OFFICIAL

Clearing Assessment Report – CPS 818

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Tanami Road SLK 27 Groundwater Investigations
Tanami Road 0020025
Kimberley
1890

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1 PROPOSAL

1.1 Purpose and Justification

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads or MRWA).

The CAR outlines the key activities associated with the project, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the project using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

1.1.1 Main Roads Approach to Road Safety and the Environment

Main Roads is committed to minimising the environmental impacts of all of its activities and manages the State road network to achieve balanced economic, social, safety and environmental benefits for the community. Main Roads recognises that Western Australia's environment is significant from a global perspective and the unique conservation values that are contained within its road reserve. Main Roads road network often adjoins natural areas and, in some locations, the reserve itself hosts remnant vegetation with high environmental values. Although the reserves were not established for this purpose, Main Roads recognises that it has a responsibility to conserve the environmental values that occur within the State's road network and minimise the impact its proposals have on the environment. In addition to providing a safe and efficient road network for all people using the roads under its control, Main Roads is also committed to protecting and enhancing the natural environment.

In accordance with National and State Government road safety policies, Main Roads is also committed to substantially reducing road trauma on the road network through Safe System principles. The Safe System approach acknowledges that more than two thirds of all serious crashes are due to human error rather than deliberate risk taking (e.g. speeding or drink driving) and seeks to improve behaviour through education and enforcement while managing the safety of vehicles, speeds and the road and road infrastructure. It is shown that improving sub-optimal road formation will substantially reduce the likelihood and severity of road crashes. For example, according to the Road Safety Management Guideline, increasing the sealed shoulder from 0.5 m to 2 m will reduce Killed and Seriously Injured numbers by more than 50%.

As the statutory authority responsible for providing and managing a safe and efficient main road network in Western Australia, Main Roads focuses on improving road safety by thoroughly considering all environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then, if required, offsetting our environmental impacts. This has been achieved through changes in proposal scope and design. Main Roads regularly reduces its clearing footprint by restricting earthworks limits for proposals, steepening batters, installing barriers, establishing borrow pits in cleared paddocks and avoiding temporary clearing for storage, stockpiles and turn around bays to avoid and minimise its impacts.

Further details on measures to avoid, minimise and reduce are provided in Section 1.5.

1.2 Proposal Scope

Project Name: Tanami Road SLK 27 Groundwater Investigations

Project Purpose / Components:

Tanami Road is currently an unsealed road in the Kimberley region connecting Halls Creek and Alice Springs (in the Northern Territory). The government has committed to seal the road as it poses a safety hazard to road users and at times becomes inaccessible for long periods of time during the wet season. At over 300km in length, this will represent a substantial upgrade over many years. The upgrade of the road between SLK 0 (Halls Creek) and SLK 311 (where the road intersects the Northern Territory border) will be completed in stages over a 10-year timeframe subject to the availability of government funding.

Main Roads commenced Tanami Road construction works in March 2023 and is anticipating sealing up to 10km of road by the end of 2023. To support the construction of Tanami Road, Main Roads requires reliable sources of water for use in construction of the road, drinking water for the camp, and dust suppression activities. Main Roads has installed several bores and utilised existing bores where practicable, however, due to the poor and unreliable performance of this infrastructure, Main Roads is proposing works to identify alternative water sources. Without a reliable water source, the project will not be able to adequately reduce dust suppression which poses a significant risk for safety incidents to occur due to poor visibility. Locating more reliable sources of water is a high priority for the project for both construction and safety purposes.

This proposal assesses the clearing of 1.5 ha of native vegetation within the Development Envelope for well investigation activities and supporting infrastructure if investigations are successful.

The scope of works under this assessment includes:

- Drill pads to support the drill rig and to contain spoil in the Development Envelope up to a maximum of 1.5 ha of clearing.
- Construction of access tracks to potential well locations.
- Construction of a bore and supporting infrastructure (dam, turnaround, water point, etc).

1.3 Proposal Location

The Development Envelope is located on Tanami Road (0020025) SLK 27, Shire of Halls Creek, as shown in Figure 1. The central coordinates of the proposal are:

- Latitude: -18.5320358°S
- Longitude: 127.5720164°E.

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:
1.5 ha within a 24.52 ha Development Envelope.

Areas of Native Vegetation Clearing:
The areas of native vegetation to be cleared are shown in Figure 2.

Type of Native Vegetation:
The type of vegetation to be cleared under this Proposal consists of H1 and H2 as briefly described below (and shown in Figure 2):

- H2 - *Corymbia opaca*, *Eucalyptus brevifolia* low open woodland over *Triodia wiseana* hummock grassland.
- H1 - *Eucalyptus brevifolia*, *Corymbia opaca* scattered low trees to low open woodland over *Triodia intermedia* hummock grassland.

