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 9354/1
Permit type:	Area permit
Applicant name:	GTG Investments Pty Ltd
Application received:	13 July 2021
Application area:	7.76 hectares
Purpose of clearing:	Horticulture – Turf farm
Method of clearing:	Mechanical Removal
Property:	Lot 5257 on Deposited Plan 162517
Location (LGA area/s):	Shire of Gingin
Localities (suburb/s):	Cowalla

1.2. Description of clearing activities

The vegetation proposed to be cleared comprises scattered trees within a block covering 123.7 hectares (see Figure 1, Section 1.5). The trees proposed to be cleared occur in low-lying wetland areas as well as on higher, well-drained parts of the site (PVG Environmental, 2021c). The total area of clearing proposed throughout the site equals 7.76 hectares (GTG Investments, 2021).

The proposed clearing is for the purpose of developing a Turf Farm (GTG Investments, 2021).

1.3. Decision on application

Decision:	Granted
Decision date:	7 February 2022
Decision area:	7.76 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. 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 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), a Vegetation Assessment (see Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable foraging habitat for Carnaby's black cockatoos
- the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values
- potential land degradation in the form of phosphorus export (eutrophication) and wind erosion and
- the loss of riparian vegetation.

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 lead to appreciable land degradation and have long-term adverse impacts on environmental values and can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures. The Rehabilitation Plan submitted to DWER, is considered sufficient to mitigate the impacts of clearing suitable Carnaby's black cockatoo foraging species and to mitigate the impact to clearing riparian vegetation.

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

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback
- commence proposed work within one month of clearing and
- rehabilitate at least one hectare of Carnaby's black cockatoo foraging species within the application area.

1.5. Site map

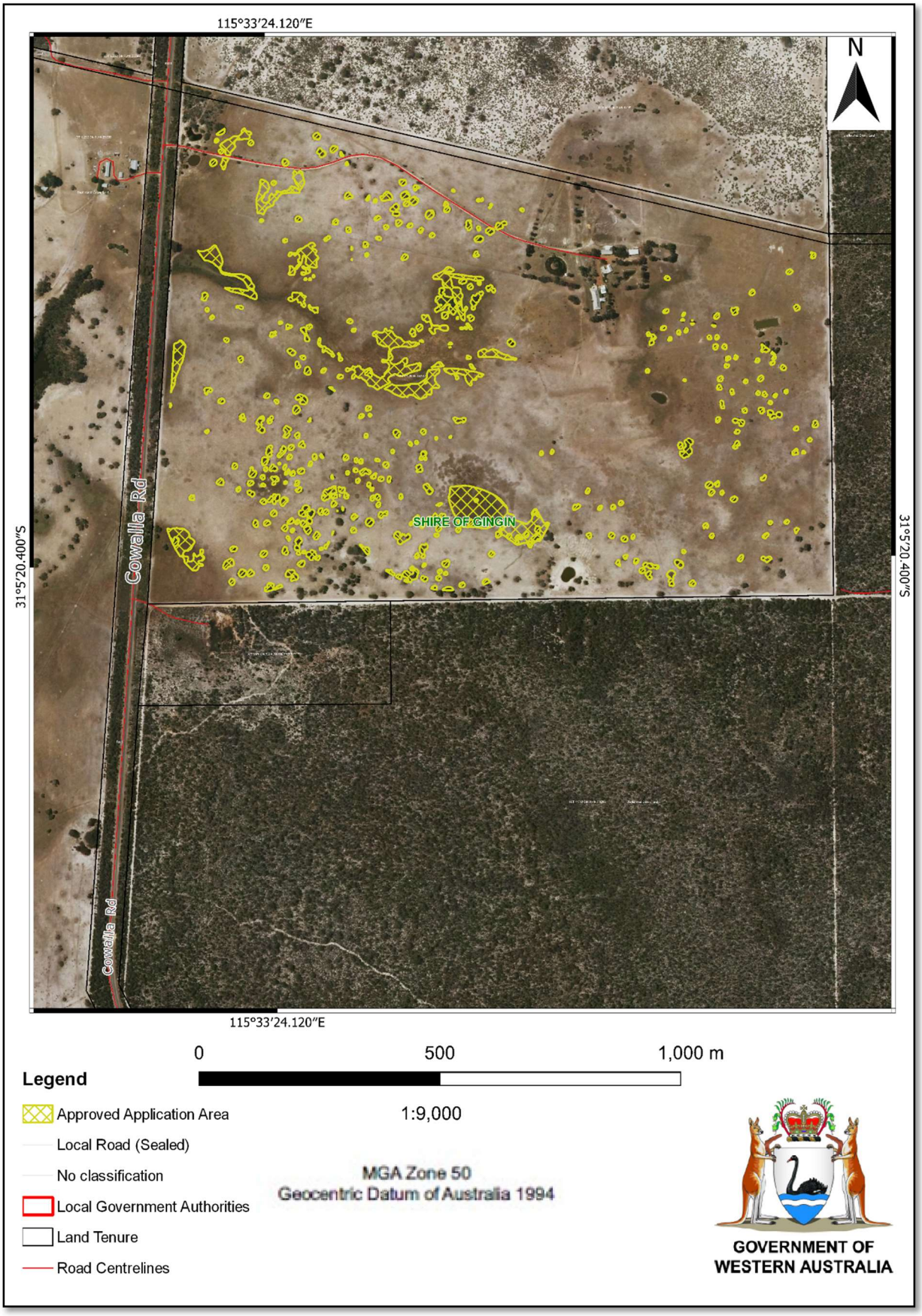


Figure 1 Map of the application area

The areas crosshatched yellow indicate the areas 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)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)

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)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)

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. GTG Investments Pty Ltd designed the Turf Farm pivots to retain trees and sedges within a ten-metre perimeter inside the property boundary (GTG Investments, 2021).

A Rehabilitation Plan was prepared by PGV Environmental and submitted to DWER by GTG Investments Pty Ltd, demonstrating that adequate mitigation measures have been considered to mitigate the risk of clearing suitable foraging species (*Eucalyptus todtiana*) for Carnaby's cockatoos. GTG Investments Pty Ltd propose to undertake both wetland rehabilitation and dryland rehabilitation. A rehabilitation species list has been developed in which 19 of the 26 species includes foraging species for Carnaby's cockatoos. The area of proposed foraging habitat within wetland, dryland, and surrounding pivot planting total of at least 9.7 hectares (PGV Environmental, 2021b). The design of the surrounding pivot planting includes of the following;

- Planting around the pivots will be installed in lines, six meters apart.
- First row (closest to the pivot) will be planted with shrubs four to six meters apart.
- Second row will be planted with larger shrubs and smallest trees six meters apart.
- Third row will be planted with large trees, ensuring that the large trees are 18 meters from the pivot.
- Some areas around the pivots will be extended further than three rows where additional infill planting can be achieved.

Rows of plants will be planted around the perimeter of all four property boundaries and the areas around the pivots. The shire has imposed rehabilitation conditions on the Development Approval to plant alongside Cowalla Road of the Turf Farm for landscaping purposes and the landscaping plan has been approved by Shire of Gingin. A similar methodology applied for the turf farm in Serpentine (photos included in Appendix E) which resulted in successful wetland and dryland rehabilitation is intended to be applied for establishment of the vegetation within the proposed application area. The rehabilitated wetland at Serpentine is now used as a breeding ground for numerous waterbirds and provides habitat for many species, including black cockatoos (PGV, Environmental, 2021b).

A copy of the rehabilitation design is included in Appendix E.

GTG Investments Pty Ltd further considers weed control measures (spot spraying around the plants) and infill planting (to ensure 75 per cent revegetation establishment is achieved) as part of the Rehabilitation Plan. Planting has already commenced adjacent to Cowalla Road as part of the Development Approval (PGV Environmental, 2021b).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid, minimise and mitigate potential impacts of the proposed clearing on environmental values. The Delegated Officer acknowledges the

mitigation credit to counterbalancing the significant residual impacts impacts of the proposed clearing through rehabilitation.

3.2. Assessment of impacts on environmental values

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

The assessment against the clearing principles (see **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to biological values (fauna), 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 (fauna) - Clearing Principles (a) and (b)

Assessment

Flora and Vegetation

Vegetation over the application area consist of large number of scattered trees on both wetlands and dryland soils. The vegetation recorded within dryland areas are not considered to be intact. The condition of the vegetation throughout the application area is classified as completely degraded (Keighery, 1994) as a result of multiple disturbances, in particular grazing by livestock in the past and predominance of introduced species (PGV Environmental, 2021a). Native vegetation recorded within the application (wetland and dryland) areas are listed below.

Wetland Vegetation

- *Melaleuca preissiana* - scattered trees over pasture
- *Melaleuca rhaphiophylla, Melaleuca teretifolia* - tall open scrub over *Lepidosperma longitudinale* and *Gahnia trifida* Sedgeland
- *Ficinia nodosa* sedgeland
- *Eucalyptus rudis* tree (will not be cleared)

Dryland Vegetation

- *Eucalyptus todtiana* - scattered trees over pasture

Spatial data indicates nine priority flora species and no threatened flora species recorded within the local area. The vegetation assessment did not record any threatened or priority plant species (PGV Environmental, 2021a) within the application area. The application area is in completely degraded (Keighery, 1994) condition and is fragmented.The application area is unlikely to provide suitable habitat for conservation significant flora known from the local area.

Fauna

A desktop assessment of the application area identified ten conservation significant fauna species specially protected under the *Biodiversity Conservation Act 2016* within the local area. This included seven bird species, two invertebrate species and one mammal species. Based on the findings of the vegetation assessment, it was determined that Carnaby's cockatoos have the potential to occur within the application area. The application area is within the modelled distribution of the Endangered Carnaby's cockatoos (*Calyptorhynchus latirostris*).

