



## 1. Application details

### 1.1. Permit application details

Permit application No.: 888/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Water Corporation

### 1.3. Property details

Property: LOT 1 ON DIAGRAM 27445 (House No. 28 KALINDA CITY BEACH 6015)  
PEEL ESTATE LOT 1310 (Lot No. 1310 EIGHTY BALDIVIS 6171)  
LOT 9538 ON PLAN 213894 (House No. 160 BURNS BEACH NEERABUP 6031)  
LOT 3 ON DIAGRAM 49980 (Lot No. 3 ALEXANDER KOONDOOLA 6064)  
Local Government Area: City Of Rockingham & City Of Wanneroo & Town Of Cambridge  
Colloquial name: Lot 3 Koondoola Ave - Mirrabooka Water Storage Reservoir

### 1.4. Application

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

## 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
Tamworth Water Storage Reservoir Beard Vegetation association 998: Medium woodland; tuart (Hopkins et al. 2001, Shepherd et al. 2001)	The areas under application comprise clearing areas for Bold Park, Tamworth, Neerabup and Mirrabooka as 2.7ha, 2.1ha, 1.8ha and 2 ha, respectively.	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)	While some vegetation within the area under application was in good condition the overall condition of the vegetation was degraded (Site Visit, 1/3/06).
Heddie Vegetation complex: Cottesloe Complex - Central and South; Mosaic of woodland of E. gomphocephala and open forest of E. gomphocephala - E. marginata - E. calophylla; closed heath on the Limestone outcrops (Heddie et al. 1980).	Tamworth Water Storage Reservoir:  The area to be cleared includes steep banks surrounding the boundary of the water reservoir and an area 3m outward from the 'toe' of the bank.  Smaller trees and weeds within this area will be removed while larger trees on the boundary of the area will be trimmed and lopped.		
Bold Park Water Storage Reservoir	Bold Park Water Storage Reservoir: The area to be cleared includes steep banks surrounding the boundary of the water reservoir and	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)	The vegetation within the area is described as being in a degraded condition due to the large weed infestations found throughout the area (Site visit 20/2/06).
Beard Vegetation association 999:			

Medium woodland; marri (Hopkins et al. 2001, Shepherd et al. 2001)	an area 3m outward from the 'toe' of the bank. Smaller trees and weeds within this area will be removed while larger trees on the boundary of the area will be trimmed and lopped.		
Hedde Vegetation complex: Cottesloe Complex - Central and South; Mosaic of woodland of E. gomphocephala and open forest of E. gomphocephala - E. marginata - E. calophylla; closed heath on the Limestone outcrops. (Hedde et al. 1980)	The vegetation within the area consists of a number of sparsely vegetated Sheoak and Eucalyptus trees with a predominantly degraded understorey with large weed infestations throughout the area (Site Visit, 20/2/06).		
Neerabup Water Storage Reservoir Beard Vegetation association 998: Medium woodland; tuart (Hopkins et al. 2001, Shepherd et al. 2001). Hedde Vegetation complex: Cottesloe Complex - Central and South; Mosaic of woodland of E. gomphocephala and open forest of E. gomphocephala - E. marginata - E. calophylla; closed heath on the Limestone outcrops (Hedde et al. 1980).	Neerabup Water Storage Reservoir: The area to be cleared includes steep banks surrounding the boundary of the water reservoir and an area 3m outward from the 'toe' of the bank.  Smaller trees and weeds within this area will be removed while larger trees on the boundary of the area will be trimmed and lopped.  The vegetation within the area consists of a number of banksia, jarrah and marri trees. Half of the area (namely the western and southern banks) have been burnt by a previous fire in the Neerabup area. The vegetation density in the area is suggested to be greater than the Bold Park area (pers. comm. Murray Newman 23/2/06).	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)	The vegetation within the area is described as being in a degraded condition. However, the burnt areas have the potential for regeneration post fire.
Mirrabooka Water Storage Reservoir Beard Vegetation association 6: Medium woodland; tuart and jarrah (Hopkins et al. 2001, Shepherd et al. 2001). Hedde Vegetation complex: Karrakatta Complex - Central and South; Predominantly open forest of E. gomphocephala - E. marginata - E. calophylla and woodland of E. marginata - Banksia species (Hedde et al. 1980).	Mirrabooka Water Storage Reservoir: The area to be cleared includes steep banks surrounding the boundary of the water reservoir and an area 3m outward from the 'toe' of the bank.  Smaller trees and weeds within this area will be removed while larger trees on the boundary of the area will be trimmed and lopped.  The subject area currently contains a dense abundance of tea trees and small populations of Banksia menziesii and Banksia attenuata. The higher parts of the bank area (where tea tree populations are less dense) comprise large weed infestations (Site Visit, 20/2/06).	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)	The vegetation within the area is described as being in a degraded condition due to the large weed infestations found on the higher parts of the bank areas (Site Visit 20/2/06).

