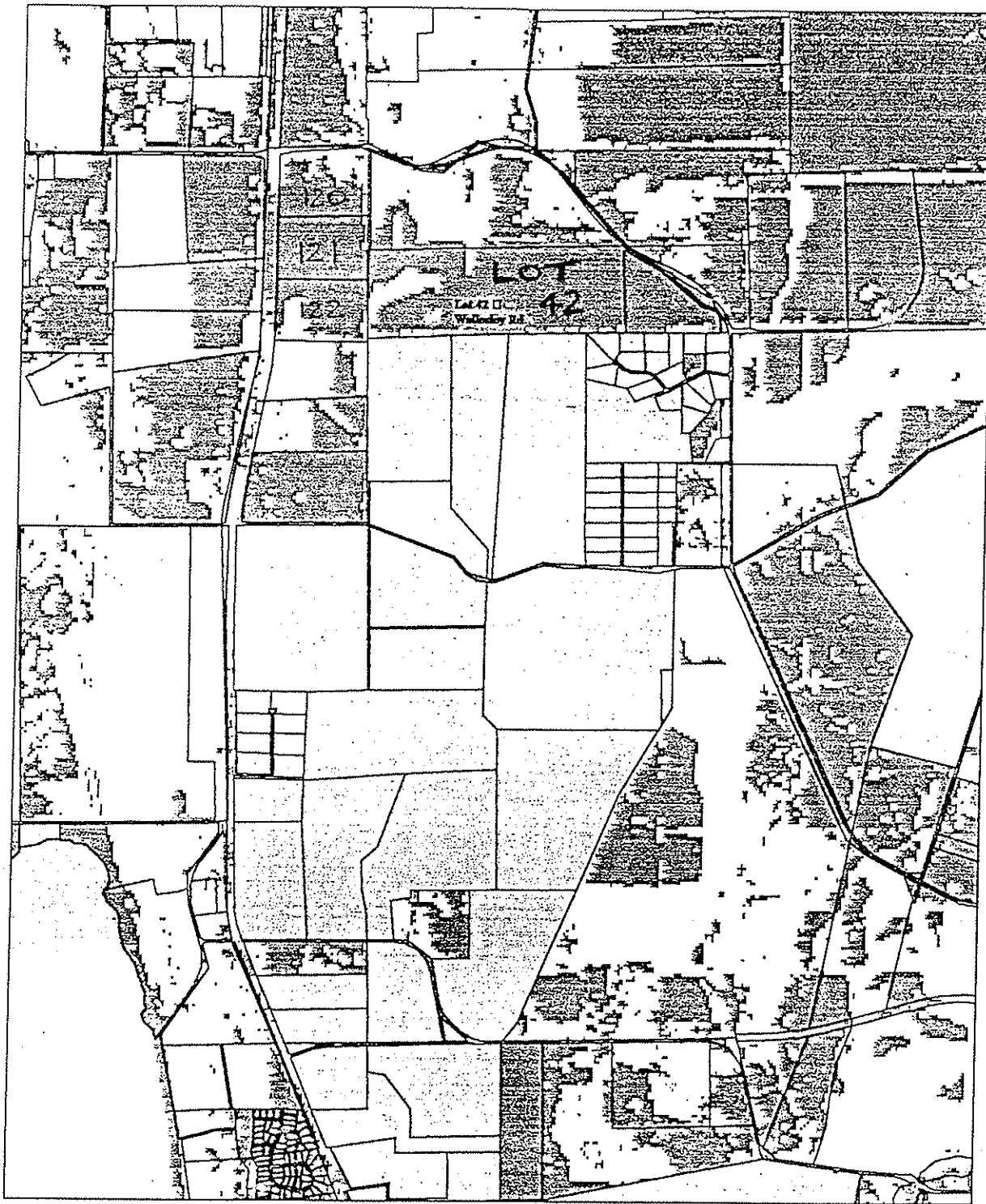
The primary environmental issue is clearing of native vegetation (estimated 125 hectares of land to be disturbed in first 5 years). The area has been identified as forming part of a “unique vegetation transect.” The project area falls within the conservation zone of the Kemerton land use map (DEP will bring a copy of this map and other vegetation maps to assist with discussions on site). M

Potential impacts on groundwater and on EPP wetland (Mialla Lagoon) are also expected to be key issues.

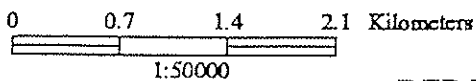
### Status of assessment

The EPA Chairman wrote to the Shire of Harvey (copied to the proponent) on 1 December 1999 (Attachment 2). In his letter, the Chairman indicated that the proposal was likely to attract a PUEA level of assessment because of its location within an environmentally significant area as identified in the Kemerton Land Use Study. M







The Chairman subsequently met with Mr Goyder and Mr Alan Longbon (consultant). At that meeting, it was agreed that it would be useful for the EPA to visit the site before making a final decision on level of assessment.






# Lot 42 Wellesley Road



### CALM Managed Land 1998

-  Freehold
-  National Park
-  Nature Reserve
-  State Forest
-  Roads - Main (WA)
-  Local Government Authority Boundaries

### Woody Vegetation Cover Legend

-  Water
-  Woody Vegetation
-  No Woody Veg.

Projection: Australian Map Grid

DEP Internal Use Only

WARNING: This map has been prepared for internal use only. The information should not be published or used outside the DEP without consultation with the GIS Unit.

This map has been prepared using satellite data. It may contain errors. The responsibility for any errors in the map content is assumed.



Department of Environment and Planning, Western Australia



# Environmental Protection Authority

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Chief Executive Officer  
Shire of Harvey  
PO Box 500  
HARVEY WA 6220

Attention: Mr P Anderson

Dear Mr Anderson

## PROPOSED SAND EXTRACTION, LOT 42 WELLESLEY ROAD KEMERTON: FRUNDSBERG PTY LTD

Thank you for your letter of 19 October 1999 regarding the above.

The Environmental Protection Authority (EPA) recently considered the whole Kemerton area and its surrounds in its assessment of the Industry 2030 strategy and Greater Bunbury Regional Scheme. Following discussions with involved government agencies, and based on botanical surveys in the area, areas of land surrounding the existing Kemerton Industrial Estate have been identified as containing regionally very significant native vegetation. Lot 42 Wellesley Rd falls within the environmentally significant area. (EPA Bulletin 902 pg 9, August 1998; EPA Letter to Western Australian Planning Commission, 31 August 1999 - copies attached).

The EPA recently advised the Department of Resources Development (DRD) that expansion of the Kemerton Industrial Estate into these environmentally significant areas would not be acceptable. The EPA has proposed to the Western Australian Planning Commission that these environmentally significant areas be protected for conservation purposes through the planning process.

In light of the above, it is unlikely that the EPA would endorse the proposal for sand extraction at Lot 42 Wellesley Rd, and it is likely that the proposal could attract a 'Proposal Unlikely to be Environmentally Acceptable' (PUEA) level of assessment. (PUEA is a new level of assessment under the *Environmental Protection Act 1986*. The intent of this level of assessment is to give the proponent early notice of the EPA's current thinking on the issue, given the available information, in order for the proponent to avoid an expensive assessment which may not ultimately result in a positive recommendation from the EPA. In the interests of natural justice, the proponent, of course, has the choice to request that the EPA does conduct a full formal assessment if it wishes to present additional information to the EPA. For your information, I have attached the relevant procedures as detailed in the Government Gazette, WA).

I would be pleased if you would advise the proponent accordingly and indeed invite him to contact me to discuss the issue if he so desires.

Yours sincerely

*Bernard Bowen*

Bernard Bowen  
CHAIRMAN

1 December 1999

Att

# Kemerton Silica Sands

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# Giacci Extension to Sand Mining Operation

## SAND EXTRACTION - WELLINGTON LOCATION 48, LOTS 120, 121 AND 122, OLD COAST ROAD, PARKWOOD, GIACCI HOLDINGS PTY LTD.

### Background

The proposal is for an expanded extractive industry operation within lots 120, 121 and 122 Old Coast Road (see location map, attachment 1). This would involve clearing of 80.5 hectares of native vegetation. The target mineral is yellow sand, which is used for building purposes. It is proposed to rehabilitate to pasture at completion of sand extraction.

The proponent has an existing extractive industry licence (issued by the Shire) on Lot 122. It is reported that the proponent has exceeded the extraction depth limits set by the licence (it is alleged that the existing excavation has penetrated the top of the water table).

The Commissioner for Soil and Land Conservation referred the land clearing NOI to the EPA. This followed objections raised by CALM, Agriculture WA and the Shire of Harvey. A neighbouring property owner also objected, citing concerns about the environmental management of the existing operation.

### Environmental issues

The primary environmental issue is clearing of native vegetation (80.5 hectares tuart woodland, Spearwood Complex). The area has been identified as forming part of a "unique vegetation transect." The project area falls within the conservation zone of the Kemerton land use map (DEP will bring a copy of this map and other vegetation maps to assist with discussions on site).

Other key issues are potential impacts on groundwater and on adjacent EPP wetlands (the wetlands fall partly within the proposal area).

### Status of assessment

Level of assessment was advertised as PER on 13 May 1999.

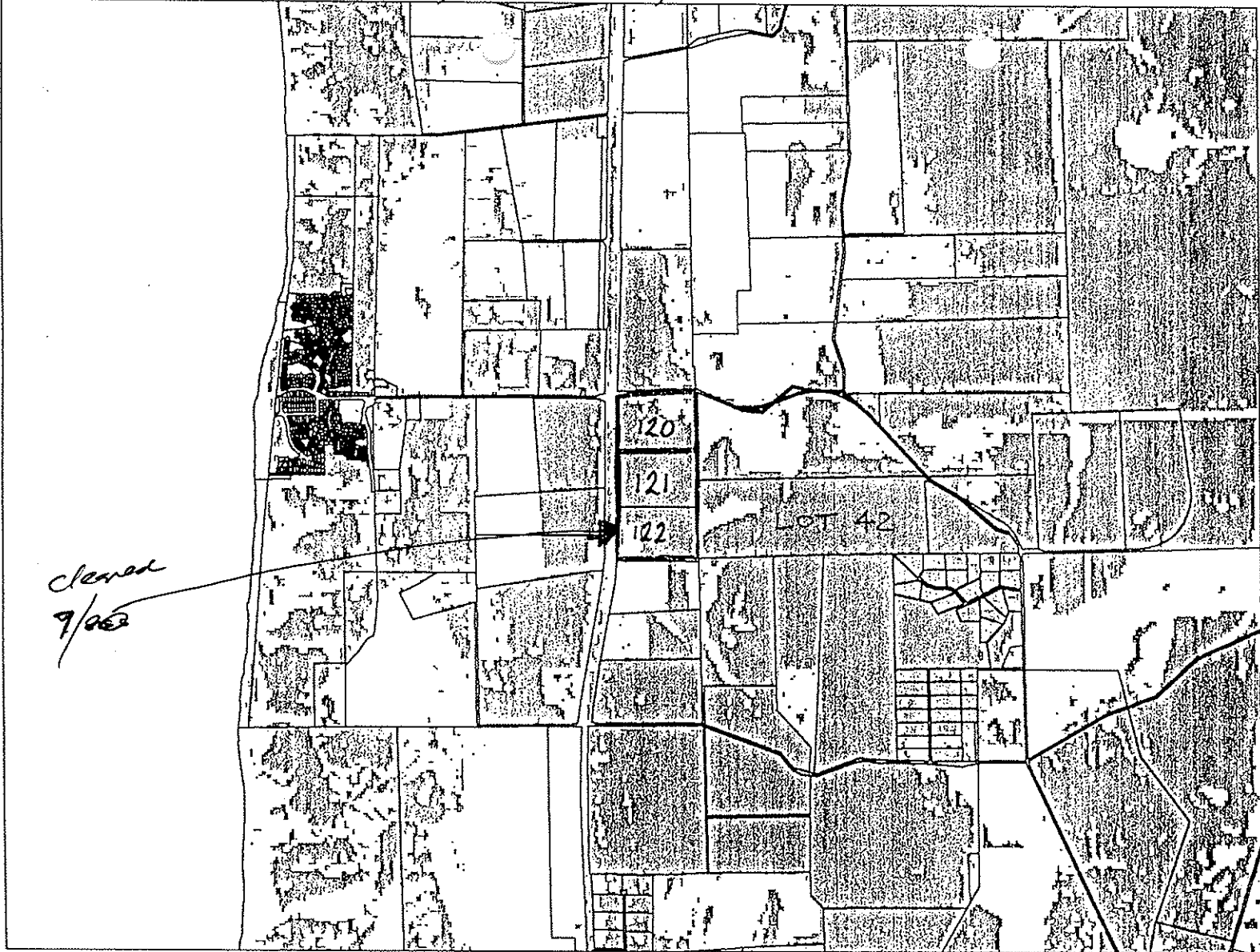
Following discussions with the DEP, the EPA Chairman wrote to the proponent on 14 July 1999 (attachment 2). In his letter, the Chairman indicated that the present proposal was unlikely to be environmentally acceptable. The Chairman suggested 3 possible options:

1. withdraw the proposal;
2. request EPA to undertake full PER assessment of existing or modified proposal; or
3. request EPA to undertake a full PER using a "staged" approach, with stage 1 to concentrate on the key factors.





















The proponent responded on 19 Oct 1999 indicating a preference for option 2 (full PER assessment).

The assessment has subsequently been "on hold" pending clarification of the EPA's views on conservation of vegetation in the Kemerton area.

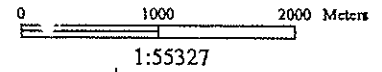
DEP has recently had some discussions with the proponent's consultant (Mr Lance Bosch of Martinick McNulty) about the possibility of restricting sand extraction to the area which is already largely cleared on the northern side of lot 120. DEP has also made it clear that there would need to be acceptable rehabilitation of the existing deep pit on lot 122.



cleared  
9/03

-  GIACCI - Lot 120
-  15 Kilometre Circle
-  Rare Flora [CALM, 1999]
-  Declared Rare Flora - Extant Taxa
-  Priority One - Poorly Known Taxa
-  Priority Two - Poorly Known Taxa
-  Priority Three - Poorly Known Taxa
-  Priority Four - Rare Taxa
-  15km CALM Managed Land 1997
-  S(g) Reserve
-  Conservation Park
-  Crown Freehold - CALM Interest
-  Executive Director Leasehold
-  Executive Director Freehold
-  Miscellaneous Reserve
-  National Park
-  Nature Reserve
-  State Forest
-  Timber Reserve
-  Cadastral Boundaries

DEP Internal Use Only



*This map has been produced using various data from other agencies. No responsibility is accepted for any error or omission.*

**WARNING:** This map has been prepared for DEP internal use only. The information should not be published or used outside DEP without consultation with the GIS Unit.

Projection: Australian Map Grid



Department of the Environment and Heritage, Western Australia



# Environmental Protection Authority

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Mr M Giacci  
Director  
Giacci Holdings Pty Ltd  
South Western Highway  
PICTON JUNCTION WA 6229

Dear Mr Giacci

**SAND EXTRACTION PROPOSAL, WELLINGTON LOCATION 48, LOTS 120, 121 AND 122, OLD COAST ROAD, PARKWOOD (EPA ASSESSMENT NO. 1274)**

Further to your meeting of 13 May 1999 with officers of the Department of Environmental Protection, I am writing to outline possible options for the environmental impact assessment of the above proposal.

The Notice of Intent to Clear (NOIC) was referred to the EPA by the Commissioner for Soil and Land Conservation. The Commissioner advised that the decision making authorities (Department of Conservation and Land Management (CALM), Agriculture Western Australia and the Shire of Harvey) had objected to the proposal.

The Environmental Protection Authority (EPA) has set the level of environmental assessment at Public Environmental Review (PER) because development of the land as proposed has the potential to cause significant environmental impacts that are locally and regionally significant.

The EPA has considered the referral, and the following key environmental issues were identified:

- the proposal area contains environmentally significant tuart woodlands;
- the proposal area is in a part of the Swan Coastal Plain which contains a unique combination of plant communities no longer found elsewhere on the Plain;
- the proposal area also includes part of the Mialla Chain of wetlands which is listed in the *Environmental Protection (Swan Coastal Plain) Policy 1991*;
- not enough information was supplied in the NOIC about the flora and fauna as there is potential for declared rare flora and fauna to be present on the site;
- there is potential for eutrophication and pollution of the superficial Bassendean Aquifer; and
- inappropriate end land use that would result in rehabilitation to pasture.

As a consequence, the EPA is likely to advise that the proposal would be environmentally unacceptable. In view of this you may wish to modify the proposal. The EPA would then assess the modified proposal based on its merits and advise the Minister for the Environment on whether the modified proposal should be implemented.

As outlined at the meeting, there are a number of ways in which you could proceed with this matter and they are as follows:

Option 1 is to simply withdraw the current proposal, in which case the EPA would not undertake its assessment.

Option 2 is to request the EPA to undertake a full environmental impact assessment (PER) (including full public consultation) of the current or modified proposal taking into account all of the environmental factors. *Applied for this.*

Option 3 is to request the EPA to undertake an environmental impact assessment (PER) of the current or modified proposal using a staged approach, whereby only the most important environmental factors would be considered in Stage 1, so as to decide as quickly as possible whether any of the most important environmental factors constitutes a "fatal flaw".

In Stage 1, the EPA would address the following key environmental factors:

- vegetation;
- groundwater;
- wetlands;
- fauna; and
- linkages between these factors (ie. ecosystem function).

Based on the information provided by the proponent and other information held by Government agencies, and following a targeted public consultation process, the EPA would submit a report to the Minister for the Environment.

If Stage 1 finds that any factor cannot be managed in an environmentally acceptable manner, the EPA would pass this advice to the Minister for the Environment with a recommendation that assessment should not proceed to Stage 2.

If it is found that the most important environmental factors can be managed in an environmentally acceptable manner, the assessment would proceed to Stage 2. It should be noted, however, that if the assessment does proceed to Stage 2, the project would still require approval by the Minister for the Environment.

In Stage 2, the EPA would examine the remaining "second tier" environmental factors in the context of the key environmental factors. The "second tier" factors would include:

- rehabilitation;
- dust;
- noise;
- visual amenity;
- road transport/traffic; and
- Aboriginal Culture and Heritage.

Additional information would be required from you at this Stage of the assessment. All of the concerns raised by the decision making authorities would have to be addressed in detail.

For your information, additional background material on the conservation values of the area can be found in the following report prepared by Muir Environmental for the Department of Resources Development: *Report of Biological Survey - Phase 1: Kemerton Industrial Estate, Volumes 1 and 2*.

As discussed at the meeting on 13 May 1999, it is your decision as to how you wish to proceed with the assessment. Please advise in writing which option you wish to adopt. Should you have any further questions, please do not hesitate to contact Mr Tim Gentle on (08) 9222 7085.

Yours sincerely

*Bernard Bowen*

Bernard Bowen  
CHAIRMAN

14 JUL 1999

cc. Mr W Martinick, Martinick McNulty Pty Ltd

V for file

## ENTERED ON GIS

**Name:** A Draft Summary Assessment of the Fauna Values of the  
Kemerton Bushland  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong

**Comments:**

*Polygon*

Created to match documented study area with low level of accuracy, actual study area unclear, buffered with a radius of 15km from the Kemerton Silica Sands mine.

Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual references with complex boundaries, resulting in minor boundary errors
- Low = Document contained little or no visual references, resulting in polygon boundary errors

*Attributes*

Report Info – Captured without problems  
Custodial/Contact – Captured without problems  
Content – Captured without problems

# A DRAFT SUMMARY ASSESSMENT OF THE FAUNA VALUES OF THE KEMERTON BUSHLAND

By JOHN DELL, CONSERVATION BRANCH, POLICY DIVISION,  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

11 SEPTEMBER, 2000

## 1 INTRODUCTION AND BACKGROUND

The mammal and bird fauna on the west coast has been documented during the past century (Moore 1884; Shortridge 1909; Glauert 1933, 1948; Serventy 1954; Storr, *et al.* 1978). This allows an evaluation of changes over time. Recent reviews indicate that only 12 of the 33 species of native mammal known from the region still occur (Kitchener *et al.* 1978). Thirteen of the 223 land bird species known from the region had become locally extinct or were on the verge of extinction by 1978 and a further 18 species had declined sharply in distribution or abundance (Storr and Johnstone 1988). Further analysis of these declines and their possible causes together with much additional information on reptiles and amphibians were presented by How and Dell (1993, 1994).

