





Wedgefield Industrial Estate

Vegetation and Fauna Management Plan

DevelopmentWA

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1. Introduction

This Flora and Fauna Management Plan relates to the development of Wedgefield Industrial Estate as identified in the Wedgefield Industrial Estate Development Plan (WIEDP) at Port Hedland in Western Australia. The scheme to implement the development of the WIEDP was referred to the Environmental Protection Authority (EPA) in April 2010 with an outcome of “Not Assessed- Advice Given”.

The Department of Environment and Conservation (DEC) in the Pilbara has undertaken a preliminary review of the WIEDP and provided a recommendation that a Management Plan be prepared that focuses on the protection of flora and fauna protected under the *Wildlife Conservation Act 1950* (now *Biodiversity Conservation Act 2016* (BC Act)) and the *Environmental Protection and Biodiversity Act 1999* (EPBC Act).

Structure Plans provide a framework for the coordinated provision and arrangement of future land use, subdivision and development. The Structure Plan for the WIEDP generally relates to an area of approximately 280 hectares located to the east and south east of the existing Wedgefield industrial area (Figure 1). The objective of the Structure Plan is to coordinate the strategic expansion of Wedgefield. The Structure Plan acknowledges the various Light Industry, Industry and Transport Development zones as they are outlined on the accompanying Scheme Amendment, with each zone having a range of permissible uses based on its envisaged role in relation to the broader Port Hedland area.

Various subdivision application approvals have been granted by the West Australian Planning Commission (WAPC) to authorise development with the WIEDP area. The most recent subdivision approval, with conditions, was issued by WAPC on 9 September 2021, with a four year validity period. Subdivision approval conditions 6 states:

*“Prior to the commencement of subdivision works a wildlife protection management plan for Bush-tailed Mulgara (*Dasyercus blythi*) is to be prepared and approved to ensure the protection and management of the sites environmental assets with satisfactory arrangements being made for the implementation of the approved plan (Local Government).”*

1.1 Previous studies/reference documents

The existing environment of the study area has also been well documented from a number of studies undertaken specifically for the proposed development. The following reports baseline information on the flora and fauna present within the WIEDP:

- GHD 2009 Preliminary Environmental Impact Assessment and Biological Survey: Report for LandCorp Industrial Land LIA 3,4,5 and General Transport A
- GHD 2011 Wedgefield Industrial Estate – LIA 3 and Transport Area A Additional Mulgara Assessment
- GHD 2021 Wedgefield Industrial Estate Clearing - Mulgara Fauna Assessment Letter 8 September 2021
- GHD 2022 Wedgefield Industrial Estate Clearing - Mulgara Fauna Assessment Letter 14 February 2022.

A brief summary of the outcomes of these studies is provided in each management section below, where relevant.

1.2 Purpose of this report

This Vegetation and Fauna Management Plan (VFMP) was originally developed in response to advice from DEC to develop a document a management plan that focuses on the protection of flora and fauna listed under the BC Act and EPBC Act. The VFMP has been revised to incorporate additional clarity regarding management measures for Bush-tailed Mulgara (Mulgara).

The purpose of the VFMP is to outline the required management measures, and monitoring and corrective actions for the development of the WIEDP, as they relate to vegetation and fauna values, and in particular Mulgara.