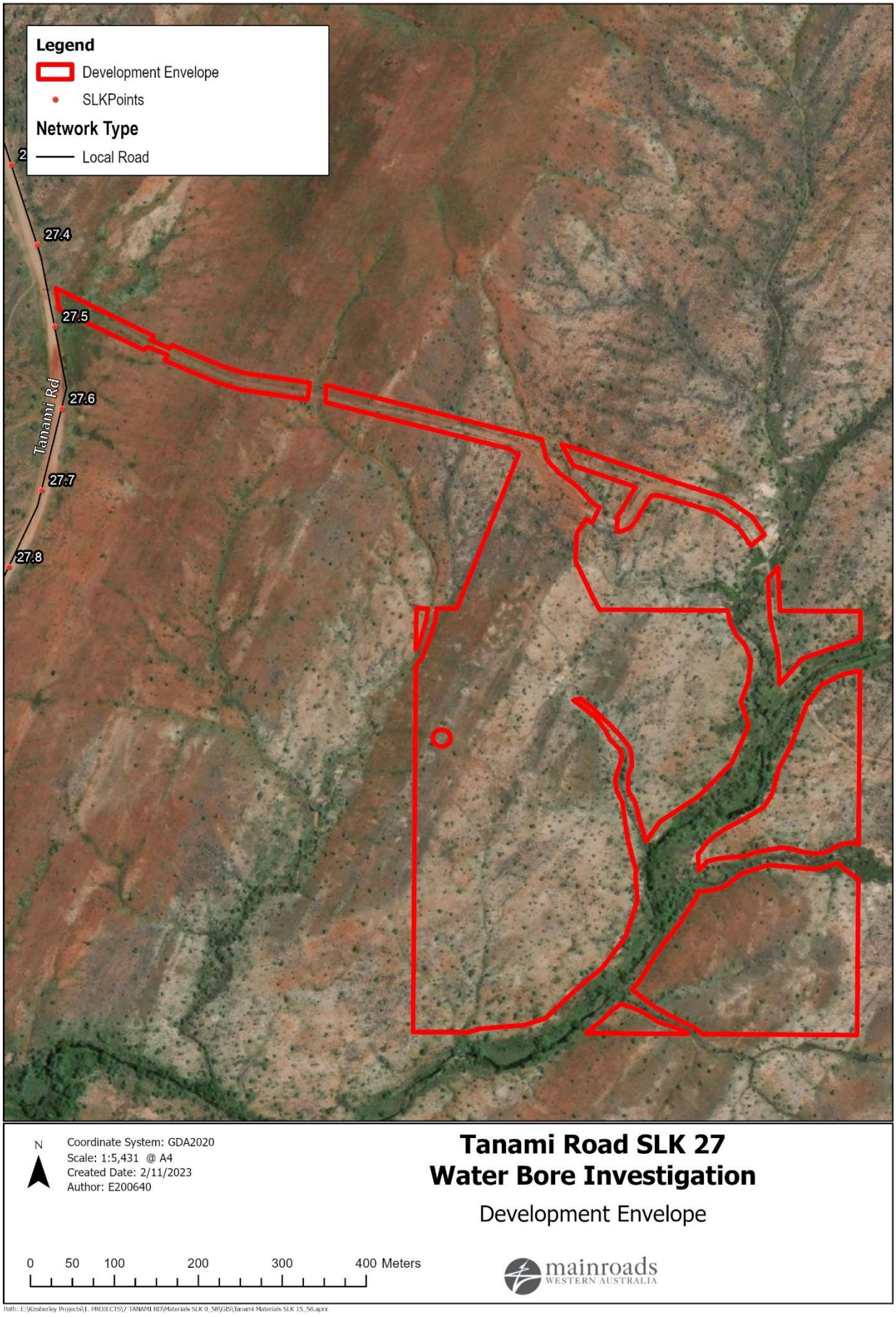

Figure 1. Tanami Road SLK 27 Groundwater Investigations Development Envelope.

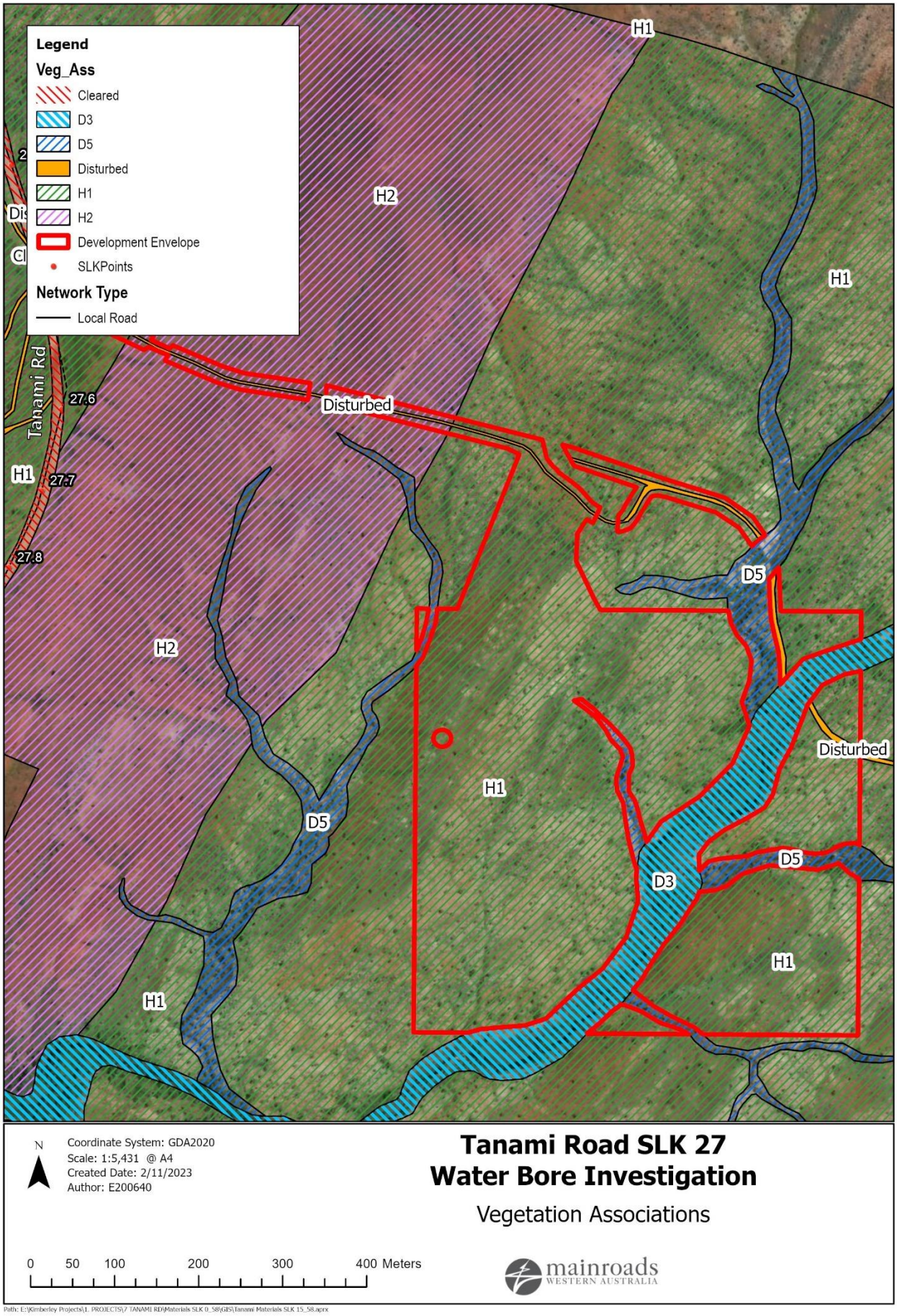

Figure 2. Tanami Road SLK 27 Groundwater Investigations Vegetation mapped by Biota (2023).

