GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9153/1
Permit Holder:	Downer Utilities Australia Pty Ltd
Duration of Permit:	2 April 2021 to 2 April 2026

The permit holder is authorised to clear native vegetation subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear native vegetation for the purpose of installing communications and electrical cables.

2. Land on which clearing is to be done

Leeming Road reserve (PINs 1360937 and 1184370), Jandakot

3. Clearing authorised

The permit holder must not clear more than 0.015 hectares of native vegetation within the area cross-hatched yellow in Figure 1 of Schedule 1.

4. Application of liability to agents of the permit holder

Without limiting or transferring the liability of the permit holder to comply with the conditions of this permit, the permit holder may authorise (in writing) additional persons, including employees, contractors, and agents of the permit holder, to clear native vegetation for the purpose specified in condition 1.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise, and reduce impacts and extent of clearing

In determining the native vegetation authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending 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.

6. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of 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) ensure that no known dieback or weed-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

PART III - RECORD KEEPING AND REPORTING

7. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) 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; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); and (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5 of this permit; and (f) actions taken to minimise the risk of the introduction and spread of weeds and dieback in accordance with condition 6 of this permit.

8. Reporting

The permit holder must provide to the *CEO* the records required under condition 7 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
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.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

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Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

10 March 2021

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below

Figure 1: Map of the boundary of the area within which clearing may occur

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9153/1
Permit type:	Purpose permit
Applicant name:	Downer Utilities Australia Pty Ltd
Application received:	18 December 2020
Application area:	0.015 hectares (ha) of native vegetation
Purpose of clearing:	Installation of communications and electrical cables
Method of clearing:	Mechanical
Property:	Leeming Road reserve (PINs 1360937 and 1184370)
Location (LGA area/s):	City of Cockburn
Localities (suburb/s):	Jandakot

1.2. Description of clearing activities

The vegetation proposed to be cleared is 0.015 ha of native vegetation within a 0.177 ha footprint. The application area is an approximately 1,500 m long contiguous strip with clearing occurring within 550 mm x 500 mm drill pits at various intervals along the application area. The clearing is for the installation of communications and electrical cables to service the Cockburn to Thornlie rail project as part of the METRONET program. Installation of cables will be done through sub-surface drilling. (see Figure 1, Section 1.5).

Decision:	Granted
Decision date:	10 March 2021
Decision area:	0.015 hectares of native vegetation, as depicted in Section 1.5, below.

1.3. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 14 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix 0), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The Delegated Officer also took into consideration that the purpose of the clearing is to facilitate the Cockburn to Thornlie rail project as part of state significant METRONET program.

The assessment identified that the proposed clearing may result in:

- potential impact to threatened flora species recorded within the local area, in particular *Drakaea micrantha* and *Caladenia hueglii;*
- potential impacts on a mapped wetland intersected by the application area;

- potential loss of habitat for threatened fauna species;
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the vegetation and its habitat values

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on wetlands, or flora or fauna of conservation significance. The proposed clearing can be managed to a degree that is unlikely to lead to an unacceptable risk to the environment.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise and reduce the impacts and extent of clearing; and
- implement hygiene measures to minimise the risk of the introduction and spread of weeds and dieback.

1.4. Site map

Figure 1 - Map of the application area

The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values. The applicant changed the scope of works from trenching to directional drilling. The use of directional drilling at a depth of 1.2 m as opposed to trenching will reduce the clearing requirements and limit root disturbance.

The applicant has agreed to the following mitigation measures:

- Excavators will be parked within areas that are devoid of native vegetation
- Where possible, drilling occurring near native vegetation will avoid root zones.
- Topsoil will be harvested and reinstated to prevent negative impacts to seed banks and underground plant tubers
- An ecologist will be present on-site during works to ensure mitigation measures are adhered to and any potential impacts to vegetation are minimised or prevented.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see sections 3.2.1 - 3.2.3) identified that the impacts of the proposed clearing present a risk to biological values (fauna, adjacent flora and vegetation), conservation areas, and land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values - Flora - Clearing Principles (a) & (c)

Assessment

The application area is between two fire breaks located between mapped occurrences of the Threatened Ecological Community (TEC) “Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Bioregion” (Banksia Woodland), federally listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The application area itself is not mapped as a TEC and is located between cleared areas in the form of fire breaks and a dirt track, however, using the key diagnostic characteristics set out in the ‘Approved Conservation Advice for the Banksia Woodlands of the Swan Coastal Plain ecological community’ (TSSC, 2016), the application area has been identified as containing certain key features of a Banksia Woodland TEC; the application area is located on the Swan Coastal Plain, is located on Bassendean soils and contains *Banksia menziesii* and *Allocauarina fraseriana*. The application area does not however contain a high, or very high diversity of shrub and herb species in the understorey as described in the composition section of the key characteristics (TSSC, 2016).

