



29 Hercules Crescent  
Albany WA 6330  
98421575

Denmark Office: Unit 7, 40 South Coast Highway  
Denmark WA 6333  
98481309

Esperance Office: Unit 2A, 113 Dempster Street  
Esperance WA 6450  
90721382

[enquiry@biodiversesolutions.com.au](mailto:enquiry@biodiversesolutions.com.au)

ABN 46 643 954 929  
Ref: MSC00429

12<sup>th</sup> July 2021

Department of Water and Environmental Regulation  
Prime House  
8 Davidson Terrace  
Joondalup, WA 6027

## Application to Clear Native Vegetation – Supporting Information Lot 24 Koojyanup Road, Frankland River WA

To whom it may concern,

Bio Diverse Solutions has been engaged by Nigel Rowe (the applicant) to prepare a letter of support for a clearing permit application (CPS 9134/1) at Lot 24 Koojyanup Road, Frankland River (here in referred to as the Subject Site). The client submitted a clearing permit application for the Subject Site which was received by the Department of Water and Environmental Regulation (DWER) on the 3<sup>rd</sup> December 2020.

The preliminary assessment of the application by DWER identified a number of areas in which information available was inadequate for the requirements of the assessment and requested the submission of a smaller revised clearing area. The DWER have outlined the additional information required to support the clearing application in Schedule 1. This letter has been prepared to address Item No. 1 of Schedule 1 as outlined below in Table 1.

Table 1: Schedule 1 - Additional Information (DWER)

Item	Information Requirements	Specifications	Rationale
1.	Mitigation of land degradation risks resulting from the proposed clearing.	<p>A modification to the area proposed to be cleared or alternative designs in order to minimise land degradation risks resulting from the proposed clearing.</p> <p>Any proposed modifications to the area to be cleared must be accompanied by updated maps and/or digital files reflecting these proposed changes.</p> <p>If the area proposed to be cleared cannot be modified to minimise land degradation risks resulting from the proposed clearing, the implementation of onsite impact mitigation strategies may be considered.</p> <p>Proposed mitigation strategies should be provided as a detailed outline of the management measures to be undertaken with a description as to how these will mitigate the relevant land degradation risks.</p>	<p>The preliminary assessment and expert advice received from the Commissioner of Soil and Land Conservation (the Commissioner) identified that soils within the application area present a moderate to high risk to off-site of land degradation in the form of salinity, waterlogging and erosion.</p> <p>Information received noted that the rate of saline groundwater recharge will increase if the native vegetation is cleared with the increased flow impacting on drainage lines and areas in the lower landscape.</p> <p>Further information is required as to how the above land degradation risks resulting from the proposed clearing are proposed to be minimised or managed.</p> <p>Please note that if you modify your application area and/or propose management measures, DWER will seek additional advice from the Commissioner on whether these modifications will adequately mitigate the identified land degradation risk.</p> <p>In addition, the items listed below should follow the address of this item (Item 1), as the address for this item is likely to reduce the size of the application area, change shape etc and any surveys for biological values would need to be aligned with revised application areas.</p>

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This letter also provides support to the application by identifying the environmental characteristics of the site, providing a review of the Land Assessment Report previously prepared by DPIRD and identifies a proposed smaller clearing area determined by the environmental risk of the site.

## **1. Site Characteristics**

A desktop assessment was conducted by Senior Hydrologist Chiquita Cramer of Bio Diverse Solutions to investigate the environmental conditions of the Subject Site to evaluate the potential impacts (in particular, risks of erosion and salinity) of the proposed clearing area and subsequent land use on the surrounding environment. The Subject Site and the proposed revised clearing area are shown on Figure 1, attached.

### **Topography**

The Subject Site has an undulating topography, with the western portion of the site generally sloping from northeast to southwest from a high point of 270mAHD in the north to a low point of 220mAHD in the southwest corner of the site. The eastern portion of the site has a high point of 280mAHD in middle of the site and slopes down radially towards the boundaries of the Subject Site, to a low point of 230mAHD in the southeast of the site. Topographic Contours for the site are shown on Figure 1, attached.