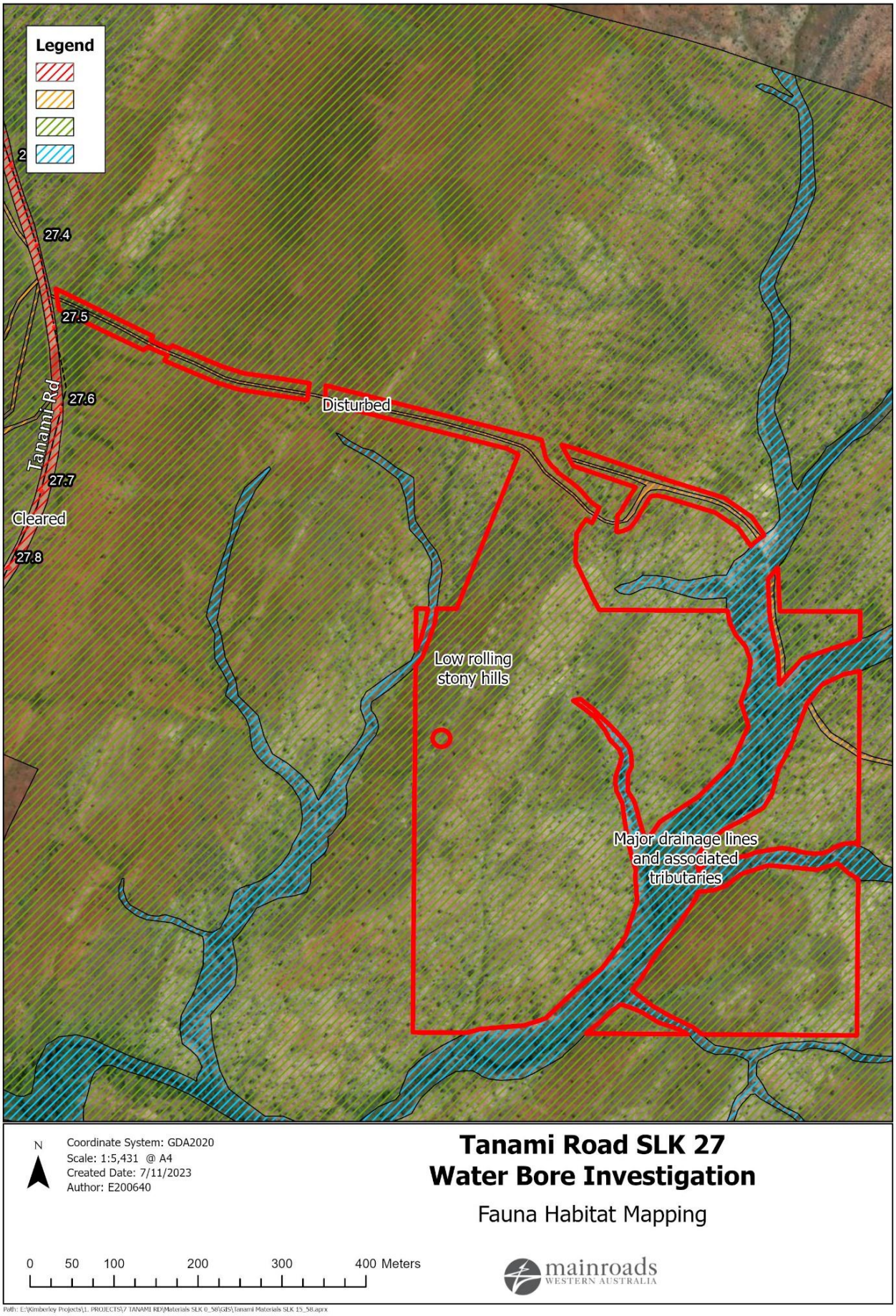

Figure 3. Tanami Road SLK 27 Groundwater Investigations Fauna Habitat mapped by Biota (2023).

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

The following alternatives to clearing were considered during the development of the proposal:

- Not sourcing a new groundwater well, however, this will result in a poorer safety outcome and may result in future fatalities or serious injuries and further degradation of the State road asset.
- Not conducting the clearing is not considered a feasible option as it does not allow for the Tanami Road upgrade works to proceed that are required to address existing safety hazards to road users.
- Main Roads retains frangible vegetation where a clear zone is to be established for road projects. For this project, however, clearing will only be required to accommodate the road formation, with no clear zone being established. Accordingly, the retention of frangible vegetation does not apply to this proposal.
- Reducing the speed limit to minimise clearing requirements, while still balancing safety (driver fatigue) and freight efficiency. Speed Limits are an essential mechanism to ensure the safe and efficient operation of road networks. The application of appropriate speed limits and other traffic management measures is a key mechanism in managing vehicle speeds to achieve desired safety, mobility, traffic management, local amenity, and road user expectations. There are several factors involved in road safety, including road conditions, driver behaviour and overall road design. Except in special situations, reducing speed limits below national standards on state and national roads is not typically supported as it has the potential to contribute to driver frustration, impatience, tiredness and recklessness. The environmental values protected by reducing the speed limit, do not justify the impacts on freight efficiencies nor road user safety. Accordingly, the reduction of the speed limits to avoid clearing of native vegetation for this proposal is not applicable given speed limits are not a relevant factor to the search for and installation of water bores covered under this scope of works.

1.6 Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts

The design and management measures implemented to avoid and minimise the clearing impacts by the project are provided in Table 1. In addition, the following measures have been considered:

- Use of existing access tracks and material pits where possible;
- The Development Envelope was modified to avoid areas of high value vegetation and Significant Flora species;
- Utilising existing groundwater bores where possible for water supply, however, due to poor performance of these assets the project is required to source other wells; and
- Implementation of clearing will be supervised by Main Roads Environment Officers.

The design and management measures implemented to avoid and minimise the potential clearing impacts of the Proposal are provided in Table 1.

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts

Design or Management Measure	Discussion and Justification
Priority species locations removed from Development Envelope	All recorded locations of significant flora species have been excised from the Development Envelope, except for one record of *Trachymene dusenii* from 2021 biological surveys which was not identified in the 2023 survey. In addition, the individual could not be located by Main Roads Environment Officer in the field in October 2023. The species is no longer in this location due to either GPS error, desiccation, or removal by livestock. The proposal has investigated and avoided all Priority species in the Development Envelope, as seen in Figure 5.
Use of existing cleared areas for access tracks and infrastructure development	Main Roads has selected a location with a large amount of existing access tracks already in place through this proposal. Utilising this track will reduce the clearing required for bore investigations and decrease clearing impacts. Existing access tracks for investigation works will be used as practicable for operational access to established wells. This reduces the amount of clearing for investigations and subsequent clearing to provide Heavy Vehicle access when operational works begin. If the Development Envelope is found not to be suitable for the construction of a dam (e.g., poor access, uneconomical distance from project), pipe will be laid from the successful well location along existing cleared areas to the nearest Main Roads dam to reduce clearing requirements.
Drainage modification	The Material Areas have been selected to avoid watercourses, reducing the risk of impeding natural drainage patterns as seen in Figure 5.

1.7 Approved Policies and Planning Instruments

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, Main Roads has also had regard to the below instruments where relevant.

Other Legislation potentially relevant for assessment of clearing and planning/other matters:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS 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)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA).

Environmental Protection Policies:

- Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992
- Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011.

Other relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (Government of WA, December 2014)
- Procedure: Native vegetation clearing permits (Government of WA, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities.

2 SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING

Native vegetation will be cleared to accommodate this Proposal. This clearing will be undertaken using the Main Roads Statewide Clearing Permit CPS 818.

To comply with CPS 818, Main Roads must prepare a Clearing Assessment Report (CAR).

The CAR outlines the key activities associated with the Proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the Proposal using the ten Clearing Principles listed under s51 of the *Environmental Protection Act 1986* (EP Act) and strategies used to manage vegetation clearing.

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **Development Envelope** – The maximum extent within which the Clearing Area will be located. This envelope is larger than the Clearing Area to allow for minor changes to the Proposal footprint as the design process continues, and to account for minor and unexpected changes that may occur during construction, such as working to avoid a large tree or encountering buried boulders or services. This flexibility allows the site personnel to make modifications to the Proposal to avoid areas that may contain better environmental values. The CAR has assessed all environmental values within the Development Envelope as though all of these values will be impacted, up to the amount specified within the Clearing Area.

  Clearing Area – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction. For this proposal, the Clearing Area is limited to 1.5 ha.

- **Survey Area** – Area covered by the Biological Survey, which is typically larger that the Development Envelope.

- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 40 km radius.

2.2 Desktop Assessment

A desktop assessment of the Development Envelope was undertaken by viewing internal datasets and other government agency managed databases, and consulting with relevant stakeholders where necessary. Results from searches can be found in Appendix 1.

GIS layer viewing and mapping is done using ArcMap and/or Main Roads corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases were searched to locate additional information, which are found under References in Section 8.

2.3 Surveys and Assessments

The following surveys/assessments were undertaken to inform this CAR:

- Tanami Road Upgrades SLK [REDACTED] Material Pits Biological Survey (Biota Environmental Sciences 2023).

