(104) a-e

15/1/85

To the System 6 Study Team

Enclosed with these submission documents is the O.D.P. for Centennial Park Development, Mandurah, which will impact in part on the areas nominated.

Pagaroni swamp & Fremantle Road swamp - (shown on the O.D.P. by the original aboriginal name as Black Swan Swamp), are of the most concern.

Yours Sincerely

Beryl Francis (vice president)
For the Peel Preservation Group Inc.

SYSTEM 6 BUSHLAND SUBMISSION FORM
FOR CONSIDERATION IN THE UPDATE PROGRAMME

If you wish to submit more than one area for consideration in the System 6 update, please use a separate form for each area.

Please fill in each section giving as much information as possible.

LOCATION, OWNERSHIP AND ZONING OF THE AREA

1. Location Approx 8 Kms. North of Mandurah along the Mandurah by-pass road & appx. 1Km east of same

Please give as accurate and detailed a description as possible of the site location

Please include either a hand drawn or copied map showing the area of the area

a) Bordering Roads: Mandurah by-pass road

b) Nearest Corner: Junction of Mandurah by-pass road & Madora Bay road.

c) Lot Number: Part lot 41 Street Number: .....

d) ~~Town/Suburb~~/Location: Cockburn Sound loc. 16 Stock Route road

e) Local Council: City of Mandurah

f) Site Name (if any): Fremantle Road Swamp

g) Approximate size of the area (ha): 21.29 ha.

h) Please locate the area on a map and give us map references if possible:

.....

i) Map: ..... Streetsmart /UBD/Other: Wettand Map Sheet 2033 II SW

j) Map no.: .....

k) ~~Grid~~ Ref: Wettand Ident. No 38466406 0 (Draft Management proposal for wettands in the City of Mandurah)

l) Please give any other information that may help us to find the location:

Map & air-photo enclosed.

m) Are you aware of any development proposals that are likely to affect the area?

Yes. Centennial Park Estate by Peet & Co Pty Ltd. O.D.P. is now with Mandurah City Council for consideration

Urgent *

NOTE: Areas that have already been given development APPROVAL should not be nominated

Enclosed with Paganoni area submission is O.D.P. of Centennial Park which affects Fremantle Road Swamp.

Please fill out those questions that you can answer

2. **Who owns the area?** (If owned by the person/s making the nomination please indicate) .....
Peet Mandurah Syndicate Pty Ltd

3. **If you own the area, and may be interested in participating in conservation on private land initiatives please indicate** (and leave your name and address at the end of this submission form) .....

4 .**What is the area zoned?** (please indicate whether zoning is Town Planning Scheme or Metropolitan Region Scheme) .....Town Planning Scheme

CAN YOU TELL US A LITTLE ABOUT THE PHYSICAL CHARACTERISTICS OF THE AREA

Also See Fuganori nomination

5. **Why do you consider this area important?** (Refer to Guiding Issues paper)
Comes under E.P.P. 1992 No See D.E.P. advise to Man. council 10.4.95
District Planning Scheme No 3 - Trial advice sections 1. 7 General objectives Appendix 5
2 - 6 Conservation & Preservation 2.6.2.1

6. **What is/are the soil type/s and colours ?** .....

Type: Sand/Clay/Gravel/Loam/Silt
Colour: White/Grey/Brown/Orange/Yellow/Red/Black

7. **Does the area have any special features such as unusual landforms / landscapes that still retain their natural vegetation?** Yes/No

If yes, what are they? .....

.....

.....

8. **Is the area a wetland or does it include a wetland?** The area is classified Sumpland.

If yes, what kind of a wetlands is it?

a) lake

b) river

c) stream

d) swamp

e) estuary

f) seasonally wet

g) other

9. What percentage of the wetland is open water in summer? .....

CAN YOU TELL US A LITTLE ABOUT THE VEGETATION /FAUNA ON THE NOMINATED AREA.

10. What percentage of the area is indigenous vegetation? .....

11. If the area includes regions cleared of native bushland please indicate reasons for the inclusion. The wetland is part of the Stakehill Suite (C.A. Semmule & Termed resource enhancement in the Draft Management Proposals for Wetlands in the City of Mandurah. Students of N.314 Environmental Management Environmental Science Murdoch University 1992

12. Has any previous flora or fauna survey work been done on the area? .....

If yes, please give details of the work ..... See above .....

.....

.....

13. How would you rate the condition of the native bushland? (see attached table)

a) pristine
b) excellent
c) very good
(d) good
(e) degraded
f) completely degraded
g) don't know

14. Please indicate the disturbances affecting the area and where appropriate the percentage of the area disturbed.

(a) Partial clearing
b) fragmentation
c) Selective removal of species: timber cutting, wildflower picking, mowing dieback and other plant diseases
d) Fire regime, including intensity, season and frequency
e) 'Enrichment plantings' that is plantings of species not found in that community
(f) Weed invasion
g) Animal impact: horses, foxes, rabbits, cats, dogs, camels, goats etc
(h) Soil movement, both removal and dumping
i) Changes in water regimes; flooding, drainage and watering
j) Salinity
k) Fertiliser drift and along waterways nutrient influx
l) Mining, including that for road works

(m) Grazing: stock, overgrazing by feral or native mammals

n) Proliferation of tracks, fire breaks and walk trails

o) Off-road vehicle use

p) Use as service corridors by the SEC, Main Roads, Water Authority.

(Source: B Keighery. Bushland Plant Survey, September 1994)

15. Does the area contain any plant species of special interest that you know of? (eg. declared rare flora, priority taxa, outlier populations) .....

Do you know what they are? .....

.....

16. Do you know of any native animals that use the area? .....Black swans

Can you list those you know of? (birds, mammals, reptiles, amphibians etc)

large unidentified number of water birds

17. Is the area used by any native animals of special interest? (eg. endangered species, large/important populations).....

If yes, please name them and indicate source of information

.....

.....

CAN YOU TELL US A LITTLE ABOUT THE SURROUNDING AREA

18. Are there any bushland areas (including wetlands) near to this area?
Pagaroni.....wetland.....

If yes, how close are they ? .....See enclosed air photo & map.....

.....area between swamp cleared except for large tuarts

-see photos.....

Are they already conservation reserves? ....See enclosed information on Pagaroni area - also submitted for System 6 listing

What is their approximate size? .....

19. Does the submitted area link other bushland areas? .....large tuarts still remain as air photo shows.....

.....

Please attach any additional information about the area which may be of use when assessing it.

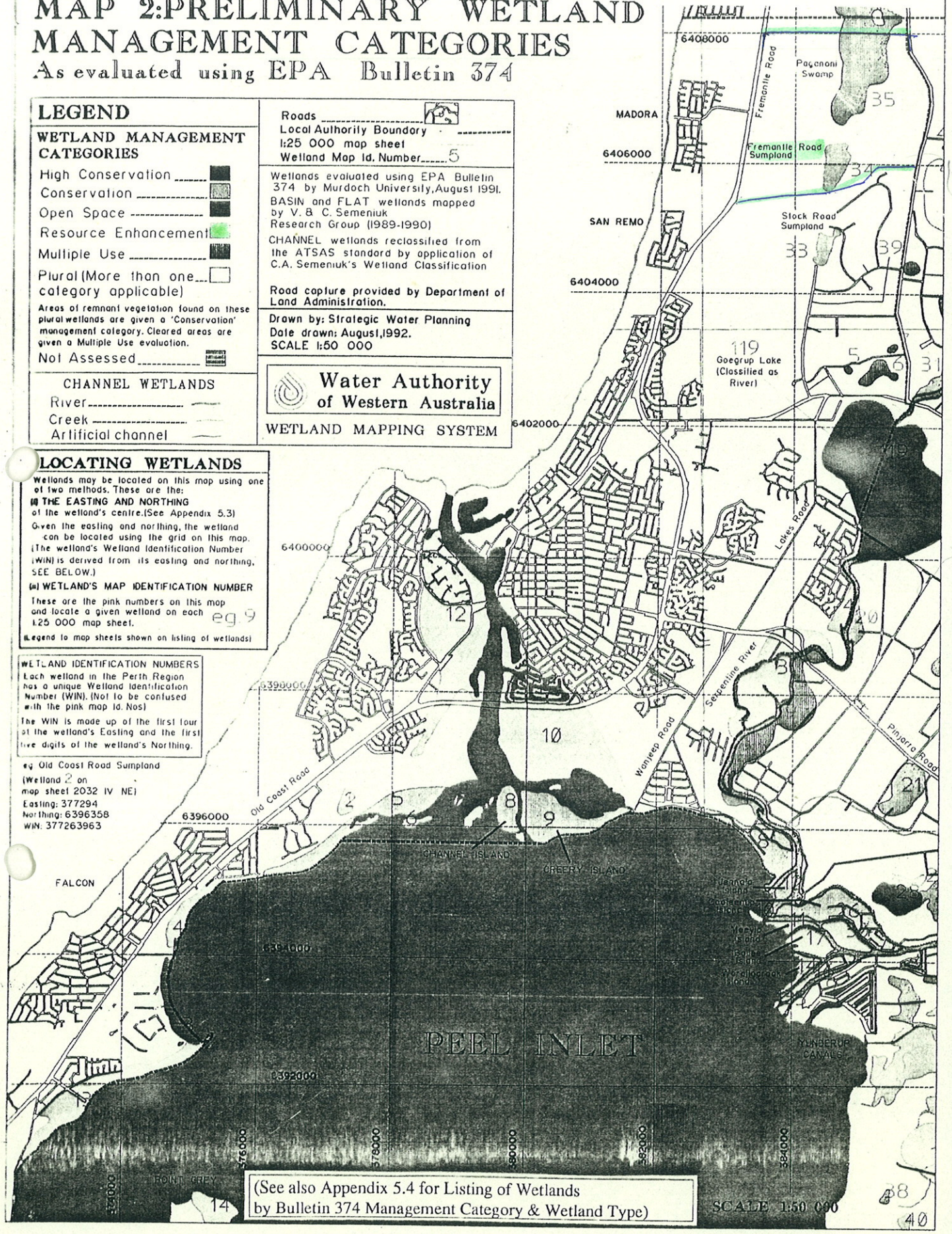
See photos enclosed

Rapid transit proposed to run along west of Fremantle Road Swamp – see Peel Regional Strategy

Area submitted

MAP 2: PRELIMINARY WETLAND MANAGEMENT CATEGORIES

As evaluated using EPA Bulletin 374



LEGEND

WETLAND MANAGEMENT CATEGORIES

- High Conservation
- Conservation
- Open Space
- Resource Enhancement
- Multiple Use
- Plural (More than one category applicable)

Areas of remnant vegetation found on these plural wetlands are given a 'Conservation' management category. Cleared areas are given a Multiple Use evaluation.

