

PROPOSED MURRAY LAKES GOLF COMPLEX  
AND RESIDENTIAL ESTATE

SUN LAND PTY LTD

Report and Recommendations  
of the  
Environmental Protection Authority

Environmental Protection Authority  
Perth, Western Australia

ISSN 1030 0120

ISBN 0 7309 1942 0

CONTENTS

	Page
1. SUMMARY AND RECOMMENDATIONS . . . . .	ii
1. INTRODUCTION . . . . .	1
2. THE PROPOSAL . . . . .	1
3. ENVIRONMENTAL ASSESSMENT . . . . .	1
3.1 <u>NUTRIENT IMPACTS</u> . . . . .	4
3.2 <u>CLEARING AND DRAINAGE</u> . . . . .	5
3.3 <u>PERTH - BUNBURY HIGHWAY</u> . . . . .	6
3.4 <u>SEWERAGE DISPOSAL</u> . . . . .	6
3.5 <u>LAKES</u> . . . . .	7
4. CONCLUSION . . . . .	7
5. REFERENCES . . . . .	8

APPENDIX

1. The Proponent's Environmental Commitments . . . . .	9
--	---

FIGURES

1. Location Plan . . . . .	2
2. Plan of Development . . . . .	3

TABLES

1. Estimated Maximum Phosphorus into Development Site During and After Establishment (tonnes/annum) (From NOI) . . . . .	4
2. Estimated Phosphorus Inputs Into Development Based on Lower Fertilizer Rates (tonnes/annum) . . . . .	5

i. SUMMARY AND RECOMMENDATIONS

Sun Land Pty Ltd (the "proponent") has proposed the development of a golf course and residential estate on Murray Location 17, immediately adjacent to, and to the south of, the existing Murray Lakes Canal Development in the Shire of Murray.

The Environmental Protection Authority decided that the proposal should be assessed under Part IV of the Environmental Protection Act 1986 and be dealt with on the basis of a Notice of Intent submitted by the proponent.

The Notice of Intent provided details of the proposed development and management of environmental impacts. The principal environmental issue arising from the proposal concerns the export of nutrients from the site into the Peel-Harvey Estuarine System. The Environmental Protection Authority has considered this and other issues associated with the proposal and has concluded that it is environmentally acceptable. It makes the following recommendations about the proposal:

RECOMMENDATION 1

The Environmental Protection Authority concludes that the proposed golf course and residential development on Murray Location 17 in the Shire of Murray is environmentally acceptable and recommends that it could proceed subject to the commitments made by the proponent, and the recommendations made in this assessment report.

RECOMMENDATION 2

The Environmental Protection Authority recommends that, after establishment of the development, the nutrient input to the site not exceed 2.1 tonnes of phosphorus/year and that the proponent should attempt to ensure it is less. To achieve this objective the Authority further recommends that a Nutrient Management Plan for the development should be prepared prior to the commencement of construction, and implemented to the satisfaction of the Authority. The management plan should include provision for amendment of soil within the golf course area where testing shows that the soil has a Phosphorous Retention Index of less than 10.

RECOMMENDATION 3

The Environmental Protection Authority recommends that, to compensate for the area of vegetation cleared for the proposed development, an area of vegetation of at least the equivalent size and preferably more, be re-established within the development site. Vegetation retention and planting should be incorporated into the Nutrient Management Plan.

RECOMMENDATION 4

The Environmental Protection Authority recommends that all drainage within the development site be contained on site.

#### RECOMMENDATION 5

The Environmental Protection Authority recommends that development in proximity to the Perth - Bunbury Highway be in accordance with the policy on land use adjacent to major highways and roads being developed by the State Planning Commission.

#### RECOMMENDATION 6

The Environmental Protection Authority recommends that the development be fully seweraged and connected to a functioning sewerage treatment plant, to the satisfaction of the Water Authority of Western Australia and the Environmental Protection Authority.