To a lesser extent where regional impacts are considered (albeit negligible from this proposal), the assessment also considers the following surveys:

- Tanami Road Upgrade and Great Northern Highway Material Pit Areas: Flora Survey (Biota Environmental Sciences, 2021);
- Tanami Road Upgrade Targeted Flora Survey (360 Environmental, 2021);
- Tanami Road Upgrade SLK 0-60 Biological Survey (Biota Environmental Services, 2020); and
- Main Roads Targeted Survey 2022 (Main Roads, 2022).

Biological and targeted surveys conducted for the proposal are outlined in Table 2, and a summary of the findings in Biota's 2023 report is presented in Section 3.

Table 2. Summary of Biological and Targeted Surveys Relevant to the Proposal

Consultant & Survey Name	Survey Details
Biota Environmental Sciences (2023)	**Survey Area:** Survey Area comprises 4563 ha on Tanami Road specifically for material areas between SLK [REDACTED]. **Type:** Detailed flora and vegetation survey, targeted flora survey and basic and targeted fauna survey. **Timing:** May 2023 **Shapefile TRIM Ref:** D23#913196 **Document TRIM Ref:** D23#913187
Biota Environmental Sciences (2020) Tanami Road Upgrade SLK 0-60 Biological Survey	**Survey Area:** Survey area comprised approximately 1650.7 ha and a contextual area of 5951.4 ha (7602.1 ha including survey area) adjacent along Tanami Road (SLK 0 – 60). This started at the Great Northern Highway (GNH) Tanami intersection and continued for 60 km at varying widths between 200m and 500m wide. **Type:** Detailed flora and vegetation survey, targeted flora survey and basic and targeted fauna survey. **Timing:** Fieldwork conducted on from the 23rd of May to 8th June 2020. **Shapefile TRIM Ref:** D21#506928 **Document TRIM Ref:** D21#125420
360 Environmental (2021) Tanami Road Upgrade Targeted Flora Survey	**Survey Area:** Nine polygons (material pit locations) were surveyed along Tanami Road, totalling 58.2 ha in area. **Type:** Targeted Flora survey for the proposed Tanami Road Upgrade (SLK 0 – 60) within nine areas (proposed material pits and construction water dams) on Tanami Road. **Timing:** Fieldwork conducted on 21st – 25th May 2021 **Shapefile TRIM Ref:** D21#1081780 **Document TRIM Ref:** D21#1081407
Biota Environmental Sciences (2021a) Tanami Road Upgrade and Great Northern Highway Material Pit Areas: Flora Survey	**Survey Area:** Survey Area comprises 44.20 ha on Tanami Road and 132.15 ha on GNH. **Type:** Targeted surveys for Priority flora species and other species of interest that were identified as occurring or potentially occurring, during the initial botanical survey in 2020. **Timing:** Fieldwork was conducted on 14th – 25th June 2021 **Shapefile TRIM Ref:** D21#1219428 **Document TRIM Ref:** D21#1020020

3 SURVEY RESULTS

Main Roads commissioned a survey for the project, completed in 2023.

A summary of the findings are presented in Sections 3.1 – 3.5.

3.1 Summary of Biological Survey – Biota 2023

The "Tanami Road Upgrade SLK [REDACTED] Material Pits Biological Survey" was conducted from the 29 May to 10 June 2023, by Biota Environmental Sciences covering a detailed survey area of 1,085.7 ha and a larger contextual mapping area totalling 4,652.7 ha. The spatial scopes for the biological survey comprised a detailed survey area, a contextual area (400 m buffer around the survey area) and the study area (40 km buffer around the survey area). A desktop flora and fauna assessment were undertaken for the study area, followed by a field survey which comprised a detailed and targeted flora and vegetation survey and a basic and targeted fauna survey of the survey area.

Vegetation
A total of 12 vegetation units were identified from the survey area, associated with drainage lines, plains and hills. None of the vegetation units represent listed Threatened Ecological Communities (TECs), or Priority Ecological Communities (PECs). The vegetation unit P10 shared some similarities to the two tussock grassland communities in the study area that are listed as PECs. Vegetation unit P10 is considered to be of local significance due to comprising of tussock grassland dominated by *Eriachne festucacea* and *Dichanthium fecundum*, however, this vegetation is not listed as a PEC. Two vegetation units from drainage line habitats (D3 and D4) were considered to represent Groundwater Dependent Ecosystems and were also considered to be locally significant. A minimal amount of Drainage Lines and no P10 vegetation units are present in the Development Envelope.

Flora
A total of 334 native vascular flora species from 150 genera and 52 families were recorded from the survey area. No Threatened flora were recorded. Eight Priority-listed species (the P1 *Goodenia lunata, Pentalepis trichodesmoides* subsp. *incana* and *Portulaca* sp. finely echinate (D.G. Tulloch 41); P2 *Ipomoea racemigera* and *Kohautia australiensis*; and P3 *Glycine falcata, Goodenia crenata* and *Trachymene dusenii*) and two species of interest (*Cullen* sp. (TAN-TW07) and *Sida* ? sp. (TAN01-17)) were also recorded from the survey area, representing new populations of these species in the locality. A total of 18 weed species were recorded, including one significant weed species **Calotropis procera* (Calotrope) which is a Declared Plant and was found scattered through plains and drainage lines throughout the survey area.

Fauna
A combined total of 113 species of vertebrate fauna were recorded, including 19 mammals, 10 bats, 79 birds, 13 reptiles and two amphibians. Two significant fauna species: the Gouldian Finch (*Chloebia gouldiae*) and Freshwater Crocodile (*Crocodylus johnstoni*) were recorded. Likelihood of occurrence assessments based on the desktop study results and an assessment of habitats undertaken during the field survey indicated that a further five significant vertebrate species are likely to occur in the survey area, while 17 may occur. Many of these are noted to be migratory bird species.

Two taxonomic groups with the potential to include short-range endemic (SRE) species were recorded within the survey area (seven mygalomorph spiders and three araneomorph spiders). Three taxa have not been recorded previously and are therefore currently known only from the survey area. Lack of survey effort in the broader locality makes it impossible to draw strong conclusions as to the extent of distribution of these lineages.

Six fauna habitats were described for the survey area, the most well represented being habitat associated with low rolling stony hills, and the least being cracking clay plains and a man-made dam. It is worth noting the least representative habitats recorded are the least preferable for material areas.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

Table 3 and Table 5 provide details of the vegetation types and their condition within the Development Envelope and the remaining extents of these associations.

Table 3. Summary of Vegetation Types within Development Envelope

Vegetation Type	Extent within Development Envelope (ha)	Total Extent Mapped (ha) within Survey Area*
Disturbed Partially cleared, fragmented or regrowing after historical clearing.	0.47	62.12
H1 – Hilly Vegetation *Eucalyptus brevifolia, Corymbia opaca* scattered low trees to low open woodland over *Triodia intermedia* hummock grassland.	23.47	1019.31
H2 – Hilly Vegetation *Corymbia opaca, Eucalyptus brevifolia* low open woodland over *Triodia wiseana* hummock grassland.	0.59	1416.99

**Survey Area is from Biota's 2023 Biological Survey.*

Table 4. Summary of Fauna Habitat Types within Development Envelope

Fauna Habitat Type	Extent within Development Envelope (ha)	Total Extent Mapped (ha) within Survey Area*
Cleared (cleared areas)	0.47	95.88
LSH (Low rolling stony hills) Hills with rocky and stony substrates. Open *Eucalyptus brevifolia* and *Corymbia opaca* woodland over hummock grasslands dominated by *Triodia intermedia* and/or *T. wiseana*.	24.05	2447.25

**Survey Area is from Biota's 2023 Biological Survey.*

Table 5. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 851	**Statewide**	111,037.36	110,983.69	99.95	0.05
	IBRA Bioregion *Ord Victoria Plain*	110,998.40	110,944.72	99.95	0.05
	IBRA Sub-region *Purnululu*	110,984.56	110,930.89	99.95	0.05
	Local Government Authority *Shire of Halls Creek*	111,037.36	110,983.69	99.95	0.05

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the Proposal's proposed clearing is likely to have a significant impact on the environment, the Proposal was assessed against the ten Clearing Principles (EP Act, Schedule 5).