- Not Assessed

CHANNEL WETLANDS

- River
- Creek
- Artificial channel

Roads
Local Authority Boundary
1:25 000 map sheet
Wetland Map Id. Number 5

Wetlands evaluated using EPA Bulletin 374 by Murdoch University, August 1991.
BASIN and FLAT wetlands mapped by V. & C. Semeniuk Research Group (1989-1990)
CHANNEL wetlands reclassified from the ATSAS standard by application of C.A. Semeniuk's Wetland Classification

Road capture provided by Department of Land Administration.

Drawn by: Strategic Water Planning
Date drawn: August, 1992.
SCALE 1:50 000

Water Authority of Western Australia

WETLAND MAPPING SYSTEM

LOCATING WETLANDS

Wetlands may be located on this map using one of two methods. These are the:

(i) THE EASTING AND NORTHING of the wetland's centre. (See Appendix 5.3)
Given the easting and northing, the wetland can be located using the grid on this map. (The wetland's Wetland Identification Number (WIN) is derived from its easting and northing, SEE BELOW.)

(ii) WETLAND'S MAP IDENTIFICATION NUMBER
These are the pink numbers on this map and locate a given wetland on each 1:25 000 map sheet. eg 9

(Legend to map sheets shown on listing of wetlands)

WETLAND IDENTIFICATION NUMBERS

Each wetland in the Perth Region has a unique Wetland Identification Number (WIN). (Not to be confused with the pink map Id. Nos)

The WIN is made up of the first four of the wetland's Easting and the first five digits of the wetland's Northing.

eg Old Coast Road Sumpland
(Wetland 2 on map sheet 2032 IV NE)
Easting: 377294
Northing: 6396358
WIN: 377263963

(See also Appendix 5.4 for Listing of Wetlands by Bulletin 374 Management Category & Wetland Type)

SCALE 1:50 000


CENTENNIAL
PARK
DEVELOPMENT
QUARRY

C.

SYSTEM 6 BUSHLAND SUBMISSION FORM
FOR CONSIDERATION IN THE UPDATE PROGRAMME

If you wish to submit more than one area for consideration in the System 6 update, please use a separate form for each area.

Please fill in each section giving as much information as possible.

LOCATION, OWNERSHIP AND ZONING OF THE AREA

1. Location Approx 8 Kms North of Mandurah along the Mandurah by-pass road & appr. 1 Km east of same

Please give as accurate and detailed a description as possible of the site location

Please include either a hand drawn or copied map showing the area of the area

a) Bordering Roads: Mandurah by-pass Road

b) Nearest Corner: Junction of Mandurah by-pass road & Madora Bay rd.

c) Lot Number: Part lot 41 Street Number: .....

d) ~~Town/Suburb~~/Location: Cockburn Sound loc 116 Stock Route Rd.

e) Local Council: City of Mandurah

f) Site Name (if any): .....

g) Approximate size of the area (ha): 2 ha.

h) Please locate the area on a map and give us map references if possible:

See map & air-photo enclosed

i) Map: ..... Streetsmart /UBD/Other: .....

j) Map no.: .....

k) Grid Ref: .....

l) Please give any other information that may help us to find the location:

.....

m) Are you aware of any development proposals that are likely to affect the area?

Yes Centennial Park Estate by Peet & Co Ltd. O.D.P. is now with Mandurah City Council for consideration

urgent **

NOTE: Areas that have already been given development APPROVAL should not be nominated

Please fill out those questions that you can answer

2. Who owns the area? (If owned by the person/s making the nomination please indicate) .....
Peat Mandurah Syndicate Pty Ltd

3. If you own the area, and may be interested in participating in conservation on private land initiatives please indicate (and leave your name and address at the end of this submission form) .....

4 .What is the area zoned? (please indicate whether zoning is Town Planning Scheme or Metropolitan Region Scheme) .....Town Planning Scheme

CAN YOU TELL US A LITTLE ABOUT THE PHYSICAL CHARACTERISTICS OF THE AREA

5. Why do you consider this area important? (Refer to Guiding Issues paper)
This area of banksia has been fenced at all times to prevent stock invasion. It has indigenous understorey with with an unsurveyed amount of .....

6. What is/are the soil type/s and colours ? .....

Type: Sand/Clay/Gravel/Loam/Silt
Colour: White/Grey/Brown/Orange/Yellow/Red/Black

7. Does the area have any special features such as unusual landforms / landscapes that still retain their natural vegetation? Yes/No

If yes, what are they? .....
.....
.....

8. Is the area a wetland or does it include a wetland? .....No.....

If yes, what kind of a wetlands is it?

a) lake

b) river

c) stream

d) swamp

e) estuary

f) seasonally wet

g) other

9. What percentage of the wetland is open water in summer? .....

CAN YOU TELL US A LITTLE ABOUT THE VEGETATION /FAUNA ON THE NOMINATED AREA.

10. What percentage of the area is indigenous vegetation? .....2 ha.....

11. If the area includes regions cleared of native bushland please indicate reasons for the inclusion. .....

.....

12. Has any previous flora or fauna survey work been done on the area?
.....N.O.....

If yes, please give details of the work .....

.....

.....

13. How would you rate the condition of the native bushland? (see attached table)

a) pristine
(b) excellent
c) very good
d) good
e) degraded
f) completely degraded
g) don't know

14. Please indicate the disturbances affecting the area and where appropriate the percentage of the area disturbed.

a) Partial clearing
b) fragmentation
c) Selective removal of species: timber cutting, wildflower picking, mowing dieback and other plant diseases
d) Fire regime, including intensity, season and frequency
e) 'Enrichment plantings' that is plantings of species not found in that community
(f) Weed invasion minimal
g) Animal impact: horses, foxes, rabbits, cats, dogs, camels, goats etc
h) Soil movement, both removal and dumping
i) Changes in water regimes; flooding, drainage and watering
j) Salinity
k) Fertiliser drift and along waterways nutrient influx
l) Mining, including that for road works

m) Grazing: stock, overgrazing by feral or native mammals

n) Proliferation of tracks, fire breaks and walk trails

o) Off-road vehicle use

p) Use as service corridors by the SEC, Main Roads, Water Authority.

(Source: B Keighery. Bushland Plant Survey, September 1994)

15. Does the area contain any plant species of special interest that you know of? (eg. declared rare flora, priority taxa, outlier populations) .....

Do you know what they are? .....

.....

16. Do you know of any native animals that use the area? ....evidence of wallaby droppings.

Can you list those you know of? (birds, mammals, reptiles, amphibians etc)

.....

17. Is the area used by any native animals of special interest? (eg. endangered species, large/important populations).....

If yes, please name them and indicate source of information

.....

.....

CAN YOU TELL US A LITTLE ABOUT THE SURROUNDING AREA

18. Are there any bushland areas (including wetlands) near to this area?
.....YES Pagaroni swamp & Fremantle Road Swamp

If yes, how close are they ? .....See air-photo enclosed.....
.....large tracts are scattered around the area

.....

Are they already conservation reserves? ..... Pagaroni area has been listed by National Trust

What is their approximate size? ..See Pagaroni - Submitted for system 6 listing

19. Does the submitted area link other bushland areas? .....
.....large tracts link the area to Pagaroni wetland & Fremantle Road swamp: but no understorey. see air-photo.

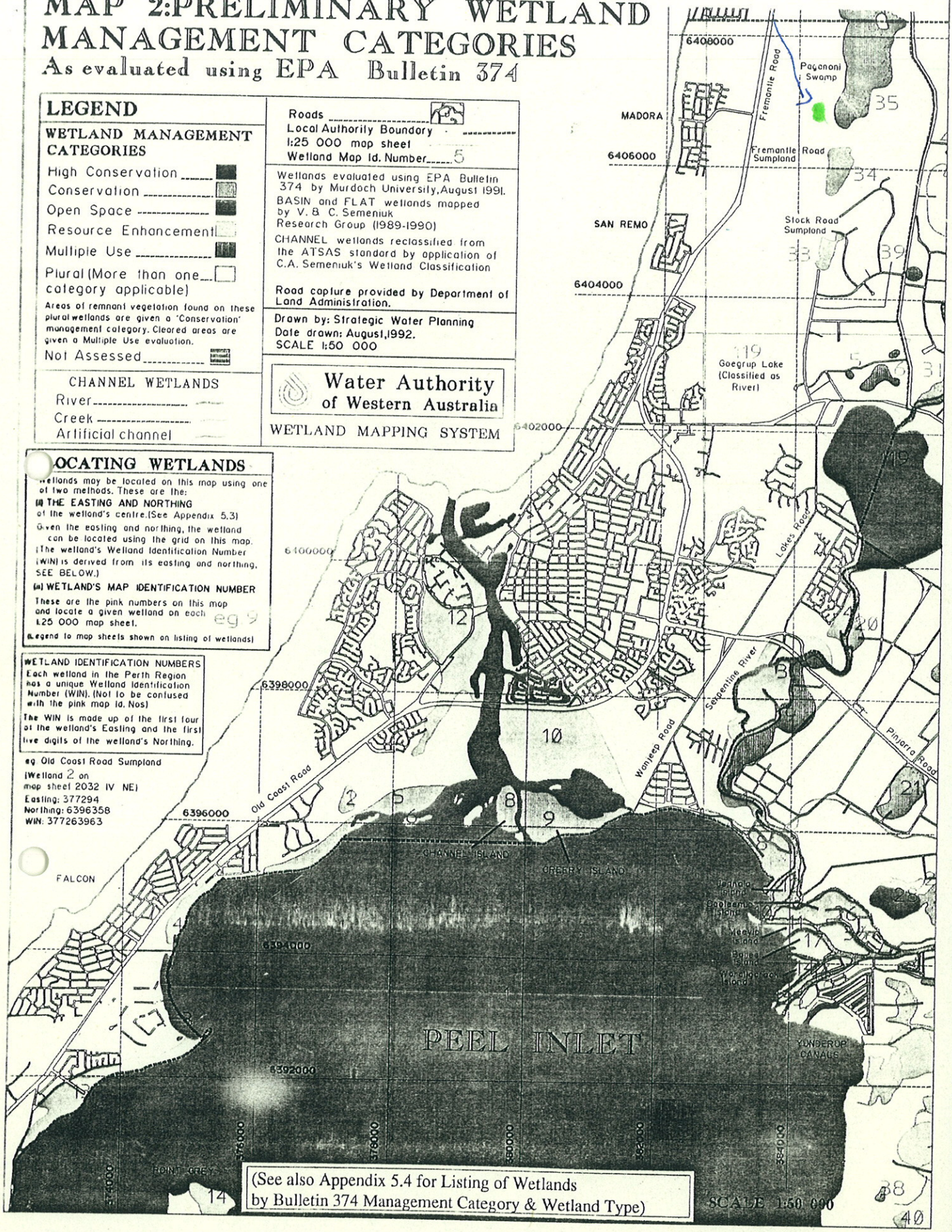
Please attach any additional information about the area which may be of use when assessing it.

photos enclosed

Area Submitted

MAP 2: PRELIMINARY WETLAND MANAGEMENT CATEGORIES

As evaluated using EPA Bulletin 374



LEGEND

WETLAND MANAGEMENT CATEGORIES

- High Conservation
- Conservation
- Open Space
- Resource Enhancement
- Multiple Use
- Plural (More than one category applicable)

Areas of remnant vegetation found on these plural wetlands are given a 'Conservation' management category. Cleared areas are given a Multiple Use evaluation.