### 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 not likely to be at variance to this Principle**  
The areas to be cleared are all within or in close proximity to Bush Forever sites. Bold Park Water Storage Area, Tamworth Water Storage Reservoir and Neerabup Water Storage Reservoir are all located within Bush Forever sites 312, 356 and 383 respectively. Bush Forever site 201 is located approximately 20m south east and 170m north east of the Mirrabooka Water Storage Reservoir.

However, due to the degraded and fragmented condition of the vegetation surrounding the dams in all cases and the small areas (approximately 1.8 - 2.7 ha) in all four areas, it is unlikely that the proposed areas for clearing contain higher biological diversity than that in the surrounding environment, being Bush Forever sites. Also, disturbance is to be minimal as clearing is to be undertaken by manual selective lopping, chipping and disposal methods (Water Corporation, 2005).

Therefore it is unlikely that the proposed clearing activity will be at variance to this Principle.

**Methodology**      Bold Park Site Visit (20/2/06)  
Mirrabooka Site Visit (20/2/06)  
Tamworth Site Visit (1/3/06)  
CALM (2006) (DoE TRIM ref: EI 6456)  
Water Corporation (2005)  
GIS Databases:  
- Bushforever - MFP 07/01  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

#### (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 not likely to be at variance to this Principle**  
The proposal is for clearing areas of between 1.8 ha and 2.7 ha at four sites for dam maintenance and safety requirements. The areas to be cleared are relatively small, surround existing dams and therefore do not appear to act as ecological linkages. The fragmented areas proposed to be cleared are surrounded by intact native vegetation, which are more likely to be of greater value for fauna habitat.

CALM advice was not deemed necessary for the Mirrabooka and Bold Park Reservoirs. For Tamworth and Neerabup Water Storage Areas CALM (2006) advise that the clearing is not likely to be at variance to this Principle.

Given the nature of the clearing, it is unlikely that this small scale clearing in fragmented and degraded habitats will impact on local movement of native fauna.

**Methodology**      CALM (2006) (DoE TRIM ref: EI 6456)  
GIS Databases:  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

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

**Comments**      **Proposal is not likely to be at variance to this Principle**  
In all of the areas applied to be cleared, there are no declared rare flora mapped within the areas under application or within 5km of the areas.

While CALM advice was not deemed necessary for the Mirrabooka and Bold Park Reservoirs, CALM (2006) advise that clearing at the Tamworth and Neerabup Water Storage Areas is not likely to be at variance to this Principle.

Given the small areas applied to be cleared and the methods used for clearing (with minimal soil and root disturbance), it is unlikely that the clearing as proposed will impact on the surrounding vegetation.

**Methodology**      CALM (2006) (DoE TRIM ref: EI 6456)  
GIS Databases:  
- Declared Rare and Priority Flora List - CALM 13/08/03  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

**(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 not likely to be at variance to this Principle**

There are no threatened ecological communities found in the areas under application or within 5kms from these areas.

While CALM advice was not deemed necessary for the Mirrabooka and Bold Park Reservoirs, CALM (2006) advise that clearing at the Tamworth and Neerabup Water Storage Areas is not likely to be at variance to this Principle.

