



# Lexington Offset Annual Report 2020

## Meteor Downs South Project

Sojitz Blue Pty Ltd



## APPROVALS

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	Name	Position	Date
<b>ORIGINATORS</b>	Dr Jarrad Cousin	Senior Ecologist	24 July 2020
<b>APPROVER</b>	Christopher Ewing	Head of Ecosystem Markets and Innovation	24 July 2020

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# 1 INTRODUCTION

## 1.1 BACKGROUND

U&D Mining Industry (Australia) Pty (U&D) has approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to develop and operate the Meteor Downs South (MDS) Coal Mine Project (the MDS Project) (Figure 1). U&D is in a joint venture with Sojitz Blue Pty Ltd (Sojitz Blue) to develop and operate the MDS Project.

The MDS project was granted Commonwealth Government approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth, EPBC Act) on 25 November 2014 (EPBC 2013/6799). State Government environmental approval was granted by the Queensland Department of Environment and Resource Management in July 2013 (Environmental Authority EPML00559513). In December 2019, Sojitz Blue received approval under the EPBC Act (EPBC 2019/8482) to develop and operate the Meteor Downs South Mine Rail Loop (MDS Rail Loop).

This annual report has been prepared to satisfy conditions 5 and 6 of the EPBC Act approval (EPBC 2013/6799) and relevant requirements for offset delivery under the Queensland Environmental Offset Framework in accordance with the project's EA for the MDS Project at the Lexington offset site. This annual report has also been prepared to satisfy conditions 2, 3, 4 and 5 of the EPBC Act approval (EPBC 2019/8482) with respect to environmental offsets at the Lexington Rail Loop offset site for significant residual impacts associated with the MDS Rail Loop.

Environmental offsets are required for significant residual impacts of the MDS project and MDS Rail Loop on the matters of national environmental significance (MNES) and matters of state environmental significance (MSES), namely:

- ▶ Natural Grasslands of the Queensland Central Highlands and Fitzroy Basin threatened ecological community (Natural Grasslands TEC) (MNES) – MDS Project and MDS Rail Loop
- ▶ Habitat for king blue-grass (*Dichanthium queenslandicum*) (MNES/MSES) – MDS Project and MDS Rail Loop
- ▶ Habitat for bluegrass (*Dichanthium setosum*) (MNES/MSES) – MDS Project only
- ▶ Habitat for squatter pigeon (southern) (*Geophaps scripta scripta*) (MNES/MSES) – MDS Project only
- ▶ Endangered RE 11.8.15 – MDS Project only
- ▶ Of concern RE 11.8.11 (MSES) (offset as part of Natural Grasslands TEC)
- ▶ Of concern RE 11.8.11a (BVG 21b) (MSES) – MDS Project only
- ▶ Watercourse RE 11.8.5 (BVG 11a) (MSES) – MDS Project only
- ▶ Watercourse RE 11.8.11 (BVG 30b) (MSES) – MDS Project only
- ▶ Watercourse RE 11.8.11a (BVG 21b) (MSES) – MDS Project only.

The Lexington property (Figure 2), owned by Sojitz Minerva Mining, is being used to acquit all of the MDS Project's and MDS Rail Loop offset requirements, with the exception of RE 11.8.15 (MDS Project) for which a financial settlement offset has been provided under the Queensland Environmental Offset Framework.

In accordance with the Offset Management Plan (OMP), the following activities are required to be completed in Year 3 (31 October 2019 to 31 October 2020) in the Lexington offset area:

- ▶ photo monitoring



- 
- ▶ weed surveys, one during the dry season (i.e. typically May/June to September/October) and other following the wet season (i.e. wet season typically November/December to March/April and post wet typically April/May)
  - ▶ pest animal monitoring, one during the dry season and the other following the wet season
  - ▶ biomass assessments at the end of the dry season and the other following the wet season
  - ▶ general offset site monitoring
  - ▶ submission of the annual report by 30 June 2020.

The OMP also outlined the following activities are required to be completed in Year 1 (31 October 2019 – 31 October 2020) in the Lexington Rail Loop site:

- ▶ establishment of permanent monitoring sites in the North Promenade, Harry's and Contours paddocks constituting the Lexington Rail Loop offset area
- ▶ baseline surveys:
  - habitat condition assessment and photo monitoring of areas of Natural Grasslands TEC and king blue-grass
  - post-wet season weed surveys
  - biomass assessments at the end of the wet season
  - general offset site monitoring
- ▶ submission of the annual report by 30 June 2020.

## 1.2 PURPOSE OF DOCUMENT

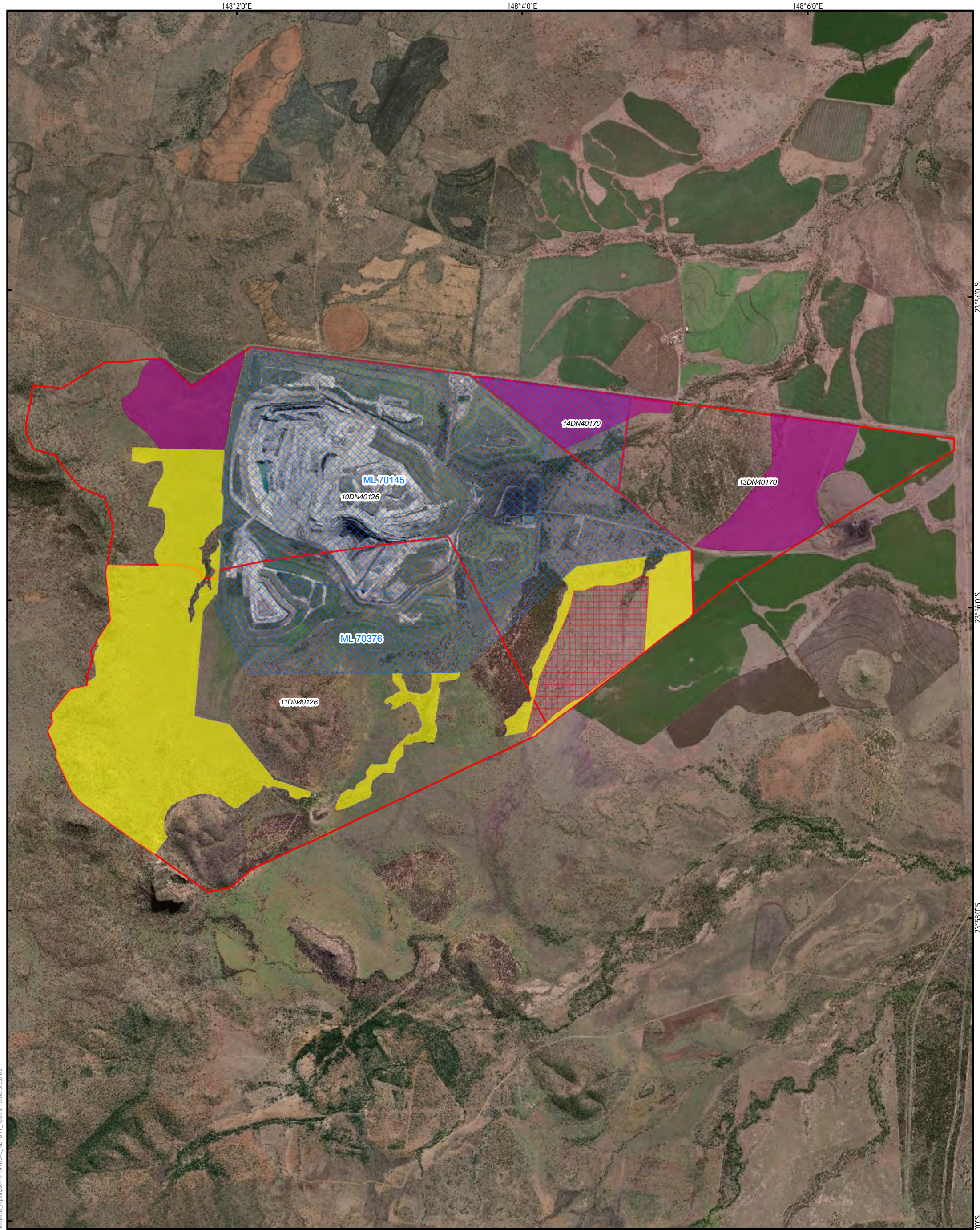
The annual report will be submitted to the Commonwealth Department of Environment and Energy (DEE) and Queensland Government documenting the implementation of and adherence to the OMP. To satisfy this requirement, this annual report has been prepared by CO2 Australia on behalf of Sojitz Blue for the period July 2019 to June 2020. This annual report presents the following:

- ▶ Project details
- ▶ A general description of climatic conditions for the management period
- ▶ Activities undertaken within the management period
- ▶ Results of monitoring events within the management period so far
- ▶ An indication of any risks or potential threats that have become apparent since the development of the OMP, and activities to be undertaken to manage these threats and risks
- ▶ Progress towards achieving the management objectives and performance criteria and any adaptive management triggers and/or corrective actions that have been implemented
- ▶ Recommendations for revising the OMP including changes to management and monitoring activities to improve management and/or monitoring performance and attained performance targets and/or completion criteria.

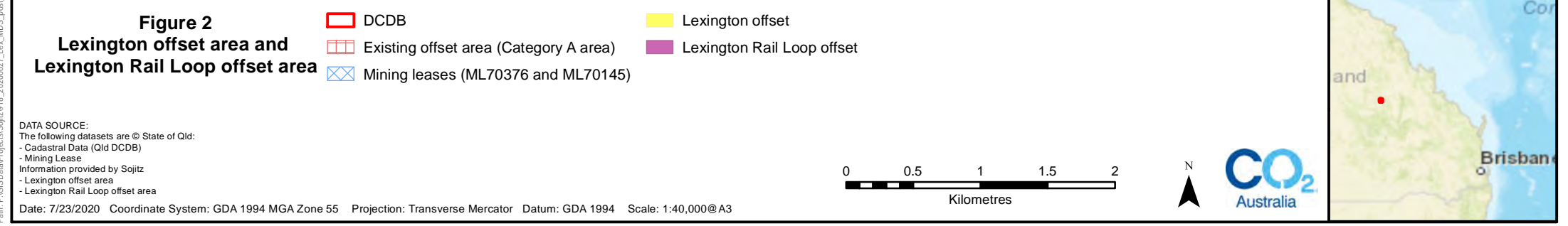








Sojitz Blue Pty Ltd Location diagram





## 2 PROJECT DETAILS

The departmental reference details for the Lexington offset site and the Lexington Rail Loop offset site are outline in Table 1.

**Table 1: Project details for the Lexington offset site**

Commonwealth offset trigger	
Relevant legislation	EPBC Act
EPBC Act approval	EPBC 2013/6799 and EPBC 2019/8482
MNES required to be offset	Listed threatened species and communities
Queensland Government offset trigger	
Relevant legislation	<i>Environmental Offsets Act 2014</i>
Environmental Authority	EPML00559513
MSES required to be offset	Regulated vegetation, protected wildlife habitat, wetlands and watercourses, connectivity areas
Offset property real property description (Primary Lot on Plan/s) and address:	
Lot 10 and Lot 11 DN40126, Lot 14 DN40170 and Lot 13 DN40170	
593-607 Wurba Road, Minerva, QLD 4722	
<b>Tenure:</b> Freehold	<b>Primary Local Government Area:</b> Central Highlands Regional Council

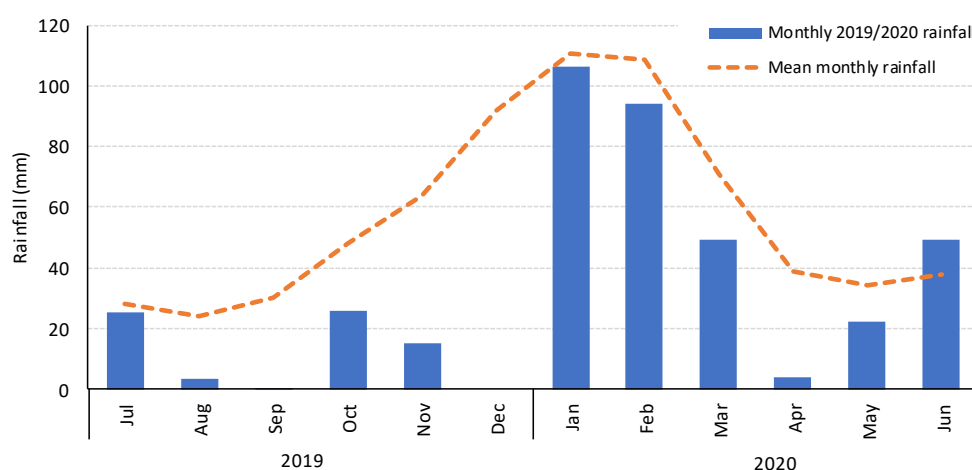


### 3 CLIMATE CONDITIONS

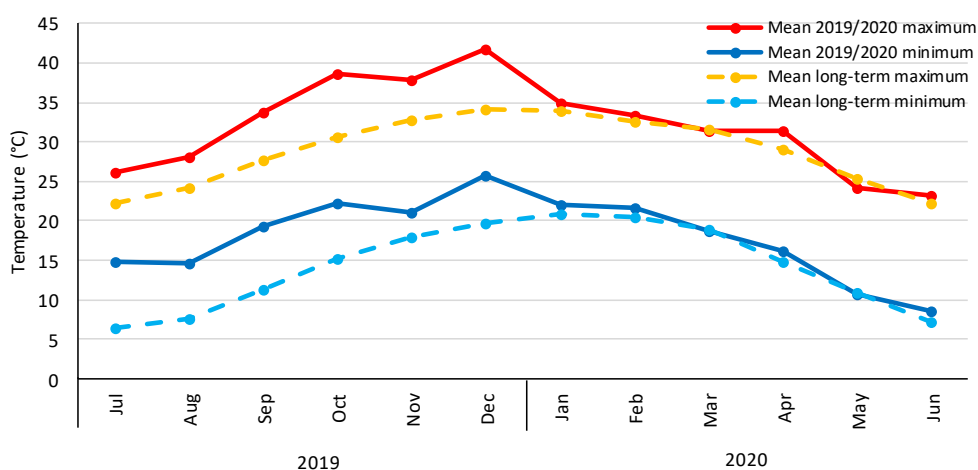
During the 2019/2020 management period, a total of 395 mm was recorded at the nearest weather station (Comet Street, Springsure #35065, ~20 km south of the offset area) which was only 57% of the long-term annual average of 686.5 mm. The five seasons in 2019 leading up to the wet season (August to December) saw only 44 mm of rain, representing only 17% of the long-term average of 257.2 mm. Notably, no rainfall was recorded in December.

The temperature data indicated mean maximum and minimum temperatures were greater than the long-term average from 10 of the 12 months, with the mean maximum and minimum temperatures during the management period ~3.2°C and 3.7°C above the long-term average, respectively. This included a particularly hot December 2019, where the maximum temperature averaged 41.7°C; being 7.6°C higher than the long term average. Minimum temperatures during the first four months of the management period (July – October 2019) averaged 7.7°C above the long term average, with the July 2019 mean minimum temperature (14.9°C) being 8.5°C higher than the long-term average of 6.4°C.

In summary, the climate conditions during the 2019/2020 management period could be characterised as being considerably warmer and drier than normal.



**Figure 3: Rainfall recorded during the 2019/2020 management period.**



**Figure 4: Temperature recorded during the 2019/2020 management period.**

## 4 ACTIVITIES UNDERTAKEN DURING THE MANAGEMENT PERIOD

Management of the offset management area is being undertaken in accordance with the OMP. The offset area is being managed in order to improve the condition and connectivity of habitat and vegetation communities for MNES and MSES, in order to attain and maintain completion criteria for the length of implementation of the OMP. Management objectives presented In Section 5 of the OMP for the Lexington offset area and Lexington Rail Loop offset area aim to:

- ▶ minimise predation risk by wild dogs, foxes and cats to threatened fauna species within the offset area (Lexington offset area)
- ▶ minimise habitat degradation caused by pest animals (pigs and rabbits) within the offset area to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC (Lexington offset area)
- ▶ control invasive weed species to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC (Lexington offset area and Lexington Rail Loop offset area)
- ▶ minimise impact of livestock grazing on the condition of habitat for threatened species and vegetation communities including those that are representative of TEC (Lexington offset area and Lexington Rail Loop offset area)
- ▶ reduce the risk of adverse impacts by unplanned fire through fire management, and improve the condition of habitat for threatened species and vegetation communities including those that are representative of TEC within offset areas (Lexington offset area and Lexington Rail Loop offset area)

An outline of the management activities and monitoring actions that have been undertaken to address the management objectives of the corresponding offset areas are presented in Table 2 for the year 3 management period (July 2019 to June 2020) in the Lexington offset area and in Table 3 for the year 1 management period (December 2019 – June 2020) in the Lexington Rail Loop offset area. These activities and timings are drawn from the *Offset Management Plan for Lexington – Meteor Downs South Project* (Sojitz 2019).



**Table 2: Management and monitoring measures undertaken within the 2019/2020 management period for the Lexington offset area.**

Activity		Timing	Management activities undertaken within the management period
General restrictions	<ul style="list-style-type: none"> <li>▶ Install locks on gates</li> <li>▶ Erect signs on access points into offset site</li> <li>▶ Annually inspect fence, gates and locks to ensure maintained in a serviceable condition.</li> </ul>	At the start of management and maintained at all times	Access to offset area locked in the north-east corner, although open, unlocked fence is accessible to vehicles via Wurba Road to the west. No signage is installed identifying site as an offset area.
Access tracks	Maintain unsealed access tracks to no more than 5 m width and in safe condition.	At all times	All access tracks in passable condition. Firebreak tracks impassable in in December 2019 have since been graded. New access tracks established providing access to south-west of offset site. Maintenance of access tracks is ongoing. Refer to Figure 5 in Appendix B for updated monitoring site maps with updated fences.
Fencing	Map location of additional fencing and install by July 2019.	In year 1 existing and required additional fencing will be mapped and additional fencing will be constructed within the first three years of management to assist with livestock management.	Numerous additional fences were installed between December 2019 and June 2020. Additional fencing and gates were being installed at the time of the June 2020 survey, with maintenance of all existing and new fencing ongoing. Refer to Figure 5 in Appendix B for updated monitoring site maps with updated fences.
Pest animal management	Complete baseline assessment of pest animals to determine control measures, location and timing for management.	As required based on results of year 1 baseline assessment	Year 1 (baseline) pest monitoring completed by CO2 Australia; additional dry season pest monitoring conducted by NRC. Baiting of feral pigs and wild dogs conducted November 2017, April 2018 and November 2018. Aerial shooting of feral pigs conducted June 2018. Aerial pig cull was completed in September 2019. Pest animal control for 2020 is planned for September – type of control yet to be determined.
Weed management	<p>Implement weed hygiene measures as part of access requirements applicable to the offset areas.</p> <p>Complete baseline assessment to determine distribution and abundance of invasive and other weed infestations and determine control measures, location and timing for management including:</p> <ul style="list-style-type: none"> <li>▶ a strategic grazing regime to reduce the presence of exotic pasture grasses to less than 25% of the total groundcover in the offset areas.</li> <li>▶ spraying of exotic grasses following strategic grazing events.</li> </ul>	Weed control activities in addition to fire management and livestock management to be undertaken as required following year 1 baseline assessment	Year 1 (baseline) weed surveys completed by CO2 Australia. New Lexington Agistment Agreement initiated; appropriate party selected will conduct weed management program in accordance with offset progress requirements and informed by year 1 (baseline) weed surveys. During the current management period, weed control was undertaken by spraying of access tracks, mainly targeting Parthenium as part of the sharefarming agreement.
Fire management	<p>Maintain existing firebreaks, access tracks and roads annually.</p> <p>Implement strategic grazing regime to maintain fuel loads.</p> <p>Undertake a mosaic low intensity burns to maintain ecological functioning.</p>	As required, with frequency determined by biomass monitoring and fire management guidelines for each of the component RE contributing to the offset management zones. Burns should only be undertaken in the late wet to early dry season when there is adequate soil moisture, burning less than 30% in any year.	Firebreaks mapped and defined. Maintenance of firebreaks completed in July 2019 with firebreaks maintained in early 2020.
Livestock management	Strategic grazing regime in offset management zones A and B – light grazing	At all times	<p>North Promenade paddock is understood to have been destocked since April 2019, however cattle were observed in North Promenade during June 2020 survey.</p> <p>It is understood that a grazing assessment for Lexington was conducted in June 2020 with the final report outstanding. Grazing sequence will be determined by the outcome of the grazing assessment report.</p>
	Reduced or restricted livestock grazing within offset management zone C for of concern RE 11.8.11a and watercourse RE 11.8.11a if rainfall events cause inundated or waterlogged soils	Excluded when inundated or waterlogged	
Erosion management	Restrict grazing within management zone C if rainfall events cause inundated or waterlogged soils	<p>At all times</p> <p>Erosion will be managed throughout the offset site by livestock management and general access restrictions</p>	<p>No evidence of cattle aside from small herd observed in North Promenade paddock in June 2020.</p> <p>Access restrictions maintained.</p>



**Table 3: Management and monitoring measures undertaken within the 2019/2020 management period for the Lexington Rail Loop offset area.**

Activity		Timing	Management activities undertaken within the management period
General restrictions	<ul style="list-style-type: none"> <li>▶ Install locks on gates</li> <li>▶ Erect signs on access points into offset site</li> <li>▶ Annually inspect fence, gates and locks to ensure maintained in a serviceable condition.</li> </ul>	At the start of management and maintained at all times	
Access tracks	Maintain unsealed access tracks to no more than 5 m width and in safe condition.	At all times	
Fencing	Map location of additional fencing and install by July 2021.	In year 1 existing and required additional fencing will be mapped and additional fencing will be constructed within the first three years of management to assist with livestock management.	
Pest animal management	Complete baseline assessment of pest animals to determine control measures, location and timing for management.	As required based on results of year 1 baseline assessment	
Weed management	<p>Implement weed hygiene measures as part of access requirements applicable to the offset areas.</p> <p>Complete baseline assessment to determine distribution and abundance of invasive and other weed infestations and determine control measures, location and timing for management including:</p> <ul style="list-style-type: none"> <li>▶ a strategic grazing regime to reduce the presence of exotic pasture grasses to less than 25% of the total groundcover in the offset areas.</li> <li>▶ spraying of exotic grasses following strategic grazing events.</li> </ul>	Weed control activities in addition to fire management and livestock management to be undertaken as required following year 1 baseline assessment	
Fire management	<p>Maintain existing firebreaks, access tracks and roads annually.</p> <p>Implement strategic grazing regime to maintain fuel loads.</p> <p>Undertake a mosaic low intensity burns to maintain ecological functioning.</p>	As required, with frequency determined by biomass monitoring and fire management guidelines for each of the component RE contributing to the offset management zones. Burns should only be undertaken in the late wet to early dry season when there is adequate soil moisture, burning less than 30% in any year.	
Livestock management	Strategic grazing regime in offset management zone B – light grazing	At all times	<p>Harry's Paddock is understood to have been destocked since April 2019, however horses were observed in Harry's Paddock during June 2020 survey.</p> <p>It is understood that a grazing assessment for Lexington was conducted in June 2020 with the final report outstanding. Grazing sequence will be determined by the outcome of the grazing assessment report.</p>
Monitoring	General offset site monitoring	Annually	
	Establishment of monitoring points	Year 1 to establish monitoring points	
	Habitat condition assessments and photo monitoring	Calculate baseline condition at established monitoring points, with habitat condition assessments and photo monitoring undertaken every 2 years for the first 10 years and then a minimum of every 5 years thereafter up to 31 October 2039. Monitoring frequency to be reviewed at Year 10 and frequency based on attainment of interim performance target	
	King blue-grass surveys	Baseline assessment in year 1, with follow-up surveys every five years until end of management period.	
	Baseline weed survey	To inform requirements for ongoing weed control a baseline survey is required in year 1	
	Weed monitoring	Every two years following baseline survey event	
	Baseline pest animal survey	To inform requirements for ongoing pest animal management a baseline survey is required in year 1	

Activity		Timing	Management activities undertaken within the management period
		Two events to be completed in year 1 – one dry season survey and one post wet survey	
	Pest animal monitoring	Every two years following baseline survey event Two events to be completed in each survey year – one dry season survey and one post wet survey	
	Monitoring biomass for grazing and fire management	At least annually, including at the end of the wet season Prior to and during grazing events	
Reporting	Annual report	By 30 June each management year	
	Review and update OMP	By 30 July each management year	



## 5 SUMMARY OF OFFSET MONITORING

### 5.1 GENERAL OFFSET MONITORING

#### 5.1.1 Lexington offset site

General site inspections were undertaken within the Lexington offset area as part of the dry season monitoring and post-wet season monitoring. While it was noted in the dry season monitoring report that proposed fencing was yet to be installed, surveying in June 2020 confirmed that much of the fencing was installed, with some of the additional fencing being installed at the time of surveying. Additional access tracks were also installed between December 2019 and June 2020, permitting additional access to additional parts of the offset area.

It is understood that a share-farming agreement is in place to limit the head of cattle per paddock. However, cattle were observed in the natural grassland areas in the west of the Lexington offset area during the post-wet season monitoring.

A number of areas away from surveyed plots were seen supporting considerable weed infestations. This included dense stands of Noogoora burr (*Xanthium occidentale*) within and adjacent the ephemeral drainage line and bore on Prickle Farm flanking the western edge of the mining lease (ML 70376). Areas away from the drainage line characterised by dense, monospecific stands of *Parthenium hysterophorus*.

A well was encountered during the dry season survey but was not encountered during the post-wet season survey.

#### 5.1.2 Lexington Rail Loop offset site

A site inspection of the Lexington Rail Loop offset site was undertaken during the post-wet season survey. A herd of 5 – 6 horses was encountered on a number of days within Harry's Paddock, with evidence throughout the paddock of horse manure. Likewise, cattle were observed within Contours paddock and in the vicinity of the southern boundary of North Promenade paddock.

All fences bounding the paddocks were in good condition. Access to many of the monitoring sites in the Contours paddock was via an access track outside of and adjacent to the western boundary of the paddock, whereas access to monitoring sites in Harry's paddock was via Wurba Road and access to the North Promenade monitoring sites was via existing access tracks into Lexington.

### 5.2 HABITAT CONDITION ASSESSMENTS

#### 5.2.1 Lexington offset site

Habitat condition assessments were undertaken in the Lexington offset area in May 2019 so were reported as part of the Annual Report prepared for the 2018/2019 management period. As outlined in the Lexington offset Monitoring Area Habitat condition and biomass monitoring report (SLR 2019), biennial habitat condition assessments will commence in 2021 at the Lexington offset site.

#### 5.2.2 Lexington Rail Loop offset site

Habitat condition assessment sites were established in the Lexington Rail Loop offset area in June 2020, with condition assessments undertaken at that time representing baseline (Year 1) assessments. The results of the habitat condition assessments indicated an average habitat condition score for Natural Grasslands TEC of 7.57 (out of 10). Of the seven habitat condition assessment sites, four were calculated as supporting Natural Grassland TEC in 'best' condition and three in 'good' condition in accordance with the Conservation Advice Condition class classification.

King blue-grass had an average habitat condition score for King blue-grass of 7.57 (out of 10), with the species positively identified from three of the seven habitat condition assessment plots at the time of surveying, either as a single tussock (Site LEXRL06) up to a population of 20-50 tussocks (Site LEXRL04).

Results of the habitat condition assessments undertaken during the 2019/2020 monitoring period in the Rail Loop offset area are presented in Section 6.1 of the post-wet season survey report (CO2 Australia 2020b)(Appendix B).

## 5.3 WEED MONITORING

### 5.3.1 Lexington offset site

Weed monitoring was done as part of dry season (December 2019) and post-wet season (June 2020) monitoring surveys at the Lexington offset site. The results of these surveys identified 22 species of weeds (averaging 6.1 species/plot) in the dry season surveys and 30 species of weeds (9.3 species/plot) in the post-wet season surveys. Weed cover averaged 22.2% in the dry season and 31.3% in the post-wet season surveys.

The 2019/2020 monitoring period represented the first weed monitoring since the baseline survey in April 2018 (dry season), with no post-wet season weed survey undertaken prior to the current June 2020 survey.

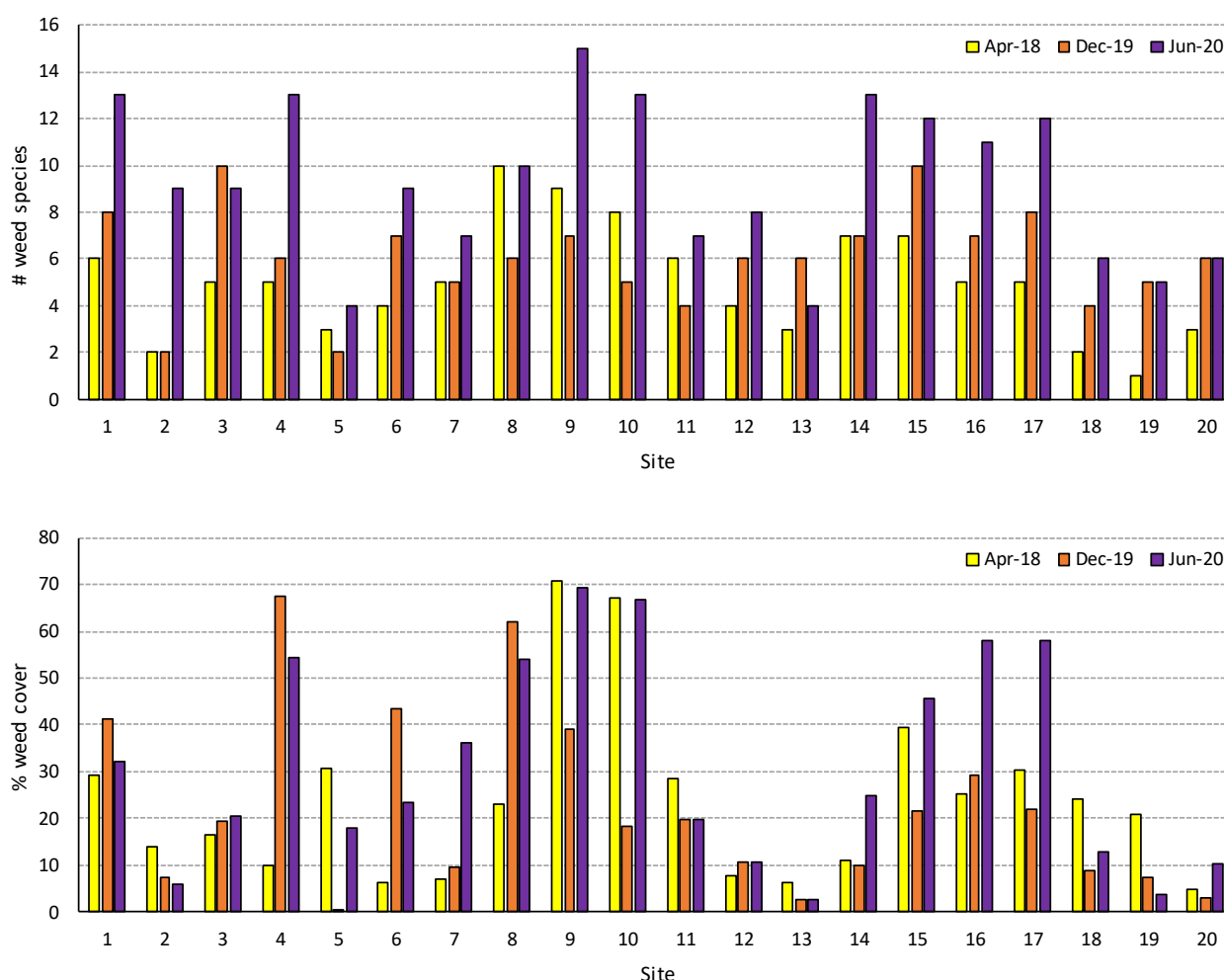
**Table 4: Comparison of weed survey results since April 2018.**

	Year 1 post-wet season - April 2018	Year 3 dry season - December 2019	Year 3 post-wet season - June 2020
Number of weed species	22	22	30
Average weed species per plot (range)	5 (1 – 10)	6.1 (2 – 10)	9.3
Average weed cover per plot (range)	23.7% (4.9 – 70.7%)	22.2% (0.6 – 67.4%)	31.3% (2.7 – 69.3%)

Figure 5 shows the number of weed species per site and % weed cover per site from the three weed surveys undertaken to date in the Lexington offset area. The results indicate a higher species richness of weeds during the June 2020 surveys than in the previous two surveys from 15 of the 20 sites. This is possibly a consequence of the more favourable conditions promoting weeds post-wet season in 2020 than in 2018. Percentage weed cover at each of the sites was relatively similar for many of the sites (accepting some variability across seasons), with the exception of a number of sites (Sites 07, 14, 15, 16 and 17) which had notably higher weed cover than in previous surveys. Four of these sites were adjacent the western boundary of the mining lease, in areas of RE 11.8.11 lower in the landscape.