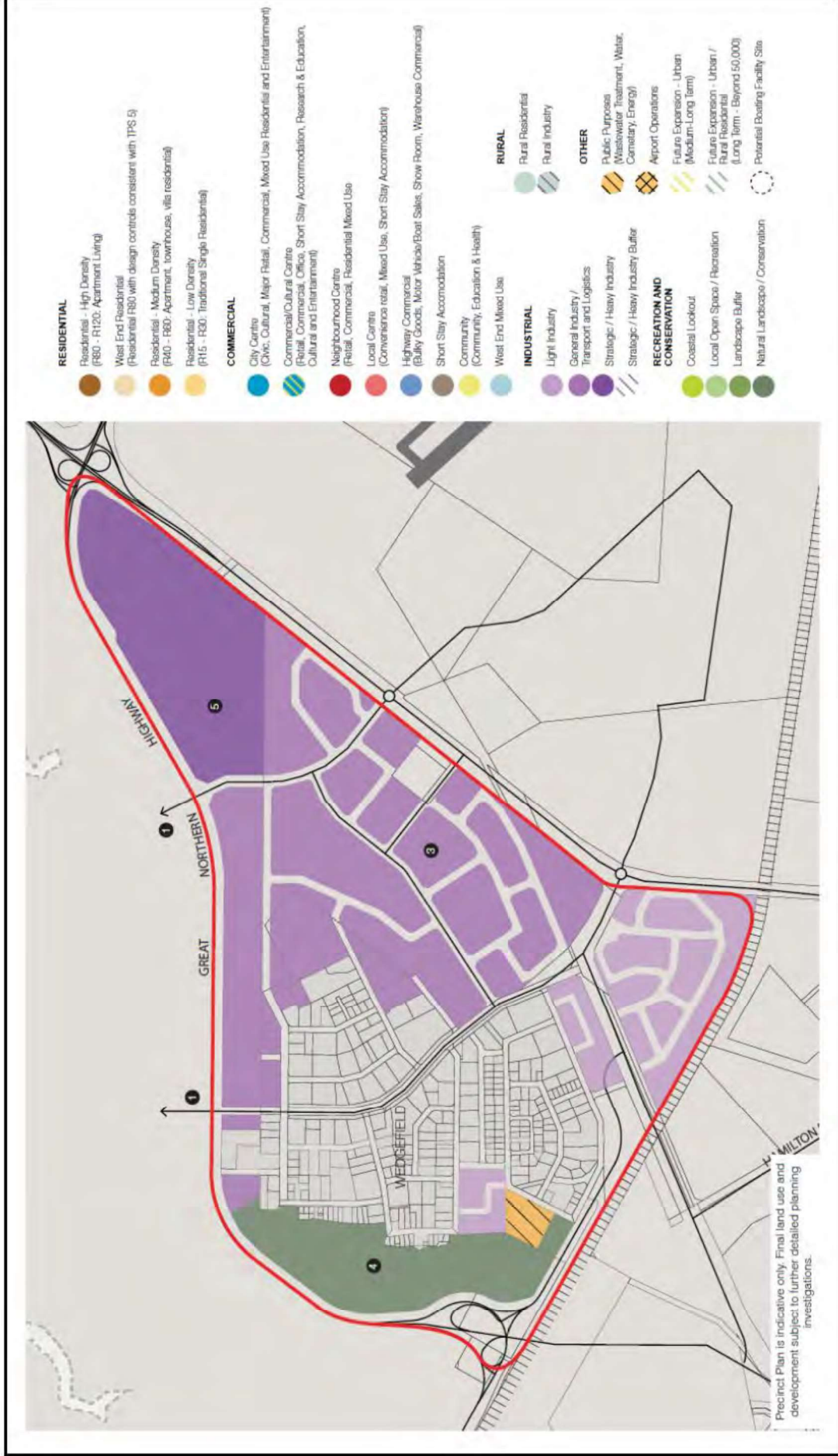


Figure 1 WIEDP Structure Plan

1.3 Scope and limitations

This report has been prepared by GHD for DevelopmentWA and may only be used and relied on by DevelopmentWA for the purpose agreed between GHD and DevelopmentWA as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than DevelopmentWA arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

1.4 Flora and fauna management objectives

Management objectives that relate to the components of this Flora and Fauna Management Plan are outlined in Table 1.

Table 1 *Ecological management objectives*

Environmental Aspect	Objective
Vegetation Clearance	To minimise the area of vegetation that is removed or disturbed outside of the development footprint.
Threatened Flora	To minimise the potential impacts on conservation significant flora species.
Weed Management	To minimise the potential for the spread or introduction of weeds.
Rehabilitation	To utilise existing vegetative resources for rehabilitation, re-establish locally occurring vegetation and minimise the risks of erosion and nuisance dust.
Fauna Protection	To minimise disturbance to any native fauna species and in particular Mulgara.

2. Vegetation Management

2.1 Summary of existing environment

The vegetation is almost completely uniform across the survey areas, with minor changes due to differing dominance of individual grass/Spinifex species, and also to historical disturbance. The vegetation consists of a low shrubland of *Acacia stellaticeps* over mixed tussock grassland of *Triodia epactia* and *T. schinzii* over very open herbs. Most of the vegetation is in excellent condition, with some weed invasion in disturbed areas (mostly on boundaries and tracks) of Buffel grass. No significant vegetation communities or threatened plant species were recorded.

Potential impacts on vegetation and flora include:

- Vegetation clearance
- Loss of significant flora species
- Introduction or spread of significant weed species.

To minimise the potential impacts on vegetation and flora of the project area, the following management measures are recommended. These management measures will be implemented during construction of the proposed development.