**This assessment examines the known conservation significance of the Kemerton area and relates this to the overall conservation of vertebrate fauna on the Swan Coastal Plain.**

The Kemerton bushland has been recognised as an area of significant conservation value for vertebrate fauna. Bamford & Bamford Consulting Ecologists (1999) in their "Kemerton Fauna Study and Review" presented information on the following endemic species:

- Birds - 98 species
- Reptiles - 21 species
- Amphibians - 8 species
- Mammals - 18 species
- Freshwater Fish - 2 species

and concluded that:

*"the vertebrate fauna of the Kemerton region is rich and distinctive. This distinctiveness comes from the number of species present which have declined elsewhere on the Swan Coastal Plain between Perth and Bunbury, and the number of*

*species that are of national conservation significance. In a sense the region supports a relictual assemblage of Swan Coastal Plain fauna”.*

## 2 CONSERVATION VALUES FOR FAUNA OF THE KEMERTON AREA

### 2.1 Background

The vegetation and flora conservation values of the Kemerton area have been assessed by Keighery (1998) based on a limited field assessment in 1997 and a major survey by Mattiske (1993 a,b). The assessment by Keighery (1998) stated:

*“Twenty four plant communities have been mapped, representing a diverse assemblage of communities (Mattiske 1993b). This diversity is particularly evident in the variety of wetland communities (Mattiske 1993b) as they:*

- are poorly represented regionally*
- contain populations of particularly significant flora*
- contain communities with a high diversity of native taxa*

*Summary: - The study area contains a high degree of diversity of plant communities, thirteen of which have been identified as having significance.”*

The assessment by Keighery (1998) also stated that the area *“provides a rare opportunity to conserve a transect of regional floristic groupings on the Plain through three major landform units; Spearwood Dunes, Bassendean Complex (Central and South) and Guildford Complex and the interfaces between them.”*

These vegetation and flora values are strongly reflected in the fauna values which are presented below.

### 2.2 Fauna Values

The faunal communities of the Kemerton area have been described in detail by Bamford & Bamford Consulting Ecologists (1999). They provided a list of the birds, reptiles, amphibians, mammals and freshwater fish. Although the bird and herpetofauna listings are incomplete and the total species present would be greater than those listed, the current list indicates **an extraordinarily high species richness.**

#### 2.2.1 Birds

The birds listed by Bamford & Bamford Consulting Ecologists (1999) include 61 Non-passerines and 37 Passerine species giving a total of 98 species. According to Bamford & Bamford Consulting Ecologists (1999) the habitats of the area are likely to support another 27 species if surveys were extended to cover other seasons. This is considerably more than that which occurs in other bushlands on the Swan Coastal Plain. For example, Lowlands, the only other large area on the southern Swan Coastal

Plain has a total of 88 bird species recorded over multiple surveys (Burbidge unpublished quoted in Government of Western Australia 1998b).

**Accordingly, the Kemerton bushland has a regionally rich avifauna.**

This high species diversity reflects the large size of the area as well as the floral and vegetation diversity of the area. Without these large areas of contiguous, or near, contiguous vegetation the bird species diversity would be lower. The extent of the contiguous vegetation is also of considerable value in reducing the impact of fire on bird populations. It has been well demonstrated by Dell and How (1995) that fire impacts severely on habitat specialist bird species. It is noteworthy that a number of those species highlighted by Dell and How (1995) as having declined severely on the Swan Coastal Plain are present in the Kemerton bushland.

Significantly the Kemerton bushland contains at least 30 species of those birds listed by Government of Western Australia (1998a) as having special conservation significance on the Swan Coastal Plain as they are either habitat specialists with a reduced distribution on the Swan Coastal Plain or they are wide-ranging species with reduced populations on the Swan Coastal Plain. Based on known distributions (Storr and Johnstone 1988) it is likely that several other of these significant bird species are also likely to occur.

Another significant value of the Kemerton bushland is in facilitating the seasonal migration of small Passerine birds. A number of species move northwards at the beginning of winter and move southwards in spring. These require native vegetation for food, shelter and roosting sites while in transit.

This area would also have long-term value in maintaining genetic movement between different areas and thus having a significant role in the conservation of Australia's biological diversity.

### **2.2.2 Reptiles**

The reptiles listed by Bamford & Bamford Consulting Ecologists (1999) includes 21 species with the possibility that another 10 species could occur.

The regional significance of the herpetofaunal assemblage at Kemerton is highlighted by the presence there of several reptile species that have either disappeared from or declined over most of the Swan Coastal Plain or are known from few localities on the Swan Coastal Plain.

### **2.2.3 Amphibians**

Bamford & Bamford Consulting Ecologists (1999) list 8 species of amphibians with the possibility that another species could occur. This area is one of the richest on the Swan Coastal Plain for amphibians (see How and Dell 2000).

#### 2.2.4 Mammals

The mammals listed by Bamford & Bamford Consulting Ecologists (1999) includes 18 species with a possibility that another seven species could occur.

Studies elsewhere on the Swan Coastal Plain, especially that by How and Dell (2000), show that no other area approaches this richness.

The report by Bamford and Bamford (1999) **highlights the significance of the area for native mammals**. The recorded mammal fauna included two species of regional significance and four species of national conservation significance. The Honey Possum and Pygmy Possum have declined on the Swan Coastal Plain especially between Mandurah and Busselton. The Chuditch is rarely recorded anywhere on the Swan Coastal Plain, the Quenda has declined severely, the Brush Wallaby and Water Rat have declined and are now restricted to larger areas of suitable habitat.

This decline mirrors declines on the Coastal Plain in the Perth Metropolitan Area where How and Dell (1993, 2000 in press) concluded that native mammals are the **most disadvantaged vertebrates in urban remnants with few species surviving the effects of long-term fragmentation**. Native mammals were locally extinct in most remnant bushlands surveyed.

There is no known relationship between the number of species of native mammals on Swan Coastal Plain remnants and the size of the area (How & Dell, 2000). This is because there has been a catastrophic decline in native mammal species and remaining species survive on too few remnants to assess minimum size needed for their survival. However, studies elsewhere demonstrate clearly that the larger the remnant area the greater the likelihood that mammal species will survive.

#### 2.2.5 Freshwater Fish

The report by Bamford & Bamford Consulting Ecologists (1999) includes two species of native fish. One species *"the Black-striped Jollytail was an unexpected find, as the species was previously thought to be confined to wetlands on the south coast between Northcliffe and near Albany. Because of its limited range, it is classified as Priority 4 by CALM, although the Kemerton population is of special significance because it is presumably a relict from when the species was more widespread"*.

### 3 GENERAL SUMMARY

The studies referred to in this assessment have recognised the significance of the area for vertebrate fauna. Specifically they identify the major values to the vertebrate fauna

as being:

- the number of ecosystems represented as well as providing buffers, replications and interchange between the ecosystems.
- the large size of the bushland area.
- the facilitation of fauna movement and the ability to manage the area to protect its important ecological functions against perturbations including fire (see references on fire especially Bamford 1986, 1992; Dell and How 1995), weed invasion and disturbance (see references especially How and Dell 1993, 1994, 2000).

The Kemerton bushland has significant regional conservation value for vertebrate fauna as it:

*Has a rich and distinctive vertebrate fauna with considerably more species of vertebrates than is known from any other area on the Swan Coastal Plain. This distinctiveness is further emphasised by the number of species present which have declined elsewhere on the Swan Coastal Plain between Perth and Bunbury, and the number of species that are of national conservation significance. In a sense the region supports a large relictual assemblage of Swan Coastal Plain fauna”.*

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## ENTERED ON GIS

**Name:** A Description of the Faunal Values of the Muddy Lakes Area of the South Bunbury to Capel Coastal Corridor  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong / Ian Steward

### **Comments:**

#### *Polygon*

Created to match documented study area with low level of accuracy

#### Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual references with complex boundaries, resulting in minor boundary errors
- Low = Document contained little or no visual references, resulting in polygon boundary errors

#### *Attributes*

Report Info – Captured without problems

Custodial/Contact – Captured without problems

Content – Captured without problems

## A DESCRIPTION OF THE FAUNAL VALUES OF THE MUDDY LAKES AREA OF THE SOUTH BUNBURY TO CAPEL COASTAL CORRIDOR

J. DELL and B. HYDER-GRIFFITHS

Department of Environmental Protection, P.O. Box K822, Perth, WA, 6842

DECEMBER 2002

### 1. INTRODUCTION

#### 1.1 The Study Area

The study area is part of the South Bunbury to Capel Coastal Corridor between the Maidens and Minninup Beach (see Map 1 in Keighery *et al.* (2002)). The area is described by Keighery *et al.* (2002) and contains the largest most southern vegetated remnant of the Quindalup Dunes on the Swan Coastal Plain. Within these naturally vegetated (after Beeston *et al.* 2001) Quindalup Dunes is a contiguous eastern wetland chain with an area of open water known as Muddy Lake.

Part of the study area including Muddy Lake and Daleyellup, have been recognised for reservation as Regional Open Space on the basis of their natural values (Keighery *et al.* 2002). While the natural values of the Coastal Corridor have been identified in a series of regional studies and several area specific studies, there has been insufficient information to adequately assess the area for specific fauna values.

#### 1.2 Background to the Fauna

The vertebrate species occurring on the Coastal Plain part of the region south of Bunbury are relatively well known from general publications, and references therein, especially Storr (1991), Storr and Johnstone (1988, 1998) and Serventy and Whittell (1976) for birds and How *et al.* (1987) for ground vertebrates. However there is little specific information available on current assemblages in different remnant vegetation remaining in the region. Information on the fauna of some specific sites within the area is available in unpublished reports especially Bow (1999), Dell *et al.* (2002) and Alan Tingay and Associates (1998).

As indicated by Shortridge (1909, 1936), How *et al.* (1987) and How and Dell (1993, 2000) there have been dramatic changes in the vertebrate assemblages in coastal parts of the South-west as a result of impacts following European colonisation. The clearing of native vegetation and the fragmentation of the remaining vegetation leads to the destruction of plant and animal communities. Changes in the vertebrate fauna of the Swan Coastal Plain are a consequence of one or several modifications including urban and agricultural development leading to habitat loss or fragmentation, altered regimes of fire frequency and intensity, introduced competitors and predators and the draining and filling of wetlands. However, little is known about the current status and conservation requirements of most faunal species in the region.

The current distribution of many bird species especially those that are listed in Table 15 in *Bush Forever* (Government of Western Australia 2000) as habitat specialists with a reduced distribution on the Swan Coastal Plain or which are wide-ranging species with reduced populations on the Swan Coastal Plain is poorly known in the region. This is a significant issue in

biodiversity conservation on this part of the Coastal Plain as there have been marked reductions in range and population levels of many sedentary bird species as a consequence of disturbance and land clearing. The role of different remnants in the region in facilitating seasonal movement of birds and the role of remnants in facilitating long-term genetic movement between populations is yet to be determined.

## 2 ASSESSMENT: 1-3 October 2002

### 2.1 Methods

The survey was undertaken over three days (1-3 October 2002) by J. Dell and B. Hyder-Griffiths. A series of transects were walked and driven to assess habitat values and record all vertebrate fauna observed in the different plant communities. The information from the survey is discussed and preliminary conclusions made as to the regional significance of the area for vertebrate fauna. Seven broad vertebrate habitats were recognized as components of the damplands, sumplands, lakes and Quindalup Dunes as described by Keighery et al. (2002):

- Lakes comprising open water and vegetated areas with *Typha orientalis*, various sedges and *Baumea*. These equate to: *Typha orientalis/Juncus pallidus* Sedgeland; Sedgelands dominated by *Baumea articulata*, *B. juncea*, \**Typha orientalis*, *T. domingensis*, *Juncus pallidus*, *Lepidosperma ?effusum*, *L. gladiatum*, *Carex appressa*, *Carex fasciculata*, *C. tereticaulis*, *Schoenoplectus pungens*, *Schoenoplectus validus* and *Gahnia trifida oligandrus* and/or combinations of these. **Quindalup Dune Swale Damplands;**
- Dense fringing vegetation on coastal side of Muddy Lake and Daleyellup lake. These equate to: *Acacia saligna* Scrub, *Isolepis nodosus/Lepidosperma angustatum* Sedgeland, *Melaleuca raphiophylla* Low Forest, *Melaleuca raphiophylla* Scrub. **Quindalup Dune Swale Damplands;**
- Wetland woodland of Tuart, *Eucalyptus gomphocephala* with an understorey of *Agonis flexuosa*, and patches of *Gahnia trifida* and *Lepidosperma* sp. These equate to: *E. gomphocephala/A. flexuosa* Forest, **Quindalup Dune Swale Damplands;**
- *Agonis flexuosa* woodlands. These equate to: *Agonis flexuosa* Mallee *Agonis flexuosa* Scrub, **Quindalup Dune Swale Damplands;**
- Wetland swamps dominated by a series of species including *Banksia littoralis*, *Agonis flexuosa*, *Acacia saligna*, and *Xanthorrhoea preissii* with a dense diverse understorey. *Banksia littoralis/Xanthorrhoea preissii* Shrubland, **Quindalup Dune Swale Damplands;**
- Quindalup Dunes heaths. These equate to: Coastal Heath on primary dunes *Spinifex/Olearia* Heath, Coastal Heath on primary dunes *Scaevola crassifolia/Diplolaena dampieri/Hemiandra pungens* Heath; Coastal Heath on secondary dunes *Acacia cochlearis/Jacksonia furcellata* Heath with *Scaevola paludosa* common; Coastal Heath on secondary dunes *Olearia axillaris/Scaevola crassifolia* Heath; Coastal Heath on secondary dunes *Acacia cochlearis/Jacksonia furcellata* Heath; and
- Cleared farmland with a mixture of introduced pasture grasses, clovers and weeds. These equate to: **Cleared Habitat.**

### 2.2 Results

The assessment on 1-3 October 2002 recorded 76 vertebrate species comprising five amphibians, four reptiles, five native mammals and 62 bird species.

#### 2.2.1 Amphibians and Reptiles

Five frog species were recorded during 1-3 October 2002 (Table 1). Distributional records based on Tyler *et. al.* (2000) indicate that another 2 species (*Helioporus eyrei* and *Geocrinia leai*) are known from the area. Tadpoles of *Crinia glauerti*, *Litoria adelaidensis* and *Litoria moorei* were all present at Muddy Lakes and *Limnodynastes dorsalis* and *Crinia insignifera* were also calling.

Four reptile species were recorded during 1-3 October 2002 (Table 1). Systematic surveys at appropriate seasons would be required to determine the reptile species present in the area.

**Table 1:** List of the amphibian and reptile species recorded on 1-3 October 2002.

Key to symbols: x = sightings; b = breeding.

AMPHIBIAN SPECIES	Lake	Fringes	Tuart	Agonis	Swamp	Dunes	Clear
Glauert's Froglet, <i>Crinia glauerti</i>	xb	x					x
Squelching Froglet, <i>Crinia insignifera</i>	xb	x					x
Banjo Frog, <i>Limnodynastes dorsalis</i>	x	x					
Slender Tree Frog, <i>Litoria adelaidensis</i>	xb	x					
Motorbike Frog, <i>Litoria moorei</i>	xb	x					
REPTILE SPECIES							
Long-necked Turtle, <i>Chelodina oblonga</i>	x						
Swamp Skink, <i>Acritoscincus trilineatum</i>		x	x				
Western Pale-flecked Morethia, <i>Morethia lineoocellata</i>						x	
Western Tiger Snake, <i>Notechis scutatus</i>		x	x				

### 2.2.2 Mammals

Five species of native mammals were recorded during 1-3 October 2002 (Table 2). These included four conservation significant species which are discussed in Section 3 below.

**Table 2:** List of the mammal species recorded on 1-3 October 2002.

Key to symbols: t = tracks; s = scats; r = runways; d = dreys; x = sightings; Conservation significant codes: P = CALM Priority 1 to 4; Sc1 = Schedule 1; CD = Conservation dependant; VU = Vulnerable.

MAMMAL SPECIES	Significance	Lake	Fringes	Tuart	Agonis	Swamp	Dunes	Clear
Quenda, <i>Isodon obesulus</i>	P4 CD	t	r			r		
Western Ringtail Possum, <i>Pseudocheirus occidentalis</i>	Sc1 VU				d			
Western Grey Kangaroo, <i>Macropus fuliginosus</i>		x					x	x
Quokka, <i>Setonix brachyurus</i>	Sc1 VU		rs			rs		
Water-rat, <i>Hydromys chrysogaster</i>	P4	x						

### 2.2.3 Birds

64 species recorded in October 2002 (Table 3).

The area has a high bird diversity with a significant number of species with reduced Swan Coastal Plain distributions or species which are wide-ranging but with reduced populations on the Swan Coastal Plain (Government of Western Australia 2000). Species of conservation significance in the area include Baudin's Cockatoo, Splendid Fairy-wren, Southern Emu-wren, White-browed Scrubwren, Weebill, Broad-tailed Thornbill, Yellow-rumped Thornbill, and a large number of waterbirds.

**Table 3:** List of the bird species recorded on 1-3 October 2002.

Key to symbols: x = sightings; b = breeding

Sc1 = Schedule 1; Conservation category 3 and 4 after Government of Western Australia (2000): Cat 3 = habitat specialists with a reduced distribution on the Swan Coastal Plain;

Cat 4 = wide-ranging species with reduced populations on the Swan Coastal Plain.