Results of the weed surveys undertaken during the 2019/2020 monitoring period in the Lexington offset area are presented in Section 4.2 of the dry season survey report (CO2 Australia 2020a)(Appendix A) and Section 5.2 of the post-wet season survey report (CO2 Australia 2020b)(Appendix B).





**Figure 5: Number of weed species per site (above) and % weed cover per site (below) from the April 2018, December 2019 and June 2020 weed surveys.**

### 5.3.2 Lexington Rail Loop offset site

Weed monitoring was undertaken at the Lexington Rail Loop offset site in June 2020, with the results representing baseline (Year 1) post-wet season assessments. The results of these surveys identified 15 species of weeds (averaging 4.8 species/plot), with weed cover averaging 11.5% (range 0.1 – 39.1%). Results of the weed surveys undertaken in the 2019/2020 monitoring period in the Rail Loop offset area are presented in Section 6.3 of the post-wet season survey report (CO2 Australia 2020b)(Appendix B).

## 5.4 BIOMASS MONITORING

### 5.4.1 Lexington offset site

Biomass monitoring was undertaken as part of the dry season (December 2019) and post-wet season (June 2020) monitoring surveys at the Lexington offset site. Table 5 shows a comparison of biomass monitoring results between the baseline surveys conducted by CO2 Australia in May 2018 and the latest assessments. The results of these surveys are also presented in Figure 6, shown as the average biomass of each RE (+/- standard error). These results demonstrate the fluctuations in biomass as a function of season, with successive surveys undertaken in opposite seasons (starting with post-wet season 2018). The results of these assessments demonstrate the overall lower biomass in areas of RE 11.8.4 and RE 11.8.5 compared with RE 11.8.11 and RE 11.8.11a. The results of the two surveys undertaken in the current management period

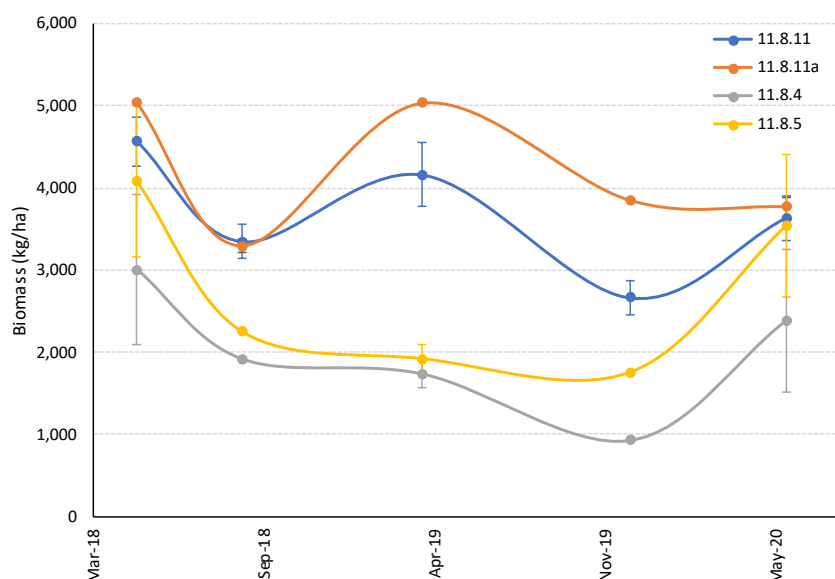
demonstrate the late wet-season rainfall has resulted in marked increase in biomass, particularly that in RE 11.8.4 and RE 11.8.5. The continued high biomass in RE 11.8.11a reflects the elevated weed loads contributing to biomass in these RE areas.

Results of the biomass monitoring assessments during the 2019/2020 monitoring period in the Lexington offset area are presented in Section 4.1 of the dry season survey report (CO2 Australia 2020a)(Appendix A) and Section 5.4 of the post-wet season survey report (CO2 Australia 2020b)(Appendix B).

**Table 5: Comparison of biomass monitoring results in the Lexington offset area since May 2018.**

Site	RE type	Biomass (kg/ha)				
		May 2018	Sep 2018	Apr 2019	Dec 2019	Jun 2020
W01	11.8.11	5,040	3,015	5,040	2,140	3,850
W02	11.8.4	5,000	1,750	1,200	310	1,750
W03	11.8.11	3,850	3,015	5,040	3,015	3,015
W04	11.8.5	5,000	2,250	1,750	1,750	2,000
W05	11.8.4	1,750	1,750	1,750	720	3,625
W06	11.8.11	5,040	3,015	3,015	2,140	3,015
W07	11.8.4	2,250	2,250	2,250	1,750	1,750
W08	11.8.11a	5,040	3,850	5,040	3,850	3,015
W09	11.8.11a	5,040	3,015	5,040	3,850	3,850
W10	11.8.11a	5,040	3,015	5,040	3,850	4,445
W11	11.8.5	5,000	2,250	1,750	1,750	5,000
W12	11.8.11	3,850	3,850	3,850	3,015	4,445
W13	11.8.11	5,040	3,850	3,850	3,015	3,850
W14	11.8.5	2,250	2,250	2,250	1,750	3,625
W15	11.8.4	5,000	2,250	2,250	1,750	2,000
W16	11.8.11	3,850	2,140	3,015	1,080	2,578
W17	11.8.11	3,850	3,850	3,850	2,140	2,578
W18	11.8.5	5,000	2,250	5,000	1,750	2,250
W19	11.8.4	1,750	2,250	2,250	720	2,000
W20	11.8.11	3,850	3,850	5,040	3,015	5,040





**Figure 6: Graphical representation of the change in biomass between May 2018 and June 2020.**

#### 5.4.2 Lexington Rail Loop offset site

Baseline biomass monitoring was undertaken in the Lexington Rail Loop offset area in June 2020. The results of that assessment identified some variability in biomass of ground cover across all 12 sites. Overall, there was a high biomass for the grassland vegetation type, with a biomass ranging between 3,015 kg/ha and 5,040 kg/ha. The average biomass varied considerably between the offset paddocks, with the average biomass at Contours (4,921 kg/ha) greater than at Harry's (4,365 kg/ha) and greater again than at North Promenade (3,681 kg/ha).

Results of the baseline biomass monitoring assessments undertaken in the 2019/2020 monitoring period of the Rail Loop offset area are presented in Section 6.4 of the post-wet season survey report (CO2 Australia 2020b)(Appendix B).

**Table 6: Biomass monitoring baseline results at the Lexington Rail Loop offset site.**

Site	RE type	Biomass kg/ha Jun 2020
LEXRL01 – North Promenade paddock	11.8.11	4,445
LEXRL02 – North Promenade paddock	11.8.11	3,850
LEXRL03 – Harry's paddock	11.8.11	3,015
LEXRL04 – Harry's paddock	11.8.11	5,040
LEXRL05 – Contours paddock	11.8.11	5,040
LEXRL06 – Contours paddock	11.8.11	4,445
LEXRL07 – Contours paddock	11.8.11	5,040
LEXRL08 – North Promenade paddock	11.8.11	3,850
LEXRL09 – North Promenade paddock	11.8.11	2,578
LEXRL10 – Harry's paddock	11.8.11	5,040
LEXRL11 – Contours paddock	11.8.11	5,040

Site	RE type	Biomass kg/ha Jun 2020
LEXRL12 – Contours paddock	11.8.11	5,040

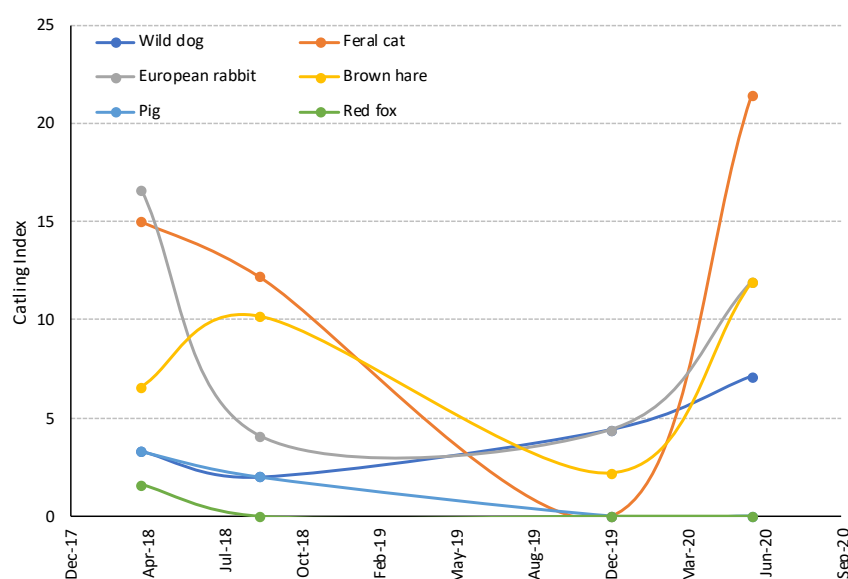
## 5.5 PEST ANIMAL MONITORING

### 5.5.1 Lexington offset site

Results of pest animal monitoring since the baseline assessment in April 2018 has indicated a steady decline in presence of a number of pest animals (measured in the form of Catling Index) prior to the December 2019 survey results. While the red fox has not been recorded on cameras since the baseline assessment, and pigs have not been detected on cameras since September 2018, the Catling Index for the remaining four species all increased in December 2019 and June 2020 (Table 7). This is best represented in Figure 7, which shows the marked increase in the Catling Index in December 2019, with the feral cat and rabbit continuing to increase in June 2020, but the brown hare and wild dog decreasing.

**Table 7: Catling Index for pest animals at the Lexington offset site April 2018 – June 2020.**

Pest animal	April 2018	September 2018	December 2019	June 2020
Wild dog	3.3	2.0	16.7	7.1
Feral cat	15.0	12.2	19.0	21.4
European rabbit	16.6	4.1	4.8	11.9
Brown hare	6.6	10.2	19.0	11.9
Pig	3.3	2.0	0	0
Red fox	1.6	0	0	0



**Figure 7: Graphical representation of the change in Catling Index between April 2018 and June 2020.**



The results of pig monitoring in the 2019/2020 monitoring period (refer to Appendix A and Appendix B) indicated the continued presence of rabbits and hares in the offset area. While there has been some decrease in pig and rabbit presence in the Lexington offset area between December 2019 and June 2020 (Table 8), the percentage of plots from which evidence for the species was confirmed is greater than the baseline incidence rates.

**Table 8: Percentage of plots from which the pest animal was detected, and rabbit impact results.**

Pest animal	April 2018	September 2018	December 2019	June 2020
Pigs	25%	63%	88%	75%
Rabbits	0%	70%	100%	90%
	3 x Acceptable*	0 x Acceptable	0 x Acceptable	2 x Acceptable
	7 x Monitor closely*	8 x Monitor closely	3 x Monitor closely	5 x Monitor closely
	0 x Unacceptable*	0 x Unacceptable	7 x Unacceptable	3 x Unacceptable

\* corrected baseline (April 2018) rabbit impact results based on stricter interpretation of Cooke et al. (2008).

### 5.5.2 Lexington Rail Loop offset site

No pest fauna monitoring is required to be undertaken within the Lexington Rail Loop offset area.

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## 6 ADHERENCE TO MANAGEMENT OBJECTIVES

Table 9 presents details of management actions undertaken in the Lexington offset area and Lexington Rail Loop offset area to date, and an assessment of whether the offset is demonstrating adherence to the management objectives outlined in the OMP.



**Table 9: Lexington offset area management objectives for offset matters, outlining management actions, management targets and triggers for corrective action.**

Management objectives		Management actions	Offset management area and relevant offset matter								Adaptive management trigger	Progress towards meeting management objectives and any adaptive management triggers	Contingency response/corrective action required
			Natural Grasslands TEC	King blue-grass	Bluegrass	Squatter pigeon	Of concern RE 11.8.11a	Watercourse RE 11.8.5	Watercourse RE 11.8.11	Watercourse RE 11.8.11a			
Minimise predation risk by pest animals to threatened fauna species within the offset area	Dogs					✓					<ul style="list-style-type: none"> <li>▶ An increase in Catling Index from baseline and/or previous monitoring event, or</li> <li>▶ An observed increase in the abundance or signs of predator pest species in the offset area, or</li> <li>▶ Interim performance target for the squatter pigeon is not attained or a completion criteria is not attained and/or maintained</li> </ul>	<p><b>Lexington offset area</b> Year 3 pest animal monitoring activities completed. While there has been a decrease in Catling Index of foxes, it has risen for cats and dogs, triggering corrective actions. <i>Corrective action triggered.</i></p> <p><b>Lexington Rail Loop offset area</b> No pest animal monitoring required.</p>	<p><b>Lexington offset area</b> Continue/additional wild dog, cat (and fox) control in accordance with Section 6.5 of the OMP and DAFF guidelines, including baiting and/or trapping.</p> <p><b>Lexington Rail Loop offset area</b> N/A</p>
	Foxes					✓							
	Cat					✓							
Minimise habitat degradation caused by pest animals in the offset site	Pigs	Pest animal management will be undertaken across the offset site in accordance with Section 6.5 of the OMP	✓	✓	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>▶ An increase in mean pig abundance score from baseline and/or previous monitoring event, or</li> <li>▶ An observed increase in the abundance of (or signs of) pigs in the offset area, or</li> <li>▶ Interim performance target for an offset matter is not attained or a completion criteria is not attained and/or maintained</li> </ul>	<p><b>Lexington offset area</b> Additional pest monitoring survey conducted during the dry and post-wet season for comparison with baseline: - Increases in feral pig presence recorded Aerial pig cull was completed in September 2019. Pest animal control for 2020 is planned for September – type of control yet to be determined. <i>Corrective action triggered.</i></p> <p><b>Lexington Rail Loop offset area</b> No pest animal monitoring required.</p>	<p><b>Lexington offset area</b> Continue/additional pig control in accordance with Section 6.5 of the OMP and DAFF guidelines.</p> <p><b>Lexington Rail Loop offset area</b> N/A</p>
	Rabbits		✓	✓	✓	✓	✓	✓	✓	✓		<p><b>Lexington offset area</b> Additional pest monitoring survey conducted during the dry and post-wet season for comparison with baseline: - Increases in European rabbit presence. - Increase in “Unacceptable” and reduction in “Acceptable” plots from baseline <i>Corrective action triggered.</i></p> <p><b>Lexington Rail Loop offset area</b> No pest animal monitoring required.</p>	<p><b>Lexington offset area</b> Implement an integrated rabbit control program in accordance with Section 6.5 of the OMP. Rabbit control to be undertaken during the dry season (June to October) using one or more control methods outlined in the DAFF guidelines. Methods to be used could include:</p> <ul style="list-style-type: none"> <li>▶ Destroying (ripping) rabbit warrens</li> <li>▶ 1080 baiting (outside of breeding periods – during the dry season)</li> <li>▶ Fumigation</li> <li>▶ Trapping and/or</li> <li>▶ Shooting</li> </ul>

Management objectives	Management actions	Offset management area and relevant offset matter								Adaptive management trigger	Progress towards meeting management objectives and any adaptive management triggers	Contingency response/corrective action required
		Natural Grasslands TEC	King blue-grass	Bluegrass	Squatter pigeon	Of concern RE 11.8.11a	Watercourse RE 11.8.5	Watercourse RE 11.8.11	Watercourse RE 11.8.11a			
												<b>Lexington Rail Loop offset area</b> N/A
Control invasive weed species to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC	Weed control will be undertaken in accordance with Section 6.6 of the OMP and weed hygiene restrictions will be implemented in accordance with Section 6.2 of the OMP	✓	✓	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>▶ An increase in the mean cover score of weed species from baseline and/or previous monitoring events, (refer to Section 7.4 of the OMP)</li> <li>▶ An increase in weed cover and density from baseline and/or previous monitoring events as derived from photo monitoring results</li> <li>▶ New outbreaks of invasive weed species</li> <li>▶ Interim performance target for an offset matter is not attained or a completion criteria is not attained and/or maintained</li> </ul>	<p><b>Lexington offset area</b> Additional weed surveys conducted during the dry and post-wet season for comparison with baseline:</p> <ul style="list-style-type: none"> <li>▶ Increase in total weed species richness across all plots from baseline</li> <li>▶ Increases in average weed species richness per plot and average weed cover per plot from baseline.</li> </ul> <p><i>Corrective action triggered.</i></p> <p><b>Lexington Rail Loop offset area</b> The 2018/2019. As this annual report presents the results of baseline weed monitoring for the Lexington Rail Loop offset area, the results of this report will serve as a baseline against which the results of future monitoring will be compared.</p>	<p><b>Lexington offset area</b> Corrective action required for control of newly identified weed species and ongoing management of previously confirmed weeds (Refer to Appendix A and Appendix B for details on dry season and post-wet season weeds and their location in the Lexington offset area).</p> <p><b>Lexington Rail Loop offset area</b> No correction action required</p>
Minimise impact of livestock grazing on the condition of habitat for threatened species and vegetation communities including those that are representative of TEC	Implementation of a strategic grazing regime in accordance with Section 6.8 of the OMP	✓	✓	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>▶ Rainfall events cause inundation or waterlogging of soils</li> <li>▶ Photo monitoring standards indicate greater than 1,500 kg/ha of dry matter is present at the end of the dry season</li> <li>▶ There is less than 20% of the plant material present as when cattle entered</li> <li>▶ Cattle are observed within an offset area outside of strategic grazing event</li> <li>▶ Damaged fencing is observed permitting cattle to enter offset area outside of strategic grazing event</li> <li>▶ Interim performance target for an offset matter is not attained or a completion criteria is not attained and/or maintained</li> </ul>	<p><b>Lexington offset area</b> Dry season biomass greater than 1,500kg/ha recorded at 16 of 20 biomass monitoring sites. Site currently destocked; however, herd of cattle in northwest of the offset area at the time of surveying in June 2020. <i>Corrective action triggered.</i></p> <p><b>Lexington Rail Loop offset area</b> Photo monitoring to be conducted in at the end of the dry season (October-November 2020), which will indicate dry matter biomass.</p>	<p><b>Lexington offset area</b> <b>Lexington Rail Loop offset area</b> Grazing assessment for Lexington was conducted in June 2020 with the final report outstanding. Grazing sequence will be determined by the outcome of the grazing assessment report. Amend stocking rates throughout offset site in accordance with Section 6.8 of the OMP. Focus of any grazing should be restricted to paddocks identified as containing highest biomass.</p>
Reduce the risk of adverse impacts by unplanned fire through fire management	Fire management across the offset site will be undertaken in accordance with Section 6.7 of the OMP.	✓	✓	✓	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>▶ An unplanned fire in the offset area</li> <li>▶ Photo monitoring standards indicate greater than 1,500 kg/ha of dry matter is present at the end of the dry season</li> <li>▶ Controlled burns contrary to fire management guidelines for offset matters (refer to OMP)</li> </ul>	Unplanned fire or controlled burns are not known to have occurred within the Lexington offsets area nor the Lexington Rail Loop offset area. Firebreaks were completed in July 2019 with firebreaks maintained for 2020.	<p><b>Lexington offset area</b> <b>Lexington Rail Loop offset area</b> Grazing assessment for Lexington was conducted in June 2020 with the final report outstanding. Grazing sequence will be determined by the outcome of the grazing assessment report.</p>
Improve the condition of habitat for threatened species and vegetation communities including those that are representative of TEC within		✓	✓	✓	✓	✓	✓	✓	✓			



Management objectives	Management actions	Offset management area and relevant offset matter								Adaptive management trigger	Progress towards meeting management objectives and any adaptive management triggers	Contingency response/corrective action required
		Natural Grasslands TEC	King blue-grass	Bluegrass	Squatter pigeon	Of concern RE 11.8.11a	Watercourse RE 11.8.5	Watercourse RE 11.8.11	Watercourse RE 11.8.11a			
offset areas through fire management										<p>► Interim performance target for an offset matter is not attained or a completion criteria is not attained and/or maintained</p>	<p><b>Lexington offset area</b> Dry season biomass greater than 1,500kg/ha at 16 of 20 biomass monitoring sites in the Lexington offset area <i>Corrective action triggered.</i></p> <p><b>Lexington Rail Loop offset area</b> Photo monitoring to be conducted in at the end of the dry season (October-November 2020), which will indicate dry matter biomass.</p>	<p>Amend stocking rates throughout offset site in accordance with Section 6.8 of the OMP.</p> <p>Focus of any grazing should be restricted to paddocks identified as containing highest biomass.</p>

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## 7 PROGRESS TOWARD COMPLETION CRITERIA

Table 10 and Table 11 details progress of the Lexington offset area and Lexington Rail Loop offset area (respectively) in achieving the interim performance targets and performance criteria outlined in the OMP.

**Table 10: Adherence to interim performance targets and performance criteria for each offset matter in the Lexington offset area.**

Offset matter	Relevant management objective	Interim performance target	Completion criteria	Progress to achieving interim performance targets and completion criteria (year 3)
Natural Grassland TEC	<ul style="list-style-type: none"> <li>▶ Minimise habitat degradation caused by pest animals (pigs and rabbits) within the offset area to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ Control invasive weed species to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ Minimise impact of livestock grazing on the condition of habitat and vegetation communities for the offset values</li> </ul>	<p>By 2027, increase condition of offset area to achieve 'good quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008), within a 0.1 ha quadrat with</p> <ul style="list-style-type: none"> <li>▶ At least three native perennial grass species from the list of perennial native grass indicator species</li> <li>▶ At least 200 native grass tussocks</li> <li>▶ Total project canopy cover of shrubs is less than 50%</li> <li>▶ Perennial non-woody introduced species are less than 30% of the total project perennial plant cover.</li> </ul>	<p>Increase habitat quality score to 9 in accordance with the <i>Guide to Determining Terrestrial Habitat Quality</i> (DEHP, 2017) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%–&lt;200% of benchmark score of 13%</li> <li>▶ Non native plant cover &lt;5%</li> </ul> <p>Attain and maintain 'best quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008), within a 0.1 ha quadrat with:</p> <ul style="list-style-type: none"> <li>▶ At least four native perennial grass species from the list of perennial native grass indicator species</li> <li>▶ At least 200 native grass tussocks</li> <li>▶ Total projected canopy cover of shrubs is less than 30%</li> <li>▶ Perennial non-woody introduced species are less than 5% of the total projected perennial plant cover.</li> </ul>	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, only three of the Natural Grassland TEC plots achieved 'best quality' habitat condition status, with one achieving 'good quality' status, and one site neither 'best quality' nor 'good quality' on account of it having fewer than three native perennial grass indicator species.</li> </ul> <p><b>COMPLETION CRITERIA NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, completion criteria not met as not all of the Natural Grassland TEC plots have achieved 'best quality' condition class and the average habitat quality score is less than 9.</li> </ul>
King blue-grass	<ul style="list-style-type: none"> <li>▶ Reduce the risk of adverse impacts on habitat condition of the offset matters caused by unplanned fire, and improve the condition of habitat and vegetation communities for the offset matters within offset areas through fire management.</li> </ul>		<p>Increase habitat quality score to 9 in accordance with the <i>Guide to Determining Terrestrial Habitat Quality</i> (DEHP, 2017) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%–&lt;200% of benchmark score of 13%</li> <li>▶ Non native plant cover &lt;5%, and/or</li> </ul> <p>Observed presence of king blue-grass species and/or population from &gt;50% targeted flora survey sites (Section 7.3 of the OMP).</p>	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, only three of the Natural Grassland TEC plots achieved 'best quality' habitat condition status, with one achieving 'good quality' status, and one site neither 'best quality' nor 'good quality' on account of it having fewer than three native perennial grass indicator species.</li> </ul> <p><b>COMPLETION CRITERIA PARTIALLY MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score was only 7, and only two of the five targeted flora survey sites supported King blue-grass.</li> </ul>
Bluegrass			<p>Increase habitat quality score to 9 in accordance with the <i>Guide to Determining Terrestrial Habitat Quality</i> (DEHP, 2017) by</p>	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, only three of the Natural Grassland TEC</li> </ul>



Offset matter	Relevant management objective	Interim performance target	Completion criteria	Progress to achieving interim performance targets and completion criteria (year 3)
			<p>achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%) &gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%–&lt;200% of benchmark score of 13%</li> <li>▶ Non native plant cover &lt;5%</li> </ul> <p>and/or observed presence of bluegrass species and/or population from &gt;50% of targeted flora survey sites (Section 7.3 of the OMP)</p>	<p>plots achieved ‘best quality’ habitat condition status, with one achieving ‘good quality’ status, and one site neither ‘best quality’ nor ‘good quality’ on account of it having fewer than three native perennial grass indicator species.</p> <p><b>COMPLETION CRITERIA PARTIALLY MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score was only 7, and none of the five targeted flora survey sites supported bluegrass.</li> </ul>
Squatter pigeon	<ul style="list-style-type: none"> <li>▶ Minimise predation risk by wild dogs, foxes and cats to threatened fauna species within the offset area</li> <li>▶ Minimise habitat degradation caused by pest animals (pigs and rabbits) within the offset area to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ Manage invasive weed species to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ Minimise impact of livestock grazing on the condition of habitat and vegetation communities for the offset values reduce the risk of adverse impacts on habitat condition of the offset matters caused by unplanned fire, and improve the condition of habitat and vegetation communities for the offset matters within offset areas through fire management.</li> </ul>	By 2027, average perennial non-woody introduced species is less than 25% of the total projected perennial plant cover (i.e. BioCondition score for non-native plant cover ≥5).	<ul style="list-style-type: none"> <li>▶ Increase habitat quality score to 9 in accordance with the <i>Guide to Determining Terrestrial Habitat Quality</i> (DEHP, 2017) based on RE 11.8.11, 11.8.4, 11.8.5, 11.8.11a and 11.4.9, including non native plant cover &lt;5%</li> <li>▶ Maintenance of a ground layer cover (native, perennial tussock grasses or a mix of perennial tussock grasses and low shrubs or forbs) &lt; 33% (DEE 2015).</li> </ul>	<p><b>INTERIM PERFORMANCE TARGET MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, Non-woody introduced species occupied less than 25% of projected plant cover at all sites.</li> </ul> <p><b>COMPLETION CRITERIA NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score for squatter pigeon was only 8.</li> </ul>
Of concern RE 11.8.11a (BVG 21b)	<ul style="list-style-type: none"> <li>▶ minimise habitat degradation caused by pest animals (pigs and rabbits) within the offset area to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ manage invasive weed species to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ minimise impact of livestock grazing on the condition of habitat and vegetation communities for the offset values</li> <li>▶ reduce the risk of adverse impacts on habitat condition of the offset matters caused by unplanned fire, and improve the condition of habitat and vegetation communities for the offset matters within offset areas through fire management.</li> </ul>	By 2027, achieve habitat quality score of 8	▶ Achieve and maintain habitat quality score of 9 by 2037	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score for of concern RE 11.8.11a offset management area is 7.</li> </ul>
Watercourse RE 11.8.5 (BVG 11a)		By 2027, achieve habitat quality score of 9	▶ Achieve and maintain habitat quality score of 10 by 2037	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score for watercourse RE 11.8.5 offset management area is 8.</li> </ul>
Watercourse RE 11.8.11 (BVG 30b)		By 2027, achieve habitat quality score of 9	▶ Achieve and maintain habitat quality score of 10 by 2037	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score for watercourse RE 11.8.11 offset management area is 8.</li> </ul>
Watercourse RE 11.8.11a (BVG 21b)		By 2027, achieve habitat quality score of 8	▶ Achieve and maintain habitat quality score of 9 by 2037	<p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on information presented in the 2019 Lexington Offset Area Annual Report (SLR 2019), based on surveys last undertaken during 2018/2019 monitoring period, average habitat quality score for watercourse RE 11.8.11a offset management area is 7.</li> </ul>

**Table 11: Adherence to interim performance targets and performance criteria for each offset matter in the Lexington Rail Loop offset area.**