Assessment of aerial imagery, spatial data, and information supplied by the applicant indicates that the vegetation condition of the application area is degraded to completely degraded (Keighery 1994). While the application area has similarities with several diagnostic features of a Banksia Woodland TEC, given the condition of the vegetation and absence of understorey diversity, it is not likely that this vegetation would meet the criteria for listing as a Threatened Ecological Community under the EPBC Act (DEE, 2016). When considered in the context of the small clearing area, there is not likely to be any significant deleterious impacts to the adjacent areas mapped as the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Bioregion TEC.

Assessment of spatial data and available records indicated that, based on soil, vegetation, and habitat type, 15 priority flora species may potentially occur within the application area (see Appendix A.3). Given the degraded condition and small size of the clearing areas, the mitigation and avoidance measures (see Section 3.1) and that no priority flora were found during a flora survey of the site, it is unlikely these species will be present within the application area or be impacted by the clearing activities (NACMS, 2020; NACMS, 2021).

Based on habitat suitability, two threatened flora (*Caladenia hueglii* and *Drakaea micrantha*) may potentially occur within the application area:

Caladenia hueglii

C. hueglii is a declared threatened flora under the *Biodiversity Conservation Act 2016*, Critically Endangered under World Conservation Union criterion B2ab (I,ii,iii,iv) as a result of severe fragmentation, and listed as endangered under the EPBC Act. Habitat requirements for the survival include areas of *B. menziesii* with scattered *A. fraseriana* over dense shrubs of *Strilingia latifolia, Hypocalymma robustum, Hibbertia hypericoides, H. subvaginata, Xanthorrhoea preisii*, *Adenanthos cuneatus*, and *Conostylis sp*. Throughout its range *C. hueglii* favours areas of dense undergrowth and is usually associated with the Bassendean sand-dune system (DEC 2009). It is noted that the application area is situated on the Bassendean dune system and contains *B. menziesii* and *A. fraseriana,* however, it is distinctly absent of the abovementioned understorey and shrub species and any density of understorey which are key habitat requirements.

C. hueglii ranges from the Perth Metro Area and foothills south down the coast to Busselton. There are 105 recorded populations of *C. hueglii* in Western Australia and approximately 1,020 individuals in populations within the local area. The condition of the vegetation in the application area does not facilitate natural range expansion due to the lack of understorey vegetation diversity and density preferred by *C. hueglii.*

No *C. hueglii* individuals were found to be present when the site was surveyed. Given the degraded to completely degraded condition of the small area proposed to be cleared, lack of dense understorey, the wide distribution range, and high number of populations in the local area, it is considered unlikely that *C. hueglii* is present within the application area and that the clearing will have any significant impact, or pose a significant risk on the conservation of the species.

Drakaea micrantha

Drakaea micrantha is listed as Endangered under the *Biodiversity Conservation Act* 2016. *D. micrantha* is usually found in cleared or disturbed areas such as firebreaks or open sandy patches where competition is reduced or removed. It occurs in infertile grey sands in Banksia, Jarrah or Sheoak woodlands and is often found under thickets of *Kunzea ericifolia* (DEWHA 2008). It ranges from Perth to Albany across 49 known records (Western Australian Herbarium, 1998), with 34 known records located within land managed by the Department of Biodiversity, Conservation, and Attractions. There are three records of *D. micrantha* within the local area, with the nearest record located approximately 1.7 km away.

Aerial imagery of the application area and assessment of photos and information supplied by the applicant indicate the area to be cleared is in degraded to completely degraded condition with evidence of disturbance. It is noted that *D. micrantha* has a propensity to occur in this type of habitat, however, the application area does not contain *Kunzea ericifolia* thickets, another favourable habitat type as per 'Approved Conservation Advice for *Drakaea micrantha*' (DEWHA, 2008).