### **Site Soils**

Department of Primary Industries and Regional Development (2018) Soil Landscape Mapping - Systems (DPIRD-064) dataset shows the majority of the Subject Site lies within the Frankland Hills 1 Subsystem (254Fh\_1) and is described as *'Lateritic crests, upper slopes and isolated low gravelly rises with widespread lateritic duricrust. Loamy and duplex sandy gravels are common. Level to gently undulating plain with numerous clay pans and salt lakes, and small areas of undulating rises. The geology comprises Tertiary sediments overlying Proterozoic granites with some minor Pleistocene sand sheets.'*

A smaller portion of the site in the southwest and in the north lie within the Frankland Hills 3 Subsystem (254Fh\_3) and is described as *'Minor valleys. Duplex sandy gravel soils are common with loamy and deep sandy gravels.'* Soil mapping is shown on Figure 2.

It is noted that duplex soils are ideal for agricultural use whilst also being favourable in the prevention of land degradation. The sandy topsoils allow for adequate infiltration of rainfall at source whilst the sandy gravels and loams underneath allow for the retention of nutrients given their higher Phosphorus Retention index (PRI).

### **Hydrology**

The Subject Site lies within the Nornalup Inlet-Frankland River hydrographic catchment, the majority of the Subject Site drains in a south-westerly direction and discharges towards a small dam to the west of the Subject Site. The dam lies within a seasonal creek line that ultimately discharges to the Frankland River located approximately 1.8kms west of the Subject Site. Runoff from the site to the Frankland River is limited to high intensity rainfall periods only.

There is a large manmade dam adjacent to the southwest corner of the Subject Site. This dam has a constructed catchment drain that extends into the Subject Site capturing rainfall runoff from the drain. It is unclear how much runoff from the Subject Site is directed to this dam, whether it is just the area surrounding the catchment drain or a larger portion of the Subject Site to the north east of the drain.

The smaller eastern portion of the site drains in a south-easterly direction towards a tributary that ultimately discharges to the Frankland River further to the south, and a smaller norther portion of the site drains in a north-westerly direction towards a seasonal creek that also discharges to the Frankland River. The surface water hydrology of the Subject Site is shown on Figure 3.

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## **Vegetation**

The Subject Site lies within the following two pre-European vegetation systems;

**System Association:** Jingalup 3

**Structure Description:** Forest

**Floristic Description:** Mainly jarrah and marri *Eucalyptus marginata*, *Corymbia calophylla*

**System Association:** Jingalup 4

**Structure Description:** Woodland southwest

**Floristic Description:** Jarrah, marri and wandoo *Eucalyptus marginata*, *Corymbia calophylla*, *E. wandoo*.

Photographs from the Land Assessment Report (DPIRD, 2021) show the Subject Site comprises of a mallee-woodland of jarrah, marri and wandoo. The trees in the woodland are sparse with no understorey or midstory. It is understood that the site was previously cleared for timber milling and few older trees (with trunk diameters <500mm) remain. The area has also historically been used for livestock grazing. Photographs of the vegetation are shown below.



**Photograph 1: Vegetation on site, a sparse woodland with no mid-story or understorey.**



**Photograph 2: Aerial view of site vegetation, showing sparse woodland.**

## Land Capability

Land capability mapping (DPIRD,2017) for the revised clearing area rates most of the land as having:

- 50 to 70% of land has moderate to high capability for dryland cropping (B2) (DPIRD, 2017a); and
- >70% of land has moderate to high capability for grazing (B1) (DPIRD, 2017b).

Land capability mapping is shown on Figures 4 and 5.