- Not Assessed

CHANNEL WETLANDS

- River
- Creek
- Artificial channel

Roads
Local Authority Boundary
1:25 000 map sheet
Wetland Map Id. Number 5

Wetlands evaluated using EPA Bulletin 374 by Murdoch University, August 1991.
BASIN and FLAT wetlands mapped by V. & C. Semeniuk Research Group (1989-1990)
CHANNEL wetlands reclassified from the ATSAS standard by application of C.A. Semeniuk's Wetland Classification

Road capture provided by Department of Land Administration.

Drawn by: Strategic Water Planning
Date drawn: August, 1992.
SCALE 1:50 000

Water Authority of Western Australia

WETLAND MAPPING SYSTEM

LOCATING WETLANDS

Wetlands may be located on this map using one of two methods. These are the:

(a) THE EASTING AND NORTHING
of the wetland's centre. (See Appendix 5.3)
Given the easting and northing, the wetland can be located using the grid on this map. (The wetland's Wetland Identification Number (WIN) is derived from its easting and northing, SEE BELOW.)

(b) WETLAND'S MAP IDENTIFICATION NUMBER
These are the pink numbers on this map and locate a given wetland on each 1:25 000 map sheet. eg 9
(Legend to map sheets shown on listing of wetlands)

WETLAND IDENTIFICATION NUMBERS
Each wetland in the Perth Region has a unique Wetland Identification Number (WIN). (Not to be confused with the pink map Id. Nos)
The WIN is made up of the first four of the wetland's Easting and the first five digits of the wetland's Northing.

eg Old Coast Road Sumpland
(Wetland 2 on map sheet 2032 IV NE)
Easting: 377294
Northing: 6396358
WIN: 377263963

(See also Appendix 5.4 for Listing of Wetlands by Bulletin 374 Management Category & Wetland Type)


PROPOSED
CENTENNIAL PAR
AREA
NOMINATE
QUARRY

SYSTEM 6 BUSHLAND SUBMISSION FORM
FOR CONSIDERATION IN THE UPDATE PROGRAMME

If you wish to submit more than one area for consideration in the System 6 update, please use a separate form for each area.

Please fill in each section giving as much information as possible.

LOCATION, OWNERSHIP AND ZONING OF THE AREA

1. Location Approx. 8 km. North of Mandurah along the Mandurah by-pass Rd. & Approx 1 km east of same

Please give as accurate and detailed a description as possible of the site location

Please include either a hand drawn or copied map showing the area of the area

a) Bordering Roads: Mandurah by-pass road

b) Nearest Corner: Junction of Mandurah by-pass road & Madora Bay Rd.

c) Lot Number: Part lot 41 Street Number: .....

d) ~~Town/Suburb~~/Location: Cockburn Sound loc 16 Stock Route Rd.

e) Local Council: City of Mandurah

f) Site Name (if any): .....

g) Approximate size of the area (ha): 5 ha

h) Please locate the area on a map and give us map references if possible:

See map & aer photo enclosed

i) Map: ..... Streetsmart /UBD/Other: .....

j) Map no.: .....

k) Grid Ref: .....

l) Please give any other information that may help us to find the location:

.....

(m) Are you aware of any development proposals that are likely to affect the area?

Yes Centennial Park Estate by Peet & Co. has O.D.P. is now with Mandurah City council for consideration

Urgent *

NOTE: Areas that have already been given development APPROVAL should not be nominated

Please fill out those questions that you can answer

2. Who owns the area? (If owned by the person/s making the nomination please indicate) .....
Peet Mandurah Syndicate Pty. Ltd.

3. If you own the area, and may be interested in participating in conservation on private land initiatives please indicate (and leave your name and address at the end of this submission form) .....

4 .What is the area zoned? (please indicate whether zoning is Town Planning Scheme or Metropolitan Region Scheme) .....Town Planning Scheme.

CAN YOU TELL US A LITTLE ABOUT THE PHYSICAL CHARACTERISTICS OF THE AREA

5. Why do you consider this area important? (Refer to Guiding Issues paper)
This is a reasonably sized area containing young & older examples of Jarra, Tuart, Prickly Pear, Red Gums, She-oaks, Banksia all of which Mandurah is losing past to developments.

6. What is/are the soil type/s and colours ? .....

Type: Sand/Clay/Gravel/Loam/Silt
Colour: White/Grey/Brown/Orange/Yellow/Red/Black

7. Does the area have any special features such as unusual landforms / landscapes that still retain their natural vegetation? Yes/No

If yes, what are they? .....
.....
.....

8. Is the area a wetland or does it include a wetland? .....N.o.....

If yes, what kind of a wetlands is it?

a) lake

b) river

c) stream

d) swamp

e) estuary

f) seasonally wet

g) other

9. What percentage of the wetland is open water in summer? .....

CAN YOU TELL US A LITTLE ABOUT THE VEGETATION /FAUNA ON THE NOMINATED AREA.

10. What percentage of the area is indigenous vegetation? .....

11. If the area includes regions cleared of native bushland please indicate reasons for the inclusion. .....

.....

12. Has any previous flora or fauna survey work been done on the area?
....No.....

If yes, please give details of the work .....

.....

.....

13. How would you rate the condition of the native bushland? (see attached table)

a) pristine
b) excellent
c) very good
(d) good
(e) degraded
f) completely degraded
g) don't know

No understorey

14. Please indicate the disturbances affecting the area and where appropriate the percentage of the area disturbed.

(a) Partial clearing
b) fragmentation
c) Selective removal of species: timber cutting, wildflower picking, mowing dieback and other plant diseases
d) Fire regime, including intensity, season and frequency
e) 'Enrichment plantings' that is plantings of species not found in that community
(f) Weed invasion
(g) Animal impact: horses, foxes, rabbits, cats, dogs, camels, goats etc
h) Soil movement, both removal and dumping
i) Changes in water regimes; flooding, drainage and watering
j) Salinity
k) Fertiliser drift and along waterways nutrient influx
l) Mining, including that for road works

(m) Grazing: stock, overgrazing by feral or native mammals

n) Proliferation of tracks, fire breaks and walk trails

o) Off-road vehicle use

p) Use as service corridors by the SEC, Main Roads, Water Authority.

(Source: B Keighery. Bushland Plant Survey, September 1994)

15. Does the area contain any plant species of special interest that you know of? (eg. declared rare flora, priority taxa, outlier populations) .....

Do you know what they are? .....

.....

16. Do you know of any native animals that use the area? Grey kangaroos use the area frequently.

Can you list those you know of? (birds, mammals, reptiles, amphibians etc)

.....

17. Is the area used by any native animals of special interest? (eg. endangered species, large/important populations).....

If yes, please name them and indicate source of information

.....

.....

CAN YOU TELL US A LITTLE ABOUT THE SURROUNDING AREA

18. Are there any bushland areas (including wetlands) near to this area?

.....

If yes, how close are they ? Paganoni area including wetlands — See air photo enclosed.

.....

Are they already conservation reserves? part vested in C.A.L.M.

What is their approximate size? See Paganoni area submitted for System 6.

19. Does the submitted area link other bushland areas? .....

.....

.....

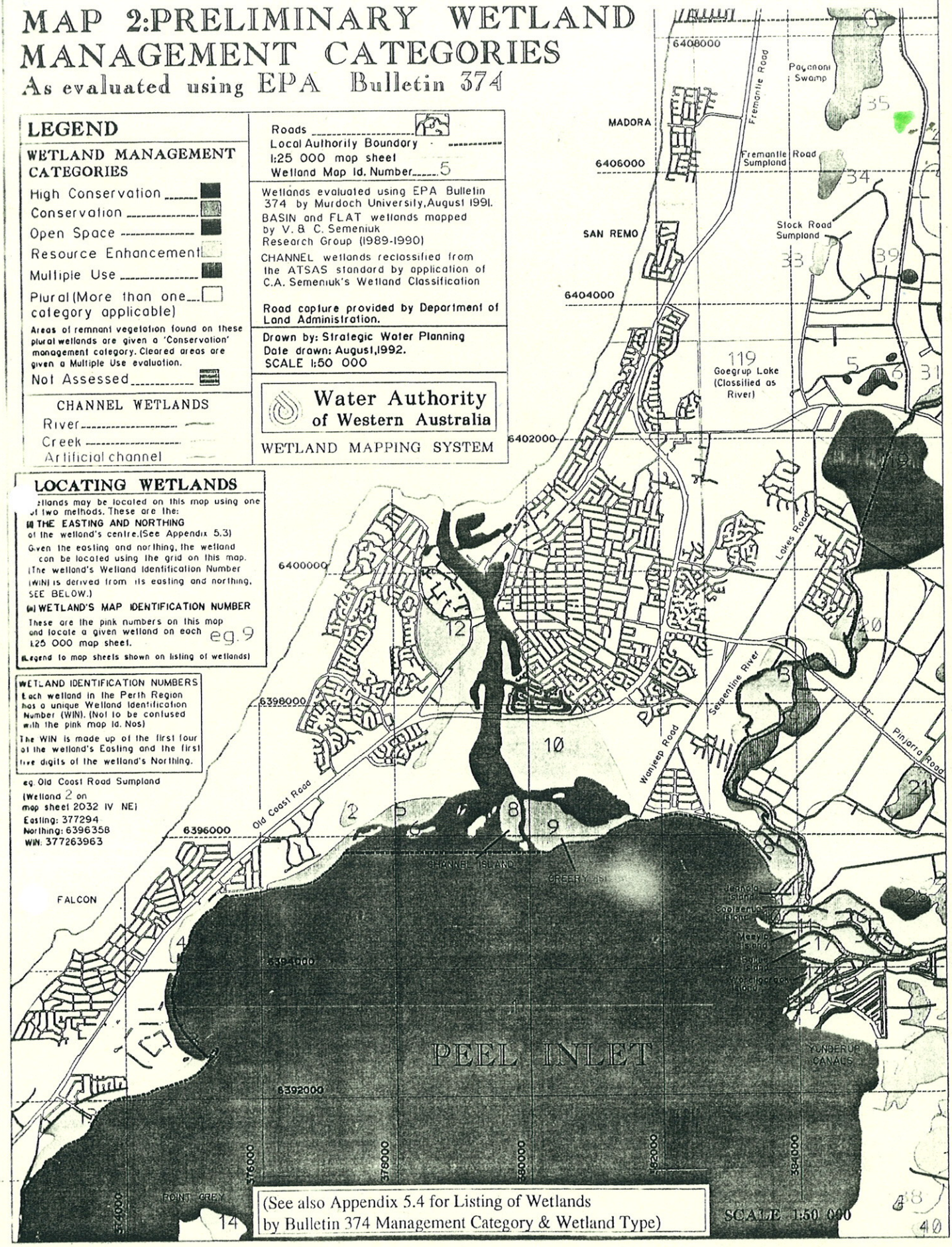
Please attach any additional information about the area which may be of use when assessing it.

photos enclosed.