Assessment of information supplied by the applicant identified that the areas proposed to contain the drilling pits (proposed clearing areas) have signs of disturbance from vehicles and kangaroo herbivory with exotic flora species such as *Pelargonim capitatum* present. Flora surveys undertaken in the adjacent Ken Hurst Park in previous years (1992, 2002, 2012, 2013, and 2020) have no records of *D. micrantha* being present. The vegetation type, soil type, and habitat are congruous with the application area (NACMS, 2020; NACMS, 2021).

Based on the above assessment, while there is potential for the occurrence of *D. micrantha* within the application area, based on the degraded and disturbed nature of the site, it is unlikely that the species is present due to the presence of exotic species, absence of *K. ericifolia* and the absence of any records in the adjacent Ken Hurst Park

Conclusion

Considering the above assessment, the small application area, and the avoidance and mitigation measures set out in section 3.1, in the unlikely event that any threatened or priority flora are present within the application area, it is unlikely that there will be any significant residual impact to these species as a result of the proposed clearing.

Conditions

No flora conditions required.

3.2.2. Biological values - Fauna - Clearing Principles (b)

Assessment

Available databases indicate that there are 5,689 records comprising 62 fauna species of conservation significance within the local area. The assessment has identified that based on the vegetation present in the clearing area and adjacent remnant vegetation, five species are potentially at risk from the clearing:

- *Calyptorhynchus banksii naso* – Forest Red-tailed Black Cockatoo
- *Calyptorhychus baudinii* – Baudin's Black Cockatoo
- *Calyptorhynchus latirostris* – Carnaby's Black Cockatoo
- *Isoodon fusciventer* - Quenda
- *Notamacropus Irma* – Western Brush Wallaby

Black Cockatoos

During breeding, Black Cockatoos will forage within a 6-12 km radius of a nesting site and post-breeding will forage within 6 km of a night roost. Breeding occurs in hollows in live or dead trees such *Eucalyptus marginata, E. gomphocephala* and *Corymbia calophylla* with night roosting occurring in tall trees of similar species. During breeding season, Black Cockatoos will forage on a range of native species, expanding to some exotic species outside of breeding season. Black Cockatoos will feed on proteaceous trees and shrubs, Eucalyptus trees, and among others, Allocasaurina cones (DSEWPC, 2012).

Spatial data and information supplied by the applicant indicate that some species used for foraging by Black Cockatoos are present in the clearing area, in the form of *Banksia menziesii* and *Allocasaurina fraseriana* (NACMS, 2020). The application area is not within an area mapped as foraging habitat for Black Cockatoos, however, is between areas of remnant vegetation that are mapped as foraging habitat. The City of Melville identified in the Ken Hurst Park Strategic Management Plan (2014) that Carnaby's Black Cockatoos utilise the adjacent Ken Hurst Park (see Figure 2) for foraging purposes and as a linkage between larger vegetation remnants. The dominant overstorey of *Eucalyptus marginata, Eucalyptus todtiana*, Banksias and Sheoak represent a significant food source for Black Cockatoos (City of Melville, 2014).

Assessment of the mapped vegetation and the information supplied by the applicant (NACMS, 2020) indicates that the presence of vegetation suitable for breeding by Black Cockatoos is not likely within the application area. NACMS (2020) identified that the application area contained *B. menziezii*, *A. Fraseriana*, *Melaleuca preissiana*, and *Adenanthos cygnorum* which is consistent with the surrounding mapped vegetation. These species are not utilised by Black Cockatoos for breeding purposes (DSEWPC, 2012) and species preferred for breeding were not identified within the application area. Similarly, species utilised for night roosting (*E. marginata*, *E. gomphocephala*, *E. patens*, *C. Calophylla*) were not present within the application area.

There are confirmed Black Cockatoo roosting sites with 6 km of the application area, however, no standing water is located within close proximity to the application area which would be utilised by roosting Black Cockatoos. The application area is within the modelled distribution for the Forest red-tailed Black Cockatoo, and mapped within the non-breeding range of Carnaby's Cockatoo (CoA, 2012). It is not within any mapped foraging or breeding areas for Baudin's Black Cockatoo, on which basis this species is considered unlikely to occur. The nearest confirmed breeding site for white tailed black cockatoos is located approximately 15 km east of the application area.

The mapped vegetation type of the application area (Bassendean Complex – Central and South) has a remaining extent of approximately 23,500 ha, 5% of which is within DBCA managed land. The local area retains approximately 13% of the original native vegetation cover, with the application area representing approximately 0.0003% of the remnant vegetation within the local area.