**Methodology** CALM (2006) (DoE TRIM ref: EI 6456)  
GIS Databases:  
- Threatened Ecological Communities - CALM 12/4/05

**(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 not likely to be at variance to this Principle**

Vegetation in the Bold Park Water Storage Area has been mapped as Beard vegetation association 999 and Heddle's Complex Cottesloe Central and South of which there is 32,451 ha (11%) and 18,320 ha (35.9%) remaining, respectively.

Vegetation in the Tamworth Water Storage Area has been mapped as Beard vegetation association 998 and Heddle Vegetation Complex Cottesloe Central and South of which there is 18,320 ha (35.9%) and 18,474 ha (41%) remaining, respectively.

Vegetation surrounding the Neerabup Water Reservoir has been mapped as Beard vegetation association 998 and Heddle Vegetation Complex Cottesloe Central and South of which there is 18,320 ha (35.9%) and 18,474 ha (41%) remaining, respectively.

The vegetation surrounding Mirrabooka Water Storage Reservoir has been mapped as Beard vegetation association 6 and Heddle's Karrakatta Complex Central and South of which there is 18,398 ha (23.3%) and 14,729 ha (29.5%) remaining, respectively.

The Tamworth, Neerabup and Mirrabooka Beard vegetation associations have a conservation status of 'depleted' for biodiversity conservation, while Bold Park has a 'vulnerable' status (Department of Natural Resources and Environment 2002).

Although some of the vegetation types are vulnerable, the removal of a small amount of vegetation in each case (approximately 1.8 - 2.7ha) is unlikely to impact on remnant native vegetation within the local area. The condition of the vegetation in all four areas is degraded and fragmented in comparison to the surrounding intact vegetation, and therefore are not good representations of the mapped vegetation associations.

**Methodology** Department of Natural Resources and Environment (2002)  
GIS Databases:  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05  
Shepherd et al. (2001)  
Heddle et al. (1980)  
Hopkins et al. (2001)

**(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 not likely to be at variance to this Principle**

In three of the four areas there are no associated wetlands within or in close proximity to the area. In the area surrounding the Tamworth Water Storage Reservoir there are two Conservation Category Wetlands; Tamworth Hill Swamp and Hollow Swamp occurring approximately 230m south east and 620m south west of the area respectively. However, due to the large distance between the proposed clearing area and the wetland and the presence of well vegetated areas between the two areas, it is unlikely that the removal of a small amount of vegetation (approximately 2.1ha) will impact on these wetlands of conservation value.

**Methodology** GIS Databases:  
- Geomorphic Wetlands (Mgmt Categories) SCP - DOE 15/09/04  
- EPP Lakes - DEP 28/07/03  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

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

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

All of the areas under application are located within a low to nil risk Acid Sulfate Soils area and all have a low groundwater salinity risk (ie. <1000mg/l).

All the areas that are proposed to be cleared surround existing dams and are located at higher elevations than the surrounding areas (average height approximately 60 to 70m AHD) with the potential for land degradation to occur on the nearby slopes. However, the clearing methods involve manual selective lopping, chipping and disposal methods (Water Corporation, 2005) that will incur minimal disturbance to the vegetation and the surrounding area. Furthermore, the Water Corporation have indicated that natural grasses will be kept on the banks surrounding the reservoirs to prevent erosion and that larger trees present on the slope will only be trimmed and lopped leaving their stumps and roots to help with the stabilisation of the sloped area (pers comms, Water Corporation, 7/6/06). Therefore, it is unlikely that the clearing of a small area (between 1.8 and 2.7 ha) will result in soil or water erosion issues.