Offset matter	Relevant management objective	Interim performance target	Completion criteria			Progress to achieving interim performance targets and completion criteria (year 1)
			North Promenade	Harry's	Contours	
Natural Grasslands TEC	<ul style="list-style-type: none"> <li>▶ minimise habitat degradation caused by pest animals (pigs and rabbits) within the offset area to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ control invasive weed species to reduce impacts on habitat for threatened species and vegetation communities including those that are representative of TEC</li> <li>▶ minimise impact of livestock grazing on the condition of habitat and vegetation communities for the offset values</li> <li>▶ reduce the risk of adverse impacts on habitat condition of the offset matters caused by unplanned fire and improve the condition of habitat and vegetation communities for the offset matters within offset areas through fire management.</li> </ul>	<ul style="list-style-type: none"> <li>▶ At Contours and North Promenade paddocks, by 2029, increase condition of offset area to achieve 'best quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008b).</li> <li>▶ At Harry's paddock, by 2029, increase condition of offset area to achieve 'good quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008b).</li> </ul>	<p>By 2039, increase habitat quality score to 9 in accordance with the Guide to Determining Terrestrial Habitat Quality (DEHP, 2014) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%-&lt;200% of benchmark score of 13%</li> <li>▶ Non-native plant cover &lt;5%</li> </ul> <p>Attain and maintain 'best quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008b), within a 0.1 ha quadrat with:</p> <ul style="list-style-type: none"> <li>▶ at least four native perennial grass species from the list of perennial native grass indicator species</li> <li>▶ at least 200 native grass tussocks</li> <li>▶ total projected canopy cover of shrubs is less than 30%</li> <li>▶ perennial non-woody introduced species are less than 5% of the total projected perennial plant cover.</li> </ul>	<p>By 2039, increase habitat quality score to 8 in accordance with the Guide to Determining Terrestrial Habitat Quality (DEHP, 2014) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;80% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;80% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%) &gt;80% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%-&lt;200% of benchmark score of 13%</li> <li>▶ Non-native plant cover &lt;5%</li> </ul> <p>Attain and maintain 'best quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008b), within a 0.1 ha quadrat with:</p> <ul style="list-style-type: none"> <li>▶ at least four native perennial grass species from the list of perennial native grass indicator species</li> <li>▶ at least 200 native grass tussocks</li> <li>▶ total projected canopy cover of shrubs is less than 30%</li> </ul> <p>perennial non-woody introduced species are less than 5% of the total projected perennial plant cover.</p>	<p>By 2039, increase habitat quality score to 9 in accordance with the Guide to Determining Terrestrial Habitat Quality (DEHP, 2014) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%-&lt;200% of benchmark score of 13%</li> <li>▶ Non-native plant cover &lt;5%</li> </ul> <p>Attain and maintain 'best quality' condition class for the Natural Grasslands TEC (in accordance with Table 1 TSSC 2008b), within a 0.1 ha quadrat with:</p> <ul style="list-style-type: none"> <li>▶ at least four native perennial grass species from the list of perennial native grass indicator species</li> <li>▶ at least 200 native grass tussocks</li> <li>▶ total projected canopy cover of shrubs is less than 30%</li> </ul> <p>perennial non-woody introduced species are less than 5% of the total projected perennial plant cover.</p>	<p><i>North Promenade</i></p> <p><b>INTERIM PERFORMANCE TARGET MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on surveys undertaken during 2018/2019 monitoring period, both Natural Grassland TEC plots achieved 'best quality' habitat condition status</li> </ul> <p><b>COMPLETION CRITERIA NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on surveys undertaken during 2018/2019 monitoring period, habitat quality score for Natural Grasslands TEC in the North Promenade plots was only 8</li> </ul> <p><i>Harry's</i></p> <p><b>INTERIM PERFORMANCE TARGET MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on surveys undertaken during 2018/2019 monitoring period, both Natural Grassland TEC plots achieved 'good quality' habitat condition status</li> </ul> <p><b>COMPLETION CRITERIA NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on surveys undertaken during 2018/2019 monitoring period, habitat quality score for Natural Grasslands TEC in the Harry's plots was only 7</li> </ul> <p><i>Contours</i></p> <p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on surveys undertaken during 2018/2019 monitoring period, only two of the three Natural Grassland TEC plots achieved 'best quality' habitat condition status</li> </ul> <p><b>COMPLETION CRITERIA NOT MET</b></p> <ul style="list-style-type: none"> <li>▶ Based on surveys undertaken during 2018/2019 monitoring period, habitat quality score for Natural Grasslands TEC in the Contours plots was only 8</li> </ul>
King blue-grass			By 2039, increase habitat quality score to 9 in accordance with the Guide to Determining Terrestrial	By 2039, increase habitat quality score to 8 in accordance with the Guide to Determining Terrestrial	By 2039, increase habitat quality score to 9 in accordance with the Guide to Determining Terrestrial	<p><i>North Promenade</i></p> <p><b>INTERIM PERFORMANCE TARGET MET</b></p>

Offset matter	Relevant management objective	Interim performance target	Completion criteria			Progress to achieving interim performance targets and completion criteria (year 1)
			<i>North Promenade</i>	<i>Harry's</i>	<i>Contours</i>	
			<p>Habitat Quality (DEHP, 2014) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%-&lt;200% of benchmark score of 13%</li> <li>▶ Non-native plant cover &lt;5%, and/or</li> <li>▶ Observed presence of king blue-grass species and/or population from &gt;50% targeted flora survey sites</li> </ul>	<p>Habitat Quality (DEHP, 2014) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;80% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;80% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;80% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%-&lt;200% of benchmark score of 13%</li> <li>▶ Non-native plant cover &lt;5%, and/or</li> <li>▶ Observed presence of king blue-grass species and/or population from &gt;50% targeted flora survey sites</li> </ul>	<p>Habitat Quality (DEHP, 2014) by achieving the following scores for each ecological attribute including:</p> <ul style="list-style-type: none"> <li>▶ Native plant species richness (grass) &gt;90% of benchmark score of 11</li> <li>▶ Native plant species richness (forbs and other) &gt;90% of benchmark score of 17</li> <li>▶ Native perennial grass cover (%)&gt;90% of benchmark score of 43%</li> <li>▶ Organic litter cover (%) &gt;50%-&lt;200% of benchmark score of 13%</li> <li>▶ Non-native plant cover &lt;5%, and/or</li> <li>▶ Observed presence of king blue-grass species and/or population from &gt;50% targeted flora survey sites</li> </ul>	<p>▶ Based on surveys undertaken during 2018/2019 monitoring period, both Natural Grassland TEC plots achieved 'best quality' habitat condition status</p> <p><b>COMPLETION CRITERIA NOT MET</b></p> <p>▶ Based on surveys undertaken during 2018/2019 monitoring period, habitat quality score for King blue-grass in the North Promenade plots was only 7</p> <p><i>Harry's</i></p> <p><b>INTERIM PERFORMANCE TARGET MET</b></p> <p>▶ Based on surveys undertaken during 2018/2019 monitoring period, both Natural Grassland TEC plots achieved 'good quality' habitat condition status</p> <p><b>COMPLETION CRITERIA NOT MET</b></p> <p>▶ Based on surveys undertaken during 2018/2019 monitoring period, habitat quality score for King blue-grass in the Harry's plots was only 7</p> <p><i>Contours</i></p> <p><b>INTERIM PERFORMANCE TARGET NOT MET</b></p> <p>▶ Based on surveys undertaken during 2018/2019 monitoring period, only two of the three Natural Grassland TEC plots achieved 'best quality' habitat condition status</p> <p><b>COMPLETION CRITERIA NOT MET</b></p> <p>▶ Based on surveys undertaken during 2018/2019 monitoring period, habitat quality score for King blue-grass in the Contours plots was only 7</p>



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## 8 THREATS TO OFFSET MATTERS

Threats to offset matters at the Lexington offset area have not changed since the development of the original OMP in 2018, with similar comparable threats to offset matters in the Lexington Rail Loop offset area.

Results of the dry season and post-wet season pest animal surveys during the 2019/2020 management period indicate the continuing threat of pest animals to the offset matters. This includes the confirmed presence of feral pigs, European rabbits and brown hares which are known to have the potential to impact all MNES (Lexington offset area and Lexington Rail Loop offset area) and MSES (Lexington offset area) through habitat degradation, while the presence of wild dogs and cats are a known threat to squatter pigeon. Ongoing management activities will include control of these pest animal species.

Weed surveys during the 2019/2020 management period indicate the continued threat of weeds throughout the offset area. The June 2020 post-wet season survey represents the first wet season survey which should be considered the baseline post-wet season weed species richness and cover.

Fire continues to be a recognised threat to the offset management area; however, as there has been no unplanned fire within the offset management period to date, fire management activities will continue to be implemented in accordance with the OMP to minimise risk of unplanned fire.

Ongoing management and monitoring activities will provide an indication of the efficacy of management towards meeting interim performance targets, with the intention to progress toward meeting the completion criteria for all MSES and MNES as stipulated in the offset management plan.

## 9 AMENDMENTS TO OMP

In accordance with the principles of adaptive management, the OMP will be reviewed annually based on outcomes of monitoring and amended (if required) to incorporate changes identified through management activities, regular site visits and monitoring activities. This may include the revision of current management actions, identification of additional activities (including monitoring activities) and responses to adaptive management triggers, other environmental threats to the offset site, or information obtained through research programs. This approach facilitates an ongoing cycle of implementation, learning and review.

- ▶ Amend Table 21 to exclude requirement for baseline pest animal survey and ongoing pest animal monitoring, given Section 7.5 of the OMP states *“Pest animal monitoring plots are not required at the three offset sites established for the Rail Loop project.”*
- ▶ Amend the North Promenade paddock boundary contributing to the Lexington Rail Loop offset area to ensure it does not overlap with the existing Lexington offset area
- ▶ Amend all paddock boundaries contributing to the Lexington Rail Loop offset area to ensure they do not overlap with the Wurba Road road reserve
- ▶ Update all maps with updated fencing and access tracks presented in post-wet season monitoring report (CO2 Australia 2020b; Appendix B)

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## 10 REFERENCES

CO2 Australia (2020). *Dry Season Monitoring Report – Year 3 (2019/20)*. A report prepared for Sojitz Mining Pty Ltd. CO2 Australia Limited, Brisbane.

CO2 Australia (2020). *Post-wet Season Monitoring Report – Year 3 (2019/20)*. A report prepared for Sojitz Mining Pty Ltd. CO2 Australia Limited, Brisbane.

SLR Consulting Australia Pty Ltd (SLR)(2019). *Matter Of National Environmental Significance Management Plan Annual Report 2019 – Lexington Offset Area*. Report prepared for Sojitz Coal Mining Pty Ltd. SLR, Townsville.

Sojitz Coal Mining Pty Ltd (Sojitz)(2019). *Offset Management Plan for Lexington – Meteor Downs South Project*. Report prepared for Sojitz Coal Mining Pty Ltd.



## **APPENDIX A   DRY SEASON MONITORING REPORT – YEAR 3 (2019/20) – CO2 AUSTRALIA 2020A**

# Dry Season Monitoring Report – Year 3 (2019/20)

## *MDS and Lexington*

### **Meteor Downs South Coal Mine Project**

Sojitz Blue Pty Ltd



Rev	Date	Description
0	21 January 2020	First draft issued to client
1	3 March 2020	Finalised based on client review
2	18 August 2020	Final issued to client

	Name	Position	Date
<b>ORIGINATORS</b>	Julian Radford-Smith Dr Jarrad Cousin Tara D'Arcy-Evans	Consultant Senior Ecologist Consultant	3 March 2020
<b>APPROVER</b>	Christopher Ewing	Senior Project Manager	3 March 2020

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# 1 INTRODUCTION

U&D Mining Industry (Australia) Pty (U&D) has approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to develop and operate the Meteor Downs South (MDS) Coal Mine Project (the Project) (Figure 1). U&D is in a joint venture with Sojitz Blue Pty Ltd (Sojitz Blue) to develop and operate the Project.

Under the Project EPBC Act approval (EPBC 2013/6779), the Project has prepared the following documents:

- ▶ Matters of National Environmental Significance Management Plan (MNESMP)
  - to address EPBC 2013/6779 conditions 2, 3 and 4 with respect to the direct and indirect impacts of the Project on matters of national environmental significance (MNES) at the Project site
- ▶ Offset Management Plan (OMP)
  - to address EPBC 2013/6779 conditions 5 and 6 with respect to environmental offsets at the Lexington offset site (Figure 1) for significant residual impacts of the MDS Project on MNES and matters of state environmental significance (MSES)

The MNESMP and OMP outline annual biodiversity monitoring requirements at each site, as summarised in Table 1. The baseline (Year 1) management periods for the Project site and the Lexington offset site are considered to be June 2017 – June 2018 (Project site) and October 2017 – October 2018 (Lexington offset site).

Consequently, the current report is the Year 3 (2019/2020) dry season monitoring report for both the Project site and the Lexington offset site.

**Table 1: Summary of Project and offset site biodiversity monitoring requirements**

Site	Monitoring activity	Management Plan	Frequency	Timing
MDS Project site	Habitat condition assessment	MNESMP Section 13.3	Annual	Dry season
	Photo monitoring	MNESMP Section 13.4	Annual	
	Targeted surveys for king blue-grass and bluegrass	MNESMP Section 13.5	Annual	
	Habitat availability assessment for Australian painted snipe	MNESMP Section 13.6	Every 2 years	Wet season or following inundation event
	Pest animal monitoring	MNESMP Section 13.7	Every 2 years	Dry season and post-wet season
	Weed monitoring	MNESMP Section 13.8	Every 2 years	
Lexington offset site	General offset site monitoring	OMP Section 7.1	Annual	Post-wet season
	Habitat condition assessment	OMP Section 7.2.1	Every 2 years for first 10 years and then every 5 years thereafter until 31 October 2039	Post-wet season
	Photo monitoring	OMP Section 7.2.2	Every 2 years for first 10 years and then every 5 years thereafter until 31 October 2039	Post-wet season

Site	Monitoring activity	Management Plan	Frequency	Timing
	Weed monitoring	OMP Section 7.4	Every 2 years	Dry season and post-wet season
	Pest animal monitoring	OMP Section 7.5	Every 2 years (dry season and post wet season surveys)	Dry season and post-wet season
	Biomass monitoring	OMP Section 7.6	Annually	Post wet season prior to and during grazing events







## 2 METHODOLOGY

Field surveys were undertaken by two tertiary-qualified ecologists (Andrew Dawson and Julian Radford-Smith) between 10 – 17 December 2019. Permanent monitoring sites were established at each site as part of the baseline surveys carried between December 2017 and April 2018, detailed in the following:

- ▶ *MNESMP Baseline Monitoring Report – Meteor Downs South Coal Mine Project*. A report prepared by CO2 Australia in 2017 (CO2 Australia 2017) – baseline monitoring sites established in December 2017
- ▶ *Lexington Offset Area Initial Baseline Monitoring Report – Meteor Downs South*. A report prepared by CO2 Australia in 2018 (CO2 Australia 2018) – baseline monitoring sites established in April 2018

### 2.1 MONITORING LOCATIONS

#### 2.1.1 MDS Project site

Dry season monitoring activities at the Project site comprised:

- ▶ Habitat condition assessments
- ▶ Targeted squatter pigeon surveys
- ▶ Photo monitoring
- ▶ Pest animal monitoring
- ▶ Weed monitoring.

Table 2 shows activities at each monitoring location at the Project site. A total of 43 permanent sites/plots were monitored across the balance of ML70452 outside of the MDS project (refer to Figure 2 and Figure 3). Permanent monitoring sites comprised a mix of nested and non-nested sites (Table 2), according to the following:

- ▶ 10 x habitat monitoring sites (100 m x 50 m)
  - collocated with weed and rabbit monitoring plots (Sites 01 – 10)
- ▶ 30 x photo monitoring sites
  - established at 0 m and 50 m points along 100 m habitat monitoring transect (Sites 01 – 10) and at SW corner of weed monitoring plots (Sites 11 – 20)
- ▶ 20 x weed monitoring plots (1 ha)
  - partly collocated with weed and rabbit monitoring plots (Sites 01 – 10), with remaining 10 sites (Sites 11 – 20) standalone weed monitoring plots
- ▶ 10 x rabbit monitoring plots (2 ha)
  - collocated with habitat monitoring sites and weed monitoring plots (Sites R01 – R10)
- ▶ 8 x pig monitoring plots (15 ha) (Sites P01 – P08)
- ▶ 15 x pest animal fauna camera stations (Sites C01 – C15)
  - Located throughout the site adjacent existing access tracks
  - Replaced the 20 x sand track stations employed previously

At each of the 10 habitat monitoring sites (Sites 01 – 10), a 1.8 m capped galvanised star picket is installed at the start (0 m) and central (50 m) points of the 100 m transect. At each of the standalone weed monitoring

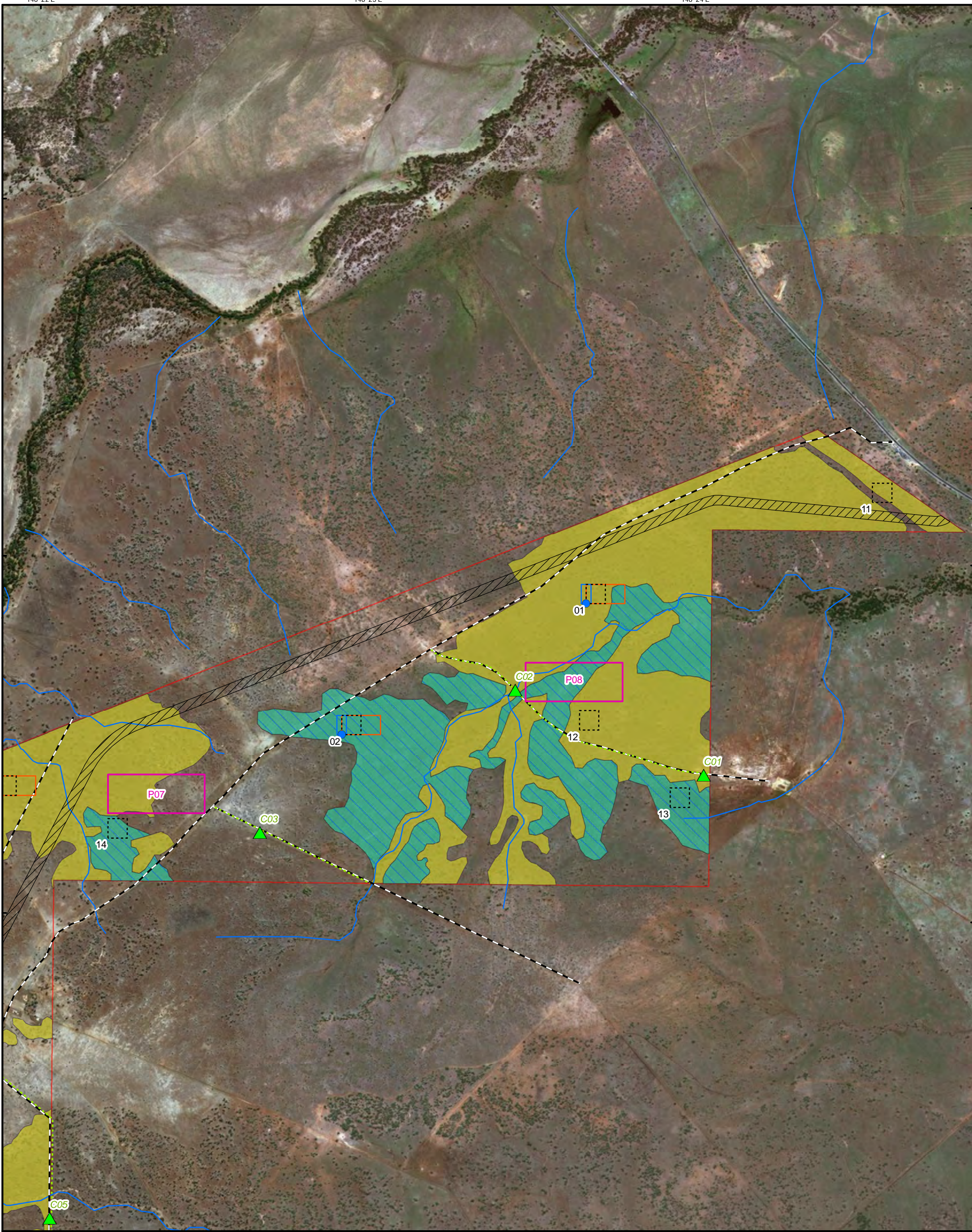
plots (Sites 11 – 20), a single 1.8 m capped galvanised star picket is installed at the SW corner of the plot. GPS locations are recorded for each of the sites in GDA94, Zone 55 projection.

Refer to Table A-1 in Appendix A for detailed locations of each of the monitoring sites at the Project site.

**Table 2: Monitoring locations at the Project site, surveyed as part of the 2019/20 dry season surveys**

Site	Habitat monitoring						Pest animal monitoring				
	Brigalow TEC	Natural Grasslands TEC	King blue-grass	Bluegrass	Squatter pigeon	Australian painted snipe	Photo monitoring	Weed monitoring	Rabbit plot	Feral pig plot	Fauna camera
01					✓		✓	✓	✓		
02		✓	✓	✓			✓	✓	✓		
03					✓		✓	✓	✓		
04		✓	✓	✓			✓	✓	✓		
05					✓		✓	✓	✓		
06		✓	✓	✓			✓	✓	✓		
07	✓						✓	✓	✓		
08		✓	✓	✓			✓	✓	✓		
09						✓	✓	✓	✓		
10					✓		✓	✓	✓		
11 – 20							✓	✓			
P01 – P08										✓	
C01 – C15											✓













**Figure 2**  
**MDS monitoring sites**  
**- north**

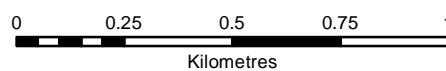
**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 17/01/2020   Coordinate System: GDA 1994 MGA Zone 55   Projection: Transverse Mercator   Datum: GDA 1994   Scale: 1:17,500@A3

-  Mining Lease
-  Disturbance areas
-  Access tracks
-  Watercourse
-  Brigalow TEC
-  Natural Grassland TEC
-  Habitat for King blue-grass and bluegrass
-  Habitat for squatter pigeon

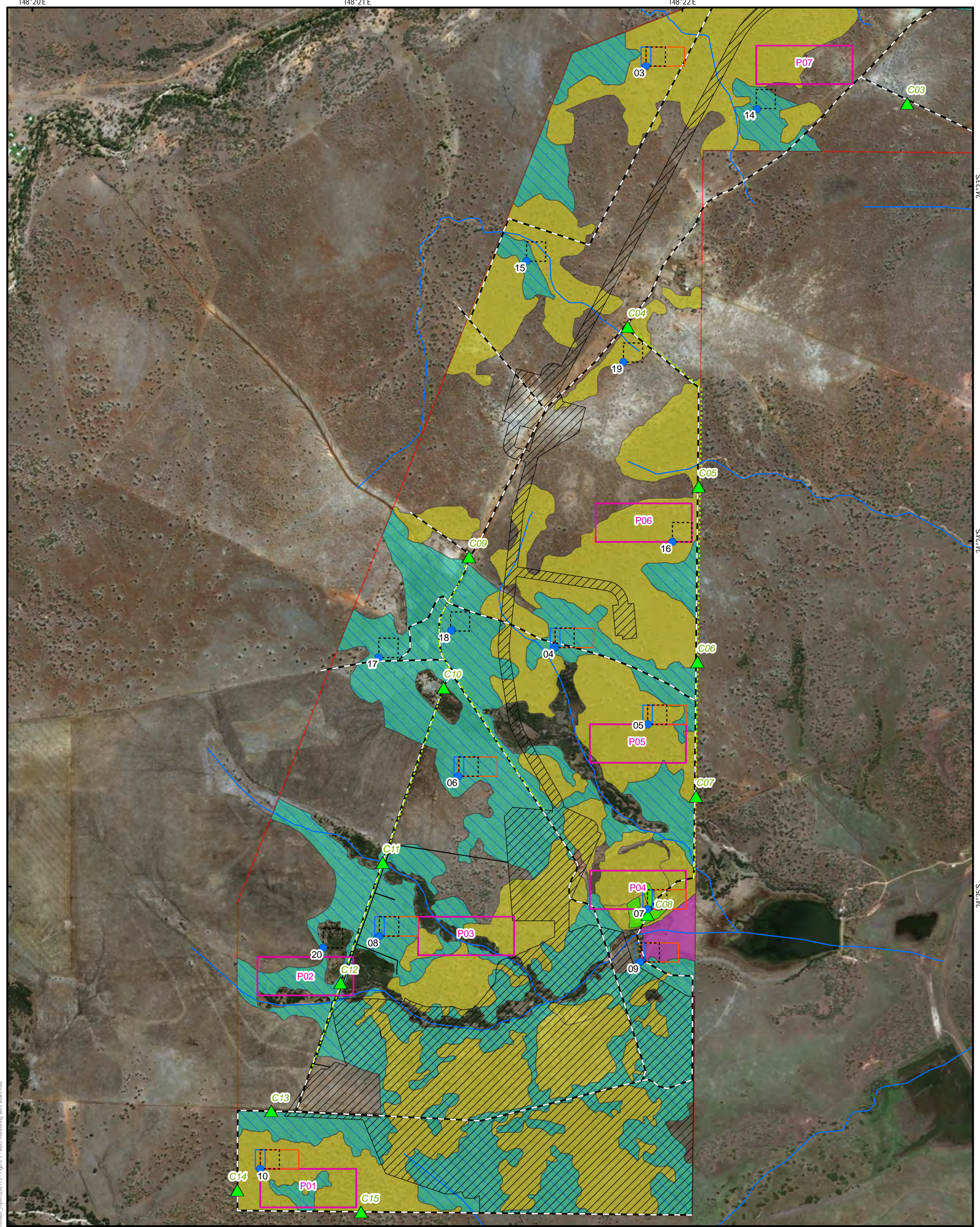
-  Habitat for Australian painted snipe
-  Habitat monitoring site
-  Habitat monitoring plots
-  Weed monitoring plots
-  Rabbit monitoring plots
-  Pig monitoring plots

- Pest animal survey tracks
- ▲ Pest animal camera sites





Path: P:\GISData\Projects\Sojitz\915\_20200115\_Lex\_MDS\_dry\_season\_monitor\_report\200115\_Figure 3 - MDS monitoring sites south.mxd



Sojitz Blue Pty Ltd - Meteor Downs South Location diagram

**Figure 3**  
**MDS monitoring sites**  
**- south**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 17/01/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:17,500@A3

Mining Lease

Disturbance areas

Access tracks

Watercourse

Brigalow TEC

Natural Grassland TEC

Habitat for King blue-grass and bluegrass

Habitat for squatter pigeon

Habitat for Australian painted snipe

Habitat monitoring site

Habitat monitoring plots

Weed monitoring plots

Rabbit monitoring plots

Pig monitoring plots

Pest animal survey tracks

Pest animal camera sites

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### 2.1.2 Lexington offset site

Dry season monitoring activities at the offset site comprised:

- ▶ Photo monitoring
- ▶ Weed monitoring
- ▶ Pest animal monitoring

Table 3 shows activities at each monitoring location at the offset site. A total of 43 permanent monitoring sites/plots were monitored across the offset site. Permanent monitoring sites comprised a mix of nested and non-nested sites (Table 2), according to the following:

- ▶ 33 x photo monitoring sites
  - 26 established at 0 m and 50 m points along 100 m habitat monitoring transect (Sites 01 – 13)
  - 7 at SW corner of weed monitoring plots (Sites 14 – 20)
- ▶ 20 x weed monitoring plots (1 ha)
  - 13 sites collocated at all habitat monitoring sites (Sites 01 – 13),
  - 7 sites (Sites 14 – 20) standalone weed monitoring plots
- ▶ 10 x rabbit monitoring plots (2 ha)
  - collocated with 10 of the habitat monitoring sites (Sites 01-05, 07-08, 10-11 and 13) and weed monitoring plots
- ▶ 8 x pig monitoring plots (15 ha) (Sites P01 – P08)
- ▶ 15 x pest animal fauna camera stations (Sites C01 – C15)
  - fauna camera stations were established along pest animal survey tracks

At each of the 13 habitat monitoring sites (Sites 01 – 13), a 1.8 m capped galvanised star picket is installed at the start (0 m) and central (50 m) points of the 100 m transect. At each of the standalone weed monitoring plots (Sites 14 – 20), a single 1.8 m capped galvanised star picket is installed at the SW corner of the plot. GPS locations are recorded for each of the sites in GDA94, Zone 55 projection.

Refer to Table A-2 in Appendix A for detailed locations of each of the monitoring sites at the Lexington offset site.

**Table 3: Monitoring locations at the Lexington offset site, surveyed as part of the 2019/20 dry season surveys**

Site	Pest animal monitoring			
	Photo monitoring	Rabbit plot	Feral pig plot	Fauna camera station
01 – 20	✓			
P01 – P08		✓	✓	
C01 – C15				✓



148°10'E

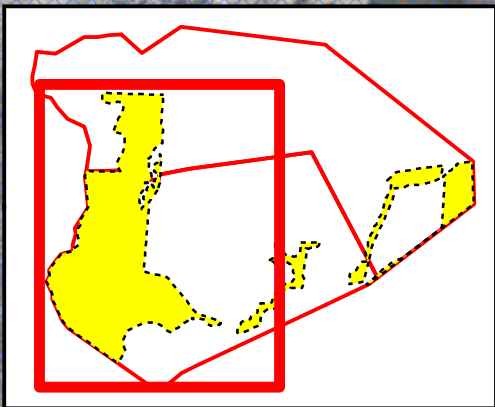
148°20'E

148°30'E

23°55'0"S

23°56'0"S

23°57'0"S



ML70145

ML70376

P07

P06

C13

C12

06

C09

17

04

C03

19

02

C02

C01

P03

01

C06

C07

16

07

C10

18

C11

08

P05

P04

P02

P01

15

14

Sojitz Blue Pty Ltd - Lexington

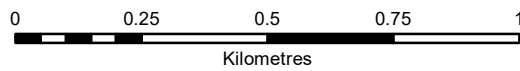
Location diagram

**Figure 4**  
**Lexington monitoring sites**  
**- west**

- |  |                           |                           |                         |
|--|---------------------------|---------------------------|-------------------------|
| Minerva lots (lot 10 & 11 DN40126)     | <b>Regional ecosystem</b> | Pest animal camera site   | Rabbit monitoring plots |
| Existing offset area (Category A area) | RE 11.8.11                | Pest animal survey tracks | Pig monitoring plots    |
| Mining leases (ML70376 and ML70145)    | RE 11.8.11a               | Habitat monitoring sites  |                         |
| Offset area                            | RE 11.8.4                 | Habitat monitoring plot   |                         |
| Access tracks                          | RE 11.8.5                 | Weed monitoring plots     |                         |

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data  
- Mining Lease  
- Existing offset area

Date: 2/03/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:15,000@A3



**CO<sub>2</sub>**  
Australia





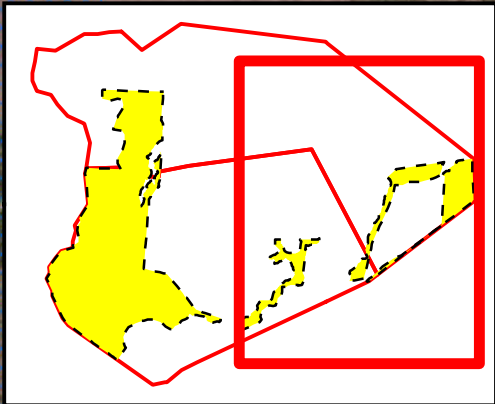
148°3'0"E

148°4'0"E

148°5'0"E

ML70376

ML70145



23°55'0"S

23°56'0"S

23°57'0"S

Path: P:\GISData\Projects\Sojitz\915\_2020\115\_Lex\_MDS\_dry\_season\_monitor\_report\201115 - Figure 5 - Lexington monitoring sites east.mxd

Sojitz Blue Pty Ltd - Lexington

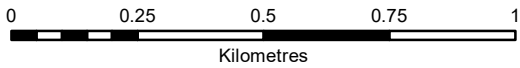
Location diagram

**Figure 5**  
**Lexington monitoring sites**  
**- east**

- |   |  |  |  |
|---|--|--|--|
| <ul style="list-style-type: none"><li>Minerva lots (lot 10 &amp; 11 DN40126)</li><li>Existing offset area (Category A area)</li><li>Mining leases (ML70376 and ML70145)</li><li>Offset area</li><li>Access tracks</li></ul> | <b>Regional ecosystem</b> <ul style="list-style-type: none"><li>RE 11.8.11</li><li>RE 11.8.11a</li><li>RE 11.8.4</li><li>RE 11.8.5</li></ul> | <ul style="list-style-type: none"><li>Pest animal camera site</li><li>Pest animal survey tracks</li><li>Habitat monitoring sites</li><li>Habitat monitoring plot</li><li>Weed monitoring plots</li></ul> | <ul style="list-style-type: none"><li>Rabbit monitoring plots</li><li>Pig monitoring plots</li></ul> |
|---|--|--|--|

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data  
- Mining Lease  
- Existing offset area

Date: 2/03/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:15,000@A3





## 2.2 HABITAT CONDITION ASSESSMENT (PROJECT SITE ONLY)

Habitat monitoring sites were established in December 2017 based on the requirements of the *Guide to determining terrestrial habitat quality* (DEHP 2017). A total of 10 habitat monitoring sites (comprising N\_S running 100 m x 50 m transect) were established (Sites 01 – 10), with the start and central points marked with a 1.8 m galvanised steel picket with plastic safety cap (refer to Figure 2 and Figure 3).