2.2 Vegetation clearance

The following management measures are proposed to be implemented during the development of Wedgefield Industrial Estate. The general principles that will be adhered to are:

- Vegetation clearance will be restricted to that necessary for the purpose of the development
- The limit of clearing and earthworks will be adequately flagged/signposted prior to the commencement of works, to minimise the risk of disturbance to vegetation in adjacent areas
- Vegetation removal will be planned to ensure the area denuded of vegetation is exposed for the shortest possible time before construction or other stabilisation treatment
- Burning of cleared vegetative materials or burning will not be permitted under any circumstances
- Vehicle and construction equipment movement will be confined to well defined tracks within the construction area to minimise disturbance of adjacent vegetation to be retained
- Good quality vegetation will be stripped and stockpiled for re-use in rehabilitation
- Stockpiles should be no higher than 2.0 m and should be kept for the minimum period possible
- Construction compounds and stockpile areas will be located within the construction zone of WIEDP or in other approved areas.

2.3 Significant flora species

No significant flora species have been identified within the clearing area, however, there is a chance that one of the species in LIA 4 may be a Priority 1 plant. The plant was only recorded once, on the edge of the lot, prior to it becoming a Priority 1 species, and no further assessment work is proposed.

2.4 Weed management

- The boundaries between areas of low and high levels of weed invasion will be clearly marked in the field prior to earthworks commencing
- Designated weedy vegetation will be cleared separately from weed-free areas and disposed of in accordance with Shire requirements
- Any machinery and off-road vehicles used during construction will be inspected and cleaned of all vegetative and soil matter prior to entering the WIEDP area, if required

- Under dry weather conditions, compressed air will be used for removing soil. Brooms will be used for sweeping loose soil from truck bodies; bars or other hand tools will be used to remove compacted soil from dozer track cleats and blades as required
- In wet weather conditions, construction vehicles and equipment will be cleaned by washing with a high pressure wash down unit
- Ensure the effluent from the clean down stations is contained and not draining into weed free areas
- The clean down station will be monitored for new weed infestations and weeds controlled as necessary
- Provide training to all vehicle operators on site in the effective use of clean down stations
- Keep a register of where the construction machinery came from to assess the weed contamination risk.

2.5 Rehabilitation

Sections of the WIEDP area not required for development lots will be rehabilitated immediately following construction of the infrastructure works. Rehabilitation will occur primarily along the road reserves. A separate, detailed rehabilitation plan has been developed. In summary the plan involves:

- Cleared vegetation and topsoil with minimal weed infestation will be re-used for rehabilitation of constructed drainage swales along the roadsides. This vegetation will be mulched and respread over the swales to provide a seed source for regeneration and also to assist with soil stabilisation
- Suitable tree species will be planted into the swales
- Drip irrigation will be used to water trees during an establishment period
- Weed control will occur bi-annually in rehabilitated areas and on immediately adjacent bushland edges following construction and for a period of 2 years afterwards.

3. Fauna Management

3.1 Existing fauna

An opportunistic fauna survey was undertaken across the WIEDP area in 2008. This study identified the presence of a number of reptile species, as well as limited use of the area by birds.

The potential presence in the area of the Mulgara was identified due to suitable habitat and burrows which appeared to have been used by the species. An additional, a targeted survey for Mulgara was undertaken in February 2011, and identified tracks and use of burrows in a range of areas over the WEIDP area. Survey efforts associated with Stage 3 of the WEIDP area during October 2021 recorded Mulgara present.

The potential impacts from the development on fauna in the study area include the following:

- Loss of fauna habitat through vegetation clearance
- Habitat fragmentation
- Barriers to fauna movement
- Potential impact on threatened fauna
- Mortality of individuals through land clearing and road kills
- Disruption to breeding cycle during earthworks
- Competition and predation by introduced fauna.

The management measures that will be implemented during construction of the proposed development to minimise the potential impacts on fauna and their habitat are detailed in the following sections.

3.2 Fauna habitat loss, degradation and fragmentation

The proposed development will result in removing habitat suitable for a range of terrestrial fauna species, particularly reptiles. Potential impacts of habitat loss and degradation can be minimised by implementing the management measures listed for vegetation above. Specifically, these include:

- Vegetation clearance will be restricted to that necessary for the purpose of the development
- The limit of earthworks will be adequately flagged/signposted prior to the commencement of earthworks, to minimise the risk of disturbance to vegetation in adjacent areas
- Clearing will occur outwards from already disturbed or developed areas to allow fauna to escape into remaining vegetated areas
- Vehicle and construction equipment movement will be confined to well defined tracks within the project area to minimise disturbance of adjacent vegetation and fauna habitats
- Construction compounds and stockpile areas will be located within the construction zone of WIEDP.