BIRD SPECIES	Significance	Lake	Fringes	Tuart	Agonis	Swamp	Dunes	Clear
Musk Duck, <i>Biziura lobata</i>	Cat 3	x						
Black Swan, <i>Cygnus atratus</i>		xb	xb					
Australian Shelduck, <i>Tadorna tadornoides</i>		x						x
Grey Teal, <i>Anas gracilis</i>		x	x	x				
Pacific Black Duck, <i>Anas superciliosa</i>		x	x	x				x
Australasian Grebe, <i>Tachybaptus novaehollandiae</i>		x						
Great Cormorant, <i>Phalacrocorax carbo</i>		x						
White-necked Heron, <i>Ardea pacifica</i>								x
White-faced Heron, <i>Ardea novaehollandiae</i>		x	x					x
Great Egret, <i>Ardea alba</i>	Jamba/Camba		x					x
Australian White Ibis, <i>Threskiornis molucca</i>			x	x				x
Straw-necked Ibis, <i>Threskiornis spinicollis</i>								x
Yellow-billed Spoonbill, <i>Platalea flavipes</i>		x						
Black-shouldered Kite, <i>Elanus caeruleus</i>		x						x
Square-tailed Kite, <i>Hamirostra isura</i>	Cat 4			x	x			
Whistling Kite, <i>Haliastur sphenurus</i>	Cat 4	x	x	x		x		
Little Eagle, <i>Aquila morphnoides</i>	Cat 4			x		x		
Marsh Harrier, <i>Circus approximans</i>		x	x					x
Australian Kestrel, <i>Falco peregrinus</i>								x
Purple Swamphen, <i>Porphyrio porphyrio</i>		x	x					
Dusky Moorhen,	Cat 3	x						

<i>Gallinula tenebrosa</i>								
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Table 3 continued

BIRD SPECIES	Significance	Lake	Fringes	Tuart	Agonis	Swamp	Dunes	Clear
Eurasian Coot, <i>Fulica atra</i>		x						
Common Bronzewing, <i>Phaps chalcoptera</i>	Cat 3	x	x	x	x	x		
Crested Pigeon, <i>Ocyphaps lophotes</i>								x
Baudin's Cockatoo, <i>Calyptorhynchus baudinii</i>	Sc 1, Cat 4			x				
Galah, <i>Cacatua roseicapilla</i>				x				x
Australian Ringneck, <i>Platycercus zonarius</i>			x	xb		x		x
Red-capped Parrot, <i>Platycercus spurius</i>			x	xb	x			
Western Rosella, <i>Platycercus icterotis</i>	Cat 4			x	x			
Elegant Parrot, <i>Neophema elegans</i>				x				x
Fan-tailed Cuckoo, <i>Cacomantis flabelliformis</i>				x	x			
Shining Bronze Cuckoo, <i>Chrysococcyx lucidus</i>				x	x			
Tawny Frogmouth, <i>Podargus strigoides</i>								x
Laughing Kookaburra, <i>Dacelo novaeguinea</i>			x	xb				
Splendid Fairy-wren, <i>Malurus splendens</i>	Cat 3		x	xb	x	x	x	
Southern Emu-wren, <i>Stipiturus malachurus</i>	Cat 3					x	x	
Striated Pardalote, <i>Pardalotus striatus</i>				xb				
White-browed Scrubwren, <i>Sericornis frontalis</i>	Cat 3		x	x	xb	xb	x	
Weebill, <i>Smicrornis brevirostris</i>	Cat 3			x				
Western Gerygone, <i>Gerygone fusca</i>			x	x	x			
Broad-tailed Thornbill, <i>Acanthiza apicalis</i>	Cat 3		x	x	x			
Yellow-rumped Thornbill, <i>Acanthiza chrysorrhoa</i>	Cat 3			x	xb			
Brown Honeyeater, <i>Lichmera indistincta</i>			x	x	x	x		
New Holland Honeyeater, <i>Phylidonyris novaehollandiae</i>	Cat 4		x		x	x		
Red Wattlebird, <i>Anthochaera carunculata</i>			x	x	x			

Table 3 continued

BIRD SPECIES	Significance	Lake	Fringes	Tuart	Agonis	Swamp	Dunes	Clear
Golden Whistler, <i>Pachycephala pectoralis</i>	Cat 3			x		x		
Rufous Whistler, <i>Pachycephala rufiventris</i>				x				
Grey Shrike-thrush, <i>Colluricincla harmonica</i>	Cat 3			x		x		
Grey Fantail, <i>Rhipidura fuliginosa</i>			x	x	x			
Willie Wagtail, <i>Rhipidura leucophrys</i>			x	x	x	x		x
Magpie-lark, <i>Grallina cyanoleuca</i>								x
Black-faced Cuckoo-shrike, <i>Coracina novaehollandiae</i>				xb	x			
Australian Magpie, <i>Cracticus tibicen</i>			x	x			x	x
Grey Butcherbird, <i>Cracticus torquatus</i>			x	x	x	x		
Australian Raven, <i>Corvus coronoides</i>		x	x	xb		x		x
Tree Martin, <i>Hirundo nigricans</i>		x		xb				x
Welcome Swallow, <i>Hirundo neoxena</i>		x	x	x	x			x
Grey-breasted White-eye, <i>Zosterops lateralis</i>			x	xb	x	x		
Australian Reed Warbler, <i>Acrocephalus australis</i>		x	x					
Little Grassbird, <i>Megalurus gramineus</i>		x	x					
Australian Pipit, <i>Anthus australis</i>								x

### 3 CONSERVATION SIGNIFICANT FAUNA SPECIES

A number of Threatened faunal species and Priority Faunal species are known from or are likely to occur in the south Bunbury to Capel coastal corridor but no detailed surveys have been conducted to determine their current distribution, population size, or conservation significance in different remnants in the study area. Those species recorded during the October survey are listed below.

#### 3.1 Reptiles

The Bunbury Skink, *Glaphyromorphus 'koontoolasi'* is currently unnamed (see Note 60 in Aplin and Smith 2001). It is listed as Priority 1 on CALM's Priority Fauna list. Priority 1 listed species need urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna. The taxonomic status of the Bunbury Skink was assessed by Aplin and Dell (1998) who determined that it was specifically distinct from the Southern Mulch Skink, *G. gracilipes*. Despite recent searches in the Bunbury region (Aplin pers. comm.) no

extant population has been discovered. This species was known to previously occur in low-lying or swampy areas and it could occur at Muddy Lakes or similar areas.

### 3.2 Mammals

#### **Quenda, *Isoodon obesulus***

The Quenda, *Isoodon obesulus*, is currently listed on CALM's Priority Fauna list and ranked Priority Four as Conservation Dependent by the Threatened Species Consultative Committee.

Numerous diggings and runways in swamp sites 6D, 11D1, 11D2 (see Figure 1 after Map 2C.2 in Keighery *et al.* 2002 ) and the dense vegetation on the western side of Muddy Lakes.

#### **Western Ringtail Possum, *Pseudocheirus occidentalis***

The Western Ringtail Possum, *Pseudocheirus occidentalis*, is currently listed on Schedule 1 of the Wildlife Conservation Act 1950 as fauna that is rare or likely to become extinct and is currently ranked as Vulnerable by the Threatened Species Consultative Committee.

Two dreys were recorded in *Agonis flexuosa* woodlands.

#### **Quokka, *Setonix brachyurus***

The Quokka, *Setonix brachyurus*, is listed on Schedule 1 of the Wildlife Conservation Act 1950 as fauna that is rare or likely to become extinct and is currently ranked as Vulnerable by the Threatened Species Consultative Committee.

Numerous Quokka runways and some scats were recorded in dense fringing vegetation on the western side of Muddy Lakes and dampland site 6D (see Figure 1, in Map 2C.2 in Keighery *et al.* 2002) in October 2002.

Quokkas were previously known to occur at Muddy Lakes. Road kill specimens have been collected recently e.g. a skull was sent to the Western Australian Museum in 1975 and other specimens are recorded in the Museum observational database. Carcasses had been brought into CALM in Bunbury sporadically up until about two years ago. Alan Tingay and Associates (1991) did not refer to the Museum database but referred to "persistent observation records from Muddy Lake by local people but which has not been positively confirmed in the area".

The current size of the population of the Quokka at Muddy Lakes and other sites in the region is yet to be determined.

#### **Water Rat, *Hydromys chrysogaster***

The Water Rat, *Hydromys chrysogaster*, is currently listed on CALM's Priority Fauna list and ranked by the Threatened Species Consultative Committee as Priority Four: Taxa in need of monitoring. These are "Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands".

A Water Rat was recorded during the daytime in a drainage channel on the western side of Muddy lakes south of the water corporation drain during the October 2002 survey.

### 3.3 Birds

#### **Baudin's Cockatoo, *Calyptorhynchus baudinii***

Baudin's Cockatoo, *Calyptorhynchus baudinii*, is currently listed on Schedule 1 of the Wildlife Conservation Act 1950 as fauna that is rare or likely to become extinct and is currently ranked as Vulnerable by the Threatened Species Consultative Committee.

Several were recorded in Tuart woodland during the October 2002 survey.

#### **3.4 Other Species**

Other Threatened or Priority fauna Species that are currently still known from and could have significant populations in the study area include Carpet Python, *Morelia spilota*, and Western Brush Wallaby, *Macropus irma*.

An assessment of the conservation values to fauna of remnant bushland in the south Bunbury to Capel coastal corridor needs to assess the total fauna present (level of survey should be indicated), faunal assemblages in different remnants, significant fauna (including Threatened Fauna, Specially Protected Fauna, Priority Fauna, range extensions, species at geographic limits, species with reduced distributions or species which are wide-ranging but with reduced populations). The role of ecological linkages between remnants and reserve areas and other adjacent bushland areas need to be addressed.

## **4 FAUNAL VALUES**

The study area has significant regional conservation value for vertebrate fauna and has a high diversity of all vertebrate groups see Section 2.2. Specifically its major vertebrate fauna values are:

- The area provides habitat for three Specially Protected mammal species and two Priority mammal species. Other Specially Protected or Priority fauna species are likely to occur;
- The area has a rich and diverse bird assemblage. This distinctiveness is further emphasised by the number of species present which have declined elsewhere on the Swan Coastal Plain between Perth and Bunbury, and the number of species that are of regional conservation significance. Species of conservation significance in the area include Baudin's Cockatoo, Splendid Fairy-wren, Southern Emu-wren, White-browed Scrubwren, Weebill, Broad-tailed Thornbill, Yellow-rumped Thornbill. The area also provides habitat for a large number of waterbirds; and
- The diversity and connectivity of habitats facilitates bird movement in this part of the Coastal Plain and also enables genetic diversity to be retained between populations of vertebrates.

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## ENTERED ON GIS

**Name:** EPA Site Visit Bunbury– Ludlow Titanium Mineral Sands Mine  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong

### **Comments:**

#### *Polygon*

Created to match documented study area with acceptable level of accuracy

#### Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual references with complex boundaries, resulting in minor boundary errors
- Low = Document contained little or no visual references, resulting in polygon boundary errors

#### *Attributes*

Report Info – Captured without problems

Custodial/Contact – Captured without problems

Content – Captured without problems

## ENTERED ON GIS

**Name:** EPA Site Visit Bunbury – Proposed Sand/Limestone Extraction,  
Gelorup  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong

**Comments:**

*Polygon*

Created to match documented study area with acceptable level of accuracy

Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual references with complex boundaries, resulting in minor boundary errors
- Low = Document contained little or no visual references, resulting in polygon boundary errors

*Attributes*

Report Info – author unclear/not noted, entered as unknown

Custodial/Contact – Captured without problems

Content – Captured without problems

## ENTERED ON GIS

**Name:** EPA Site Visit Bunbury – Greater Bunbury Region Scheme  
**Date:** 02/05/2006  
**Capture Author:** Thomas Leong

**Comments:**

*Polygon*

Created to match documented study area with high level of accuracy

Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual references with complex boundaries, resulting in minor boundary errors
- Low = Document contained little or no visual references, resulting in polygon boundary errors

*Attributes*

Report Info – Captured without problems

Custodial/Contact – Captured without problems

Content – Captured without problems

**EPA SITE VISIT**

**BUNBURY**

**6-7 FEBRUARY 2003**

# ITINERARY - SITE INSPECTION BUNBURY

6 - 7 FEBRUARY 2003

Thursday 6th  
February

0815 Depart Perth  
2 x vehicle for 2 days (Chairman and Exec Officer vehicles).  
1 x DEWCP 6 cylinder Station Wagon (Warren Tacey) -  
6/2/03  
1 x DEWCP 6 cylinder vehicle (J Dell) - 6/2/03 noon  
1 x Avis (Welshpool Office) 4WD vehicle (Gary Williams) -  
6/2/03 noon

1030 - 1545

## Ludlow Mineral Sands Mine Proposal

1030 Attendees meet at Cable Sands  
Northshore offices, Bunbury

1030 - 1115 Introductions, morning tea and brief  
presentation by Cable  
Sands.

1115-1145 Drive to Ludlow deposit in Cable Sands  
supplied bus. (2xEPA vehicles to follow  
- leave vehicles at Ludlow Mine Site.

1145-1245 Traverse the mining tenement and  
discuss relevant points of  
interest.

1245-1315 View proposed 56ha land donation  
adjoining the Wonnerup  
Estuary.

1315- 1415 Drive to Capel and lunch at Bubbling  
Billy café (discussion over lunch)

1415-1445 Drive to Dunkley property (North  
Capel) and view 14yo Tuart trees  
growing on previously mined soil.

1445-1530 Drive to Stratham to view proposed  
35ha land donation.

1530-1545 Return to Ludlow Mine site - EPA  
members to depart in EPA vehicles.

**DEP Project Officer:** Murray Hogarth

1545 - 1640

Travel to and visit proposed sand/limestone extraction,  
Location 41 Lots 313-317, Gelorup. (view from road)  
Issue is clearing during PER process for Sand Mining  
proposal.  
Also proposed as urban deferred in Bunbury Region Scheme.

**DEP Project Officers:** Gary Williams, Bronwen Keighery,  
John Dell (will meet EPA -Cnr Harewoods Road)

1700 Arrive Lighthouse Beach Resort, Bunbury  
(Book in)

1900 Dinner (Louisa's, 15 Clifton Street, Bunbury) –  
Bunbury Regional Manager will join the EPA for dinner.  
(Booked for 11 people)

Overnight

**Friday 7th  
February**

0730 - 0830 Breakfast (continental at hotel)  
(Check out of Lighthouse Beach Resort)

0900 - 1030 Meeting with Bunbury Department of Planning and  
Infrastructure staff to be briefed on Greater Bunbury Region  
Scheme  
Department of Planning and Infrastructure office, 6<sup>th</sup> Floor,  
Bunbury Tower, 61 Victoria Street, Bunbury  
**DEP Project Officers:** Gary Williams/Bronwyn Keighry/John  
Dell

1030 – 1430 Visit Greater Bunbury Region Scheme sites where  
environmental issues are still to be resolved.  
(including picnic lunch)

**DEP Project Officer:** Gary Williams/Bronwyn Keighry/John  
Dell

1630 Arrive Perth

**Attendees**

**EPA**

Bernard Bowen      Libby Matiske      Wally Cox      Graeme French

**EPA Service Unit**

Kim Taylor, Director, Environmental Impact Assessment Division  
Warren Tacey, Assistant Director, Environmental Impact Assessment Division  
(Mobile 0400 866 456)  
Tim Gentle, Manager, Mining and Petroleum Assessments  
Murray Hogarth – Project Officer, Mining and Petroleum Assessments - Ludlow  
Mineral Sands Mine  
Darren Walsh, Manager, Planning Assessments  
Gary Williams–Project Officer      }  
Browen Keighery –Ecological Systems Branch      } Greater Bunb. Region Scheme  
John Dell –Ecological Systems Branch      }

**DEWCP South West Regional Office**

Wayne Tingey, Regional Manager Tel:9726 4111      Mobile:0417 916 506

**Ludlow Mineral Sands Mine – Cable Sands**

***Proponent Representatives – Cable Sands***

Mr Collis Thorpe (Managing Director)  
Mr Gary Crockford (General Manager)  
Mr Gary Fee (Environmental Superintendent)  
Mr Brant Edwards (Project Environmental Officer)  
Mr Darren Brearley (Rehabilitation Consultant)

***CALM Representatives***

Mr Norm Caporn (Coordinator, Mining and Petroleum)  
John McGrath (Group Manager, Forests and Tree Crops)-Mobile 0417 995 100  
Mr Bob Chandler (CALM Regional Manager)-Mobile 0418 908 228

**Greater Bunbury Region Scheme – Department of Planning and Infrastructure**

***Proponent Representatives – Department of Planning and Infrastructure***

Mr Larry Guise – Regional Manager, South West Planning Services  
Mr Mike Schramm – Coordinator, Local and Regional South West Planning Services  
Jerum Hurley – Manager of the Greater Bunbury Region Scheme

**Contacts**

Lighthouse Beach Resort - Tel: 9721 1311      Fax: 9721 3584 (\$78 per room including  
continental breakfast)  
Louisa's Restaurant, 15 Clifton Street, Bunbury – Tel: 9721 9959  
Do It Yourself Lunch Bar, 42 Victoria Street, Bunbury Tel: 9791 1868 (confirm  
Lunch week prior to visit)  
Department of Planning and Infrastructure, Bunbury Tel: 9791 0577  
Gary Williams – Mobile 0404 816 007  
Graeme French mobile phone will be on at all times 0400 866 408

Cable Sands – Brant Edwards Tel: 9721 0229

## **Vehicle Arrangements - Logistics**

### **6/2/03 – Depart Perth**

3 x vehicles – B Bowen, G French, W Tacey

#### Occupants

B Bowen, E Bowen, L Mattiske, G French, K Taylor, W Tacey, T Gentle and M Hogarth

#### Notes:

1. On arrival at Cable Sands Office, Bunbury Esme' to take Bernard's vehicle
2. Meet B Chandler, Norm Caporn and J McGrath at Cable Sands Office, Bunb.
3. W Cox and B Kieherly already in Bunbury and will meet at Cable Sands Office, Bunbury

### **6/2/03 – Depart Cable Sands Office, Bunbury for Ludlow Tour**

1 x Bus

#### Occupants

B Bowen, L Mattiske, W Cox, K Taylor, T Gentle, M Hogarth, B Keighery, C Thorpe, G Crockford, G Fee, B Edwards, D Brearley, N Caporn, J Mc Grath and B Chandler

#### Notes:

1. Leave W Cox, B Chandler and Norm Caporn vehicles at Cable Sands Office, Bunbury to collect at end of tour
2. 2 x vehicles to follow bus to Ludlow Minerals Sands Mine Site to be left during tour (G French and W Tacey)
3. W Tingey has morning meeting in Busselton but will meet at Ludlow Minerals Sands Mine Site
4. G French, W Tacey and W Tingey to join bus at Ludlow mine site for tour

### **6/2/03 – Depart Ludlow Mineral Sands Mine Site for Gelorup Sand/Limestone Extraction Proposal**

3 x vehicles – W Tingey, G French and W Tacey

#### Occupants

B Bowen, L Mattiske, W Cox, G French, K Taylor, W Tacey, T Gentle, M Hogarth, W Tingey and B Keighery,

#### Notes:

1. Cable Sands Bus with CALM and Cable Sands representatives return to Bunbury

### **Meet at site Gelorup Sand/Limestone Extraction Proposal**

2 x vehicles – G Williams and J Dell

#### Occupants

D Walsh, G Williams and J Dell

**6/2/03 Depart Gelorup Sand/Limestone Extraction Proposal Site for Perth**

1 x vehicle – Warren Tacey

Occupants

W Tacey, T Gentle and M Hogarth

**6/2/03 Depart Gelorup Sand/Limestone Extraction Proposal Site for Bunbury Overnight**

3 x vehicles – J Dell and G Williams  
(Pick-up W Cox vehicle from Cable Sands, Bunbury on-route)

Occupants

B Bowen, L Mattiske, W Cox, G French, K Taylor, G Williams,  
B Keighery, D Walsh and J Dell

Notes:

1. W Tingey returns to Bunbury in own vehicle

**7/2/03 Depart Hotel to Bunbury DPI Office**

4 x vehicles – G French, W Cox, J Dell and G Williams

Occupants

B Bowen, L Mattiske, W Cox, G French, K Taylor, G Williams,  
B Keighery, D Walsh and J Dell

Note:

1. Meet W Tingey at DPI Office

**7/2/03 Depart Bunbury DPI Office for Greater Bunbury Region Scheme Site Tours**

3 x 4WD vehicles – G Williams, W Tingey and DPI rep.

Occupants

B Bowen, L Mattiske, W Cox, G French, K Taylor, G Williams,  
B Keighery, J Dell, D Walsh, W Tingey, L Guise, M Schramm and J Hurley

Note:

1. W Cox will follow tour in his vehicle and join tour party in 4WD at each site. He will depart for Perth at 1pm to attend other appointments.
2. Leave G French and J Dell vehicles at DPI Office to collect at end of tour.

7/2/03 Depart at end of Greater Bunbury Region Scheme Site Tours from DPI  
Office for Perth

2 x vehicles - J Dell and G Williams

Occupants

L Mattiske, K Taylor, G Williams,  
B Keighery, D Walsh and J Dell

Notes:

1. J Dell to collect vehicle from DPI Office for return trip to Perth.
2. G French to collect his vehicle and drop B Bowen of at Hotel. Both G French and B Bowen staying over in Bunbury)

**LUDLOW TITANIUM  
MINERAL SANDS MINE**

**TO:** EPA members  
**FROM:** Murray Hogarth  
**SUBJECT:** Ludlow Titanium Minerals Mine — Site visit 6 February 2003  
**DATE:** 24 JANUARY 2003

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### **Purpose of the visit**

To familiarise the EPA with the proposal area, and to view past rehabilitation works and proposed offsets.

The EPA will be finalising its assessment of this proposal shortly after this site visit.

### **The proposal**

The proponent, Cable Sands (WA) Pty Ltd wishes to develop a mineral sands mine in a section of State Forest No.2, 34 km south of Bunbury. The mining area (Refer to Figures 1 and 2) is located between the north and south parts of the Tuart Forest National Park. The mining area is covered by a tall tuart woodland that has been significantly altered since European settlement, as has much of the surrounding National Park.

State Forest No.2 was established in 1918 to provide for better management and protection of the forest. It had been evident since the 1840s that there had been changes in the understorey structure of tuart communities in the Ludlow and Yalgorup areas. Logging, grazing, and changes in the fire regime had resulted in the understorey being dominated by peppermint, grassy weeds, and arum lilies, which had started to affect the regrowth of tuart. In the 1930's, pines were planted as method of controlling peppermints with the objective of later regenerating the tuart forest after the pines had been removed.