Habitat condition assessments for Brigalow TEC, Natural Grasslands TEC, bluegrass, king blue-grass, squatter pigeon and Australian painted snipe were undertaken at the habitat monitoring sites generally in accordance with the *Guide to determining terrestrial habitat quality* (DEHP 2017). Through the application of the guide, a habitat quality score was calculated for each MNES based on the following key indicators:

- ▶ site condition: a general condition assessment of vegetation compared to a benchmark
- ▶ site context: an analysis of the site in relation to the surrounding environment
- ▶ fauna species habitat index: the ability of the site to support the given target fauna species.

The species habitat index assessment was assessed for the squatter pigeon and Australian painted snipe, although only included targeted fauna surveys for squatter pigeon given the paucity of habitat in the immediate vicinity of Naroo Dam. The targeted fauna survey for squatter pigeon was undertaken generally in accordance with the *Survey Guidelines for Australia's Threatened Birds* (DEWHA 2010).

In the absence of the *Guide to determining terrestrial habitat quality* (DEHP 2017) including a species habitat index for flora species, the habitat condition scores for the two MNES flora species (king blue-grass and bluegrass) included a species presence index out of three, whereby: 0 = absent/not confirmed, 2 = up to five tussocks confirmed, 2.5 = up to 20 tussocks confirmed, 3 = more than 20 tussocks confirmed. The habitat condition score for the two MNES flora species was then calculated as a combination of site condition and site context for the RE assessment unit (representing 80% of the score), with species stocking rate converted to a score out of 10 and contributing 20%.

## 2.3 PHOTO MONITORING (PROJECT SITE AND LEXINGTON)

Photo monitoring was undertaken at permanent sites established as part of baseline surveys on the Project site and the offset site to give a representative indication of cover and species composition (including weeds) for the general area and enable visual assessment of habitat changes over time. Photo monitoring sites were established with a 1.8 m galvanised steel picket with plastic safety cap.

At each of the photo monitoring points, five photos were taken from 1.5 m height above ground level looking north, east, south and west with a ground photo taken looking down at an angle of 45° to the north-west of the star picket.

On MDS, photo monitoring was undertaken at 30 sites, including two at each of the 10 habitat condition assessment sites (0 m and 50 m points: Site 01 – 10), with single photo monitoring points at the SW corner of the remaining 10 weed monitoring plots (Site 11 – 20) identified in Table 2 and shown in Figure 2 and Figure 3.

On the Lexington offset site, photo monitoring was carried out at the SW corner star picket of each of the 20 weed monitoring plots, identified in Table 3 and shown in Figure 4 and Figure 5. In addition to visual assessment of habitat changes, photo monitoring at Lexington is also used to monitor biomass within the

offset areas by comparing to relevant photo standards from the Future Beef website<sup>1</sup> in order to manage grazing biomass and minimise risk of unplanned fire.

A record of the photographs for the Project site is shown in Appendix C, with a record of the photographs for the offset site shown in Appendix D.

## 2.4 WEED MONITORING (PROJECT SITE AND LEXINGTON)

For the purposes of this assessment, weeds were taken as any species of plant not considered by the Queensland Herbarium as being native to Queensland, as well as species of plant not considered locally endemic to the region.

Weed monitoring was undertaken at 20 permanent plots established at the Project site and at the offset site to incorporate natural variability such as aspect (e.g. a mix of north-, east-, south- and west-facing monitoring sites) and community type, while also targeting trafficable areas (e.g. entry gates, creek crossings, stock watering points) to monitor potential introduction and/or irruptions of prohibited and restricted weed species. At each weed monitoring plot, 3 x 100 m transects (traversing in an east-west direction) were traversed, keeping them parallel to one another, 50 m apart.

Figure 2 and Figure 3 show the MDS Project site weed monitoring locations, with Figure 4 and Figure 5 showing the Lexington offset site weed monitoring locations.

At each of the permanent weed monitoring plots, monitoring of weeds was undertaken in accordance with the following method:

- ▶ At 10 m intervals along each of the three transects, a 2 m x 2 m plot frame was used to record the presence, species and cover of weeds
- ▶ Weed cover at each 2 m x 2 m survey site was recorded as one of five cover classes: 1 = 0%; 2 = 0-5%; 3 = 6-25%; 4 = 26-50%; 5 = 51-100% (Auld 2009)
- ▶ An average cover score for each weed species for each 1 ha site was calculated
- ▶ The average cover score was then calculated as the average percentage from the 30 plots surveyed from the three 100 m transects
- ▶ The mean cover score across all weed monitoring sites was then calculated.

For the purposes of the calculation of average percentage cover of weeds, each of the five weed cover classes (0 – 5) were converted to a quantitative weed cover value based on the average value of the range corresponding to that weed cover class, as outlined below:

- ▶ Weed cover class 1 (0%) retained a value of 0%
- ▶ Weed cover class 2 (0-5%) was converted to a value of 2.5%
- ▶ Weed cover class 3 (6-25%) was converted to a value of 15%
- ▶ Weed cover class 4 (26-50%) was converted to a value of 37.5%
- ▶ Weed cover class 5 (51-100%) was converted to a value of 75%.

<sup>1</sup> See <https://futurebeef.com.au/knowledge-centre/pastures-forage-crops/pasture-photo-standards/>

In addition to permanent weed monitoring sites, where relevant, incidental observations were collated as part of general site monitoring, recording details of weeds (including location, species and extent) and areas of significant weed cover.

## 2.5 PEST ANIMAL MONITORING (PROJECT SITE AND LEXINGTON)

For the purposes of this assessment, pest animals are defined as any species of fauna not native to Queensland, nor protected under the *Nature Conservation Act 1992* (Qld; NC Act).

Pest animal monitoring was undertaken through a combination of:

- ▶ plot based monitoring, searching for direct presence (e.g. visual confirmation) or indirect evidence (e.g. tracks, diggings, scats, rubbings etc)
- ▶ infra-red, motion-detector fauna cameras, representing opportunities to visually confirm the presence of pest animals.

### 2.5.1 Rabbits

An assessment of the presence and impact of rabbits was undertaken generally in accordance with Cooke *et al.* (1990). Rabbit monitoring plots were established at the same location as habitat monitoring sites and weed monitoring plots (refer to Figure 2 and Figure 3 for locations at project sites and Figure 4 and Figure 5 for locations at the offset site).

Each rabbit monitoring plot consisted of a 2 ha plot which was traversed for 15 to 20 minutes, assessing the following (refer to Cooke *et al.* 1990):

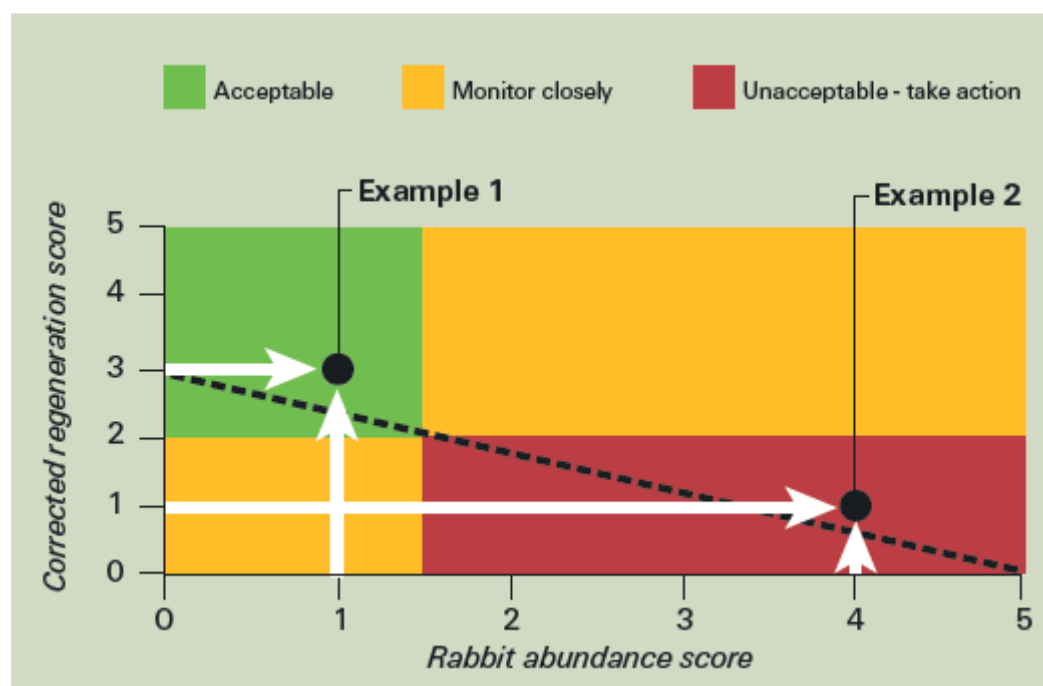
- ▶ Rabbit abundance – a measure of the presence and number of rabbit warrens and the abundance of any faecal pellets (including ‘buck-heaps’ or latrines) – measured on a scale of 0 – 5.
- ▶ Seedling abundance – a measure of the presence and abundance of native vegetation seedlings encountered during the 15-20-minute traverse – measured on a scale of 0 – 5.
- ▶ Rabbit damage – a measure of seedlings (< 0.5 m height) with evidence of rabbit damage, identified as 45° ‘secateurs-like’ cuts through smaller stems, defoliation and gnawing of bark – measured on a scale of 0 – 5.

From this assessment, a ‘corrected regeneration score’ was calculated from the seedling abundance and rabbit damage score in accordance with Table 4. This measure corrects for seedling regeneration as a function of observed rabbit damage and is subsequently used to calculate overall rabbit impact with the rabbit abundance score.

**Table 4: Calculation of corrected regeneration score.**

Rabbit damage	Seedling abundance					
	0	1	2	3	4	5
0	0.20	1.00	2.00	3.00	4.00	5.00
1	0.20	0.50	1.00	1.50	2.00	2.50
2	0.20	0.34	0.70	1.00	1.30	1.70
3	0.20	0.28	0.50	0.80	1.00	1.30
4	0.20	0.20	0.40	0.60	0.80	1.00
5	0.20	0.20	0.30	0.50	0.70	0.80

As illustrated in Figure 6, overall rabbit impact was assigned as one of three categories – ‘acceptable’, ‘monitor closely’ or ‘unacceptable’, as determined from a combination of the score for rabbit abundance and the corrected regeneration score. Note that it was assumed that any site with a rabbit abundance score of ‘0’ was assumed to be ‘acceptable’, irrespective of corrected regeneration score. This is to avoid the situation where, with an absence of rabbits, and a corrected regeneration score of  $\leq 2$  (attributable to no rabbit damage and less than 20 seedlings), a given site may be identified as one to ‘monitor closely’ only by virtue of the fact that the few seedlings are attributable to the site being a grassland, rather than it reflecting rabbit grazing.



**Figure 6: Calculation of overall rabbit impact based on rabbit abundance score and corrected regeneration score.**

### 2.5.2 Fauna camera stations

An assessment of pest animal presence and activity was conducted using infra-red cameras. Infra-red fauna cameras were placed approximately 1.3 m above the ground at 15 fauna camera stations at the MDS Project site, and 15 fauna camera stations at the offset site. Once established, the fauna cameras were left unattended for 3 days/nights to be able to intercept any active fauna using trails in the survey area.

Cameras were represented by 12 Browning Dark Ops 940 HD 16 mega-pixel digital cameras (BTC-6HD-940) and three LTL-6310 Acorn 12 mega-pixel digital cameras (LTL-6310M). Both camera models were supported by 940nm infra-red night vision and motion sensor capabilities to allow for capture of fauna during the day and night.

The camera settings were set to capture a series of images in succession following a motion trigger. If motion continued after this series of images were captured, then the camera would continue to capture images (in sets of four), followed by at least a one-minute pause, after which any new the camera could be



triggered again. Secure Digital (SD) memory cards of 32 gigabyte capacity were used in the cameras for storing captured images.

For each pest animal species, a measure of pest animal presence/activity (Catling Index value) was calculated for the site by summing the number of operable fauna camera stations with evidence of the targeted pest animal by the sum of all operable station days/nights (refer to Mitchell and Balogh 2007a).

Refer to Figure 2 and Figure 3 for locations at project sites and Figure 4 and Figure 5 for locations at the offset site.

### 2.5.3 Feral pigs

An assessment of the presence of feral pig signs (as a measure of feral pig presence or activity) was undertaken generally in accordance with (Mitchell & Balogh 2007b) and (Hone 1988).

Randomly stratified, 500 m x 300 m (15 ha) plots were established in environments that are more regularly impacted included plots within and traversing ephemeral watercourses. A total of eight pig monitoring plots were established at the project site (Figure 2 and Figure 3) including plots within the immediate vicinity of Naroo Dam in the east of the site. Eight pig monitoring plots were also established at the offset site (Figure 4 and Figure 5), one of which was relocated (P03) following a recommendation in the 2018/19 monitoring report (NRC 2019).

Each 15-ha plot comprised 3 x 500 m transects spaced 100 m apart. At each plot, the following method was used for each of the transects:

- ▶ traversing in an east-west direction, surveying for the presence of any feral pig signs (rooting, wallows, dung, footprints, travel pads, plant damage and tree rubs, as well as the physical presence of feral pigs) 1 m either side of the transect in 50 m sections
- ▶ calculating an abundance score for each transect as the percentage of 'present' feral pig signs from the 10 sections along the 500 m transect
- ▶ calculating the mean abundance score (and variance) across all transects.

## 2.6 GENERAL OFFSET SITE ASSESSMENTS

Additional, general site monitoring was conducted as part of conducting habitat condition assessments, weed monitoring and pest animal surveys, including:

- ▶ Observations of fencing condition, including any repair/upgrades
- ▶ Access track conditions, including location of watercourse crossings, grids, erosion, etc
- ▶ Fire management, including assessment of existing firebreaks, access tracks and roads, fuel loads, and any recent burning activities
- ▶ Livestock management including assessment of signs of land degradation and over-grazing, especially in offset management zone C for of concern RE 11.8.11a and watercourse RE 11.8.11a
- ▶ Erosion management, including assessment of the incidence of erosion within the offset site, especially around permanent and semi-permanent water bodies or areas subject to inundation or waterlogging (e.g. areas of RE 11.8.11a)
- ▶ Incidental fauna observations, including presence, traces and/or abundance of pest animals. Any additional risks to fauna (i.e. evidence of vehicle strike)

## 3 RESULTS: MDS PROJECT SITE

### 3.1 HABITAT MONITORING

Results of the habitat condition assessments identified an average site condition score of 7.14 out of 10 across all ten habitat monitoring sites, with scores ranging between 5.31 (Site 05) and 8.50 (Site 04). Table B-1 and Table B-2 of Appendix B outline details of the site condition assessments, summarised below in Table 5.

**Table 5: Project site habitat monitoring sites: site condition and site context scores calculated in accordance with the Guide to determining terrestrial habitat quality (DEHP 2017).**

Site	RE	Site condition score (/10)	Site context score (/10)
01	11.8.5	7.56	7.69
02	11.8.11	6.83	6.92
03	11.8.5	7.94	7.69
04	11.8.11	8.50	7.69
05	11.8.5	5.31	7.69
06	11.8.11	6.17	7.31
07	11.4.3	7.00	7.69
08	11.8.11	6.33	7.31
09	11.3.3a	6.00	7.69
10	11.8.5	7.75	7.69
<b>Average score</b>		<b>6.94</b>	<b>7.54</b>

#### MNES habitat condition assessments

Based on the results of the site condition and assessments, habitat condition scores for the six MNES ranged between 5.38 (Australian painted snipe) and 7.39 (Natural grasslands TEC) out of 10 (Table 6). The comparatively low score for Australian painted snipe habitat is in part attributable to the low site condition for RE 11.3.3a habitat (6.00), but also the low fauna species habitat index (3.20), reflecting an absence of appropriate foraging and shelter habitat for the species at the time of surveying. In contrast, Natural Grasslands TEC habitat had the highest habitat condition score (8.13), attributable in large part to low weed cover and high species richness for grasses at each of the contributing RE 11.8.11 sites (refer to Table B-1 of Appendix B for site condition raw data contributing to site condition score in Table B-2).

**Table 6: Project site monitoring sites showing their habitat condition scores contributing to MNES.**

Site	RE	Brigalow TEC	Natural Grasslands TEC	King blue-grass	Bluegrass	Squatter pigeon	Australian painted snipe
01	11.8.5					7.08	
02	11.8.11		6.96	5.57	5.57		
03	11.8.5					7.28	
04	11.8.11		8.13	6.50	6.50		

Site	RE	Brigalow TEC	Natural Grasslands TEC	King blue-grass	Bluegrass	Squatter pigeon	Australian painted snipe
05	11.8.5					5.93	
06	11.8.11		7.14	5.71	5.71		
07	11.4.3	7.17					
08	11.8.11		7.32	5.86	5.86		
09	11.3.3a						5.38
10	11.8.5					7.18	
Average score		7.17	7.39	5.91	5.91	6.87	5.38

### Natural Grasslands, king blue-grass and bluegrass habitat

As discussed above, areas of Natural Grasslands TEC, represented by RE 11.8.11, were all in good condition considering the current drought, with habitat condition scores for the four assessment sites ranging between 6.96 and 8.13. The four assessment sites supported three TEC indicator grass species (Table 7). While additional species are likely to have been present, some individuals could not be identified to species level due to the dry conditions and a consequent lack of fertile material.

**Table 7: Natural Grasslands TEC indicator species**

Scientific name	Common name	Site			
		02	04	06	08
<i>Aristida latifolia</i>	Feather-top wiregrass				
<i>Aristida leptopoda</i>	White speargrass	✓	✓	✓	
<i>Astrebla elymoides</i>	Hoop mitchell grass				
<i>Astrebla lappacea</i>	Curly mitchell grass				
<i>Astrebla squarrosa</i>	Bull mitchell grass				
<i>Bothriochloa erianthoides</i>	Satin-top grass		✓	✓	
<i>Dichanthium queenslandicum</i>	King blue-grass				
<i>Dichanthium sericeum</i>	Queensland bluegrass				
<i>Eriochloa crebra</i>	Cup grass				
<i>Panicum decompositum</i>	Native millet		✓		✓
<i>Panicum queenslandicum</i>	Yabila grass				
<i>Paspalidium globoideum</i>	Shot grass				
<i>Thellungia advena</i>	Coolibah grass				
TOTAL		1	3	2	1

### Squatter pigeon

Incidental searches for the squatter pigeon were conducted opportunistically from over 250 km of driving during the four days of field surveys on the project site, however, no squatter pigeons were recorded.

Further targeted surveys will be undertaken during the post-wet season survey when birds are more likely to be actively foraging for grass seed.

### Australian painted snipe

No surveying was undertaken for Australian painted snipe during the dry season survey monitoring. Instead, surveys will be undertaken during the wet season (defined as between 1 November in one year to 31 May in the following year), following a significant inundation event.

## 3.2 PHOTO MONITORING

Although very dry, photo monitoring on the Project site showed a variety of levels of cover ranging from dense grassy understorey (Site 11: refer to Photo C-105 in Appendix C) through to areas subject to moderate grazing (Site 12: Photo C-110 in Appendix C) resulting in reduced grass cover. The results of the photo monitoring on the offset site are presented in Appendix C.

## 3.3 WEED MONITORING

A total of 20 weed species were identified from the weed monitoring plots. Results are presented for 19 of the 20 weed monitoring plots as data for Site 05 was lost following completion of fieldwork. No additional species of weeds were observed on the site outside of those identified within the weed monitoring plots. Across the 19 weed monitoring plots, the average number of weed species observed per plot was 3.2 species, ranging between no species (Site 10) and five species (Site 02, 04, 06, 19 and 20), with 11 weed species only encountered at single sites. Weed cover across the 20 weed monitoring plots averaged 4.8%; ranging between 0% (Site 10) and 12.6% (Site 11) (Table 8) (Figure 7: Project site weed monitoring results).

The most commonly encountered weeds were *Verbena officinalis* and *Parthenium hysterophorus*, each recorded from 11 of the 19 sites (Table 8). However, while encountered at a large number of sites, the average cover of *Melinis repens* and *Parthenium hysterophorus* across those encountered sites averaged 1.5% and 1.7% respectively. *Cenchrus ciliaris* was the weed species with the highest average cover, averaging 3.9% cover across the seven sites it was recorded from (Table 8).

Spatially, the site with the highest cover of weeds was not evidently subject to grazing (Site 11). Sites which had been grazed displayed less weed cover (e.g. Site 13, with 3.9% cover), however, this may be due to a considerable reduction in total groundcover – resulting from a combination of overgrazing and drought.



Table 8: Results of weed monitoring assessments at the Project site

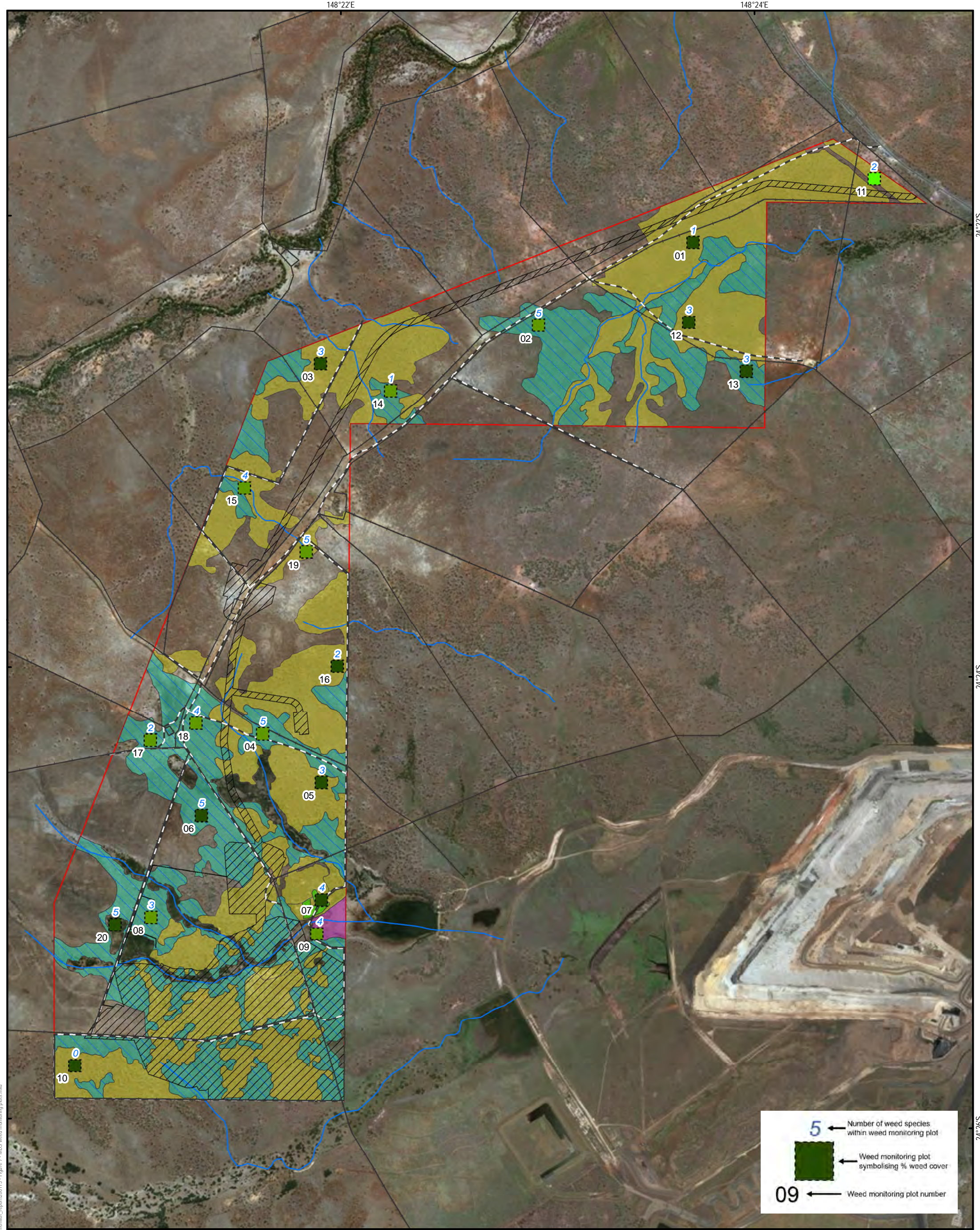
Scientific name	Common name	Family name	Percentage cover of weed species from given site																				# sites	Avg cover (%) <sup>a</sup>
			01	02	03	04	05 <sup>c</sup>	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20		
<i>Cyclospermum leptophyllum</i>	Slender celery	Apiaceae				0.2	-																1	0.2
<i>Gomphocarpus physocarpus</i>	Balloon cottonbush	Apocynaceae					-	0.6			0.1												2	0.4
<i>Cirsium vulgare</i>	Spear thistle	Asteraceae		0.1			-																1	0.1
<i>Erigeron bonariensis</i>	Giant fleabane	Asteraceae					-				0.1												1	0.1
<i>Lactuca serriola</i>	Prickly lettuce	Asteraceae				0.1	-																1	0.1
<i>Parthenium hysterophorus</i>	Parthenium	Asteraceae				1.3	-	1.1	0.2	0.5	4.1				3.2		0.2		0.1	3.8	0.3	4.1	11	1.7
<i>Senecio madagascariensis</i>	Fireweed	Asteraceae		0.1			-																1	0.1
<i>Opuntia stricta</i>	Common prickly pear	Cactaceae					-		0.2														1	0.2
<i>Opuntia tomentosa</i>	Velvet tree pear	Cactaceae					-							2.5									1	2.5
<i>Senna sp</i>		Fabaceae					-															0.1	1	0.1
<i>Stylosanthes viscosa</i>	Sticky stylo	Fabaceae					-							0.1							1.1		2	0.6
<i>Vachellia farnesiana</i>	Mimosa bush	Fabaceae					-			5.0	2.5								6.1	3.0	0.5	0.3	6	2.9
<i>Sida cordifolia</i>	Flannel weed	Malvaceae		0.2	0.1	0.4	-						0.3										4	0.3
<i>Sida spinosa</i>	Sida	Malvaceae					-	0.1															1	0.1
<i>Argemone ochroleuca</i>	Mexican poppy	Papaveraceae					-	0.1															1	0.1
<i>Cenchrus ciliaris</i>	Buffel grass	Poaceae			1.5		-		0.2				12.3				5.2	0.2			7.6	0.2	7	3.9
<i>Megathyrsus maximus</i>	Guinea grass	Poaceae					-		0.5														1	0.5
<i>Sorghum halepense</i>	Johnson grass	Poaceae		3.8			-								0.3		0.1						3	1.4
<i>Stachytarpheta jamaicensis</i>	Snakeweed	Verbenaceae					-	0.1		0.1										0.2		0.1	4	0.1
<i>Verbena officinalis</i>	Common verbena	Verbenaceae	1.4	1.2	0.2	4.9	-							0.1	0.4	7.1	0.2	0.1		0.7	0.3		11	1.5
		# species	1	5	3	5	-	5	4	3	4	0	2	3	3	1	4	2	2	4	5	5		
		Weed cover (%) <sup>b</sup>	1.4	5.4	1.8	6.9	-	2.0	1.1	5.6	6.8	0.0	12.6	2.7	3.9	7.1	5.7	0.3	6.2	7.7	9.8	4.8		

<sup>a</sup> Avg cover (%) represents the average percentage cover of a given weed species across encountered sites.

<sup>b</sup> Weed cover represents the sum of the average weed cover percentages of all weed species.

<sup>c</sup> Weed cover data lost





### Figure 7 MDS Weed monitoring results

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by U&D Mining  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 20/01/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:27,500@A3

Disturbance areas	Brigalow TEC	Weed monitoring plots	11 - 15
Mining Lease	Natural Grassland TEC	<b>Weed cover (%)</b>	16 - 25
Fences	Habitat for King blue-grass and bluegrass	< 5	26 - 50
Access tracks	Habitat for squatter pigeon	6 - 10	51 - 100
Watercourse	Habitat for Australian painted snipe		

0    0.25    0.5    0.75    1  
Kilometres

N



## 3.4 PEST ANIMAL MONITORING

### 3.4.1 Rabbits

Results of rabbit monitoring confirmed the presence of rabbit/hare scats from six of the ten rabbit monitoring plots (R02, R04, R06, R07, R08, R09). Across these plots, pellet abundance ranged from isolated pellets and small clumps more than 10 m apart, to scattered pellets and clumps less than 10 m apart. Brown hares (*Lepus europaeus*) and European rabbits (*Oryctolagus cuniculus*) were also visually confirmed (Figure 8: European rabbit (*Oryctolagus cuniculus*) captured at fauna camera station C01 at the MDS site.) at three separate fauna camera stations (Site C09, C04, C01), which were located along the north-east boundary and main south-west access track (Figure 9).