Each principle has been assessed in accordance with the former Department of Environment Regulation (now Department of Water and Environmental Regulation (DWER) '*A Guide to the Assessment of Applications to Clear Native Vegetation*' (Department of Environment Regulation, 2014) and other relevant clearing permit application decision reports prepared by DWER.

The proposed clearing is not at or not likely to be at variance with the ten Clearing Principles.

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

Proposed clearing is not at variance to this Principle.

The following metrics are considered to be indicators of high biological diversity (as described in DER 2014):

1. Biodiversity hotspots

The proposed clearing is not located in a Biodiversity Hotspot (DER 2014).

2. Flora and Fauna species diversity

334 native flora species and 113 vertebrate fauna species were identified in Biota's 2023 biological survey (partially seen in Figure 4). Whilst some of these were listed significant species, all significant species locations have been excised from the Development Envelope except for one, *Trachymene dusenii* from 2021 biological surveys, that was not identified in the 2023 survey. In addition, the individual could not be located by Main Roads Environment Officer in the field in October 2023. The species is no longer in this location due to either GPS error, desiccation, or removal by livestock. As such, no Priority or Threatened species are known to occur within the Development Envelope.

3. Priority and other Significant Flora

Only one significant flora species was identified in the Development Envelope (*Kohautia australiensis*), which was recorded as dead in 2021, however, this location has still been excised from the Development Envelope with a buffer of 10m applied. No impact to Priority or significant flora species is anticipated.

4. Priority Fauna

113 vertebrate fauna species were identified in Biota's 2023 biological survey, of which no Threatened or Priority fauna species were identified in the Development Envelope. No impact to these species is anticipated. Biota's 2023 Biological survey identified the following species as likely to occur or have the potential to occur in the survey area:

- Gouldian Finch (EN)
- Gravel Dragon (P1)
- Yellow-lipped Cave Bat (P2)
- Freshwater Crocodile (OS).

These species will be discussed further in Principle (b).

The Development Envelope consists of one fauna habitat, approximately 24.05 ha of Low rolling Stony Hills (LSH) and 0.47 ha of "Cleared" areas (as seen in Figure 3). Whilst existing disturbed areas will be preferentially utilised, the majority of clearing will occur in LSH habitat of which over 3,960 ha has been

mapped from biological surveys along Tanami Road. The proposal will result in the maximum impact of 1.5 ha to LSH, which is 6.12% of the DE, or 0.04% of the total mapped extent of LSH. This surrounding habitat is highly contiguous as seen in Figure 2, and provides significant area and (excellent) quality vegetation for fauna species to utilise. The removal of 1.5 ha for the proposal is unlikely to have a significant impact on LSH fauna habitat at a local or regional scale.

5. Ecological Community Diversity

Biota's 2023 biological survey identified Twelve vegetation types over three broad landforms (hills, plains and drainage lines). Two Ecological Communities occur in the Development Envelope, H1 and H2 which are low open woodlands and do not consist of a PEC or TEC (Biota 2023). This 24.52 ha Development Envelope consists of 2.26% of the 1085.95 ha survey area, and 2.41% and 1.73% of each mapped vegetation type respectively from the 2023 Biological survey. Removal of 1.5 ha of either of these vegetation types will not impact ecological community diversity.

- H1 - *Eucalyptus brevifolia*, *Corymbia opaca* scattered low trees to low open woodland over *Triodia intermedia* hummock grassland.
- H2 - *Corymbia opaca*, *Eucalyptus brevifolia* low open woodland over *Triodia wiseana* hummock grassland.

6. Significant Ecological Communities

No Environmentally Sensitive Areas (ESAs) and Threatened Ecological Communities (TECs) were identified in or adjacent to the Development Envelope.

- The nearest ESA is the Lake Gregory System, located over 170 km South of the Proposal.
- The nearest PEC is over 17km South-west of the Development Envelope and listed as P1.

No impact to either a listed TEC/PEC/ESA is anticipated due to the proposal's distance from the nearest receptors.

7. Vegetation Condition

Most of the vegetation in the Development Envelope is in Excellent condition, with a small section in Degraded condition from a fence line access track. Despite the proportionately high level of Excellent condition vegetation, the removal of 1.5 ha within a 24.52 ha Development Envelope (6.12%) is a small subset of the Development Envelope and will leave over 93% of Excellent condition vegetation once the proposal is complete. The proposed clearing of 1.5 ha is unlikely to cause a significant impact on vegetation or biodiversity at a local (or regional) scale.

This vegetation is not of significance to flora, fauna, biodiversity or other factors and the surrounding vegetation is highly contiguous. The removal of 1.5 ha is unlikely to have a significant impact at a local or regional scale for the above reasons.

Based on the above, the project is not at variance to this Principle.

Methodology

- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- DCCEEW Protected Matters Search Tool Report (31/10/2023)
- DER 2014
- Government GIS Shapefiles:
    - DBCA Threatened and Priority Ecological Community database search (Accessed 30/10/2023)
    - DBCA Threatened and Priority flora database search (Accessed 30/10/2023)
    - ESA
    - TEC PEC
- Statewide Vegetation Statistics (Government of Western Australia 2018)

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

Proposed clearing is not at variance to this Principle.

The Development Envelope consists of 24.05 ha of Low rolling Stony Hills (LSH) fauna habitat and 0.47 ha of "Cleared" areas. Clearing will impact LSH of which over 3,960 ha has been mapped from biological surveys along Tanami Road. The proposal will result in the maximum impact of 1.5 ha to LSH, which is 6.12% of LSH represented in the Development Envelope, or 0.06% of LSH mapped in Biota's 2023 survey.

- **LSH**: Hills with rocky and stony substrates. Open *Eucalyptus brevifolia* and *Corymbia opaca* woodland over hummock grasslands dominated by *Triodia intermedia* and/or *T. wiseana*.
- **Cleared:** Areas that were completely cleared of native vegetation.

No Threatened or Priority fauna species were identified in the Development Envelope. However, Biota's 2023 Biological survey identified the following species as likely to occur or have the potential to occur in the survey area:

- Gouldian Finch (EN)
- Gravel Dragon (P1)
- Yellow-lipped Cave Bat (P2)
- Freshwater Crocodile (OS).

The **Gouldian Finch** (EN) prefer open grassy habitats with eucalypt woodlands and grasslands, often near rocky ridges and slopes when breeding. The Development Envelope includes Eucalyptus woodlands and grasslands, and as such may be suitable for Gouldian Finches. Large and hollow-bearing trees will be avoided as practicable. As habitat in the area is highly contiguous, it is unlikely that the removal of 1.5 ha of LSH habitat will significantly impact the species, as this habitat is highly available at a local and regional scale. Furthermore, development of a dam would provide an additional water source for the species and has the potential to support the species during the dry season as a safe and reliable water source. No impact to the species is anticipated.