Mining would require the removal of many of the tuart trees. Post-mining it is proposed to rehabilitate the area to a tuart forest (which comprises tuart trees with a reconstituted understorey), that could eventually be incorporated into the National Park.

Key aspects of the proposal include:

- disturbance of 147 ha of State Forest No. 2 (loss of 1700 tuart trees, approximately 55% of the tuarts on the mining lease);
- a 4-year mine life, during which 7 million tonnes of ore would be mined to produce 800 000 tonnes of heavy mineral concentrate;
- mining to a maximum depth of 6 m, then wet processing of the ore (which is principally a physical separation process requiring few chemicals) to produce concentrate that is transported to Bunbury for further processing;
- return of waste materials to excavated pit to recreate current landform and soil profile;
- retention of pockets of habitat trees within the mining area (23 trees);
- revegetation of disturbed areas through the creation of ash-beds, and then seeding and planting of tuart forest flora;
- a number of environmental "offsets", including:

- \$80 000 funding to the Department of Conservation and Land Management (DCLM) for scientific studies to assist in the development of the Tuart Forest Management Plan.
- 56ha land donation that will provide a linkage between the Wonnerup Estuary and the National Park (and partial rehabilitation of this land).
- 35 ha land donation of tuart forest in good condition adjacent to the National Park.
- \$750 000 funding for tuart conservation initiatives (a number of options have been suggested by the proponent for consideration by the EPA and Government)

### **Assessment Process**

The proposal is being assessed at the level of an Environmental Review and Management Programme (ERMP). The ERMP document was released on 7 January 2002 for a 10 week public review period. The proposal generated a high level of public interest for a mining project, with 81 submissions received (9 Government, 14 NGOs, 58 individuals).

To address concerns raised during the public review period, the proponent has carried out additional studies and revised analysis of early work. Extra work has been carried out on soil profiling and establishing the source of water that supports tuart trees in the region. Additional work has also been done comparing the vegetation of the mining area with the adjacent National Park, to better understand its condition in a regional context.

The proponent has completed preparation of its response to submissions.

In developing this proposal the proponent has established a community consultation group, the Ludlow Working Party. The Ludlow Working Party includes representatives from:

- South West Environment Centre
- Ruabon Railway Group
- Bunbury Naturalist Society
- Busselton Naturalist Society
- CALM Busselton
- Capel Shire Council
- Geographe Catchment Council
- DEP Bunbury
- Ludlow Township Resident
- Capel LCDC (LandCare Group)
- Australian Conservation Foundation
- Conservation Council of WA
- Peppermint Grove Beach Community Association
- Busselton/ Dunsborough Environment Centre
- Friends of the Forest
- Independent Environmental Lobbyist
- Cable Sands

Most participants have appreciated the proponent's commitment to the consultation process, even although they may disagree with the proposal that has been put forward.

In addition to direct consultation with members of the Ludlow Working Party, the proponent has made much of its supporting environmental data available through its website at <http://www.cablesands.com.au/ludlow/default.asp>.

## Key issues raised

Most of the issues raised during the public review of the proposal revolve around the loss of tall tuart forest, the significance of this section of the tuart forest, and the ability of the proponent to restore it after mining. These include:

- **Tuart Condition** — In arguing its case, the proponent emphasised that the tuart forest was heavily modified by past practices, notably the removal of 90% of the tuart trees, planting of pine trees, and infestation by arum lily. Many pointed out that much of this is also true for much of the surrounding areas of tuart forest that have been included in the National Park, and hence its condition and value is similar.
- **Soil profile** — Reestablishment of the soil profile is considered critical to the restoration of a tall tuart forest after mining. While many of the public felt that tuart forest restoration was not well understood and inherently risky, the DCLM believes that the area currently has very good prospects for restoration. In its view, the most significant risk to restoration is the alteration of the soil structure through mining excavation and tailings deposition. This can alter the water available to trees and the ability of roots to penetrate through the soil profile to access water.
- **Icon forest** — State forest No. 2 is part of the tourist route along Tuart Drive. It is the experience of driving through a tuart forest that gives this route its value as a tourist site. Mining will affect a 2.7 km section of this Tuart Drive. It is therefore of concern to some people and groups that screening of the mine will not be sufficient to protect the tourist value of this route and the character of the area (as an entrance to Busselton).
- **Offsets** — In the ERMP document the proponent offered as environmental offsets:
  - \$80 000 funding to DCLM for scientific studies to assist in the development of the tuart Forest Management Plan.
  - 56ha land donation linking the Wonnerup Estuary and the National Park.The \$750 000 was expected to be paid into consolidated revenue and was not guaranteed to be used to fund tuart conservation initiatives.

These offsets were not considered adequate by many, including DCLM. The Wonnerup area, while of value as a linkage, was not seen as having sufficient intrinsic values (as a result of its poor condition) to provide an equal offset to the value of the tuart forest that would be mined.

It should also be noted that tuart conservation and protection has become a high profile issue in the last few years. Concern about the decline of tuart forest at Yalgorup has led to the formation of a Tuart Response Group by the Minister for the Environment and Heritage. This group has published its *Status Report: Tuart Conservation and Protection* in August 2002. Most of the members of this group made submissions to the EPA on this proposal.

## Preliminary assessment strategy

On balance, this proposal is likely to be environmentally acceptable. While it will result in short-term loss of tuart forest in the mining area, this loss would not jeopardise conservation of the tuart species and there is sufficient confidence that rehabilitation will restore most, if not all, the current (and potential) conservation values of the area. To mitigate against the short-term loss and the possible long-term reduction in values, the proponent has committed to a number of environmental offsets. These offsets will ultimately enhance the conservation of tuart forests.

## Biodiversity

The proposal will result in a short-term loss of biodiversity through the direct clearing of 147 ha of vegetation and through the indirect effects of this clearing on the connection between the north and south sections of the Tuart Forest National Park.

Flora and fauna surveys of the project area indicate that there would not be any significant impacts on any rare or endangered species. There are no declared rare or priority flora species within the mining area. There are a number of fauna species of conservation significance that could be present in the mining area including:

- Mammals Chuditch, Brush-tailed Phascogate, Quenda, Western Ring-tailed Possum, Brush Wallaby
- Birds Square Tailed Kite, Peregrine Falcon, Carnaby's Black-Cockatoo, Baudin's Black Cockatoo, Barking Owl, Masked Owl, and a number of migratory birds.

None of these species are dependent on the mining area for their conservation but would be affected by the loss of habitat in the mined areas. This impact would be lessened to some extent by the retention of some habitat trees within the mining area and the proximity of similar habitat in the nearby National Park. Over the time period of mining and rehabilitation, the fragmentation caused by mining is not expected to cause genetic isolation of populations.

In the longer term (10 years after mining), rehabilitation of the mining area will have restored much of the understorey habitat, and 50% of the older habitat trees would still remain.

With regard to the tall tuart forest itself, this vegetation type is well represented in the conservation estate. According to the recent *Status Report: Tuart Conservation and Protection*, approximately 66% of the pre-1750 area of this vegetation type remains and 46% is in conservation reserves. However, the remaining area is relatively small (2 088 ha) and hence there is a strong argument for restoration of the tuart forest post-mining, as the proponent intends. Nevertheless, the short-term loss of 149 ha will not significantly affect the conservation of this vegetation type.

#### Rehabilitation/Conservation of Tuarts

The mining of the area will create some uncertainty in relation to restoration of the tall tuart forest, however, this uncertainty in outcome may be adequately compensated for by offset measures aimed to improve the conservation of tuart and by the fact that the proponent is committed to restoring a tuart forest that can ultimately be included in the National Park.

While the area currently has a good stand of tall tuart trees, its condition as a tall tuart forest has been significantly degraded by activities since European settlement. A substantial amount of work would be required in order to improve the condition to a level for inclusion into the National Park. This work would include removal of pines (which is now taking place), creating conditions for the regrowth of tuart trees (ash-beds and clearing of peppermint), management of weeds, and restoration of a native understorey. Obviously, without the disturbance of mining, the soils of the area do have the capacity to maintain the tuart forest ecosystem that previously existed on them and so restoration is theoretically more certain without mining. On the other hand, without mining it is not clear that the State will provide the resources necessary to restore the area, nor that native understorey can successfully be established beneath the existing tree canopy. A number of submitters noted that the Ludlow Tuart Forest has suffered many years of neglect from the State agencies.

Should mining be approved, then the whole mining lease would be rehabilitated by the proponent. While there is still some disagreement on the performance of reconstructed soils, it is agreed by the DCLM that restoration of tuart trees to the area is achievable. Disagreement is now limited as to

whether reconstructed soils will provide the same amount of water to the tuarts, and hence whether the rehabilitated tuart forest will have equivalent status and vigour as unmined areas.

Offsets now include.

- 56ha land linkage to the Wonnerup Estuary — although this land is quite degraded and would require a substantial rehabilitation effort to form an effective linkage. The proponent has committed \$150 000 to rehabilitating a corridor in this area. There are also options to rehabilitate more of this area using the \$750 000 donation.
- 35 ha land donation of tuart forest adjacent to the National Park. This land is reported to be in excellent condition and would be a valuable addition to the conservation estate.
- \$750 000 donation for tuart conservation initiatives
- \$80 000 funding to assist in the development of the Tuart Forest Management Plan.

### Community Values

It is clear from the submissions that the community values tuart forests in general, and State Forest No. 2 in particular. As well as the tourist value of this section of forest, this proposal has provided a forum for the public to present its concerns regarding the recent decline of tuarts in the region and management of the tuart forest generally.

Impacts on the visual amenity as seen travelling along Tuart Drive would be moderate and short-to-medium term. A 2.7km section of the route will be mined and mining is set back a short distance from the road. Some vegetative screening will be established by the time mining commences. Most of the visual impact will disappear once mining ceases, after which rehabilitation will gradually improve visual amenity.

As discussed above, impacts on biodiversity and conservation of tuart are considered to be within acceptable limits. Moreover, the offsets committed to by the proponent are likely to deliver a lasting benefit to the tuart forests of the region and so address some of the public concern. In particular, the \$750 000 donation has the flexibility to be used on a range of regional conservation projects. Groups with an interest and understanding of tuart forests could also be involved in deciding which projects are pursued.

### **Conclusion**

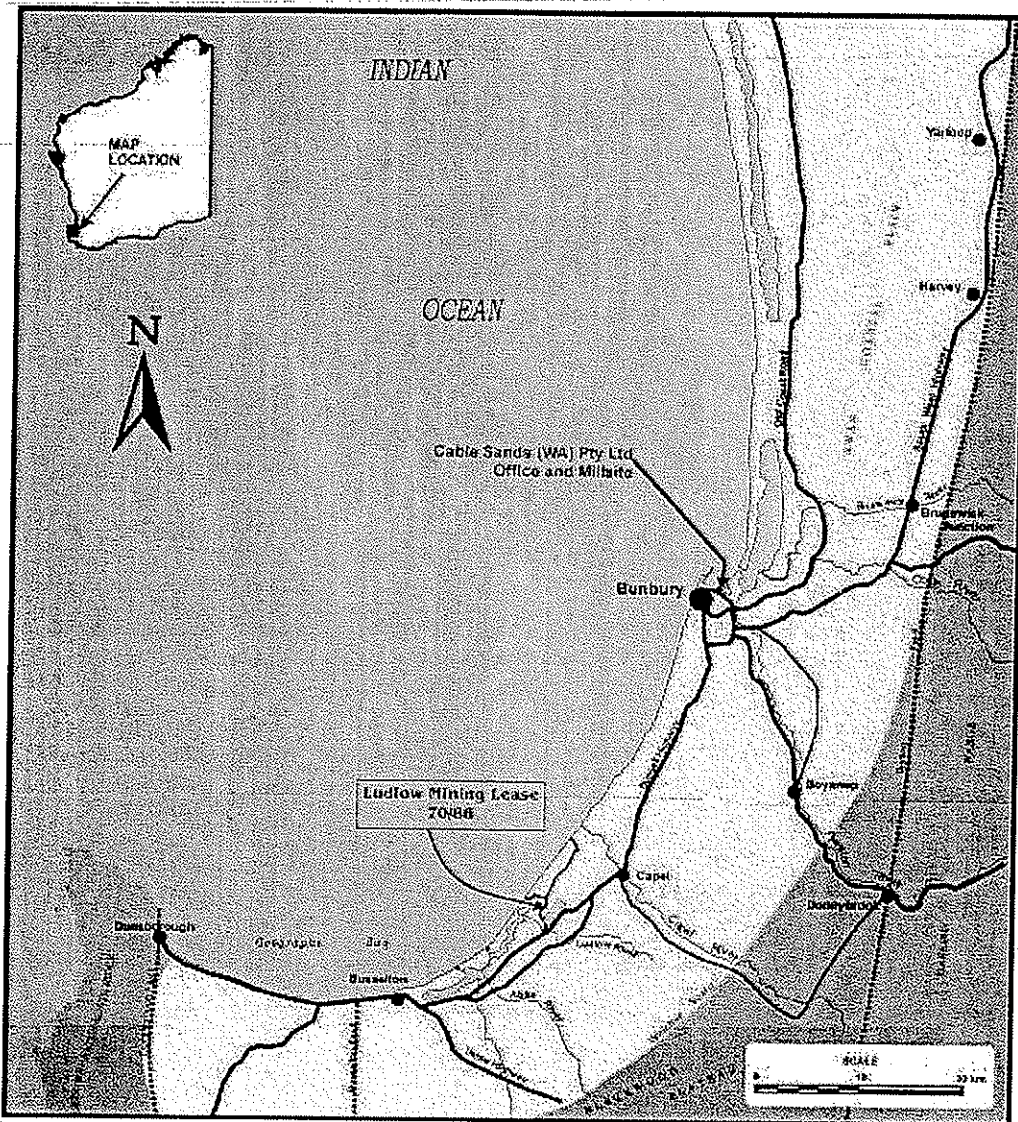
Ultimately this assessment will come down to a judgement by the EPA on the balance between risk to the conservation of tuart against the potential benefits to the conservation of tuart through the implementation of the proposal and its offsets.

There is substantial opposition to the proposal. As illustrated by the creation of the Tuart Response Group there is a lot of public concern over the decline of tuart and threats to its conservation. Most importantly, both the Conservation Commission and the DCLM have made submissions that are not supportive of the proposal. While the proponent has carried out additional studies to reduce uncertainty about outcomes, this is not likely to be sufficient to sway these agencies from their understandably precautionary position. Representatives from the DCLM will be attending the site visit and so will be able present DCLM's current view on the proposal to the EPA.

However, on balance the proposal would seem to provide a neutral-to-slightly-positive outcome for tuart conservation in the long term. On this basis the EPA could find the proposal to be environmentally acceptable, subject to conditions. Conditions would need to ensure restoration of the area to a standard for eventual inclusion in the National Park, focussing on reconstruction of a suitable soil profile and completion criteria for revegetation. Conditions would also need to safeguard the environmental offsets offered by the proponent for tuart conservation, and set out a

process for allocating funds to the various options identified. This process should include the Tuart Response Group, The Ludlow Working Party, the DCLM, and the EPA.

FIGURE 1



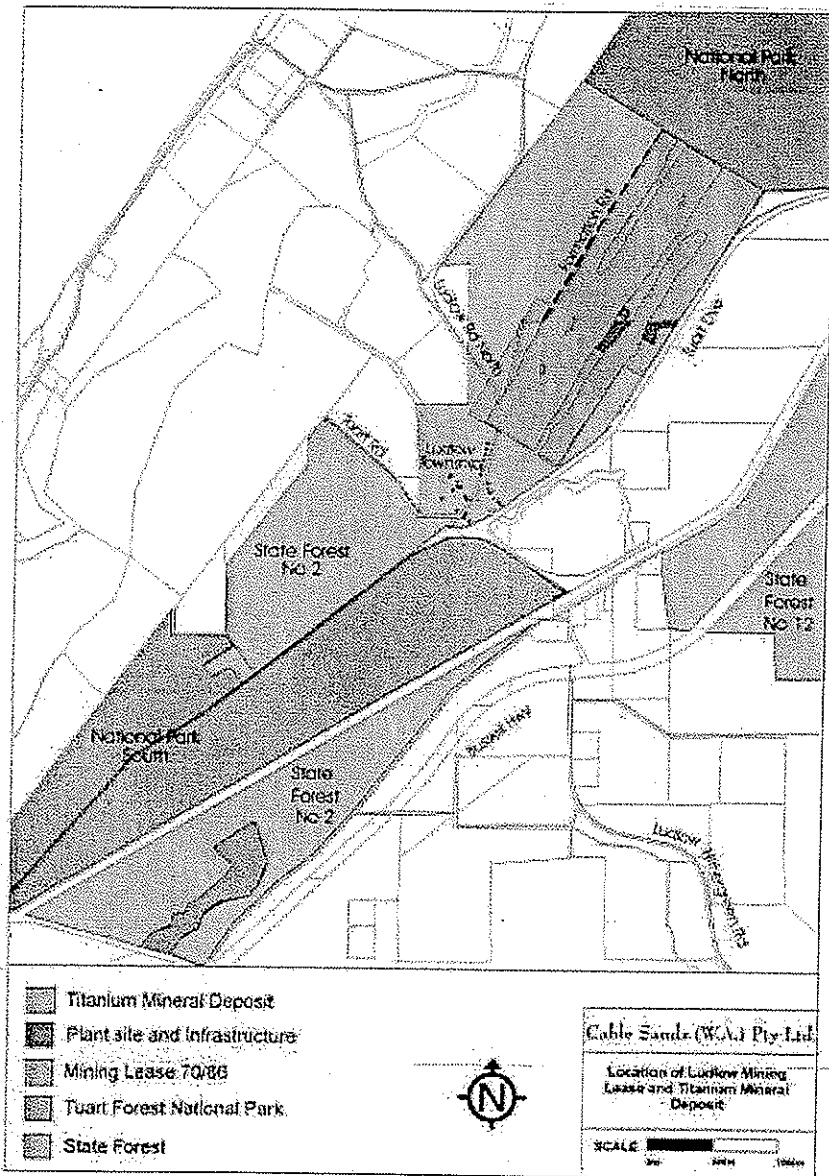


Figure 1.2 Local location of the Ludlow mining lease

**PROPOSED  
SAND/LIMESTONE  
EXTRACTION,  
GELORUP**

Also refer appendix 4 of Greater Bunbury  
Region Scheme Briefing Note.

**ENVIRONMENTAL PROTECTION AUTHORITY  
BRIEFING NOTE**

**Subject:** Proposed sand/limestone extraction, Public Environmental Review, Wellington Location 41, Lots 313-317, Gelorup: Piacentini & Son Pty Ltd

**Purpose:** For site visit in 2003.

**Current status of assessment:**

The EPA issued guidelines for the PER on 18 June 2002. The proponent has commissioned an environmental consultant to prepare the PER document. No timing has been provided to the EPA Service Unit as to when a draft PER will be prepared.

**Background**

The proponent, Piacentini & Son Pty Ltd, is seeking approval for sand and limestone extraction within Lots 313-317 Gelorup, which are located approximately 8.5 km south of Bunbury (Attachment 1). The land is privately owned by the proponent, and is zoned rural. However, in the draft Bunbury Region Scheme Environmental Review document, the area is proposed to be zoned 'Urban Deferred'. This scheme is currently being formally assessed under s48 of the EP Act.

The proposal area is classified as a cattle farm. An EPP wetland occurs to the west, a System 6 reserve area occurs to the east. North of Harewoods Rd is the an area of vegetation which will be cleared for the Dalyellup Beach Estate (approved by the EPA in July 1998). Immediately south of the proposal area is a vineyard owned by Mr Ben Killerby. Both Mr Killerby and the project manager for the Dalyellup Beach Estate are strongly opposed to the proposal.

**The proposal**

- The proponent has applied for a 21 year extractive industry license.
- Proposal is to be staged (18 stages in total), with Stage 1 commencing beyond a 40 m buffer adjacent to Harewoods Rd.
- Each stage is between 3-4 ha in area.
- Conventional loader/road truck methods will be used for the excavation of sand.
- A small limestone crushing plant will be installed.