The removal of vegetation within the application area will have a negligible impact on the extent of both the mapped vegetation type and remnant vegetation remaining within the local area. Minimal clearing will be conducted with directional drilling techniques implemented to mitigate and minimise clearing impacts. The application area is not within a mapped breeding area of any species of Black Cockatoo, with the nearest confirmed breeding site 15 km to the east. Given the location and species composition of the application area, it is unlikely it will be utilised for breeding or night roosting. The availability of highly suitable foraging habitat in the adjacent Ken Hurst Park means that any potential loss of foraging species as a result of clearing will be not be significant in the context of the availability of better quality foraging resources in the local area, including those immediately adjacent to the application area.

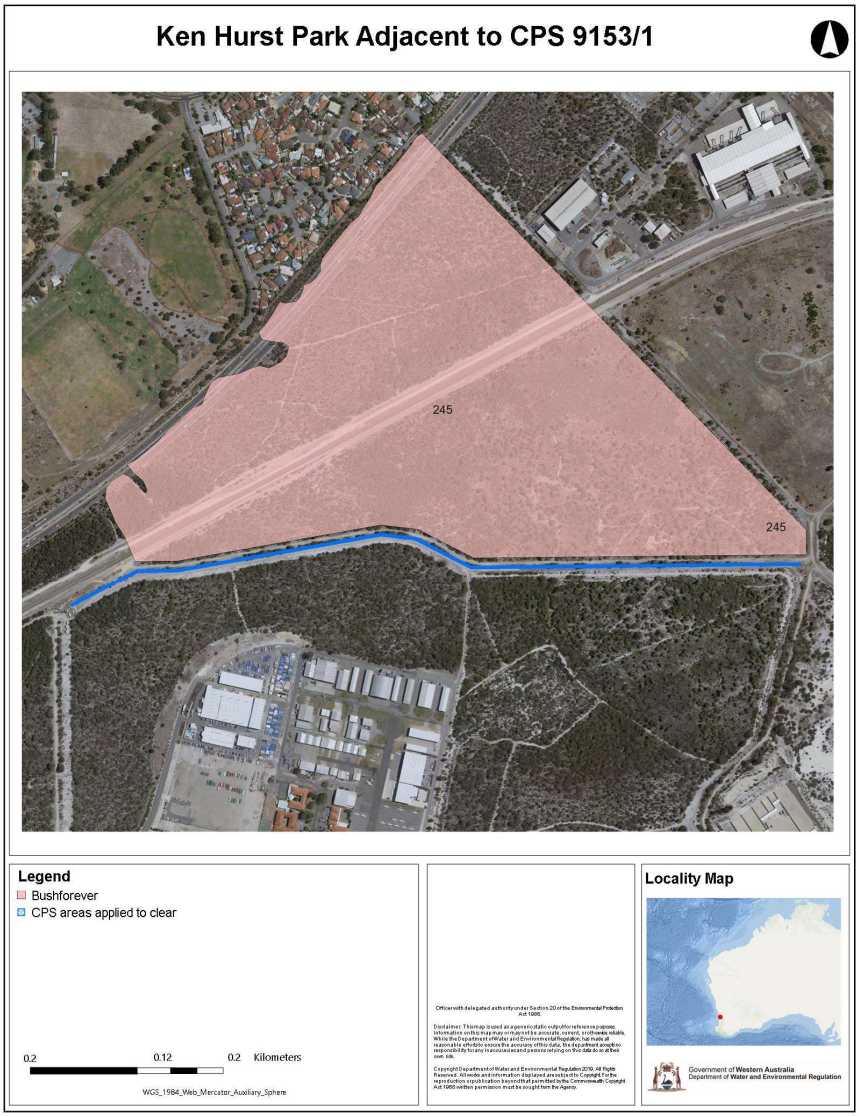

Figure 2: Ken Hurst Park (shown in pink) in relation to clearing application area (CPS 9153/1).

Quenda and Western Brush Wallaby

Quendas (*Isoodon fusciventer)* usually live in dense understorey around swamps or in Banksia and Jarrah woodlands utilising several daytime nesting sites. These nesting sites will be hidden under shrubs and lined with leaves and other soft materials (DBCA, 2017). Given the degraded to completely degraded condition and low species diversity, it is unlikely that quenda are present within the application area.

