



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 5242/1
Permit Holder:	Commissioner of Main Roads Western Australia
Duration of Permit:	19 April 2013 – 19 April 2018

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purpose of road construction and associated activities for the Gateway WA (Perth Airport and Freight Access) Project.

2. Land on which clearing is to be done

LOT 07 ON PLAN 2302 (KEWDALE 6105)
LOT 10 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 10126 ON PLAN 215187 (FORRESTFIELD 6058)
LOT 1094 ON PLAN 5273 REDCLIFFE 6104)
LOT 1096 ON PLAN 5273 REDCLIFFE 6104)
LOT 1097 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1098 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1099 ON PLAN 5273 (REDCLIFFE 6104)
LOT 11 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 1100 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1101 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1102 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1103 ON PLAN 5273 (PERTH AIRPORT 6105)
LOT 11741 ON PLAN 190361 (KEWDALE 6105)
LOT 12 ON DIAGRAM 74873 (KEWDALE 6105)
LOT 12 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 12 ON PLAN 8047 (REDCLIFFE 6104)
LOT 12718 ON PLAN 193116 (REDCLIFFE 6104)
LOT 13 ON PLAN 2302 (KEWDALE 6105)
LOT 13 ON PLAN 3781 (FORRESTFIELD 6058)
LOT 14 ON PLAN 2302 (KEWDALE 6105)
LOT 14 ON PLAN 3781 (FORRESTFIELD 6058)
LOT 14175 ON PLAN 221057 (KEWDALE 6105)
LOT 1439 ON PLAN 5273 (REDCLIFFE 6104)
LOT 15 ON PLAN 3781 (WATTLE GROVE 6107)

LOT 15531 ON PLAN 43224 (FORRESTFIELD 6058)
LOT 16 ON PLAN 3781 (WATTLE GROVE 6107)
LOT 17 ON PLAN 6836 (REDCLIFFE 6104)
LOT 2 ON DIAGRAM 67640 (REDCLIFFE 6104)
LOT 2 ON DIAGRAM 72255 (REDCLIFFE 6104)
LOT 2 ON DIAGRAM 74788 (KEWDALE 6105)
LOT 21 ON PLAN 3217 (KEWDALE 6105)
LOT 22 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 23 ON PLAN 7057 (CLOVERDALE 6105)
LOT 230 ON PLAN 8803 (CLOVERDALE 6105)
LOT 24 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 265 ON PLAN 24993 (CLOVERDALE 6105)
LOT 281 ON PLAN 3245 (CLOVERDALE 6105)
LOT 3 ON DIAGRAM 25125 (REDCLIFFE 6104)
LOT 30 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 3788 ON PLAN 190362 (KEWDALE 6105)
LOT 387 ON PLAN 2284 (KEWDALE 6105)
LOT 4 ON DIAGRAM 58597 (CLOVERDALE 6105)
LOT 41 ON PLAN 8047 (REDCLIFFE 6104)
LOT 471 ON PLAN 5047 (REDCLIFFE 6104)
LOT 472 ON PLAN 5047 (REDCLIFFE 6104)
LOT 49 ON PLAN 6716 (REDCLIFFE 6104)
LOT 498 ON PLAN 5047 (REDCLIFFE 6104)
LOT 499 ON PLAN 5047 (REDCLIFFE 6104)
LOT 5 ON PLAN 14113 (PERTH AIRPORT 6105)
LOT 50 ON DIAGRAM 13520 (REDCLIFFE 6104)
LOT 50 ON PLAN 3217 (KEWDALE 6105)
LOT 500 ON PLAN 15914 (REDCLIFFE 6104)
LOT 500 ON PLAN 56763 (CLOVERDALE 6105)
LOT 501 ON PLAN 15914 (REDCLIFFE 6104)
LOT 505 ON PLAN 5047 (REDCLIFFE 6104)
LOT 506 ON PLAN 5047 (REDCLIFFE 6104)
LOT 5084 ON PLAN 38120 (WATTLE GROVE 6107)
LOT 51 ON PLAN 13688 (FORRESTFIELD 6058)
LOT 51 ON PLAN 7067 (PERTH AIRPORT 6105)
LOT 52 ON PLAN 7067 (KEWDALE 6105)
LOT 55 ON PLAN 6907 (KEWDALE 6105)
LOT 56 ON PLAN 6907 (KEWDALE 6105)
LOT 56 ON PLAN 8167 (KEWDALE 6105)
LOT 564 ON PLAN 5047 (REDCLIFFE 6104)
LOT 57 ON PLAN 6907 (FORRESTFIELD 6058)
LOT 57 ON PLAN 8167 (KEWDALE 6105)
LOT 572 ON PLAN 5047 (REDCLIFFE 6104)
LOT 58 ON PLAN 6907 (KEWDALE 6105)
LOT 58 ON PLAN 8167 (KEWDALE 6105)
LOT 59 ON PLAN 6907 (FORRESTFIELD 6058)
LOT 59 ON PLAN 8167 (KEWDALE 6105)
LOT 6 ON DIAGRAM 71584 (KEWDALE 6105)
LOT 6 ON PLAN 14114 (PERTH AIRPORT 6105)
LOT 6 ON PLAN 2302 (KEWDALE 6105)

LOT 60 ON PLAN 8167 (KEWDALE 6105)
LOT 61 ON PLAN 8167 (KEWDALE 6105)
LOT 62 ON PLAN 8167 (KEWDALE 6105)
LOT 626 ON PLAN 5047 (REDCLIFFE 6104)
LOT 627 ON PLAN 5047 (Lot REDCLIFFE 6104)
LOT 63 ON PLAN 7066 (WATTLE GROVE 6107)
LOT 64 ON PLAN 7066 (FORRESTFIELD 6058)
LOT 67 ON PLAN 15195 (REDCLIFFE 6104)
LOT 68 ON PLAN 15195 (REDCLIFFE 6104)
LOT 70 ON DIAGRAM 71872 (REDCLIFFE 6104)
LOT 70 ON PLAN 15195 (REDCLIFFE 6104)
LOT 7868 ON PLAN 15914 (REDCLIFFE 6104)
LOT 8 ON PLAN 2302 (WATTLE GROVE 6107)
LOT 801 ON PLAN 70627 (CLOVERDALE 6105)
LOT 802 ON PLAN 49537 (WATTLE GROVE 6107)
LOT 804 ON PLAN 49537 (WATTLE GROVE 6107)
LOT 806 ON PLAN 49537 (WATTLE GROVE 6107)
LOT 85 ON PLAN 7067 (KEWDALE 6105)
LOT 86 ON PLAN 7067 (WATTLE GROVE 6107)
LOT 87 ON PLAN 7067 (WATTLE GROVE 6107)
LOT 88 ON PLAN 7067 (WATTLE GROVE 6107)
LOT 9 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 9947 ON PLAN 183309 (FORRESTFIELD 6058)
ROAD RESERVES (ASCOT 6104)
ROAD RESERVES (BELMONT 6105)
ROAD RESERVES (CLOVERDALE 6105)
ROAD RESERVES (FORRESTFIELD 6058)
ROAD RESERVES (KEWDALE 6105)
ROAD RESERVES (PERTH AIRPORT 6105)
ROAD RESERVES (REDCLIFFE 6104)
ROAD RESERVES (WATTLE GROVE 6107)

3. Area of Clearing

The Permit Holder must not clear more than 103 hectares of native vegetation within the area shaded yellow on attached Plan 5242/1.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for the purpose described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for that purpose under the *Main Roads Act 1930* or any other written law.

6. Compliance with Assessment Sequence and Management Procedures

Prior to clearing any native vegetation under conditions 1, 2 and 3 of this Permit, the Permit Holder must comply with the Assessment Sequence and the Management Procedures set out in Part II of this Permit.

PART II – ASSESSMENT SEQUENCE AND MANAGEMENT PROCEDURES

7. Avoid, minimise etc clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

- (A) avoid the clearing of native vegetation;
- (B) minimise the amount of native vegetation to be cleared; and
- (C) reduce the impact of clearing on any environmental value.

8. Environmental management plan (offset)

(A) By 1 January 2014 the Permit Holder must submit an Environmental Management Plan to the CEO.

(B) The Environmental Management Plan must include:

- (i) a plan for managing the *impacts*; and
- (ii) an *offset proposal* prepared in accordance with conditions 8(C) and 8(D) of this permit; and
- (iii) a table setting out the Permit Holder's commitments to the Environmental Management Plan requirements; and
- (iv) a program for monitoring compliance with the Permit Holder's commitments;

(C) Determination of *offsets*:

- (i) In determining the *offset* to be implemented with respect to a particular area of native vegetation proposed to be cleared under this Permit, the Permit Holder must comply with the *offset* principles contained in condition 8(D) of this Permit;
- (ii) The offset must address residual impacts, including but not limited to:
 - (a) Clearing of 40 hectares of feeding habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii subsp. naso*); and
 - (b) Clearing of 101 potential *habitat trees*; and
 - (c) Direct clearing of 3.8 hectares of Threatened Ecological Community (TEC) FCT02, 1.7 hectares of TEC FCT20a and 1.93 hectares of TEC FCT3a; and
 - (d) Indirect impacts to 5.16 hectares of TEC FCT02, 50.19 hectares of TEC FCT20a and 11 hectares of TEC FCT3a; and
 - (e) Clearing of 62 *Conospermum undulatum* plants; and
 - (f) Clearing of 34 hectares of wetland vegetation.
- (iii) The Permit Holder must implement the *offset proposal* approved under condition 8(E); and
- (iv) The implementation of the approved *offset proposal* must be completed by 19 April 2018; and
- (v) Each *offset proposal* must include a *direct offset*, timing for implementation of the *offset proposal* and may additionally include *contributing offsets*.

(D) For the purpose of this condition, the *offset* principles are as follows:

- (i) *direct offsets* must directly counterbalance the loss of the native vegetation;
- (ii) *contributing offsets* must complement and enhance the *direct offsets*;
- (iii) *offsets* are implemented only once all avenues to avoid, minimise, rectify or reduce environmental impacts have been exhausted;
- (iv) the environmental values, habitat, species, *ecological community*, physical area, ecosystem, landscape, and hydrology of the *offset* should be the same as, or better than, that of the area of native vegetation being *offset*;
- (v) a ratio greater than 1:1 must be applied to the size of the area of native vegetation that is offset to compensate for the risk that the *offset* may fail;
- (vi) *offsets* must entail a robust and consistent assessment process;
- (vii) in determining an appropriate *offset*, consideration should be given to ecosystem function, rarity and type of *ecological community*, vegetation *condition*, habitat quality and area of native vegetation cleared;
- (viii) the *offset* must lead to a net gain in native vegetation and improve the *condition* of the natural environment;
- (ix) *offsets* must satisfy all statutory requirements;

- (x) *offsets* must be clearly defined, documented and audited;
 - (xi) *offsets* must ensure a long-term (10-30 year) benefit; and
 - (xii) an *environmental specialist* must be involved in the design, assessment and monitoring of *offsets*.
- (E) The Environmental Management Plan must be approved by the CEO prior to being implemented.
 - (F) The approved Environmental Management Plan must be implemented by the Permit Holder.
 - (G) If it is necessary to modify the Environmental Management Plan, then the Permit Holder must submit the modified plan to the CEO.
 - (H) The modified Environmental Management Plan must not be implemented until approved by the CEO.
 - (I) An approved modified Environmental Management Plan supersedes any previous Environmental Management Plan.

9. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

- (A) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (B) shall only move soils in *dry conditions*;
- (C) ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
- (D) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

10. Flora management

Where rare flora listed in the *Wildlife Conservation (Rare Flora) Notice* occurs within the area shaded yellow on attached Plan 5242/1, the Permit Holder shall ensure that:

- (A) no more than sixty-two (62) plants of rare flora species *Conospermum undulatum* are cleared; and
- (B) no clearing of identified rare flora occurs unless in accordance with the *Wildlife Conservation Act 1950*.

PART III - RECORD KEEPING AND REPORTING

11. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (A) In relation to the clearing of native vegetation authorised under this Permit:
 - (i) the species composition, structure and density of the cleared area;
 - (ii) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
 - (iii) the date that the area was cleared; and
 - (iv) the size of the area cleared (in hectares).
- (B) The Permit Holder must maintain records of the Environmental Management Plan activities undertaken, in accordance with the Environmental Management Plan in relation to condition 8 of this Permit.

- (C) In relation to flora management pursuant to condition 10 of this Permit:
- (i) the location of each rare flora species cleared, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the date(s) that rare flora was cleared; and
 - (iii) the number rare flora plants that were cleared.

12. Reporting

- (A) The Permit Holder must provide to the CEO on or before 30 June of each year, a written report:
- (i) of records required under condition 11 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (B) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the CEO on or before 30 June of each year.
- (C) Prior to 19 January 2018, the Permit Holder must provide to the CEO a written report of records required under condition 11 of this Permit where these records have not already been provided under condition 12(A) of this Permit.