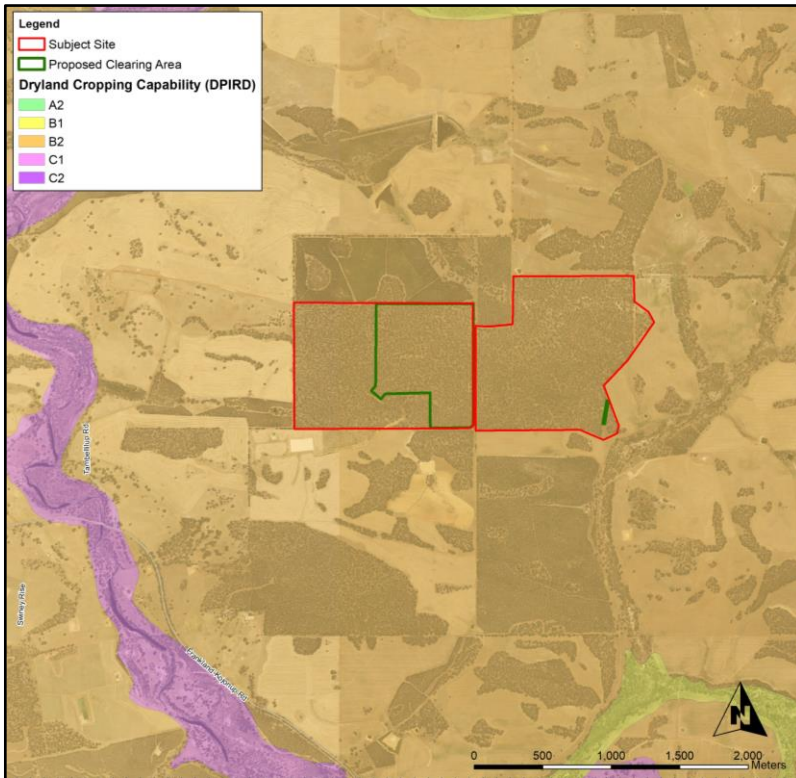


Figure 4: Dryland Cropping capability mapping (DPIRD, 2017a)

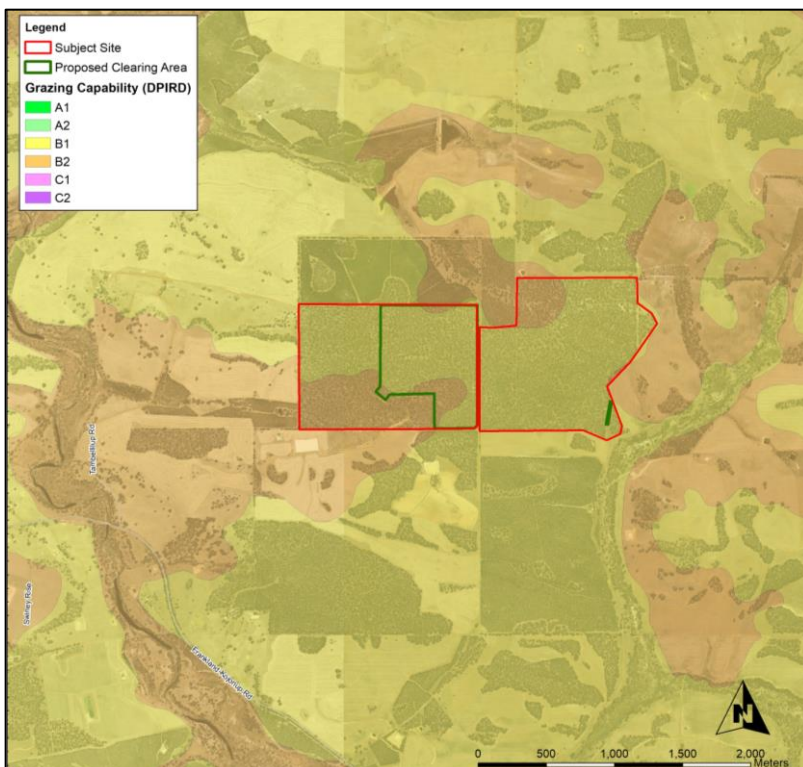


Figure 5: Grazing capability mapping (DPIRD, 2017b)