Class: Birds

Three birds identified through the desktop assessment are migratory birds associated with mudflats, freshwater wetlands, saltmarshes and mangroves. The application area comprise of number of Multiple Use Wetlands however there are no permanent water sources within the application area to support habitat for the *Philomachus pugnax* (Ruff), *Plegadis falcinellus* (Glossy ibis) and *Tringa nebularia* (Common greenshank) (SPRAT, 2021).

The *Oxyura australis* (Blue-billed duck) is a priority four bird that inhabits deep, freshwater swamps with dense vegetation and nest in rushes, sedges and melaleuca and forages by sifting mud and water (Birdlife Australia, 2021). *Thinornis rubricollis* (hooded plover, hooded dotterel) is a priority four species that inhabits broad, sandy beaches and forages in seaweed for marine worms, molluscs, crustacea, insects, water plants and seeds (SPRAT, 2021). Suitable habitat for these species does not occur within the application area.

Based on the known distribution and habitat preference, *Calyptorhynchus latirostris* (Carnaby's cockatoo) are likely to occur within the application area.

Carnaby's cockatoos were once numerous in the southwest of Western Australia (DPaW, 2013), however has suffered at least a 50 per cent decline in the total population and has disappeared from more than a third of its breeding range between 1968 and 1990 (Saunders and Ingram, 1998). It is now listed as endangered under both the federal *Environmental Protection and Biodiversity Conservation Act* (EPBC Act) and state *Biodiversity Conservation Act 2016* (WA) (BC Act). The decline of Carnaby's cockatoo has been due primarily to the loss and fragmentation of habitat, as a result of clearing of native vegetation, since the middle of the 20th century (DPaW, 2013). Identified breeding and nearby feeding habitat, former breeding habitat that has hollows intact and vegetation that provides habitat for feeding, watering and regular night roosting is considered habitat critical for recovery of the species (DPaW, 2013). The application area does not have habitat suitable for formation of large hollows appropriate for Carnaby's cockatoos (PGV Environmental, 2021a) therefore, the proposed clearing is not likely to have an impact on Carnaby's cockatoo breeding or roosting habitats.

The vegetation assessment identified the presence of numerous *Eucalyptus todtiana* trees scattered on the upland sections of the site which is a known foraging resource for Carnaby's cockatoos. Carnaby's cockatoo forages on the seeds, nuts and flowers of variety of plants, including Proteaceous species (banksia, hakea and grevillea), allocasuarinas, eucalyptus species, marri and a range of introduced species (Valentine and Stock, 2008). Food resources within the range of breeding sites and roost sites are important to sustain Carnaby's cockatoo populations. Carnaby's cockatoos generally forages within six kilometres (and up to 12 kilometres) of its nesting or night roost site (Commonwealth of Australia, 2017). A known black cockatoo breeding site was identified approximately 8.5 kilometres to the south of the application area. The vegetation proposed to be cleared includes Carnaby's cockatoo foraging species (*Eucalyptus todtiana*) within the foraging distance to the known breeding site.

Nearby foraging habitat, in better condition, occurs within conservation estate including Moore River National Park to the east and the Gnangara-More River State to the west of application area . Based on vegetation mapping, there is 30,737 hectares of mapped foraging habitat in the local area. The application area represents approximately 0.02 per cent of the current foraging habitat in the local area. The figure two below represents the extent of suitable foraging habitat available for Carnaby's cockatoo in the local area.

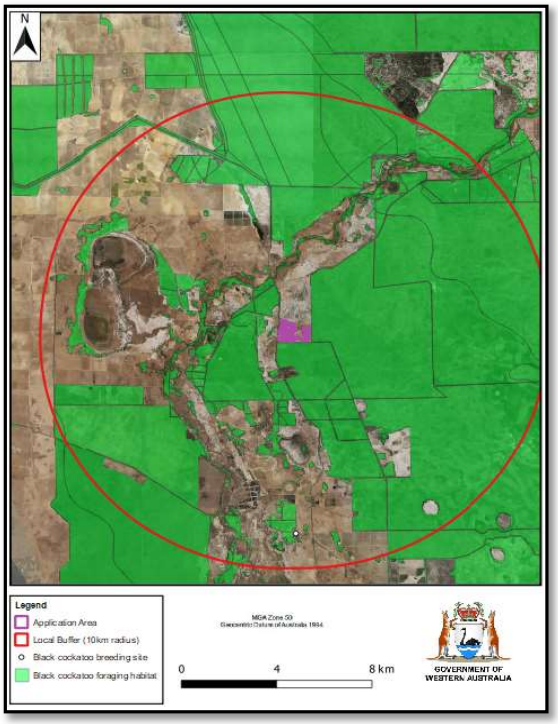


Figure 2: Black cockatoo foraging habitat within the surroundings of the application area.

Noting the above, the vegetation within the application area is not likely to represent a significant proportion of foraging habitat for Carnaby's cockatoos. However, due to the loss of approximately one hectare of foraging resource (*Eucalyptus todtiana* trees) from the proposed clearing, located within a mapped Carnaby's cockatoo distribution area, a minor impact to Carnaby's cockatoo foraging habitat remains. The applicant is committed to replace *Eucalyptus todtiana* trees removed by planting Carnaby's cockatoo foraging species within the proposed turf farm at a rate greater than two trees planted for each tree cleared to mitigate the potential impact.

Class: Invertebrates

Spatial data identifies the vulnerable *Westralunio carteri* (Carter's freshwater mussel) was identified within the ten-kilometre local area. The most recent record was in 1972. Carter's freshwater mussel inhabits sandy/muddy sediment of freshwater lakes, rivers and streams; usually occurring with woody debris and overhanging riparian vegetation. They retreat to shallow pools or damp mud with most leaf litter in times of drought (Klunzinger et al, 2015). There are no permanent waterlines within the application area to support this species. Noting this, the proposed clearing is not likely to impact the Carter's freshwater mussel.

Priority three *Hylaeus globuliferus* (woolybush bee) was identified approximately 7.55 kilometres from the application area. This species is poorly known and thought to favour flowers of *Adenanthos cygnorum* for feeding and *Banksia attenuate* (Atlas of living Australia, n.d). The vegetation assessment (PGV Environmental, 2021a) did not identify vegetation preferred by woolybush bee within the application area. Noting this, the proposed clearing is not likely to impact the Woolybush bee.

Class: Mammal

One record of the vulnerable *Macrotis lagotis* (bilby, dalgyte, ninu) was identified approximately 4.64 kilometres from the application area. The record is historical from 1920. *Macrotis lagots* inhabits tussock grassland, mulga woodlands/shrublands and hummock grasslands on sand plains and dunes. Species refuge usually consists of burrows with multiple entrances. They forage on seeds and various grasses and invertebrates (SPRAT, 2021). The proposed clearing area does not provide suitable habitat for this species given the completely degraded (Keighery, 1994) condition of the application area (PGV Environmental, 2021a).

Threatened and Priority Ecological Communities

According to available databases, several occurrences of the Federally listed Threatened Ecological Community (TEC) 'Banksia woodlands of the Swan Coastal Plain' and '*Eucalyptus gomphocephala* woodlands and forests of the Swan Coastal Plain' occur within the local area. Banksia Dominated Woodlands of the Swan Coastal Plain is mapped immediately adjacent to the east and to the south of the application area as illustrated in Figure three below. These ecological communities are listed as a priority three Priority Ecological Community (PEC) by DBCA and a TEC under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). None of the species/vegetation identified during the vegetation assessment are representative of the Banksia woodlands of the Swan Coastal Plain' and '*Eucalyptus gomphocephala* woodlands and forests of the Swan Costa Plain (PGV Environmental, 2021a). Figure three is a representation of the extent of the identified state listed PEC woodlands within local area.

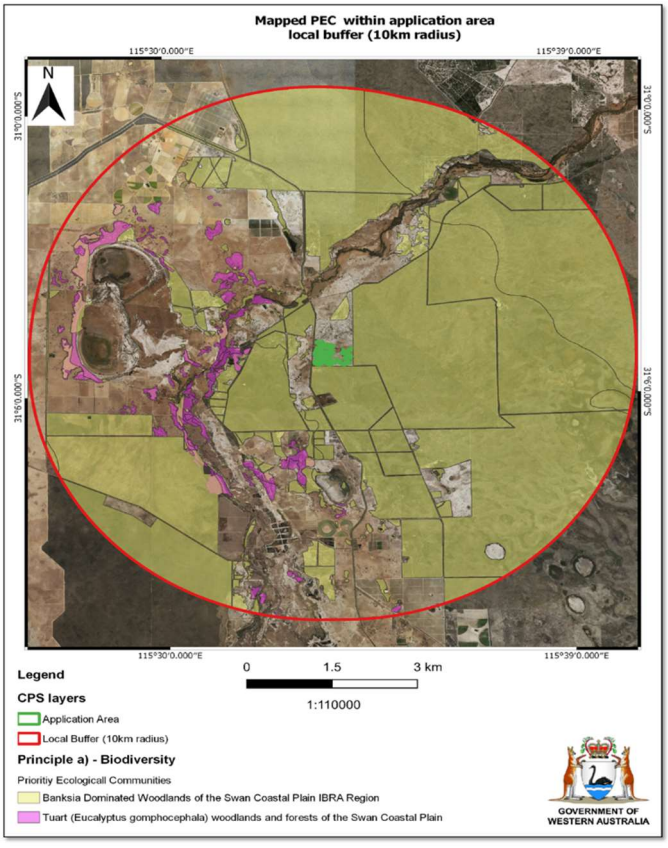


Figure 3: Representation of the extent of Banksia Dominated Woodland and Tuart Woodlands of the Swan Coastal Plain within a ten-kilometre radius of the application area.