DEFINITIONS

The following meanings are given to terms used in this Permit:

condition means the rating given to native vegetation using the *Keighery scale* and refers to the degree of change in the structure, density and species present in the particular vegetation in comparison to undisturbed vegetation of the same type;

contributing offset/s has the same meaning as is given to that term in the Environmental Protection Authority's *Position Statement No.9: Environmental Offsets*, January 2006;

dieback means the effect of *Phytophthora* species on native vegetation;

direct offset/s has the same meaning as is given to that term in the Environmental Protection Authority's *Position Statement No.9: Environmental Offsets*, January 2006;

dry conditions means when soils (not dust) do not freely adhere to rubber tyres, tracks, vehicle chassis or wheel arches;

ecological community/ies means a naturally occurring biological assemblage that occurs in a particular type of habitat (English and Blythe, 1997; 1999);

environmental specialist means a person who is engaged by the Permit Holder for the purpose of providing environmental advice, who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit;

fill means material used to increase the ground level, or fill a hollow;

habitat tree(s) means trees that have a diameter, measured at 1.5 metres from the base of the tree, of 50 centimetres or greater, that contains or has the potential to develop hollows or roosts suitable for native fauna;

impacts means any impact of clearing on environmental values;

Keighery scale means the vegetation condition scale described in *Bushland Plant Survey: A Guide to Plant Community Survey for the Community (1994)* as developed by B.J. Keighery and published by the Wildflower Society of WA (Inc). Nedlands, Western Australia;

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

offset proposal means an *offset* provided by the Permit Holder in accordance with condition 8 of this permit

offset/s means an offset required to be implemented under condition 8 of this Permit;

weed/s means any plant -

- (A) that is declared under section 37 of the *Agriculture and Related Resources Protection Act 1976*;
or
- (B) published in the Department of Environment and Conservation Regional Weed Assessments, regardless of ranking; or
- (C) not indigenous to the area concerned; and

Wildlife Conservation (Rare Flora) Notice means those plant taxa gazetted as rare flora pursuant to section 23F(2) of the *Wildlife Conservation Act 1950* (as amended).



Jason Banks
DEPUTY DIRECTOR GENERAL, ENVIRONMENT

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

28 March 2013

Plan 5242/1



LEGEND

- Perth Metropolitan Central
15cm Orthomosaic - Landgate
2011
- Local Government
Authorities
- Road Centrelines
- Clearing Instruments



Scale 1:40000

(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

J Banks *[Signature]* Date: 2/3/19

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



Department of
Environment and Conservation

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1. Application details

1.1. Permit application details

Permit application No.: 5242/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Commissioner of Main Roads Western Australia

1.3. Property details

Property:

LOT 07 ON PLAN 2302 (KEWDALE 6105)
LOT 10 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 10126 ON PLAN 215187 (FORRESTFIELD 6058)
LOT 1094 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1096 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1097 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1098 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1099 ON PLAN 5273 (REDCLIFFE 6104)
LOT 11 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 1100 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1101 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1102 ON PLAN 5273 (REDCLIFFE 6104)
LOT 1103 ON PLAN 5273 (PERTH AIRPORT 6105)
LOT 11741 ON PLAN 190361 (Lot No. 11741 CHISHOLM KEWDALE 6105)
LOT 12 ON DIAGRAM 74873 (Lot No. 12 CHISHOLM KEWDALE 6105)
LOT 12 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 12 ON PLAN 8047 (REDCLIFFE 6104)
LOT 12718 ON PLAN 193116 (House No. 35 MORRISON REDCLIFFE 6104)
LOT 13 ON PLAN 2302 (KEWDALE 6105)
LOT 13 ON PLAN 3781 (FORRESTFIELD 6058)
LOT 14 ON PLAN 2302 (KEWDALE 6105)
LOT 14 ON PLAN 3781 (FORRESTFIELD 6058)
LOT 14175 ON PLAN 221057 (Lot No. 14175 DADDOW KEWDALE 6105)
LOT 1439 ON PLAN 5273 (REDCLIFFE 6104)
LOT 15 ON PLAN 3781 (House No. 85 HARDEY EAST WATTLE GROVE 6107)
LOT 15531 ON PLAN 43224 (FORRESTFIELD 6058)
LOT 16 ON PLAN 3781 (House No. 75 HARDEY EAST WATTLE GROVE 6107)
LOT 17 ON PLAN 6836 (REDCLIFFE 6104)
LOT 2 ON DIAGRAM 67640 (REDCLIFFE 6104)
LOT 2 ON DIAGRAM 72255 (House No. 57 JOHNSON REDCLIFFE 6104)
LOT 2 ON DIAGRAM 74788 (House No. 130 CHISHOLM KEWDALE 6105)
LOT 21 ON PLAN 3217 (KEWDALE 6105)
LOT 22 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 23 ON PLAN 7057 (House No. 401 KEW CLOVERDALE 6105)
LOT 230 ON PLAN 8803 (House No. 2 DEMPSEY CLOVERDALE 6105)
LOT 24 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 265 ON PLAN 24993 (House No. 8L FLORRIE CLOVERDALE 6105)
LOT 281 ON PLAN 3245 (Lot No. 281 LEACH CLOVERDALE 6105)
LOT 3 ON DIAGRAM 25125 (House No. 72 STANTON REDCLIFFE 6104)
LOT 30 ON PLAN 2302 (FORRESTFIELD 6058)
LOT 3788 ON PLAN 190362 (House No. 120 CHISHOLM KEWDALE 6105)
LOT 387 ON PLAN 2284 (Lot No. 387 NEWBURN KEWDALE 6105)
LOT 4 ON DIAGRAM 58597 (CLOVERDALE 6105)
LOT 41 ON PLAN 8047 (REDCLIFFE 6104)
LOT 471 ON PLAN 5047 (House No. 7 RYANS REDCLIFFE 6104)
LOT 472 ON PLAN 5047 (House No. 9 RYANS REDCLIFFE 6104)
LOT 49 ON PLAN 6716 (REDCLIFFE 6104)
LOT 498 ON PLAN 5047 (Lot No. 498 TONKIN REDCLIFFE 6104)

LOT 499 ON PLAN 5047 (Lot No. 499 TONKIN REDCLIFFE 6104)
 LOT 5 ON PLAN 14113 (PERTH AIRPORT 6105)
 LOT 50 ON DIAGRAM 13520 (House No. 13 MORRISON REDCLIFFE 6104)
 LOT 50 ON PLAN 3217 (KEWDALE 6105)
 LOT 500 ON PLAN 15914 (REDCLIFFE 6104)
 LOT 500 ON PLAN 56763 (House No. 16 DOD CLOVERDALE 6105)
 LOT 501 ON PLAN 15914 (REDCLIFFE 6104)
 LOT 505 ON PLAN 5047 (House No. 12 RYANS REDCLIFFE 6104)
 LOT 506 ON PLAN 5047 (House No. 10 RYANS REDCLIFFE 6104)
 LOT 5084 ON PLAN 38120 (House No. 90 HARDEY EAST WATTLE GROVE 6107)
 LOT 51 ON PLAN 13688 (FORRESTFIELD 6058)
 LOT 51 ON PLAN 7067 (PERTH AIRPORT 6105)
 LOT 52 ON PLAN 7067 (KEWDALE 6105)
 LOT 55 ON PLAN 6907 (Lot No. 55 CHISHOLM KEWDALE 6105)
 LOT 56 ON PLAN 6907 (KEWDALE 6105)
 LOT 56 ON PLAN 8167 (KEWDALE 6105)
 LOT 564 ON PLAN 5047 (Lot No. 564 TONKIN REDCLIFFE 6104)
 LOT 57 ON PLAN 6907 (FORRESTFIELD 6058)
 LOT 57 ON PLAN 8167 (KEWDALE 6105)
 LOT 572 ON PLAN 5047 (Lot No. 572 TONKIN REDCLIFFE 6104)
 LOT 58 ON PLAN 6907 (KEWDALE 6105)
 LOT 58 ON PLAN 8167 (KEWDALE 6105)
 LOT 59 ON PLAN 6907 (FORRESTFIELD 6058)
 LOT 59 ON PLAN 8167 (KEWDALE 6105)
 LOT 6 ON DIAGRAM 71584 (House No. 110 CHISHOLM KEWDALE 6105)
 LOT 6 ON PLAN 14114 (PERTH AIRPORT 6105)
 LOT 6 ON PLAN 2302 (KEWDALE 6105)
 LOT 60 ON PLAN 8167 (KEWDALE 6105)
 LOT 61 ON PLAN 8167 (KEWDALE 6105)
 LOT 62 ON PLAN 8167 (KEWDALE 6105)
 LOT 626 ON PLAN 5047 (House No. 7 CRIBB REDCLIFFE 6104)
 LOT 627 ON PLAN 5047 (Lot No. 627 TONKIN REDCLIFFE 6104)
 LOT 63 ON PLAN 7066 (WATTLE GROVE 6107)
 LOT 64 ON PLAN 7066 (FORRESTFIELD 6058)
 LOT 67 ON PLAN 15195 (REDCLIFFE 6104)
 LOT 68 ON PLAN 15195 (REDCLIFFE 6104)
 LOT 70 ON DIAGRAM 71872 (REDCLIFFE 6104)
 LOT 70 ON PLAN 15195 (REDCLIFFE 6104)
 LOT 7868 ON PLAN 15914 (REDCLIFFE 6104)
 LOT 8 ON PLAN 2302 (WATTLE GROVE 6107)
 LOT 801 ON PLAN 70627 (CLOVERDALE 6105)
 LOT 802 ON PLAN 49537 (House No. 65A HARDEY EAST WATTLE GROVE 6107)
 LOT 804 ON PLAN 49537 (House No. 55A HARDEY EAST WATTLE GROVE 6107)
 LOT 806 ON PLAN 49537 (House No. 47A HARDEY EAST WATTLE GROVE 6107)
 LOT 85 ON PLAN 7067 (KEWDALE 6105)
 LOT 86 ON PLAN 7067 (WATTLE GROVE 6107)
 LOT 87 ON PLAN 7067 (WATTLE GROVE 6107)
 LOT 88 ON PLAN 7067 (WATTLE GROVE 6107)
 LOT 9 ON PLAN 2302 (FORRESTFIELD 6058)
 LOT 9947 ON PLAN 183309 (FORRESTFIELD 6058)
 ROAD RESERVE (BELMONT, CITY OF)
 ROAD RESERVE (ASCOT 6104)
 ROAD RESERVE (CLOVERDALE 6105)
 ROAD RESERVE (FORRESTFIELD 6058)
 ROAD RESERVE (KEWDALE 6105)
 ROAD RESERVE (PERTH AIRPORT 6105)
 ROAD RESERVE (REDCLIFFE 6104)
 ROAD RESERVE (WATTLE GROVE 6107)

Local Government Area:
 Colloquial name:

City of Belmont; Shire of Kalamunda
 Gateway WA (Perth Airport and Freight Access) Project - Stage 1

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
103		Mechanical Removal	Road construction or maintenance

1.5. Decision on application

Decision on Permit Application:	Grant
Decision Date:	28 March 2013

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Association:			
1001 - Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina (Leach Hwy /Tonkin Hwy intersection and north)	The amended application is to clear up to 103 hectares of native vegetation on various properties and road reserves under State jurisdiction in the City of Belmont and the Shire of Kalamunda, for construction associated with Stage 1 of the Gateway WA (Perth Airport and Freight Access Project).	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994)	Vegetation condition was determined through site visit conducted by the Department of Environment and Conservation on 22 October 2012 (DEC, 2012) and biological survey information provided as supporting documentation with the application (Gateway Vision, 2012).
1018 - Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa (Tonkin Hwy and Tonkin/Roe intersection)	Main Roads Western Australia (MRWA) intends to upgrade the major public arterial road network around Perth Airport, largely focussing on road and infrastructure upgrades along Tonkin Highway between Great Eastern Highway and Roe Highway, as well as part of Leach Highway from Orrong Road to the Perth Airport (Gateway Vision, 2012).	To Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994)	
1009 - Medium woodland; marri & river gum (south of Roe intersection and western end of Roe Hwy)			
968 - Medium woodland; jarrah, marri & wandoo (southern end of Tonkin Hwy past the Roe intersection) (Shepherd et al., 2001)	The project construction is planned to take place over a number of different phases and the proponent has advised that a separate application for a clearing permit will be submitted if further clearing is required for subsequent phases (Gateway Vision, 2012).		
Hedde Vegetation Complex:			
Bassendean Complex-Central and South - Vegetation ranges from woodland of Eucalyptus marginata (Jarrah) - Allocasuarina fraseriana (Sheoak) - Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. This area includes the transition of Eucalyptus marginata (Jarrah) to Eucalyptus tottiana (Pricklybark) in the vicinity of Perth (northern half of application area)	The application area is located approximately 8 kilometres east of Perth CBD, in the eastern Perth Metropolitan suburbs of Redcliffe, Belmont, Cloverdale, Kewdale and Forrestfield (Gateway Vision, 2012). It is immediately south and west of the existing Perth Airport. The project also includes development within the adjacent Perth Airport land, which is under Commonwealth tenure.		
Southern River Complex - Open woodland of Corymbia calophylla (Marri) - Eucalyptus marginata (Jarrah) - Banksia species with fringing woodland of Eucalyptus rudis (Flooded Gum) - Melaleuca raphiophylla (Swamp Paperbark) along creek beds. (southern half of application area) (Hedde et al., 1980)	The original application was to clear 112 hectares of native vegetation remaining in a 206 hectare footprint. The proponent subsequently removed 36 hectares from the footprint and reduced the amount of clearing by 9 hectares. There is approximately 111 hectares of native vegetation in the 170 hectare footprint and the amended application proposes to clear 103 hectares.		
	The proponent expects the area of impact will be less than the 103 hectares applied for, as it will be confined to a 4 metre buffer to the boundary of the permanent road (GHD, 2013), which will be identified following detailed design (Gateway Vision, 2012).		
	A level 2 flora and vegetation assessment identified fourteen vegetation types within the original footprint area (Gateway Vision, 2012). The majority of the vegetation under application is located along the eastern		

side of Tonkin Highway, particularly just to the north of the Leach Highway intersection, and in the vicinity of the Tonkin / Roe Highways intersection. Some of the vegetation is reported to have been planted for revegetation along Tonkin Highway (Gateway Vision, 2012).