Area Submitted

MAP 2: PRELIMINARY WETLAND MANAGEMENT CATEGORIES

As evaluated using EPA Bulletin 374



LEGEND

WETLAND MANAGEMENT CATEGORIES

- High Conservation
- Conservation
- Open Space
- Resource Enhancement
- Multiple Use
- Plural (More than one category applicable)

Areas of remnant vegetation found on these plural wetlands are given a 'Conservation' management category. Cleared areas are given a Multiple Use evaluation.

- Not Assessed

CHANNEL WETLANDS

- River
- Creek
- Artificial channel

- Roads
- Local Authority Boundary
- 1:25 000 map sheet
- Wetland Map Id. Number 5

Wetlands evaluated using EPA Bulletin 374 by Murdoch University, August 1991.

BASIN and FLAT wetlands mapped by V. & C. Semeniuk Research Group (1989-1990)

CHANNEL wetlands reclassified from the ATSAS standard by application of C.A. Semeniuk's Wetland Classification

Road capture provided by Department of Land Administration.

Drawn by: Strategic Water Planning
Date drawn: August, 1992.
SCALE 1:50 000

Water Authority of Western Australia

WETLAND MAPPING SYSTEM

LOCATING WETLANDS

Wetlands may be located on this map using one of two methods. These are the:

(a) THE EASTING AND NORTHING of the wetland's centre. (See Appendix 5.3)

Given the easting and northing, the wetland can be located using the grid on this map. (The wetland's Wetland Identification Number (WIN) is derived from its easting and northing, SEE BELOW.)

(b) WETLAND'S MAP IDENTIFICATION NUMBER

These are the pink numbers on this map and locate a given wetland on each 1:25 000 map sheet. eg. 9

(Legend to map sheets shown on listing of wetlands)

WETLAND IDENTIFICATION NUMBERS

Each wetland in the Perth Region has a unique Wetland Identification Number (WIN). (Not to be confused with the pink map Id. Nos)

The WIN is made up of the first four of the wetland's Easting and the first five digits of the wetland's Northing.

eg. Old Coast Road Sumpland
(Wetland 2 on map sheet 2032 IV NE)
Easting: 377294
Northing: 6396358
WIN: 377263963

(See also Appendix 5.4 for Listing of Wetlands by Bulletin 374 Management Category & Wetland Type)

SCALE 1:50 000


ARCA
NOMINATE
QUARRY
PROPOSED
CENTENNIAL

e.

SYSTEM 6 BUSHLAND SUBMISSION FORM
FOR CONSIDERATION IN THE UPDATE PROGRAMME

If you wish to submit more than one area for consideration in the System 6 update, please use a separate form for each area.

Please fill in each section giving as much information as possible.

LOCATION, OWNERSHIP AND ZONING OF THE AREA

1. Location Approx. 8 Kms North of Mandurah along the Mandurah by-pass Road & appr. 1 Km east. of same.

Please give as accurate and detailed a description as possible of the site location

Please include either a hand drawn or copied map showing the area of the area

a) Bordering Roads: Mandurah by-pass Road

b) Nearest Corner: Intersection of Mandurah by-pass road & Madora Bay Rd.

c) Lot Number: Part lot 41 Street Number: .....

d) ~~Town/Suburb~~/Location: Cockburn Sound loc 16 Stock Route Rd

e) Local Council: City of Mandurah

f) Site Name (if any): .....

g) Approximate size of the area (ha): .....

h) Please locate the area on a map and give us map references if possible:

See map + air-photo enclosed

i) Map: ..... Streetsmart /UBD/Other: .....

j) Map no.: .....

k) Grid Ref: .....

l) Please give any other information that may help us to find the location:

.....

Urgent *

(m) Are you aware of any development proposals that are likely to affect the area?

Yes Centennial Park Estate by Peet & Co Pty Ltd.

O.D.P. is now with Mandurah City Council for consideration

NOTE: Areas that have already been given development APPROVAL should not be nominated

Please fill out those questions that you can answer

2. **Who owns the area?** (If owned by the person/s making the nomination please indicate) .....
Peet Mandurah Syndicate Pty Ltd

3. **If you own the area, and may be interested in participating in conservation on private land initiatives please indicate** (and leave your name and address at the end of this submission form) .....

4 .**What is the area zoned?** (please indicate whether zoning is Town Planning Scheme or Metropolitan Region Scheme) ...Town Planning Scheme.....

CAN YOU TELL US A LITTLE ABOUT THE PHYSICAL CHARACTERISTICS OF THE AREA

5. **Why do you consider this area important?** (Refer to Guiding Issues paper)
.....
This is a limestone ridge with unique characteristics.

6. **What is/are the soil type/s and colours ?** .....

Type: Sand/Clay/Gravel/Loam/Silt
Colour: White/Grey/Brown/Orange/Yellow/Red/Black

7. **Does the area have any special features such as unusual landforms / landscapes that still retain their natural vegetation?** Yes/~~No~~

If yes, what are they? limestone ridge formation unique to the Mandurah (& Rockingham) area.

8. **Is the area a wetland or does it include a wetland?** .....

If yes, what kind of a wetlands is it?

a) lake

b) river

c) stream

d) swamp

e) estuary

f) seasonally wet

g) other

9. What percentage of the wetland is open water in summer? .....

CAN YOU TELL US A LITTLE ABOUT THE VEGETATION /FAUNA ON THE NOMINATED AREA.

10. What percentage of the area is indigenous vegetation? .....

11. If the area includes regions cleared of native bushland please indicate reasons for the inclusion. .....

The intensity of quarrying activities in the area will leave no example of this type of limestone formation.

12. Has any previous flora or fauna survey work been done on the area?

...N.O.....

If yes, please give details of the work .....

.....

.....

13. How would you rate the condition of the native bushland? (see attached table)

a) pristine
b) excellent
c) very good
d) good
e) degraded
f) completely degraded
g) don't know

14. Please indicate the disturbances affecting the area and where appropriate the percentage of the area disturbed.

a) Partial clearing
b) fragmentation
c) Selective removal of species: timber cutting, wildflower picking, mowing dieback and other plant diseases
d) Fire regime, including intensity, season and frequency
e) 'Enrichment plantings' that is plantings of species not found in that community
f) Weed invasion
g) Animal impact: horses, foxes, rabbits, cats, dogs, camels, goats etc
h) Soil movement, both removal and dumping
i) Changes in water regimes; flooding, drainage and watering
j) Salinity
k) Fertiliser drift and along waterways nutrient influx
l) Mining, including that for road works

(m) Grazing: stock, overgrazing by feral or native mammals

n) Proliferation of tracks, fire breaks and walk trails

o) Off-road vehicle use

p) Use as service corridors by the SEC, Main Roads, Water Authority.

(Source: B Keighery. Bushland Plant Survey, September 1994)

15. Does the area contain any plant species of special interest that you know of? (eg. declared rare flora, priority taxa, outlier populations) .....

Do you know what they are? .....

.....

16. Do you know of any native animals that use the area? .....

Can you list those you know of? (birds, mammals, reptiles, amphibians etc)

.....

17. Is the area used by any native animals of special interest? (eg. endangered species, large/important populations).....

If yes, please name them and indicate source of information

.....

.....

CAN YOU TELL US A LITTLE ABOUT THE SURROUNDING AREA

18. Are there any bushland areas (including wetlands) near to this area?

.....

If yes, how close are they ? .....

.....

.....

Are they already conservation reserves? .....

What is their approximate size? .....

19. Does the submitted area link other bushland areas? ..... See aerial photo

.....

.....

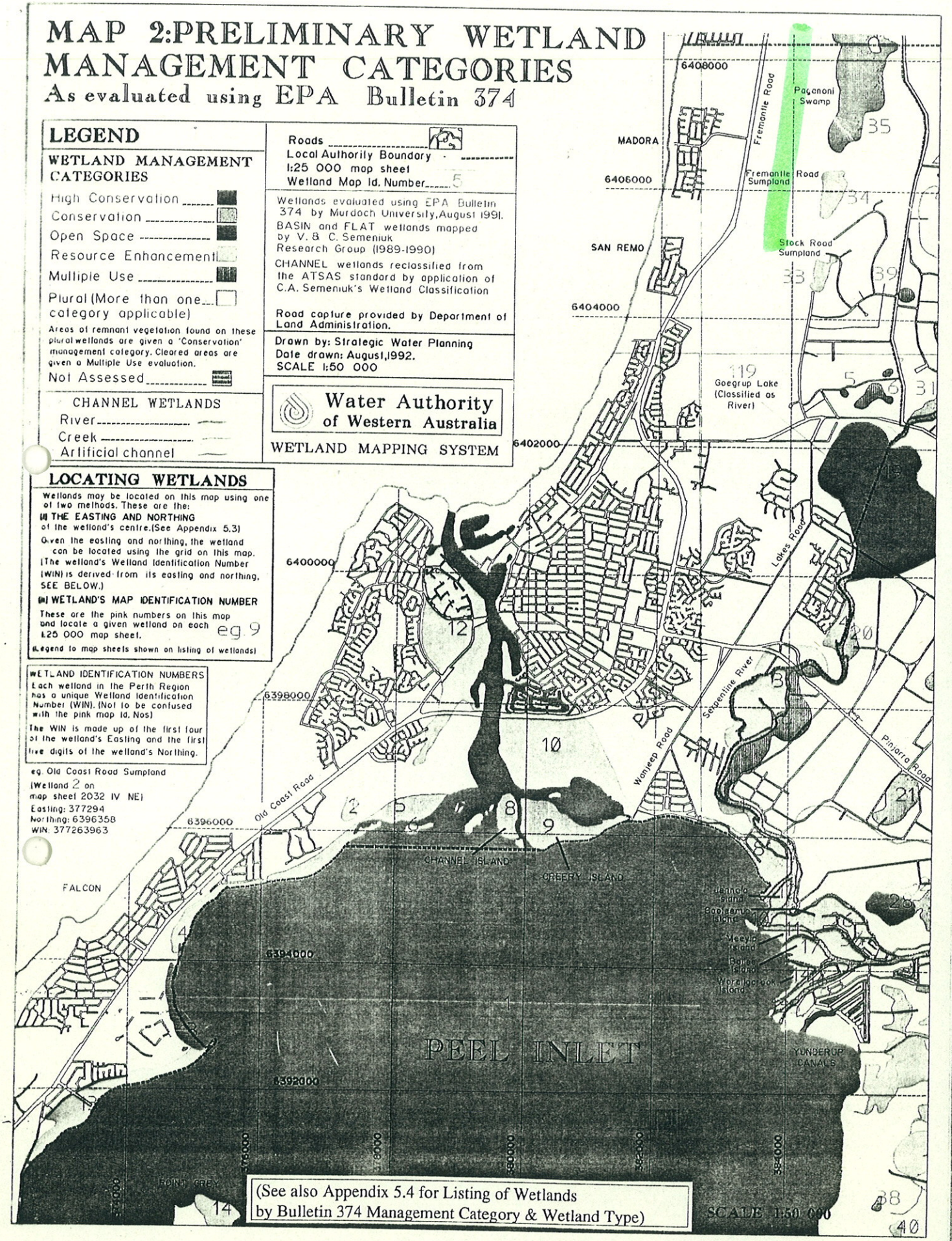
Please attach any additional information about the area which may be of use when assessing it.