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## 2. Land Assessment (DPIRD, 2021) review

A review of the *Land Assessment Report for Application to Clear Native Vegetation within Lot 24 (185) Koojyanup Rd Frankland River, Shire of Cranbrook* prepared by DPIRD was conducted to highlight a number of areas in which this report did not adequately depict the environmental conditions of the Subject Site. The findings are as follows:

- Figure 6 of the Land Assessment Report (DPIRD, 2021) identifies 3 seepage areas (Seepage areas 1, 2 and 3). Seepage Area 1 was found to be hypersaline and seepage areas 2 and 3 were not assessed. It is unclear how and when Seepage Area 1 was tested for salinity and what the salinity reading was. Seepage Areas 2 and 3 are shown on Figure 6 however they were not tested for salinity as part of the review, with their inclusion appearing as though these areas were also found to be saline. There is no information to show the extent of the salinity in the area surrounding the Subject Site particularly to the west and southwest of the site adjacent to the proposed clearing area.
- Figure 8 of the report shows aeromagnetic imagery of the Subject Site depicting the likely presence of a dolerite dyke transecting the western portion of the Subject Site. The significance of the dolerite dyke and how this relates to clearing and potential land degradation is not discussed in the report. Confirmation of the dolerite dyke on site has not been made, with no ground-based geological observations made on the site.

Weathered dykes are often associated with clay saprolite forming above the dolerite, this clay is usually less permeable than the surrounding weathered granite impacting groundwater movement and acting as a linear hydraulic barrier to lateral groundwater flow. Given the size of proposed clearing area compared to the scale of the hydrogeological zone, clearing here if on a dolerite dyke compared to on weathered granite is not likely to have an increase in environmental risk, land degradation and salinity.

- Figure 9 of the report shows surface hydrology flow lines. This map has been computer generated based on the topography of the site and does not accurately reflect the surface water hydrology of the site. Figure 9 shows a drainage line/creek extending the majority of the length of the southern boundary in the west of the Subject Site, however aerial imagery of the site (as shown on Figure 3 of this letter) shows the seasonal creek line only extends a relatively small distance into the southwest corner of the Subject Site. Other than the catchment drain for the dam to the southwest of the site (which is not shown on Figure 9 of the Land Assessment Report (DPIRD, 2021) there does not appear to be any other drainage networks within the Subject Site, opposed to that depicted in Figure 9 which shows multiple surface flow lines through the site.

The Land Assessment Report (DPIRD, 2021) draws conclusions from several computer-generated maps. These maps are very general and may assist at a broad scale however, in this instance provide little information on what is actually present on site.

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### 3. Proposed clearing area and management

#### **Proposed revised clearing area**

A revised clearing area is proposed by the applicant based on recommendations provided by DWER, with the now proposed clearing area comprising of 55ha (23% of the 236ha Subject Site). This includes a smaller area of 0.23ha in the southeast of the site to allow for safe vehicle access to and from the adjacent farming areas owned by the proponent. The proposed revised clearing area is shown on Figure 1.

The revised clearing area has been selected based on minimising environmental risk (particularly land degradation) to the Subject Site and surrounding area. The clearing area comprises the flattest portion of the Subject Site minimising the risk of soil erosion caused by rainfall runoff. There are no drainage networks throughout the Subject Site other than a small section of seasonal creek line in the southwest of the Subject Site. The proposed clearing area is approximately 450m from the seasonal creek line in the southwest and the area has been revised to avoid the lower lying areas that feed into the seasonal creek.

The revised clearing area also avoids the higher hill top areas that are more susceptible to wind erosion, with the proposed area being well protected by the surrounding topography and uncleared vegetation. The vegetation in this area is also the sparsest and most degraded across the Subject Site providing the least amount of potential habitat for native fauna and biological value.