The proponent (Gateway Vision, 2013) has advised that 47.67 hectares of the vegetation in the revised application area is in good (Keighery, 1994) or better condition and that approximately 55.66 hectares is in a degraded (Keighery, 1994) condition.

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is seriously at variance to this Principle

The amended application is to clear up to 103 hectares of native vegetation for the purpose of road and intersection upgrades and associated infrastructure for Stage 1 of the Gateway WA (Perth Airport and Freight Access) Project. The footprint area supports approximately 111 hectares of native vegetation and the application is to clear 103 hectares.

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced, including evidence of adequate surface water flow management. DEC also advised consideration should be given to moving the clearing footprint to the southern side of Roe Highway in order to minimise the clearing of vegetation on the northeast side of the Tonkin / Roe intersection.

In response, MRWA reduced the amount of clearing by 9 hectares by removing some areas outside the Metropolitan Regional Scheme reserves dedicated for primary regional roads and areas that do not contain native vegetation (GHD, 2013). This removed the areas within the City of Canning from the application.

The proponent has advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b). The planning of this project is reported to have included extensive analysis of road alignment and intersection options and the preferred alignment has been designed to minimise impacts on biodiversity where possible, endeavouring to avoid impacts to sensitive areas and environmental values as far as possible (Gateway Vision, 2012). MRWA has advised that selection of the preferred alignment was based on a comprehensive analysis of route options which included consideration of impacts on native bushland, areas of significant ecological value and fragmentation of vegetation (Gateway Vision, 2012).

The proponent has advised that there are opportunities to reduce impacts on a number of key environmental factors, particularly through changes to design, minimising construction zones and managing indirect impacts from edge effects including weed and fire risk during construction through a detailed Construction Environmental Management Plan (CEMP) (MRWA, 2012b). A draft CEMP that includes commitments to minimise impacts to flora, fauna, vegetation communities and wetlands and ensure adequate hygiene has been provided to DEC.

GHD conducted a level 2 flora and vegetation survey of the broader project area in 2010 and 2011 which included the vegetation under application. This survey recorded 261 native flora, including rare and priority species, and 43 introduced (weed) species (Gateway Vision, 2011). Fourteen of the 20 vegetation types identified in the survey occur within the clearing application footprint area (Gateway Vision, 2012).

The proponent (Gateway Vision, 2013) has advised that 47.67 hectares of the vegetation in the revised application area is in good (Keighery, 1994) or better condition and that approximately 55.66 hectares is degraded (Keighery, 1994).

The majority of the vegetation in the area of the Tonkin / Roe Highway interchange is reported to be in good or better (Keighery, 1994) condition (Gateway Vision, 2012). This area supports rare and priority flora, is significant habitat for fauna of conservation significance (particularly black cockatoos and quenda) and is mapped as Conservation Category and Resource Enhancement wetland. A Bush Forever Area (BFA 319) that extends into the road reserve will be impacted by the proposed clearing.

Analysis of the GHD quadrat data found two of the five survey quadrats on the northeast side of the Tonkin /Roe Highway interchange align with the threatened ecological communities (TEC) floristic community type (FCT) 20a (*Banksia attenuata* woodland over species rich dense shrublands), two align with FCT 02 (Southern wet shrublands, Swan Coastal Plain) and the fifth aligns with Priority 3 FCT 21c (Low lying *Banksia attenuata* woodlands or shrublands). Additionally, Quadrat 10 (southwest of the Tonkin /Roe intersection) was found to have some affinity with FCT 3a (*Corymbia calophylla* - *Kingia australis* woodlands on heavy soils) and is probably a transitional unit of the TEC, which is listed as Critically Endangered in Western Australia and Endangered under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, and Priority 3 ecological community (PEC) FCT 21c.

A hybrid of the rare flora impacted by the proposed clearing was collected from the southeast side of the Tonkin / Roe Highway interchange in 2005. This is one of three locations of the hybrid, all of which are within 5 kilometres of the application area. The southeast side of the Tonkin / Roe Highway interchange currently supports the largest stand of the hybrid (16 plants). The other two locations of the hybrid have very low numbers, with plants in one of the locations having declined substantially over the past decade. This hybrid is considered to be very important from a scientific perspective as an evolutionary link and is the only known hybrid in existence for the genus. The distribution of the hybrid suggests that they are continually produced, but don't spread. There appears to be inter-grades of the hybrid, which means it is likely that they produce some seed, possibly of lower viability, however this has not been confirmed.

Hybridisation has been shown to be a critical process in the evolution of plants and can lead to the evolution of new species through the process of 'recombinational speciation'. Therefore, the conservation of hybrids is an important part of conserving biodiversity and evolutionary processes. There are numerous examples of Western Australian hybrids that have not yet been separately identified. Many of the hybrids may be under threat, predominantly from land clearing and some have almost certainly been destroyed. It is appropriate, therefore, to protect rare hybrids, as a means of conserving genetic diversity, and the processes that may ultimately lead to the genesis of new species. The protection of rare hybrids should also include associated vegetation and the areas in which they occur and should also include 'rare varieties' as well as subspecies. Hybrids are often morphologically distinguishable and consistent, and able to replicate (even if) by asexual means.

Gateway Vision's (2012) condition mapping of the application area indicates the majority of the (approximately) 13 hectares of vegetation on the eastern side of the Tonkin / Leach Highway interchange is in good or better (Keighery, 1994) condition, including a small area in excellent (Keighery, 1994) condition (Gateway Vision, 2012). This area is predominantly *Banksia* woodland type vegetation and is identified by Gateway Vision (2012) as core black cockatoo feeding habitat, also containing 2 possible roost sites and numerous possible breeding trees. Signs of foraging on cones of *Banksia* trees was recorded within the application area during a site visit by DEC on 22 October 2012 (DEC, 2012). This vegetation is also part of the BFA 386 - Perth Airport and Adjacent Bushland and is mapped as a wetland of conservation category and resource enhancement classification. Analysis of the GHD quadrat data found 3 of the 5 quadrats surveyed in this area showed an affinity with Priority 3 PEC FCT 21c (Low lying *Banksia attenuata* woodlands or shrublands).

Significant black cockatoo feeding habitat and possible nesting trees also occur along the northern section of the application area, on the eastern side of Tonkin Highway in the vicinity of the proposed Tonkin Highway / Boud Avenue interchange (Gateway Vision, 2012).

The application is in an urban area and approximately 90 to 95 percent of the local area (10 kilometre radius) is cleared for residential, industrial and airport purposes. The vegetation under application is significant as part of an ecological linkage in an extensively cleared landscape.

Considering the above, the vegetation under application in the vicinity of the Tonkin / Leach Highway interchange and the Tonkin / Roe Highway interchange comprises high biological diversity and very high conservation values. In particular, the vegetation on northeast side of the Tonkin / Roe intersection area is of extremely high conservation value.

DEC's preliminary assessment of 15 November 2012, found the proposed clearing to be at variance to this principle. However upon closer consideration and, given the limited details on opportunities to avoid, minimise and manage environmental impacts of the project, DEC has undertaken a reassessment of the proposed clearing and has found that the proposed clearing of 103 hectares is seriously at variance to this principle.

An appropriate strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

An appropriate offset proposal should consider, but not be limited to, the following:

- Significant resources for improving conservation and management of remaining areas of TECs, PECs and other bushland within and adjacent to the clearing footprint
- Fencing and resources for the long term protection of other remaining areas of bushland
- Engaging a professional to collect seed from the hybrid flora species for long-term storage in the DEC Threatened Flora Seed Centre and seed orchard store (Please liaise with DEC Species and Communities Branch for further information.)

A draft offset strategy has been provided, which includes:

- Purchasing and ceding 181 hectares of land to DEC, which includes 154 hectares of black cockatoo feeding habitat and 114 hectares of conservation category wetlands (Gateway WA, 2013c).
- Establishing 120 plants of the impacted rare flora in adjacent areas of suitable habitat and trialling relocation of mature plants during the construction process, including watering and monitoring for a considerable period (Gateway WA, 2013c).
- Rehabilitating bushland in Pioneer Park (Bush Forever Area 440), which is managed by the Shire of Kalamunda and contains the impacted rare flora species and the TEC FCT 20a (Gateway WA, 2013c). The rehabilitation will include re-establishment of the rare flora and protection of its habitat, as well as opportunities for re-establishment of native plants and weed control in degraded areas (Gateway WA, 2013d). The proponent has provided "in principle" support from the Shire of Kalamunda for the rehabilitation in Pioneer Park. Information on what is required to finalise this agreement has not been provided.

DEC is working with the proponent to finalise the offset strategy and include an offset for impacts to the TECs and PEC.

The proponent also commits to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation and has advised that negotiation is underway with the Department of Planning to remove the road reserve from Bush Forever Areas (MRWA, 2013).

Methodology

References:

- DEC, 2012
- Gateway Vision, 2011
- Gateway Vision, 2012
- Gateway WA, 2013c
- Gateway WA, 2013d
- GHD, 2013
- Keighery, 1994
- MRWA, 2012a
- MRWA, 2012b
- MRWA, 2013
- GIS Databases:
 - Bush Forever
 - DEC Managed Lands
 - NLWRA, Current Extent of Native Vegetation
 - Perth Metropolitan Central - Landgate 2011
 - SAC Biodatasets (Accessed 09/12)

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal is seriously at variance to this Principle

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced.

In response, MRWA reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b). The proponent has also advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA (2012b) has advised it will undertake a detailed tree survey within the potential clearing area to map trees with a diameter at breast height of 150 millimetres or greater, which designers will then use to consider ways to retain as many trees as possible. MRWA advised that there are opportunities to minimise the loss of trees and other habitat vegetation, especially along Tonkin Highway. This may occur through the provision of barriers to reduce safety risks to road users, altering the alignment of noise walls, shared paths and other parts of the total road design (MRWA, 2012b). Localised retaining walls may also be employed to protect trees that would otherwise be impacted adversely by road batters (MRWA, 2012b). Feeding habitat for black cockatoos will be preserved wherever possible through these opportunities and approximately 15 of the 101 potential black cockatoo breeding trees identified as being impacted may also be protected in this way (MRWA, 2012b). Details of the changes to the design have not been provided to DEC for consideration.

MRWA also advised (MRWA, 2012b) that indirect impacts from edge effects, such as weed and fire risk, will be managed during construction through a detailed Construction Environmental Management Plan (CEMP). A draft CEMP has been provided to DEC, which includes commitments to identify and minimise impacts to terrestrial and protected fauna, in particular black cockatoos and quenda. There are records of numerous fauna species of conservation significance within the local area (10 kilometre radius) (DEC, 2007-).

Carnaby's cockatoo (*Calyptorhynchus latirostris*) is listed as rare or likely to become extinct under the state Wildlife Conservation Act 1950 (WC Act) and Endangered under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This species nests in large hollows of eucalyptus trees and forages on the seeds, nuts and flowers of a large variety of plants including Proteaceous species (Banksia, Hakea, Grevillea), as well as Allocasuarina and Eucalyptus species, *Corymbia calophylla* and a range of introduced species (Shah, 2006; Valentine and Stock, 2008). One of the major threats to Carnaby's cockatoo is the accumulative clearing of feeding habitat on the Swan Coastal Plain (Cale, 2003). Given this, all feeding habitat within the Swan Coastal Plain is considered significant. Any clearing of cockatoo feeding habitat on the Swan Coastal Plain will contribute to the cumulative loss and fragmentation of remaining habitat and poses a significant threat to the long term survival of Carnaby's cockatoo.