Western Brush Wallabies (*Notamacropus Irma)* optimum habitat is open forest of woodland favouring open, seasonally wet flats with low grasses and open scrubby thickets. Western Brush Wallabies are grazers and have been seen foraging on *Carpobrotus edulis, Cynodon dactlyon* and *Nuytsia floribunda* (DEC, 2012*)*. Considering the degraded condition, size and linear configuration of the application area, it is unlikely that any Western Brush Wallabies will be present.

Conclusion

Given the degraded condition of the vegetation in the clearing area, the vegetation composition, the method of using directional drilling to reduce the amount of clearing, and the extent of better quality vegetation available in the local

area and within close proximity to the application area, it is unlikely that the clearing will impact on significant habitat for any species of conservation significance.

Conditions
No fauna management conditions required.

3.2.3. Land and Water Resources - Clearing Principle (f) & (i)

Assessment

Approximately 430 m of the eastern portion of the application area intersects with a mapped resource enhancement wetland (REW). Given that the application area is located between an unsealed track and firebreaks, it is unlikely that this vegetation is riparian, or acts as an important buffer to the wetland. The vegetation condition is degraded to completely degraded and clearing will consist of 550 mm x 500 mm drill pits with drilling to be undertaken at a depth of 1.2 m, reducing potential impact to root mass of the vegetation.

Considering the directional drilling and small amount of clearing that is being proposed, it is unlikely that the clearing proposed in this application will significantly impact the hydrological function of the mapped wetland. It is also noted that based on topographical mapping, it is not a low point in the landscape and is congruous with the surrounding topography.

Assessment of aerial imagery and mapping indicates that there is no standing water or watercourses that are intersected by the application area, hence any inundation would be ephemeral in nature. The application area is located within the proclaimed Jandakot Groundwater Area, with the Priority 1 Jandakot Underground Water Pollution Control Area located approximately 450 m from the application area. No dewatering or abstraction will be necessary as part of this application. Given the small clearing footprint and the 1.2 m depth of drilling, it is unlikely that the clearing will intersect groundwater or impact on the quality of any surface or groundwater resource.

Conclusion

For the reasons set out above, the proposed clearing does not pose a significant risk to the hydrology and hydrogeological function of the local area and is not likely to have any long-term adverse impacts on any environmental values.

Conditions

No water management conditions required.

3.2.4. Significant Remnant Vegetation and Conservation Areas - Clearing Principle (h)

The application area is located within Bush Forever Site 388 Jandakot Airport, Jandakot and adjacent to site 245 Ken Hurst Park, Leeming. Through Bush Forever Volume 1: Policies, Principles and Processes, the Bush Forever sites were identified on the basis of criteria relating to conservation value. Where possible a comprehensive representation of all ecological communities originally occurring in the region, principally through protecting at least 10 percent of each vegetation complex should be achieved (DPLH, 2000). Bush Forever sites were selected based on the following criteria:

- a number of areas selected to represent the range of ecological communities and the places in which these communities merge;
- areas with a high diversity of flora and/or fauna species or species of restricted distribution;
- areas containing rare or threatened communities or species or species of restricted distribution;
- maintenance of ecological systems or natural processes;
- protection of wetland, streamline, coastal vegetation, conservation category wetlands including fringing vegetation and associated upland vegetation.

Bush Forever Volume 1 identifies that boundaries of Bush Forever sites take into account considerations of management and cadastral and ownership boundaries. For this reason, site boundaries include non-bushland areas that are not intended, except in a few rare cases, to be protected under Bush Forever.

Figure 3: Aerial image showing access to application area. The site is easily accessible with no impact to native vegetation required.

Aerial imagery identifies that the area proposed to be cleared is easily accessible on the eastern side from Clifton and Johnston Road (Figure 3). The area along the northern boundary of the application area is cleared in the form of Leeming Road. This cleared area and accessibility will allow the clearing to be undertaken with no disturbance to the Bush Forever sites as clearing and drilling equipment can be parked in cleared areas and no clearing undertaken to access the site.

The application area is in degraded to completely degraded condition with low species diversity and the presence of exotic species, is on the northern boundary of Bush Forever site 388 and is adjacent to two cleared areas. Assessment of clearing principles (a), (b), and (c), has indicated that the presence of threatened flora and fauna is unlikely as is the use of the application area for habitat. The scale of the application area represents a negligible proportion of the vegetation complex that is within the threshold for retention with the constrained area of the Swan Coastal Plain. Given this, it is unlikely that the application area and the cleared areas adjacent would meet the criteria for consideration as a Bush Forever site, particularly given that these boundaries encompass non-bushland areas that are not afforded protection under Bush Forever.