3.3 Barriers to fauna movement and potential fauna deaths

The potential impacts of the proposed development on fauna movement, includes the construction of windrows, trenches, roads and fencing. Management measures that can minimise barriers to fauna movement include:

- Constructing windrows with 'escape routes' or gaps that lead to safe areas
- Trenches within the WIEDP area to be constructed with escape routes/ladders. All trenches to be inspected morning and evening for trapped fauna. Trapped fauna to be removed, taken to adjacent bushland which will not be impacted, or given an escape option
- If trenches are left open for more than one day, vegetative material will be placed every 100m along the trench to provide shade for trapped animals
- Speed limits to be placed on all construction roads to minimise collision with fauna

- No construction activity to occur after dark to minimise the potential for road kill
- Ensure fencing does not act as a barrier between the active clearing areas and the escape route to undisturbed areas
- Keep a register of road kill
- Develop a protocol for reporting death or injury of threatened or priority fauna on site to the DEC Pilbara Region office
- Undertake an investigation of threatened and priority fauna deaths or injury and provide corrective actions where possible.

3.4 Workforce management

The behaviour of contractors can create or exacerbate impacts to fauna in the general area. The following management measures will be undertaken:

- All personnel involved in the vegetation clearing process are inducted and fully briefed on animal welfare implications and procedures
- No dogs, traps or firearms allowed on the construction site
- Contractors shall keep the construction area tidy and free of refuse and food litter. All litter to be retained in lidded bins and disposed of regularly to the Shire landfill site
- The contractor will provide workforce training on fire risks and emergency procedures in relation to fire
- The contractor will provide, or have readily available, approved fire fighting equipment which shall be deployed in the event of any fire within the construction site.

3.5 Protection of Significant listed fauna

Mulgara are a muscular carnivorous marsupial with short round ears and short tapering tails. They are light reddish-brown or tan above and whitish below. Males are generally larger than females. The Brush-tailed Mulgara is a Priority 4 species that is Near Threatened. This species is close to Vulnerable, but not listed as Conservation Dependent. Small scattered populations of Mulgara have been found in arid regions favouring sandplains through Central and Western Australia, including Pilbara and Port Hedland areas.

Mulgara and their preferred habitat occur within the Wedgefield Industrial Estate. Fauna surveys have identified Mulgara as being present within the WIEDP area. The proposed management measures to minimise the impact on this species are as follows:

- A sequential clearing plan that avoids isolating fauna in ‘islands’ and allows for fauna to escape and relocate
- Active Mulgara burrows to be flagged and not cleared until the animals have had an opportunity to escape (24 to 48 hrs depending on the distance from the disturbance)
- WIEDP contractors must not carry out any activities that are likely to cause harm to threatened fauna.

3.5.1 Survey and clearance method statement for Mulgara

A survey and clearance operating procedure is included as a method statement in Appendix A.

The method statement specifies the steps to complete the pre-clearance Targeted Mulgara survey, initial vegetation clearing, camera installation and analysis, and decision pathway for clearing the remaining vegetation surrounding any identified active burrows.

4. Monitoring and Corrective Action

The management actions listed should be regularly monitored for compliance, to ensure that they are effective and to provide opportunities for development of more appropriate actions if required.

Monitoring actions include:

- The contractor will provide a designated Environmental Officer, who will ensure the application of the management actions in this EMP
- The Environmental Officer will develop a monitoring program, based on the actions in this EMP, to ensure that the actions are applied where necessary, and that investigations of non-compliance and subsequent corrective actions are developed and undertaken
- The results of the monitoring, investigation and corrective action will be reported weekly to the construction superintendent.

5. Implementation of the Management Plan

The potential impacts on the WIEDP area can be effectively managed by implementing the management and monitoring measures outlined in this report.

Table 2 lists the recommended management measures, the stage of development at which they are to be implemented and to whose satisfaction they are to be implemented.

Responsibility for ensuring that these management measures are implemented at the appropriate stage of development will ultimately lie with the WIEDP Project Managers. However, as the construction will be undertaken under a contract arrangement, the day to day management during construction will lie with the Contract Superintendent.