The southern end of the application area is within the buffer to an unconfirmed roost area for Carnaby's cockatoo and extends within 150 metres of the buffer to a confirmed roost area. Carnaby's cockatoo forages intensively in suitable vegetation within 15 kilometres of a roost site. Gateway Vision (2012) reported approximately 15.95 hectares of the vegetation under application to be core feeding habitat for Carnaby's cockatoo (which primarily consisted of Banksia woodland vegetation, or other vegetation with suitable feed species), however approximately 40 hectares of the vegetation under application is mapped as Carnaby's cockatoo feeding habitat. In addition, the mapped possible breeding range for Carnaby's cockatoo covers some of the application area.

The vegetation under application includes some large and consolidated areas of preferred feeding species for Carnaby's cockatoo, particularly around the proposed Tonkin / Leach Highway interchange and the area of the Tonkin / Roe Highway interchange. Signs of foraging on cones of Banksia trees were recorded within the application area during a site visit by DEC on 22 October 2012 (DEC, 2012). DEC also observed a number of large hollow-bearing, and potentially hollow-bearing, trees within the application area (DEC, 2012).

Carnaby's cockatoo feeding habitat and possible breeding trees also occur along the northern section of the application area, on the eastern side of Tonkin Highway in the vicinity of the proposed Tonkin Highway / Boud Avenue interchange (Gateway Vision, 2012).

Gateway Vision (2012) reported there to be 101 trees with the potential to provide breeding habitat for black cockatoos in the application area. These trees may also be suitable as potential breeding habitat for a range of other native fauna.

Forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*) is listed as rare or likely to become extinct under the WC Act and Vulnerable under the EPBC Act. This species is known to utilise the vegetation under application to feed (Gateway Vision, 2012) and may also breed in the area (SEWPAC, 2012).

Gateway Vision (2012) has also identified wetland areas within and adjacent to the proposed clearing alignment as important core habitat for quenda (*Isodon obesulus fusciventer*), which is a priority species. In particular, the wetland area including the Tonkin/Roe Highway interchange has been recognised as providing large, consolidated areas of habitat for this species.

The application area includes some areas of high quality vegetation with high habitat values and relatively low levels of disturbance (DEC, 2012). While the majority of the roadside vegetation along Tonkin Highway is highly disturbed, consisting mainly of scattered patches of overstorey species (DEC, 2012), this vegetation retains significant value as habitat for birds, including black cockatoos.

The application is in an urban / industrial area and the local area (10 kilometre radius) is approximately 90 to 95 percent cleared. The vegetation under application is significant as part of an ecological linkage, fauna refuge and wildlife corridor between remnants in an extensively cleared landscape.

Considering the above, the vegetation under application includes significant areas of core habitat for species of conservation significance, as well as supporting the maintenance of core habitat.

DEC's preliminary assessment of 15 November 2012, found the proposed clearing to be at variance to this principle. However upon closer consideration and, given the limited detail on opportunities to avoid, minimise and manage environmental impacts of the project, DEC has undertaken a reassessment of the proposed clearing and has found that the proposed clearing of 103 hectares is seriously at variance to this principle.

An appropriate strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

An appropriate offset proposal should consider, but not be limited to, the allocation of significant resources for improving conservation and management of remaining areas of significant fauna habitat within and adjacent to the clearing footprint, as well as in other strategic locations on the Swan Coastal Plain.

A draft offset strategy has been provided (Gateway WA, 2013c), which includes purchasing and ceding 181 hectares of land to DEC, which includes 154 hectares of black cockatoo feeding habitat and 114 hectares of conservation category wetlands.

DEC is working with the proponent to finalise the offset strategy.

In addition, the proponent commits to retaining and preserving as much vegetation as possible, including black cockatoo habitat, and has advised that surveying of trees over 150 millimetres in diameter along the project area has now been undertaken and they will continue to look for opportunities to preserve vegetation through design and construction techniques (MRWA, 2013).

Methodology

References:

Cale, 2003
DEC, 2007-
DEC, 2012
Gateway Vision, 2012
Gateway WA, 2013c
GHD, 2013
Keighery, 1994
MRWA, 2012b
MRWA, 2013
SEWPAC, 2012
Shah, 2006
Valentine and Stock, 2008

GIS Databases:

- Carnaby's Cockatoo Roost Areas (Buffered) Confirmed
- Carnaby's Cockatoo Roost Areas (Buffered) Unconfirmed
- Carnaby's Cockatoo Breeding Areas Unconfirmed
- Carnaby's Cockatoo Feeding SCP Unconfirmed
- Perth Metropolitan Central - Landgate 2011
- Pre-European vegetation
- SAC Biodatasets (Accessed 09/12)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments

Proposal is seriously at variance to this Principle

Numerous rare flora occur within the local area (10 kilometre radius). One rare flora species has been recorded within the application footprint and another occurs in close proximity.

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced, including evidence of adequate surface water flow management procedure. DEC also suggested MRWA consider moving the clearing footprint to the southern side of Roe Highway in order to minimise the clearing of vegetation on the northeast side of the Tonkin / Roe intersection.

In response, MRWA reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b). The proponent has also advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA advised that there are opportunities to reduce the construction zone along Roe Highway in areas where rare plants occur (MRWA, 2012b). MRWA will also look for opportunities to reduce the number of plants impacted through design of road batters and drains in relevant areas and through the use of temporary and permanent barriers alongside areas with groups of plants and also, potentially, through the use of low retaining walls instead of road batters to minimise direct and indirect impacts (MRWA, 2012b). Detailed plans of these changes and commitments have yet to be provided to DEC for consideration.

MRWA (2012b) considers there will be no direct or indirect impacts to the rare flora species occurring beyond the application area and that the surface hydrology of the area is not likely to change. MRWA advised that the design of the drainage for the upgraded Roe Highway will aim to redistribute draining across the area, via flows off the road surface, where appropriate and at the Tonkin / Roe Highway interchange, drainage will be directed into infiltration basins/ areas in the interchanges, as it is at present (MRWA, 2012b). Indirect impacts to wetland areas will be managed through direct infiltration of runoff on roadsides where possible, and through infiltration of rainfall / drainage through detention basins following treatment for pollutants (MRWA, 2012b).

MRWA also advised that a general drainage strategy has been developed and has been approved by the Department of Water (DoW) and that MRWA will continue consultation with DoW during the detailed design and

construction process (MRWA, 2012b). MRWA (2012b) also advised that indirect impacts from edge effects including weed and fire risk will be managed during construction through a detailed Construction Environmental Management Plan (CEMP). The drainage strategy and draft CEMP have been provided to DEC for consideration.

DEC acknowledges the information and commitments provided by MRWA, however hydrological information has not been provided to support this. In the absence of supporting hydrological information, the precautionary principle applies and, therefore, there is a risk of hydrological alterations as a result of clearing 103 hectares and the impacts to rare flora are as follows.

GHD conducted a level 2 flora and vegetation survey in 2010 and 2011 and confirmed the presence of one species of rare flora within the clearing footprint (Gateway Vision, 2012). The second rare flora occurs on the Commonwealth Perth Airport land, near the proposed Tonkin / Leach Highway interchange (Gateway Vision, 2011), which is outside the application area.

The rare flora within the application area is listed as Vulnerable under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and is currently known from 30 locations and nearly 11, 000 plants in Western Australia. However, it has a restricted range of approximately 14 kilometres along the eastern edge of the Swan Coastal Plain between High Wycombe and Martin in the Perth Metropolitan area. The main threats to this species are urban development and the degradation of small bushland remnants in which it occurs (primarily on private property). Several populations occur on land considered more secure including Shire land managed as parkland reserves and land purchased by the Government to be managed as conservation estate.

A number of populations/plants of this species are in degraded and vulnerable situations that do not contribute as effectively to the conservation of the species as larger populations in better condition vegetation. Surveys conducted by the proponent recorded 185 plants of this species within the application area (Gateway Vision, 2012). According to records in the Threatened Flora Database, the proposed clearing appears to impact at least 3 subpopulations of the species, including an area that supports one of the largest and best condition populations. Therefore this area is of high importance for the conservation of the species.

The proponent has calculated that a maximum of 62 plants may be directly impacted by the proposed clearing for Stage 1 of the project (MRWA, 2012b). This is based on the actual clearing expected to be a 4 metre construction zone beyond the permanent road boundary (GHD, 2013). However, the road alignment has not been finalised and the application is for a permit to clear all vegetation within the footprint area. Depending on the final alignment chosen, 185 plants and approximately 8.5 percent of the largest subpopulation may be cleared.

In addition, a hybrid of this species was collected within the clearing footprint area proposed for clearing, southeast of the Tonkin /Roe Highway, in 2005 and is considered to be very important from an scientific perspective as an evolutionary link. This is the only known hybrid in existence for the genus. As a minimum, the proponent should engage a professional to collect genetic material from the population for long-term storage in the DEC Threatened Flora Seed Centre and seed orchard store. The proponent is to liaise with DEC Species and Communities Branch for further information.

The rare flora species that occurs nearby is also listed as Endangered under the EPBC Act. This species occurs in areas that are associated with wetlands. The proponent recorded this species 150 metres away from the proposed works and advised that there will be no direct or indirect impacts to this species (MRWA, 2012b).The avoidance of indirect impacts to this species will be dependent on the maintenance of the hydrological regime of the vegetation community in which it occurs.

DEC's preliminary assessment of 15 November 2012, found the proposed clearing to be at variance to this principle. However upon closer consideration and, given the limited detail on opportunities to avoid, minimise and manage environmental impacts of the project, DEC has undertaken a reassessment of the proposed clearing and has found that the proposed clearing of 103 hectares is seriously at variance to this principle.

An appropriate strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

An appropriate offset proposal should consider, but not be limited to, significant resources for improving conservation, management and long term protection of remaining areas of rare flora within and adjacent to the clearing footprint, as well as in other strategic locations on the Swan Coastal Plain.

A draft offset strategy has been provided, which includes:

- Establishing 120 plants of the impacted rare flora in adjacent areas of suitable habitat and trialling relocation of mature plants during the construction process, including watering and monitoring for a considerable period (Gateway WA, 2013c).
- Rehabilitating bushland in Pioneer Park (Bush Forever Area 440), which is managed by the Shire of Kalamunda and contains the impacted rare flora species and the TEC FCT 20a (Gateway WA, 2013c). The rehabilitation will include re-establishment of the rare flora and protection of its habitat, as well as opportunities for re-establishment of native plants and weed control in degraded areas (Gateway WA,

2013d). The proponent has provided 'in principle' support from the Shire of Kalamunda for the rehabilitation in Pioneer Park. Information on what is required to finalise this agreement has not been provided.

DEC is working with the proponent to finalise the offset strategy.

The proponent has also committed to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation and to impact no more than 62 rare flora plants (MRWA, 2013).

Methodology **References:**
Gateway Vision, 2011
Gateway Vision, 2012
Gateway WA, 2013c
Gateway WA, 2013d
GHD, 2013
MRWA, 2012b
MRWA, 2013
GIS Databases:
- DEC Managed Lands
- NLWRA, Current Extent of Native Vegetation
- SAC Biodatasets (Accessed 09/12)

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments Proposal is seriously at variance to this Principle

There are numerous threatened ecological communities (TEC) in the local area (10 kilometre radius), two of which are mapped within the application area and a third is in close proximity.

The floristic community type (FCT) 02 (Southern wet shrublands, Swan Coastal Plain) is listed as an Endangered TEC in Western Australia. The clearing footprint is partially within the mapped boundary of a 6.22 hectare occurrence of this TEC on the northeast side of the Tonkin /Roe Highway intersection, and there is a second 2.7 hectare occurrence 25 metres north of the clearing footprint in this area.

A second TEC, FCT 20a (Banksia attenuata woodland over species rich dense shrublands) is listed as Endangered in Western Australia and is partially mapped over the north side of Roe Highway. This occurrence of FCT 20a is approximately 39 hectares in size and there is a further 12.89 hectares of this TEC across four additional occurrences within 200 metres of the clearing footprint.

The third TEC, FCT 3a (Corymbia calophylla - Kingia australis woodlands on heavy soils) is listed as Critically Endangered in Western Australia and Endangered under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999. There are two mapped occurrences of this TEC 250 metres 350 metres from the application area, on the northeast side of the Tonkin /Roe Highway intersection. These occurrences are approximately 9.68 hectares and 1.32 hectares in size, respectively.

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced, including evidence of adequate surface water flow management procedure. DEC also suggested MRWA consider moving the clearing footprint to the southern side of Roe Highway in order to minimise the clearing of vegetation on the northeast side of the Tonkin / Roe intersection.