Conclusion

For the reasons set out above, the proposed clearing is not likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Conditions

No conditions required.

3.3. Relevant planning instruments and other matters

The Shire of Cockburn advised DWER that local government approvals are not required, and that the proposed clearing is consistent with the Shire's Local Planning Scheme. The Shire of Cockburn did not have any objections to the proposed clearing.

It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is a 0.015 ha within a 0.177 ha footprint. It is located within an existing firebreak/track in between two pieces of remnant vegetation within the intensive land use zone of Western Australia. It is surrounded by native vegetation immediately north and south along the majority of the clearing area. The western extent is adjacent to the Leeming railway and the eastern end is at the intersection of Leeming, Johnston, and Clifton Roads. Leeming Road, an unsealed road, runs parallel to the application area along its entirety. The area to the north of the application area is zoned as 'parks and recreation' and 'public purposes' to the south. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 13 per cent of the original native vegetation cover.
Ecological linkage	The application area is not mapped within any formal ecological linkages. It is unlikely to contribute to any linkages as the application area is located within a firebreak.
Conservation areas	The application area is mapped within Bush Forever site 388 and is adjacent to Bush Forever site 245.
Vegetation description	The vegetation survey (NACMS, 2020) indicates the vegetation within the proposed clearing area consists of *Allocasaurina fraseriana, Banksia menziesii, Melaleuca preissiana, Adenanthos cygnorum, Regelia ciliate, Hypolaena exsulca* and *Lyginia barbata*. The full survey descriptions and maps are available in Appendix D. This is consistent with the mapped vegetation type: • Bassendean Complex-Central and South, which is described as vegetation ranging from woodland of *Eucalyptus marginata* (Jarrah) – *Allocasaurina fraseriana* (Sheoak) – Banksia species to low woodland of Melaleuca species, and sedgelands on the moister sites. The area includes the transition of Jarrah to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth. The mapped vegetation type retains approximately 27 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Photographs and information supplied by the applicant indicate the vegetation within the proposed clearing area is in Degraded to Completely Degraded (Keighery, 1994) condition, described as: • Degraded - Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing. • Completely Degraded - The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs. The full Keighery (1994) condition rating scale is provided in Appendix C. Representative photos and survey descriptions and mapping are available in Appendix D.

Characteristic	Details
Climate	Mean annual rainfall: 900 mm Evapotranspiration: 800 mm
Topography	The elevation of the application area varies from 26m AHD on the eastern extent, rising to 33m AHD before dropping to approximately 28 m AHD on the western end. There are elevated areas of 35-36m AHD immediately north and south of the application area approximately 550 m in from the western edge. The remaining portion of the clearing area is relatively congruous with the elevation of the adjacent landscape.
Soil description	The soils of the application area are mapped as: • Bassendean B2 Phase (212Bs_B2) described as flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale-yellow B horizon or a weak iron-organic hardpan 1-2m • Bassendean B1 Phase (212Bs_B1) described as extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sand sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant. • EnvGeol 28 Phase (212 Bs_S8) – described as Sand – very light grey at surface, yellow at depth, fine to medium grained, sub-rounded, quartz, moderately well sorted of eolian origin. • EnvGeol S10 Phase (213Pj_S10) described as Sand – as S8 as relatively thin veneer over sand clay to clayey sand. Of Eolian origin.
Land degradation risk	• 30-50% of map unit has a high to extreme phosphorus export risk • >70% of map unit has a high to extreme phosphorous export risk • >70% of map unit has a high subsurface acidification risk or is presently acid • 50-70% of map unit has a high to extreme wind erosion risk • 30-50% of map unit has a high to extreme wind erosion risk
Waterbodies	The desktop assessment and aerial imagery indicated that the application area does not intersect any waterways. The Swan and Canning River are within the local area, located approximately 5 km away. Approximately 430 m of the application area intersects a Resource Enhancement Wetland (REW), with approximately 610 m adjacent to a Conservation Category Wetland.
Hydrogeography	The application area is located within the Jandakot Groundwater Area and is adjacent to the Perth Groundwater Area, both proclaimed under the *Rights in Water and Irrigation Act 1914*. The Priority 1 Jandakot Underground Water Pollution Control Area is located approximately 400 m from the application area. The application area is not located within a proclaimed surface water area and there are no waterways within 3 km.
Flora	There are 487 records from 79 different species of conservation significance within the local area, 77 of which occur on the same soil types found within the application area. The most common species is the threatened species *Caladenia hueglii* with 69 records. There are two records of *Caladenia hueglii* within 50-60 m of the application area.
Ecological communities	The application area is situated between mapped occurrences of Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Banksia Woodlands) TEC. There are 1,538 recorded occurrences of Threatened or Priority Ecological Communities in the local area, with Banksia Woodlands being the most common with 1,470 records. The closest occurrence is approximately 10 m from the application area.
Fauna	There are 5,689 records in the local area from 62 different fauna species of conservation significance. There are approximately 25 records in the immediate vicinity of the application area consisting of *Isoodon fusciventer* (Quenda), *Notamacropus Irma* (Western Brush Wallaby), and *Calyptohynchus banksia naso* (Forest Red-tailed Black Cockatoo). The closest record is of a Forest Red-tailed Black Cockatoo approximately 30 m away.