**Methodology Water Corporation (2005)**

GIS Databases:

- Topographic Contours, Statewide - DOLA 12/09/02
- Acid Sulfate Soil Risk Map, SCP - DOE 04/11/04
- Groundwater Salinity, Statewide - 22/02/00

**(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 not likely to be at variance to this Principle**

Bold Park Water Storage Area and Neerabup Water Storage Reservoir are both located in a System 6 Conservation Reserve. Neerabup National Park is located approximately 100m north west and 110m south west of the Neerabup Water Storage Reservoir area. A System 6 Conservation Reserve is also located approximately 10m north west and 10m south east of the Tamworth Water Storage Reservoir area. There are no reserves of conservation value within or in close proximity to the Mirrabooka Water Storage Reservoir area.

The areas to be cleared are all within or in close proximity to a Bush Forever site. Bold Park Water Storage Area, Tamworth Water Storage Reservoir and Neerabup Water Storage Reservoir are all located in Bush Forever sites 312, 356 and 383 respectively. Bush Forever site 201 is located approximately 20m south east and 170m north east of the Mirrabooka Water Storage Reservoir. Clearing in the Mirrabooka Water Storage area is restricted to the steep banks and an area 3m outward from the 'toe' of the bank with an access track separating the Bush Forever area from the clearing area (Site visit, 20/2/06).

Due to the disturbed and fragmented nature of the vegetation under application, being less than 2.7ha surrounding each of the existing dams, in addition to the minimal disturbance to the site by the clearing methods adopted by the Water Corporation (Water Corporation 2005) it is unlikely that the clearing will impact on the conservation values in the adjacent areas (CALM 2006).

**Methodology Water Corporation (2005)**

CALM (2006) (DoE TRIM ref: EI 6456)

Pers comm. Water Corporation - (23/2/06)

Site Visit (20/2/06)

GIS Databases:

- CALM Managed Lands and Waters - CALM 01/08/04
- Bushforever - MFP 07/01
- Register of National Estate - EA 28/01/03
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

**(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 not likely to be at variance to this Principle**

In all of the areas under application there are no associated watercourses or wetlands. The only wetlands in close proximity to a clearing area include Tamworth Hill Swamp and Hollow Swamp that are located approximately 230m south east and 620m south west of the Tamworth Water Storage Area. Given these areas are sufficiently distanced from the clearing area, it is unlikely that the small amount of clearing required (approximately 2.1ha) with minimal soil and root disturbance will impact on the quality of surface water within these areas.

Neerabup Water Storage Reservoir and Mirrabooka Water Storage Reservoir are located in the Perth Coastal Underground and Gngangara Underground Water areas respectively. These areas are both Policy P3 classification Public Drinking Water Source Areas where the guiding principle for these areas are defined to

'manage the risk of pollution' (DoE, 2004). Given the small areas proposed to be cleared in each of these two areas, together with the minimal disturbance method to be used, it is unlikely that there will be a risk of pollution to groundwater.

Furthermore, due to the small scale of clearing proposed in each area (approximately 1.8 to 2.7 ha) with minimal disturbance clearing methods such as manual selective lopping (Water Corporation, 2005), it is unlikely that the removal of these small amounts of vegetation in already degraded areas (with surrounding areas of intact vegetation) is likely to cause deterioration in the quality of surface or underground water.

**Methodology** DoE (2004)  
Water Corporation (2005)  
GIS Databases:  
- Geomorphic Wetlands (Mgmt Categories) SCP - DOE 15/09/04  
- Public Drinking Water Source Areas (PDWSAs) - DOE 29/11/04  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

**(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 areas applied to be cleared include the steep banks and an area 3m outward from the 'toe' of the bank, surrounding each of the water reservoirs, in order to comply with ANCOLD Dam safety requirements (pers comms. Water Corporation, 20/2/06). Therefore, the cleared areas are generally at a higher elevation than surrounding areas (average height approximately 60 to 70m AHD).

All areas are located in a 800-900mm annual rainfall area, and with exceptionally high infiltration rates found on the Swan Coastal Plain (pers comms DoE Hydrologist 28/2/06). Hence, the clearing of a small area (approximately 1.8 to 2.7 ha) is unlikely to exacerbate on or off site flooding.