#### RECOMMENDATION 7

The Environmental Protection Authority recommends that the lakes within the development be constructed with adequate capacity and/or embankments so that they will not flood and transport nutrients into the Peel-Harvey Estuary during heavy rains and flood events.

## 1. INTRODUCTION

In September 1988 Sun Land Pty Ltd submitted a proposal to establish a golf course and residential development on land adjacent to, and immediately south of, the existing Murray Lakes Canal Estate in the Shire on Murray (Figure 1). In considering the referral, the Authority determined the potential for environmental impact was such that the proposal would require assessment under Part IV of the Environmental Protection Act, 1986 and that the level of assessment would be a Notice of Intent (NOI).

In February 1989 a Notice of Intent was submitted to the Authority for assessment.

## 2. THE PROPOSAL (FIGURE 2)

Sun Land Pty Ltd proposes to develop a golf course, club and residential development on Murray Location 17 in the Shire of Murray (Figure 1). The development site covers an area of 270.4 hectares and is currently used for grazing.

The development consists of two main components, namely:

- . The Golf Course - this consists of golf course, club and hotel facilities, and reserves. The proposed golf course covers an area of 145.3 ha. Of this fairways and greens will constitute 45ha of the course and the remaining 100.3 ha will be vegetated and landscaped. The golf course will be both watered and fertilized via an underground irrigation system.

The proposed golf club and hotel are situated on a 3.5 ha site in the centre of the golf course. It is located within the 1 in 100 year flood zone and will be elevated to 3 metre AHD (Australian Height Datum).

The proposed reserves, totalling an additional 32.7ha are located in the western section of the subject land and will consist of native vegetation and existing lakes and waterways. An additional 30ha of vegetation is to be retained to the west of the golf course.

- . Residential Estate - approximately 80ha are proposed to be used for residential development and this area is located predominantly in the southern sector of the site. The proposal is for approximately 400 allotments, principally in the range of 1000 - 2000 square metres, but including some up to 8000 square metres in area. All proposed allotments will be fully sewered and serviced with water, power and telephone.

## 3. ENVIRONMENTAL ASSESSMENT

The Environmental Protection Authority's main objective in assessing the proposal was to ensure that the proposed development would not further contribute to the existing problems in the Peel-Harvey Estuarine System. The estuarine system is heavily polluted through an excess of phosphorus fertilizers which wash from the farmlands, through drains, creeks and rivers, and into the estuary. The excess phosphorus stimulates the growth of algae so much that, in most years there is eutrophication (or nutrient enrichment). There is a real risk that rotting algae may lead to the total collapse of the biological systems in the estuary, with associated large kills of fish, crabs and bottom-dwelling creatures. The amenity values of the estuary could also be significantly affected.

Figure 1. Location Plan.

Figure 2. Plan of Development.



In November 1988, the Authority reported on the management measures outlined in the Stage II Peel Harvey Environmental Review and Management Programme. The Authority has been guided in this assessment by the comments and recommendations in that assessment report and the Ministerial conditions that were subsequently determined. (EPA, 1988a) Potential impacts assessed by the Authority are as follows:

### 3.1 NUTRIENT IMPACTS

At present approximately 230 ha of the property is cleared and used for grazing. The Department of Agriculture's recommended fertilizer application rate for pasture is 9 kg of phosphorus per hectare (p/ha). The existing land use would therefore result in approximately 2100 kg of phosphorus being applied to the site if the Department of Agriculture's recommended application rate was used. The Notice of Intent for the proposal states that at the present time a phosphorus input of approximately 5000 kg is being applied to the site.

The proposed golf course and residential estate has a number of potential nutrient sources. These were outlined in detail in the Notice of Intent. The estimated maximum phosphorus inputs into the development site during and after establishment are outlined in the following table. Figures are in tonnes of elemental phosphorus per year and rounded up to the nearest 0.1 tonnes.