Conclusion

For the reasons set out above, and the avoidance and mitigation measures provided by GTG Investments Pty Ltd (Section 3.1), it is considered that potential impacts of the proposed clearing on Threatened species of Carnaby's black cockatoo can be mitigated by the re-planting of Carnaby's cockatoo foraging species within the proposed turf farm to ensure the habitat is not permanently lost.

GTG Investments Pty Ltd proposes to rehabilitate the application area with at least 9.7 hectares of Carnaby's cockatoo foraging habitat to counterbalance the potential impacts of clearing up to one hectare of *Eucalyptus todtiana.* It is also considered appropriate that hygiene measures should be implemented during clearing to help protect adjacent remnant vegetation from weed and dieback spread and the resultant degradation in habitat that can occur.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- The permit holder is to take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.
- The permit holder is to successfully rehabilitate minimum of one hectare of 9.7 hectares of native vegetation, within the application area, with known Carnaby's cockatoos foraging species to mitigate the impact of clearing Carnaby's cockatoos foraging habitat.

3.2.2. Environmental value: Land and water resources - Clearing Principles (f) and (i)

According to available databases, a number of wetlands and watercourses occur within the local area, including the following;

- Multiple use wetlands are mapped within and in close proximity of the application area;
- Conservation Category Wetlands (CCW) are mapped in close proximity of the application area, with the nearest being approximately 170 metres away;
- Resource enhancement wetlands are mapped approximately 80 metres from the application area; and
- Moore River runs parallel to the application area, being within two kilometres of the application area at its nearest point.

Multiple use wetlands are wetlands with few remaining important attributes and functions, development and management should be considered in the context of ecologically sustainable development and best management practice. Resource enhancement wetlands are wetlands that have been modified and lack the clearly recognised human use in their urban or rural settings. Management objective of these wetlands is to maintain and enhance the existing ecological function (Water and Rivers Commission, 2001).

The term resource enhancement has been used to indicate that opportunities may exist for commercial development to enhance the conservation values of these wetlands (Water and Rivers Commission, 2001). While it is acknowledged that resource enhancement wetlands do still have ecological values, the proposed clearing will not impact on the nearby resource enhancement wetland values due to the distance between the known wetlands and the application area. Evidence supplied by the applicant suggest that the wetland values have been impacted with little native vegetation remaining, with the wetland areas currently being utilised for agricultural purposes (PGV Environmental, 2021c).

CCW's support a high level of ecological attributes and functions and recognised as the highest priority for preservation, and buffers are designed to protect wetlands from potential impacts while helping to maintain ecological processes and functions within the wetland (Water and Rivers Commission, 2001). The proposed clearing is unlikely to have a significant impact on the ecological attributes and functions of the CCW due to sufficient buffer distance between the known CCW and the application area.

Wetlands located within the application area are mapped as resource enhancement or conservation category on the DWER available databases however, after consultation with DBCA, it was advised all wetlands which fall within application area were remapped as Multiple use wetlands (DBCA, 2021). These wetlands do not have the same level of protection or restriction on development and the proposed clearing is unlikely to contribute to a significant impact on the wetland values (PGV Environmental, 2021c). The following are the wetlands mapped on the site, either in their entirety or partially.

Table 1: Wetlands mapped within the application area

Wetland UFI	Wetland Type	Management Category mapped on publicly available database.	Management Category advised by DBCA*
9233	Dampland	Conservation	Multiple Use
9232	Dampland	Multiple Use	Multiple Use
9068	Sumpland	Resource Enhancement	Multiple Use
9234	Dampland	Resource Enhancement	Multiple Use
9218	Dampland	Resource Enhancement	Multiple Use
9078	Dampland	Resource Enhancement	Multiple Use
9230	Dampland	Resource Enhancement	Multiple Use

(DBCA, 2021)

The application area includes vegetation such as *Melaleuca preissiana*, *Malaleuca rhaphiophylla* and *Melaleuca teretifolia* which are riparian in nature. The vegetation is in a completely degraded (Keighery, 1994) condition with scattered trees over weeds (PGV Environmental, 2021a). The site has been used for stock grazing for many years, and due to significant grazing pressures native understorey and midstorey species were not observed within the application area (PGV Environmental, 2021a).

The proposed clearing will impact riparian vegetation associated with the mapped wetlands. Given the extent of the proposed clearing, the impact to the wetland is not likely to be significant. GTG Investments Pty Ltd intend to mitigate impacts to riparian vegetation by constructing a wetland with riparian vegetation, in the centre of the application area. The landscaping plan which includes the wetland has been approved and is regulated by Shire of Gingin (PGV Environmental, 2021b & Appendix E).

Application area falls within the proclaimed Gingin Groundwater Area (DWER-034) and Surface Water Area (DWER-037) proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The applicant holds an existing groundwater licence (GWL203789) for the purpose of extracting water and the proposed clearing will not involve disturbance to bed and banks of a watercourse. The application area has relatively flat topography, an average rainfall of 600 millimetres per annum and groundwater salinity mapped 500-1000 total dissolved solids (milligrams per litre) (DWER-026). Noting the area appears previously disturbed from grazing by livestock and groundwater modelling indicates no groundwater will be impacted as a result of the proposed work, the proposed clearing is not likely to deteriorate the quality of surface or groundwater.

Conclusion

Based on the above assessment, the proposed clearing will result in clearing of riparian vegetation. The application area includes seven individual multiple use wetlands. However, due to the completely degraded (Keighery, 1994) condition of the vegetation and noting multiple use wetlands are classified as having few important ecological attributes and functions remaining, the proposed clearing is not likely to have a significant impact on the values of these wetlands. Application area does not include mapped watercourses. Although the proposed clearing will involve clearing of riparian vegetation, it is not likely the loss will have a significant residual impact on the wetlands or deteriorate the quality of groundwater or surface water.

For the reasons set out above, the impacts of the proposed clearing on riparian vegetation and the multiple use wetlands are proposed to be mitigated through rehabilitating the site to ensure the habitat is not permanently lost. The applicant proposes to construct a wetland in the central part of the application area. Wetland will be rehabilitated in four lines with the areas closest to the wetland planted with rushes and appropriate species selected for the banks and top of banks (PGV Environmental, 2021b) (Appendix F).

Conditions

No Riparian vegetation, wetland, groundwater and surface water management conditions are required.

3.2.3. Environmental value: Land and water resources - Clearing Principles (g)

The application area is situated within the Bassendean soil-landscaping system described as sand dunes and sandplains with pale deep sand, semi-wet and wet soil comprising of Banksia-paperbark woodland and mixed heath vegetation (DPIRD, 2019).

The application area is not located within an area that is mapped as having a risk of acid sulfate soils. Soils within some extents of the application area are mapped susceptible to flooding, water logging, wind erosion, subsurface acidification and phosphorus export (DPIRD, 2019). As the purpose of the proposed clearing is for turf farming,

DWER sought advice from Department of Primary Industries and Rural Development (DPIRD) in relation to the land degradation risk categories.

The land degradation assessment report contained the following conclusions:

- The risk of salinity causing land degradation is low within the application area (CSLC, 2021).
- The risk of eutrophication causing land degradation will be low given the application area is relandscaped and appropriately monitored (CSLC, 2021).
- The risk of wind erosion causing land degradation will be low given application area is relandscaped and provide infill for lower areas to level the land for turf farm. The areas between the pivots would be planted to vegetation to provide wind breaks. Vegetation has already been planted along the fences to provide further windbreaks (CSLC, 2021).
- The risk of water erosion causing land degradation is low due to the soil type's present and the final land use being a turf farm (CSLC, 2021).
- The risk of waterlogging causing land degradation will be low due to the soil type present, depth to groundwater (one to two metres) and the relandscaping for the turf farm (CSLC, 2021).
- The risk of flooding causing land degradation will be low due to the application area already being parkland cleared, hence, removal of the native vegetation is unlikely to contribute to flooding (CSLC, 2021).

Conclusion

Based on the above assessment, it is considered that the impact of the proposed clearing on land degradation can be managed by the proposed moisture monitoring system used to maximise watering efficiently and nutrient monitoring undertaken by external consultants as planned by GTG Investments Pty Ltd. The proposed and already existing wind breaks, and landscaping of the application area will mitigate the majority of the risk of wind erosion (CSLC, 2021). Further mitigation, including managing the soil exposure timeframes, is required to further minimise wind erosion risks.

Wind break and landscaping commitments conditioned on the Development Approval issued by Shire of Gingin (Shire of Gingin, 2021) will not be conditioned on the clearing permit to minimise duplication in regulation.

Conditions

Commencement of construction within one month of clearing to further mitigate the risk of wind erosion will be required as a condition on the clearing permit.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include:

- Development approval under the *Planning and Development Act 2005* (issued by the Shire of Gingin)
- Licence to abstract ground water under the *Rights in Water and Irrigation Act 1914* (GWL203789).

The Shire of Gingin advised DWER that local government approval has been obtained by GTG Investments Pty Ltd, and that the proposed clearing is consistent with the Shire's Local Planning Scheme. The Shire did not have any objections to the proposed clearing and confirms the Development Approval held by GTG Investments Pty Ltd is valid (Shire of Gingin, 2021).

The application area is located within the Gingin Groundwater Area proclaimed under *the Rights in Water and Irrigation Act 1914* (RIWI Act) (DWER-034) and within a Surface Water Area or Irrigation Districts proclaimed under the RIWI Act (DWER-037). The applicant holds a valid groundwater licence (GWL203789) which expire on 22 December 2024. A bed or banks permit is not required due to the absence of a permanent watercourse. No additional permitting by DWER is required.

The application does not fall within a public drinking water source or a clearing control catchment protected under the *Country Areas Water Supply Act 1947* (CAWSA).