In response, MRWA reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b). The proponent has also advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA advised that there are opportunities in the detailed design phase (being undertaken shortly) to slightly reduce direct impacts on TECs and to prevent or minimise indirect impacts through changes to design and minimising construction zones (MRWA, 2012b). It considers the surface hydrology of the area is not likely to change from that currently occurring and advised that a general drainage strategy has been developed (MRWA, 2012b). MRWA (2012b) advised the strategy has been approved by the Department of Water (DoW) and that it will continue consultation with DoW during the detailed design and construction process (MRWA, 2012b). MRWA (2012b) also advised that indirect impacts from edge effects including weed and fire risk will be managed during construction through a detailed Construction Environmental Management Plan (CEMP). The drainage strategy and draft CEMP have been provided to DEC for consideration.

DEC acknowledges the information and commitments provided by MRWA, however hydrological information

has not been provided to support this. In the absence of supporting hydrological information, the precautionary principle applies and, therefore, there is a risk of hydrological alterations as a result of clearing 103 hectares and the impacts to TECs are as follows.

GHD established quadrats and undertook a statistical analysis of its floristic data, however the analysis was unable to establish alignment with the FCTs described in the report 'A floristic survey of the southern Swan Coastal Plain' by Gibson et al. (1994) (Gateway Vision, 2011). This may be due to a number of reasons but the most likely include data quality and possibly vegetation condition. EA Griffin and Associates utilise two statistical methods to analyse new quadrat data for the Swan Coastal Plain (Classification and Nearest Neighbour), and both can then be used to help align the quadrats to previously determined FCTs; however only one method appears to have been used by the consultants.

Analysis of the GHD quadrat data (Gateway Vision, 2011) using different methods, based on presence of taxa that are particularly useful in discerning the FCTs present, found that two of the five quadrats within the vegetation under application in the northeast side of the Tonkin Roe Highway interchange align with FCT 20a and two align with FCT 02. Quadrat 10 has an affinity for FCT 3a, as well as FCT 21c (a priority ecological community).

FCT 02 is known from seven small bushland remnants between Busselton and Forrestfield and covers a total area of approximately 42 hectares. The largest known occurrence of the FCT 02 TEC is at Ambergate near Busselton and covers about 9.9 hectares. The next closest occurrence is at Byford, then Mundijong. Additional surveys undertaken over the past few years have shown that it is most unlikely that further intact examples of this community type will be found. Based on the shapefiles provided for the clearing proposal and current DEC mapping of the TEC, the clearing footprint covers approximately 3.8 hectares of the 6.22 hectare occurrence of the FCT 02 vegetation mapped at the junction of Tonkin and Roe Highways, and this represents over 60 percent of that particular occurrence. This occurrence of FCT 02 is described in mainly excellent (Keighery, 1994) condition. MRWA calculated that the Stage 1 development will result in a direct loss of 2.58 hectares of FCT 02 (MRWA, 2012b). This is based on the actual clearing expected to be a 4 metre construction zone beyond the permanent road boundary (GHD, 2013), however, the road alignment has not been finalised. Depending on the final alignment chosen, 3.8 hectares of FCT 02 may be directly cleared, representing approximately 9 percent of the total known area of this TEC and this would be considered to represent a significant impact. Works proposed at this site are likely to disrupt or change the hydrology of the area, and thereby alter the water regime on which this community relies. In addition, the new roadway would be within approximately 25 metres of another occurrence of the same TEC and there is likely to be indirect impacts to the remaining 5.16 hectares of the TEC outside of the clearing footprint (a further 12 percent of the total area of the TEC). FCT 02 occurs on seasonally inundated sandy clay soils and is most likely to have some level of dependence on groundwater.

FCT 20a is known from a total of approximately 420 hectares in 35 separate bushland areas between Neerabup and Orange Grove. FCT 20a is known from two groups of occurrences that are centred on Wanneroo and Forrestfield and vary in composition. Based on the shapefiles provided and DEC's current TEC mapping, about 1.7 hectares of FCT 20a is within the clearing footprint. MRWA calculated that the Stage 1 development will result in a direct loss of 1.08 hectares of FCT 20a (MRWA, 2012b). This is based on the actual clearing expected to be a 4 metre construction zone beyond the permanent road boundary (GHD, 2013), however, the road alignment has not been finalised. Depending on the final alignment chosen, 1.7 hectares of FCT 20a may be directly cleared, representing approximately 4 percent of this occurrence. Considering the precautionary principle, indirect impacts of the proposed clearing are likely to affect the remainder of the 39 hectare occurrence and the 12.89 hectares of other nearby areas of this TEC.

FCT 3a is known from 39 occurrences in 25 separate bushland areas between Stratton in the north and Capel River in the south (approximately 200 kilometre range). The total known area of occurrence is 153 hectares, with a maximum occurrence size of 33 hectares, minimum of 0.08 hectares, and mean of 3.9 hectares. Quadrat 10 (south east of the Tonkin /Roe interchange) has an affinity with FCT 3a, although it lacks the typical marri overstorey of this community. Based on the presence of a particular combination of taxa present in Quadrat 10, the vegetation appears to have some affinity to FCT 3a and is probably a transitional unit of the TEC. Quadrat 10 is located within GHD's mapped V2 vegetation type (Gateway Vision, 2011), which covers approximately 1.93 hectares. Considering the precautionary principle, this area is considered to be an occurrence of FCT 3a and the proposed clearing may directly impact up to 1.93 hectares of the TEC, representing approximately 1.3 percent of the total area of the community. The other two occurrences of V2 are not considered to be representative of this TEC. The proposed clearing along Roe Highway may also result in indirect impacts to the two mapped occurrences of FCT 3a, which cover a combined area of 11 hectares, representing 7.2 percent of the total area of the community.

DEC's TEC database includes approximate boundaries of FCT 02 and 20a that had been recorded in bushland in the proposal area based on quadrats established by the then Department of Environmental Protection; (Quadrats Dundas03 and M5304). DEC's long term monitoring transect JP02, established in 2006 in FCT 02 is also within the area proposed for clearing.

Edge effects such as encroachment of weeds into adjacent bushland, and residual impacts including increased weed invasion and altered hydrology are likely to be substantial as a consequence of the proposed clearing.

DEC's preliminary assessment of 15 November 2012, found the proposed clearing to be at variance to this principle. However upon closer consideration and, given the limited detail on opportunities to avoid, minimise

and manage environmental impacts of the project, DEC has undertaken a reassessment of the proposed clearing and has found that clearing 103 hectares is seriously at variance to this principle.

An appropriate strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

An appropriate offset proposal should consider, but not be limited to significant resources for improving conservation, management and protection of remaining areas of TECs, PECs and other bushland within and adjacent to the clearing footprint, as well as in other strategic locations on the Swan Coastal Plain.

A draft offset strategy has been provided, which includes rehabilitating bushland in Pioneer Park (Bush Forever Area 440), which is managed by the Shire of Kalamunda and contains the impacted rare flora species and the TEC FCT 20a (Gateway WA, 2013c). The rehabilitation will include re-establishment of the rare flora and protection of its habitat, as well as opportunities for re-establishment of native plants and weed control in degraded areas (Gateway WA, 2013d). The proponent has provided 'in principle' support from the Shire of Kalamunda for the rehabilitation in Pioneer Park. Information on what is required to finalise this agreement has not been provided.

DEC is working with the proponent to finalise the offset strategy and include an offset for impacts to the TECs and PEC.

The proponent also commits to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation (MRWA, 2013).

Methodology

References:

Gateway Vision, 2011
Gateway Vision, 2012
Gateway WA, 2013c
Gateway WA, 2013d
GHD, 2013
Gibson et al., 1994
Keighery, 1994
MRWA, 2012b
MRWA, 2013
GIS Databases:
- SAC Biodatasets (Accessed 09/12)

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments

Proposal is seriously at variance to this Principle

The National Objectives and Targets for Biodiversity Conservation include a target that prevents the clearance of ecological communities with an extent below 30 percent of that present pre-European settlement (Commonwealth of Australia, 2001). All of the mapped vegetation complexes associated with the area under application are below the State Government's target of 30 percent retention (Government of Western Australia, 2011; Shepherd, 2007).

The Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region as a constrained area, which provides for the reduction of vegetation complexes to a minimum of 10 percent of the pre-European extent (EPA, 2006). Vegetation association Beard 968 is below this threshold with 7 percent and the City of Belmont has 10 percent remaining (Government of Western Australia, 2011). In addition, Beard 1018 and 1009 associations are poorly reserved, with 3 and 2 percent of the remaining extent in DEC managed land, equating to 102 and 84 hectares respectively (Government of Western Australia, 2011).

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced.

In response, MRWA reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b). The planning of this project is reported to have included extensive analysis of road alignment and intersection options and the preferred alignment has been designed to minimise impacts on biodiversity where possible, endeavouring to avoid impacts to sensitive areas and environmental values as far as possible (Gateway Vision, 2012). MRWA has advised that selection of the preferred alignment was based on a comprehensive analysis of route options which included consideration of impacts on native bushland, areas of significant ecological value and fragmentation of vegetation (Gateway Vision, 2012).

The proponent has also advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

The application is in an urban area and the local area (10 kilometre radius) is approximately 90 to 95 percent cleared.

The vegetation under application is significant as part of an ecological linkage between remnants in an extensively cleared landscape and holds high environmental values including significant fauna habitat, biodiversity, rare flora, threatened ecological communities and high value wetlands. In particular, the areas in the vicinity of the proposed Tonkin / Leach Highway and Tonkin /Roe Highway interchanges provides large, consolidated areas of high value vegetation.

Vegetation within two Bush Forever areas, flora, ecological communities and wetlands of conservation significance will be impacted by the proposed clearing.

Considering the above, the vegetation proposed to be cleared is of regional significance and is significant as remnant native vegetation in an extensively cleared area.

DEC's preliminary assessment of 15 November 2012, found the proposed clearing to be at variance to this principle. However upon closer consideration and, given the limited detail on opportunities to avoid, minimise and manage environmental impacts of the project, DEC has undertaken a reassessment of the proposed clearing and has found that clearing 103 hectares is seriously at variance to this principle.

An appropriate strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

A draft offset strategy has been provided, which includes:

- Purchasing and ceding 181 hectares of land to DEC, which includes 154 hectares of black cockatoo feeding habitat and 114 hectares of conservation category wetlands (Gateway WA, 2013c).
- Establishing 120 plants of the impacted rare flora in adjacent areas of suitable habitat and trialling relocation of mature plants during the construction process, including watering and monitoring for a considerable period (Gateway WA, 2013c).
- Rehabilitating bushland in Pioneer Park (Bush Forever Area 440), which is managed by the Shire of Kalamunda and contains the impacted rare flora species and the TEC FCT 20a (Gateway WA, 2013c). The rehabilitation will include re-establishment of the rare flora and protection of its habitat, as well as opportunities for re-establishment of native plants and weed control in degraded areas (Gateway WA, 2013d). The proponent has provided 'in principle' support from the Shire of Kalamunda for the rehabilitation in Pioneer Park. Information on what is required to finalise this agreement has not been provided.

DEC is working with the proponent to finalise the offset strategy and include an offset for impacts to the TECs and PEC.

The proponent also commits to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation (MRWA, 2013).

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in DEC Managed Lands (%)
IBRA Bioregion*				
Swan Coastal Plain	386,411	118,581	30	46
Shire*				
City of Belmont	3,939	426	10	0
Shire of Kalamunda	32,386	23,606	72	84
Beard Vegetation Association in Bioregion*				
1018	14,059	2,612	18	3 (102 ha)
1001	57,410	14,151	24	5 (800 ha)
1009	18,184	2,979	16	2 (64 ha)
968	136,188	9,798	7	15 (1,554 ha)
Heddele Vegetation Complex **				
Bassendean Complex-Central and South	87,318	24,610	28	3 (3,012 ha)
Southern River Complex	57,170	12,058	21	1 (944 ha)

* Government of Western Australia, 2011

** Shepherd, 2007

Methodology

References:
Commonwealth of Australia, 2001

DEC, 2012
EPA, 2006
Gateway WA, 2013c
Gateway WA, 2013d
GHD, 2013
Government of Western Australia, 2011
Keighery, 1994
MRWA, 2012b
MRWA, 2013
Shepherd, 2007
GIS Databases:
- Bush Forever
- DEC Managed Lands
- Matiske Vegetation
- NLWRA, Current Extent of Native Vegetation
- Perth Metropolitan Central 15cm Orthomosaic - Landgate 2011
- Pre-European vegetation
- SAC Biodatasets (Accessed 09/12)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced, including evidence of adequate surface water flow management procedure.

In response, MRWA reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b). The planning of this project is reported to have included extensive analysis of road alignment and intersection options and the preferred alignment has been designed to minimise impacts on biodiversity where possible, endeavouring to avoid impacts to sensitive areas and environmental values as far as possible (Gateway Vision, 2012). MRWA has advised that selection of the preferred alignment was based on a comprehensive analysis of route options which included consideration of impacts on native bushland, areas of significant ecological value and fragmentation of vegetation (Gateway Vision, 2012).