Photos enclosed

Area Submitted

MAP 2: PRELIMINARY WETLAND MANAGEMENT CATEGORIES

As evaluated using EPA Bulletin 374



LEGEND

WETLAND MANAGEMENT CATEGORIES

- High Conservation
- Conservation
- Open Space
- Resource Enhancement
- Multiple Use
- Plural (More than one category applicable)

Areas of remnant vegetation found on these plural wetlands are given a 'Conservation' management category. Cleared areas are given a Multiple Use evaluation.

- Not Assessed

CHANNEL WETLANDS

- River
- Creek
- Artificial channel

- Roads
- Local Authority Boundary
- 1:25 000 map sheet
- Wetland Map Id. Number 5

Wetlands evaluated using EPA Bulletin 374 by Murdoch University, August 1991.
BASIN and FLAT wetlands mapped by V. & C. Semeniuk Research Group (1989-1990)
CHANNEL wetlands reclassified from the ATSAS standard by application of C.A. Semeniuk's Wetland Classification

Road capture provided by Department of Land Administration.

Drawn by: Strategic Water Planning
Date drawn: August, 1992.
SCALE 1:50 000

Water Authority of Western Australia

WETLAND MAPPING SYSTEM

LOCATING WETLANDS

Wetlands may be located on this map using one of two methods. These are the:

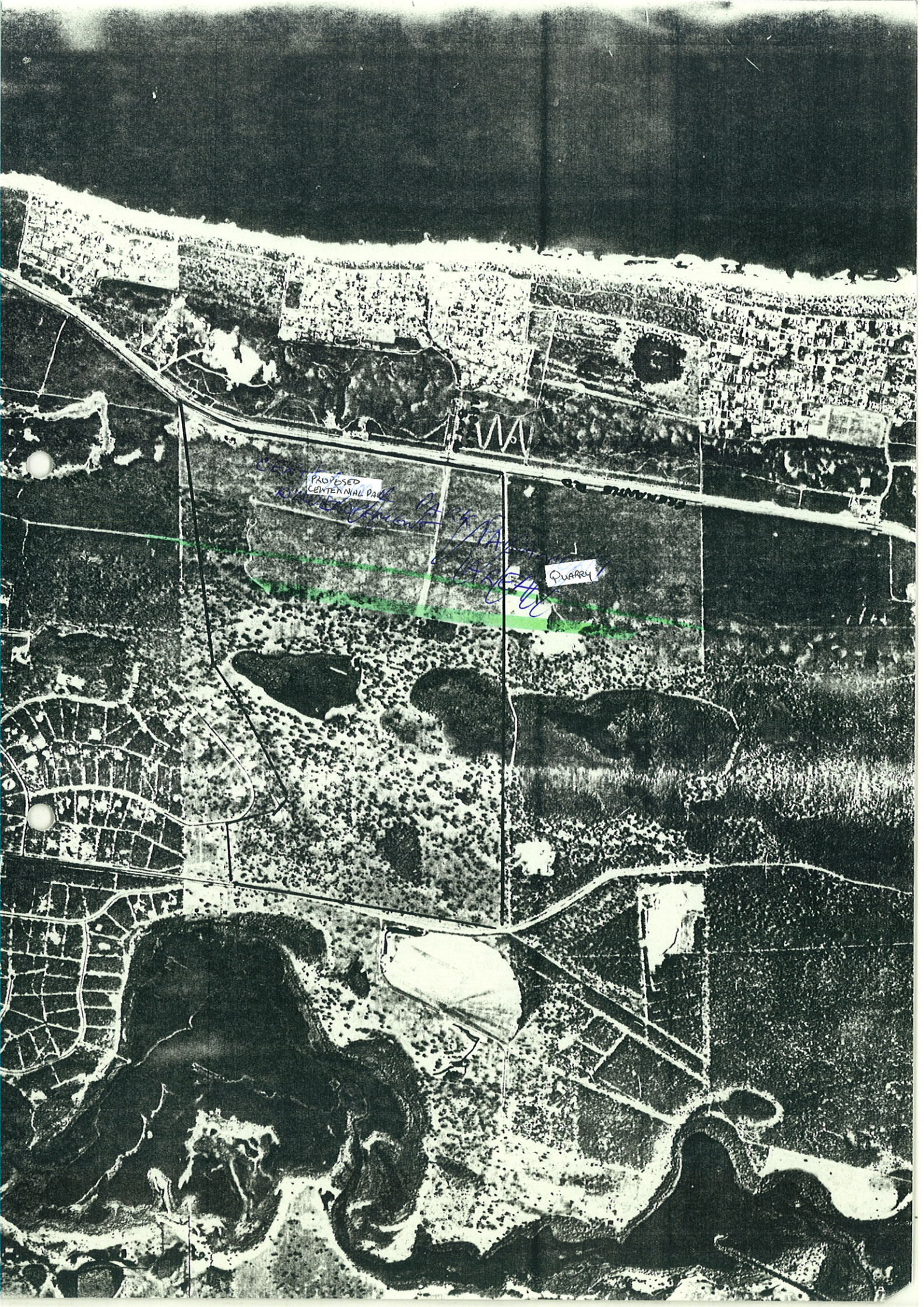
(i) THE EASTING AND NORTHING
of the wetland's centre. (See Appendix 5.3)
Given the easting and northing, the wetland can be located using the grid on this map. (The wetland's Wetland Identification Number (WIN) is derived from its easting and northing, SEE BELOW.)

(ii) WETLAND'S MAP IDENTIFICATION NUMBER
These are the pink numbers on this map and locate a given wetland on each 1:25 000 map sheet. eg. 9
(Legend to map sheets shown on listing of wetlands)

WETLAND IDENTIFICATION NUMBERS
Each wetland in the Perth Region has a unique Wetland Identification Number (WIN). (Not to be confused with the pink map Id. Nos)
The WIN is made up of the first four of the wetland's Easting and the first five digits of the wetland's Northing.

eg. Old Coast Road Sumpland
(Wetland 2 on map sheet 2032 IV NE)
Easting: 377294
Northing: 6396358
WIN: 377263963

(See also Appendix 5.4 for Listing of Wetlands by Bulletin 374 Management Category & Wetland Type)


PROPOSED
CENTENNIAL PARK
QUARRY

ALAN TINGAY & ASSOCIATES
ENVIRONMENTAL SCIENTISTS

28 November 1995 PM:ct/94058/982

Ms Natalie Thorning
Department of Environmental Protection
Westralia Square
141 St Georges Terrace
PERTH WA 6000

Dear Natalie,

RE: CENTENNIAL PARK ESTATE

Peet and Company have asked me to provide you with environmental information regarding Centennial Park Estate (Peel Estate Part Lot 41).

The attached document is an excerpt of the environmental section from the Centennial Park Structure Plan document. Our environmental assessment of the property included analysis of the topography, geology and soils, hydrology flora and vegetation, wetlands and surrounding land uses.

The Structure Plan has incorporated the major environmental issues in its design. In particular the two wetlands on the property, the southern extent of Paganoni Swamp and Black Swan Swamp, were defined with respect to their wetland boundary and dryland buffer zones. These boundaries were set in accordance with EPA Guidelines and Criteria and in conjunction with Garry Middle and Gary Williams of the Department of Environmental Protection. An open space corridor, 100-175m wide, has been provided to link the two wetlands.

Drainage has been designed according to Water Sensitive Urban Design guidelines and will incorporate the use of infiltration basins.

A small area of native vegetation west of Paganoni Swamp has been assessed and will be retained as open space in the development.

There are no other areas of native vegetation in natural condition on the property. In other words all good quality native vegetation areas will be retained in the development of this site.

There are two regional planning issues which the Structure Plan is required to address.

Firstly, the future alignment of the Kwinana Freeway will delineate the eastern extent of urban development.

A. & S.R. Tingay Pty Ltd – A.C.N. 009 103 468
35 LABOUCHERE RD, SOUTH PERTH, WESTERN AUSTRALIA 6151
TELEPHONE: (09) 474 1300 FAX: (09) 474 3394

Secondly the proposed alignment of the Rapid Transit Route is on the western side of Paganoni Swamp and Black Swan Swamp.

Please contact me if you would like to discuss any aspect of this study.

Yours sincerely

DR PAUL van der MOEZEL
Associate

PEET & COMPANY

CENTENNIAL PARK ESTATE

ENVIRONMENTAL APPRAISAL

(Excerpt From Structure Plan Document)

ALAN TINGAY & ASSOCIATES

DECEMBER 1995

SITE ANALYSIS

Topography

The main landscape features at Centennial Park are two ridgelines that run parallel, roughly north to south (Figure X). The western ridge is steeper than the eastern ridge and attains heights up to 29.4m AHD. The eastern ridge is more gently undulating, although higher at 31.9m AHD.

Immediately adjacent to the Fremantle to Mandurah Road is a relic foredune plain which comprises a series of low parallel dune ridges with shallow intervening swales at approximately 7m AHD. The dune ridges typically attain heights of 10m to 12m AHD. Slopes on the ridgelines vary from 3° to 10°.

Between the two main ridges is a deflation hollow, within which the two wetland areas Paganoni Swamp and Black Swan Swamp occur. The sumps of the wetlands are generally defined by the 2m AHD contour.