No Aboriginal sites of significance have been mapped within the application area. The closest known Aboriginal site is the Gingin Brook Waggyl Site (22280) (DPLH-001). 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. Additional information provided by applicant

Information	Description
Vegetation Assessment prepared by PGV Environmental on behalf of GTG Investments Pty Ltd (PGV Environmental, 2021a).	This document is an assessment of the vegetation on 2800 (Lot 5257) Cowalla Road, Gingin. The focus of the survey was mainly to assess the vegetation in the seven areas mapped as wetlands. Observations of the vegetation in the dryland areas were also assessed during the survey (PGV Environmental, 2021a).
Supporting information package prepared by PGV Environmental on behalf of GTG Investments Pty Ltd (PGV Environmental, 2021c).	This document provides background information to the proposed project and includes an assessment of the ten clearing principals. The document contains attachments of the Development Approval. Correspondence advice received from DBCA in regard to the wetlands and maps of the clearing permit area.
Rehabilitation Plan prepared by PGV Environmental on behalf of GTG Investments Pty Ltd (PGV Environmental, 2021b)	Details the mitigation measures proposed to mitigate the risk of clearing Carnaby's cockatoo foraging habitat and includes: • Maps of proposed rehabilitation areas. • Timeframe of the proposed work and the proposed rehabilitation. • Species list used for wetland rehabilitation, dryland rehabilitation and perimeter planting • Number of trees proposed for planting.

Appendix B. Site characteristics

B.1. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix C.

Characteristic	Details
Local context	The application area is situated within the Swan Coastal Plain bioregion approximately 23 kilometres southeast of Lancelin town site, within the Shire of Gingin. The total size of the property is 123.7 hectares and has been used for stock grazing for many years (PGV Environmental, 2021c). The application area is predominately cleared although many isolated native trees are located throughout the site and the application area is located in the intensive land use zone of Western Australia. Aerial imagery and spatial data indicate the local area (ten-kilometre radius from the centre of the application area) retains approximately 44.20 per cent of the original native vegetation cover (Appendix B.2.).
Ecological linkage	No ecological linkages are mapped or known to exist within the application area. From aerial imagery, vegetation surrounding the application area appears to comprise dense vegetation preferable as an ecological corridor in comparison to the completely degraded (Keighery, 1994) vegetation within the application area.
Conservation areas	According to available datasets, a number of conservation areas have been recorded with the ten-kilometre radius local area, namely; • Moore River National Park located 3.4 kilometres east of application area.

Characteristic	Details
	• Cowalla Bridge Marine Park located 1.5 kilometres northwest of application area. • Gnagara-Moore River State Forest located 5.6 kilometres southeast of application area. • Nabaroo Nature Reserve located 2.3 kilometres west of application area. The proposed application area does not fall within a conservation covenant, regional park or DBCA areas of interest (DBCA-012, DBCA-026).
Vegetation description	Photographs supplied by the applicant and a vegetation survey indicate the vegetation within the proposed clearing area consists of cleared pastureland with large, scattered trees among wetland and dryland landforms (PGV Environmental, 2021a). The vegetation identified within wetland landforms comprise of: • *Melaleuca preissiana* scattered trees over pasture • *Melaleuca rhaphiophylla/M. teretifolia* tall open scrub over *Lepidosperma* • *longitudinale/Gahnia trifida* sedgeland • *Lepidosperma longitudinale/Gahnia trifida* sedgeland • *Ficinia nodosa* sedgeland • *Eucalyptus rudis* tree Vegetation identified within dryland landforms comprise of scattered *Eucalyptus todtiana*. Full vegetation descriptions with mapping and photographs are available in Appendix E. This is consistent with the mapped vegetation type: • Heddle Bassendean Complex-North, which is described as vegetation ranges from a low open forest and low open woodland of Banksia species *Eucalyptus todtiana* (Prickly bark) to low woodland of Melaleuca species and sedgelands which occupy the moister sites (Government of Western Australia, 2019b). • Beard vegetation association (949), which is described as low woodland or open low woodland of Banksia (Government of Western Australia, 2019a). The mapped vegetation types retain approximately 71 per cent and approximately 57 per cent of the original extent respectively (Government of Western Australia, 2019).
Vegetation condition	The assessment descriptions with mapping and photographs indicate the vegetation within the proposed clearing area is severely impacted by multiple disturbances with no obvious understorey present (PGV Environmental, 2021a). The condition of the vegetation is completely degraded (Keighery, 1994), described as: • "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" (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in Appendix D. Vegetation descriptions with mapping and photographs are available in Appendix E.
Climate and landform	The application area is situated near the 650-millimetre rainfall isohyet and occupies lower slopes in the landscape. The application area is dominated by the following map units (DPIRD, 2019). • Bassendean, Phase 9. Map unit 212Bs_9 • Bassendean, Phase 7. Map The application area falls into the Bassendean system (Map Unit 212Bc) described as Swan Coastal from Busselton to Jurien, sand dunes and sandplains with pale deep sand, semi-wet and wet soil. Banksia-paperbark woodlands and mixed heath (DPIRD, 2019).
Soil description	The application area is located within four soil phases (DPIRD, 2019). • Bassendean, phase nine (212Bs_9) – Humic dark grey swamp soils • Bassendean, phase seven (212Bs_7) – Bleached sands

Characteristic	Details
	• Bassendean, phase seven + nine (212Bs_7+9) - Bleached sands and humic dark grey swamp soils, co-dominant. • Bassendean, phase seven + eight (212Bs_7+8) - Bleached sands, lower slopes and flat areas with 0-3 per cent slopes. Grey sand to light grey sand over dark iron-organic pan over pale sand 200 centimetres plus, gleyed clayey layers may be present at depth, pH - acid to neutral, co-dominant. Bassendean, phase nine (212Bs_9) is the dominant soil phase comprising approximately 65 per cent of the application area.
Land degradation risk	The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the systems level. The land degradation table B.6. below summaries the soil degradation risk within the application area. The risk of land degradation varies across the different soil phases within the application area. Majority of the proposed area is susceptible to water logging, wind erosion, subsurface acidification and phosphorus export.
Waterbodies	The application area is within the Moore River hydrographic catchment and falls within the Coastal Plain Hydrological Zone (DPIRD-069). Aerial imagery indicates that an inundation area transects the application area however there is no evidence of a watercourse within the application area (DPIRD-069). Several wetlands are mapped within the ten kilometres radius of the application area, seven individual multiple use wetlands occur within the application area.
Hydrogeography	The application area does not occur within a Public Drinking Water Source Area (DWER-033) or area subject to the *Country Areas Water Supply Act 1947*. The application area is mapped within the Moore River and certain tributaries surface water area and within the Gingin groundwater area under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (DWER-034, DWER-037). Groundwater salinity level (Total Dissolved Solids) is mapped as 500-1000 milligrams per litre (fresh water) (DWER-026).
Flora	Nine conservation significant flora taxa are known to occur within the ten-kilometre local area. The closest record identified is (*Dodonaea hackettiana)* 1.49 kilometres away from the application area and is categorised as a Priority four species. The vegetation assessment undertaken by PGV Environmental did not identify any threatened or priory species within the application area (PGV Environmental, 2021a). However, given the assessment was not a targeted flora survey and was conducted during February outside of the optimal survey period, the results are inconclusive. Based on the habitat features identified within the application area, the risk of threatened or priority flora occurring within the application area is low. The flora table B.3. below provides an analysis of the species identified within the local area.
Ecological communities	No ecological communities are mapped within the application area. The application area is adjacent to state listed Banksia woodland PEC on the eastern and southern boundaries of the application area.
Fauna	Ten conservation significant fauna species were identified within the local area including seven bird species, two invertebrate species and one mammal species. There were 18 records of Carnaby's cockatoo in the local area and one known black cockatoo breeding site located approximately 8.5 kilometres south of application area. The application area falls within a black cockatoo feeding area and the Carnaby's cockatoo distribution zone. The nearest record of Carnaby's cockatoo is 0.22 kilometres from the application area (GIS database). The fauna table B.4. below provides an analysis of the species identified within the local area.

B.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 Association**					
Bassendean (949)	209,983.26	120,287.93	57.28	67,844.75	32.31
Vegetation Complex*					
Bassendean Complex-North	79,057.35	56,659.67	71.67	30,558.65	38.65
Local area					
10km radius	31,437.48	20,462.53	65	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and vegetation assessment information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)
Allocasuarina grevilleoides	P3	N	N	3.96	1
Banksia dallanneyi subsp. pollosta	P3	N	N	4.13	3
Calothamnus accedens	P4	N	N	7.44	1
Calothamnus pachystachyus	P4	N	N	3.96	1
Dodonaea hackettiana	P4	N	Y	1.49	15
Gyrostemon sp. Mogumber (T.J. Hawkeswood 250)	P1	N	N	6.53	1
Leucopogon sp. Yanchep (M. Hislop 1986)	P3	N	N	3.96	9
Verticordia lindleyi subsp. lindleyi	P4	Y	N	9.35	2
Verticordia paludosa	P4	N	N	5.13	4

P: priority

B.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and vegetation assessment information, impacts to the following conservation significant fauna required further consideration.

Species name (Scientific name)	Common name	Conservation status	Distance of closest record to application area (km)	Number of known records (total)	Suitable habitat features? [Y/N]
BIRD					
Calyptorhynchus latirostris	Carnaby's cockatoo	EN	0.22	18	Y (foraging habitat)
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	EN	1.55	1	Y (foraging habitat)
Oxyura australis	Blue-billed duck	P4	1.84	3	N
Philomachus pugnax	Ruff (reeve)	MI	8.46	1	N
Plegadis falcinellus	Glossy ibis	MI	8.50	1	N
Thinornis rubricollis	hooded plover, hooded dotterel	P4	7.44	2	N
Tringa nebularia	Common greenshank, greenshank	MI	3.93	1	N
INVERTEBRATE					
Hylaeus globuliferus	woolybush bee	P3	7.55	2	N
Westralunio carteri	Carter's freshwater mussel	VU	3.47	1	N
MAMMALS					
Macrotis lagotis	bilby, dalgyte, ninu	VU	4.64	1	N

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

B.5. Ecological community analysis table

Community name	Conservation status (State)	Distance of closest record to application area (km)	Extend of PEC within 10km radius (total)	Are surveys adequate to identify? [Y, N, N/A]
Banksia Dominated Woodlands of the Swan Coastal Plain	P3	0.035	*Refer to section 3.2.1 above*	N
Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain	P3	2..04	*Refer to section 3.2.1 above*	N

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

B.6. Land degradation risk table

Land quality risk level against aspects of land degradation.