**Methodology** GIS Databases:  
- Topographic Contours, Statewide - DOLA 12/09/02  
- Swan Coastal Plain North 40cm Orthomosaic - DLI 05  
- Swan Coastal Plain South 40cm Orthomosaic - DLI 05

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

**Comments**

A submission was received from the City of Rockingham for Lot 1310 Eighty Road, Baldivis (City of Rockingham 2006).

Following a site visit to the area by officers from the Kwinana Peel DoE officers, Water Corporation Officials, and a City of Rockingham officer, the following conclusions were indicated in the submission;

1. It was unclear if the permit was for all or part of the ridge;
2. It was unclear which trees and how many trees were to be cleared;
3. None of the trees and bushes posed a threat to reservoir integrity as many of the trees that may be removed were below the base of the reservoir and up to 40 metres away from the reservoir; and
4. The main purpose of clearing was to make visual inspection of the batters relatively quick and easy.

The City of Rockingham also indicated that many of the trees and bushes could be retained without impairment to reservoir inspection, and that the trees and bushes were in fact, assisting in maintaining batter stability and also providing an improved visual aspect from the Settlers Hill Estate.

The City recommended that prior to any assessment of a clearing permit, a vegetation survey be required, as part of a management plan that should also address batter stability and visual impacts of clearing on surrounding areas.

The City of Rockingham therefore recommend that the clearing permit application be refused until a detailed management plan has been submitted and appropriately assessed.

In response, the Water Corporation have indicated that the clearing permit was only for the removal of vegetation that will impede visual inspection on the slopes surrounding the reservoir, and an area 3 m outward from the 'toe' of the bank, in accordance with the ANCOLD guidelines. The metropolitan reservoirs under application have been classified as 'referrable dams' and hence the requirement for clearing will be undertaken in accordance with the ANCOLD guidelines (pers comms. Water Corporation, 7/6/06). Vegetation beyond the slopes would not be impacted upon. It was also confirmed that trees present on the slope that impede a visual inspection would be trimmed and slashed and not removed, to aid the stabilisation and prevent erosion of the banks.

Bush Forever have indicated that an Environmental Management Plan be prepared for each of the four sites to mitigate any impacts of the clearing on surrounding native vegetation (Bush Forever 2006). Given the safety

issue involved in this application, the small areas to be cleared, the overall degraded condition of the vegetation applied to be cleared and the nature of the clearing (no disturbance of root stock ), the assessing officer recommends that Management Plans be developed by Water Corporation, but not a condition of this permit.

There is no other RIWI Act Licence, Works Approval or EP Act Licence that will affect the area that has been applied to clear.

**Methodology** City of Rockingham (2006) (DoE TRIM ref: EI 5117)  
 Bush Forever (2006) (DoE TRIM ref: EI5846-9)

#### 4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Dam construction or maintenance	Mechanical Removal	4	Grant	The areas applied to be cleared total 8.5 ha and the application has been amended accordingly. The clearing as applied has been assessed and is not likely to be at variance with any of the clearing principles. Given that the areas under application are small, consisting mostly of degraded vegetation, with clearing methods such as manual selective lopping (Water Corporation, 2005) designed to minimise disturbance to the area, there is a limited perceived environmental impact on the areas and the surrounding habitat. The assessing officer therefore recommends that a clearing permit be granted.

#### 5. References

- CALM (2006) Land clearing proposal advice. Advice to A/Director General, Department of Environment (DoE). Department of Conservation and Land Management, Western Australia. DoE TRIM ref: EI 6456.
- City of Rockingham (2006) Direct Interest Submission. DoE TRIM ref: EI 5117
- Department of Environment (2004) Water Quality Protection Note - Land use compatibility in Public Drinking Water Source Areas. (DoE TRIM ref: EI6495)
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- 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.
- Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) A database on the vegetation of Western Australia. Stage 1. CALMScience after J. S. Beard, late 1960's to early 1980's Vegetation Survey of Western Australia, UWA Press.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

#### 6. Glossary

Term	Meaning
CALM	Department of Conservation and Land Management
DAWA	Department of Agriculture
DEP	Department of Environmental Protection (now DoE)
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 DoE)