To the east of the eastern ridgeline, the elevation drops to between 2.7m and 9.5m AHD on Stock Road.

Centennial Park is generally within the Spearwood Dune geomorphic classification (Gozzard, 1983) with a small portion of the eastern sector belonging to the Bassendean Dune System.

Geology and Soils

The western third of the property, including the western ridgeline comprises Tamala Limestone with areas of Safety Bay Sand. The limestone is a pale yellowish brown with fine to coarse grains. The extent of lithification of the limestone varies and shell debris may be found in it. To the north of Centennial Park, and in its south-western corner, limestone is quarried for construction purposes. It is possible that karstic phenomena such as solution cavities and fissures, swallows and dolines occur in the limestone area, although no evidence for this was observed on site. These features can indicate variable bearing capacity with respect to development.

The deflation hollow between the two ridgelines, and including the eastern ridge, contains sands which are derived from the Tamala Limestone. These are known as Spearwood Sands. This sand is pale yellowish brown and has the potential to attenuate some pollutants due to small amounts of clay present.

The eastern portion of the subject land consists of Bassendean sands which are light grey at ground surface becoming yellow at depth. These soils are well drained and have a limited capacity to retain nutrients. When cleared of vegetation, these sands tend to be prone to wind erosion.

The wetland areas consist of clayey sands which are black, fine to medium grained quartz sands with a clay matrix. Organic content of these swamp deposits is variable. Areas that

TABLE X
LAND UNITS AT CENTENNIAL PARK

LAND UNIT	DESCRIPTION (Salient Features)	URBAN LAND USE PLANNING CONSIDERATIONS
Main Dune Ridges		
S1a	Dune ridge complex (including crests and sideslopes) with shallow yellow-brown siliceous sands, very common limestone outcrop and slopes 5-15%	Fair capability for urban development. Moderate excavation and landscaping constraints due to limestone outcrops. Higher areas have views towards the coastal dunes to the west.
S1b	Dune ridge sideslopes with gentle to moderate gradients (5-15%), and deep sands. These may be pale greyish sands with yellow-brown subsoils or yellow-brown siliceous sands.	High capability. Attractive parkland cleared landscape. Affords views of central "valley" with wetlands.
S1e	Crests and gentle upper slopes on the leeward side of the central dune ridge complex, with moderately deep yellow-brown siliceous sands, few areas of limestone outcrops and predominantly open scrub.	Some excavation constraints due to limestone outcrops. Higher areas have both easterly and westerly views.
S1f	Crests and gentle upper slopes on the leeward side of the central dune ridge comples, with deep yellow-brown siliceous sands, very few areas of limestone outcrops and 'parkland cleared' Tuart Woodland.	High capability land for urban development, minor excavation constraints in limited areas. Views to wetlands.
S1g	Crests and gentle upper slopes on the eastern dune ridge, with deep yellow-brown siliceous sands and no limestone outcrops.	High capability land similar to S1f but on the eastern dune ridge. Similar landscape considerations.

Lower Slopes S2b	Very gently undulating lower dune ridges and slopes (<5%) with shallow to very shallow siliceous yellow-brown sands. Limestone outcrops common.	Fair capability for urban development. Moderate excavation and landscaping difficulties due to limestone outcrops.
S2c	Very gently sloping (1-3%) footslopes on the eastern side of the central dune ridge complex, with deep sands. (pale greyish sands with yellow-brown subsoils or yellow siliceous sands).	High capability land, slightly more elevated than adjacent S2d.
S2d	Very gently sloping (1-3%) footslopes on the eastern side of the central dune ridge complex, with deep bleached grey sands with yellow-brown subsoils.	Lower slopes form a buffer zone to the western margin of the wetlands. Soils have potential to leach nutrients to wetlands.
Swales (depressions) S3a	Inter-dunal swales or depressions at western margin of central dune ridge complex, with gentle sideslopes, moderately deep to deep yellow-brown siliceous or earthy sands, and few areas limestone outcrops.	Secluded areas with better soil conditions for housing than adjacent more rocky, exposed terrain.
S3b	Inter-dunal swales or depressions with central dune ridge complex (similar slopes, soils and rock outcrop as S3a but more elevated).	As above. Higher landscape position means greater depth to ground water.
Sandplain S4a	Flat to very gently undulating sandplain with deep, well drained sands (yellow-brown siliceous sands or pale greyish sands with yellow-brown subsoils).	Very high capability land for urban development.

S4c	Flat to very gently undulating sandplain with deep imperfectly drained pale or bleached sands with yellow-brown subsoils.	Marginally lower sandplain than S4a, adjacent to, and linking wetlands. Watertable within 5m of ground surface. Low suitability for development
Swamps		
Sw1	Central swamp areas subject to inundation for much of the year. (Open areas and stands of *Melaleuca rhaphiophylla*)	Sumplands. Low suitability for urban development.
Sw2	Fringes of swamps supporting sedges and rushes, and inundated for lesser periods than Sw1. Soils are poorly drained, with a very dark loamy sand or sandy loam surface and bleached or gleyed clayey sand subsoil; sometimes over lenses of sandy clay.	Low capability for urban development.
Sw3	Very shallow depression ('dampland') with scattered clumps of *Melaleuca* species and somewhat poorly drained black loam shallowly overlying yellowish brown clay loam and then sands.	Degraded dampland. Suitable for use as a drainage retention basin to receive urban stormwater runoff.
Sw4	Very shallow depression similar to Sw3 but mostly cleared and with somewhat poorly drained black loam shallowly overlying light grey clay and sands.	Dampland, as above, but marginally better drained.

contain this unit are prone to inundation and flooding although permeability of the soil is moderate.

The Department of Agriculture (Wells, 1989) has divided soil types within the Spearwood and Bassendean Sands into units depending on landform, soil types and groundwater proximity. These units allow small scale assessment of land capabilities for land use planning purposes. The land units at Centennial Park are described in Table X and illustrated in Figure X.

Hydrology

At Centennial Park, the sands derived from Tamala Limestone, and the limestone itself contains a shallow unconfined aquifer known as the Stakehill Mound. The highest point of the Stakehill Mound is relatively low (2.3m AHD) and occurs to the north of Centennial Park. The entire aquifer is approximately 15m to 20m thick (Davidson, 1984) with salinity generally less than 1000mg/L TDS. Recharge to the aquifer is by rainfall infiltration.

The Stakehill Mound extends through the centre of Centennial Park. This has the effect of groundwater on the western part of the property flowing towards the coast (to the west), while groundwater on the eastern portion of the property flows to the Serpentine River (to the east).

Groundwater levels at Centennial Park range from between 0 to 32m below ground surface. Surface water levels are expressed as wetland areas (see Section X). The highest water table level recorded at Centennial Park is approximately 1.5m AHD (Figure X).

Vegetation

The native vegetation at Centennial Park has largely been cleared for agricultural purposes, although many trees remain in a parkland setting in the eastern sector.

A small (1.5ha) area of native vegetation has been retained on the eastern side of the western ridge (Figure X). This area is situated in an area which covers the transition of soil types from limestone outcrops on the ridgeline to deeper sand over limestone further down the slope. The transition in soil type corresponds with a gradient of vegetation from *Allocasuarina humilis/Grevillea crithmifolia* Heath and *Acacia rostellifera* on limestone outcrops to *Banksia attenuata* Low Woodland in the deeper sand areas. Occasional Tuart trees (*Eucalyptus gomphocephala*) are emergent over both the Heath and Banksia areas.

While this small area has been fenced off, it remains accessible to sheep and cattle which continually graze the area. The understorey of the Banksia Low Woodland has been particularly affected by grazing.

The northern wetland, Paganoni Swamp, supports fringing vegetation in relatively good condition, including *Melaleuca rhaphiophylla* Low Woodland over a *Baumea articulata* Sedgeland. Vegetation in Black Swan Swamp, to the south is also in relatively good condition, although grazing pressure has been more marked. It contains stands of *M. rhaphiophylla* with areas of *M. cuticularis*. *Juncus pallidus* is present as an Open

Sedgeland particularly on the north-eastern section of the wetland where it is waterlogged and occasionally inundated in winter.

The native vegetation on the western portion of the property where soils comprise limestone with shallow sands and rocky outcrops has been severely disturbed by partial clearing and grazing. Regrowth has mainly been limited to non-palatable species such as *Hakea prostrata.*

The dryland areas of deep Spearwood Sands in the deflation hollow between the two main ridgelines contains a large number of mature Tuart trees over a pasture understorey.

The eastern ridgeline has relatively deep sands and supports *Eucalyptus marginata* (Jarrah) and *E. calophylla* (Marri) with occasional *E. gomphocephala* (Tuart). This area has been parkland cleared with some trees remaining over and understorey comprising solely of pasture species.

The small area of *Allocasuarina* Heath and *Banksia* Woodland near the western ridge will be retained in the future development as Public Open Space (POS) as it represents a remnant example of the transition between two distinctive vegetation types.

The native wetland vegetation will also be reserved as Open Space for conservation and passive recreation purposes.

Where possible the remaining trees at Centennial Park will be retained (e.g. in road reserves and POS) for their landscaping and amenity value.

Flora

As Centennial Park has largely been cleared for agricultural purposes, the number of native species present is low. However, a flora survey was carried out of the fenced area of *Allocasuarina* Heath/*Banksia* Woodland on 31 August 1994. This survey listed a total of 45 native species (15 Monocotyledons, 30 Dicotyledons). The flora list is included in Appendix X.

Jacksonia sericea is a common sub-shrub in the *Allocasuarina* Heath area.. *Jacksonia sericea*, is listed as a Priority 3 species on the CALM Priority Species List (14 September 1994). Priority 3 species include taxa which are known from several populations, some of which are not believed to be under immediate threat. These taxa are under consideration for declaration as 'Rare Flora' but are in need of further survey. This population will be protected by retaining this area as POS in the development.

ENVIRONMENTAL ISSUES

Wetlands

There are two significant wetlands at Centennial Park namely Paganoni and Black Swan Swamps (Figure X). These wetlands are classified as sumplands because they are seasonally inundated basins that partly dry out during dry summer months (Semeniuk, 1987).

The northern wetland, Paganoni Swamp supports fringing vegetation of *Melaleuca rhaphiophylla* and *Baumea articulata*. Although grazing has occurred in the area, the vegetation is in relatively good condition.

The southern wetland, Black Swan Swamp has fringing wetland vegetation in some areas, including *M. rhaphiophylla* and *M. cuticularis*. However, due to clearing and grazing, much of the original vegetation cover is no longer present, is weed infested or has a patchy distribution.

The EPA has devised a Guide to Wetland Management on the Swan Coastal Plain (EPA, 1993). The Guide allows wetlands to be classified into Management Categories based on their natural and human attributes (WAWA and DEP, 1994).