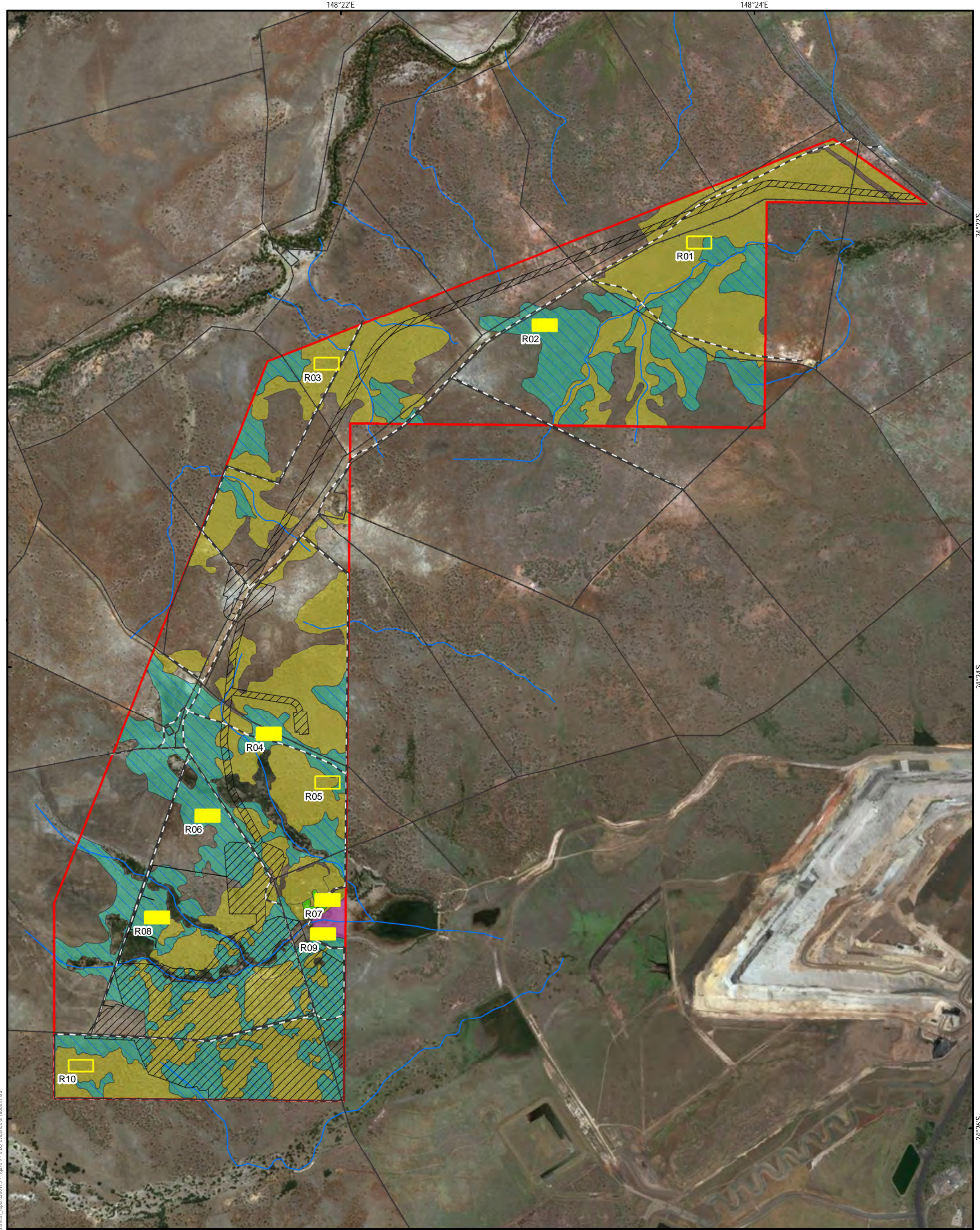
**Figure 8: European rabbit (*Oryctolagus cuniculus*) captured at fauna camera station C01 at the MDS site.**

Table 9 shows the results of the assessment of overall rabbit impact. The results indicate that over half of the sites displayed evidence of rabbit abundance. As these surveys were conducted during the dry season, no seedlings were observed and the seedling abundance score was marked as 0 for each site. The assessment of overall rabbit impact was denoted as 'Monitor closely' or 'Acceptable' for the majority of sites, with sites R02 and R07 denoted as 'Unacceptable' due to higher rabbit abundance. It is important to note that these overall rabbit impact scores are likely to have been exaggerated by the absence of seedlings, resulting from a lack of rainfall rather than high rabbit abundance.

**Table 9: Assessment of overall rabbit impact at the MDS Project site.**

Site	Rabbit abundance score (0 – 5)	Seedling abundance score (0 – 5)	Rabbit damage score (0 – 5)	Corrected regeneration score (0 – 5)	Overall rabbit impact
R01	0	0	0	0.2	Acceptable
R02	2	0	0	0.2	Unacceptable
R03	0	0	0	0.2	Acceptable
R04	1	0	0	0.2	Monitor closely
R05	0	0	0	0.2	Acceptable
R06	1	0	0	0.2	Monitor closely
R07	2	0	0	0.2	Unacceptable
R08	1	0	0	0.2	Monitor closely
R09	1	0	0	0.2	Monitor closely
R10	0	0	0	0.2	Acceptable





**Figure 9**  
**MDS**  
**Evidence of rabbits/hares**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by U&D Mining  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 20/01/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:27,500@A3

Disturbance areas  
Mining Lease  
Fences  
Tracks  
Watercourse

Brigalow TEC  
Natural Grassland TEC  
Habitat for King blue-grass and bluegrass  
Habitat for squatter pigeon  
Habitat for Australian painted snipe

**Rabbit monitoring plots (R01 - R10)**  
No evidence for rabbits/hares  
Evidence of rabbits/hares

Sojitz Blue Pty Ltd - Meteor Downs South

Location diagram

0 0.25 0.5 0.75 1  
Kilometres

**CO<sub>2</sub>**  
Australia



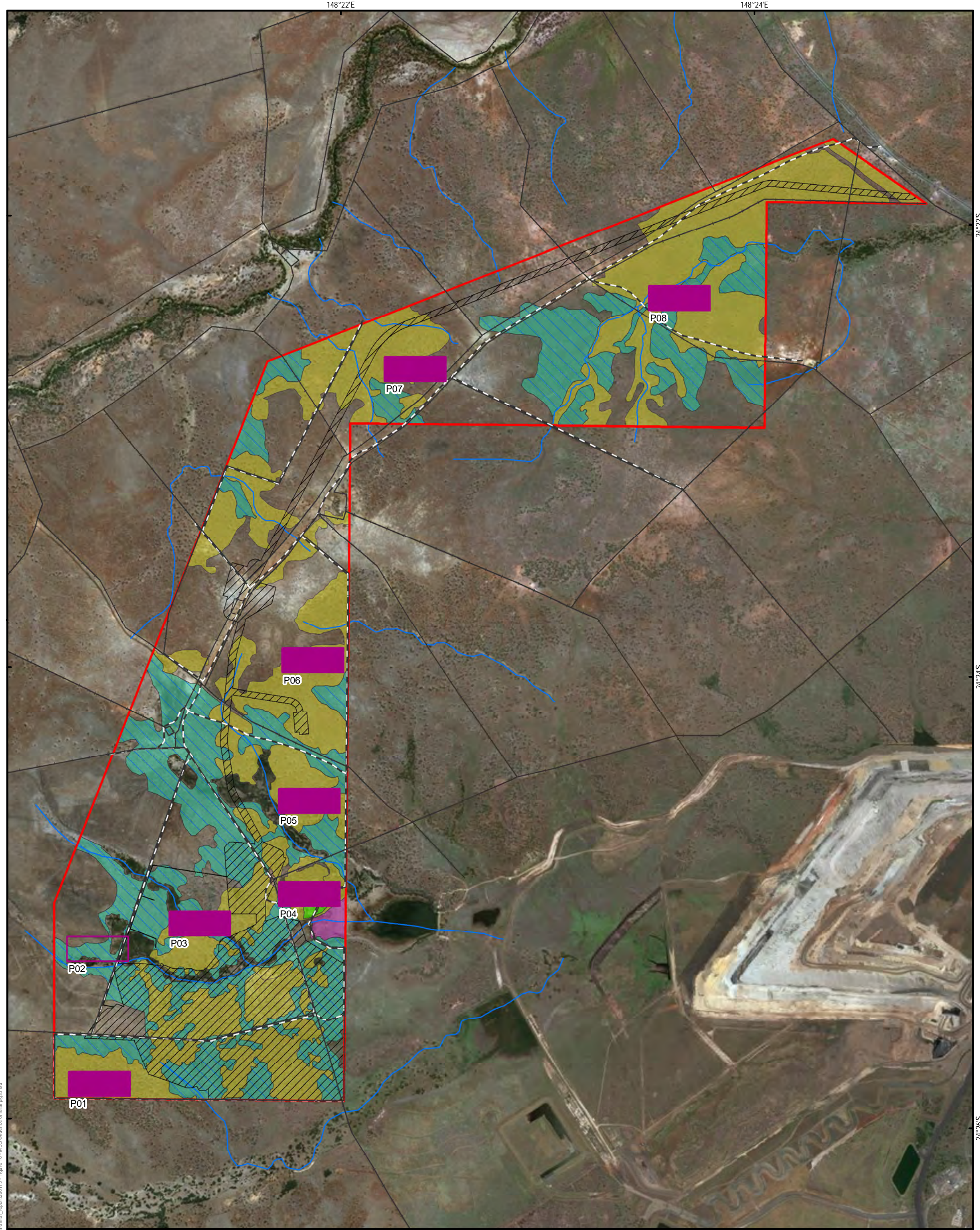
### 3.4.2 Feral pigs

Across all eight pig monitoring plots, represented by a total of 12 km of transects, there was confirmed evidence for the presence of feral pigs in seven plots (Figure 10). However, there was no visual evidence for feral pigs either through direct observation or captured at the fauna camera stations. Evidence of feral pig presence within plots ranged from 0% (Site P02) to 57% (Site P01) and, on average, was observed across 19.6% of the available transect sections within each plot (Table 10: Assessment of overall feral pig presence and activity at the MDS Project site, denoted as either rooting (R), wallows (W), dung (D) or tree rubbing/tusking (T).). Furthermore, opportunistic surveying through ephemeral watercourses, including observation efforts during weed and rabbit monitoring, revealed additional evidence of feral pigs. It is important to note that, due to the very dry conditions, pig scats are likely to have persisted for a number of weeks, thus potentially allowing for an increased abundance of scats compared to during the wet season.

**Table 10: Assessment of overall feral pig presence and activity at the MDS Project site, denoted as either rooting (R), wallows (W), dung (D) or tree rubbing/tusking (T).**

Plot	Transect	Monitoring plot survey section (50 m)										Transect	Plot % (record/30)
		1	2	3	4	5	6	7	8	9	10		
P01	1	R	-	R	-	-	R	D W R	D	R	R	70%	57%
	2	R	-	-	R	R	-	-	T	R	R	60%	
	3	-	-	-	R	-	-	R	R	-	R	40%	
P02	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P03	1	D	W	-	-	-	-	-	-	-	-	20%	10%
	2	-	-	-	R	-	-	-	-	-	-	10%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P04	1	-	-	-	-	-	-	-	-	R	-	10%	26.7%
	2	R	R	R	R	-	-	-	-	R	-	50%	
	3	-	D	R	-	-	-	-	-	-	-	20%	
P05	1	-	-	-	-	-	-	-	-	-	-	0%	23%
	2	D R	D	D	-	-	-	-	-	-	-	30%	
	3	R	-	-	-	R	D	-	D	-	-	40%	
P06	1	-	-	R	R	R	-	-	-	R	-	40%	23%
	2	R	-	-	-	R	-	-	R	-	-	30%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P07	1	-	-	-	-	-	-	D	-	-	-	10%	13.3%
	2	-	-	-	-	R	-	-	-	-	-	10%	
	3	-	-	-	-	-	-	R	R	-	-	20%	
P08	1	-	-	-	-	-	-	-	-	-	-	0%	3%
	2	R	-	-	-	-	-	-	-	-	-	10%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
												<b>Total</b>	<b>19.6%</b>





Sojitz Blue Pty Ltd - Meteor Downs South

Location diagram

**Figure 10**  
**MDS**  
**Evidence of feral pigs**

Disturbance areas

Mining Lease

Fences

Tracks

Watercourse

Brigalow TEC

Natural Grassland TEC

Habitat for King blue-grass and bluegrass

Habitat for squatter pigeon

Habitat for Australian painted snipe

**Pig monitoring plots (P01 - P08)**

No evidence of feral pigs

Evidence of feral pigs

0 0.25 0.5 0.75 1  
Kilometres

DATA SOURCE:  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by U&D Mining  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 20/01/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:27,500@A3

Path: P:\GISData\Projects\Sojitz\915\_20200115\_Lex\_MDS\_dry\_season\_monitor\_report\200115\_Figure 10 - MDS evidence of feral pigs.mxd



### 3.4.3 Fauna camera stations

Of the 15 fauna camera stations, all 15 were considered operable stations across each of the three consecutive nights, resulting in a total of 45 operable station nights for the purposes of calculating Catling Index values for pest animal species. As indicated in Table 11, the fauna cameras confirmed the presence of three pest animal species, namely brown hare (*Lepus capensis*), European rabbit (*Oryctolagus cuniculus*) and feral dog (*Canis familiaris/lupus*). The highest Catling Index score was 4.4, which was calculated for both wild dog and European rabbit. Non-pest animals were also detected from the fauna camera stations, including eastern grey kangaroo (*Macropus giganteus*), cattle (*Bos taurus*) and common brushtail possum (*Trichosurus vulpecula*).

Overall, there were only five individual pest animal detections, recorded from five of the 15 fauna camera stations. The majority of these records originated from cameras located across a central portion of the site (C05, C06, C09, C10), within 1.5 km of the main site office (Figure 11). These areas are located adjacent to existing drainage channel within the vicinity of vegetation patches mapped as 11.8.5, which are likely to be favoured by pest animals given the greater opportunity for both water and shade compared to the surrounding grassland. The remaining detection was recorded from C01, which is also in close proximity to woodland and a watercourse.

In addition, feral goat (*Capra hircus*) scats were observed outside of weed monitoring plot W03. However, there was no evidence for goats either through direct observation or via the fauna cameras.

**Table 11: Pest animal results for the Project site**

Pest animal species	Confirmed incidence of pest animal species from given site															Catling Index
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	
Dog																
Day 1																4.4
Day 2																
Day 3				✓	✓											
Cat																
Day 1																0
Day 2																
Day 3																
European rabbit																
Day 1																4.4
Day 2	✓								✓							
Day 3																
Brown hare																
Day 1																2.2
Day 2										✓						
Day 3																
Feral pig																
Day 1																0
Day 2																
Day 3																







### 3.5 GENERAL SITE INSPECTION

The condition of fencing and access gates across the MDS site was good, with no requirement for repair at the time of surveying. Existing access tracks including firebreaks were of a similar standard and are unlikely to require maintenance or upgrades in the near future. Assessment of access tracks and watercourse crossings will be undertaken again post-wet season.

Field investigations revealed that some areas appear to have been subject to overgrazing. In particular, the paddock containing weed monitoring plot W17 displayed a notable lack of groundcover (Figure 12) due to continued grazing during the drought period, with weeds such as *Parthenium hysterophorus* and *Vachellia farnesiana* contributing to a high proportion of the remaining cover. Notwithstanding, it is understood that MDS is responsible for the management of activities within the Project site only and does not have any responsibility for grazing regimes in the mining lease area that is outside of the Project site.



Figure 12: Overgrazing in the vicinity of W17, located within RE 11.8.11



## 4 RESULTS: LEXINGTON OFFSET SITE

### 4.1 PHOTO MONITORING

The results of the photo monitoring are present in Appendix C, showing five photos taken ~1.5 m height above ground level looking north, east, south and west with a ground photo taken looking down at an angle of 45° to the north-west of the star picket. This was undertaken at the 20 weed monitoring plots.

Although very dry, photo monitoring showed a variety of levels of cover ranging from a sparse understorey with limited groundcover (Weed plot 02: refer to Photo D-110 in Appendix C) through to areas that have not been grazed and exhibit a dense grassy understorey (Site 09: Photo D-145 in Appendix C).

Brigalow Belt pasture photo standards were used for all monitoring points across the project site and the offset site. 'Downs country' photo standards were used for offset areas comprising of RE 11.8.11 and RE 11.8.11a, whilst photo monitoring results from areas of 11.8.4 and 11.8.5 were assessed against 'Narrow-leaved Ironbark' photo standards (Table 12).

Photo monitoring showed some variability in feed amount levels of ground cover across all photo monitoring sites. Sites in RE 11.8.11 and 11.8.11a ranged in feed amount levels from 1080 kg/ha to 3850 kg/ha. Sites 08, 09, and 10 (representing RE 11.8.11a) had the highest feed amount levels of 3850 kg/ha. Photo monitoring sites in RE 11.8.4 and 11.8.5 ranged in feed amount levels from 310 kg/ha to 1750 kg/ha (Table 12). Although some sites recorded very low feed amounts, these results are likely attributable to lower than average rainfall during the 2019 dry season and are unlikely to have resulted solely from overgrazing.

**Table 12: Results of photo monitoring assessments on the offset site using Brigalow Belt pasture photo standards.**

Photo monitoring site	RE type	Brigalow Belt pasture photo standard type		
		Narrow-leaved ironbark	Downs country	Biomass kg/ha
01	11.8.11		✓	2140
02	11.8.4	✓		310
03	11.8.11		✓	3015
04	11.8.5	✓		1750
05	11.8.4	✓		720
06	11.8.11		✓	2140
07	11.8.4	✓		1750
08	11.8.11a		✓	3850
09	11.8.11a		✓	3850
10	11.8.11a		✓	3850
11	11.8.5	✓		1750
12	11.8.11		✓	3015
13	11.8.11		✓	3015
14	11.8.5	✓		1750
15	11.8.4	✓		1750
16	11.8.11		✓	1080
17	11.8.11		✓	2140

Brigalow Belt pasture photo standard type				
Photo monitoring site	RE type	Narrow-leaved ironbark	Downs country	Biomass kg/ha
18	11.8.5	✓		1750
19	11.8.4	✓		720
20	11.8.11		✓	3015



## 4.2 WEED MONITORING

A total of 22 weed species were identified from the 20 weed monitoring plots. No additional species of weeds were observed on the site outside of those identified within the weed monitoring plots. Across the 20 weed monitoring plots, the average number of weed species observed per plot was 6.1 species, ranging between two species (Site 02, 05) and ten species (Site 03, 15), with seven weed species only encountered at single sites. Weed cover across the 20 weed monitoring plots averaged 22.2%; ranging between 0.60% (Site 05) and 67.4% (Site 04) (Table 13) (Figure 13).

The most commonly encountered weed was *Cenchrus ciliaris*, recorded from 18 of the 20 sites (Table 13). It was also the weed species with the highest average cover, averaging 13.1% cover across the sites it was recorded within. Although only recorded within two weed plots, *Megathyrsus maximus* also displayed a high average cover of 13.1%.

The site with the highest cover of weeds was Site 04, which was dominated by *Cenchrus ciliaris*, despite not currently being subject to grazing. Sites with higher species richness (Site 03, 15) also displayed evidence of historical grazing pressure; it is likely that cattle were significant vectors of weed propagules across the Lexington site. Site 05 displayed the lowest cover and species richness of weeds, yet also exhibited signs of historical grazing pressure. On average, weed plots located in areas of natural grassland (RE 11.8.11) contained a higher species richness of weeds (7.2) compared with woodland sites (5.1).

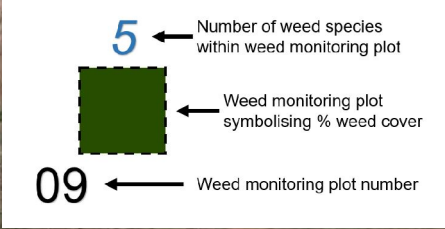
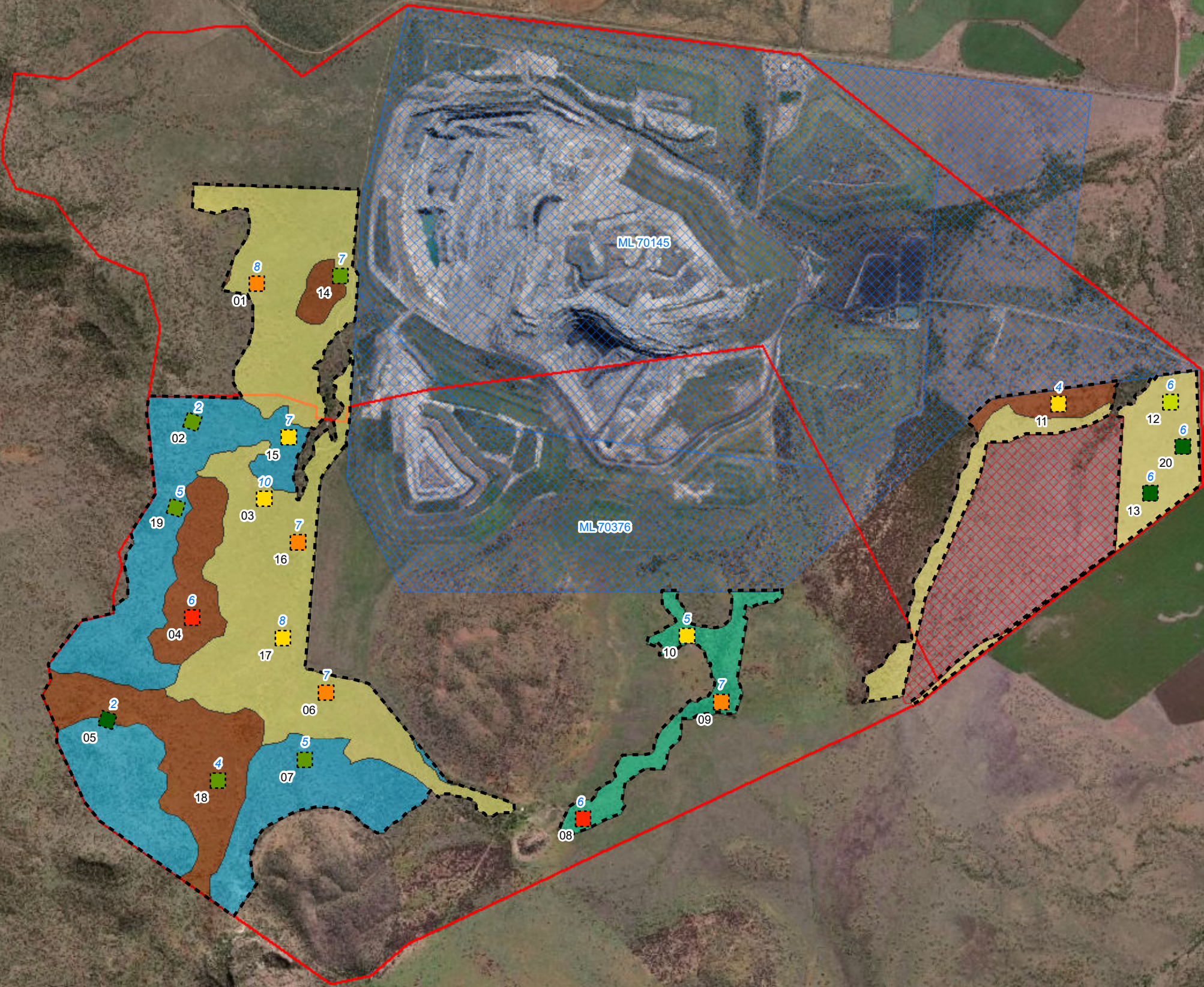
**Table 13: Results of weed monitoring assessments at Lexington.**

Scientific name	Common name	Family name	Percentage cover of weed species from given site																				# sites	Avg cover (%) <sup>a</sup>
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20		
<i>Bidens bipinnata</i>	Bipinnate beggar's ticks	Asteraceae	0.1		0.1						0.1						0.2	1.1					5	0.3
<i>Lactuca serriola</i>	Prickly lettuce	Asteraceae				0.1																	1	0.1
<i>Parthenium hysterophorus</i>	Parthenium weed	Asteraceae	6.6		4.6	0.2		24.3	0.1	2.1			0.1	1.1	0.9	5.5	4.3	0.7	3.6		0.1	0.5	15	3.6
<i>Verbesina encelioides</i>	Goldweed	Asteraceae	0.2		0.2						4.3	2.9		0.3	0.6				0.1			0.7	8	1.2
<i>Xanthium pungens</i>	Noogoora burr	Asteraceae																	0.1				1	0.1
<i>Opuntia stricta</i>	Prickly pear	Cactaceae							0.1								0.1						2	0.1
<i>Cucumis myriocarpus</i>	Paddy melon	Cucurbitaceae	0.2		0.8			6.6		0.3		0.1		0.1	0.4	0.1	3.1	1.3	1.5			0.2	12	1.2
<i>Crotolaria juncea</i>	Sun hemp	Fabaceae																0.1					1	0.1
<i>Stylosanthes viscosa</i>	Sticky stylo	Fabaceae				0.3	0.2	0.5	1.8			0.1					0.4			0.2	0.6		8	0.5
<i>Vachellia farnesiana</i>	Mimosa bush	Fabaceae	10.1		11.1	3.0		6.0	0.1	5.8	0.1		1.3			0.8	8.2	7.5	10.7	0.2		0.1	14	4.6
<i>Sida spinosa</i>	Sida	Malvaceae	0.2		0.5						0.2												3	0.3
<i>Waltheria indica</i>	Sleepy morning	Malvaceae															0.6	0.1					2	0.4
<i>Cenchrus ciliaris</i>	Buffel grass	Poaceae	21.3	7.0	0.6	62.6	0.4		7.6	50.6	8.2	12.5	18.0	8.7	0.1		4.1	18.6	2.6	6.6	5.0	1.3	18	13.1
<i>Megathyrsus maximus</i>	Guinea grass	Poaceae									23.5	2.6											2	13.1
<i>Melinis repens</i>	Red natal grass	Poaceae																			0.1		1	0.1
<i>Sorghum halepense</i>	Johnson grass	Poaceae			0.1			2.6		2.5				0.2		2.0							5	1.5
<i>Capsicum sp.</i>	Chilli	Solanaceae									2.7												1	2.7
<i>Stachytarpheta jamaicensis</i>	Snake weed	Verbenaceae						1.3															1	1.3
<i>Verbena officinalis</i>	Common verbena	Verbenaceae	2.7	0.3	1.2	1.2		2.3		0.6			0.4	0.4	0.5	1.2	0.5		2.9	1.7	1.5		14	1.2
Weed sp. Large seed pod																	0.3						1	0.3
Weed sp.1					0.3											0.2			0.3			0.1	4	0.2
Weed sp.2															0.1	0.2							2	0.2
		# species	8	2	10	6	2	7	5	6	7	5	4	6	6	7	10	7	8	4	5	6		
		Weed cover (%) <sup>b</sup>	41.3	7.3	19.5	67.4	0.6	43.5	9.7	61.9	39.1	18.2	19.7	10.8	2.6	10.0	21.7	29.4	21.8	8.7	7.3	2.9		

<sup>a</sup> Avg cover (%) represents the average percentage cover of a given weed species across encountered sites.

<sup>b</sup> Weed cover represents the sum of the average weed cover percentages of all weed species.





Sojitz Blue Pty Ltd - Lexington

Location diagram

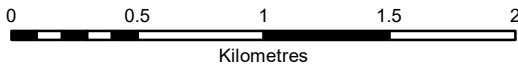
**Figure 13**  
**Lexington**  
**Weed monitoring results**

- Minerva lots (lot 10 & 11 DN40126)
- Existing offset area (Category A area)
- Mining leases (ML70376 and ML70145)
- Offset area
- Weed monitoring plots

Weed cover (%)	Regional ecosystem
<5%	RE 11.8.11
6 - 10	RE 11.8.11a
11 - 15	RE 11.8.4
16 - 25	RE 11.8.5
26 - 50	
>50	

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data (Qld DCDB)  
- Mining Lease

Date: 2/03/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:30,000@A3





## 4.3 PEST ANIMAL MONITORING

### 4.3.1 Rabbits

Results of rabbit monitoring confirmed the presence of rabbit/hare scats from all 10 rabbit monitoring plots (R01 – R10) (Figure 15). Across these plots, pellet abundance ranged from isolated pellets and small clumps more than 10 m apart, to abundant pellets, often in large clumps and buck-heaps. Brown hares (*Lepus europaeus*) and European rabbits (*Oryctolagus cuniculus*) (Figure 14) were also visually confirmed by six separate fauna camera stations (Site C03, C09, C10, C12, C13, C15), which were spread evenly across the whole site. Brown hares were found to be more abundant, with eight captures recorded across five cameras on three separate nights, as opposed to only two rabbit sightings on one night.



**Figure 14: European rabbit (*Oryctolagus cuniculus*) captured on a fauna camera at Site C12 at Lexington.**

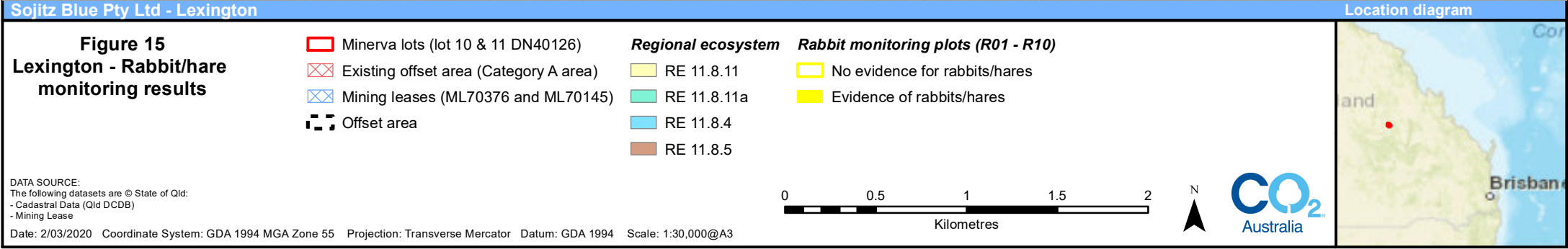
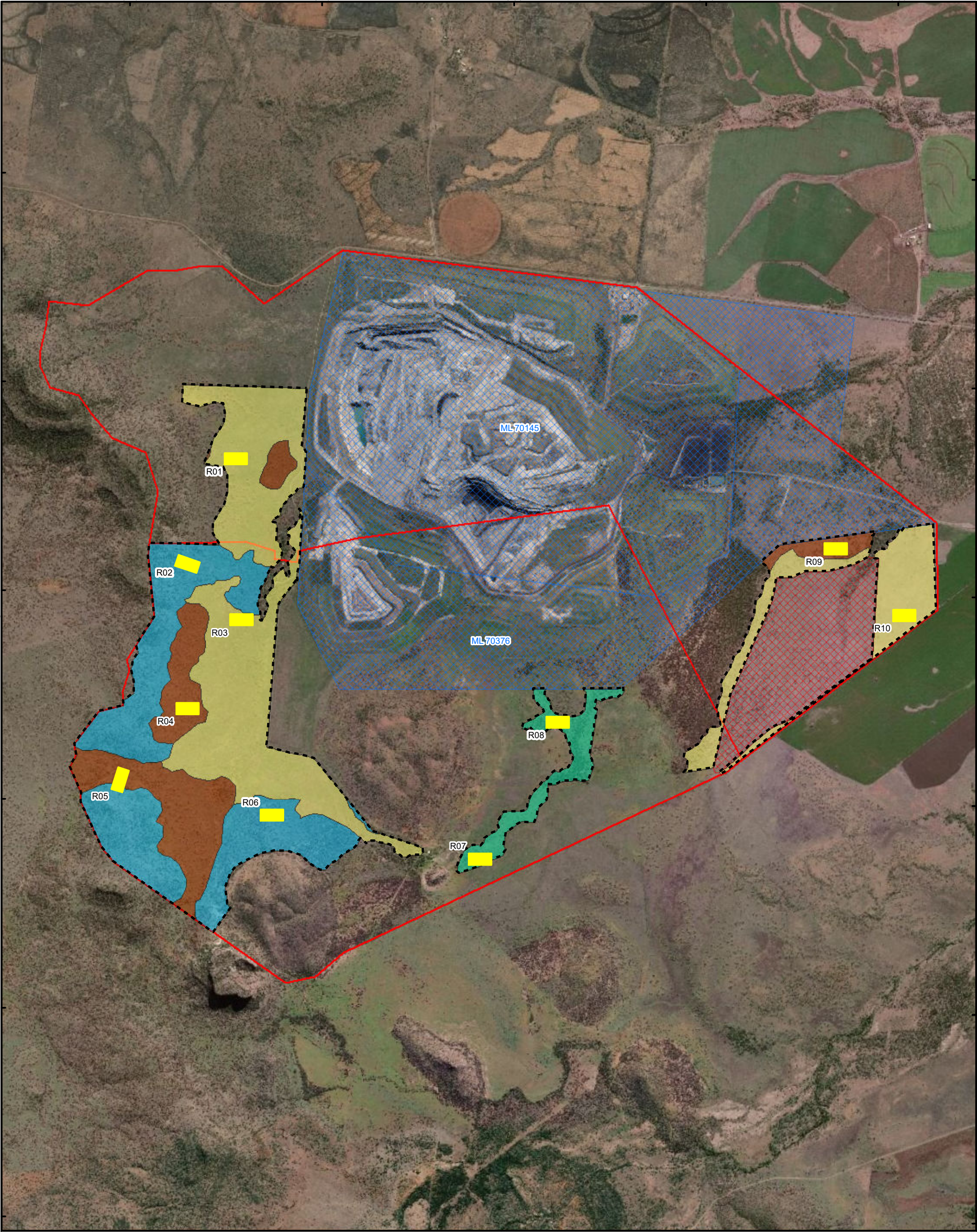
Table 14 shows the results of the assessment of overall rabbit impact. The results indicate that all of the sites displayed evidence of rabbit abundance. As these surveys were conducted during the dry season, no seedlings were observed, and the seedling abundance score was marked as 0 for each site. The assessment of overall rabbit impact was denoted as 'Unacceptable' for most sites, due to high levels of rabbit abundance. It is important to note that these overall rabbit impact scores are likely to have been exaggerated by the absence of seedlings, resulting from a lack of rainfall rather than high rabbit abundance.