The proponent has also advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA (2012b) considers that as the barrier of Roe Highway and Tonkin Highway already exists and has altered surface flows off the Darling Range for some years, the surface hydrology of the area is not likely to change. The proponent also advised that design of the drainage for the upgraded Roe Highway will aim to redistribute draining across the area, via flows off the road surface, where appropriate. At the Tonkin / Roe Highway interchange, drainage will be directed into infiltration basins/ areas in the interchanges, as it is at present (MRWA, 2012b). MRWA (2012b) also considers there is very little risk to any changes to groundwater as a result of the road upgrades as the new ramps and loops will be above ground or close to the existing road surface and will therefore not impact on groundwater flows or directions.

MRWA (2012b) advised that indirect impacts to wetlands will be managed through direct infiltration of runoff on roadsides where possible, and through infiltration of rainfall / drainage through detention basins following treatment for pollutants. MRWA maintains that much of the vegetation at the Leach / Tonkin Highway and Roe / Tonkin Highway interchanges is not wetland vegetation as it includes a number of key overstorey species that are not wetland dependent or normally found in wetlands (MRWA, 2012b). Direct impacts on the remaining wetlands are unavoidable but will be minimised wherever possible through careful design and construction (MRWA, 2012b).

MRWA (2012b) advised that a general drainage strategy has been developed and has been approved by the Department of Water (DoW). MRWA also advised it will continue consultation with DoW during the detailed design and construction process (MRWA, 2012b). Indirect impacts from edge effects including weed and fire risk will be managed during construction through a detailed Construction Environmental Management Plan (CEMP).

The drainage strategy and draft CEMP have been provided to DEC for consideration. The draft CEMP includes commitments to minimise impacts to flora, fauna, vegetation communities and wetlands and ensure adequate hygiene (Gateway WA, 2013a). The general drainage strategy is to 'provide disconnection of the drainage system where possible; utilise bioretention and oil and sediment separators to provide water quality improvement prior to discharging to existing systems; and to provide full compensation of flood flows entering

existing drainage systems via dry detention basins' (Gateway WA, 2013b).

DEC acknowledges the information and commitments provided by MRWA, however hydrological information has not been provided to support this. In the absence of supporting hydrological information, the precautionary principle applies and, therefore, there is a risk of hydrological alterations as a result of clearing 103 hectares and the impacts to wetlands are as follows.

Approximately 29 hectares of the vegetation along the eastern side of Tonkin Highway, in the vicinity of the Tonkin / Leach Highway interchange, is mapped as a dampland type of wetland, supporting approximately 14 hectares of native vegetation. Approximately 66 hectares of the vegetation within the Tonkin / Roe Highway interchange area is mapped as a palusplain type of wetland, supporting approximately 20 hectares of native vegetation.

These areas are dampland and palusplain wetlands identified within the Mungala suite of wetlands. Dampland and palusplain wetlands are seasonally waterlogged types of wetland. Seasonally waterlogged wetlands often have a higher plant and animal species richness than permanent wetlands. Seasonally waterlogged wetlands, however, are being lost at a faster rate than other wetland types due to their less obvious boundaries and the traditional land development approach.

The wetland areas have management categories assigned to them, which reflect differing values within the larger dampland and palusplain wetlands. However, the management category assigned to wetland areas does not represent separate wetlands. Approximately 11.6 percent (209.16 hectares) of the dampland within the Mungala suite is identified as Conservation Category, which is the highest of the three categories. Conservation Category Wetlands (CCW) support a high level of attributes and functions and are the highest priority for protection. There should be no further loss or degradation of CCWs and their protection also requires the retention of an adequate buffer (Government of Western Australia, 1997). Approximately 4.1 percent (741.69 hectares) of the Mungala suite palusplain area is identified as CCW. Resource Enhancement Wetlands (REW) are the second highest category and Multiple Use Wetlands (MUW) are the lowest conservation value.

The eastern side of Tonkin Highway is partially mapped as a Mungala suite dampland, mostly at the location of the proposed Tonkin / Leach Highway interchange. Approximately 7 percent of the wetland area within the Mungala suite is identified as dampland. In this location, approximately 43 percent (6 hectares) of the application area is mapped as CCW and a further 43 percent (6 hectares) is REW. The remainder is MUW. This dampland extends onto the adjacent Commonwealth airport land and includes the Perth Airport Woodland Swamps, which is recognised as a wetland of national importance in the Directory of Important Wetlands in Australia (DIWA), approximately 430 metres from the clearing footprint. The proposed road layout in this area extends to the adjacent Commonwealth land and passes through the DIWA wetland. Some of the areas mapped as wetland do not contain native vegetation. Approximately 14 hectares of the clearing footprint mapped as dampland in this area does support native vegetation.

Approximately 85 percent of the clearing footprint at the Tonkin /Roe Highway interchange is mapped as palusplain wetland. Approximately 70 percent of the wetland area within the Mungala suite is identified as palusplain. Approximately 17 percent (14.6 hectares) of the footprint is mapped as CCW. A further 17 percent (14.6 hectares) is REW, however, as this area is also associated with a threatened ecological community FCT 20a - southern wet shrublands, Swan Coastal Plain, it is likely that this area would be commensurate with CCW values. Wetland vegetation in this area also supports rare flora. Some of the areas mapped as wetland do not contain native vegetation. Considering this, approximately 20 hectares of the clearing footprint at the Tonkin /Roe Highway interchange is mapped as palusplain wetland supporting native vegetation.

Considering the above, the proposed clearing of wetland vegetation will result in the loss of regionally significant wetland vegetation in good to excellent (Keighery, 1994) condition and will increase fragmentation and edge effects into wetland areas due to loss of buffers. The wetland areas within and adjacent to the Tonkin /Roe Highway interchange are likely to have the highest wetland values along the alignment and the potential for the greatest impact.

The proposed clearing will result in cumulative loss of representative wetland areas already lost on the Swan Coastal Plain, that is, Conservation and Resource Enhancement Category palusplain and dampland wetlands within the Mungala suite. Hydrological change to wetland areas from alteration of surface flows associated with road design will also increase secondary impacts to the remaining wetland areas e.g. batters and drainage infrastructure.

The clearing permit application support document states that some wetland areas, particularly those around the proposed Tonkin /Leach Highway interchange do not support wetland vegetation (Gateway Vision, 2012). To determine whether these areas are wetland or dryland would require a more thorough investigation of the vegetation present, supported by information related to hydrology and soils.

The environmental values in these areas are significant and the proposed clearing is at variance with this principle.

An appropriate strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

A draft offset strategy has been provided (Gateway WA, 2013c), which includes purchasing and ceding 181 hectares of land to DEC, which includes 114 hectares of CCW.

DEC is working with the proponent to finalise the offset strategy.

The proponent also commits to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation (MRWA, 2013).

Methodology References:
Gateway Vision, 2012
Gateway WA, 2013a
Gateway WA, 2013b
Gateway WA, 2013c
GHD, 2013
Government of Western Australia, 1997
Keighery, 1994
MRWA, 2012b
MRWA, 2013
GIS Databases:
- ANCA (DIWA), Wetlands
- Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal is at variance to this Principle

The application area is in an area mapped as having groundwater salinity of 500 -1000mg/L. Salinity risk is mapped as low in this area.

The application area is located within the Bassendean and Southern River units of the Bassendean Dunes (Gateway Vision, 2012). The chief soils mapped within the application footprint are described as leached sands, sometimes with clayey swamps (Northcote et al., 1960-).

Land degradation risks typically associated with the removal of vegetation from sandy soils are nutrient export and erosion.

The area is relatively flat, with topography of 20-25 metres AHD and the majority of the application area is mapped as wetland, with significant areas of Conservation category and Resource Enhancement conservation value.

Considering the above, and the large amount of clearing proposed (103 hectares), the proposed clearing has a high risk of soil erosion and nutrient export and is at variance to this principle.

Appropriate soil, surface water and nutrient management practices will reduce these impacts.

The proponent has advised that any areas not required as part of the road infrastructure will be rehabilitated to ensure that land degradation of adjacent areas does not occur and that drainage design and suitable erosion controls will minimise potential degradation to surrounding land (Gateway Vision, 2012).

Methodology References:
Gateway Vision, 2012
Northcote et al., 1960-
GIS Databases:
- Groundwater Salinity, statewide
- Hydrogeology, statewide
- Rainfall, Mean Annual
- Salinity Risk
- Soils, Statewide
- Topographic Contours, Statewide

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is at variance to this Principle

The amended clearing footprint includes areas of two Bush Forever sites.

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project

and advised that clearing within Bush Forever Area (BFA) 282 is not supported by the Department of Planning.

In response, MRWA removed BFA 282 and BFA 440 from the clearing footprint, reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b), based on a comprehensive analysis of route options which included consideration of impacts on native bushland, areas of significant ecological value and fragmentation of vegetation (Gateway Vision, 2012).

The proponent has advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road (GHD, 2013). However, the road alignment has not been finalised therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA has advised that a general drainage strategy has been approved by the Department of Water and that it will continue consultation with DoW during the detailed design and construction process (MRWA, 2012b). MRWA (2012b) has advised that indirect impacts from edge effects including weed and fire risk will be managed during construction through a detailed Construction Environmental Management Plan (CEMP). The drainage strategy and draft CEMP have been provided to DEC for consideration.

DEC acknowledges the information and commitments provided by MRWA, however hydrological information has not been provided to support this. In the absence of supporting hydrological information, the precautionary principle applies and, therefore, there is a risk of hydrological alterations as a result of clearing 103 hectares and the impacts to conservation areas are as follows.

The impacts of the amended application on BFAs are:

- 12.29 hectares of the application area is within the 629.5 hectare Bush Forever Area (BFA) 386 - Perth Airport and Adjacent Bushland. This area is on the eastern end of the proposed Tonkin / Leach Highway interchange area.
- 6.26 hectares of the application area is within the 58.1 hectare BFA 319 - Dundas Road Bushland. This area is in the northeast corner of the Tonkin / Roe Highway interchange area and extends along the northern side of Roe Highway, to the east.

DoP (2012) advised that the areas of BFA 386 and 319 within the clearing footprint are identified in the State Planning Policy 2.8 - Bushland Policy for the Perth Metropolitan Region (SPP 2.8) as Government Lands / Public Infrastructure.

DoP (2012) considers the proposed clearing to be generally consistent with the Perth Airport Master Plan 2009, approved by the Federal Minister for Transport and Regional Services in November 2009. On this basis it considers the proposed clearing to be justified in terms of the wider social benefit and advised it has no objection to the proposed clearing within BFA 386 and 319 subject to implementation of a range of conditions, including offsets, avoidance of clearing or disturbance of surrounding vegetation and management of waste and building materials (DoP, 2012).

The proponent calculated 30.2 hectares of Conservation Category and Resource Enhancement Wetlands are mapped within the footprint area (Gateway Vision, 2011). Conservation Category Wetlands (CCW) support a high level of attributes and functions and are the highest priority for protection. There should be no further loss or degradation of CCWs and their protection also requires the retention of an adequate buffer (Government of Western Australia, 1997).

Resource Enhancement Wetlands (REW) are considered priority wetlands which may have been partially modified but still retain substantial attributes and functions, with the potential for restoration towards Conservation Category and should be retained and managed where possible.

The eastern side of Tonkin Highway in the vicinity of the existing intersection with Leach Highway is mapped predominantly as CCW and REW, which extends onto the adjacent Commonwealth airport land and includes the Perth Airport Woodland Swamps, which is recognised as a wetland of national importance in the Directory of Important Wetlands in Australia (DIWA), approximately 430 metres from the clearing footprint. The clearing footprint in this area consists of approximately 6.1 hectares of CCW and 4.7 hectares of REW. The proposed road layout in this area extends to the adjacent Commonwealth land and passes through the DIWA wetland.

The eastern end of the Roe Highway section of the application area is adjacent to Nature Reserve 37997, which is a Class A reserve for the conservation of flora and fauna.

Edge effects such as encroachment of weeds into adjacent bushland, and residual impacts including increased weed invasion and altered hydrology are likely to be substantial as a consequence of the proposed clearing.

Considering the above, the proposed clearing is at variance to this principle.

Appropriate management and a strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

A draft offset strategy has been provided, which includes:

- Purchasing and ceding 181 hectares of land to DEC, which includes 154 hectares of black cockatoo feeding habitat and 114 hectares of conservation category wetlands (Gateway WA, 2013c).
- Establishing 120 plants of the impacted rare flora in adjacent areas of suitable habitat and trialling relocation of mature plants during the construction process, including watering and monitoring for a considerable period (Gateway WA, 2013c).
- Rehabilitating bushland in Pioneer Park (Bush Forever Area 440), which is managed by the Shire of Kalamunda and contains the impacted rare flora species and the TEC FCT 20a (Gateway WA, 2013c). The rehabilitation will include re-establishment of the rare flora and protection of its habitat, as well as opportunities for re-establishment of native plants and weed control in degraded areas (Gateway WA, 2013d). The proponent has provided 'in principle' support from the Shire of Kalamunda for the rehabilitation in Pioneer Park. Information on what is required to finalise this agreement has not been provided.