Table 2 Flora and fauna management plan actions for the Wedgefield Industrial Estate Development

Issue	Objective	Management Measures	Phase of Development for Implementation	Whose responsibility
Vegetation Clearance	To minimise the area of vegetation that is removed or disturbed.	<ol style="list-style-type: none"> 1. Vegetation clearance will be restricted to that necessary for the purpose of the development. 2. The limit of earthworks will be adequately flagged/signposted prior to the commencement of earthworks, to minimise the risk of disturbance to vegetation in adjacent areas. 3. Vegetation removal will be well planned to ensure the area denuded of vegetation is exposed for the shortest possible time before construction or other stabilisation treatment. 4. Good quality vegetation will be stripped and stockpiled for re-use in rehabilitation. 5. Stockpiles should be no higher than 2.0 m and should be kept for the minimum period possible. 6. Burning of cleared vegetative materials will not be permitted under any circumstances. 7. Vehicle and construction equipment movement will be confined to well defined tracks within the construction area to minimise disturbance of adjacent vegetation. 8. Construction compounds and stockpile areas will be located within the construction zone of the WIEDP or in other approved areas. 	<p>Pre-construction</p> <p>Construction</p> <p>Construction</p> <p>Construction Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p>	<p>Design Consultant</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>
Weed Management	To minimise the potential for the spread or introduction of weeds.	<ol style="list-style-type: none"> 9. The boundaries between areas of low and high levels of weed invasion will be clearly marked in the field prior to earthworks commencing. 10. Designated weedy vegetation will be cleared separately from weed-free areas and disposed of in accordance with Shire requirements. 11. Any machinery and off-road vehicles used during construction will be inspected and cleaned or all vegetative and soil material prior to entering the WIEDP, if required. 12. Under dry weather conditions, compressed air will be used for removing soil. Brooms will be used for sweeping loose soil from truck bodies; bars or other hand tools will be used to remove compacted soil from dozer track cleats and blades as required. 13. In wet weather conditions, construction vehicles and equipment will be cleaned by washing with a high pressure wash down unit. 14. Ensure the effluent from the clean down stations is contained and not draining into weed free areas. 	<p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p> <p>Construction</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>

		15. The clean down station will be monitored for new weed infestations and weeds controlled as necessary.	Construction	Contractor
		16. Provide training to all vehicle operators on site in the effective use of clean down stations.	Construction	Contractor
		17. Keep a register of where the construction machinery came from to assess the weed contamination risk.	Construction	Contractor
		18. Vegetation clearance will be restricted to that necessary for the purpose of the development.	Construction	Contractor
Rehabilitation		19. Cleared vegetation and topsoil with minimal weed infestation will be re-used for rehabilitation of constructed drainage swales along the roadsides. This vegetation will be mulched and respread over the swales to provide a seed source for regeneration and also to assist with soil stabilisation.	Construction	Contractor
		20. Suitable tree species will be planted into the swales.	Post-construction	Contract Manager
		21. Drip irrigation will be used to water trees during an establishment period.	Post-construction	Contract Manager
		22. Weed control will occur bi-annually in rehabilitated areas and on immediately adjacent bushland edges following construction and for a period of 2 years afterwards.	Construction and Post construction	Contract Manager
Fauna Protection	To minimise disturbance to any native fauna species that may use the study area.	23. Implement the Mulgara survey and clearance method statement	Construction	DevelopmentWA / Contractor
		24. The limit of earthworks will be adequately flagged/signposted prior to the commencement of earthworks, to minimise the risk of disturbance to vegetation in adjacent areas.	Construction	Contractor
		25. Clearing will occur outwards from already disturbed or developed areas to allow fauna to escape into remaining vegetated areas.	Construction	Contractor
		26. Vehicle and construction equipment movement will be confined to well defined tracks within the study area to minimise disturbance of adjacent vegetation and fauna habitats.	Construction	Contractor
		27. Construction compounds and stockpile areas will be located within the construction zone of WIEDP. Vegetation clearance will be restricted to that necessary for safety and to provide adequate access.	Construction	Contractor
		28. Constructing windrows with 'escape routes' or gaps that lead to safe areas.	Construction	Contractor
		29. Trenches within the WIEDP to be constructed with escape routes/ladders. All trenches to be inspected morning and evening for trapped fauna. Trapped fauna to be removed or given an escape option.	Construction	Contractor
		30. If trenches are left open for more than one day, vegetative material will be placed every 100m along the trench to provide shade for trapped animals.	Construction	Contractor
		31. Speed limits to be placed on all construction roads to minimise collision with fauna.	Construction	Contractor