**Table 14: Assessment of overall rabbit impact at the Lexington offset site.**

Site	Rabbit abundance score (0 – 5)	Seedling abundance score (0 – 5)	Rabbit damage score (0 – 5)	Corrected regeneration score (0 – 5)	Overall rabbit impact
R01	2	0	0	0.2	Unacceptable
R02	4	0	0	0.2	Unacceptable
R03	2	0	0	0.2	Unacceptable
R04	1	0	0	0.2	Monitor closely
R05	3	0	0	0.2	Unacceptable
R06	3	0	0	0.2	Unacceptable
R07	2	0	0	0.2	Unacceptable
R08	1	0	0	0.2	Monitor closely
R09	3	0	0	0.2	Unacceptable
R10	1	0	0	0.2	Monitor closely







### 4.3.2 Feral pigs

Across the eight pig monitoring plots, there was confirmed evidence for the presence of feral pigs in 4 plots. However, there was no evidence for feral pigs either through direct observation or via the fauna cameras. Evidence of feral pig presence within plots ranged from 0% (Sites P02, P03, P04 and P08) to 23% (Site P01) and, on average, was observed across 6.7% of the available transect sections within each plot (Table 15). Indicators of pig presence were often observed within the direct vicinity of areas mapped as RE 11.8.11a (Figure 16). These areas are represented by *Melaleuca bracteata* woodland along ephemeral watercourse and as such, are likely to be favoured by feral pigs given they afford greater cover compared to the surrounding woodland and grassland habitat. Opportunistic surveying through ephemeral watercourses, including observation efforts during weed and rabbit monitoring, also revealed additional evidence of feral pigs. As aforementioned, due to the very dry conditions, pig scats are likely to have persisted for an extended period, thus potentially allowing for an increased observed abundance of scats compared to during the wet season.

**Table 15: Assessment of overall feral pig presence and activity at the Lexington offset site, denoted as either rooting (R), wallows (W), dung (D) or tree rubbing/tusking (T).**

Monitoring plot survey section (50 m)													
Plot	Transect	1	2	3	4	5	6	7	8	9	10	Transect	Plot % (record/30)
P01	1	-	-	-	-	-	-	-	-	-	-	0%	23%
	2	D	-	-	-	-	-	D	R	R	-	40%	
	3	D	D	-	-	R	-	-	-	-	-	30%	
P02	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P03	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P04	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P05	1	-	-	-	-	D	-	-	-	-	-	10%	7%
	2	-	-	-	-	-	R	-	-	-	-	10%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P06	1	-	-	-	-	-	-	-	D	-	-	10%	17%
	2	-	-	-	-	R	D	D	-	-	-	30%	
	3	R	-	-	-	-	-	-	-	-	-	10%	
P07	1	-	-	-	-	-	-	-	-	-	-	0%	6.67%
	2	-	-	-	-	D	-	D	-	-	-	20%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P08	1	-	-	-	-	-	-	-	-	-	-	0%	0%

Monitoring plot survey section (50 m)													
Plot	Transect	1	2	3	4	5	6	7	8	9	10	Transect	Plot % (record/30)
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
												<b>Total</b>	<b>6.67%</b>



148°10'E 148°20'E 148°30'E 148°40'E 148°50'E

23°54'0"S

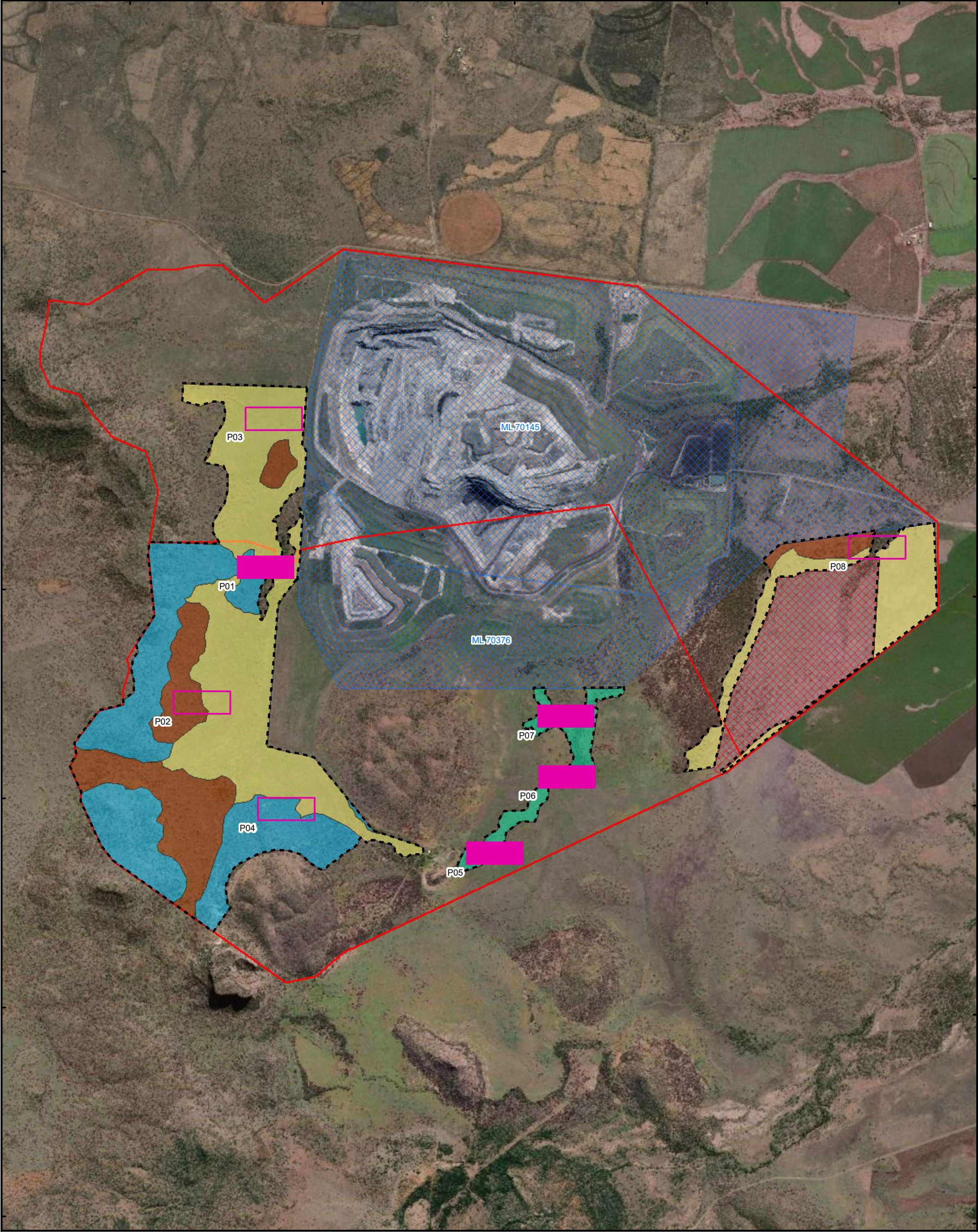
23°55'0"S

23°56'0"S

23°57'0"S

23°58'0"S

23°59'0"S



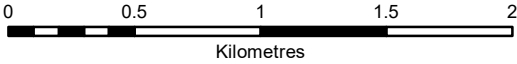
Sojitz Blue Pty Ltd - Lexington Location diagram

**Figure 16**  
**MDS**  
**Evidence of feral pigs**

- |  |                           |   |
|--|---------------------------|---|
| Minerva lots (lot 10 & 11 DN40126)     | <b>Regional ecosystem</b> | <b>Pig monitoring plots (P01 - P08)</b> |
| Existing offset area (Category A area) | RE 11.8.11                | No evidence of feral pigs               |
| Mining leases (ML70376 and ML70145)    | RE 11.8.11a               | Evidence of feral pigs                  |
| Offset area                            | RE 11.8.4                 |   |
|  | RE 11.8.5                 |   |

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data (Qld DCDB)  
- Mining Lease

Date: 2/03/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:30,000@A3





### 4.3.3 Fauna camera station

Of the 15 fauna camera stations, 14 were considered operable stations across each of the three consecutive nights, resulting in a total of 42 operable station nights for the purposes of calculating Catling Index values for pest animal species. The fauna camera at site C11 did not display any captures due to a camera error and was deemed inoperable. The fauna cameras confirmed the presence of four pest animal species, namely brown hare (*Lepus capensis*), European rabbit (*Oryctolagus cuniculus*), feral cat (*Felis catus*) (Figure 17) and wild dog (*Canis familiaris*) (Figure 18). The highest Catling Index score was 19.0 for the brown hare, followed by feral cat (19) and wild dog (16.7). Non-pest animals were also detected from the fauna camera stations, including eastern grey kangaroo (*Macropus giganteus*), and pretty-faced wallaby (*Macropus parryi*).

Overall, there were 25 individual pest animal detections, recorded from 12 of the 15 fauna camera stations (Table 16). These detections were made throughout the site (Figure 20), with a concentration of records around a central portion of the property (C10, C12, C13) represented largely by non-remnant grassland (Figure 4).

**Table 16: Pest animal results from the Lexington offset site.**

Pest animal species	Confirmed incidence of pest animal species from given site															Catling Index
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11*	C12	C13	C14	C15	
Dog																
Day 1	✓												✓			16.7
Day 2												✓	✓			
Day 3												✓	✓	✓		
Cat																
Day 1								✓	✓	✓						19.0
Day 2							✓	✓								
Day 3					✓	✓				✓						
European rabbit																
Day 1										✓		✓				4.8
Day 2																
Day 3																
Brown hare																
Day 1			✓												✓	19.0
Day 2			✓						✓						✓	
Day 3												✓	✓		✓	
Feral pig																
Day 1																0
Day 2																
Day 3																





Figure 17: Feral cat (*Felis catus*) captured at fauna camera station C09 on the Lexington offset site.



Figure 18: Wild dog (*Canis familiaris*) captured at fauna camera station C13 on the Lexington offset site.

#### 4.3.4 Significant fauna observations

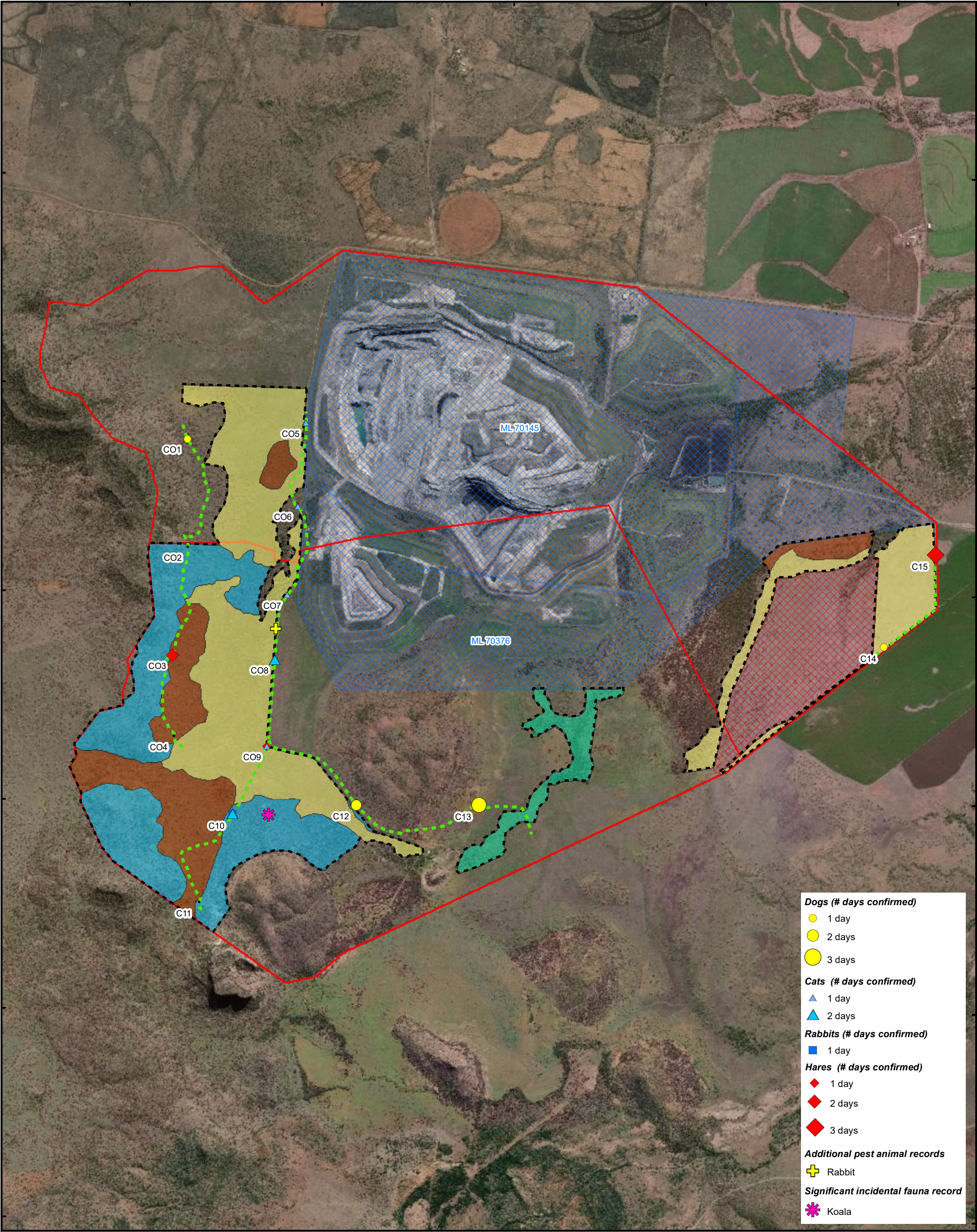
During a weed survey at W07, located in RE 11.8.4 (Figure 4), a koala (*Phascolarctos cinereus*) was observed in a mature *Eucalyptus crebra*. The koala is listed as Vulnerable under the EPBC Act and NC Act, and this sighting constitutes the only known record of this species on Lexington.





Figure 19: Koala (*Phascolarctos cinereus*) observed in weed plot W07 on Lexington, sheltering in a *Eucalyptus crebra*.





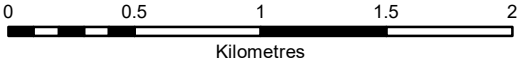
Sojitz Blue Pty Ltd - Lexington

**Figure 20**  
**Lexington**  
**Pest animal results**

- |  |                           |
|--|---------------------------|
| Minerva lots (lot 10 & 11 DN40126)     | <b>Regional ecosystem</b> |
| Existing offset area (Category A area) | RE 11.8.11                |
| Mining leases (ML70376 and ML70145)    | RE 11.8.11a               |
| Offset area                            | RE 11.8.4                 |
| Pest animal survey tracks              | RE 11.8.5                 |

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data (Qld DCDB)  
- Mining Lease

Date: 3/03/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:30,000@A3





#### 4.4 GENERAL SITE INSPECTION

The condition of fencing and access gates across the Lexington site was relatively poor, with some fences loose or slumping in a number of locations. In particular, the fence adjacent to the main access track leading from the site entry gate is in poor condition. Sojitz Blue has confirmed in February 2020 that fence maintenance works are proposed to commence in the coming months. Track condition was great overall, with only one prominent pothole along the south-east access track adjacent to weed monitoring plot W18. All dams and watercourses were dry and will be assessed again during the post-wet season monitoring period.

During field investigations at pig monitoring plot P08, a well<sup>2</sup> was encountered (Figure 21). The well was open and there were no protective barriers or cautionary signage to prevent access. Given this poses a significant risk to traversing wildlife and personnel, it is recommended that the well is either appropriately barricaded or sealed.



**Figure 21: Open well discovered in pig monitoring plot P08**

<sup>2</sup> Located at 23.92856°S, 148.081944°E



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## 5 REFERENCES

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- Mitchell, B., & Balogh, S. (2007b). *Monitoring Techniques for Vertebrate Pests: Feral Pigs*. NSW Department of Primary Industries. Bureau of Rural Sciences, Orange NSW.
- Northern Resources Consultants (NRC) (2019). *Lexington Offset Area – Pest and Biomass Monitoring – February 2019*. Northern Resources Consultants, Townsville.

## APPENDIX A MONITORING SITE LOCATIONS

### PROJECT SITE

Table A-1: Dry-season monitoring site locations and purpose on the Project site

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
01	H01_0m	641462	7304249	✓	Squatter pigeon	✓				
	H01_50m	641462	7304301	✓		✓				
	W01_01	641462	7304249	✓		✓	✓			
	W01_02	641462	7304301				✓			
	W01_03	641462	7304348				✓			
	R01	641462	7304249	✓				✓		
02	H02_0m	640199	7303572	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓		✓		
	H02_50m	640203	7303621	✓		✓		✓		
	W02_01	640199	7303572	✓		✓	✓			
	W02_02	640203	7303621				✓			
	W02_03	640210	7303627				✓			
	R02	640199	7303572	✓				✓		
03	H03_0m	638418	7303259	✓	Squatter pigeon	✓				
	H03_50m	638425	7303308	✓		✓				
	W03_01	638418	7303259	✓		✓	✓			
	W03_02	638425	7303308				✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
	W03_03	638430	7303358				✓			
	R03	638418	7303259	✓				✓		
04	H04_0m	637945	7300236	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓				
	H04_50m	637951	7300287	✓		✓				
	W04_01	637945	7300236	✓		✓	✓			
	W04_02	637951	7300287				✓			
	W04_03	637950	7300338				✓			
	R04	637945	7300236	✓				✓		
05	H05_0m	638426	7299836	✓	Squatter pigeon	✓				
	H05_50m	638420	7299885	✓		✓				
	W05_01	638426	7299836	✓		✓	✓			
	W05_02	638420	7299885				✓			
	W05_03	638416	7299937				✓			
	R05	638426	7299836	✓				✓		
06	H06_0m	637445	7299566	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓				
	H06_50m	637447	7299615	✓		✓				
	W06_01	637445	7299566	✓		✓	✓			
	W06_02	637447	7299615				✓			
	W06_03	637443	7299668							
	R06	637445	7299566	✓				✓		

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Pest animal monitoring				
						Photo monitoring	Weed monitoring	Rabbit plot	Feral pig plot	Fauna camera
07	H07_0m	638426	7298876	✓	Brigalow TEC	✓				
	H07_50m	638419	7298926	✓		✓				
	W07_01	638426	7298876	✓		✓	✓			
	W07_02	638419	7298926				✓			
	W07_03	638423	7298974				✓			
	R07	638426	7298876	✓				✓		
08	H08_0m	637032	7298735	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓				
	H08_50m	637034	7298785	✓		✓				
	W08_01	637032	7298735	✓		✓	✓			
	W08_02	637034	7298785				✓			
	W08_03	637039	7298835				✓			
	R08	637032	7298735	✓				✓		
09	H09_0m	638387	7298599	✓	Australian painted snipe	✓				
	H09_50m	638380	7298648	✓		✓				
	W09_01	638387	7298599	✓		✓	✓			
	W09_02	638380	7298648				✓			
	W09_03	638372	7298699				✓			
	R09	638387	7298599	✓				✓		
10	H10_0m	636412	7297523	✓	Squatter pigeon	✓				
	H10_50m	636415	7297571	✓		✓				



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
	W10_01	636412	7297523	✓		✓	✓			
	W10_02	636415	7297571				✓			
	W10_03	636413	7297617				✓			
	R10	636412	7297523	✓				✓		
11	W11_01	642941	7304772	✓		✓	✓			
	W11_02	642937	7304825				✓			
	W11_03	642938	7304876				✓			
12	W12_01	641428	7303597	✓		✓	✓			
	W12_02	641426	7303646				✓			
	W12_03	641429	7303696				✓			
13	W13_01	641896	7303196	✓		✓	✓			
	W13_02	641899	7303247				✓			
	W13_03	641900	7303297				✓			
14	W14_01	638991	7303038	✓		✓	✓			
	W14_02	638987	7303090				✓			
	W14_03	638988	7303140				✓			
15	W15_01	637797	7302245	✓		✓	✓			
	W15_02	637796	7302296				✓			
	W15_03	637796	7302347				✓			
16	W16_01	638556	7300785	✓		✓	✓			

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
	W16_02	638560	7300832				✓			
	W16_03	638566	7300882				✓			
17	W17_01	637029	7300184	✓		✓	✓			
	W17_02	637028	7300231				✓			
	W17_03	637024	7300282				✓			
18	W18_01	637401	7300321	✓		✓	✓			
	W18_02	637401	7300368				✓			
	W18_03	637398	7300421				✓			
19	W19_01	638301	7301720	✓		✓	✓			
	W19_02	638295	7301771				✓			
	W19_03	638290	7301821				✓			
20	W20_01	636740	7298674	✓		✓	✓			
	W20_02	636746	7298723				✓			
	W20_03	636752	7298771				✓			
21	P01_01	636412	7297523						✓	
	P01_02	636412	7297423						✓	
	P01_03	636412	7297323						✓	
22	P02_01	636397	7298627						✓	
	P02_02	636397	7298527						✓	
	P02_03	636397	7298427						✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
23	P03_01	637232	7298835						✓	
	P03_02	637232	7298735						✓	
	P03_03	637232	7298635						✓	
24	P04_01	638126	7299076						✓	
	P04_02	638126	7298976						✓	
	P04_03	638126	7298876						✓	
25	P05_01	638126	7299836						✓	
	P05_02	638126	7299736						✓	
	P05_03	638126	7299637						✓	
26	P06_01	638156	7300985						✓	
	P06_02	638156	7300885						✓	
	P06_03	638156	7300785						✓	
27	P07_01	638992	7303366						✓	
	P07_02	638992	7303266						✓	
	P07_03	638992	7303166						✓	
28	P08_01	641150	7303945						✓	
	P08_02	641150	7303845						✓	
	P08_03	641150	7303745						✓	
29	C01	642072	7303376							✓
30	C02	641090	7303799							✓

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
31	C03	639787	7303069							✓
32	C04	638310	7301921							✓
33	C05	638696	7301071							✓
34	C06	638688	7300283							✓
35	C07	638680	7299504							✓
36	C08	638449	7298889							✓
37	C09	637509	7300705							✓
38	C10	637531	7300057							✓
39	C11	637071	7299149							✓
40	C12	636869	7298600							✓
41	C13	636439	7297829							✓
42	C14	636321	7297317							✓
43	C15	637054	7297306							✓

<sup>a</sup> Start points with prefix H = habitat assessment sites (HXX\_0m and HXX\_50m corresponds to 0 m and 50 m point of north-south habitat assessment transect), W = start point (west) of each site's weed monitoring plot transects (WXX\_01, WXX\_02 and WXX\_03 corresponds to transect 1, 2 and 3), R = start point (south-west) of 2 ha rabbit monitoring plot, P = start point (west) of each site's pig monitoring plot transects (PXX\_01, PXX\_02 and PXX\_03 corresponds to transect 1, 2 and 3), C = fauna camera station. Start points for habitat assessment, weed monitoring and rabbit monitoring plots are the same for sites 01 – 10, with sites 11 – 20 only corresponding to weed monitoring plots.



## LEXINGTON OFFSET SITE

Table A-2: Dry season monitoring site locations and purpose on the Lexington offset site

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
01	W01_01	604331	7354000	✓	✓	✓			
	W01_02	604331	7353950			✓			
	W01_03	604331	7353900			✓			
	R01	604331	7353900	✓			✓		
02	W02_01	603925	7353100	✓	✓	✓			
	W02_02	603908	7353053			✓			
	W02_03	603892	7353005			✓			
	R02	603892	7353005	✓			✓		
03	W03_01	604380	7352577	✓	✓	✓			
	W03_02	604380	7352527			✓			
	W03_03	604380	7352477			✓			
	R03	604380	7352477	✓			✓		
04	W04_01	603904	7351791	✓	✓	✓			
	W04_02	603904	7351741			✓			
	W04_03	603904	7351691			✓			
	R04	603904	7351691	✓			✓		
05	W05_01	603360	7351127	✓	✓	✓			
	W05_02	603345	7351079			✓			
	W05_03	603330	7351031			✓			

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
	R05	603426	7351001	✓			✓		
06	W06_01	604790	7351295	✓	✓	✓			
	W06_02	604790	7351245			✓			
	W06_03	604790	7351195			✓			
07	W07_01	604649	7350850	✓	✓	✓			
	W07_02	604649	7350800			✓			
	W07_03	604649	7350750			✓			
	R06	604649	7350750	✓			✓		
08	W08_01	606488	7350461	✓	✓	✓			
	W08_02	606488	7350411			✓			
	W08_03	606488	7350361			✓			
	R07	606488	7350361	✓			✓		
09	W09_01	607401	7351233	✓	✓	✓			
	W09_02	607401	7351183			✓			
	W09_03	607401	7351133			✓			
10	W10_01	607175	7351671	✓	✓	✓			
	W10_02	607175	7351621			✓			
	W10_03	607175	7351571			✓			
	R08	607175	7351571	✓			✓		
11	W11_01	609631	7353204	✓	✓	✓			
	W11_02	609631	7353154			✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
	W11_03	609631	7353104			✓			
	R09	609631	7353104	✓			✓		
12	W12_01	610371	7353217	✓	✓	✓			
	W12_02	610371	7353167			✓			
	W12_03	610371	7353117			✓			
13	W13_01	610237	7352615	✓	✓	✓			
	W13_02	610237	7352565			✓			
	W13_03	610237	7352515			✓			
	R10	610237	7352515	✓			✓		
14	W14_01	604883	7354051	✓	✓	✓			
	W14_02	604883	7354001			✓			
	W14_03	604883	7353951			✓			
15	W15_01	604543	7352984	✓	✓	✓			
	W15_02	604543	7352934			✓			
	W15_03	604543	7352884			✓			
16	W16_01	604604	7352289	✓	✓	✓			
	W16_02	604604	7352239			✓			
	W16_03	604604	7352189			✓			
17	W17_01	604503	7351656	✓	✓	✓			
	W17_02	604503	7351606			✓			
	W17_03	604503	7351556			✓			

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
18	W18_01	604074	7350714	✓	✓	✓			
	W18_02	604074	7350664			✓			
	W18_03	604074	7350614			✓			
19	W19_01	603812	7352530	✓	✓	✓			
	W19_02	603798	7352482			✓			
	W19_03	603784	7352434			✓			
20	W20_01	610453	7352923	✓	✓	✓			
	W20_02	610453	7352873			✓			
	W20_03	610453	7352823			✓			
21	P01_01	604442	7353084					✓	
	P01_02	604442	7352984					✓	
	P01_03	604442	7352884					✓	
22	P02_01	603879	7351891					✓	
	P02_02	603879	7351791					✓	
	P02_03	603879	7351691					✓	
23	P03_01	604513	7354397					✓	
	P03_02	604513	7354297					✓	
	P03_03	604513	7354197					✓	
24	P04_01	604624	7350950					✓	
	P04_02	604624	7350850					✓	
	P04_03	604624	7350750					✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
25	P05_01	606463	7350561					✓	
	P05_02	606463	7350461					✓	
	P05_03	606463	7350361					✓	
26	P06_01	607101	7351233					✓	
	P06_02	607101	7351133					✓	
	P06_03	607101	7351033					✓	
27	P07_01	607092	7351771					✓	
	P07_02	607092	7351671					✓	
	P07_03	607092	7351571					✓	
28	P08_01	609840	7353261					✓	
	P08_02	609840	7353161					✓	
	P08_03	609840	7353061					✓	
29	C01	604003	7354128						✓
30	C02	604006	7353171						✓
31	C03	603871	7352215						✓
32	C04	603885	7351500						✓
33	C05	605051	7354267						✓
34	C06	604978	7353531						✓
35	C07	604885	7352747						✓
36	C08	604776	7352174						✓
37	C09	604705	7351408						✓

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
38	C10	604402	7350811						✓
39	C11	604107	7350032						✓
40	C12	610612	7353100						✓
41	C13	610156	7352282						✓
42	C14	606580	7350889						✓
43	C15	605496	7350889						✓

<sup>a</sup> Start points with prefix W = start point (west) of each site's weed monitoring plot transects (WXX\_01, WXX\_02 and WXX\_03 corresponds to transect 1, 2 and 3), R = start point (south-west) of 2 ha European rabbit monitoring plot, P = start point (west) of each site's feral pig monitoring plot transects (PXX\_01, PXX\_02 and PXX\_03 corresponds to transect 1, 2 and 3), C = fauna camera station. Start points for weed monitoring and European rabbit monitoring plots are the same for sites 01 – 10, with sites 11 – 20 only corresponding to weed monitoring plots.



## APPENDIX B PROJECT SITE – YEAR 3 HABITAT CONDITION ASSESSMENT

The following tables provide details of the habitat condition assessments undertaken during the Year 3 monitoring period at the Project site (Meteor Downs South). Habitat condition scores were calculated in accordance with the *Guide to Determining Terrestrial Habitat Quality version 1.2* (DEHP, 2017). The data required to inform the site condition, fauna species habitat index scores and flora species stocking rates were collected as part of detailed field surveys in December 2019. The site context score was calculated based on a desktop assessment following the method prescribed in the *Guide to Determining Terrestrial Habitat Quality version 1.2* (DEHP, 2017), incorporating ground-truthed regional ecosystem mapping within the extent of ML70452.