- The depth of excavation will not be greater than 10-15 m, and no excavation will be carried out below 2 m above the highest groundwater table.
- Topsoil and overburden will be stored for rehabilitation.
- Rehabilitation to be progressive.
- A 250 m buffer will be retained at the southern boundary of the proposal area. (See Attachment 2)

### **Contentious issues**

The proponent commenced parkland clearing of the proposal area around 20 September 2002 for the purpose to improving the value of the area for cattle farming. This clearing followed the proponent receiving advice from the Department of Agriculture on 11 September 2002 on the amount/nature of clearing allowed under the Soil and Land Conservation Act that did not need to be notified.

However, it appears that the proponent may have carried out more clearing than was allowed. Mr John Firth from the Department of Agriculture is undertaking an investigation of this matter, to determine if Mr Piacentini could be charged with illegal clearing under the Soil and Land Conservation Act.

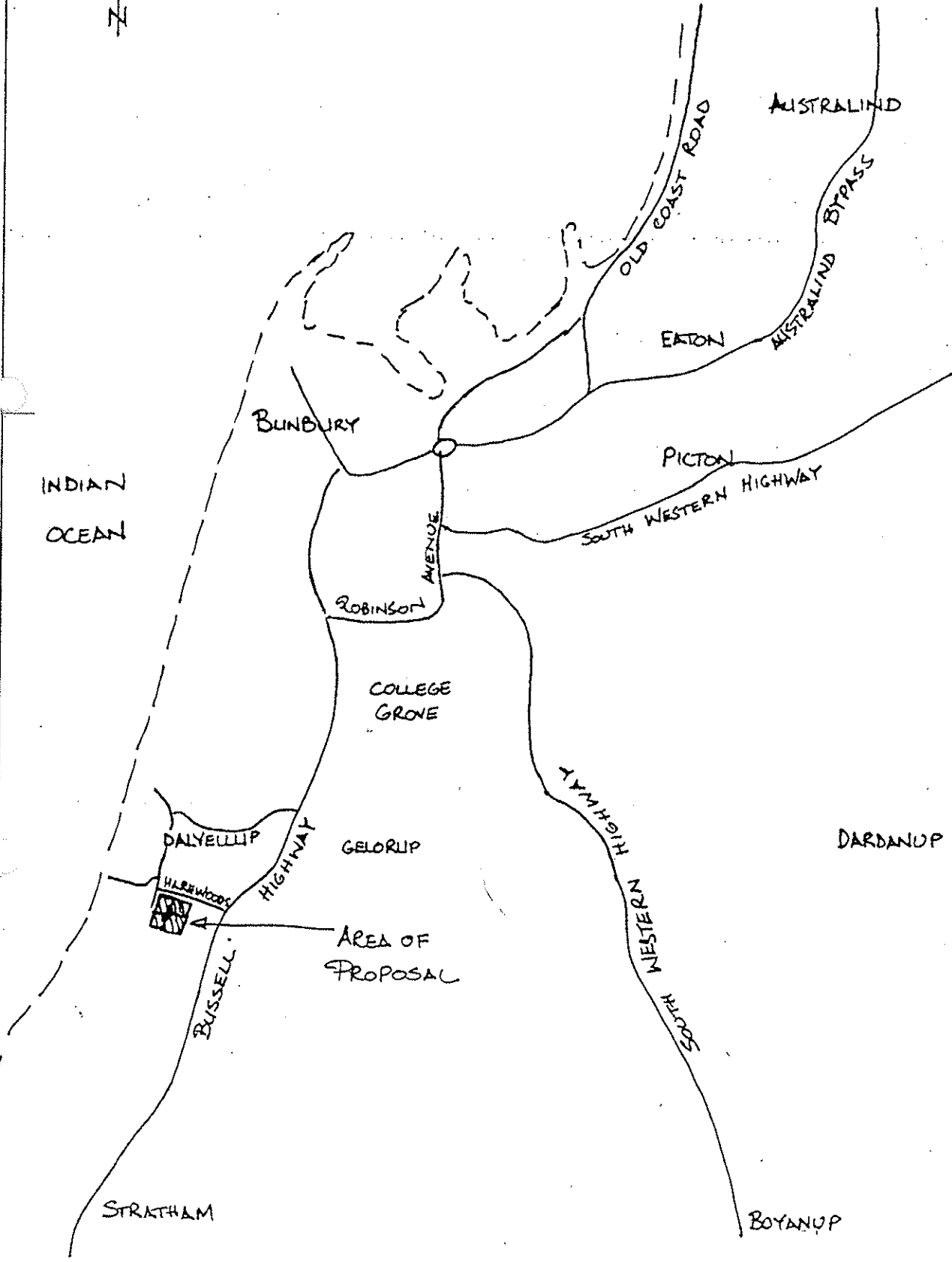
Under the EP Amendment Act transitional provisions, the DEP is unable to act on the matter until the clearing is declared to be unlawful by the Commissioner for Soil and Land Conservation. Mr Alex Marsden (Program Manager Native Vegetation Protection) is investigating whether the transitional provisions could be used to require Mr Piacentini to restore any illegally cleared vegetation.

The EPA wrote to Mr Piacentini on 18 October 2002 to seek further information on the clearing (Attachment 3). To date, no response has been received.

### **Environmental issues**

The primary environmental issue is the clearing of approximately 80 ha of native vegetation, which includes tuart trees. There is also a potential for rare flora and fauna to occur within the proposal area.

Other important issues for the proposal include noise, dust, surface water drainage and rehabilitation.



PROPOSED EXCAVATION OF SAND AND LIMESTONE  
WELLINGTON LOCATION A1 LOTS 313-317 GELORUP  
LOCALITY SKETCH.

NOT TO SCALE

INDIAN  
OCEAN



MINNUP ROAD

DALYELLUP

DALYELLUP RD

HAREWOODS ROAD

AREA OF  
PROPOSAL

CROWD RD

GELORUP

GELORUP DRIVE

HIGHWAY

BUSSELL

WOODS RD.

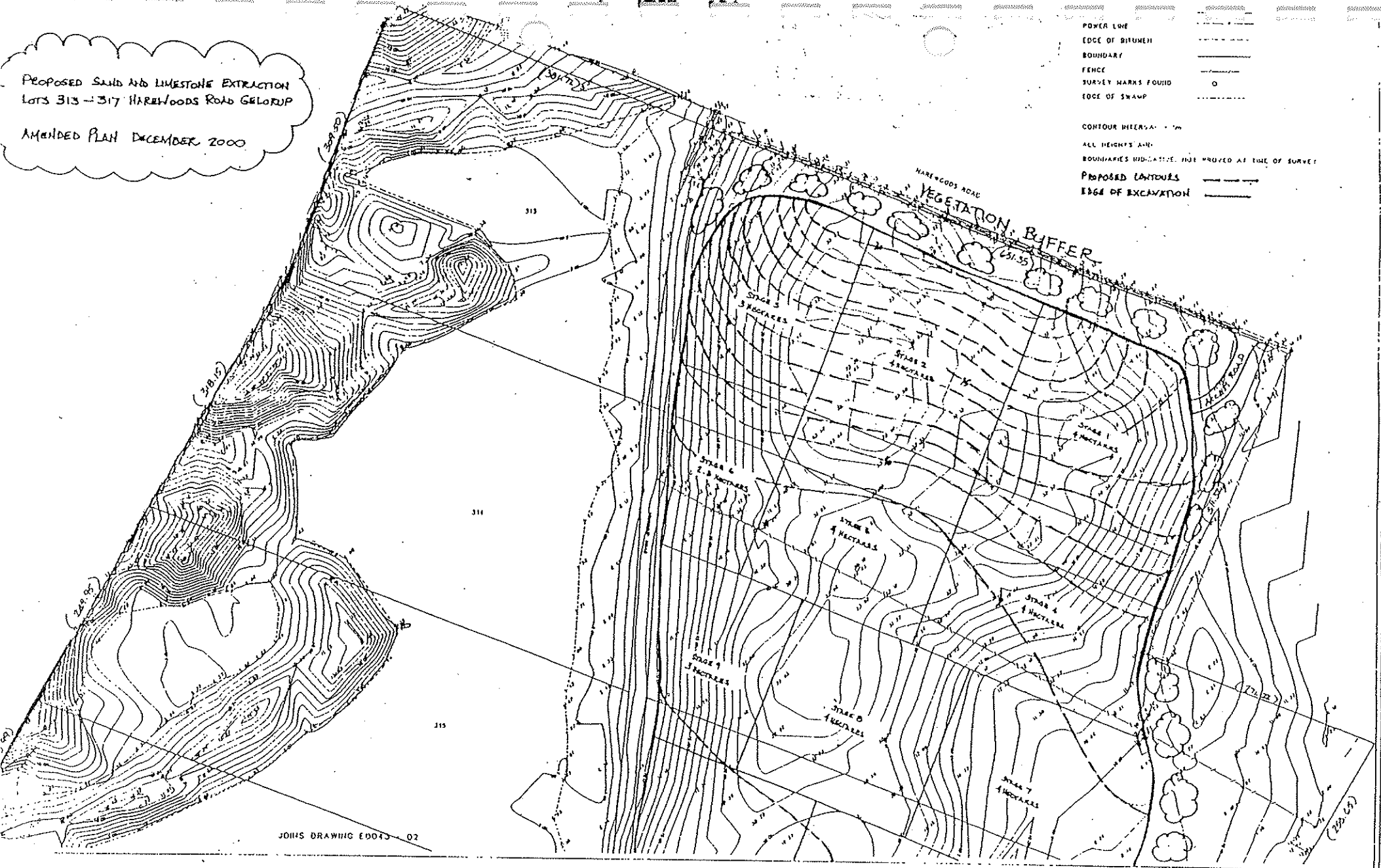
PROPOSED EXCAVATION OF SAND AND LIMESTONE  
WELLINGTON LOCATION 41 LOTS 313-317 GELORUP  
LOCALITY SKETCH N°1.

NOT TO SCALE

PROPOSED SAND AND LIMESTONE EXTRACTION  
 LOTS 313 - 317 HAREWOODS ROAD GELORUP

AMENDED PLAN DECEMBER 2000

- POWER LINE
- EDGE OF BITUMEN
- BOUNDARY
- FENCE
- SURVEY MARKS FOUND
- EDGE OF SWAMP
- CONTOUR INTERVAL 1m
- ALL HEIGHTS AND BOUNDARIES INDICATED, NOT PROVED AT TIME OF SURVEY
- PROPOSED CONTOURS
- EDGE OF EXCAVATION



JOHS DRAWING E0043 02

ISSUED FOR APPROVAL		ISSUE	NORTH POINT		SURVEYOR: CATALANO		 <b>BCE SURVEYORS</b> LICENSED & ENGINEERING SURVEYING CONSULTANTS 31 ROSE STREET PO BOX 2448 BUNBURY WA 6231 Ph. (08) 9781 7411 Fax. (08) 9781 9310 Mob. 0812 382 312	CONTOUR SURVEY OF LOTS 313 - 317 HAREWOODS ROAD		ORIGINAL SHEET SIZE	
REVISION		DRAWN	DRAWN: J O'NEILL		SCALE: 1:2000			JOB No. E0043	PLAN No. F9043 - 01	ISSUE A	A1

(1/2)

Attachment 2



- EDGE OF EXCAVATION
- PROPOSED CONTOURS
- CRASH
- POWER LINE
- EDGE OF BITUMEN
- BOUNDARY
- FEHLE
- SURVEY MARKS FOUND
- EDGE OF SWAMP

CONTOUR INTERVAL - 1m  
 ALL HEIGHTS AND BOUNDARIES INDICATIVE NOT PROVED AT TIME OF SURVEY.

PROPOSED SAND AND LIMESTONE EXTRACTION  
 LOTS 313 - 317 HAREWOODS ROAD GELORUP  
 AMENDED PLAN DECEMBER 2000

ISSUED FOR APPROVAL REVISION DATE	NORTH POINT  SURVEY FOR C. CATALANO FIELD BOOK DRAWN J. O'HART SCALE 1:2000	 <b>B C E SURVEYING</b> LICENSED & ENGINEERING SURVEYING CONSULTANTS 31 ROSE STREET PO BOX 2448 BUNBURY WA 6211 Ph. (081) 9791 2411 Fax. (081) 9791 9315 Mob. 0418 389 377	CONTOUR SURVEY OF LOTS 313 - 317 HAREWOODS ROAD JOB No. E0043 PLAN No. E0043 - 02 ISSUE A	SHEET SIZE A1
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Mr Colin Piacentini  
Piacentini & Son Pty Ltd  
PO Box 308  
BUNBURY WA 6231

Dear Mr Piacentini

**WELLINGTON LOCATION 41, LOTS 315-317, AND PART OF LOTS 313 AND 314,  
GELORUP**

On the 27 September 2002, staff from the Environmental Protection Authority (EPA) Service Unit observed the clearing and burning of vegetation in the above area.

I am writing to seek clarification from you as to the nature and extent of the clearing. I understand that the Department of Agriculture had issued advice to you on 11 September 2002 for the area, specifically in regard to fire and access control. However, I have also received reports that a considerable area of understorey vegetation has now been cleared, apparently well beyond what would normally be required for fire and access control.

As you are aware, the area is currently the subject of a formal environmental assessment, at the level of Public Environmental Review (PER), for the proposed extraction of sand and limestone. The EPA's decision to set a PER on the proposal was based on a number of environmental issues, including the likely presence of rare fauna associated with the native vegetation on this land.

I am concerned that the EPA was not consulted prior to the clearing taking place. I request that you provide me with details of the clearing, including how you propose to address the relevant environmental factors relating to flora and fauna contained in the EPA Guidelines previously issued to you for preparation of your environmental review document.

Yours sincerely

*B. Bowen (Executive Officer)*

for  
Bernard Bowen  
CHAIRMAN

18 October 2002

cc Mr Andrew Watson, Deputy Commissioner, Soil and Land Conservation  
Mr Alex Marsden, Resource Management Division, Water and Rivers Commission

**GREATER BUNBURY  
REGION SCHEME**

**MEETING No: 804**  
**DATE: 30 January 2003**

**ENVIRONMENTAL PROTECTION AUTHORITY**  
**BRIEFING NOTE**

**Subject:** Progress report on the formal Section 48A assessment of the Greater Bunbury Region Scheme and background notes for Bunbury field trip

**Briefing Officer(s):** Darren Walsh and Gary Williams  
(Environmental Assessment Division, Planning Assessments Branch)

Bronwen Keighery and John Dell  
(Policy and Coordination Division, Ecological Systems Branch)

**Purpose:** **FOR INFORMATION, DISCUSSION and GUIDANCE**

**Background**

Officers of the Environmental Protection Authority (EPA) Service Unit provided a progress report on the assessment of the Greater Bunbury Region Scheme (GBRS) at the EPA's meeting on the 5 December 2002. The background to the assessment is again outlined below for the benefit of the new EPA member.

The GBRS defines the broad pattern of land use for the City of Bunbury and the Shires of Harvey, Dardanup and Capel. It includes regional reservations and broad land use zones (Appendix 1).

The GBRS was referred to the EPA by the Western Australian Planning Commission (WAPC) in August 1996. The EPA decided, in September 1996, that the GBRS should be formally assessed. The Instructions for the preparation of the Environmental Review were subsequently issued by the EPA in November 1996.

The public consultation period (3mths standard + 3 mths extension) closed on 16 February 2001 during which time approximately 300 submissions were received. A large number of the submissions related to the alignment of Regional Open Space boundaries and the natural values of areas subject to zoning change in the Scheme. In March 2002, the WAPC submitted an interim response to the submissions raising environmental issues, as a basis for dialogue and investigations between the EPA Service Unit and Department for Planning and Infrastructure (DPI).

The DPI is currently considering, in detail, the environmental issues raised in the submissions. The WAPC proposes to forward its final response to the EPA in early March 2003. The WAPC independently contracted consultants to conduct botanical and fauna surveys to assist with its response to submissions. The DPI is also liaising with the EPA Service Unit in relation to the environmental issues raised in the submissions.

Once the EPA has received the WAPC's final response to submissions the EPA Service Unit will review the responses, particularly the technical veracity and acceptability of the botanical and fauna surveys on which the responses will be based.

While waiting for the WAPC to respond to the submissions the EPA Service Unit has undertaken additional natural value surveys to assess the potential impacts of a number of the new zones and reservations and the adequacy and validity of a number of proposed Regional Open Space reserve boundaries in the GBRS. These areas were not the subject of any of the submissions being considered by the WAPC.

***Strategy to identify regionally significant natural areas in the GBRS portion of the Swan Coastal Plain.***

To guide the assessment of the GBRS, the EPA has prepared a *Strategy to identify regionally significant natural areas in the GBRS portion of the Swan Coastal Plain* (the Strategy). For the purpose of the assessment of the GBRS, the Strategy will be applied to the assessment of new zones and reserves and the adequacy of a number of Regional Open Space boundaries. The principles of the Strategy are being used by the WAPC in its response to submissions.

The EPA Service Unit sought comments from selected stakeholders (including the DPI) on any errors and omissions in the Strategy. The EPA noted at its December 2002 meeting that a few minor alterations had been made to the strategy following advice from stakeholders, but the essence of the strategy remains the same as that considered by the EPA at meeting No 787 on 9 May 2002.

The Strategy has been used as a guide to prepare a plan showing the Regional Ecological Linkages within the Greater Bunbury Region. This plan will be presented for discussion at the EPA meeting.

***Timeline for completing the assessment***

The EPA is required to report to the Minister for the Environment and Heritage on the relevant environmental factors and the conditions to which the GBRS should be subject within the timeframes specified in the *Environmental Protection Act 1986*, or such longer period as the Minister allows (section 48D(1) *EP Act*).

In response to a request from the EPA the Minister for the Environment and Heritage extended the EPA's reporting time from 30 days to 60 days after receiving the response to submissions, for it to report to the Minister. On this basis, if the WAPC

forwards its final response to submissions in early March 2003, as proposed, the EPA will be required to report to the Minister on the GBRS in early May 2003.

The EPA Service Unit will endeavour to meet this timeline, however, due to the complexity of the issues and scope of the assessment there may be a need for the EPA to seek a further extension. The EPA Service Unit will be in a better position to determine when the GBRS assessment may be completed after the final response to submissions has been received from the WAPC.

At the EPA's December 2002 meeting it was agreed that an EPA sub-group be formed, consisting of the Chairman and Deputy Chairman, to work with the EPA Service Unit on matters of detail in relation to the assessment.

**Important Issues and/or Needs Statement:**

The main purpose of the briefing is to provide:

1. EPA members with a description of the sites proposed to be visited during the field trip;
2. new EPA members with the background to the EPA's assessment of the Greater Bunbury Region Scheme (GBRS);
3. an outline of the issues to be resolved before the EPA is expected to be able to report to the Minister for the Environment and Heritage; and
4. a projected timeline for reporting to the Minister for the Environment and Heritage.

**Reference Material:**

1. EPA (2002). *Draft Strategy for the EPA to identify regionally significant natural areas in its consideration of the Greater Bunbury Region Scheme portion of the Swan Coastal.*
2. WAPC (2002). *Draft report on responses to the EPA on submissions raising environmental issues and investigations into alternatives to regional open space reservation.*
3. HGM (2002). *Natural values of 12 sites of the Greater Bunbury Region Scheme.*
4. ecologia Environmental Consultants (2001). *Part Lot 211 Barnes Avenue, Australind - Fauna Assessment Survey.*
5. McDonald Hales & Associates Pty Ltd (2002). *Part Lot 211 Barnes Avenue, Australind - Report on an Aboriginal Heritage Survey.*
6. Keighery BJ, Keighery GJ and Santich S (2002). *A description of natural values of the South Bunbury to Capel Coastal Corridor.*

**Staff from Government Departments and DEWCP Divisions Consulted**

1. Gary Whisson, Bronwen Keighery and John Dell (Policy and Coordination Division, Ecological Systems Branch)

### **EPA Service Unit Advice**

The new zones and reserves in the GBRS that are likely to have significant environmental impacts and require further EPA assessment are listed in Appendix 2.

A number of these new zones and reserves are particularly contentious in that they raise critical environmental issues and are of concern to the community and affected landowners. For these reasons it would be useful for the EPA to visit these sites.