Characteristic	Details
	There are confirmed Black Cockatoo roosting sites approximately 175 m north and 1 km north of the application area and an unconfirmed roosting site approximately 1.3 km west.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,221.93	579,813.47	38.62	222,916.97	14.85
Vegetation complex					
Bassendean Complex-Central and South**	87,476.26	23,508.66	26.87	4,377.36	5

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (local area)	Are surveys adequate to identify? [Y, N, N/A]
Amanita carneiphylla	P3	Y	Y	Y	3.7	17	N/A
Amanita drummondii	P3	Y	Y	Y	3.8	2	N/A
Amanita fibrillopes	P3	Y	Y	Y	3.8	6	N/A
Amanita preissii	P3	Y	Y	Y	3.8	12	N/A
Amanita quenda	P1	Y	Y	Y	3.6	7	N/A
Amanita wadjukiorum	P3	Y	Y	Y	3.9	18	N/A
Amanita wadulawitu	P2	Y	Y	Y	3.85	23	N/A
Angianthus micropodioides	P3	N	Y	Y	6	5	N/A
Boronia tenuis	P4	N	Y	Y	10	1	N/A
Byblis gigantea	P3	Y	Y	Y	3.7	13	N/A
Caladenia huegelii	CR	Y	Y	Y	0.045	41	N/A
Cyathochaeta teretifolia	P3	N	Y	Y	5	2	N/A
Dampiera triloba	P3	Y	Y	Y	4.5	3	N/A
Diuris drummondii	T	N	Y	Y	2.3	3	N/A
Diuris purdiei	T	N	Y	Y	2.6	22	N/A
Dodonaea hackettiana	P4	N	Y	Y	1.4	17	N/A
Drakaea elastica	T	N	Y	Y	0.8	3	N/A
Drakaea micrantha	T	Y	Y	Y	1.7	3	N/A
Eremophila glabra subsp. Chlorella	T	N	Y	Y	3.4	12	N/A
Hydrocotyle striata	P1	N	Y	Y	4.2	1	N/A
Jacksonia gracillima	P3	Y	Y	Y	3.6	11	N/A
Johnsonia pubescens subsp. cygnorum	P2	N	Y	Y	8.6	1	N/A

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (local area)	Are surveys adequate to identify? [Y, N, N/A]
Kennedia beckxiana	P4	N	Y	Y	8.1	1	N/A
Levenhookia preissii	P1	N	Y	Y	0.452	3	N/A
Phlebocarya pilosissima subsp pilosissima	P3	Y	Y	Y	7.8	1	N/A
Stylidium paludicola	P3	Y	Y	Y	2.7	5	N/A
Styphelia filifolia	P3	Y	Y	Y	1.4	7	N/A
Synaphea sp Fairbridge Farm.	T	N	Y	Y	2.2	1	N/A
Tripterococcus sp. brachylobus	P4	Y	Y	Y	1.5	16	N/A
Verticordia lindleyi subsp. lindleyi	P4	Y	Y	Y	5.6	19	N/A

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

A.4. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (local area)	Are surveys adequate to identify? [Y, N, N/A]
Calyptohynchus banksia naso	VU	Y	Y	0.055	161	N/A
*Calyptorhynchus baudinii**	EN	Y	Y	5.5	5	N/A
*Calyptorhynchus latirostris**	EN	Y	Y	0.180	1968	N/A
Isoodon fusciventer	P4	Y	Y	0.078	1155	N/A
Notamacropus irma	P4	Y	Y	0.086	44	N/A

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

*119 records present of “white-tailed black cockatoo” that could be this species.