DEC is working with the proponent to finalise the offset strategy and include an offset for impacts to the TECs and PEC.

The proponent also commits to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation and has advised that negotiation is underway with the Department of Planning to remove the road reserve from Bush Forever Areas (MRWA, 2013).

Methodology

References:

DoP, 2012

Gateway Vision, 2012

Gateway WA, 2013c

Gateway WA, 2013d

Government of Western Australia, 1997

MRWA, 2012b

MRWA, 2013

GIS Databases:

- ANCA, Wetlands

- Bush Forever

- DEC Managed Lands

- Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain

- Hydrography, linear

- NLWRA, Current Extent of Native Vegetation

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments

Proposal is at variance to this Principle

Several major drains occur within or cross the application area, particularly in the southern end around the Tonkin / Roe Highway interchange.

The majority of the vegetation within the clearing footprint is associated with dampland and palusplain type wetland areas. These are seasonally waterlogged types of wetlands.

The Department of Environment and Conservation (DEC) wrote to the proponent (MRWA) on 15 November 2012 requesting information on how it has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced, including evidence of adequate surface water flow management procedure.

In response, MRWA reduced the amount of clearing by 9 hectares and advised that a detailed planning study and review was undertaken in selecting the proposed road alignment (MRWA, 2012b), based on a comprehensive analysis of route options which included consideration of impacts on native bushland, areas of significant ecological value and fragmentation of vegetation (Gateway Vision, 2012).

The proponent has advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing principles considers the maximum potential impacts of clearing 103 hectares.

MRWA (2012b) considers that, as the barrier of Roe Highway and Tonkin Highway already exists and has altered surface flows off the Darling Range for some years, the surface hydrology of the area is not likely to change. The proponent also advised that design of the drainage for the upgraded Roe Highway will aim to redistribute draining across the area, via flows off the road surface, where appropriate. At the Tonkin / Roe Highway interchange, drainage will be directed into infiltration basins/ areas in the interchanges, as it is at present (MRWA, 2012b). MRWA (2012b) also considers there is very little risk to any changes to groundwater as a result of the road upgrades as the new ramps and loops will be above ground or close to the existing road surface and will therefore not impact on groundwater flows or directions.

MRWA (2012b) advised that indirect impacts to wetlands will be managed through direct infiltration of runoff on roadsides where possible, and through infiltration of rainfall / drainage through detention basins following treatment for pollutants. MRWA maintains that much of the vegetation at the Leach / Tonkin Highway and Roe / Tonkin Highway interchanges is not wetland vegetation including a number of key overstorey species that are not wetland dependent or normally found in wetlands (MRWA, 2012b). Direct impacts on the remaining wetlands are unavoidable but will be minimised wherever possible through careful design and construction (MRWA, 2012b).

MRWA (2012b) advised that a general drainage strategy has been developed and has been approved by the Department of Water (DoW). MRWA also advised it will continue consultation with DoW during the detailed design and construction process (MRWA, 2012b). Indirect impacts from edge effects including weed and fire risk will be managed during construction through a detailed Construction Environmental Management Plan (CEMP).

The drainage strategy and draft CEMP have been provided to DEC for consideration. The draft CEMP includes commitments to minimise impacts to flora, fauna, vegetation communities and wetlands and ensure adequate hygiene (Gateway WA, 2013a). The general drainage strategy is to 'provide disconnection of the drainage system where possible; utilise bioretention and oil and sediment separators to provide water quality improvement prior to discharging to existing systems; and to provide full compensation of flood flows entering existing drainage systems via dry detention basins' (Gateway WA, 2013b).

DEC acknowledges the information and commitments provided by MRWA, however hydrological information has not been provided to support this. In the absence of supporting hydrological information, the precautionary principle applies and, therefore, there is a risk of hydrological alterations as a result of clearing 103 hectares and the impacts to water quality are as follows.

The proposed clearing will result in cumulative loss of representative wetland areas already lost on the Swan Coastal Plain, that is, Conservation category palusplain and dampland wetlands within the Mungala suite.

Hydrological change to wetland areas from alteration of surface flows associated with the road design will also increase secondary impacts to the remaining wetland areas e.g. batters and drainage infrastructure.

The chief soils mapped within the application footprint are described as leached sands, sometimes with clayey swamps (Northcote et al., 1960-). Removal of vegetation from sandy soils poses a high risk of nutrient export and erosion.

Considering the above the proposed clearing is likely to result in increased sedimentation and eutrophication of surface water and is at variance to this principle.

The proponent has acknowledged that erosion or sedimentation may occur following clearing and has advised that it can be mitigated by the use of appropriate surface water management and rehabilitation techniques (Gateway Vision, 2012).

Appropriate management and a strategy to offset the proposed clearing of 103 hectares may assist in mitigating unavoidable impacts.

A draft offset strategy has been provided, which includes:

- Purchasing and ceding 181 hectares of land to DEC, which includes 154 hectares of black cockatoo feeding habitat and 114 hectares of conservation category wetlands (Gateway WA, 2013c).
- Establishing 120 plants of the impacted rare flora in adjacent areas of suitable habitat and trialling relocation of mature plants during the construction process, including watering and monitoring for a considerable period (Gateway WA, 2013c).
- Rehabilitating bushland in Pioneer Park (Bush Forever Area 440), which is managed by the Shire of Kalamunda and contains the impacted rare flora species and the TEC FCT 20a (Gateway WA, 2013c). The rehabilitation will include re-establishment of the rare flora and protection of its habitat, as well as opportunities for re-establishment of native plants and weed control in degraded areas (Gateway WA, 2013d). The proponent has provided 'in principle' support from the Shire of Kalamunda for the rehabilitation in Pioneer Park. Information on what is required to finalise this agreement has not been provided.

DEC is working with the proponent to finalise the offset strategy and include an offset for impacts to the TECs and PEC.

The proponent also commits to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation and has advised that negotiation is underway with the Department of Planning to remove the road reserve from Bush Forever Areas (MRWA, 2013).

Methodology References:
Gateway Vision, 2012
Gateway WA, 2013a

Gateway WA, 2013b
Gateway WA, 2013c
Gateway WA, 2013d
MRWA, 2012b
MRWA, 2013
Northcote et al., 1960-
GIS Databases:
- Geomorphic Wetlands (Mgt Categories), Swan Coastal Plain
- Hydrography, linear

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The application area is located within the Bassendean and Southern River units of the Bassendean Dunes (Gateway Vision, 2012). The chief soils mapped within the application footprint are described as leached sands, sometimes with clayey swamps (Northcote et al., 1960-).

There are numerous constructed drains crossing the application area and water management infrastructure associated with the existing roads in the area.

Considering the above, the proposed clearing is unlikely to increase or exacerbate the incident or intensity of flooding.

The proponent has advised that runoff from proposed road development will be subject to detailed drainage management, in consultation with the Department of Water (Gateway Vision, 2012).

Methodology References:
Gateway Vision, 2012
Northcote et al., 1960-
GIS Databases:
- Hydrography, linear
- Soils, Statewide

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

The proposed clearing of 103 hectares of native vegetation is for the purpose of construction associated with Stage 1 of the Gateway Project including road upgrades and associated infrastructure (MRWA, 2012b).

The Gateway WA Perth Airport and Freight Access Project (Gateway Project) is to upgrade the major public arterial road network around Perth Airport as part of a national infrastructure priority (Gateway Vision, 2012). It focuses largely on road upgrades and new construction the stretch of Tonkin Highway between Great Eastern Highway and Roe Highway, as well as part of Leach Highway from Orrong Road to the Perth Airport (Gateway Vision, 2012).

The proponent has advised that the project construction is planned to take place over a number of different phases and any additional clearing required will be applied for separately (Gateway Vision, 2012).

The Gateway Project also includes development within the adjacent Perth Airport land, which is under Commonwealth tenure. The proponent advised that 36 hectares of clearing is expected to be required on Commonwealth land for Stage 1 of the project (MRWA, 2012a).

MRWA has obtained support for the clearing application from relevant government agencies and is in the process of acquiring private property to enable widening of the road reserve in some places. MRWA has advised that no clearing of native vegetation will be required on the privately owned properties that are to be acquired (DEC, 2012b).

The majority of the application area is identified as Primary Regional Road in the Metropolitan Regional Scheme.

The Perth Airport and Freight Access project was referred to the Environmental Protection Authority (EPA) on 29 March 2010. The EPA determined that the project should be treated as 'Not Assessed - Public Advice Given and Managed Under Part V (Clearing)' on 29 March 2010 (CRN222510) and gave the following public advice on 13 May 2010:

- The final layout of the roads shall be designed to avoid, minimise and manage the potential environmental impacts;
- Clearing should be constrained to be the minimum required for construction and the proponent should utilise previously disturbed areas for materials storage, laydown areas and turning points;

- Develop and implement clear and concise Environmental Management Plans to enact the commitments made, including the recommendations listed in Table 17 of AECOM (2009) Perth Airport and Freight Access Project Environmental Constraints document;
- Relevant government agencies should be consulted during the preparation of the Environmental Management Plans; and it is understood that public consultation will be undertaken regarding the finalisation of the design. This consultation should include a discussion of environmental issues. It is expected that a record be kept of the issues raised and how the final design has changed to incorporate these issues.

(EPA, 2010)

The (then) Commonwealth Department of the Environment, Water, Heritage and the Arts determined the project to be a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 on 31 March 2010 (EPBC Act referral 2010/5384). The (now) Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) approved the project, subject to conditions, on 20 February 2013 (SEWPAC, 2013).

Baseline soil and groundwater analysis has identified the possible presence of Acid Sulphate Soils (ASS) in the vicinity of the Tonkin /Roe Highway interchange and Leach Highway /Abernethy Road interchange (Gateway Vision, 2012). ASS was also identified at the Tonkin /Leach Highway interchange, however at a depth of 16 metres, which the proponent advised is not likely to be disturbed by the proposed construction (Gateway Vision, 2012).

Authority from the Minister for Environment is required to take rare flora.

The City of Belmont (2012) confirmed that planning approval for the proposed clearing is not required from the City of Belmont, and that the proposed works are consistent with the City of Belmont's Local Planning Scheme No. 15. The City also noted that several of the lots proposed to be impacted are outside the current Primary Regional and Other Region road reservation in the Metropolitan Regional Scheme and are in the process of acquisition and rezoning, including portions of some parks and reserves managed by the City of Belmont (City of Belmont, 2012). The City also raised some environmental concerns and recommendations, including the establishment of local offset sites and ensuring the protection of adjacent natural areas (City of Belmont, 2012). The proponent is advised to liaise with the City of Belmont in relation to seed collection and salvaging of flora for use in future revegetation and landscaping.

There are numerous registered Aboriginal Sites of Significance within the application area. The proponent is advised to contact the Department of Indigenous Affairs regarding obligations under the Aboriginal Heritage Act 1972.

The clearing footprint area includes some areas of land that are within the Whadjuk People's native title area. The South West Aboriginal Land and Sea Council (SWALSC) reserve the right to request heritage survey protection and /or monitors in relation to the vegetation clearing permit (SWALSC, 2012). The proposed clearance is a significant area and the protection of native vegetation is of high importance to the Whadjuk People. It directly impacts on their native title rights and interests in terms of social and community activities (SWALSC, 2012).

A public submission was made against the application based on 'the very strong view that the Gateway project has numerous very serious environmental impacts on an area that can generally be said to be of very high conservation value' (Submission, 2012). Concerns raised included:

- The vegetation has high floral biodiversity and may comprise threatened ecological communities
- The vegetation along Tonkin Highway is a wildlife refuge and corridor and provides habitat for native birds, reptiles and mammals that are rarely seen in nearby suburbia
- The proposed Tonkin / Leach Highway interchange impacts on high quality habitat and is an ecological transition from wetland to ridge habitat, which is rarely found in reserves so close to the city
- Areas of non-core habitat for fauna species adjacent to core habitat areas should not be dismissed as unimportant, as it is required to assist in the maintenance of the health of the core habitat
- The proposed clearing will reduce and fragment a very large area of contiguous habitat areas for quenda, which is important as this is a place in the metropolitan area where the species currently thrives
- Impacts to rare flora and habitat for rare flora
- Impacts to vegetation communities that are poorly reserved
- The vegetation under application includes wetland habitat that is largely in a bushland context, which is important as it provides a variety of habitats that most of the region's natural remnants lack as they do not have the combination of wetland and drier bushland vegetation.

- The proposed Tonkin / Leach Highway interchange cuts through a 30 hectare Conservation and Infrastructure Zone and the Tonkin /Roe Highway interchange will impact directly on Bush Forever sites. (Submission, 2012)

These concerns have been addressed under the appropriate clearing principles.