One State listed species, the **Freshwater Crocodile (OS)** (*Crocodylus johnstoni*) was observed in Biota's 2023 biological survey. Freshwater Crocodiles prefer permanent freshwater lagoons, rivers and billabongs. The Development Envelope does not intersect these areas and as such is unlikely to impact the species. Furthermore, development and operational works will only occur during the dry season when this area is unlikely to be wet enough to provide suitable habitat for the species. As such, no impact to the species is anticipated.

Whilst not observed during the survey, the **Gravel Dragon (P1)** (*Cryptagama aurita*) prefers stony soils with spinifex and May Occur within the survey area. LSH, providing rocky substrates and spinifex is suitable habitat for the species. As such, the species may be present, however, the clearing will be relatively small and spread out across the large 24.52 ha footprint of the Development Envelope. Removal of up to 1.5 ha (4.07%) of LSH habitat in the Development Envelope is unlikely to significantly impact the species at a local or regional scale. No significant impact to the species is anticipated.

Biota (2023) indicated the **Yellow-lipped Cave Bat (P2)** May Occur within the survey area for foraging purposes. It has typically been recorded foraging in habitats including melaleuca and pandanus-lined waterways and adjacent tropical woodlands, and roosts in sandstone and limestone caves, typically near water (Churchill 2008). The fauna habitat present in the proposal area (LSH) is unsuitable for roosting, however, adjacent drainage areas may provide suitable foraging habitat. However, the proposed works do not intersect drainage areas and proposed impacts to LSH are unlikely to significantly impact this foraging behaviour. Furthermore, the species was not recorded during the survey and no regional records were identified from a desktop analysis. No significant impact to the species is anticipated.

The removal of 1.5 ha for the proposal is unlikely to have a significant impact on any of the above listed or other Priority/Threatened species. As such, the project is not at variance to this Principle.
Methodology • 360 Environmental, (2022) • Biota, (2023) • Biota, (2021a) • Biota, (2021b) • Biota (2021c) • DCCEEW Protected Matters Search Tool Report • Government GIS Shapefiles: • DBCA Threatened and Priority fauna database search (Accessed 30/10/2023) • Species specific conservation listing advice and recovery plans.

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

Proposed clearing is not at variance to this Principle.

The Desktop Database Searches (Main Roads ArcGIS files and PMST report) identified no known records of rare flora listed under the Biodiversity Conservation Act 2016 from the project 40km radius desktop search.

The Biological Survey undertaken by Biota, (2021a, 2023) and the subsequent Targeted Flora Survey by Biota (2021b), and 360 Environmental (2022) did not record any rare or Threatened flora taxa from within the broader survey area.

No Priority flora or fauna species are present in the Development Envelope. As there are no Priority or Threatened species within the Development Envelope, or within proximity to be exposed to indirect impacts by the proposed works, the project is not at variance to this Principle.

Methodology

- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- DCCEEW Protected Matters Search Tool Report (31/10/2023)
- DER 2014
- Government GIS Shapefiles:
    - DBCA Threatened and Priority Ecological Community database search (Accessed 30/10/2023)
    - DBCA Threatened and Priority flora database search (Accessed 30/10/2023)

(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.

Proposed clearing is not at variance to this Principle.

The Desktop database searches (PMST report and DBCA Shapefiles) show no known records of State listed Threatened Ecological Communities (TECs) from within the project 40 km radius desktop search.

No TECs are located within or adjacent to the Development Envelope. No impact on TECs is anticipated due to none being present within or in proximity to proposed work area.

Based on the above, the project is not at variance to this Principle.

Methodology

- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- DCCEEW Protected Matters Search Tool Report (31/10/2023)
- Government GIS Shapefiles:
    - DBCA Threatened and Priority Ecological Community database search (Accessed 30/10/2023)
    - DBCA Threatened and Priority flora database search (Accessed 30/10/2023)
    - ESA
    - TEC PEC

(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.

Proposed clearing is not at variance to this Principle.

As evident from Table 5, the current extent of pre-European remnant vegetation is more than 30% of the "National Threshold Level" at all scales (State IBRA Bioregion, IBRA Subregion, LGA). Over 99.95% of the pre-European vegetation association remains and vegetation proposed to be removed is less than 2.04% of the Development Envelope. Vegetation types in the Development Envelope were commonly found in Biota's 2023 survey, with over 2,259 ha of H1 and 1,736 ha of H2. Considering the wide representation of these vegetation types in the local area, no significant impact is anticipated as a result of clearing associated with this proposal.

Given the level of vegetation remaining, the area is not subject to extensive clearing and therefore, it does not represent a significant remnant of native vegetation.

Based on the above, the project is not at variance to this Principle.

Methodology

- Aerial photography
- Commonwealth of Australia (2001)
- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- DCCEEW Protected Matters Search Tool Report (31/10/2023)
- Government GIS Shapefiles:
- Statewide Vegetation Statistics (Government of Western Australia 2018)
- Government GIS shapefiles:
    - Pre-European vegetation (Accessed 30/10/2023)
      Commonwealth of Australia 2001

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

Proposed clearing is not at variance to this Principle.

The proposal is also located in a Surface Water Area, the Fitzroy River and Tributaries.

No riparian vegetation or watercourses are present within the Development Envelope and vegetation mapped to be associated with watercourses by Biota (2023) has been excised from the Development Envelope. No significant impact is anticipated from the proposal.

Based on the above, the project is not at variance to this Principle.

Methodology

- Aerial photography
- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- Government GIS shapefiles:
    - Geomorphic Wetlands (Accessed 30/10/2023)
    - Ramsar Wetlands (Accessed 30/10/2023)
    - Important Wetlands (Accessed 30/10/2023)
    - Watercourses (Accessed 30/10/2023)
    - RIWI Act Rivers (Accessed 30/10/2023)

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

Proposed clearing is not at variance to this Principle.

The proposal proposes a minimal amount of clearing that is unlikely to pose a significant impact to the vegetation in the area. Clearing will follow the path of least resistance, consisting primarily of shrubs and grasses. Clearing will be limited as practicable, with the largest impact coming from drill pads which will constitute an area that is approximately 20x20m, but up to 50x50m if required to manage spoil from drilling activities.

The soil has been mapped as F9 by the Bureau of Rural Sciences (2009) which is described as "mountains-rocky ridges of metamorphic rocks (phyllites, schists, and gneisses): the main surface is outcropping rock with virtually no soil or some shallow dense loamy soils (Um5.41). Included valley plains have hard neutral red soils (Dr2.42) and (Dr2.32) with some mixed alluvia along streamlines. Small areas of other soils such as (Um2.12) may occur on slopes".

The proposal is situated within the Dockrell Land System (Schoknecht and Payne 2011). This system is considered to be 'stable' with very low susceptibility to erosion, as it is predominantly rocky ground with skeletal soils.

The proposal will encompass a small footprint of 1.5 ha spread over the 24.52 ha Development Envelope. The proposal is unlikely to cause significant land degradation due to the small scale of works, small footprint in a vegetated landscape, and predominantly shallow-rooted species such as shrubs and grasses being cleared.