Given the proposed clearing area avoids the lower lying areas there is also less risk to increased salinity in groundwater and surface water resources. The groundwater is not likely to be close to surface in this area and given the likely presence of a dolerite dyke here groundwater may not be present at all. The tributary to the southeast of the site was found to be hypersaline and therefore clearing adjacent to this area has been avoided other than a relatively small area to provide safe vehicle access, which is likely to have a negligible effect on the salinity of the tributary given the size of the proposed clearing area here (0.2ha).

It is unlikely the proposed clearing area will impact the dam to the southwest of the of the Subject Site. The catchment drain will remain and is likely to have sufficient catchment to the south and west of the clearing area to maintain water levels.

#### **Proposed land use and environmental management strategies**

The proposed clearing area will be used for mixed rotational cropping and livestock, a dam is proposed in the southwest corner of the clearing area. Erosion prevention and control strategies will be utilised as part of the cropping and livestock operations, these include but are not limited to;

**Maintenance of ground cover** - Maintaining ground cover is critical for reducing the effects of raindrop impact and aggregate disintegration from slaking. Ground cover prevents raindrops from directly striking the soil surface and allow rainfall to slowly penetrate the soil surface. A number of options exist for maintaining vegetation or residue cover during and between cropping operations. These include sowing a cover crop, retaining cereal stubble and direct drilling into a stubble mulch.

**Stubble retention** - Retaining a cereal stubble provides ground cover and organic matter during fallow periods and successive crops. Advantages of cereal stubble include, no competition with the crop and reduced herbicide use. Difficulties with tillage and sowing through the cereal stubble may be overcome by finely chopping the stubble before sowing and modifying direct drilling equipment.

**Preventing and controlling runoff** – It is not expected that recontouring of the land in this instance is required given the flat nature of the site, however if scouring/erosion is evident a number of means exist to control or prevent runoff from eroding cropping lands and causing sedimentation in local waterways including:

- cut-off drains to prevent run-on from entering cropping areas;
- contour drains and mulched rip lines to stop runoff within paddocks; and
- grassed waterways to safely deliver water off paddocks.

**Maintain a vegetated perimeter** – The proposed clearing area has been selected so that a vegetated area is maintained around the perimeter, the large trees surrounding the proposed clearing area will assist with the

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prevention of erosion, with the tree roots providing soil stability and the height of the trees assisting with wind erosion.

#### **4. Conclusion**

A revised clearing area of 55ha has been proposed by the applicant, which has been selected with respect to reducing environmental risk in particular land degradation. Agricultural management practices will also be utilised by the proponent to further reduce the risk of erosion and land degradation in the area.

If you have any queries regarding the information presented in this letter, please feel free to contact me via email or phone on 9842 1575.

Kind regards,



Chiquita Cramer  
Senior Hydrologist  
Bio Diverse Solutions  
[chiquita@biodiversesolutions.com.au](mailto:chiquita@biodiversesolutions.com.au)

c/o Nigel Rowe

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## **References**

DPIRD, Department of Primary Industries and Regional Development (2017a). Land Capability – Dryland Cropping (DPIRD-031) dataset.

DPIRD, Department of Primary Industries and Regional Development (2017b). Land Capability - Grazing (DPIRD-032) dataset.

DPIRD, Department of Primary Industries and Regional Development (2018). Soil Landscape Mapping - Systems (DPIRD-064) dataset.

Department of Primary Industries and Development (2021) *Land Assessment Report for Applicant to Clear Native Vegetation within Lot 24 (185) Koojyanup Road Frankland River, Shire of Cranbrook.*