It is likely that the EPA will need to recommend that environmental conditions be imposed on the GBRS in relation to these sites, requiring that the Scheme be modified in a number of instances where proposed zones or reserves are likely to have unacceptable environmental impacts.

The primary contentious sites are:

- Muddy Lakes - Minninup Road, Capel; and
- South Dalyellup Urban Deferred (Lots 313-317 south of Harewoods Road;
- Twin Rivers - Pt Lot 211 Barnes Avenue, Australind.

The sites are described in detail in Appendices 3, 4 and 5, respectively.

Dr Paul van der Moezel (environmental consultant) and Peter Lynch (representing the landowner) will be present at the Twin Rivers site visit to provide a short overview of the subdivision proposal and answer questions.

Controversial issues will arise in relation to other sites as the EPA's assessment of the GBRS progresses. It is expected that the EPA Service Unit will work with the EPA sub-group to resolve the majority of these issues.

Following the EPA's site inspection the EPA Service Unit will also require guidance from the EPA sub-group on recommendations that the EPA Service Unit has made in relation to Muddy Lake (Appendix 3) and South Dalyellup (Appendix 4). The recommendations are that:

- an interim planning mechanism be put in place to ensure that conservation values in the Dalyellup/Minninup Lake Natural Area (Appendix 3) and South Dalyellup (Appendix 4) are protected from any further development or change of land use until suitable protection measures under the Greater Bunbury Region Scheme are provided; and
- adequate funding arrangements be included in the GBRS to ensure that funds are available for the WAPC to purchase areas of regional conservation value.

### **Outcomes Statement**

1. EPA is informed on the controversial sites.

2. Endorse the EPA Service Unit's recommended Regional Ecological Linkages Plan.

**Recommendation(s) to EPA:**

It is recommended that, following the site visit, the EPA:

1. Provide guidance on which areas at Muddy Lakes, South Dalyellup and Twin Rivers should be appropriately zoned and managed to ensure that regional conservation value are protected;
2. Endorse and provide guidance on the EPA Service Unit's recommended Regional Ecological Linkages Map;

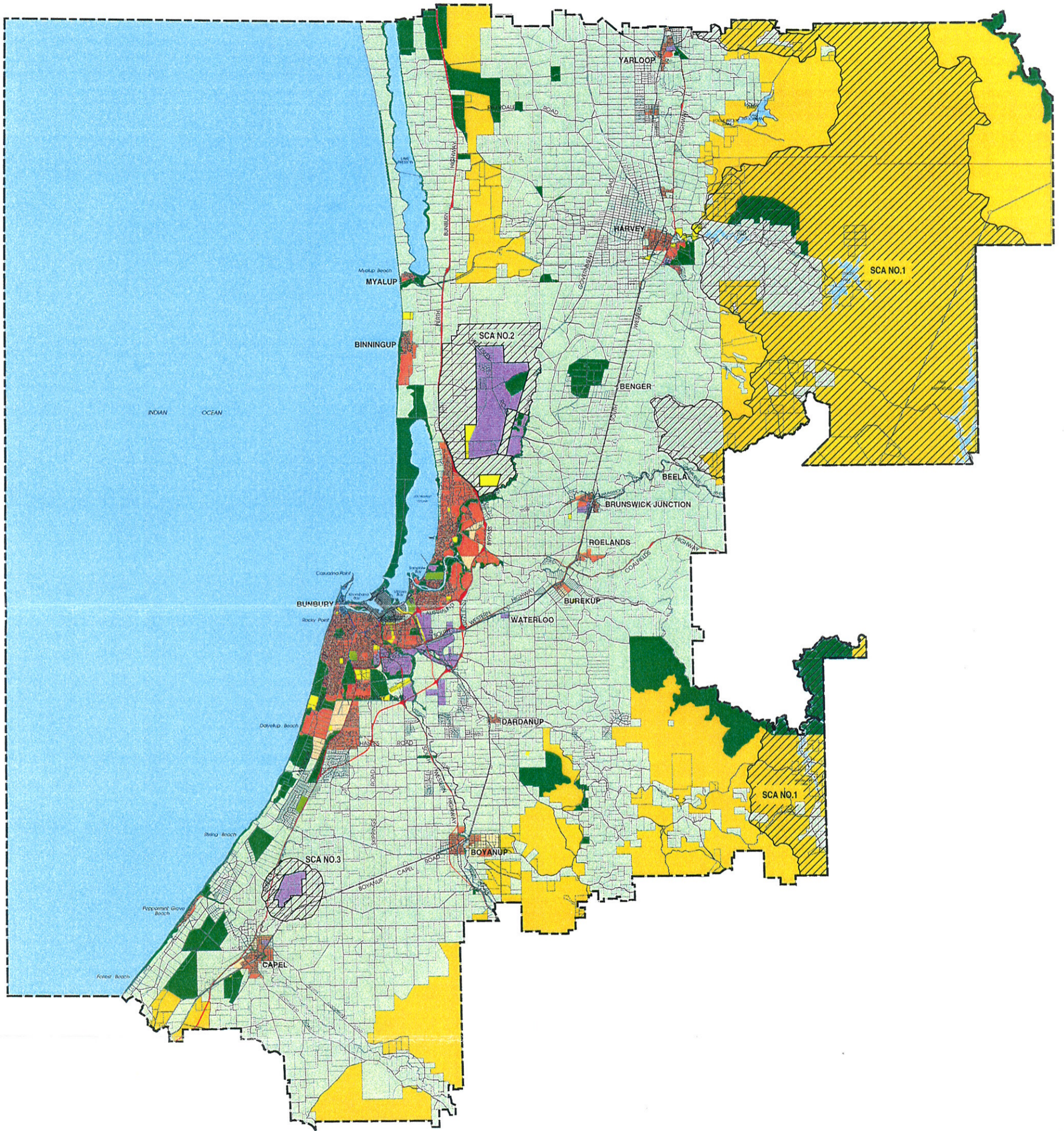


FIGURE 1

<p>PRODUCED BY THE STATUTORY MAPPING SECTION, GEOGRAPHIC AND PLANNING INFORMATION BRANCH, MINISTRY FOR PLANNING</p>	<p><b>LEGEND</b></p>			<p><b>SPECIAL CONTROL AREAS DENOTED AS FOLLOWS:</b></p> <p>SCA NO.1 WATER CATCHMENTS</p> <p>SCA NO.2 KEMERTON INDUSTRIAL ZONE BUFFER AREA</p> <p>SCA NO.3 NORTH CAPEL INDUSTRIAL ZONE BUFFER AREA</p> <p>--- GREATER BUNBURY REGION SCHEME BOUNDARY</p>
	<p><b>RESERVED LANDS</b></p> <ul style="list-style-type: none"> <li>REGIONAL OPEN SPACE</li> <li>RAILWAYS</li> <li>STATE FORESTS</li> <li>WATERWAYS</li> </ul>	<p><b>PORT INSTALLATIONS</b></p> <ul style="list-style-type: none"> <li>PRIMARY REGIONAL ROADS</li> <li>OTHER REGIONAL ROADS</li> <li>PUBLIC PURPOSES</li> </ul>	<p><b>ZONES</b></p> <ul style="list-style-type: none"> <li>URBAN</li> <li>URBAN DEFERRED</li> <li>REGIONAL CENTRE</li> <li>INDUSTRIAL</li> </ul>	

**GREATER BUNBURY REGION SCHEME ENVIRONMENTAL REVIEW DRAFT SCHEME MAP**

SCALE 1:300000

## Appendix 2

### The new zones and reserves in the GBRs that are likely to have significant environmental impacts and require further EPA assessment

- (a) Assessment of new urban zones that are likely to have significant environmental impacts
  - East Australind Urban Deferred Paris Road – Decommissioned Waste Water Treatment Plant (WWTP)
  - East Australind Urban Deferred Paris Road, Australind (private land north of WWTP)
  - South Dalyellup Urban Deferred (Lots 313 – 317 south of Harewoods Road)
  - Harewoods Road Urban Deferred, Dalyellup
- (b) Assessment of new Industrial zones that are likely to have significant environmental impacts
  - Kemerton Industrial Area expansion
  - Davenport Industrial zone Lot 15 South West Highway
- (c) Assessment of the potential environmental impacts of the new Kemerton Public Purpose Reserve (waste water treatment plant)
- (d) Assessment of the potential environmental impacts of the new Port Installation zone
- (e) Assessment of new road and rail reserves that are likely to have significant environmental impacts
  - South Western Highway
  - Port Access Road
  - Boyanup Bypass
- (f) Assessment of other reserves (existing) that are likely to have significant environmental impacts
  - Bunbury Outer Ring Road Primary Regional Road reserve;
  - Glen Iris Service Corridor Public Purpose reserve;
- (g) Assessment of the adequacy of Regional Open Space
  - Myalup, south of Myalup Road
  - Lot 7 Buffalo Road, Binningup;
  - Twin Rivers – Pt Lot 211 Barnes Avenue, Australind;
  - Picton Waters – EPP Lake on portion of Lots 40-44 Jeffery Road, Picton;
  - College Grove – Lot 1000 Bussell Highway; and
  - Muddy Lakes – Minninup Road, Capel.

(h) Assessment of Special Control Areas

- Special Control Area No. 1 – Water Catchments
- Special Control Area No. 2 – Kemerton Industrial Zone Buffer
- Special Control Area No. 3 – North Capel

(i) Assessment of policies linked to the GBRS

- Public Water Supply Catchment Policy
- Floodplain Management Policy
- Strategic Agricultural Resource Policy
- Strategic Minerals and Basic Raw Materials Resource Policy

(j) Other regionally significant environmental issues

- Natural areas of regional significance
- Acid sulfate soils
- Alcoa Wagerup buffer

## Appendix 3

### **MUDDY LAKES REGIONAL OPEN SPACE RESERVE BOUNDARY ALIGNMENT**

#### ***Location and zoning***

Muddy Lakes is situated approximately 13km south of the Bunbury CBD and 800m from the ocean. (Attachment 1). The wetland is also known as Minninup Swamp.

Muddy Lakes and its fringes are currently zoned Rural in the Shire of Harvey's Town Planning Scheme. The GBRS proposes to reserve part of the properties as Regional Open Space (Attachment 2). The ROS reserve boundary roughly aligns with the boundary of the wetland.

Parts of the wetland provides valuable summer grazing for horses. The landowners are opposed to their land being reserved as ROS because of concern that it will restrict the availability of the areas for summer grazing.

The Chairman of the Western Australian Planning Commission, Department for Planning and Infrastructure and EPA Service Unit have attended a number of public meetings concerning this issue. Staff from both agencies have also met with Bernie Masters MLA and visited a number of the rural properties.

#### ***Environmental values***

The Muddy Lakes ROS reserve is part of a larger natural area of outstanding regional significance, the Dalyellup/Minninup Swamp Natural Area. This area contains a very large consolidated vegetated area of Quindalup Dunes and the eastern predominantly vegetated sumplands and lake of the Minninup Swamp. The areas of proposed ROS are centred on two EPP Lakes - Dalyellup and Muddy Lake. The central area of Dalyellup/Minninup Swamp Natural Area is not identified in the ROS (Attachment 2).

The Muddy Lake ROS reserve is considered to be a regionally significant natural area of high value because it meets all six of the criteria being used to identify regionally significant natural areas in the EPA's assessment of the GBRS. These criteria are:

- Representation of Ecological Communities;
- Diversity;
- Rarity;
- Maintaining Ecological Processes and Natural Systems;
- Scientific or Evolutionary Importance; and
- General Criteria for the Protection of Wetland and Streamline and Estuarine fringing Vegetation and Coastal vegetation.

The natural attributes of the Muddy Lakes ROS that contribute to meeting the criteria are listed below. Some of these natural attributes are shared with the Dalyellup/Minninup Swamp Natural Area.

- The largest and most southern area of vegetated parabolic Quindalup Dunes remaining on the Swan Coastal Plain.
- One of the few areas of Quindalup Dunes on the Plain with substantial wetland and upland areas.
- Substantial representative area of natural vegetation in Excellent to Good condition of the Quindalup and Vasse Vegetation Complexes. Less than 30% of the Vasse Complex remains vegetated on the Plain.
- The wetlands of the Vasse Vegetation Complex are highly variable and the sumplands of the Muddy Lake area (part of Minninup Swamp) are one of the few examples of its type, the most similar known being the sumpland/lakes of Yanchep National Park.
- A highly diverse area with respect to diversity of Quindalup Dunes, wetlands, upland and wetland vegetation units, habitat and vertebrate diversity (100 vertebrate species recorded). The wetland and vertebrate diversity of the Dalyellup/Minninup Swamp Natural Area are considered unique on the southern Swan Coastal Plain.
- The communities of the Quindalup Dune damplands are considered to be either a threatened ecological community (floristic community type 19) or a rarer closely related ecological community. Floristic community type 19 is recognised by the State and is subject to protection under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.
- Location for three rare species of fauna - Western Ringtail Possum, Quokka and Baudin's Black Cockatoo. These species are recognised by the State and are subject to protection under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999.
- Only remaining Quokka population on the Swan Coastal Plain.
- High number of other significant vertebrate species: one species protected under JAMBA/CAMBA treaties (Great Egret), two Priority 4 species (Quenda and Water-rat) recorded. 17 conservation significant species recognised as declining species on the Swan Coastal Plain (Government of Western Australia, 2000).
- Contains wetlands, Conservation category damplands, sumplands and lake areas of regional significance.
- Contains the area of the EPP Lake - Muddy lake.
- Part of two regional ecological linkages: the north-south South Bunbury to Capel Coastal and Dalyellup/Preston River/Dardanup Primary Regional Ecological Linkages.

The WRC has advised that grazing activities that occur adjacent to, or directly within the wetland, are likely to have a further impact on the wetland system and vice versa. These activities may impact on either the ecology, hydrology or both of this system and hence lead to a decline in the conservation values currently noted by the V&C Semeniuk Research Group (1998), Keighery *et al* (2002) and HGM (2002).

A number of impacts arising from current land uses have degraded the conservation value of parts of the wetland. The cause of this degradation can be directly linked with the current land use practice, which is predominated horse grazing. Grazing has led to

extensive weed invasion from pasture species (namely *Pennisetum clandestinum*, Common Name: kikuyu) as well as the destruction of wetland plants and the disturbance of wetland sediment. In addition to these, there has been excavation of the sumpland in parts and, to a lesser extent, the creation of a localised acid sulphate problem.

### ***Discussion***

The inclusion of the degraded grazing areas within the proposed ROS reserve boundary, particularly those to the east of Muddy Lake, has been questioned by the DPI following submissions by landowners. However, it is considered that these areas comprise only a small part of the total area proposed to be included in ROS. In order to support the high conservation values of the entire wetland system, the EPA Service Unit and the Wetlands Section of the Water and Rivers Commission consider that, although degraded, these areas should not be excluded from proposed ROS. In fact, it recommended that the full extent of the wetland boundary (Attachment 2) be included in the ROS reserve, to limit the likely impacts on the hydrology and ecology of this system by future land uses.

However, the DPI has advised that the ROS reserve boundary can not be modified without readvertising the GBRS, therefore, the EPA Service Unit recommends that the boundary be amended as priority once the GBRS has been proclaimed.

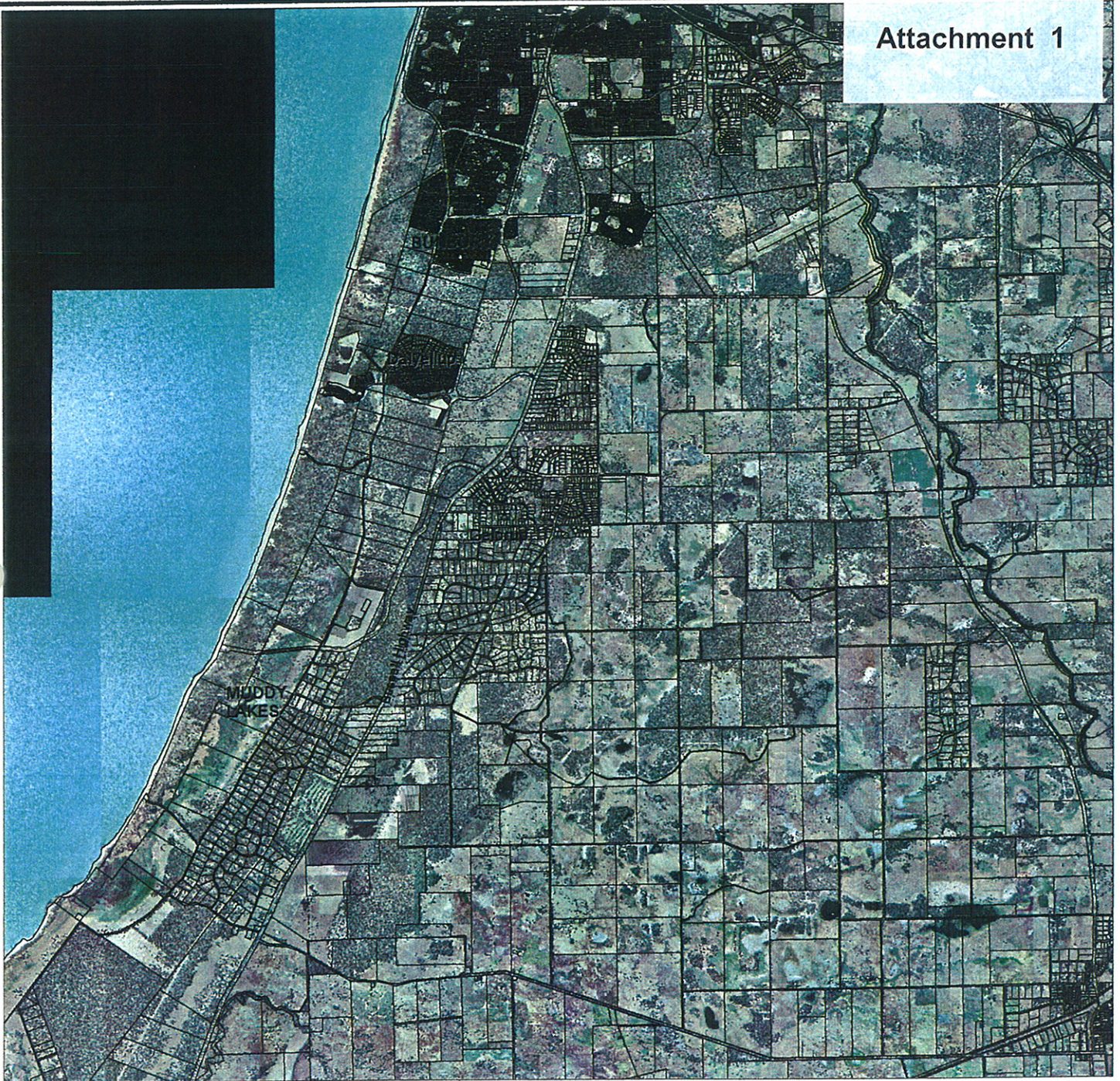
In the meantime the EPA Service Unit recommends that Muddy Lakes should be managed and protected for conservation purposes as a matter of priority. Short term management arrangements are required to prevent further degradation by the current land use activities. Further biological and hydrological studies will be required to ensure that the wetland is properly managed.

Contiguous regionally significant natural areas to the north of the proposed Muddy Lakes ROS reserve should also be managed in the short and included in the ROS reserve once the GBRS has been promulgated.

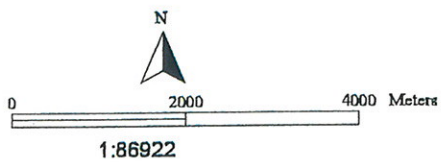
### ***EPA Service Unit recommendations***

It is recommended that:

- 1) The alignment of the ROS reserve boundary be modified once the GBRS has been proclaimed to include:
  - the full extent of the eastern side of the Muddy Lakes wetland boundary; and
  - the area between Dalyellup wetland and Muddy Lakes
- 2) Short term management arrangements be implemented in the Dalyellup/Minninup Lake Natural Area to prevent further degradation by current land use activities;
- 3) Interim planning mechanisms be put in place to ensure that conservation values in the Dalyellup/Minninup Lake Natural Area are protect from any further development or change of land use until suitable protection measures under the Greater Bunbury Region Scheme are provided; and
- 4) Further biological and hydrological studies be undertaken to ensure that the Dalyellup/Minninup Lake Natural Area is properly managed.