**Table B-1: Site condition raw data for each RE assessment unit**

Ecological condition indicators	Site 01 RE 11.8.5			Site 02 RE 11.8.11			Site 03 RE 11.8.5			Site 04 RE 11.8.11			Site 05 RE 11.8.5			Site 06 RE 11.8.11			Site 07 RE 11.4.3			Site 08 RE 11.8.11			Site 09 RE 11.3.3a			Site 10 RE 11.8.5		
	Raw data	Benchmark (11.8.5)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.5)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.5)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.4.3)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.3.3)	Score	Raw data	Benchmark (11.8.5)	Score
Recruitment of woody perennial species	100	100	5	-	-	-	100	100	5	-	-	-	100	100	5	-	-	-	100	100	5	-	-	-	100	100	5	100	100	5
Native plant species richness - trees	3	2	5	-	-	-	4	2	5	-	-	-	1	2	3	-	-	-	9	2	5	-	-	-	2	3	3	2	2	5
Native plant species richness - shrubs	4	3	5	-	-	-	2	3	3	-	-	-	1	3	3	-	-	-	8	10	3	-	-	-	4	5	3	5	3	5
Native plant species richness - grasses	4	6	3	7	5	5	7	6	5	6	5	5	2	6	3	4	5	3	4	4	5	3	5	3	3	12	3	5	6	3
Native plant species richness - forbs	2	16	2.5	3	10	3	2	16	2.5	1	10	2.5	6	16	3	4	10	3	6	13	3	5	10	3	3	15	2.5	6	16	3
Tree canopy height	16.2	15	5	-	-	-	18.8	15	5	-	-	-	13.03	15	2.5	-	-	-	10.43	24	3	-	-	-	8.93	18	1.5	10.23	15	4
Tree sub canopy height	4.5	5		-	-		6.67	5		-	-		0	5		-	-					-	-	-	0	10		5.1	5	
Tree canopy cover	4	13	1	-	-	-	11.7	13	5	-	-	-	0	13	0	-	-	-	28.6	70	2	-	-	-	10.8	28	1	4.6	13	1
Tree sub canopy cover	0	4		-	-		3.1	4		-	-		0	4		-	-					-	-	-	0	5		0	4	
Shrub canopy cover	0.9	3	3	-	-	-	0.2	3	0	-	-	-	0.4	3	3	-	-	-	5.85	48	3	-	-	-	0	4	0	1.1	3	3
Native perennial grass cover	26	60	1	53.6	30	5	30	60	3	46	30	5	2	60	0	2.8	30	0	7.4	6	5	3	30	1	11	45	1	2	60	0
Organic litter	27	25	5	18	49	3	53.2	25	3	24	49	3	80.2	25	3	45.2	49	5	45	75	5	74	49	5	72	30	3	82	25	3
Large eucalypt trees	6	6	10	-	-	-	14	6	15	-	-	-	2	6	5	-	-	-	0	0	5	-	-	-	0	10	15	12	6	15
Large non-eucalypt trees	0	0		-	-		0	0		-	-		0	0		-	-		2	80		-	-	-	44	0		0	0	
Coarse woody debris	170	250	5	-	-	-	603	250	2	-	-	-	102	250	2	-	-	-	640	1752	2	-	-	-	0	285	0	169	250	5
Non-native plant cover	0.5	0	10	5.5	0	5	0.1	0	10	4.75	0	10	1.25	0	10	3.5	0	10	1.45	0	10	4	0	10	3.1	0	10	1.5	0	10
Total			60.5			21			63.5			25.5			42.5			21			56			22			48			62
/10			7.56			7.00			7.94			8.50			5.31			7.00			7.00			7.33			6.00			7.75

**Table B-2: Summary of the site condition, site context and fauna species habitat index scores used to calculate the habitat condition score for each RE assessment unit**

	Site 01	Site 02	Site 03	Site 04	Site 05	Site 06	Site 07	Site 08	Site 09	Site 10
	11.8.5	11.8.11	11.8.5	11.8.11	11.8.5	11.8.11	11.4.3	11.8.11	11.3.3a	11.8.5
MNES values	Squatter pigeon	Natural Grasslands TEC, King blue-grass, Bluegrass	Squatter pigeon	Natural Grasslands TEC, King blue-grass, Bluegrass	Squatter pigeon	Natural Grasslands TEC, King blue-grass, Bluegrass	Brigalow TEC	Natural Grasslands TEC, King blue-grass, Bluegrass	Australian painted snipe	Squatter pigeon
<b>Site condition</b>										
Recruitment of woody perennial species	5	-	5	-	5	-	5	-	5	5
Native plant species richness - trees	5	-	5	-	3	-	5	-	3	5
Native plant species richness - shrubs	5	-	3	-	3	-	3	-	3	5
Native plant species richness - grasses	3	5	5	5	3	3	5	3	3	3
Native plant species richness - forbs	2.5	3	2.5	2.5	3	3	3	3	2.5	3
Tree canopy height	5	-	5	-	2.5	-	3	-	1.5	4
Tree canopy cover	1	-	5	-	0	-	2	-	1	1
Shrub canopy cover	3	-	0	-	3	-	3	-	0	3
Native perennial grass cover	1	5	3	5	0	0	5	1	1	0
Organic litter	5	3	3	3	3	5	5	5	3	3
Large trees	10	-	15	-	5	-	5	-	15	15
Coarse woody debris	5	-	2	-	2	-	2	-	0	5
Non-native plant cover	10	5	10	10	10	10	10	10	10	10
Total of BioCondition attributes	60.5	21	63.5	25.5	42.5	21	56	22	48	62
MAX ecological condition score	80	30	80	30	80	30	80	30	80	80
<b>Score /10</b>	<b>7.56</b>	<b>7.00</b>	<b>7.94</b>	<b>8.50</b>	<b>5.31</b>	<b>7.00</b>	<b>7.00</b>	<b>7.33</b>	<b>6.00</b>	<b>7.75</b>
<b>Site context</b>										
Size of patch (fragmented bioregions)	10	10	10	10	10	10	10	10	10	10
Connectivity (fragmented bioregions)	5	4	5	5	5	5	5	5	5	5
Context (fragmented bioregions)	5	4	5	5	5	4	5	4	5	5
Distance to permanent watering point (intact bioregions)	-	-	-	-	-	-	-	-	-	-
Ecological corridors	0	0	0	0	0	0	0	0	0	0
Total of site context attributes	20	18	20	20	20	19	20	19	20	20
MAX site condition score	26	26	26	26	26	26	26	26	26	26
<b>Score /10</b>	<b>7.69</b>	<b>6.92</b>	<b>7.69</b>	<b>7.69</b>	<b>7.69</b>	<b>7.31</b>	<b>7.69</b>	<b>7.31</b>	<b>7.69</b>	<b>7.69</b>
<b>Fauna species habitat index</b>										
Threats to species	7	-	7	-	7	-	-	-	1	7
Quality and availability of food and foraging habitat	5	-	5	-	5	-	-	-	5	5
Quality and availability of shelter	5	-	5	-	5	-	-	-	5	5
Species mobility capacity	10	-	10	-	10	-	-	-	1	10



	Site 01	Site 02	Site 03	Site 04	Site 05	Site 06	Site 07	Site 08	Site 09	Site 10
	11.8.5	11.8.11	11.8.5	11.8.11	11.8.5	11.8.11	11.4.3	11.8.11	11.3.3a	11.8.5
MNES values	Squatter pigeon	Natural Grasslands TEC, King blue-grass, Bluegrass	Squatter pigeon	Natural Grasslands TEC, King blue-grass, Bluegrass	Squatter pigeon	Natural Grasslands TEC, King blue-grass, Bluegrass	Brigalow TEC	Natural Grasslands TEC, King blue-grass, Bluegrass	Australian painted snipe	Squatter pigeon
Role of site location to species overall population in the state	3	-	3	-	3	-	-	-	4	3
Total of fauna species habitat index	30	-	30	-	30	-	-	-	16	30
MAX fauna habitat index score	50	-	50	-	50	-	-	-	50	50
<b>Score /10</b>	<b>6.00</b>	-	<b>6.00</b>	-	<b>6.00</b>	-	-	-	<b>3.20</b>	<b>6.00</b>

**Table B-3: Summary of the species stocking rate index for king blue-grass and bluegrass**

	Site 01	Site 02	Site 03	Site 04	Site 05	Site 06	Site 07	Site 08	Site 09	Site 10
Species stocking rate /3 <sup>a</sup>	11.8.5	11.8.11	11.8.5	11.8.11	11.8.5	11.8.11	11.4.3	11.8.11	11.3.3a	11.8.5
King blue-grass	-	0	-	0	-	0	-	0	-	-
Bluegrass	-	0	-	0	-	0	-	0	-	-

<sup>a</sup> species stocking rate contributes 20% toward the habitat condition score for the two MNES flora species, with the remaining 80% made up of site condition and site context.

**Table B-4: Summary of the MNES habitat condition score for each RE assessment unit**

Assessment unit habitat condition score /10	Site 01	Site 02	Site 03	Site 04	Site 05	Site 06	Site 07	Site 08	Site 09	Site 10	FINAL MNES habitat quality score
	11.8.5	11.8.11	11.8.5	11.8.11	11.8.5	11.8.11	11.4.3	11.8.11	11.3.3a	11.8.5	
Brigalow TEC	-	-	-	-	-	-	7.17	-	-	-	7.17
Natural Grasslands TEC	-	6.96	-	8.13	-	7.14	-	7.32	-	-	7.39
King blue-grass	-	5.57	-	6.50	-	5.71	-	5.86	-	-	5.91
Bluegrass	-	5.57	-	6.50	-	5.71	-	5.86	-	-	5.91
Squatter pigeon	7.08	-	7.28	-	5.93	-	-	-	-	7.18	6.87
Australian painted snipe	-	-	-	-	-	-	-	-	5.38	-	5.38

---

## **APPENDIX C    PROJECT SITE PHOTO MONITORING**



## SITE 01 – H01\_0M



Photo C-1 North



Photo C-2 East



Photo C-3 South



Photo C-4 West



Photo C-5 Ground



## SITE 01 – H01\_50M



Photo C-6 North

Photo C-7 East



Photo C-8 South

Photo C-9 West



Photo C-10 Ground



## SITE 02 – H02\_0 M



Photo C-11 North

Photo C-12 East



Photo C-13 South

Photo C-14 West

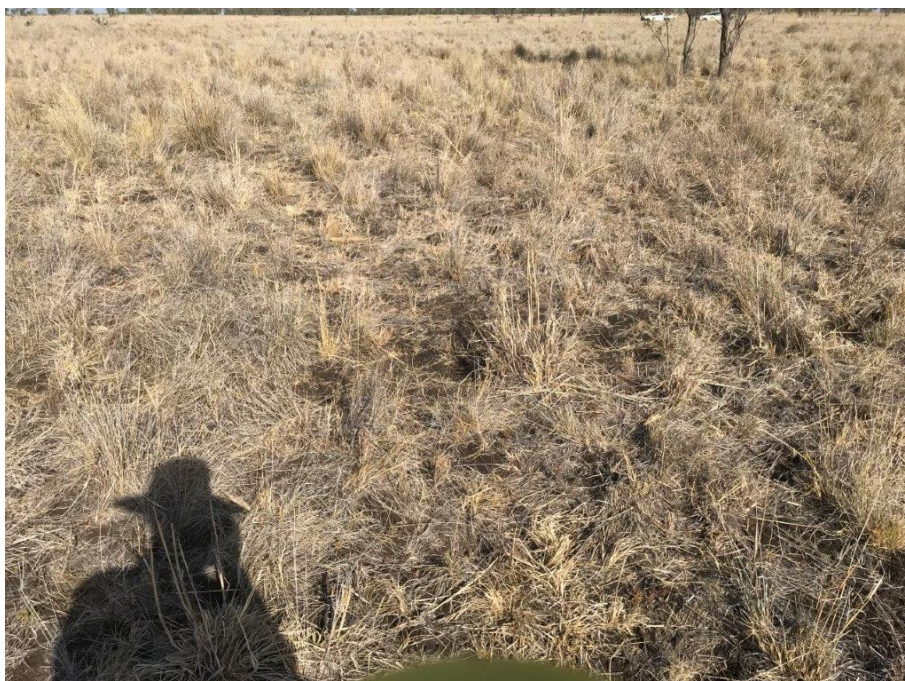


Photo C-15 Ground



## SITE 02 – H02\_50M



Photo C-16 North

Photo C-17 East



Photo C-18 South

Photo C-19 West



Photo C-20 Ground



## SITE 03 – H03\_0M



Photo C-21 North

Photo C-22 East



Photo C-23 South

Photo C-24 West



Photo C-25 Ground



## SITE 03 – H03\_50M



Photo C-26 North

Photo C-27 East



Photo C-28 South

Photo C-29 West



Photo C-30 Ground



## SITE 04 – H04\_OM



Photo C-31 North

Photo C-32 East



Photo C-33 South

Photo C-34 West



Photo C-35 Ground



## SITE 04 – H04\_50M



Photo C-36 North

Photo C-37 East



Photo C-38 South

Photo C-39 West



Photo C-40 Ground



## SITE 05 – H05\_0M



Photo C-41 North

Photo C-42 East



Photo C-43 South

Photo C-44 West



Photo C-45 Ground



## SITE 05 – H05\_50M



Photo C-46 North

Photo C-47 East



Photo C-48 South

Photo C-49 West



Photo C-50 Ground



## SITE 06 – H06\_0M



Photo C-51 North



Photo C-52 East



Photo C-53 South



Photo C-54 West



Photo C-55 Ground



## SITE 06 – H06\_50M



Photo C-56 North



Photo C-57 East



Photo C-58 South



Photo C-59 West



Photo C-60 Ground



## SITE 07 – H07\_0M



Photo C-61 North

Photo C-62 East



Photo C-63 South

Photo C-64 West



Photo C-65 Ground



## SITE 07 – H07\_50M



Photo C-66 North

Photo C-67 East



Photo C-68 South

Photo C-69 West



Photo C-70 Ground



## SITE 08 – H08\_0M



Photo C-71 North

Photo C-72 East



Photo C-73 South

Photo C-74 West



Photo C-75 Ground



## SITE 08 – H08\_50M



Photo C-76 North

Photo C-77 East



Photo C-78 South

Photo C-79 West



Photo C-80 Ground



## SITE 09 – H09\_0M



Photo C-81 North

Photo C-82 East



Photo C-83 South

Photo C-84 West



Photo C-85 Ground



## SITE 09 – H09\_50M



Photo C-86 North

Photo C-87 East



Photo C-88 South

Photo C-89 West



Photo C-90 Ground



## SITE 10 – H10\_0M



Photo C-91 North

Photo C-92 East



Photo C-93 South

Photo C-94 West



Photo C-95 Ground



## SITE 10 – H10\_50M



Photo C-96 North

Photo C-97 East



Photo C-98 South

Photo C-99 West



Photo C-100 Ground



## SITE 11 – W11



Photo C-101 North

Photo C-102 East



Photo C-103 South

Photo C-104 West

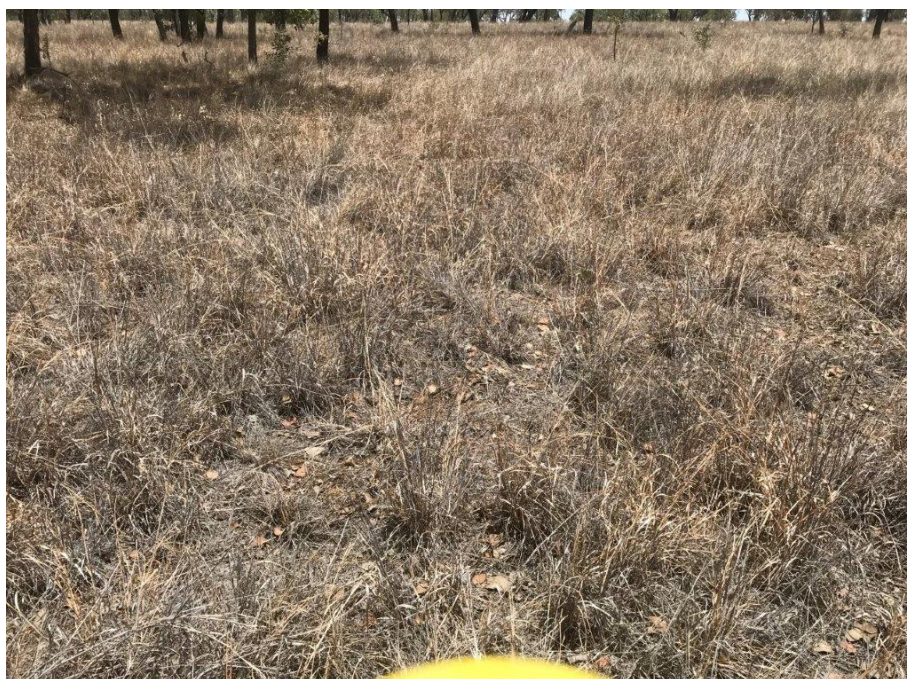


Photo C-105 Ground



## SITE 12 – W12



**Photo C-106 North**

**Photo C-107 East**



**Photo C-108 South**

**Photo C-109 West**



**Photo C-110 Ground**



## SITE 13 – W13



Photo C-111 North



Photo C-112 East



Photo C-113 South



Photo C-114 West



Photo C-115 Ground



## SITE 14 – W14



Photo C-116 North

Photo C-117 East



Photo C-118 South

Photo C-119 West



Photo C-120 Ground



## SITE 15 – W15



Photo C-121 North

Photo C-122 East



Photo C-123 South

Photo C-124 West



Photo C-125 Ground



## SITE 16 – W16



Photo C-126 North

Photo C-127 East



Photo C-128 South

Photo C-129 West



Photo C-130 Ground



## SITE 17 – W17



Photo C-131 North

Photo C-132 East



Photo C-133 South

Photo C-134 West



Photo C-135 Ground



## SITE 18 – W18



Photo C-136 North

Photo C-137 East



Photo C-138 South

Photo C-139 West



Photo C-140 Ground



## SITE 19 – W19



Photo C-141 North

Photo C-142 East



Photo C-143 South

Photo C-144 West

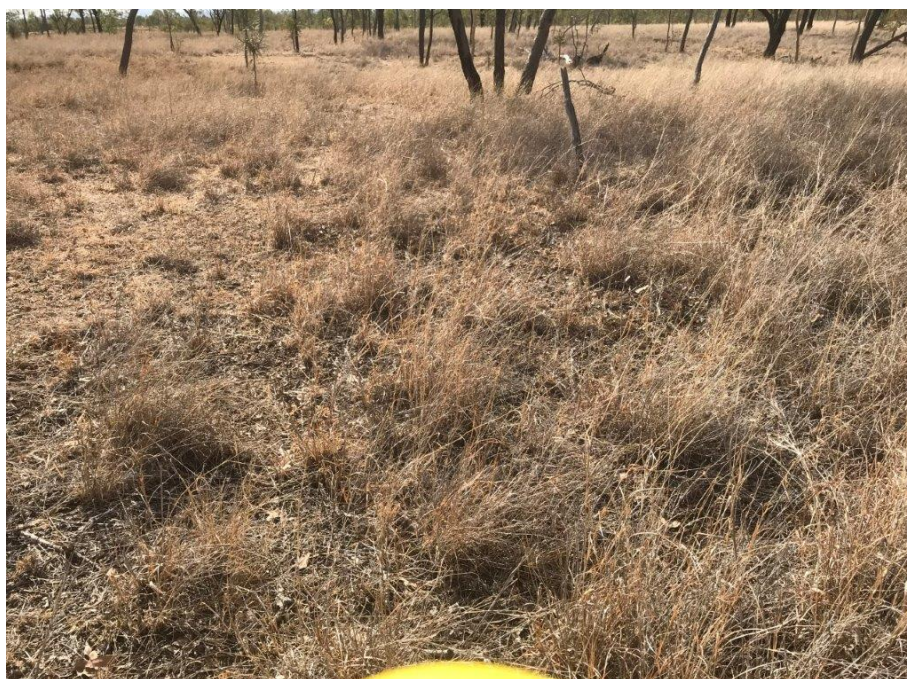


Photo C-145 Ground



## SITE 20 – W20



Photo C-146 North

Photo C-147 East



Photo C-148 South

Photo C-149 West



Photo C-150 Ground



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## APPENDIX D   OFFSET SITE PHOTO MONITORING

## SITE 01 – W01



Photo D-1 North

Photo D-2 East



Photo D-3 South

Photo D-4 West

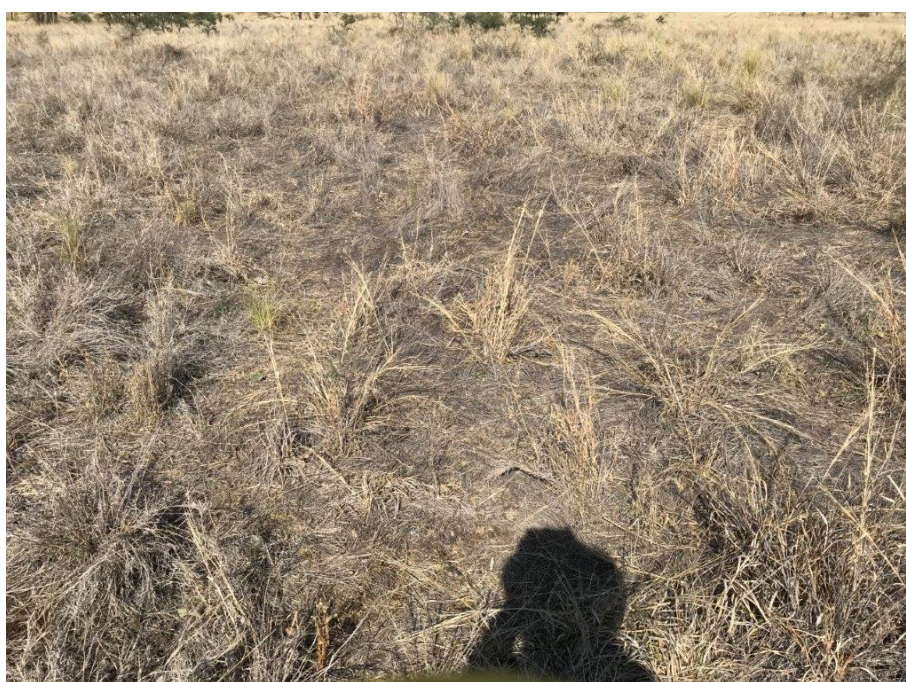


Photo D-5 Ground



## SITE 02 – W02



Photo D-6 North

Photo D-7 East



Photo D-8 South

Photo D-9 West



Photo D-10 Ground



## SITE 03 – W03



Photo D-11 North

Photo D-12 East



Photo D-13 South

Photo D-14 West



Photo D-15 Ground



## SITE 04 – W04



Photo D-16 North

Photo D-17 East



Photo D-18 South

Photo D-19 West



Photo D-20 Ground



## SITE 05 – W05



Photo D-21 North

Photo D-22 East



Photo D-23 South

Photo D-24 West

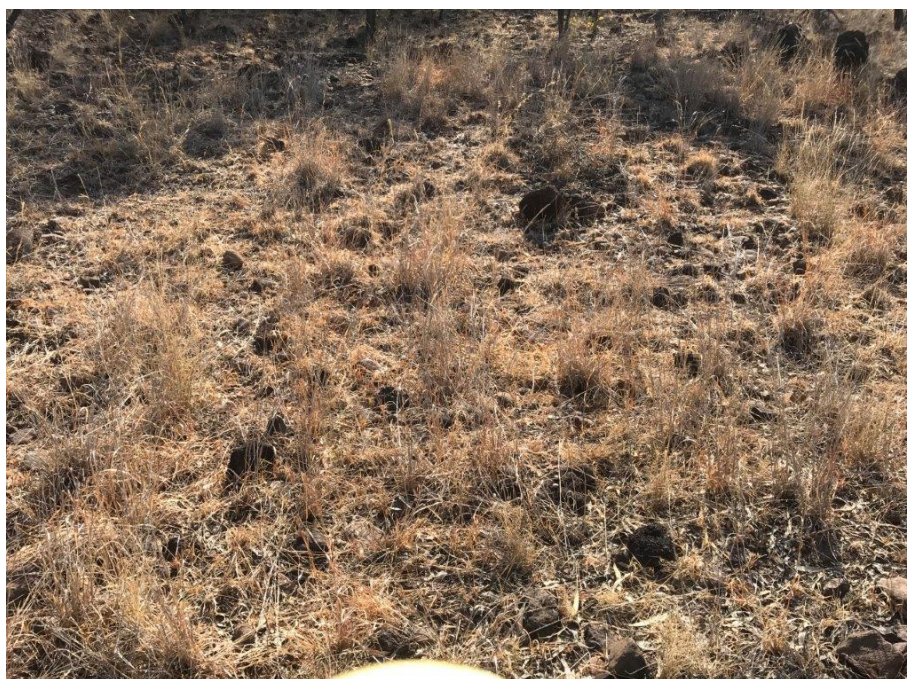


Photo D-25 Ground



## SITE 06 – W06



Photo D-26 North



Photo D-27 East



Photo D-28 South



Photo D-29 West



Photo D-30 Ground



## SITE 07 – W07



Photo D-31 North

Photo D-32 East



Photo D-33 South

Photo D-34 West



Photo D-35 Ground



## SITE 08 – W08



Photo D-36 North

Photo D-37 East



Photo D-38 South



Photo D-39 West



Photo D-40 Ground



## SITE 09 – W09



Photo D-41 North

Photo D-42 East



Photo D-43 South

Photo D-44 West



Photo D-45 Ground



## SITE 10 – W10



Photo D-46 North

Photo D-47 East



Photo D-48 South

Photo D-49 West



Photo D-50 Ground



## SITE 11 – W11



Photo D-51 North

Photo D-52 East



Photo D-53 South

Photo D-54 West



Photo D-55 Ground



## SITE 12 – W12



Photo D-56 North

Photo D-57 East



Photo D-58 South

Photo D-59 West

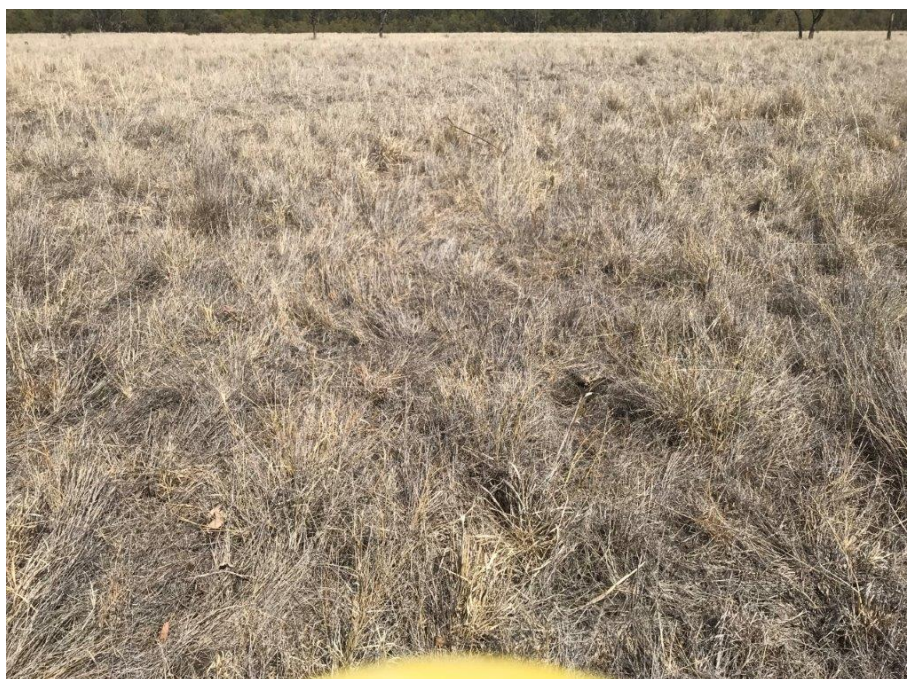


Photo D-60 Ground



## SITE 13 – W13



Photo D-61 North

Photo D-62 East



Photo D-63 South

Photo D-64 West



Photo D-65 Ground



## SITE 14 – W14



Photo D-66 North

Photo D-67 East



Photo D-68 South

Photo D-69 West



Photo D-70 Ground



## SITE 15 – W15



Photo D-71 North

Photo D-72 East



Photo D-73 South

Photo D-74 West



Photo D-75 Ground



## SITE 16 – W16



Photo D-76 North

Photo D-77 East



Photo D-78 South

Photo D-79 West



Photo D-80 Ground



## SITE 17 – W17



Photo D-81 North

Photo D-82 East



Photo D-83 South

Photo D-84 West



Photo D-85 Ground



## SITE 18 – W18



Photo D-86 North

Photo D-87 East



Photo D-88 South

Photo D-89 West

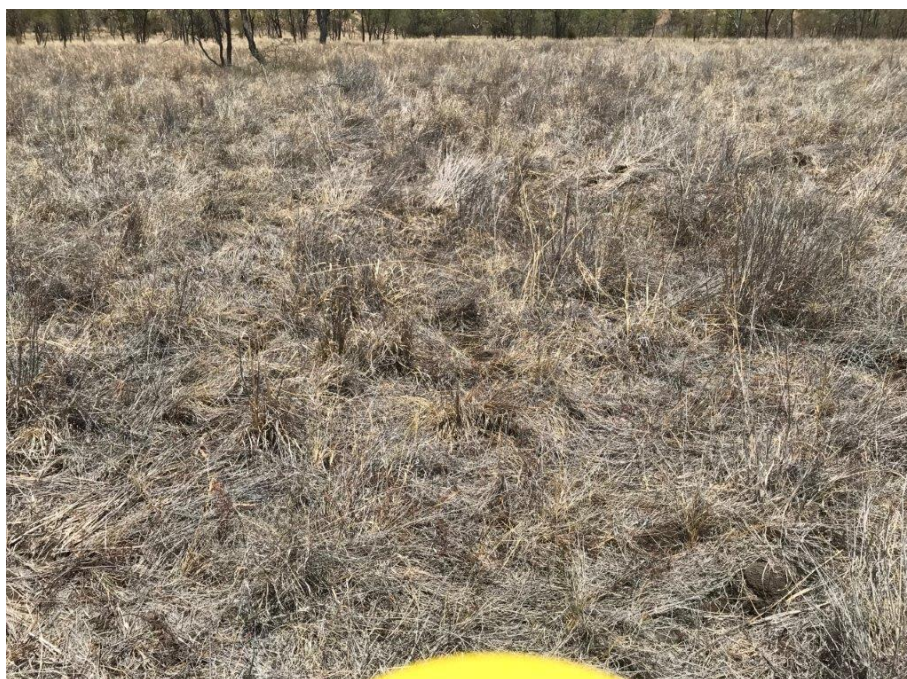


Photo D-90 Ground



## SITE 19 – W19



Photo D-91 North

Photo D-92 East



Photo D-93 South

Photo D-94 West



Photo D-95 Ground



## SITE 20 – W20



**Photo D-96 North**

**Photo D-97 East**



**Photo D-98 South**

**Photo D-99 West**



**Photo D-100 Ground**



## **APPENDIX B POST-WET SEASON MONITORING REPORT – YEAR 3 (2019/20) – CO2 AUSTRALIA 2020B**

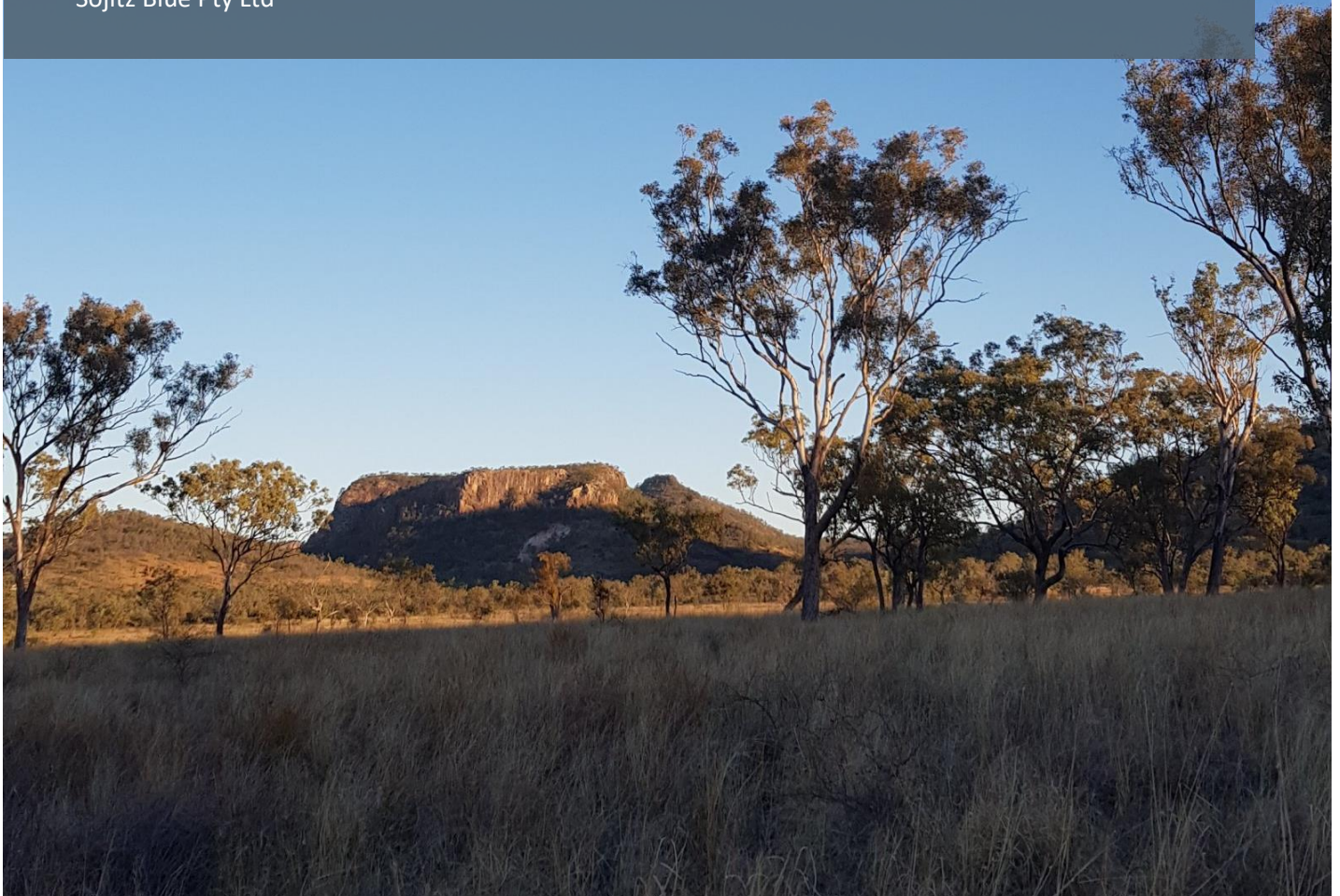


# Post-wet Season Monitoring Report – Year 3 (2019/20)

- *MDS Project site*
- *MDS Rail Loop site*
- *Lexington offset site*
- *Lexington Rail Loop offset site*