Nigel Rowe (2021) *Personal communication on the 12<sup>th</sup> June 2021.*

## **Figures**

Figure 1: Proposed Clearing Area

Figure 2: Topography & Soil Mapping

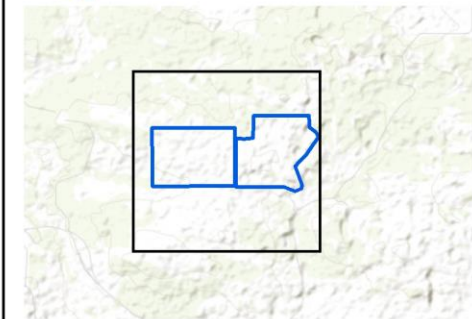
Figure 3: Hydrology Mapping



Albany Office:  
29 Hercules Crescent  
Albany, WA 6330  
(08) 9842 1575

Denmark Office:  
7/40 South Coast Highway  
Denmark, WA 6333  
(08) 9848 1309

Esperance Office:  
24/113 Dempster Street  
Esperance, WA 6450



Overview Map Scale 1:100,000

**Legend**

- Subject Site
- Proposed Clearing Area
- Cadastre



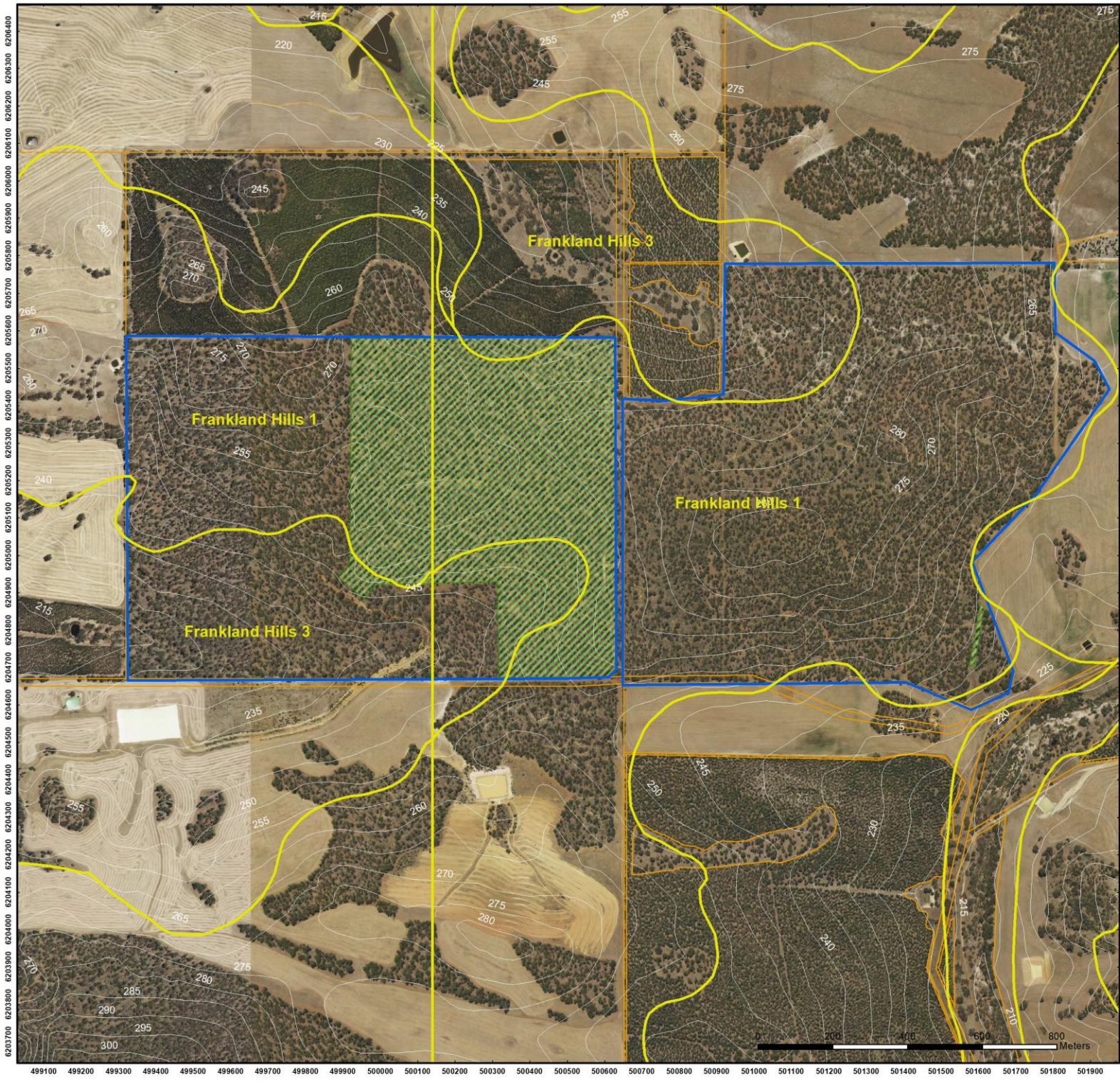
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1:10,000 @ A3  
GDA MGA 94 Zone 50