Based on the above, the project is not at variance to this Principle.

Methodology

- Aerial photography
- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- Google Earth Elevation Mapping (Accessed 30/10/2023)
- Government GIS Shapefiles:
  - Acid Sulphate Soil Risk Map (Accessed 30/10/2023)
- Schoknecht and Payne (2011)

(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.

Proposed clearing is not at variance to this Principle.

No conservation areas are located within, or adjacent to the Development Envelope. The nearest DBCA reserved land is the Ord River Regeneration Reserve which is over 24.2 km East of the proposal. No significant impact to this area is anticipated from the proposal.

Based on the above, the proposal is not at variance to this Principle.

Methodology

- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- Environmental Offsets Register
- Government GIS Shapefiles:
  - DBCA Legislated Lands and Waters & Lands of Interest (Accessed 30/10/2023)
  - Geomorphic Wetlands (conservation category wetlands only) (Accessed 30/10/2023)
  - Ramsar Wetlands (Accessed 30/10/2023)
  - Important Wetlands ((Accessed 30/10/2023)

(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.

Proposed clearing is not likely to be at variance to this Principle.

The proposal is located in a Surface Water Area, the Fitzroy River and Tributaries, and the Canning-Kimberley Groundwater Area. These areas are Proclaimed Areas under the RIWI 1914 Act.

The proposal involves drilling to identify a suitable location for a new water bore to supply the Tanami Road construction activities and will intersect with underground water. A (26D) licence to construct a well in this location has been acquired. Well investigation activities will be undertaken by a licenced Level 1 driller in accordance with the conditions of the 26D licence. Complying with the licence conditions and employment of an appropriately qualified drilling operator minimises the risk to groundwater in the Development Envelope and on surface water in adjacent areas.

No significant impact is anticipated from the proposal. As such, the proposal is not likely to be at variance to this Principle.

Methodology

- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- Government GIS Shapefiles:
    - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed 30/10/2023)
    - CAWSA Part 2A Clearing Control Catchments (Accessed 30/10/2023)
    - RIWI Act, Groundwater Areas (Accessed 30/10/2023)
    - Acid Sulphate Soil risk mapping (Accessed 30/10/2023)

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

Proposed clearing is not at variance to this Principle.

The proposal area has a high-water shedding ability, with the terrain being hilly with a southern slope down to Six Mile Creek. This area has an approximate peak of 474m along the access track into the investigation area of the Development Envelope, where it gradually slopes down to a low of 455m (as seen in Plate 1). The proposal will involve clearing small, isolated pockets of approximately 20x20m drill pads (up to 50x50m if required to manage spoil from drilling activities) and access tracks to these locations. These works are not expected to significantly impact the water shedding ability of the area.

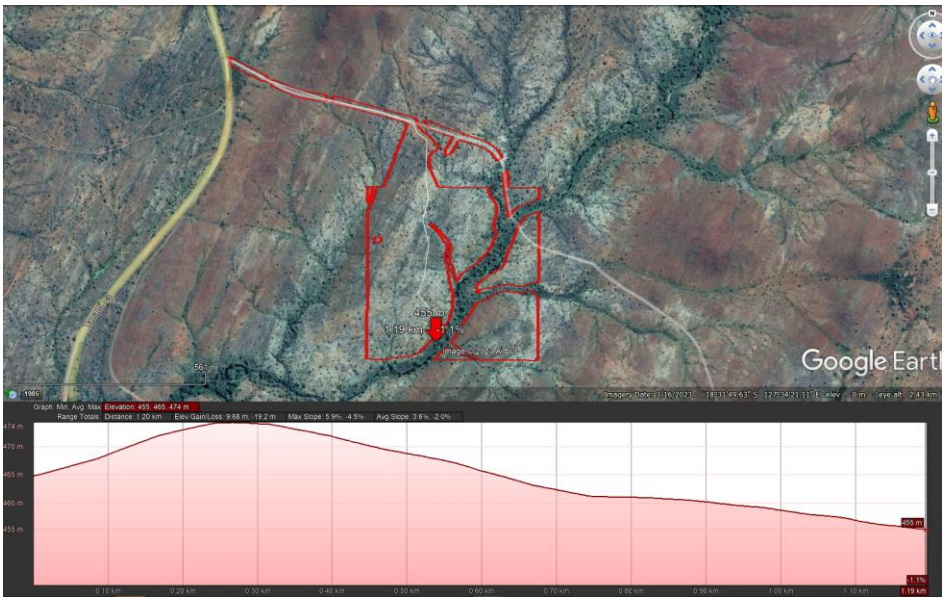

Plate 1. Topography of Tanami Road SLK 27 Bore Investigation Works.

The proposal is situated within the Dockrell Land System (Schoknecht and Payne 2011). This system is considered to be 'stable' with very low susceptibility to erosion, as it is predominantly rocky ground with skeletal soils. Proposal works are predominantly low impact works with low risk to exacerbate flooding, which is further mitigated by the low risk of erosion from the local soil type.

No significant impact is anticipated from the proposal. The proposal is not at variance to this Principle.

Methodology

- Aerial photography
- 360 Environmental, (2022)
- Biota, (2023)
- Biota, (2021a)
- Biota, (2021b)
- Biota (2021c)
- Google Earth Elevation Mapping (Accessed 30/10/2023)
- Government GIS Shapefiles:
    - Acid Sulphate Soil Risk Map (Accessed 30/10/2023)
- Schoknecht and Payne (2011)

6 REHABILITATION, REVEGETATION & OFFSETS

6.1 Revegetation and Rehabilitation

Main Roads will undertake rehabilitation of unsuccessful bore access tracks if not required as part of final infrastructure. Topsoil and vegetation will be pushed back over the cleared access tracks and drill pad.

6.2 Offset Proposal

No offset proposal is required as the proposed clearing will not result in significant residual impacts to native vegetation within the region.

7 COMPLIANCE WITH CPS 818

Table 6 summarises what further pre-clearing impact assessment is required in accordance with CPS 818.

Table 6. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	**No**	No further action required.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **or** (j) the incidence of flooding.	**No**	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **and** (j) the incidence of flooding.	**No**	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
5a. Proposal is within a Region that: • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for **uninfested** areas to be impacted.	**No**	Vehicle Hygiene Checklist actions from CEMP D22#1270748 (Appendix 9), actions from EWI's: Mulch and Topsoil Management, Water Abstraction and Storage , and Vegetation Clearing will be applied.
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	**No**	No further action required.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	**No**	No further action required.

Impact of Clearing	Yes/No or NA	Further Action Required
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	**No**	No further action required.
8. Did an environmental specialist conduct the survey or field assessment?	**Yes**	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than three years' experience.
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	**Yes**	The Environmental Specialist preparing the Assessment Report and any other associated documentation including the VMP was suitably qualified and had more than three years' experience.