Map Unit 212Bs_9	
Risk categories	***Level of Risk***
Wind erosion	L1: 0% of map unit has a high to extreme hazard
Water erosion	H2: 100% of map unit has a very high to extreme hazard
Salinity	M1: 30% of map unit has a moderate hazard
Subsurface Acidification	H1: 100% of map unit has a high susceptibility
Flood risk	H2: 100% of the map unit has a moderate to high hazard
Water logging	H2: 100% of map unit has a moderate to very high risk
Phosphorus export risk	H2: 100% of map unit has a high to extreme hazard
Map Unit 212Bs_7	
Risk categories	***Level of Risk***
Wind erosion	M1: 30% of map unit has a high to extreme hazard
Water erosion	L1: 0% of map unit has a very high to extreme hazard
Salinity	L1: 0% of map unit has a moderate hazard
Subsurface Acidification	H1: 100% of map unit has a high susceptibility
Flood risk	H2: 100% of the map unit has a moderate to high hazard
Water logging	H2: 100% of map unit has a moderate to very high risk
Phosphorus export risk	H2: 100% of map unit has a high to extreme hazard
Map Unit 212Bs_7+9	
Risk categories	***Level of Risk***
Wind erosion	H1: 60% of map unit has a high to extreme hazard
Water erosion	L1: 0% of map unit has a very high to extreme hazard
Salinity	L1: 0% of map unit has a moderate hazard
Subsurface Acidification	H1: 100% of map unit has a high susceptibility
Flood risk	L1: 0% of the map unit has a moderate to high hazard
Water logging	H1: 60% of map unit has a moderate to very high risk
Phosphorus export risk	H1: 70% of map unit has a high to extreme hazard
Map Unit 212Bs_7+8	
Risk categories	***Level of Risk***
Wind erosion	H2: 80% of map unit has a high to extreme hazard
Water erosion	L1: 0% of map unit has a very high to extreme hazard
Salinity	L1: 0% of map unit has a moderate hazard
Subsurface Acidification	H1: 100% of map unit has a high susceptibility
Flood risk	L1: 0% of the map unit has a moderate to high hazard
Water logging	H1: 60% of map unit has a moderate to very high risk
Phosphorus export risk	H2: 85% of map unit has a high to extreme hazard

L = Low, M = Medium, H = High

Appendix C. 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: Native vegetation over the application area consists of scattered trees with no understorey (Appendix E). Native vegetation is in a completely degraded (Keighery, 1994) condition with no native species represented in the understorey. The application area does not represent any conservation significant ecological communities and does not support Threatened or Priority flora taxa. Application area comprises of scattered foraging trees suitable for Carnaby's black cockatoos. Considering, all biological values, the application area does not comprise a high level of biodiversity,	May 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 contains foraging habitat for Carnaby's cockatoos due to the presence of *Eucalyptus todtiana* within the application area (PGV Environmental, 2021a). However, considering the completely degraded (Keighery, 1994) vegetation condition availability of better condition vegetation in conservation estate locally, it is unlikely the clearing will result in a significant residual impact to Carnaby's cockatoo foraging habitat. To mitigate the cumulative loss of Carnaby's cockatoo foraging habitat, applicant proposes to rehabilitate approximately 9.7 hectares of Carnaby's foraging habitat within the proposed Turf farm (PGV Environmental, 2021b).	At variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: Native vegetation identified within the application area is in a completely degraded (Keighery, 1994) condition. The area proposed to be cleared is unlikely to contain habitat for threatened flora species listed under the *BC Act*.	Not likely to be at variance	No
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 does not contain species that can indicate a Threatened Ecological Community at state or commonwealth level.	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 consistent with the national objectives and targets for biodiversity conservation in Australia. The extent of vegetation remaining within the bioregion, vegetation association and	Not at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
vegetation complex (refer to Appendix B.2.) is greater than 30 per cent (Commonwealth of Australia, 2001) threshold. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.		
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 does not fall within a conservation area. Given the distance to the nearest conservation area, the proposed clearing is not likely to directly or indirectly impact on the environmental values of any conservation area.	Not at variance	No
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: Seven multiple use wetlands are mapped within the application area and the level of protection or restriction on development on multiple use wetlands when compared to resource enhancement wetlands and CCW is significantly lower. As such the proposed clearing is unlikely to impact on environment associated with a watercourse or wetland. The proposed clearing will involve clearing of riparian vegetation within the multiple use wetlands.	At variance	Yes *Refer to Section 3.2.2, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: As outlined within Appendix B.6, the application area is located within four soil map units with the most dominant being the Bassendean phase nine map unit (212Bs_9) which occupies approximately 65 per cent of the application area (DPIRD, 2019). The greatest risk of land degradation from the proposed clearing is identified as phosphorus export (eutrophication) and wind erosion from the advice received by Commissioner of Soil and Land Conservation (CSLC), however noting that a moisture monitoring system will be used to maximise watering efficiency and nutrient monitoring undertaken by external consultants as well as wind breaks and landscaping of the application area (CSLC, 2021), it is unlikely that the proposed clearing will have an appreciable impact on land degradation.	At variance	Yes *Refer to Section 3.2.3, above.*
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: Seven individual multiple use wetlands are mapped within the application area. No Public Drinking Water Source Areas (DWER-033) or CAWSA clearing control catchments are recorded within the application area. The application area falls within the proclaimed Gingin groundwater area and the applicant holds a valid groundwater licence for the purpose of extracting water for the turf farm. Extensive groundwater modelling was undertaken to ensure the proposed development does not impact groundwater (PGV	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental, 2021c). Application area is within the Moore River and certain tributaries proclaimed area under the RIWI Act, surface water areas. Groundwater salinity is mapped at 500-1000 total dissolved salts (TDS) milligrams per litre (mg/L), that is fresh (DWER-026). The proposal is not likely to cause deterioration in the ground water.		
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: The application area is mapped within an inundation area however, during a site visit by Commissioner of Soil and Land Conservation (CSLC), no areas of inundation were observed on the property. The proposed clearing area is parkland cleared with isolated trees throughout the property and the removal of native vegetation is not expected to contribute to flooding (CSLC, 2021). The application area is not mapped within a floodplain area. Given the soil type present, current water table depth (one to two meters) and the proposed landscaping for the turf farm operation, it is unlikely that any waterlogging will occur on the proposed area to clear.	Not likely to be at variance	No

Appendix D. Vegetation condition rating scale

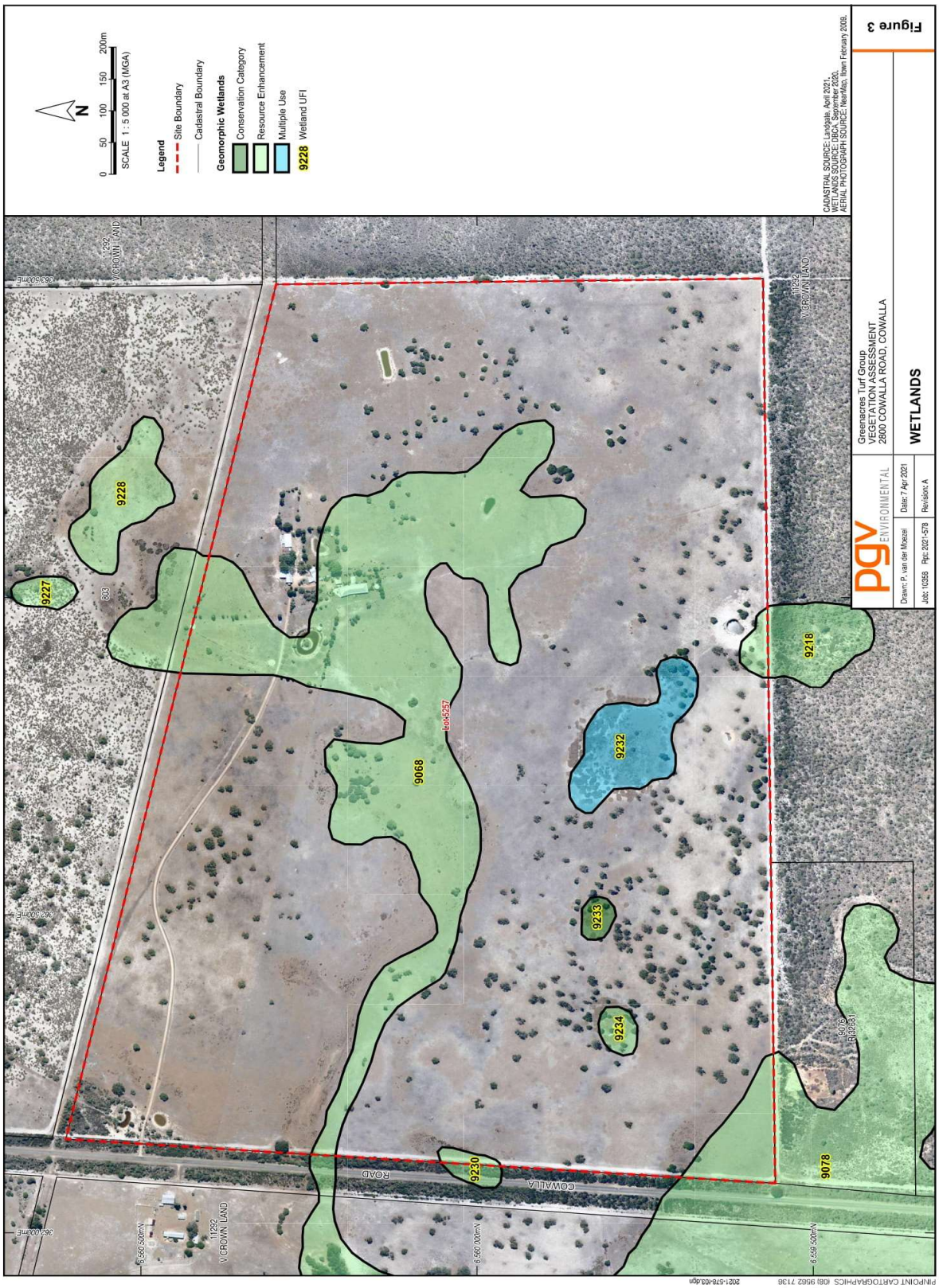
Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree 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 E. Vegetation Assessment excerpts (PGV Environmental, 2021a), External advice excerpts (PGV Environmental, 2021c) and Rehabilitation Plan excerpts (PGV Environmental 2021b).