**Data Sources**  
Aerial Imagery: WA Now, Landgate Subscription Imagery  
Cadastre, Relief Contours and Roads: Landgate 2017  
IRIS Road Network: Main Roads Western Australia 2017  
Overview Map: World Topographic map service, ESRI 2012

**CLIENT**  
Nigel Rowe  
Lot 24 Koojyanup Road,  
Frankland River, WA, 6396

**Figure 1: Proposed Clearing Area**

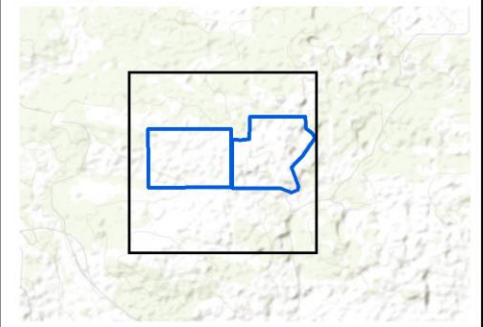
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STATUS <b>FINAL</b>	FILE <b>MSC0449</b>	DATE <b>28/06/2021</b>



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Albany Office: 29 Hercules Crescent Albany, WA 6330 (08) 9842 1575  
 Denmark Office: 7/40 South Coast Highway Denmark, WA 6333 (08) 9848 1309  
 Esperance Office: 2A/113 Dempster Street Esperance, WA 6450



Overview Map Scale 1:100,000

- Legend**
- Subject Site
  - Proposed Clearing Area
  - Cadastre
  - Soil Landscape Mapping (Best Available) (DPIRD)