The northern wetland, Paganoni Swamp, has been placed in the Conservation Category due to its high degree of naturalness. The management objectives for such wetlands according to the EPA are to maintain and enhance their natural attributes and functions.

The southern wetland, Black Swan Swamp, has been placed in the Conservation and Recreation (Category O for Open Space) classification. This classification is due to the fact that the wetland has been modified, although it still has a moderate degree of naturalness. This wetland is also considered to play an important role in its present rural setting as well as having a high potential for human interest in its proposed urban setting. The management objectives for Black Swan Swamp are to provide for human uses whilst maintaining and enhancing the existing natural attributes.

Both Paganoni and Black Swan Swamp are included in the EPA's Environmental Protection (Swan Coastal Plain Lakes) Policy (1992). The purpose of this policy is to protect the environmental values of lakes on the Swan Coastal Plain by preventing specified wetlands from being excavated, filled in, drained into or out of, and the discharge of effluent. These activities cannot occur without permission from the Minister for the Environment.

Under the Environmental Protection Policy (EPP) the following uses of wetlands are considered to be beneficial:

- For local and migratory birds and other native flora and fauna.
- As a focus of cultural and heritage values for communities on the Swan Coastal Plain (Aboriginal and European).

- As important aesthetic educational, and drainage components of the natural landscape.

The EPA is currently preparing guidelines for the treatment of wetlands within urban developments including buffer zones and drainage requirements.

Generally, the EPA recommends a dryland buffer around wetlands to separate the water habitat of the wetland from surrounding human activities and to provide habitat for wildlife.

The EPA has outlined a Draft Guideline for establishing the extent of wetlands and defining areas of dryland buffers (Appendix X).

There are several important points to consider when determining the requirement for, and width of, buffers around Paganoni and Black Swan Swamps, including:

- The dryland native vegetation of land surrounding the wetlands has largely been removed, although individual trees remain.

- The wetland vegetation at Paganoni is in good condition despite the surrounding rural land use. However, native wetland vegetation surrounding Black Swan Swamp has been more markedly degraded. This is partially due to the fact that the eastern section of the wetland forms a palusplain that has been more suitable for pastoral activities.

- Future land uses around the two wetlands will be urban, probably with Paganoni Swamp managed for Conservation and Black Swan Swamp managed for Conservation and Recreation (as Open Space).

Due to the above, it is recommended that Paganoni Swamp have a 50m buffer from the edge of the sump (Figure X) for establishment of native vegetation for conservation purposes. However, as Black Swan Swamp will have a more prominent recreation purpose, a 30m dryland buffer was considered to be adequate with additional Open Space utilised to create a link between the two wetlands. This green link will provide a corridor for wildlife and human users.

Surrounding Land Uses

To the north of Centennial Park mining operations for limestone are currently being undertaken (Figure X). Excavation of the northern portion of the ridgeline that extends down to Centennial Park is producing limestone suitable for building purposes. The limestone ridge has not been included in the Basic Raw Materials Policy (DPUD, 1992) as it lies outside the Perth Metropolitan Area boundary.

The eastern edge of Centennial Park forms part of the Catchment of the Peel Inlet and Harvey Estuary. This catchment area is the subject of the EPA Environmental Protection (Peel Inlet-Harvey Estuary) Policy (1992). The purpose of this policy is to set out environmental quality objectives for the estuary with the aim of rehabilitating and protecting the estuary from further degradation. Nutrient enrichment of the Peel-Harvey

system has been caused by a combination of clearing native vegetation and by land uses which cause the leaching of nutrients (particularly phosphorus) into the waterways that flow into the Estuary. Excessive levels of nutrients in the estuary have lead to nuisance algal blooms which have seriously degraded the estuary.

The proposed urban development at Centennial Park will not contribute to nutrients in the Peel-Harvey system as storm water will be disposed of on site and all effluent will be removed for treatment via a reticulated sewerage system.

Immediately to the east of Stock Road, adjacent to Centennial Park is a market garden which produces vegetables. Treatments at this farm include minimal spraying of pesticides and fertiliser applications. Drift contamination of sprayed products is not considered to be a problem as application is carried out to minimise spray becoming airborne.

The Perth to Bunbury Highway will run along the eastern boundary of Centennial Park with a bypass to Mandurah (Figure X). Environmental assessment of this proposal has yet to be completed.

Situated approximately 5km from the eastern boundary of Centennial Park is the Wandalup commercial piggery. The buffer zone for urban development generally recommended for piggery activities is 5km. The location of the piggery is not considered to constitute an environmental issue with respect to the development of Centennial Park.

REFERENCES

Davidson, W.A. (1984). A Flow Net Analysis of the Unconfined Groundwater in the Superficial Formations of the Southern Perth Area, WA. WA Geological Survey, Perth.

Department of Planning & Urban Development (1992). Basic Raw Materials. Policy Statement for the Perth Metropolitan Region.

Environmental Protection Authority (1993). A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area An Update to Bulletin 374. Bulletin 686.

Gozzard, J.R. (1983). Rockingham Part Sheets 2033III and 2033II. Perth Metropolitan Region, Environmental Geology Series, Geological Survey of Western Australia.

Semeniuk, C.A. (1987). Wetlands of the Darling System - Consanguineous Wetlands and Their Distribution in the Darling System, South Western Australia. J.Roy.Soc. West. Aust. 70: 69-87.

Water Authority of Western Australia and Department Environmental Protection (1994). Encouraging Wise Use of Perth's Wetlands. Wetlands of the Perth to Bunbury Region. Poster.

Wells, M.R. (1989). Land Capability Study of the Shires of Mandurah and Murray Land Resources Series No. 2. Western Australian Department of Agriculture.

APPENDIX X

CENTENNIAL PARK
TWO HECTARE REMNANT BUSHLAND

NATIVE FLORA LIST
31 AUGUST 1994

MONOCOTYLEDONS

Acanthocarpus preissii
Burchardia umbellata
Chamaescilla corymbosa
Conostylis aculeata
Corynotheca micrantha
Dianella divaricata
Isolepis nodosa
Lepidosperma angustatum
Loxocarya flexuosa
Patersonia occidentalis
Schoenus grandiflorus
Sowerbaea laxiflora
Thysanotus manglesianus
Thysanotus patersonii
Xanthorrhoea preissii
Dich. capillipes
Stipa flavescens (scattered through entire area)
Tricoryne elatior
Lepidosperma

DICOTYLEDONS

Acacia cochlearis
Acacia pulchella
Acacia rostellifera
Acacia saligna
Allocasuarina fraseriana
Allocasuarina humilis
Banksia attenuata
Banksia grandis
Bossiaea eriocarpa
Gompholobium tomentosum
Conostephium pendulum
Drosera macrantha
Dryandra nivea
Eucalyptus gomphocephala
Eucalyptus marginata
Geranium molle
Grevillea crithmifolia
Grevillea thelemanniana
Hardenbergia comptoniana
Hibbertia hypericoides
Hybanthus calycinus
Jacksonia furcellata
Jacksonia sericea
Kennedia prostrata
Leucopogon australis
Melaleuca acerosa
Persoonia saccata
Phyllanthus calycinus
Rhagodia baccata
Templetonia retusa
Hakea liss.

VILLAGE 2
NATIVE FLORA

VILLAGE FLORA PARK

RETIREMENT HOUSING

PAGANONI SWAMP

RESERVE

Average of 50m

2m AHD

80

VILLAGE 5
WETLAND ECOSYSTEMS

Wildlife Access Link

VILLAGE GREEN

OPEN SPACE / WILDLIFE LINK

PRIMARY SCHOOL SITE

LOCAL CENTRE

VILLAGE 6
ABORIGINAL HERITAGE

VILLAGE GREEN

W.A.W.A.