DEC wrote to the proponent (MRWA) on 15 November 2012 after conducting a preliminary assessment of the proposed clearing, providing the opportunity to respond to the impacts identified in the preliminary assessment report, in particular requesting information on how MRWA has avoided or minimised environmental impacts in planning the project and ways in which these impacts could be further reduced. DEC also requested evidence of adequate surface water flow management procedure and advised consideration should be given to moving the clearing footprint to the southern side of Roe Highway in order to minimise the clearing of vegetation on the northeast side of the Tonkin / Roe intersection.

MRWA responded in a letter dated 20 December 2012 (MRWA, 2012b) and the preliminary assessment has been updated in light of the below additional information.

In relation to how MRWA has avoided or minimised environmental impacts in planning the project, MRWA advised that:

- The clearing requested includes some areas of limited, highly degraded or no native vegetation and is the maximum amount required for Stage 1.
- Within the boundaries of the footprint area there are opportunities to reduce impacts on a number of key environmental factors.
- A detailed planning study and review was undertaken for the project as a whole and also for the comparison of options for individual road interchanges/ sections.
- The road alignment options used in this study were for the ultimate final road concept, not just for the Stage 1 works.
- 26 different interchange options were considered, with unsuitable options first eliminated based on whether it was an appropriate type of interchange for the size of the roads it was connecting and its engineering feasibility.
- An initial engineering assessment was then conducted on the possible options, focussing on the following engineering objectives: Tonkin Highway to be freeway standard; complies with Towards Zero principles; road network is legible; compliance with aviation constraints model; accommodates PTA rail corridor and all movements are possible at all interchanges. Options that could not achieve these objectives were considered to be fatally flawed and eliminated from further consideration. MRWA advised that the fatal flaw analysis also considered environmental, road design, social and economic considerations and that environmentally sensitive areas on Perth Airport land were considered in order to eliminate options that were considered flawed due to significant environmental impact.
- Options were then reviewed for the level of service that could be achieved for 2031 traffic volumes and future flexibility. Options that could not meet the target level of service were considered fatally flawed and eliminated.
- From the alternative design options, a shortlist of 2 feasible options for the major interchanges was chosen by the above assessment for fatal flaws. Multi-Criteria Analysis (MCA) was conducted on the 2 short listed options, considering 5 weighted assessment criteria: Road Safety (23 percent weighting); Network Performance (20 percent); Community Amenity (19 percent); Environment and Heritage (14 percent); Constructability (12 percent); and Project Cost (12 percent). Criteria considered in the Environment and Heritage category were: native bushland, native vegetation fragmentation, significant sites, declared rare flora, wetlands, integration of drainage management and Aboriginal heritage. An Environmental Reference Group (consisting of representatives from the Conservation Council of WA, Urban Bushland Council, local governments, Perth Region NRM, Department of Environment and Conservation, Department of Water, MRWA, Swan River Trust, Wildflower Society of WA, Westralia Airports Corporation and Eastern Metropolitan Regional Council) developed the criteria and determined the relative value of each, giving them the above weightings.
- The outcome of the MCA on the two feasible options was that:
 - the preferred Leach/ Tonkin Highway interchange achieve the highest score against all of the environment and heritage assessment criteria, with lower impact to the Runway Swamp (Nationally significant wetland on the airport Commonwealth land) and less impact on other wetlands, less overall bushland impact and less impact on core black cockatoo and bandicoot habitat; and
 - the preferred Tonkin / Roe Highway interchange option is not significantly better than the alternative option, based on environmental criteria, but is slightly better. It is significantly more acceptable from a road safety perspective and has slightly less native vegetation fragmentation

impact, slightly less impact on significant habitat, less impact on declared rare and priority flora and less areas of wetlands impacted.

In relation to ways in which environmental impacts could be further reduced, MRWA advised:

- There are opportunities in the detailed design phase (being undertaken shortly) to slightly reduce direct impacts on threatened ecological communities (TEC) and to prevent or minimise indirect impacts.
- As the barrier of Roe Highway and Tonkin Highway already exists and has altered surface flows off the Darling Range for some years, the surface hydrology of the area is not likely to change from that currently occurring.
- Design of the drainage for the upgraded Roe Highway will aim to redistribute draining across the area, via flows off the road surface, where appropriate. At the Tonkin / Roe Highway interchange, drainage will be directed into infiltration basins/ areas in the interchanges, as it is at present.
- There is very little risk to any changes to groundwater as a result of the road upgrades as the new ramps and loops will be above ground or close to the existing road surface and will therefore not impact on groundwater flows or directions.
- A general drainage strategy has been developed and has been endorsed by the Department of Water (DoW) and MRWA will continue consultation with DoW during the detailed design and construction process.
- Indirect impacts to wetlands will be managed through direct infiltration of runoff on roadsides where possible, and through infiltration of rainfall / drainage through detention basins following treatment for pollutants. MRWA advised that direct impacts on the remaining wetlands are unavoidable but will be minimised wherever possible through careful design and construction.
- MRWA considers that much of the vegetation at the Leach / Tonkin Highway and Roe / Tonkin Highway interchanges is not wetland vegetation including a number of key overstorey species that are not wetland dependent or normally found in wetlands.
- Indirect impacts from edge effects including weed and fire risk will be managed during construction through a detailed Construction Environmental Management Plan (CEMP).
- A detailed tree survey will be undertaken within the potential clearing area to map trees with a diameter at breast height of 150 millimetres or greater, which designers will then use to consider ways to retain as many trees as possible. MRWA advised that there are opportunities to minimise the loss of trees and other habitat vegetation, especially along Tonkin Highway. This may occur through the provision of barriers to reduce safety risks to road users, altering the alignment of noise walls, shared paths and other parts of the total road design. Localised retaining walls may also be employed to protect trees that would otherwise be impacted adversely by road batters. Feeding habitat for black cockatoos will be preserved wherever possible through these opportunities. Also, approximately 15 of the 101 potential black cockatoo breeding trees identified as being impacted may be protected.
- A 4 metre construction access way was planned along both sides of Roe Highway for the Stage 1 works, however MRWA has advised that there is opportunity to reduce this in areas where rare flora is known to occur. MRWA advised it will also look for opportunities to reduce the number of rare flora plants impacted through design of road batters and drains in relevant areas and through the use of temporary and permanent barriers alongside groups of plants and potentially through the use of low retaining walls instead of road batters to minimise direct and indirect impacts.
- There will be no direct or indirect impacts to the second rare flora species as the nearest record is 150 metres away from the proposed works and MRWA considers it highly unlikely that any changes to surface hydrology will impact habitat for this species.
- The Stage 1 project will not impact Bush Forever Area 282; this was an error on the figure and has since been removed from the application. However, MRWA advised this site may be impacted by the ultimate project.

(MRWA, 2012b)

DEC acknowledges the above information and commitments provided by MRWA, however hydrological information has not been provided to support this. Therefore the assessment against the clearing principles considered the precautionary principle and identified a risk of hydrological alterations as a result of clearing 103 hectares.

The proponent has also advised that the expected area of impact will be a 4 metre buffer to the boundary of the permanent road and that the amount of clearing will be less than the 103 hectares applied for (GHD, 2013). However, the road alignment has not been finalised and therefore the assessment against the clearing

principles considers the maximum potential impacts of clearing 103 hectares.

The draft CEMP has been provided to DEC and includes commitments to minimise impacts to flora, fauna, vegetation communities and wetlands and ensure adequate hygiene (Gateway WA, 2013a).

The general drainage strategy has been provided to DEC and is to 'provide disconnection of the drainage system where possible; utilise bioretention and oil and sediment separators to provide water quality improvement prior to discharging to existing systems; and to provide full compensation of flood flows entering existing drainage systems via dry detention basins' (Gateway WA, 2013b).

A draft offset strategy has been provided, which includes:

- Purchasing and ceding 181 hectares of land to DEC, which includes 154 hectares of black cockatoo feeding habitat and 114 hectares of conservation category wetlands (Gateway WA, 2013c).
- Establishing 120 plants of the impacted rare flora in adjacent areas of suitable habitat and trialling relocation of mature plants during the construction process, including watering and monitoring for a considerable period (Gateway WA, 2013c).
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DEC is working with the proponent to finalise the offset strategy and include an offset for impacts to the TECs and PEC.

The proponent has also committed to protect any vegetation remaining within the road reserve through fencing where appropriate, weed control and rehabilitation and has advised that negotiation is underway with the Department of Planning to remove the road reserve from Bush Forever Areas (MRWA, 2013).

Methodology

References:

- AECOM, 2009
- City of Belmont, 2012
- DEC, 2012
- DEC, 2012b
- EPA, 2010
- Gateway Vision, 2012
- Gateway WA, 2013a
- Gateway WA, 2013b
- Gateway WA, 2013c
- Gateway WA, 2013d
- GHD, 2013
- MRWA, 2012b
- MRWA, 2013
- SEWPAC, 2013
- Submission, 2012
- SWALSC, 2012
- GIS Databases:
 - Aboriginal Sites of Significance
 - Metropolitan Regional Scheme

4. References

- AECOM (2009) Perth Airport and Freight Access Project Environmental Constraints. Prepared for Main Roads Western Australia, 30/11/2009. AECOM Australia Pty Ltd. DEC Ref: A584095
- Cale, B. (2003) Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan 2002- 2012. Department of Environment and Conservation. Wanneroo WA.
- City of Belmont (2012) Direct Interest Comment for Clearing Permit Application CPS 5242/1. Dated 18/10/2012. City of Belmont, Western Australia. DEC Ref: A559536
- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- DEC (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. URL: <http://naturemap.dec.wa.gov.au/>. Accessed 15/11/2012
- DEC (2012) Site inspection report for Clearing Permit Application CPS 5242/1. Conducted 22/10/2012. Department of Environment and Conservation, Western Australia. DEC Ref: A568287
- DoP (2012) Bush Forever advice for Clearing Permit Application CPS 5242/1. Dated 18/10/2012. Department of Planning, Western Australia. DEC Ref: A559139
- EPA (2006) Guidance for the Assessment of Environmental Factors - Level of Assessment for Proposals Affecting Natural

- Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region. Guidance Statement No 10. Environmental Protection Authority, Western Australia.
- EPA (2010) Perth Airport and Freight Access CRN222510 - Notice Under Section 39A(3)(a) 'Not Assessed - Public Advice Given and Managed under Part V of the EP Act'. Environmental Protection Authority. DEC Ref: A584098; A584098
- Gateway Vision (2011) Flora and Vegetation Survey Gateway WA Project. Document No; GVWA-16.00-RP-EN-0033 Revision A, December 2011. DEC Ref: A542462
- Gateway Vision (2012) Clearing Permit Supporting Document Main Roads Contract 141/09. Document No: GVWA-18.00-RP-EN-0077 Revision 3, August 2012. Gateway Vision. DEC Ref: A542462
- Gateway WA (2013a) Draft Construction Environmental Management Plan GWA-PW-MNP-EN-0001 Rev 01, January 2013 DEC Ref: A604047
- Gateway WA (2013b) Drainage Strategy Report Rev 01, April 2012. DEC Ref: A606454
- Gateway WA (2013c) Draft Environmental Offset Strategy. DEC Ref: A604321
- Gateway WA (2013d) Additional information on Pioneer Park offset. Received 12/03/2013. DEC Ref: A608759
- GHD (2013) Supplementary information in response to DEC's Preliminary Assessment of 15/11/2012. DEC Ref: A590338; A592778
- Gibson N., Keighery B., Keighery G., Burbidge A. and Lyons M. (1994) A Floristic Survey of the Southern Swan Coastal Plain. Western Australian Department of Conservation and Land Management and the Western Australian Conservation Council.
- Government of Western Australia (2011); 2011 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.
- Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.
- MRWA (2012a) Clearing Permit Application CPS 5242/1. Received 6/09/2012. Main Roads Western Australia. DEC Ref: A542462
- MRWA (2012b) Response to Preliminary Assessment. Received 20/12/2012. Main Roads Western Australia. DEC Ref: A582739
- MRWA (2013) Response to Preliminary Assessment. Received 20/02/2013. Main Roads Western Australia. DEC Ref: A603838
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- SEWPAC (2012) EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species, April 2012. Department of Sustainability, Environment, Water, Populations and Communities. Commonwealth of Australia. Available from <http://www.environment.gov.au/epbc/publications/pubs/referral-guidelines-wa-black-cockatoo.pdf>
- SEWPAC (2013) Approval - Perth Airport and Freight Access Project (Gateway WA) EPBC 2010/5384. 20/02/2013. DEC Ref: A604047
- Shah, B. (2006) Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.
- Shepherd, D.P. (2007) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Submission (2012) Public submission for Clearing Permit Application CPS 5242/1. Received 8/10/2012. DEC Ref: A553825
- SWALSC (2012) Native Title Notification Response for CPS 5242/1. Received 23/11/2012. South West Aboriginal Land and Sea Council. DEC Ref: A584114
- Valentine, L.E. and Stock, W. (2008) Food Resources of Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) in the Gngangara Sustainability Strategy Study Area. Edith Cowan University and Department of Environment and Conservation. December 2008.

5. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)