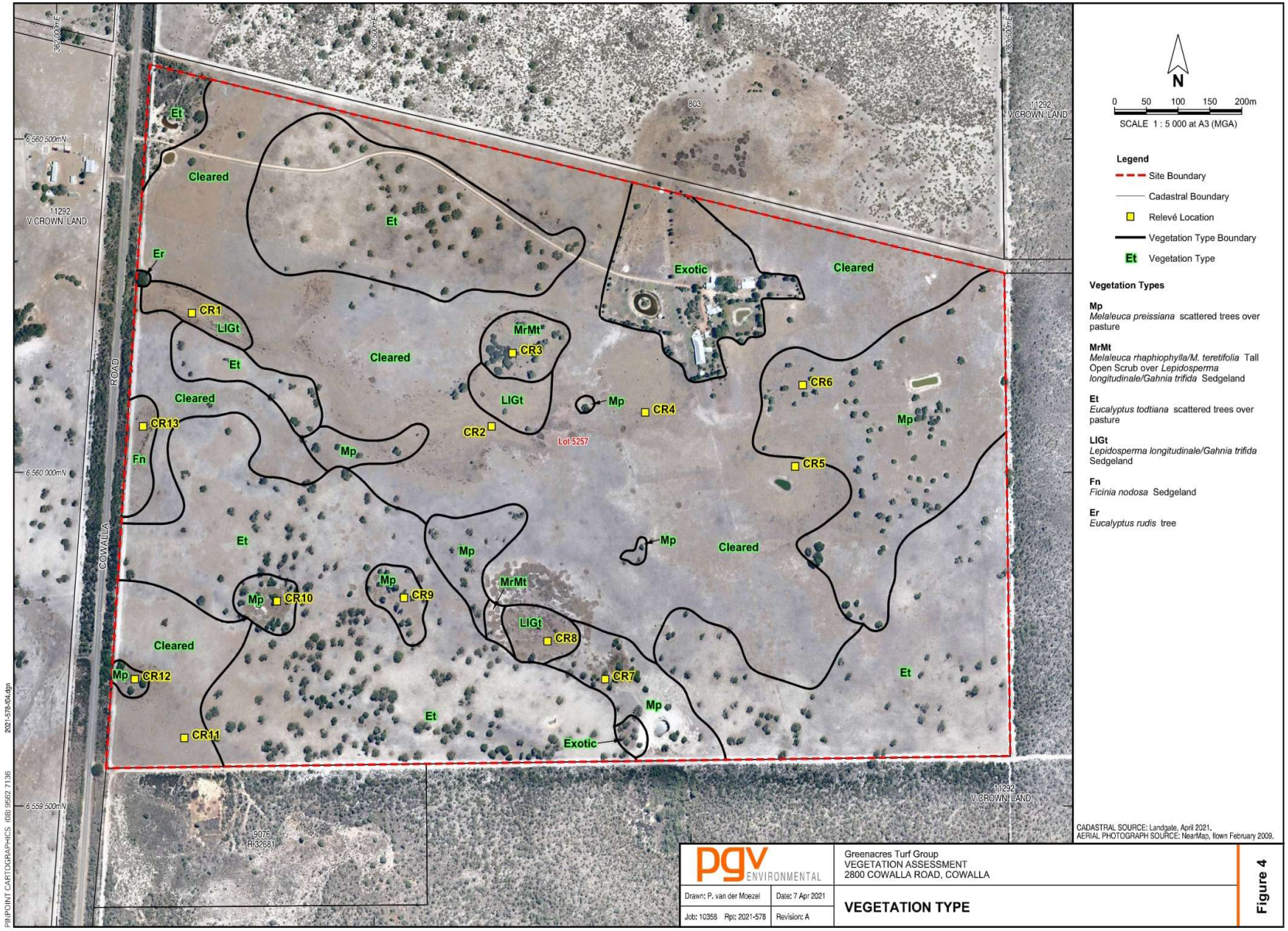

N
0 50 100 150 200m
SCALE 1 : 5 000 at A3 (MGA)
Legend
Site Boundary
Cadastral Boundary
Relevé Location
Vegetation Type Boundary
Et Vegetation Type
Vegetation Types
Mp
Melaleuca preissiana scattered trees over pasture
MrMt
Melaleuca rhaphiophylla/M. teretifolia Tall Open Scrub over Lepidosperma longitudinale/Gahnia trifida Sedgeland
Et
Eucalyptus todtiana scattered trees over pasture
LIGt
Lepidosperma longitudinale/Gahnia trifida Sedgeland
Fn
Ficinia nodosa Sedgeland
Er
Eucalyptus rudis tree
COWALLA ROAD
6 560 500mN
6 560 000mN
6 559 500mN
11292 V CROWN LAND
803
9076 R 32681
Lot 5257
Cleared
Exotic
CR1
CR2
CR3
CR4
CR5
CR6
CR7
CR8
CR9
CR10
CR11
CR12
CR13
CADASTRAL SOURCE: Landgate, April 2021.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown February 2009.
PINPOINT CARTOGRAPHICS (08) 9582 7136
2021-578-f04.dgn
pgv ENVIRONMENTAL
Greenacres Turf Group
VEGETATION ASSESSMENT
2800 COWALLA ROAD, COWALLA
Drawn: P. van der Moezel
Date: 7 Apr 2021
Job: 10358 Rpt: 2021-578
Revision: A
VEGETATION TYPE
Figure 4

Table 2: Vegetation on the Site

Vegetation Type	Description	Photograph
Wetland Vegetation		
UFI 9068 Vegetation Types: Cleared, Mp, MrMt, LlGt, Er	This is the largest wetland on the site and was previously mapped as a Resource Enhancement wetland but is now considered a Multiple Use wetland. The wetland extends from the western boundary to close to the eastern boundary. Vegetation and soil mapping suggests the wetland extends to the eastern boundary. The landform of the western third of the wetland, with a slight west-east trending depression or 'channel', indicates that some surface water might flow to the west during periods of high rainfall. Most of the wetland is bare of native vegetation (top photo to the right). The vegetation on the western part of the wetland is mostly non-native pasture species including Couch Grass and Perennial Veldtgrass as well as other introduced species such as *Cyperus gymnocaulos, Romulea rosea* (Guildford Grass), *Hordeum leporinum* (Barley Grass), *Lotus subbiflorus*, *Persicaria prostrata, Rumex crispus* and *Cyperus congestus*. At the western end some native *Gahnia trifida* and *Lepidosperma longitudinale* sedges fringe the central west-east 'channel' (middle photo to the right) Some scattered Paperbark trees occur in the wetland. One native Flooded Gum (*Eucalyptus rudis*) occurs at the western end of the wetland.	 

Vegetation Type	Description	Photograph
Wetland Vegetation		
	A small stand of native *Melaleuca rhaphiophylla* and *Melaleuca teretifolia* over *Lepidosperma longitudinale* and *Gahnia trifida* occurs in the central part of the wetland (bottom photo to the right). Most of the understorey however contains introduced species particularly Couch Grass and Barley Grass and also *Rumex acetosella, Rumex crispus* (Dock), *Cirsium vulgare* (Spear Thistle) and *Citrullus amarus* (Melon). Relevés 1,2,3,4,5 and 6 were located in this wetland	
UFI 9233 Vegetation Types: Cleared, Mp	This is a small wetland that was previously mapped as a Conservation Category wetland and is now considered a Multiple Use wetland. The vegetation consists of several *Melaleuca preissiana* trees to 8m over introduced species including *Ehrharta calycina* (Perennial Veldtgrass), *Cynodon dactylon* (Couch Grass), *Arctotheca calendula* (Capeweed), *Cyperus* sp. No native understorey was present. Relevé 9 was located in this wetland	

Vegetation Type	Description	Photograph
Wetland Vegetation		
UFI 9232 Vegetation Types: Cleared, Mp, MrMt, LlGt	This is a medium sized wetland that has remained as a Multiple Use wetland. The southern half of the wetland contains *Melaleuca preissiana* trees to 5m over a mix of native sedges (*Ficinia nodosa, Lepidosperma longitudinale*) and introduced species Perennial Veldtgrass, Capeweed, Couch Grass and *Cyperus* sp. (top photo to the right) The northwestern end of the mapped wetland is wetter than the southern end and contains a few *Melaleuca teretifolia* shrubs to 2m. (bottom photo to the right) Relevés 7 and 8 were located in this wetland	 