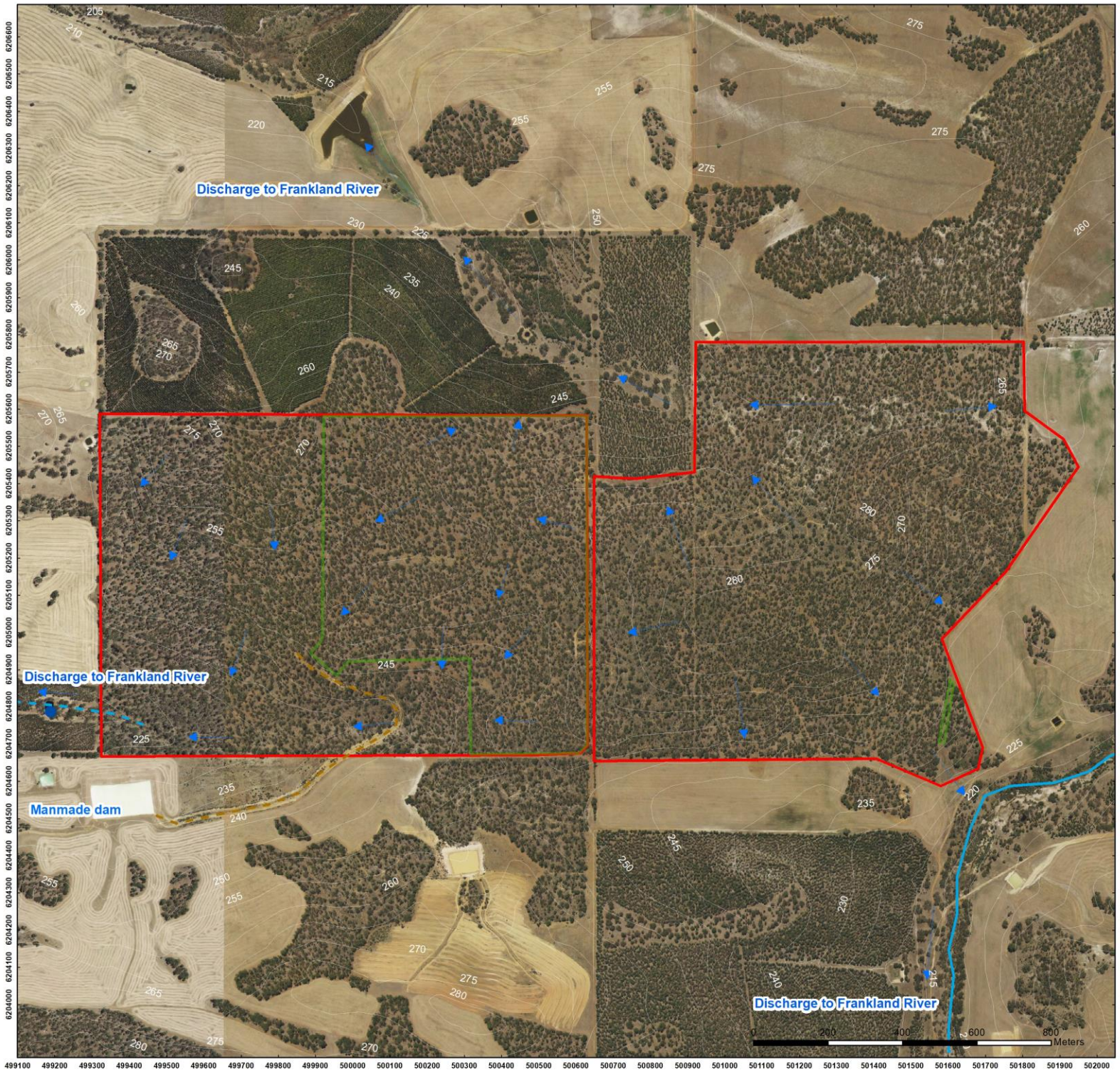
Scale  
 1:10,000 @ A3  
 GDA MGA 94 Zone 50

**Data Sources**  
 Aerial Imagery: WA Now, Landgate Subscription Imagery  
 Cadastre, Relief Contours and Roads: Landgate 2017  
 IRIS Road Network: Main Roads Western Australia 2017  
 Overview Map: World Topographic map service, ESRI 2012

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**Figure 2: Topography & Soil Mapping**

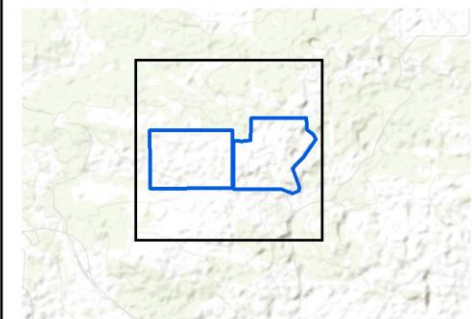
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Albany Office: 29 Hercules Crescent  
Albany, WA 6330  
(08) 9842 1575

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Overview Map Scale 1:100,000

- Legend**
- Subject Site
  - Proposed Clearing Area
  - ▶ Drainage Direction
  - ▶ Frankland River Tributary
  - - - Dam Catchment Drain
  - - - Seasonal Creek Line (Discharge to Frankland River)
  - Dam within seasonal creek line



Scale  
1:10,000 @ A3  
GDA MGA 94 Zone 50

**Data Sources**  
Aerial Imagery: WA Now, Landgate Subscription Imagery  
Cadastral, Relief Contours and Roads: Landgate 2017  
IRIS Road Network: Main Roads Western Australia 2017  
Overview Map: World Topographic map service, ESRI 2012

**CLIENT**  
Nigel Rowe  
Lot 24 Koojyanup Road,  
Frankland River, WA, 6396

**Figure 3: Hydrology**

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