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9 APPENDICES

Appendix 1: Environmental Mapping

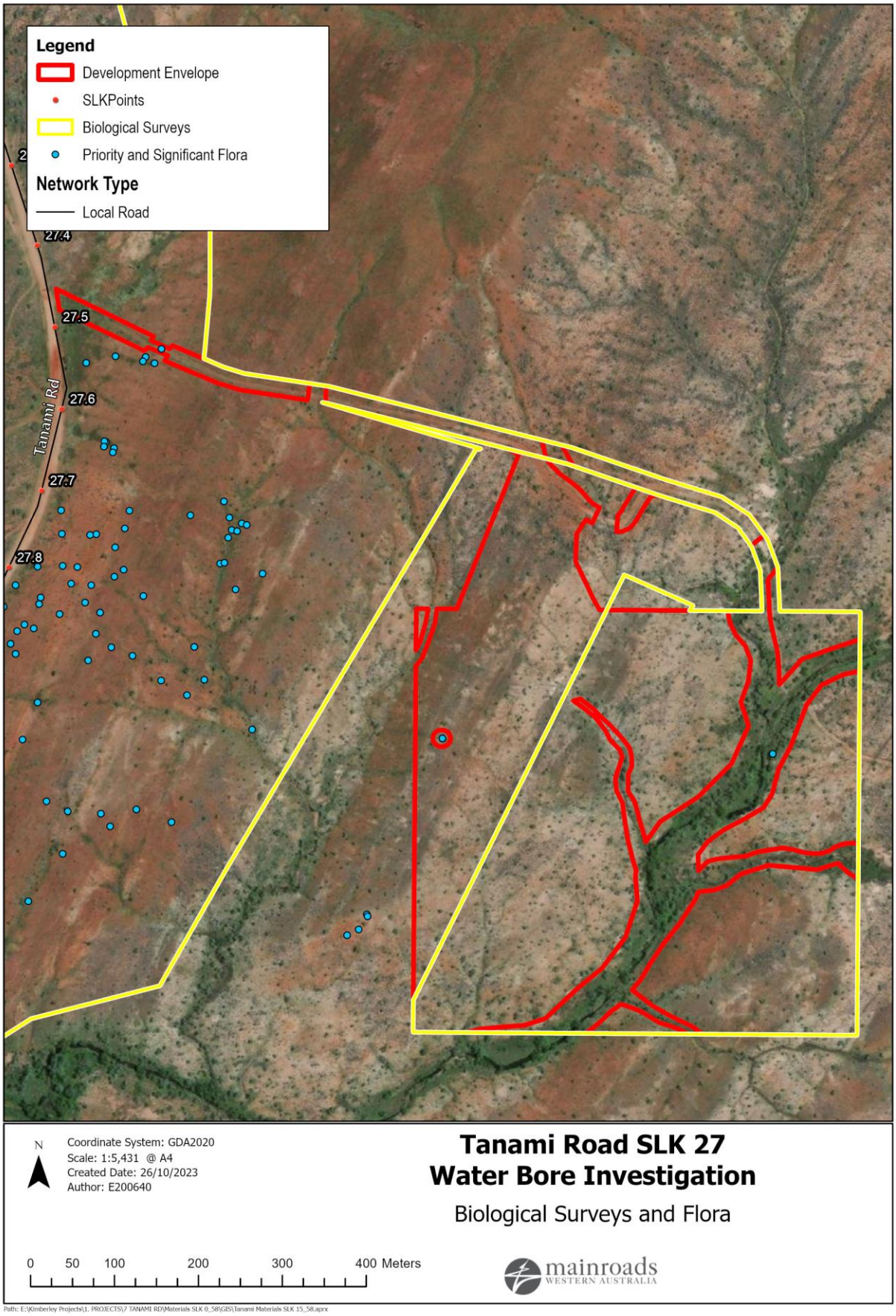

Figure 4: Tanami Road SLK 27 Water Bore Investigation Biological Surveys & Flora.

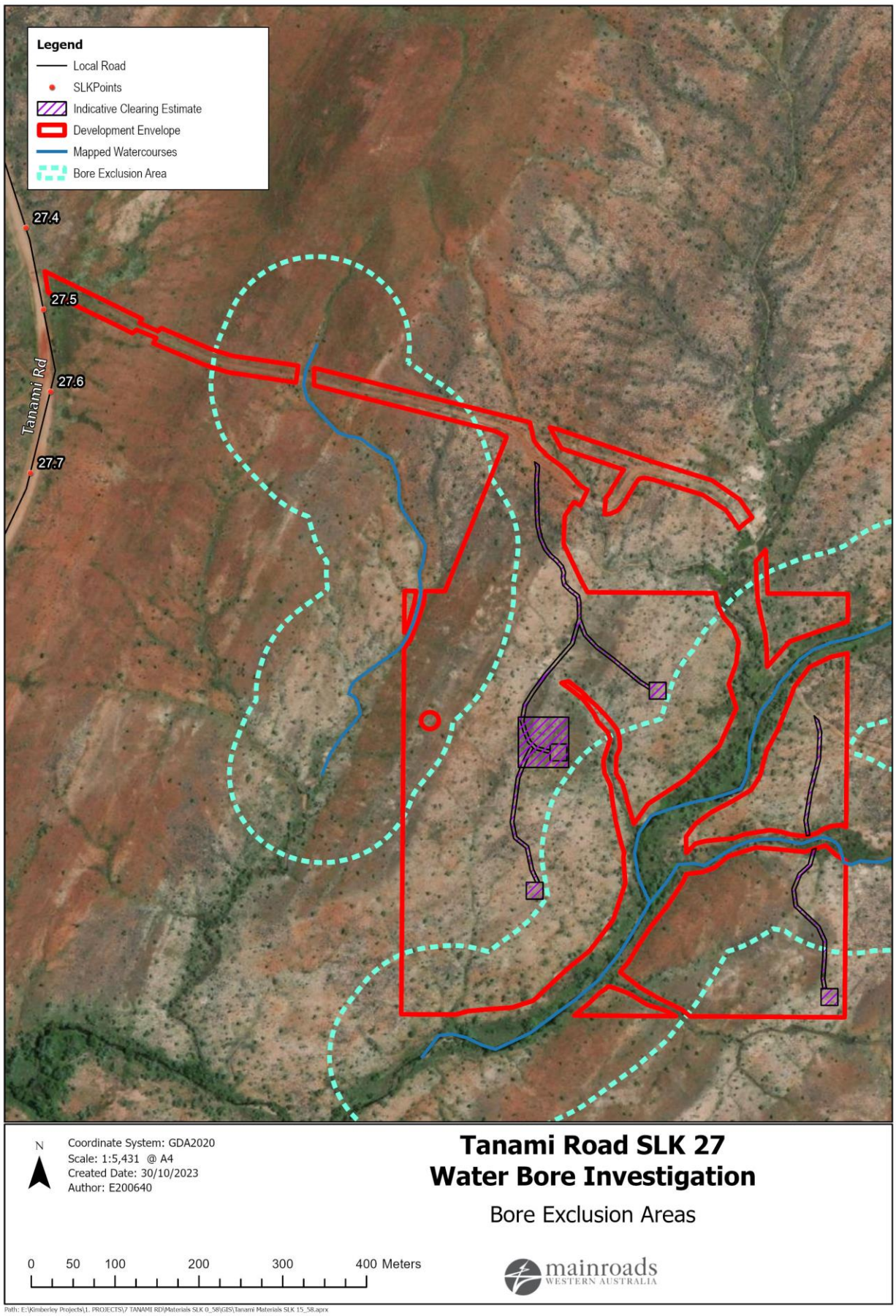

Figure 5: Tanami Road SLK 27 Water Bore Investigation Water Bore Exclusion Area & Indicative Clearing Area.