Vegetation Type	Description	Photograph
Wetland Vegetation		
UFI 9234 Vegetation Types: Cleared, Mp	This is a small wetland that was previously mapped as a Resource Enhancement wetland and is now considered a Multiple Use wetland. The vegetation consists of several *Melaleuca preissiana* trees to 5m over introduced species including *Ehrharta calycina* (Perennial Veldtgrass), *Taraxacum officinale* (Dandelion) and *Cyperus* sp. No native understorey was present. Relevé 10 was located in this wetland	
UFI 9230 Vegetation Types: Cleared, Fn	This is a very small wetland straddling the mid-west boundary of the site that was previously mapped as a Resource Enhancement wetland and is now considered a Multiple Use wetland. The vegetation consists of native *Ficinia nodosa* Sedgeland with introduced species particularly Perennial Veldtgrass, Couch Grass as well as Guildford Grass, Capeweed and *Cyperus congestus*. Relevé 13 was located in this wetland	

Vegetation Type	Description	Photograph
Wetland Vegetation		
UFI 9078 Vegetation Types: Cleared, Fn	This is a small wetland in the south-west corner of the site that was previously mapped as a Resource Enhancement wetland and is now considered a Multiple Use wetland. The vegetation is mostly cleared pasture grasses. One small stand of *Melaleuca preissiana* occurs at the north-west tip of the wetland. Relevés 11 and 12 were located in this wetland	
Dryland Vegetation		
Eucalyptus todtiana scattered trees over pasture	Most of the elevated parts of the site contained scattered *Eucalyptus todtiana* (Pricklybark) trees over pasture on sandy dry soils. No other native shrubs, sedges, herbs etc were present in these areas apart from a few *Jacksonia furcellata* shrubs. No relevés were sampled from the areas of scattered *Eucalyptus todtiana.*	

From: Michael Roberts <michael.roberts@dbca.wa.gov.au>
Sent: Monday, 8 March 2021 12:56 PM
To: marie@sportsturf.net.au
Subject: RE: Development Application - Turf Farm - Lot 5257 Cowalla Rd, Cowalla (DBCA ref: PRS 46504)

Hello Marie

Apologies for the delay in responding, I have undertaken further liaison within the department and have been advised that as part of the department's review of the Geomorphic Wetlands Swan Coastal Plain dataset, the wetlands on Lot 5257 are no longer considered to be Resources Enhancement (REW) or Conservation category wetland (CCW) classification with the wetlands remapped to multiple use (MUW). This information was not available previously as the revised dataset has not been finalised or publicly released.

Accordingly given that the wetlands are multiple use, there is not the same level of protection or restrictions on development when compared to REW or CCW wetlands. As such the department does not object to the proposed development.

Regards

Michael Roberts | Planning Officer (Land Use) |

Department of Biodiversity, Conservation and Attractions

Parks and Wildlife Service

Swan Coastal District

5 Dundebar Road Wanneroo WA 6065

P 9303 7755

Department of
Primary Industries and Regional Development

GOVERNMENT OF WESTERN AUSTRALIA

Our Ref: CPS 9354/1
Enquiries: Buddy Wheaton
Telephone: 9368 3282
Date: 5 October 2021

Ms Jessica Burton
A/Senior Environmental Officer
Native Vegetation Regulation
Department of Water and Environment Regulation
Locked Bag 10
JOONDALUP WA 6919

Dear Ms Burton

CPS 9354/1 – APPLICATION TO CLEAR NATIVE VEGETATION WITHIN LOT 5257 ON DEPOSITED PLAN 162517, COWALLA – GTG INVESTMENTS PTY LTD.

Thank you for your email dated 11 August 2021, requesting advice on land degradation impacts associated with the proposed clearing of 7.76 hectares of native vegetation for the purpose of developing a turf farm.

Mr John Firth of this office inspected the land clearing application area on 27 August 2021. I attach for your information, a copy of his report.

Mr Firths report noted that the application area is on the lower slopes of the landscape and is located on two soil-landscape units of the Bassendean Phase: Phase 9, Map Unit 212Bs_9 and Phase 7, Map Unit 212Bs_7. Map Unit 212Bs_9 is comprised of humic dark grey swamp soils; Map Unity 212Bs_7 is described as bleached sands.

The mixed eucalyptus vegetation is in poor condition with evidence of past grazing by livestock.

The report identified eutrophication and wind erosion of sandy rises as potential risks should the CPS area be cleared of vegetation. However, it is noted that a moisture monitoring system will be used to maximize watering efficiency and nutrient monitoring will be undertaken by external consultants. Additionally, wind breaks and landscaping of the application area should reduce the risks of wind erosion.

Therefore, based on the information available to me at the time of the assessment, I am of the opinion that the clearing of the application area is not likely to be at variance with principle (g) for land degradation.

Yours sincerely

B. Wheaton

Buddy Wheaton
DEPUTY COMMISSIONER OF SOIL
AND LAND CONSERVATION
Att:

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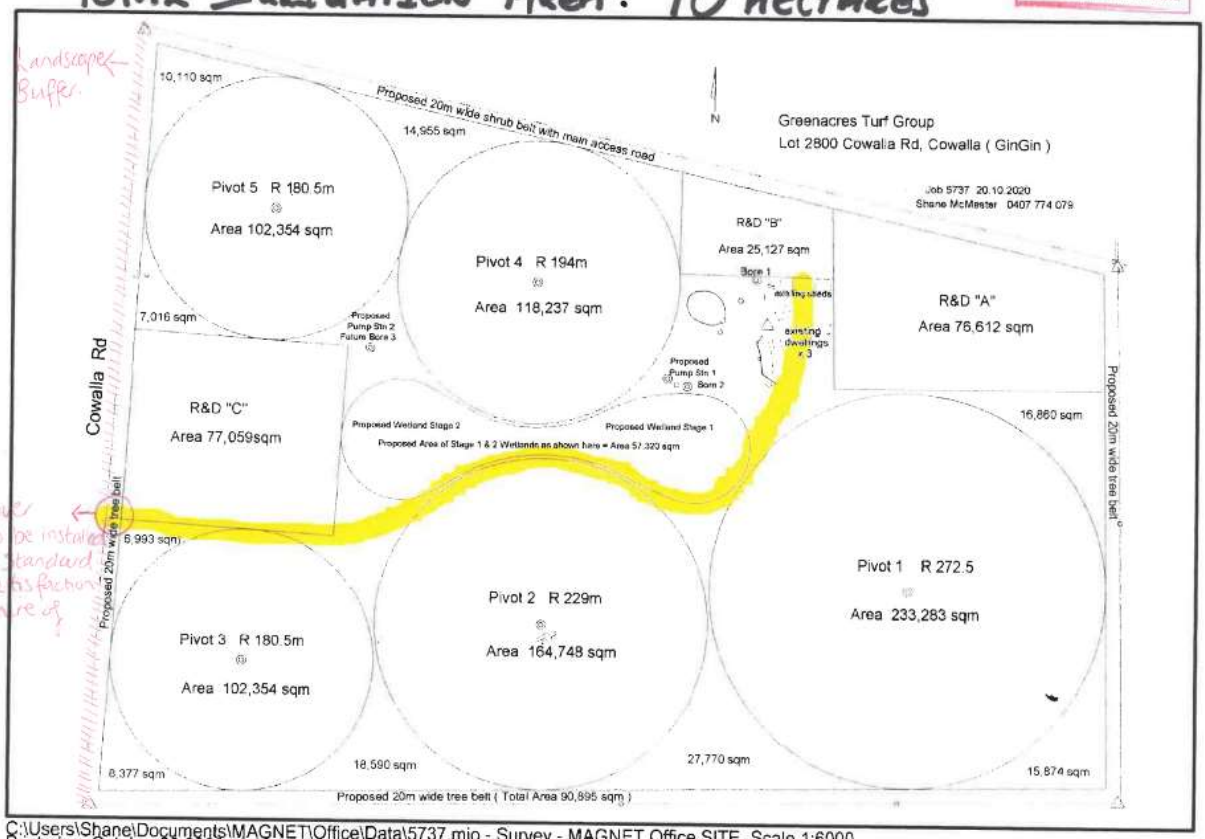
TOTAL IRRIGATION AREA: 90 HECTARES