VILLAGE GREEN

FREEWAY

ENTERPRISE PRECINCT

Car Park

Car Park

Car Park

RAIL STATION

TRANSIT

Average of 30m

COMMUNITY FACILITIES
Town Square
Community Hall
Library

DISTRICT CENTRE

BLACK SWAN SWAMP

2mAHD

30

ANA

HIGH SCHOOL SITE

MADORA BEACH ROAD

ROAD

VILLAGE 2
NATIVE FLORA

PAGANON

Average of 50m

VILLAGE GREEN

VILLAGE 1
COASTAL LANDSCAPES

VILLAGE FLORA PARK

RESERVE

VILLAGE 5
WETLAND ECOSYSTEMS

Wildlife Access Link

RETIREMENT HOUSING

VILLAGE GREEN

OPEN S
WILDLIFE

FREMANTLE

Dell/ Medical/ Community

ENTERPRISE PRECINCT

Car Park

Car Park

Car Park

RAIL STATION

VILLAGE GREEN

PRIVATE SCHOOL SITE

VILLAGE GREEN

PRIMARY SCHOOL SITE

WAWA

TRANSIT

COMMUNITY FACILITIES
Town Square
Community Hall
Library

DISTRICT CENTRE

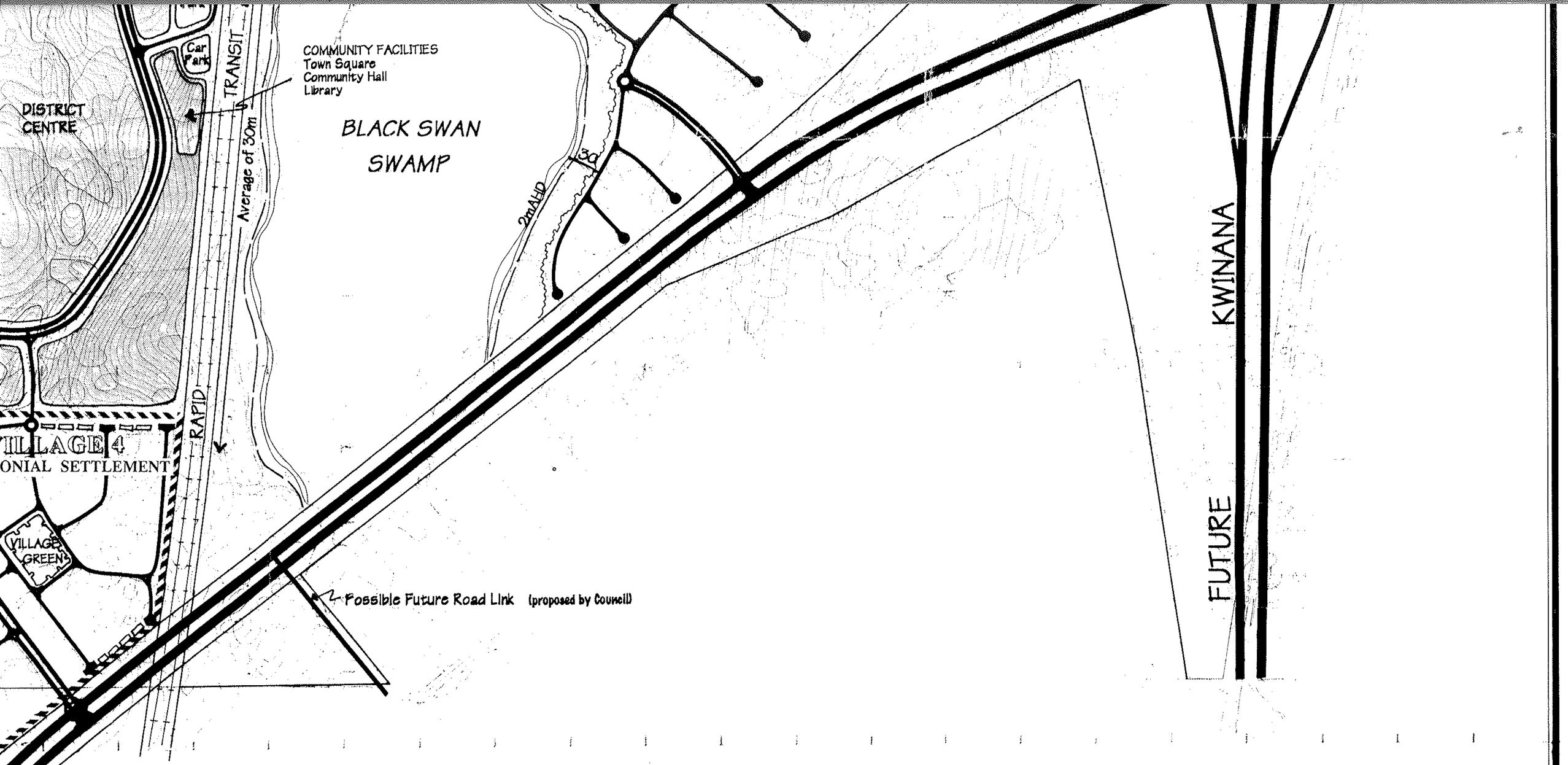
BLACK SWAN SWAMP

Average of 30m

2mAHD

MANDURAH

Possible Aged Persons Village

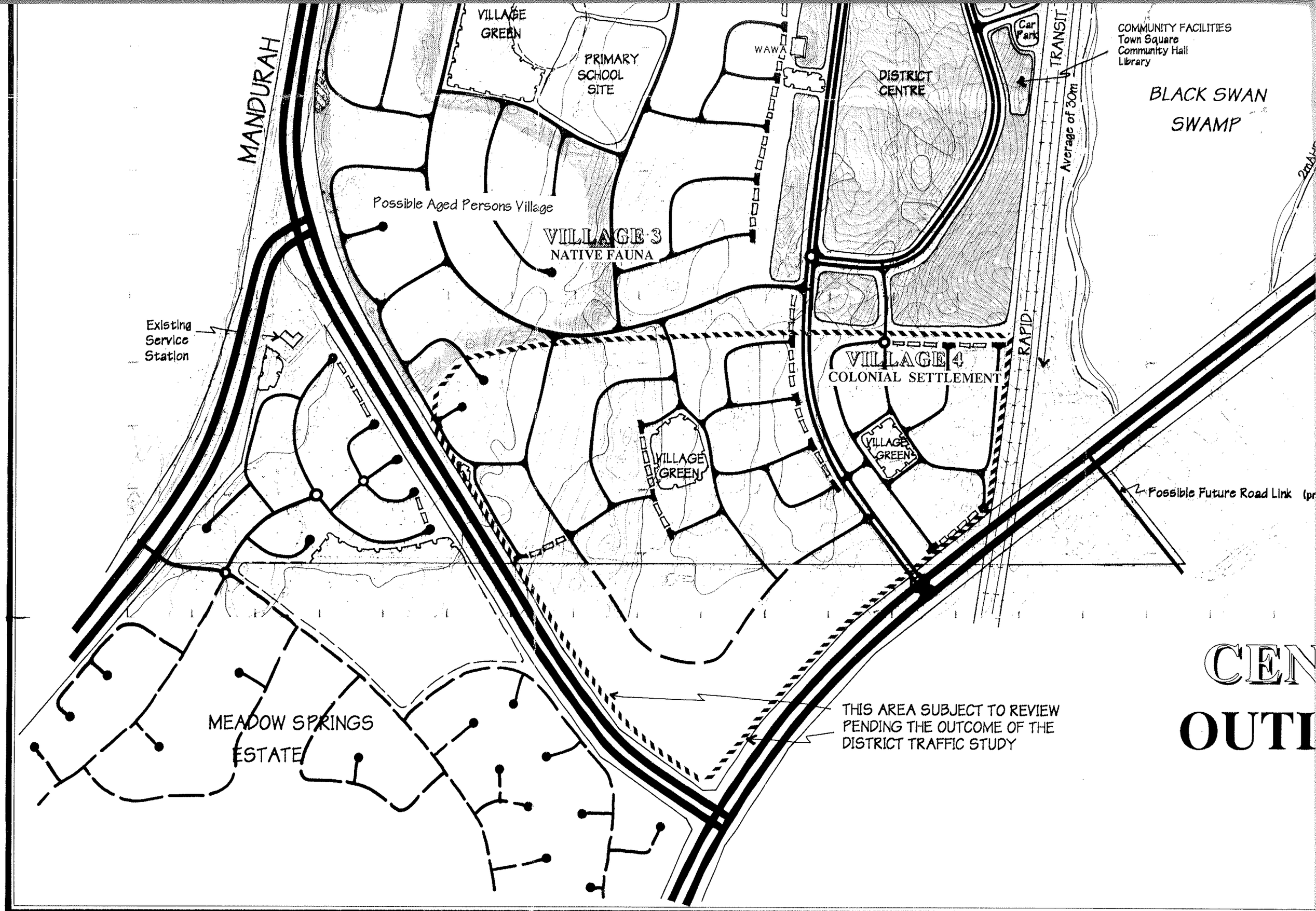


CENTENNIAL PARK ESTATE

OUTLINE DEVELOPMENT PLAN

Plan No. 93/79/20
Date: July 1995
Scale 1:5 000

RUSSELL TAYLOR & WILLIAM BURRELL
Consultants in Town Planning & Civic Design
187 Roberts Road Subiaco


VILLAGE GREEN
PRIMARY SCHOOL SITE
WAWA
DISTRICT CENTRE
Car Park
TRANSIT
COMMUNITY FACILITIES
Town Square
Community Hall
Library
BLACK SWAN SWAMP
MANDURAH
Average of 30m
Possible Aged Persons Village
VILLAGE 3
NATIVE FAUNA
Existing Service Station
RAPID
VILLAGE 4
COLONIAL SETTLEMENT
VILLAGE GREEN
VILLAGE GREEN
Possible Future Road Link (pr
MEADOW SPRINGS ESTATE
THIS AREA SUBJECT TO REVIEW PENDING THE OUTCOME OF THE DISTRICT TRAFFIC STUDY
CEN
OUTI

Department of Environmental Protection

Head Office:
8th Floor, Westralia Square
141 St Georges Terrace
Perth, Western Australia 6000
Tel (09) 222 7000 Fax (09) 322 1598

Waste Management Division:
Ground Floor, 32 St Georges Terrace
Perth, Western Australia 6000
Tel (09) 222 0422 Fax (09) 222 0455
or PO Box Y3030, East, St Georges Terrace
Perth, Western Australia 6832

Regional Offices:
Bunbury • Karratha • Kalgoorlie • Kwinana

Mr Michael Hallen
Peet Mandurah Syndicate
Peet & Co
7th Floor, 200 St Georges Terrace
PERTH WA 6000

Your Ref
Our Ref 67/91
Enquiries N Thorning

Dear Mr Hallen

SYSTEM SIX UPDATE PROGRAMME - FLORA SURVEY INFORMATION

Thank you for providing permission for our botanical team to survey the bushland on your property. As arranged between yourself and Miss Natalie Thorning of this Department, the bushland Cockburn Sound Location 16 part Lot 4 was visited on 1 December 1995.

The botanical survey provides us with information on the natural plant communities found in the area, and their condition. This information is needed to assist the Department of Environmental Protection in its programme to update the conservation recommendations for System 6 and the coastal plain portion of System 1. The main objective of the programme is to ensure that the proposed conservation estate is representative of the ecological communities extant in the region.

As part of this programme the Department has advertised for the public to submit areas of bushland that they consider to be of regional significance. Our botanical team is surveying these submitted areas as well as those it considers may be important based on other factors such as their location and soil type etc. The botanical survey provides us with information on the natural plant communities found in the area, and their condition. Please note that the area is one of many sites that we have surveyed. The fact that we visited and surveyed the site does not indicate that it will necessarily be included in the updated System Six Recommendations.

The update programme has employed the botanical survey methodology used in Gibson et al. (1994), 'A Floristic Survey of the Southern Swan Coastal Plain', to provide the main information base upon which to review the adequacy of the existing System recommendations and to assess other bushland areas.

A general description of the vegetation and an assessment of its condition was completed, however, survey sites were not located on your property.

The information collected during the visits will be used to assess the relative conservation values of the bushland areas. The final selections for inclusion in the updated System Six Recommendations will be the best possible examples of bushland containing plant community types that are either unrepresented or poorly represented in the current and proposed conservation system.

If you are interested in the information we have collected, the location of the survey sites or any other additional information on the System Six Update Programme please don't hesitate to contact Miss Natalie Thorning (222 7051) or Mr Kevin McAlpine (222 7055).

Once again, thank you very much for your support for this programme.

Yours sincerely

Colin Sanders
DIRECTOR
POLICY AND STRATEGIC STUDIES

20 December 1995

work something out

Surveyors pegs

cows grazing otherwise

OK otherwise call

Thursday

If gate locked

key.

FAX 3001489

entrance opp Madora Bay Rd

turnoff opp

gate opp

under lock is a rock

under rock is key.

SUBM 104

Peet Mandurah Syndicate.

Cockburn Sound loc. 16 Part lot 41

Peet & Co.

7th Floor, 200 St Georges Tce

322 3322

Michael Hallen.

rang 19 Oct not to go until owners returned from holidays. MH will call.

rented out

204

Friday

pick up Bron ~~7.30~~ 7.30 - 7.45

Bibra Lake.

S of Paganoni:

Southern River

Paganoni Loc 16 Lot 41
Mandurah Farmworld.
Lot 41 Fremantle Rd.
537 1128

Michael Hellen.

1st December ~~Monday~~ Friday

meet on site
entrance of estate
opposite Madora Bay turn off
.entrance to Mandurah Farmworld
10 am