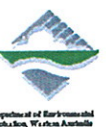
### Muddy Lakes Locality Plan

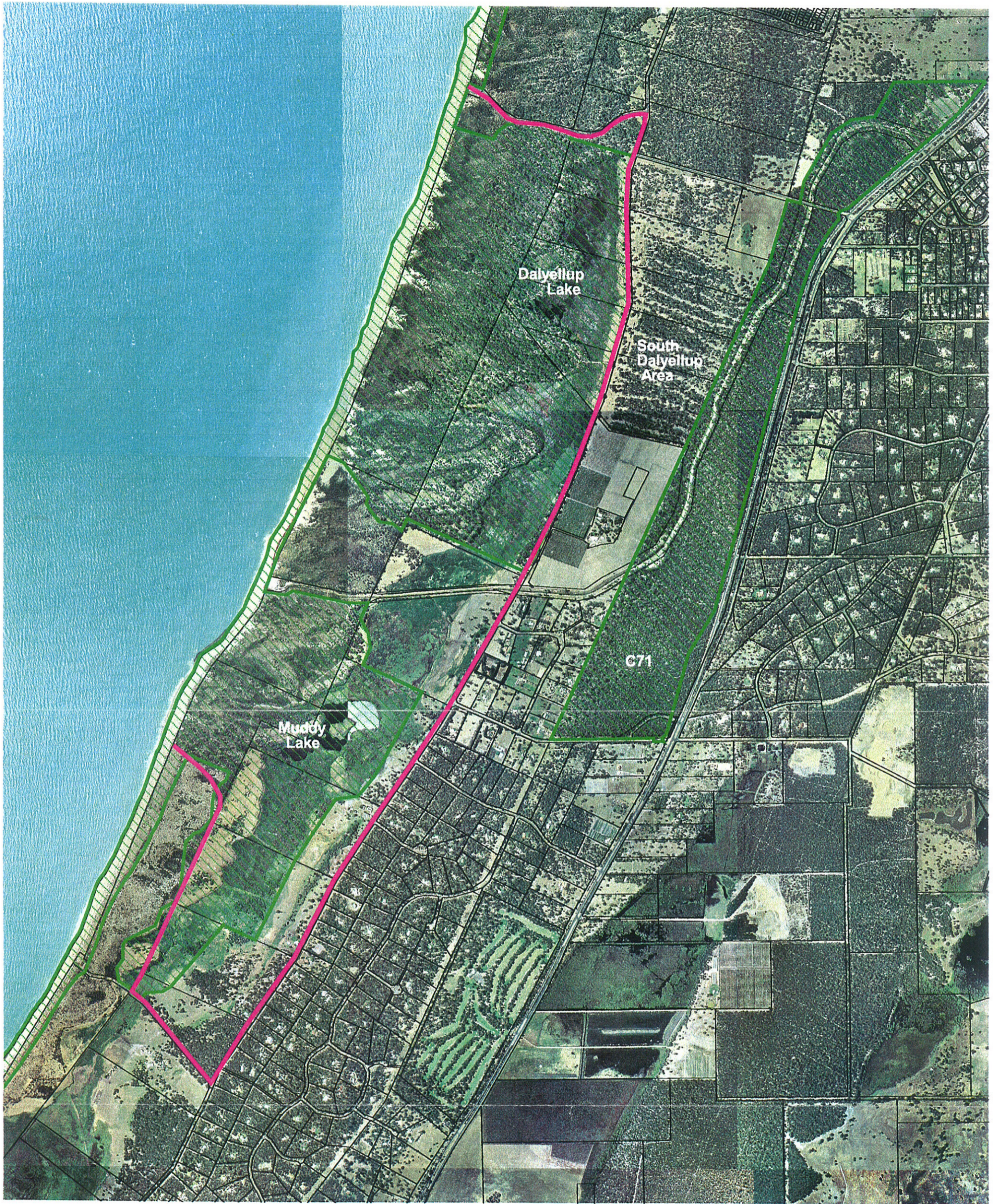


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Zones and Detailed Locality Map

-  Dalyellup / Minninup Lake Natral Area
  -  GBRS - Regional Open Space Reserve boundary alignment
  -  Cadastral boundaries
- 2002 Skyview Imagery - DOLA



## APPENDIX 4

### SOUTH DALYELLUP URBAN DEFERRED, WELLINGTON LOCATION 41, LOTS 313-317, GELORUP

These notes accompany the briefing note prepared for the EPA's field trip concerned with the proposed sand and limestone quarry on Lots 313-317, Gelorup.

#### ***Background***

Lots 313-317 are situated approximately 8.5km south of Bunbury (Attachment 1) and designated as Urban Deferred in the Greater Bunbury Region Scheme (GBRS) (Attachment 2). The subject land is currently zoned Rural under the Shire of Capel Town Planning Scheme.

The landowner is seeking approval for a sand and limestone quarry over Lots 313-317, Gelorup. The EPA is formally assessing this proposal pursuant to Section 38 of the *Environmental Protection Act 1986*.

The proponent has not indicated when a draft PER will be prepared for the quarry operation, so the timing of the EPA's assessment of the quarry proposal is unknown. However, S48A requires the EPA to meet certain statutory timeframes in its assessment of the GBRS. It is anticipated that the EPA will need to report to the Minister for the Environment and Heritage in early May 2003 to meet these timeframes.

The EPA, therefore, needs to consider the environmental values of the property as part of its assessment of the GBRS prior to assessing the impacts of the proposed quarry.

#### ***Environmental values***

The site is considered to be a regionally significant natural area of high value because it meets two of the criteria being used to identify regionally significant natural areas in the EPA's assessment of the GBRS. These criteria are:

- Representation of Ecological Communities; and
- Maintaining Ecological Processes and Natural Systems.

The natural attributes that contribute to these criteria being met are listed below:

- Substantial representative area of natural vegetation of Spearwood Dune vegetation of Karrakatta Complex Central and South Vegetation Complex (75ha mapped as native vegetation).
- Representative of the southern *Eucalyptus gomphocephala* – *Agonis flexuosa* woodlands (floristic community type 25) which is the only representation of this floristic community type in the Dalyellup/Preston River/Dardanup Primary Regional Ecological Linkage.
- Contained a core area of vegetation in Very Good condition until recent clearing activity removed most of the low trees and understorey. Tall habitat trees were retained in higher densities than other layers of vegetation.

- Large area of native vegetation of compact shape and contiguous with very significant natural areas to the east and west. To the west is the northern extent area of the Dalyellup/Minninup Swamp Natural Area identified as the Dalyellup ROS portion in the GBRs, and to the east is the proposed ROS reserve over the System 6 area C71 (Dalyellup Reserves).
- This area is critical in the Dalyellup/Preston River/Dardanup Primary Regional Ecological Linkage containing the only area of its type in the linkage not already developed for housing or with subdivision approval.
- Contains Tuart and Peppermint Open Forest to Woodland which is significant breeding habitat for bird species utilising tall trees or hollows and species of wetland birds that feed in adjacent wetlands and significant habitat for animals moving between the different habitats of the Dalyellup/Preston River/Dardanup Primary Regional Ecological Linkage. Ring tail possums could occur on the site.

The EPA needs to determine which parts of the site should be conserved and what limitations should be placed on Urban development and potential sand and limestone quarrying.

#### ***WAPC's Draft ROS reserve boundary realignment***

The results of the independent environmental study prepared to assist the WAPC with its response to submissions concludes that the southern three lots proposed to be zoned Urban Deferred (Lots 315, 316 and 317) have regionally significant conservation value, although it is noted in the study that this value is being intentionally degraded by the landowner.

#### ***Discussion***

As a consequence of the regional significance of the natural areas of the area it is proposed that Lots 315, 316 and 317, be identified as a suitable area for retention and protection of these natural values (Attachment 2). These lots have the following specific attributes.

- Contain the area of Spearwood Dune vegetation of Karrakatta Complex Central and South Vegetation Complex in best condition, predominantly Very Good (after HGM 2002).
- Provide adequate linkage opportunity between proposed Dalyellup ROS portion of the Dalyellup/Minninup Swamp Natural Area and adjacent bushland to east is ROS in the System 6 area C71 (Dalyellup Reserves).
- Provide an adequate area of Tuart and Peppermint Open Forest to Woodland which is significant breeding habitat for bird species utilising tall trees or hollows and species of wetland birds that feed in adjacent wetlands.

The identification of this area is consistent with the DPI's recommendations described above.

The EPA Service Unit is concerned that the land owner will continue to further degrade the natural values of the site and recommends that short term planning measures be

implemented by the Western Australian Planning Commission to management and prevent any further development or change of land use on Lots 315, 316 and 317.

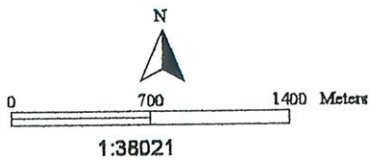
***EPA Service Unit recommendations***

It is recommended that:

1. The zoning over Lots 315, 316 and 317 in the Greater Bunbury Region Scheme be changed from Urban Deferred to Rural lots as shown in Attachment 2; and
2. Until the Greater Bunbury Region Scheme has been proclaimed, short term planning measures be implemented by the Western Australian Planning Commission to management and prevent any further development or change of land use on Lots 315, 316 and 317.



**SOUTH DALYELLUP LOCALITY PLAN**  
Lot 313-317, Gelorup



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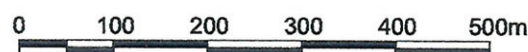


Department of Environment and Planning, Western Australia



South Dalyellup  
Lots 313 - 317, Gelorup

-  GBRS - Regional Open Space Reserve boundary alignment
-  GBRS - Urban Deferred
-  EPA Service Unit recommended conservation boundary  
(to remain in Rural zone at present)
- 313 Cadastral boundaries; Lot number
- 2002 Skyview Imagery - DOLA



**TWIN RIVERS – PT LOT 211 BARNES AVENUE, AUSTRALIND*****Location and zoning***

Pt Lot 211 Barnes Avenue is situated at the confluence of the Collie and Brunswick Rivers and is locally known as Twin Rivers (Attachment 1)

The site is 37 hectares in area and is partly zoned Residential and partly reserved for Recreation in the Shire of Harvey District Planning Scheme No. 1 (DPS No. 1)(Attachment 2). Prior to being released for public comment in August 2000, the GBRS was modified by the WAPC to provide a wider river foreshore Regional Open Space (ROS) reserve in response to community and government agency concerns and based on technical assessment of conservation and recreation values. The modified ROS reserve boundary accommodates the flood fringe of the Collie and Brunswick Rivers (Attachment 3). The original GBRS ROS reserve boundary was similar to the Recreation boundary in the *Shire of Harvey Town Planning Scheme No. 1* (Attachment 2).

***Environmental values***

The Twin River site is considered to be a regionally significant natural area of high value because it meets five of the criteria being used to identify regionally significant natural areas in the EPA's assessment of the GBRS. These criteria are:

- Representation of Ecological Communities,
- Diversity,
- Rarity,
- Maintaining Ecological Processes and Natural Systems and General Criteria for the Protection of Wetland,
- Streamline and Estuarine fringing Vegetation and Coastal vegetation.

The natural attributes that contribute to these criteria being met are listed below:

- Substantial representative area of natural vegetation in Very Good to Good condition of Swan and Karrakatta Complex Central and South Vegetation Complexes. This criterion is met to a limited extent as area is located within the 'Constrained' area of the GBRS, where the criterion *Representation of Ecological Communities* is modified to reflect a >10% threshold for retention. The Karrakatta Complex Central and South Vegetation Complex does not meet this criterion. However it is considered that this criterion is met for the Swan Vegetation Complex as the remaining areas of this Complex are closer to the 10% threshold and this vegetation is generally significantly altered from its natural condition. The area of Swan Complex is one of the best examples of its type.
- Contains conservation category wetland with intact floodplain vegetation.
- In combination the area is diverse for its type in respect to landforms, flora and fauna.
- It is the largest consolidated naturally vegetated remnant on the Collie and Brunswick Rivers with contiguous protected bushland areas to the north and south.

- It is part of the north-south Leschenault/Collie and Brunswick Rivers/Kemerton/Riverdale Road Dalyellup/Preston River/Dardanup Primary Regional Ecological Linkage.
- Location for three rare species, Western Ringtail Possum, Baudin's Black Cockatoo and *Diuris drummondii*. These species are recognised by the State and are subject to protection under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.
- Location for other significant flora and fauna being:
  - Flora - *Lasiopetalum membranaceum* (Priority 3); *Caladenia speciosa* (Priority 4)
  - Fauna - two species protected under JAMBA/CAMBA treaties (Common Greenshank, Great Egret), one Priority 1 species (Square-tailed Kite), one Priority 4 species (Quenda) recorded. Of the fauna known to be present in the region, 9 other priority species utilise habitats similar to those present in the study area and are likely to be present also.

The EPA needs to determine whether the ROS reserve over Pt Lot 211 sufficiently protects these environmental values as part of its formal environmental assessment of the GBRS.

#### ***Subdivision proposal***

A proposal to subdivide Pt Lot 211 Barnes Avenue, Australind was referred to the EPA by the WAPC for consideration under the *Environmental Protection Act* on the 28 September, 1999. The landowners, Marist Brothers Community, proposed to create 248 lots on the site, ranging in size from 600m<sup>2</sup> to 4,000m<sup>2</sup>. The subdivision proposal was based on the Urban zone boundaries shown in the Shire of Harvey DPS No. 1 (Attachment 2).

The Chairmen of the EPA and WAPC met to discuss an appropriate way of dealing with the subdivision ahead of the finalisation of the GBRS, because it was thought that determination of the subdivision may pre-empt the WAPC and EPA assessments of the GBRS in terms of the subject land.

Following this meeting the DPI advised the proponent that it was unlikely the WAPC would approve a subdivision unless it was consistent with the modified ROS reserve boundaries in the GBRS. The Chairman of the EPA advised that, prior to it completing its assessment of the GBRS a subdivision proposal would only likely be considered environmentally acceptable if it was considered unlikely to cause a significant environmental impact and was set well back from the GBRS ROS reserve boundary so as to not pre-empt any changes to the ROS boundary that the EPA may recommend as an outcome of its formal assessment of the GBRS.

In response to the changes to the GBRS and discussions with the Chairman of the EPA, the applicant submitted to the WAPC a revised subdivision design for Stage One of the Twin Rivers Estate (Attachment 4). Stage One was referred to the EPA by the WAPC on

the 6 September 2001 and the EPA subsequently decided to "not assess" Stage One of the Twin Rivers subdivision.

In arriving at a decision to not assess the proposed Stage One subdivision and to provide publicly available environmental advice, the EPA acknowledged that the proposal was associated with potentially significant environmental impacts but considered that there was an adequate area of land being reserved to represent the environmental values and that conditions could be imposed on the subdivision by the WAPC to protect the environmental values of the site. (This is contrary to the advice that the EPA Service Unit is now providing following a more comprehensive assessment of the natural values of the site using the criteria adopted by the EPA to identify regionally significant natural areas in the Greater Bunbury Region Scheme.)

A number of appeals were received on the recommended level of assessment set by the EPA. The Minister for the Environment and Heritage subsequently upheld a number of these appeals. The Minister remitted the proposal to the EPA pursuant to section 101(1)(b)(i) of the *Environmental Protection Act 1986* and recommended that the EPA consider making a decision on the level of assessment for the proposal following completion of the EPA's assessment of the GBRs.

#### ***DPI's Draft ROS reserve boundary realignment***

The DPI has recommended further modifications to the ROS reserve boundary on the Twin Rivers site as shown in Appendix 5.

This modification is based on recommendations in the environmental study commissioned by the WAPC to review the adequacy of the proposed ROS. The study concluded that the entire Twin Rivers site has conservation value, although it conceded that the reserve proposed in the GBRs is acceptable given the current zoning, subject to minor modifications to the boundary alignment as shown in Attachment 5. The modification recommended by the DPI is intended to increase the corridor width along the foreshore and include more upland vegetation at the west of the site.

The DPI has indicated that it is unwilling to increase the extent of the ROS reservation over the Twin Rivers site due to the lack of funds that will be available to the WAPC to purchase the land. The EPA Service Unit recommends that adequate funding arrangements should be included in the GBRs to ensure that funds are available for the WAPC to purchase areas of regional conservation value.

The DPI has advised that the landowner accepts the increased reservation width shown in the GBRs subject to the WAPC purchasing portion of the ROS.

#### ***Discussion***

As described above the Twin Rivers site is considered to be a regionally significant natural area of high value because it meets a number of the criteria being used by the EPA to identify regionally significant natural areas. The EPA Service Unit does not

consider that the current alignment of the ROS reserve adequately protects the values of the site and needs to be realigned to include the following values:

- Inclusion of significant upland areas;
- retention of all vegetated wetland units;
- configuration that allows for a width of at least 300m of upland vegetation adjacent to wetland (this is of particular significance adjacent to the river sand cliff);
- provides sufficient habitat for the rare and significant flora and fauna; and
- the area of bushland should not be less than 20ha

These values have been used to identify the area the EPA Service Unit recommends should be conserved as shown in Attachment 6. This boundary is inconsistent with the boundary of the Stage One subdivision which the EPA previously decided could be managed to protect the regional values of the site. The boundary now being recommended by the EPA Service Unit indicates that the natural values of the site which have been identified using the criteria, are greater than previously thought.

The boundary recommended by the EPA Service Unit is also inconsistent with the boundary recommended by the DPI (Attachment 6).

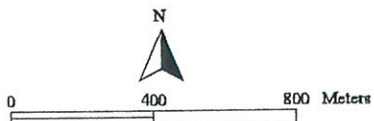
***EPA Service Unit recommendations***

It is recommended that:

1. consideration be given to modifying the boundary of the area to be conserved as shown in Attachment 6.
2. adequate funding arrangements be included in the GBRS to ensure that funds are available for the WAPC to purchase areas of regional conservation value.