A.5. Ecological community analysis table

Community name	Conservation status (BC Act)	Conservation status (EPBC Act)	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (local area)	Are surveys adequate to identify? [Y, N, N/A]
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	P3	EN	Y	Y	0.010	1470	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared is located between mapped occurrences of the state listed PEC and federally listed TEC "Banksia Dominated Woodlands of the Swan Coastal Plain IBRA region". The condition of the vegetation within the application area does not meet the diagnostic criteria for classification of a TEC under the Approved Conservation. The application area is degraded to completely degraded with exotic species present and low native species diversity.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (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."* Assessment: The area proposed to be cleared may contain potential foraging habitat for conservation significant fauna such as Black Cockatoos, Quenda, and Western Brush Wallaby. Given the small extent of clearing and the proximity to native vegetation remnants, it is unlikely this clearing will pose any significant risk to local fauna through habitat loss or displacement.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is in a degraded to completely degraded condition and a survey undertaken by Natural Area Consulting Management Services (2020) did not detect the presence of any threatened flora. Within the local area there are two threatened flora species that occur in the same habitat type as the application area, however, their likelihood of occurrence within the application area is assessed as being low.	May be at variance	Yes *Refer to Section 3.2.1, above*
Principle (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."* Assessment: The area proposed to be cleared is not mapped within a State listed Threatened Ecological Community and there are no TECs within 5km. Given the low extent of clearing, the degraded to completely degraded condition of the application area, and the proximity to mapped TECs, the clearing is unlikely to pose a significant risk.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (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."* Assessment: The extent of native vegetation in the local area is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The National Objectives and Targets for Biodiversity Conservation 2001-2005 include a target to have clearing controls in place that prevent clearance of ecological	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
communities with an extent below 30 per cent of that present pre-1750 (Commonwealth of Australia 2001). In the Perth Metropolitan and Bunbury regions, the Environmental Protection Authority (EPA) has a modified objective to retain at least 10 per cent of the pre-clearing extent of vegetation complexes for defined constrained areas (intensely developed) (EPA, 2015; EPA, 2003; Government of Western Australia, 2000). The application area is located within a constrained area given that it occurs within the Bush Forever Study Area Boundary.		
Principle (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."* Assessment: The application area is located within Bush Forever site 388 and is adjacent to Bush Forever site 245.Given the degraded to completely degraded condition of the vegetation proposed to be cleared and the minimal clearing that will occur as a result of the directional drilling method, it is unlikely the clearing will compromise the environmental values of the Bush Forever sites.	May be at variance	Yes *Refer to Section 3.2.4, above*
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: The application area intersects a mapped Resource Enhancement Wetland (damp land) and is adjacent to a mapped Conservation Category Wetland (damp land).	At variance	Yes *Refer to Section 3.2.3, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are moderately *to* highly susceptible to wind erosion, nutrient export, and subsurface acidification. Noting the extent of the application area and the condition of the vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation. The method of installing the infrastructure will also further reduce the risk of subsurface acidification given minimal soil will be exposed.	Not likely to be at variance	No
Principle (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."* Assessment: The desktop assessment and aerial imagery indicated that the application area does not intersect any waterways. The application area is not located within a proclaimed surface water area. Although the application area is within a proclaimed groundwater area and is located approximately 400 m from the Jandakot Underground Pollution Control Area, given the depth of directional drilling and extent of the clearing, there are not likely to be any detrimental effects on ground water.	Not likely to be at variance	Yes *Refer to Section 3.2.3, above*
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment:	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
The mapped topographic contours in the surrounding area and the application area do not intersect any floodway, flood fringe, or flood development control area, which indicates that the proposed clearing is not likely to contribute to increased incidence or intensity of flooding. Given no watercourses are recorded within 5 kilometres of the application area and the minimal impacts as a result of directional drilling, the proposed clearing is unlikely to contribute to waterlogging.		

Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Representative photos of the application area / Maps

Figure 1: Current site conditions, Leeming Road, Leeming

Figure 4: Clearing application area in relation to the two Bush Forever Sites.

Appendix E. Sources of information

E.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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