Table 1. Estimated Maximum Phosphorus into Development Site During and After Establishment (tonnes/annum). (From NOI)

YEAR	GOLF COURSE	RESIDENTIAL	PUBLIC RESERVES	TOTAL
1	2.0	2.7	0.6	5.3
2	1.8 a	1.2	0.3	3.3
3 onwards	1.2 a	1.2	0.3	2.7

a = assuming Stage 2 of golf course is commenced in year 2. (Stage 1 of the golf course is 18 holes and Stage 2 is extending the golf course to 27 holes).

Within the NOI a Nutrient Management Strategy is outlined (see Appendix A for commitments made in regard to the Nutrient Management Strategy) and it is stated that through nutrient management the total phosphorus load to the development area could be reduced to 1.6 tonnes/ year.

The success of some of the proposed nutrient management methods is uncertain, particularly those proposed for the residential areas. The Authority's previous experience in assessment of golf course developments suggests that in deriving the proposed figures used for the golf course, fertilizer rates may have been overestimated. The following table indicates the phosphorus inputs into the golf course if fertilizer rates are consistent with those used for other golf courses assessed by the Authority in recent years.

Table 2. Estimated Phosphorus Inputs Into Development  
Based on Lower Fertilizer Rates (tonnes/annum)

YEAR	GOLF COURSE	RESIDENTIAL	PUBLIC RESERVES	TOTAL
1	0.8	2.7	0.6	4.1
2	0.9 a	1.2	0.3	2.4
3	0.4 a	1.2	0.3	1.9
4 onwards	0.2 a	1.2	0.3	1.7

a = assuming Stage 2 of the golf course is commenced in year 2

Fertilizer rates at a more realistic application rate (as outlined above), combined with success of some of the nutrient management strategies should therefore result in a lower phosphorus input to the site after the establishment years than both the current input and levels that which would result from the adoption of the Department of Agriculture's suggested fertilizer application rates.

The proponent has made a commitment (Appendix 1) to amend the soils of the putting green and tees, as necessary. As fertilizer will be applied to the entire golf course area, it would be appropriate to amend soils wherever testing shows that the Phosphorus Retention Index of the soil is less than 10.

## RECOMMENDATION 2

The Environmental Protection Authority recommends that, after establishment of the development, the nutrient input to the site not exceed 2.1 tonnes of phosphorus/year and that the proponent should attempt to ensure it is less. To achieve this objective, the Authority further recommends that a Nutrient Management Plan for the development should be prepared prior to the commencement of construction, and implemented to the satisfaction of the Authority. The management plan should include provision for amendment of soil within the golf course area where testing shows that the soil has a Phosphorus Retention Index of less than 10.

### 3.2 CLEARING AND DRAINAGE

A State Government moratorium currently applies to clearing and drainage within the Peel-Harvey Estuary resulting from the environmental assessment of the Peel-Harvey Estuarine System. The overall objective of the moratorium is to prevent the export of further nutrients to the estuarine system. It has been recognised that clearing and drainage have contributed to the current situation where the estuary is receiving approximately 70% more phosphorus per year than it can assimilate. (Kinhill Engineer Pty Ltd, 1988)

The proposed golf course and residential development will result in approximately 50 hectares of vegetation being cleared. The proponent has stated within the NOI that at least this area of vegetation will be re-established within the development.

The proposed drainage design for the development involves contouring the site such that all surface and groundwater will collect in existing waterways and lakes. Stormwater from the residential areas and drains along roadways will also feed to this drainage system. This will result in the collection of stormwater within the site and restrict losses to the Murray River and Peel-Harvey Estuarine System.

#### RECOMMENDATION 3

The Environmental Protection Authority recommends that, to compensate for the area of vegetation cleared for the proposed development, an area of vegetation of at least the equivalent size and preferably more, be re-established within the development site. Vegetation retention and planting should be incorporated into the Nutrient Management Plan.

#### RECOMMENDATION 4

The Environmental Protection Authority recommends that all drainage within the development site be contained on site.