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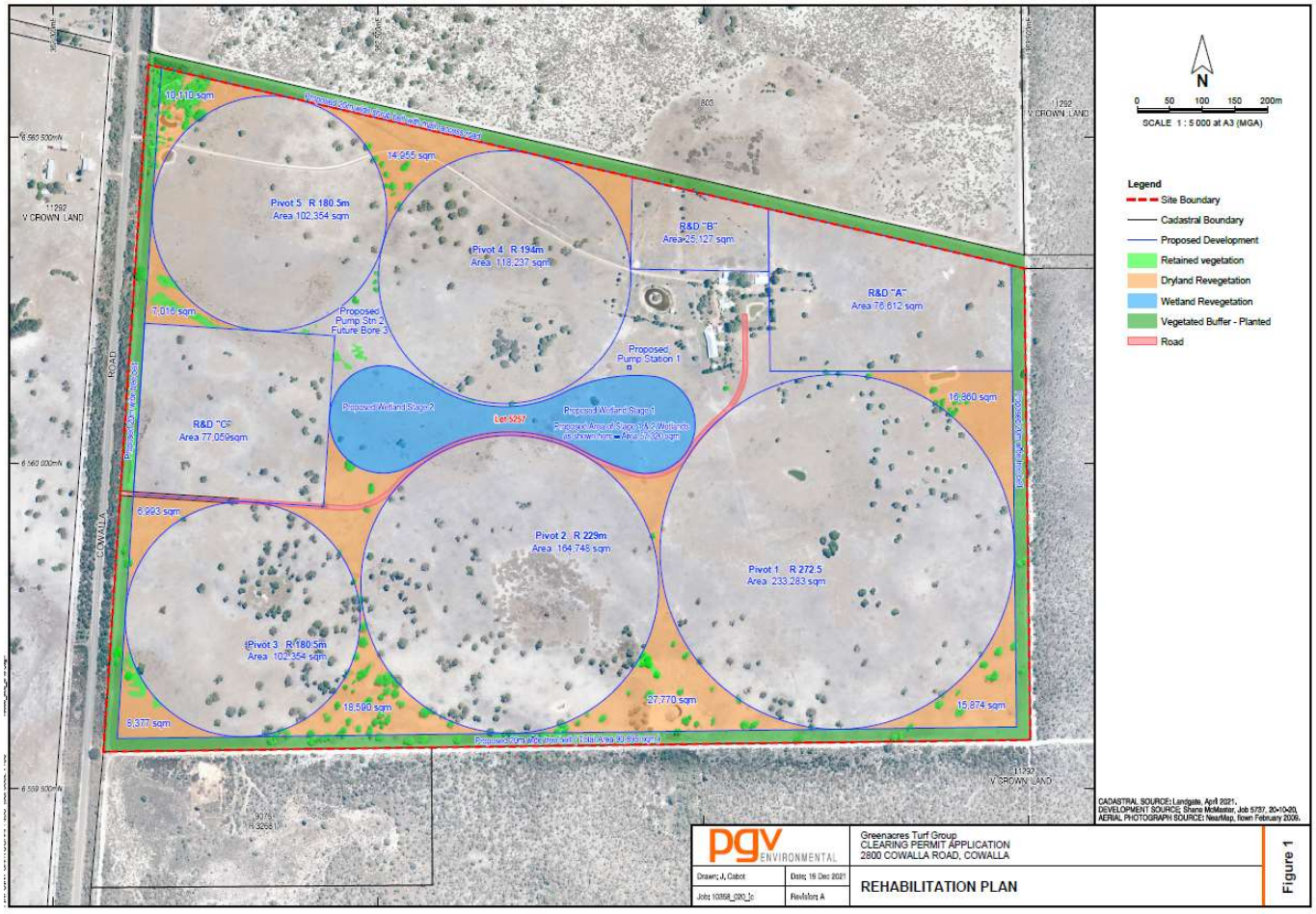

Table 1: Species Used in Rehabilitation of Wetland Area

Species	Common Name	Carnaby's Cockatoo Foraging*
First line – Waterline		
Juncus pallidus	Club Rush	No
Juncus pauciflorus	Loose Flower Rush	No
Juncus subsecundus	Finger Rush	No
Second line – Lower Bank		
Banksia prionotes	Acorn Banksia	Yes
Callistemon citrinus	Red Bottlebrush	No
Callistemon salignus	Willow Bottlebrush	No
Callistemon viminalis	Weeping Bottlebrush	Yes
Hakea bucculenta	Red Pokers	Yes
Hakea corymbosa	Cauliflower Hakea	No
Hakea laurina	Pin-cushion Hakea	Yes
Hakea multilineata	Grass Leafed Hakea	Yes
Third line – Upper Bank		
Acacia saligna	Coojong	Yes
Eucalyptus caesia	Silver Princess Gum	Yes
Eucalyptus kondininensis	Kondinin blackbutt	No
Eucalyptus macrocarpa	Mottlecah	No
Eucalyptus platypus	Moort	No
Eucalyptus utilis	Coastal Moort	No
Melaleuca armillaris	Bracelet Honey Myrtle	No
Melaleuca hamulosa	Broom Bush	No
Melaleuca nesophila	Showy Honey-myrtle	No
Fourth line – Upper Bank		
Casuarina obesa	Swamp She-oak	Yes
Corymbia citriodora	Lemon-scented Gum	Yes
Corymbia maculata	Spotted Gum	No
Eucalyptus camaldulensis	River Red Gum	Yes
Eucalyptus grandis	Rose Gum	Yes
Grevillea robusta	Silky Oak	Yes

Table 2: Dryland Species List

Species	Common Name	Carnaby's Cockatoo Foraging*
Line 1 - Shrubs		
Kunzea ericifolia	Spearwood	No
Kunzea muelleri	Yellow Kunzea	No
Callistemon viminalis	Weeping Bottlebrush	Yes
Melaleuca incana	Grey Honey Myrtle	No
Hakea bucculenta	Red Pokers	Yes
Hakea laurina	Pin-cushion Hakea	Yes
Hakea multilineata	Grass Leafed Hakea	Yes
Melaleuca fulgens	Scarlet Honey Myrtle	No
Line 2 – Large Shrubs and Small Trees		
Acacia saligna	Coojong	Yes
Banksia prionotes	Acorn Banksia	Yes
Banksia attenuata	Candlestick Banksia	Yes
Corymbia ficifolia	Red Flowering Gum	Yes
Melaleuca viminea	Mohan	No
Eucalyptus platypus	Moort	No
Eucalyptus caesia	Silver Princess Gum	Yes
Eucalyptus todtiana	Blackbutt	Yes
Allocasuarina fraseriana	Western Sheoak	Yes
Casuarina obesa	Swamp Sheoak	Yes

Species	Common Name	Carnaby's Cockatoo Foraging*
Line 3 – Large Trees		
Corymbia calophylla	Marri	Yes
Corymbia citriodora	Lemon-scented Gum	Yes
Corymbia maculata	Spotted Gum	Yes
Eucalyptus grandis	Rose Gum	Yes
Eucalyptus leucoxylon	Yellow Gum	Yes
Eucalyptus macrocarpa	Mottlecah	No
Eucalyptus gomphocephala	Tuart	Yes
Grevillea robusta	Silky Oak	Yes

Table 3: Approved Buffer Species List

Species	Common Name	Carnaby's Cockatoo Foraging*
Acacia saligna	Coojong	Yes
Allocasuarina fraseriana	Western Sheoak	Yes
Beaufortia sparsa	Swamp Bottlebrush	No
Callistemon citrinus	Crimson Bottlebrush	No
Callistemon phoeniceus	Scarlet Bottlebrush	No
Calothamnus hirsutus	Hawkeswood	No
Calothamnus lateralis		No
Casuarina obesa	Swamp Sheoak	Yes
Corymbia calophylla	Marri	Yes
Corymbia citriodora	Lemon-scented Gum	Yes
Corymbia ficifolia	Red Flowering Gum	Yes
Corymbia maculata	Spotted Gum	No
Eucalyptus gomphocephala	Tuart	Yes
Eucalyptus grandis	Rose Gum	Yes
Eucalyptus leucoxylon	Yellow Gum	Yes
Eucalyptus macrocarpa	Mottlecah	No
Eucalyptus platypus	Moort	No
Grevillea robusta	Silky Oak	Yes
Kunzea ericifolia	Spearwood	No
Kunzea muelleri	Yellow Kunzea	No
Melaleuca fulgens	Scarlet Honey Myrtle	No
Melaleuca incana	Grey Honey Myrtle	No
Melaleuca viminea	Mohan	No

Plate 1: Rehabilitated Wetland by Greenacres Turf Group in Serpentine

Plate 2 and 3: Rehabilitated Areas around Pivot by Greenacres Turf Group in Serpentine

Appendix F. Sources of information

F.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)

F.2. References

Atlas of Living Australia (n.d). *Hylaeus (Sphaerhylaeus) globuliferus* (Cockerell, 1929). Available from https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:d3d52d02-537e-4cda-bfb2-0c0e93e38088

Birdlife Australia (2021) Blue-billed Duck (*Oxyura australis*). Available from https://www.birdlife.org.au/bird-profile/blue-billed-duck

Commissioner of Soil and Land Conservation (CSLC) (2021) *Land Degradation Advice and Assessment Report for clearing permit application CPS 9354/1,* received 6 October 2021, Department of Primary Industries and Regional Development, Western Australia (DWER Ref: A2057001).

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Commonwealth of Australia (2017) Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo.

Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.

Department of Biodiversity, Conservation and Attractions (DBCA) (2021) Regional advice from the Swan Coastal District for clearing permit application CPS 9354/1, received 08 March 2021. Department of Biodiversity, Conservation and Attractions, Western Australia. (DWER Ref: DWERDT478243).

Department of Parks and Wildlife (2013) Carnaby's cockatoo (*Calyptorhynchus latirostris*) Recovery Plan. Department of Parks and Wildlife, Perth, Western Australia.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development.* Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed 19 October 2021).

Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.

GTG Investments Pty Ltd (2021) *Clearing permit application CPS 9354/1*, received 13 July 2021 (DWER Ref: DWERDT478243).

Government of Western Australia. (2019a) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Government of Western Australia (2019b) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, https://catalogue.data.wa.gov.au/dataset/dbca

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Klunzinger M. W., Beatty S. J., Morgan D. L., Pinder A. M., and Lymbery A. J.. (2015). Range decline and conservation status of Westralunio carteri Iredale, 1934 (Bivalvia: Hyriidae) from southwestern Australia

Shire of Gingin (2021) *Advice for clearing permit application CPS 9354/1*, received 28 October 2021 (DWER Ref: DWERDT520846).

PGV Environmental (2021a) *Vegetation Assessment, 2800 Cowalla Road, Cowalla*, received 13 July 2021 (DWER Ref: DWERDT478243).

PGV Environmental (2021b*) CPS 9354/1 – Lot 5257 (2800) Cowalla Road, Cowalla – Rehabilitation Plan*, received 20 December 2021 (DWER Ref: DWERDT541323).

PGV Environmental (2021c) *Supporting information for clearing permit application CPS 9354/1,* received 13 July 2021 (DWER Ref: DWERDT478243).

SPRAT (2021) Species Profile and Threats Database. Department of Agriculture, Water and the Environment. Available from https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66726

Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation. December 2008.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed 19 December 2021)