**TWINS RIVERS LOCALITY PLAN  
Pt Lot 211 Barnes Avenue, Australind**



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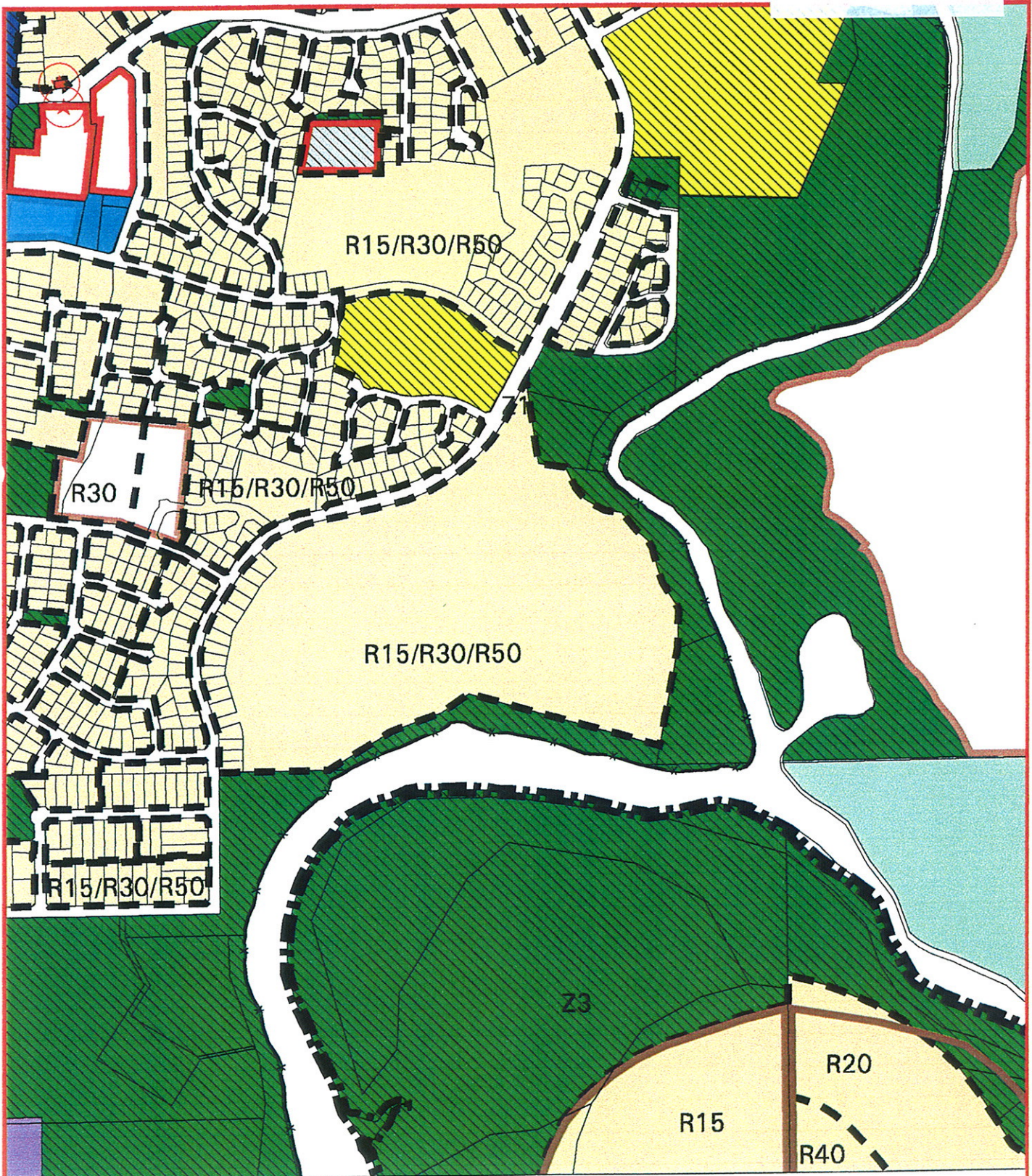
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Department of Environment and Planning, Western Australia



**SCHEME MAP**  
 Pt Lot 211 Barnes Ave  
 Australind, Sh. of Harvey  
 WAPC REF: 112057

**MFP INTERNAL USE ONLY**

Prepared By: Frank Scibilia

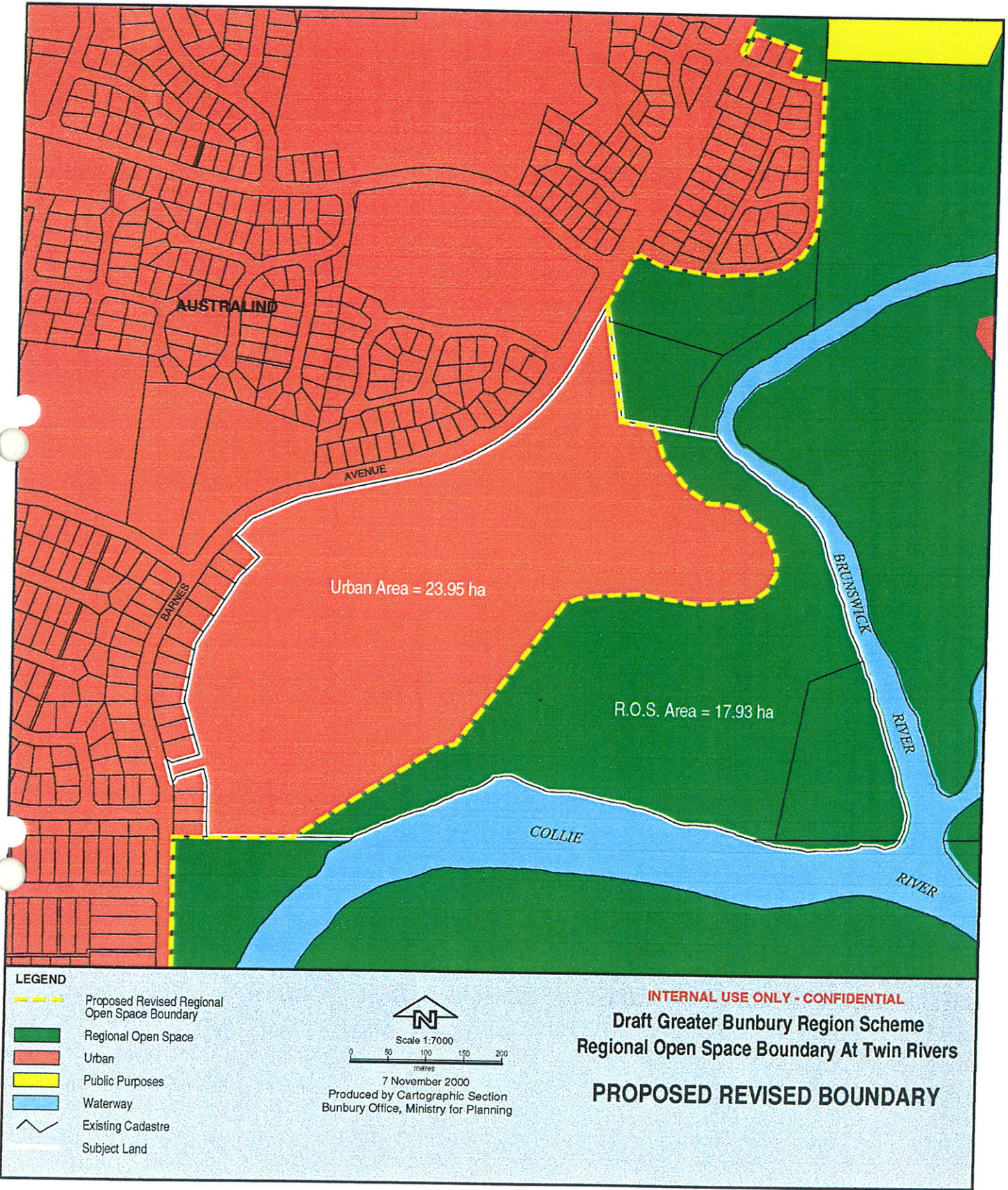
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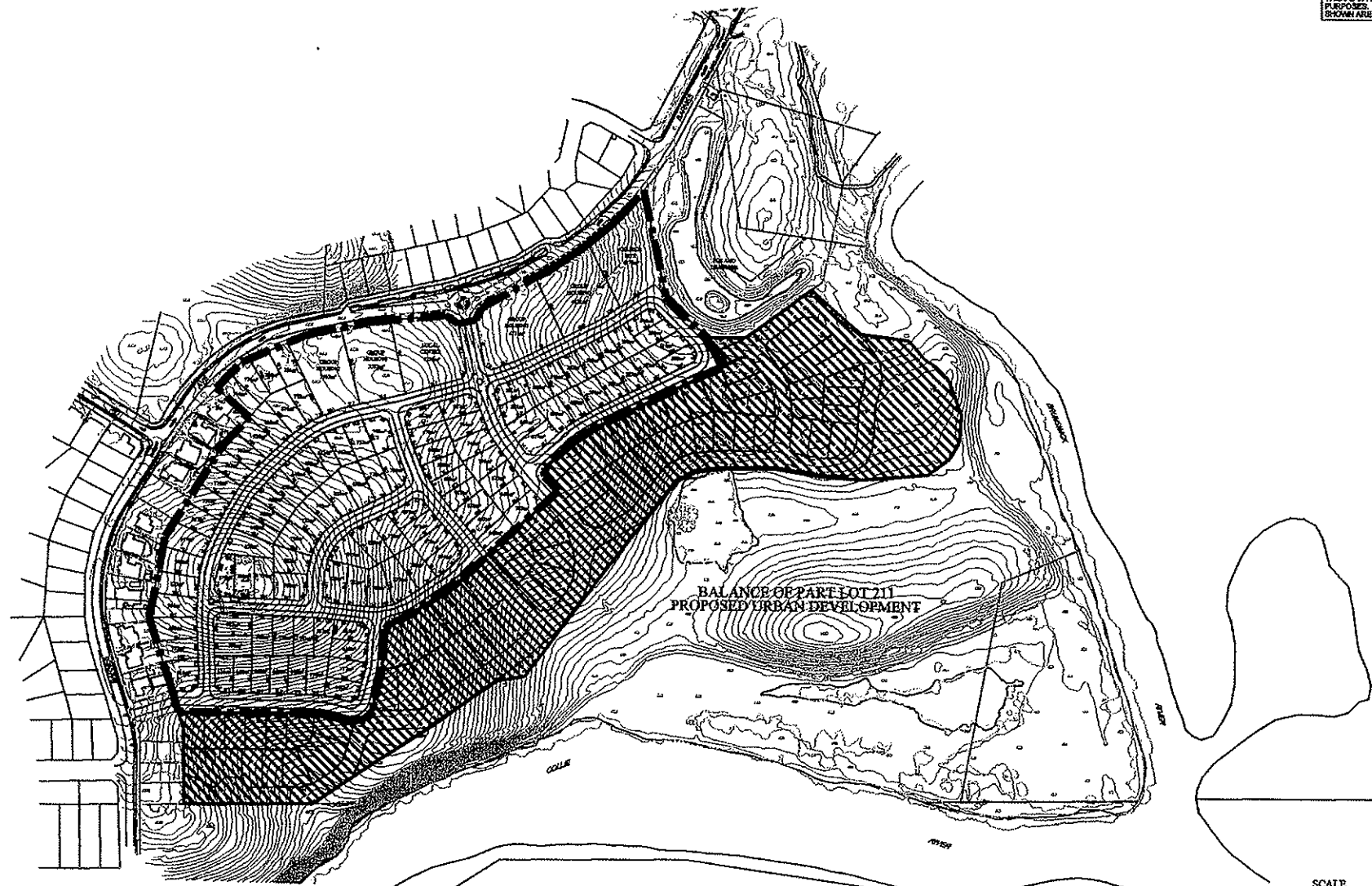
Date: 07 Nov 2000

Scale 1:10000

Cadastre	OFFICE	Dardanup Z 3
Harvey Z 1	RESIDENTIAL DEVELOPMENT	RECREATION
GENERAL FARMING	GENERAL INDUSTRY	RESIDENTIAL
RESIDENTIAL	IMPORTANT REGIONAL ROADS	TPS - R Cod
PUBLIC PURPOSES	NO ZONE	TPS - Scher
RECREATION	SPECIAL USE OTHER COMMUNITY	RESIDENTIAL
PUBLIC UTILITIES	SPECIAL USE	PLACE OF
SHOP		



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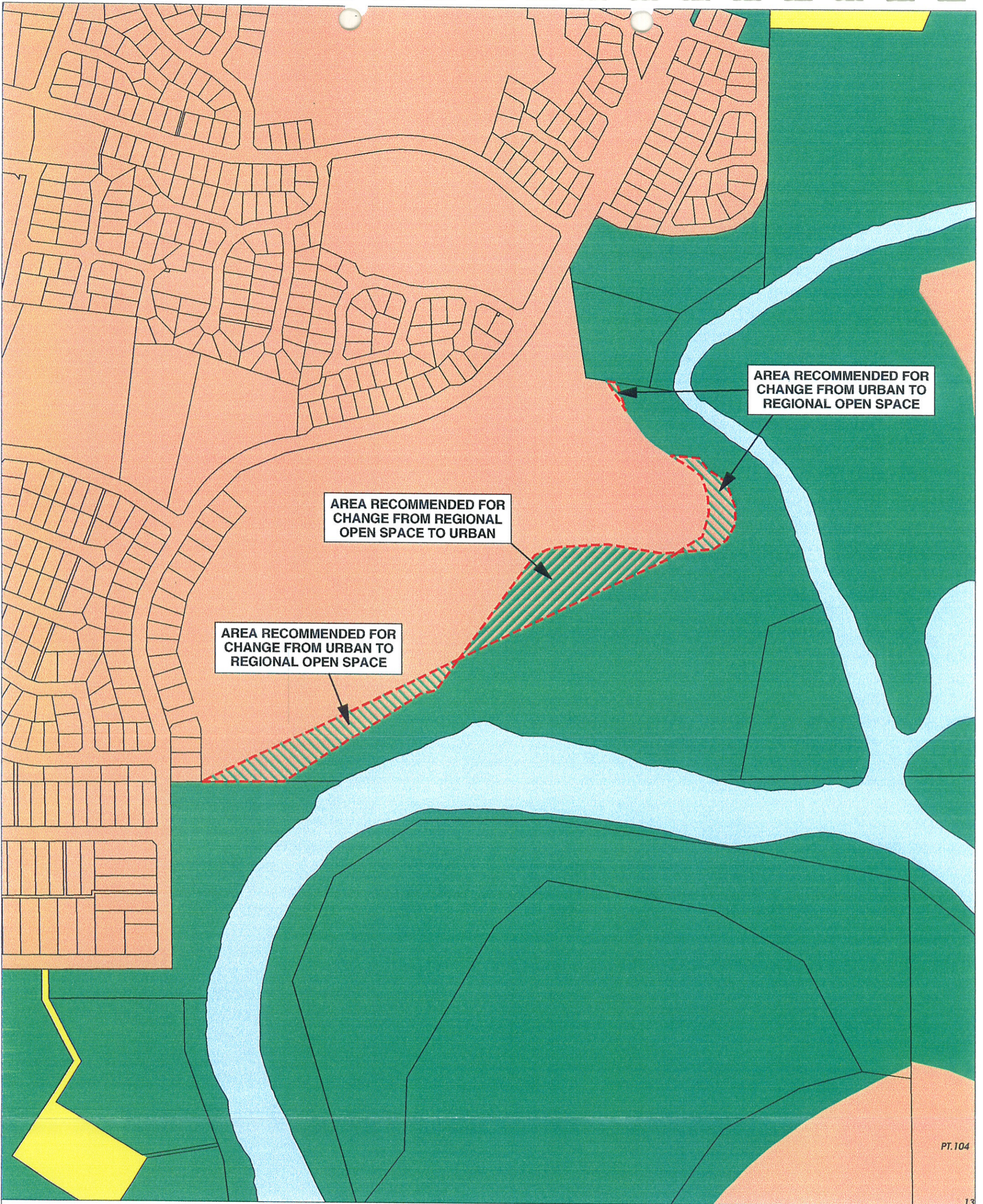


**SUBDIVISION PLAN  
"TWIN RIVERS"  
PT LOT 211 BARNES AVENUE  
AUSTRALIND**

- ■ — ■ — APPLICATION BOUNDARY
- ▨ PROPOSED STAGE 2

SCALE	DATE
1:6000	JUNE 2001
PLAN No.	
99016P-08	





AREA RECOMMENDED FOR CHANGE FROM URBAN TO REGIONAL OPEN SPACE

AREA RECOMMENDED FOR CHANGE FROM REGIONAL OPEN SPACE TO URBAN

AREA RECOMMENDED FOR CHANGE FROM URBAN TO REGIONAL OPEN SPACE

PT. 104

13

**RECOMMENDED MODIFICATION  
TWIN RIVERS**

**SITE 1**

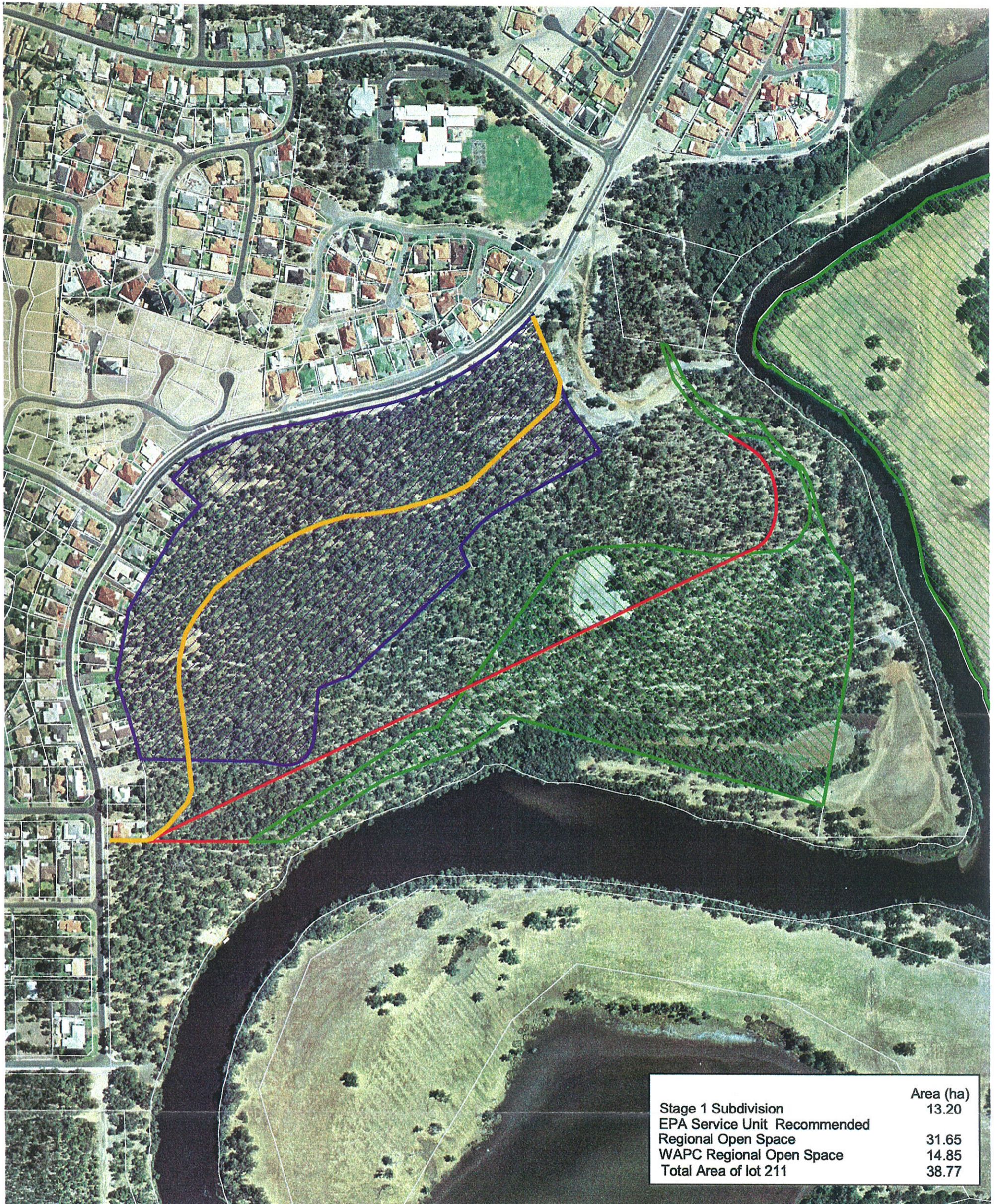
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PRODUCED BY CARTOGRAPHIC SECTION, BUNBURY OFFICE

RESERVED LANDS		LEGEND	
	REGIONAL OPEN SPACE		PUBLIC PURPOSES - DENOTED AS FOLLOWS:
	RAILWAYS	A	AIRPORT
	STATE FORESTS	H	HOSPITAL
	WATERWAYS	HS	HIGH SCHOOL
	PORT INSTALLATIONS	P	PRISON
	PRIMARY REGIONAL ROADS	PU	PUBLIC UTILITIES
	OTHER REGIONAL ROADS	SU	SPECIAL USES
		TS	TECHNICAL SCHOOL
		U	UNIVERSITY
			URBAN
			URBAN DEFERRED
			REGIONAL CENTRE
			INDUSTRIAL
			RURAL
			PRIVATE RECREATION
			SPECIAL CONTROL AREAS DENOTED AS FOLLOWS:
		SCA NO.1	WATER CATCHMENTS
		SCA NO.2	KEMERTON INDUSTRIAL ZONE BUFFER AREA
		SCA NO.3	NORTH CAPEL INDUSTRIAL ZONE BUFFER AREA
			SCHEME BOUNDARY
			AREA OF RECOMMENDED MODIFICATION






**N**  
**SCALE 1:5000**

0 100  
**Metres**

NOTE: All Dimensions are in Metres



Twin Rivers  
Pt Lot 211 Barnes Avenue, Australind

-  GBRs - Regional Open Space Reserve boundary alignment, as advertised
-  EPA Service Unit recommended conservation boundary
-  WA Planning Commission recommended ROS Reserve boundary modified alignment
-  Stage One Subdivision application, referred to the EPA 6th September, 2001
-  Cadastral boundaries

2002 Skyview Imagery - DOLA



0 100 200m

GDA Projection: Map Grid of Australia (MGA94)



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