#### 3.3 PERTH - BUNBURY HIGHWAY

The proposed Perth - Bunbury Highway runs adjacent to the subject land. In December 1988 the Environmental Protection Authority released its assessment report on the southern extension of the Kwinana Freeway (Thomas St to the Metropolitan Region Scheme boundary) (EPA, 1988b). In this report the EPA recommended that the State Planning Commission should prepare a policy which addresses land use adjacent to major highways and roads, relating particularly to traffic noise. The Authority therefore considers that residential development within the proximity of the Perth - Bunbury Highway should be in accordance with the Policy to be developed by the State Planning Commission.

#### RECOMMENDATION 5

The Environmental Protection Authority recommends that development in proximity to the Perth - Bunbury Highway be in accordance with the policy on land use adjacent to major highways and roads being developed by the State Planning Commission.

#### 3.4 SEWERAGE DISPOSAL

The proponent has made a commitment within the NOI that the development will be deep seweraged. The NOI proposes that the development will be connected to the South Yunderup Sewerage Treatment Plant. However, advice from the Water Authority of Western Australia indicates that the South Yunderup Plant would not have the capacity to cope with the extra waste generated by the development. Sewerage from the proposed development would therefore have to be pumped to another sewerage treatment plant. The EPA considers that for the development to be environmentally acceptable it must be connected to deep sewerage and a properly functioning sewerage treatment plant.

#### RECOMMENDATION 6

The Environmental Protection Authority recommends that the development be fully seweraged and connected to a functioning sewerage treatment plant, to the satisfaction of the Water Authority of Western Australia and the Environmental Protection Authority.

### 3.5 LAKES

The North West corner of the site is within the Western Australia Water Authority defined 1 in 100 year floodway of the Murray River. The proposed development includes a number of lakes. Several of the lakes are within this floodway and there is therefore a danger that the lakes will be flushed during heavy rains, carrying with them a considerable nutrient load into the estuary. The Authority considers that the lakes should be constructed in locations or in ways so that they will not contribute nutrients to the estuary, by way of overflow or groundwater.

#### RECOMMENDATION 7

The Environmental Protection Authority recommends that the lakes within the development be constructed with adequate capacity and/or embankments so that they will not flood and transport nutrients into the Peel-Harvey Estuary during heavy rains and flood events.

#### 4. CONCLUSION

The Environmental Protection Authority has assessed Sun Land Pty Ltd's proposal to develop a golf course and residential development on Location 17 in the Shire of Murray. The proposed development is within the Peel Harvey Catchment area. In November 1988 the Environmental Protection Authority assessed the Peel Inlet and Harvey Estuary Management Strategy and following the Authority's assessment the Minister for Environment set conditions on the Management Strategy proposal. The Environmental Protection Authority is aware of these conditions and has examined this proposal in that context. This proposal should result in a reduced nutrient export to the estuary and will be consistent with the objectives of the Ministerial conditions. The Authority concludes that the proposal is environmentally acceptable subject to the commitments made by the proponent (see Appendix 1) and the recommendations in this report. The Authority therefore recommends:

#### RECOMMENDATION 1

The Environmental Protection Authority concludes that the proposed golf course and residential development on Murray Location 17 in the Shire of Murray is environmentally acceptable and recommends that it could proceed subject to the commitments made by the proponent, and the recommendations made in this assessment report.

5.           **REFERENCES**

Environmental Protection Authority (1988a). The Peel Inlet and Harvey Estuary Management Strategy Stage 2: Report and Recommendations by the Environmental Protection Authority. EPA Bulletin No. 319, No.1., March 1988.

Kinhill Engineer Pty Ltd (1988). Peel Inlet and Harvey Estuary Management Strategy - Environmental Review and Management programme - Stage 2, State Printing Division, Perth, Western Australia.

**APPENDIX 1**

**THE PROPONENT'S ENVIRONMENTAL COMMITMENTS**