## Meteor Downs South Coal Mine Project

Sojitz Blue Pty Ltd





Rev	Date	Description
0	17 July 2020	First draft issued to client
1	18 August 2020	Final issued to client

	Name	Position	Date
<b>ORIGINATORS</b>	Dr Jarrad Cousin	Senior Ecologist	17 July 2020
<b>APPROVER</b>	Christopher Ewing	Head of Ecosystem Markets and Innovation	17 July 2020

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# 1 INTRODUCTION

U&D Mining Industry (Australia) Pty (U&D) has approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to develop and operate the Meteor Downs South (MDS) Coal Mine Project (the MDS Project) (Figure 1). U&D is in a joint venture with Sojitz Blue Pty Ltd (Sojitz Blue) to develop and operate the MDS Project.

Under the Project EPBC Act approval (EPBC 2013/6779), the MDS Project has prepared the following documents:

- ▶ Matters of National Environmental Significance Management Plan (MNESMP)
  - to address EPBC 2013/6779 conditions 2, 3 and 4 with respect to the direct and indirect impacts of the MDS Project on matters of national environmental significance (MNES) at the MDS Project site
- ▶ Offset Management Plan (OMP)
  - to address EPBC 2013/6779 conditions 5 and 6 with respect to environmental offsets at the Lexington offset site (Figure 1) for significant residual impacts of the MDS Project on MNES and matters of state environmental significance (MSES)

The MNESMP and OMP outline annual biodiversity monitoring requirements at each site, as summarised in Table 1. The baseline (Year 1) management periods for the MDS Project site and the Lexington offset site are considered to be June 2017 – June 2018 (Project site) and October 2017 – October 2018 (Lexington offset site).

The current report is the Year 3 (2019/2020) post-wet season monitoring report for both the MDS Project site and the Lexington offset site.

**Table 1: Summary of MDS Project and offset site biodiversity monitoring requirements.**

Site	Monitoring activity	Management plan	Frequency	Timing
MDS Project site	Habitat condition assessment	MNESMP Section 13.3	Annually	Dry season
	Photo monitoring	MNESMP Section 13.4	Annually	
	Targeted surveys for king blue-grass and bluegrass	MNESMP Section 13.5	Annually	End of the wet season and/or when most detectable
	Habitat availability assessment for Australian painted snipe	MNESMP Section 13.6	Every 2 years	Wet season or following inundation event
	Pest animal monitoring	MNESMP Section 13.7	Every 2 years	Dry season and post-wet season
	Weed monitoring	MNESMP Section 13.8	Every 2 years	
Lexington offset site	General offset site monitoring	OMP Section 7.1	Annual	Post-wet season
	Habitat condition assessment and photo monitoring	OMP Section 7.2	Every 2 years for first 10 years and then every 5 years thereafter until 31 October 2037	Post-wet season
	Weed monitoring	OMP Section 7.4	Every 2 years	Dry season and post-wet season



Site	Monitoring activity	Management plan	Frequency	Timing
	Pest animal monitoring	OMP Section 7.5	Every 2 years (dry season and post wet season surveys)	Dry season and post-wet season
	Biomass monitoring	OMP Section 7.6	Annually	Post wet season prior to and during grazing events

In December 2019, Sojitz Blue received approval under the EPBC Act to develop and operate the Meteor Downs South Mine Rail Loop (MDS Rail Loop). Under the Project EPBC Act approval (EPBC 2019/8482), Sojitz Blue has prepared the following documents:

- ▶ Matters of National Environmental Significance Management Plan (Rail Loop MNESMP)
  - to address EPBC 2019/8482 condition 6 with respect to the direct and indirect impacts of the MDS Rail Loop project on matters of national environmental significance (MNES) at the MDS Rail Loop site
- ▶ Offset Management Plan (OMP)
  - to address EPBC 2019/8482 conditions 2, 3, 4 and 5 with respect to environmental offsets at the Lexington Rail Loop offset site (Figure 1) for significant residual impacts of the MDS Rail Loop on MNES.

The Rail Loop MNESMP and OMP outline annual biodiversity monitoring requirements at each site, as summarised in Table 2. This report incorporates the Year 1 (2019/2020) post-wet season monitoring report for both the MDS Rail Loop and the corresponding Lexington offset site, including the establishment of monitoring sites at each.

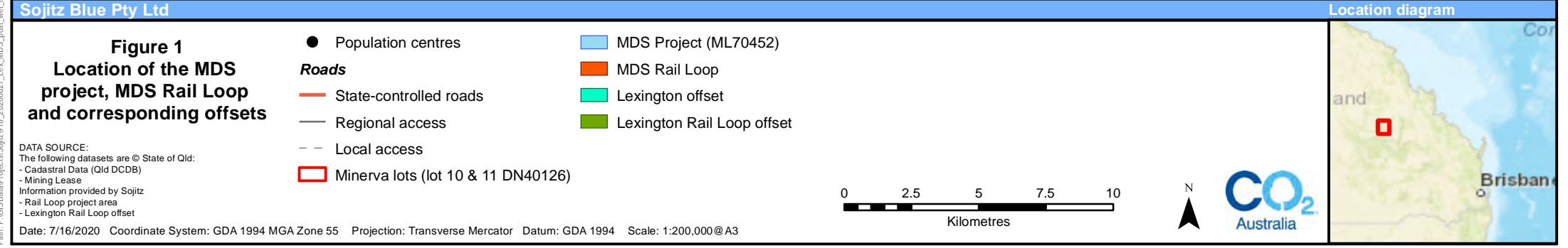
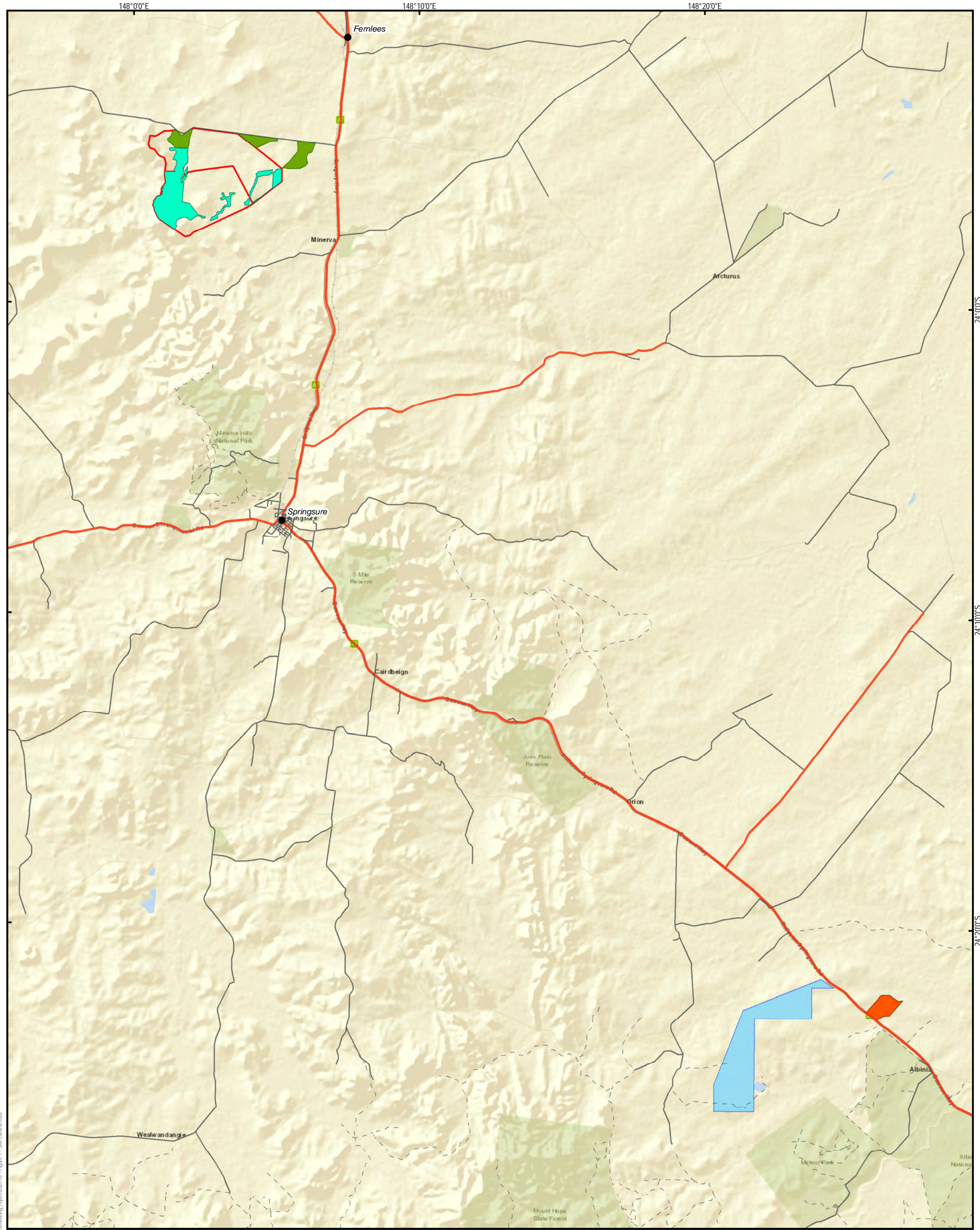
**Table 2: Summary of MDS Project Rail Loop and Lexington Rail Loop offset biodiversity monitoring requirements.**

Site	Monitoring activity	Management plan	Frequency	Timing
MDS Rail Loop site	General site inspection	Rail Loop MNESMP Section 7.2	Biannually	End of the dry season and end of the wet season
	Habitat quality assessments and photo monitoring	Rail Loop MNESMP Section 7.3	Annually	Post-wet season
	Targeted surveys for king blue-grass	Rail Loop MNESMP Section 7.4	Annually	
	Weed monitoring	Rail Loop MNESMP Section 7.5	Biannually within habitat quality assessment plots Every 2 years at each of the weed monitoring plots	End of the dry season and post-wet season
	Biomass monitoring for fire management	Rail Loop MNESMP Section 7.6	Biannually	End of the dry season and end of the wet season
	General offset site monitoring	OMP Section 7.1	Annually	Post-wet season



Site	Monitoring activity	Management plan	Frequency	Timing
Lexington Rail Loop offset site	Habitat condition assessment and photo monitoring	OMP Section 7.2	Every 2 years for first 10 years and then every 5 years thereafter until 31 October 2039	Post-wet season
	King blue-grass surveys	OMP Section 7.3	Every 5 years from baseline (2019)	End of the wet season and/or when most detectable
	Weed monitoring	OMP Section 7.4	Baseline in 2020 (Year 1), then every 2 years	Dry season and post-wet season
	Biomass monitoring	OMP Section 7.6	Annually	Post wet season prior to and during grazing events







## 2 METHODOLOGY

Field surveys were undertaken by two tertiary-qualified ecologists (Dr Jarrad Cousin and peter lack) between 16 – 29 June 2020. Permanent monitoring sites were established at each site for the MDS Project and Lexington offset site as part of the baseline surveys carried out between December 2017 and April 2018, detailed in the following:

- ▶ *MNESMP Baseline Monitoring Report – Meteor Downs South Coal Mine Project*. A report prepared by CO2 Australia in 2017 (CO2 Australia 2017) – baseline monitoring sites established in December 2017
- ▶ *Lexington Offset Area Initial Baseline Monitoring Report – Meteor Downs South*. A report prepared by CO2 Australia in 2018 (CO2 Australia 2018) – baseline monitoring sites established in April 2018.

Permanent monitoring sites for the MDS Rail Loop and the Lexington Rail Loop offset were established as part of Year 1 surveys carried out during the current post-wet season field surveys (June/July 2020), and are detailed herein.

### 2.1 MONITORING LOCATIONS

#### 2.1.1 MDS Project site

Post-wet season monitoring activities at the MDS Project site comprised:

- ▶ General site inspection
- ▶ Habitat availability assessment for Australian painted snipe
- ▶ Targeted squatter pigeon surveys
- ▶ Targeted king blue-grass and bluegrass surveys
- ▶ Biomass monitoring
- ▶ Photo monitoring
- ▶ Weed monitoring
- ▶ Pest animal monitoring.

Table 3 shows activities at each monitoring location at the MDS Project site. A total of 43 permanent sites/plots were monitored across the balance of ML70452 outside of the MDS project (refer to Figure 2 and Figure 3). Permanent monitoring sites comprised a mix of nested and non-nested sites (Table 3), according to the following:

- ▶ 10 x habitat monitoring sites (100 m x 50 m)
  - collocated with weed and rabbit monitoring plots (Sites 01 – 10)
- ▶ 30 x photo monitoring sites
  - established at 0 m and 50 m points along 100 m habitat monitoring transect (Sites 01 – 10) and at SW corner of weed monitoring plots (Sites 11 – 20)
- ▶ 20 x weed monitoring plots (1 ha)
  - partly collocated with weed and rabbit monitoring plots (Sites 01 – 10), with remaining 10 sites (Sites 11 – 20) standalone weed monitoring plots
- ▶ 10 x rabbit monitoring plots (2 ha)
  - collocated with habitat monitoring sites and weed monitoring plots (Sites R01 – R10)
- ▶ 8 x pig monitoring plots (15 ha) (Sites P01 – P08)



- ▶ 15 x pest animal fauna camera stations (Sites C01 – C15)
  - Located throughout the site adjacent existing access tracks

At each of the 10 habitat monitoring sites (Sites 01 – 10), a 1.8 m capped galvanised star picket is installed at the start (0 m) and central (50 m) points of the 100 m transect. At each of the standalone weed monitoring plots (Sites 11 – 20), a single 1.8 m capped galvanised star picket is installed at the SW corner of the plot. GPS locations are recorded for each of the sites in GDA94, Zone 55 projection.

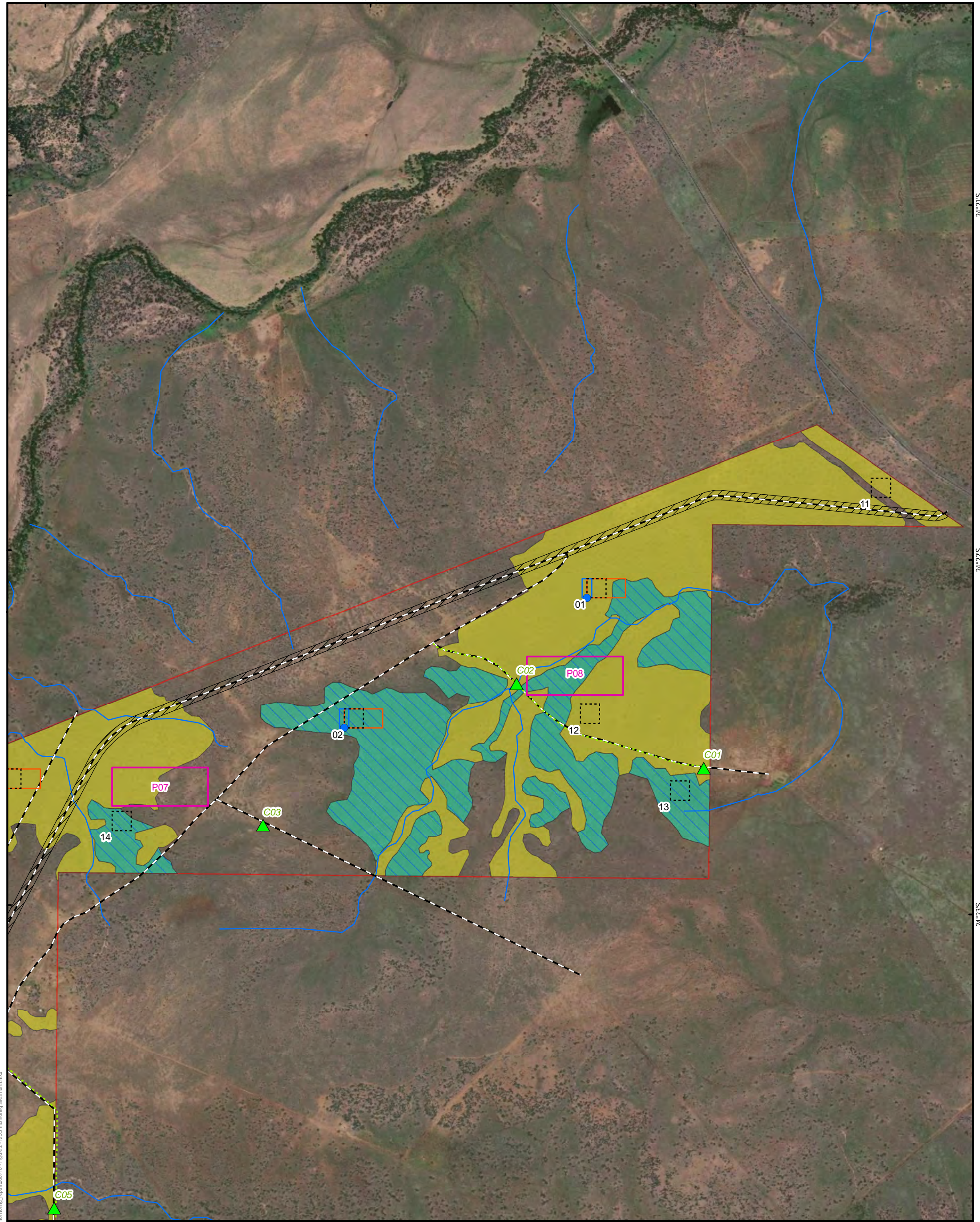
Refer to Table A-1 in Appendix A for detailed locations of each of the monitoring sites at the MDS Project site.

**Table 3: Monitoring locations at the MDS Project site, surveyed as part of the 2019/20 post-wet season surveys.**

Site	King blue-grass and bluegrass	Australian painted snipe	Biomass monitoring	Photo monitoring	Weed monitoring	Pest animal monitoring		
						Rabbit plot	Feral pig plot	Camera trap
01 - 10			✓	✓	✓	✓		
11 – 20			✓	✓	✓			
P01 – P08							✓	
T01 – T20								✓
Established transects	✓							
Narooma Dam		✓						



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Sojitz Blue Pty Ltd - MDS Project

Location diagram

### Figure 2 MDS Project monitoring sites - north

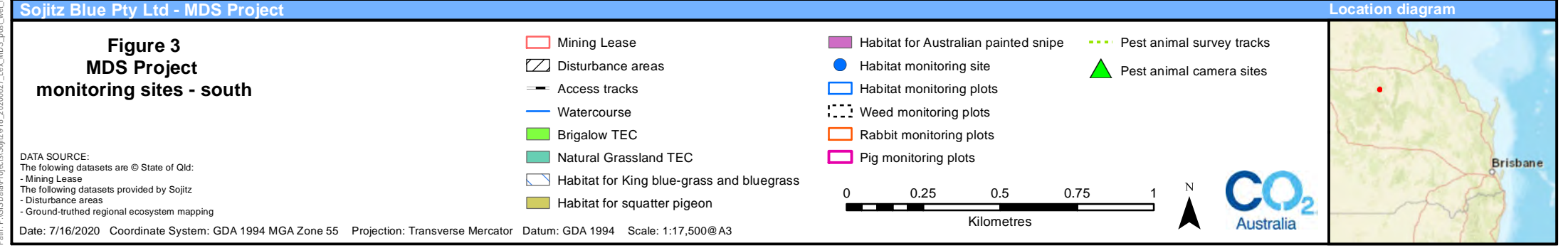
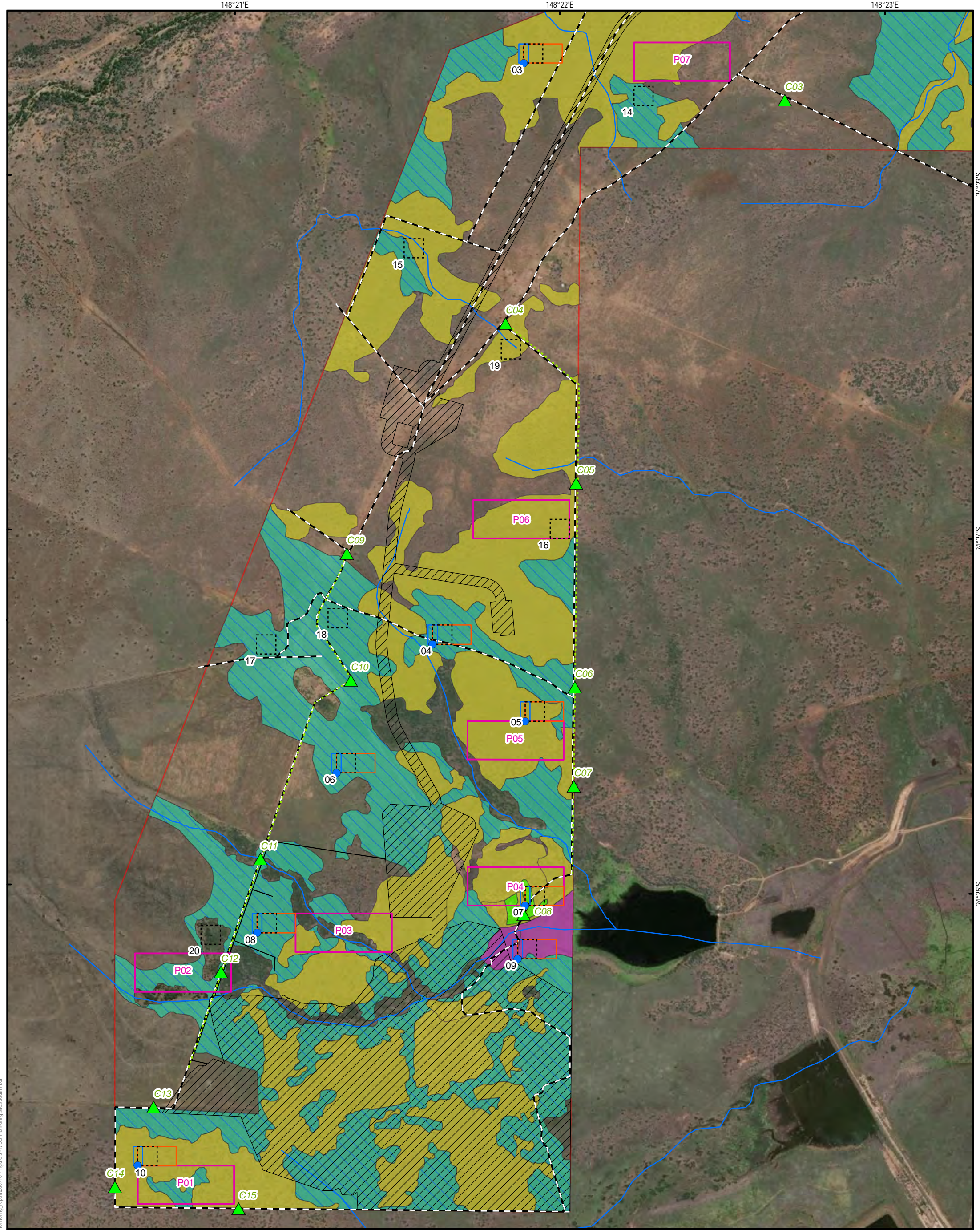
**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:17,500@A3

Mining Lease	Disturbance areas	Habitat for Australian painted snipe	Pest animal survey tracks
Access tracks	Watercourse	Habitat monitoring site	Pest animal camera sites
Brigalow TEC	Natural Grassland TEC	Habitat monitoring plots	
Habitat for King blue-grass and bluegrass	Habitat for squatter pigeon	Weed monitoring plots	
		Rabbit monitoring plots	
		Pig monitoring plots	

0 0.25 0.5 0.75 1  
Kilometres







### 2.1.2 MDS Rail Loop site

Post-wet season monitoring activities at the MDS Rail Loop site comprised establishment and monitoring of the following:

- ▶ General offset site monitoring
- ▶ Habitat quality assessments (including assessment of Natural Grassland thresholds)
- ▶ Weed monitoring
- ▶ Photo monitoring
- ▶ Targeted king blue-grass surveys
- ▶ Biomass monitoring

Table 3 shows activities at each monitoring location established at the MDS Rail Loop site. A total of five permanent monitoring sites/plots are monitored (refer to Figure 4). While the Rail Loop MNESMP (SLR 2019a) stipulated one of the weed monitoring plots to be established in the *Leucaena* plantation, consultation with Sojitz Blue indicated the safety issues related to monitoring sites within the centre of the rail loop requiring crossing of the rail line. Instead, all plots were established on the outside of the rail loop (refer to Figure 4). Permanent monitoring sites comprised a mix of nested and non-nested sites (Table 4), according to the following:

- ▶ 4 x habitat quality assessment sites (50 m x 10 m)
  - collocated with weed monitoring plots, grassland assessment sites and king blue-grass survey sites (Sites MDSRL01 – MDSRL04)
- ▶ 4 x Natural Grasslands TEC monitoring sites (50 m x 20 m)
  - collocated with habitat quality assessment sites, assessing Natural Grassland indicators (Sites MDSRL01 – MDSRL04)
- ▶ 4 x targeted King blue-grass surveys (50m x 10m)
  - collocated with habitat quality assessment plots and grassland assessment sites (Sites MDSRL01 – MDSRL04)
- ▶ 9 x photo monitoring sites
  - established at 0 m and 50 m points along 50 m habitat monitoring transect (Sites MDSRL01 – MDSRL04) and at SW corner of standalone weed monitoring plot (Site MDSRL05)
- ▶ 5 x weed monitoring plots (1 ha)
  - collocated with the habitat monitoring sites (Sites MDSRL01 – MDSRL 04), with a single standalone weed monitoring plot (Site MDSRL05)
- ▶ 4 x biomass monitoring sites
  - assessed from the 50 m point of the habitat monitoring transect at each of the four habitat monitoring sites (Sites MDSRL01 – MDSRL04),



**Table 4: Monitoring locations at the MDS Rail Loop site, surveyed as part of the 2019/20 post-wet season surveys.**

Site	Habitat quality assessment	Natural Grasslands TEC monitoring	King blue-grass surveys	Photo monitoring	Weed monitoring	Biomass monitoring
MDSRL01 – MDSRL04	✓	✓	✓	✓	✓	✓
MDSRL05				✓	✓	







### 2.1.3 Lexington offset site

Post-wet season monitoring activities at the offset site comprised:

- ▶ General offset site monitoring
- ▶ Photo monitoring
- ▶ Weed monitoring
- ▶ Biomass monitoring
- ▶ Pest animal monitoring

Table 5 shows activities at each monitoring location at the offset site. A total of 43 permanent monitoring sites/plots were monitored across the offset site. Permanent monitoring sites comprised a mix of nested and non-nested sites (Table 3), according to the following:

- ▶ 13 x habitat monitoring sites (100 m x 50 m)
  - collocated with weed and rabbit monitoring plots
- ▶ 33 x photo monitoring sites
  - 26 established at 0 m and 50 m points along 100 m habitat monitoring transect (Sites 01 – 13)
  - 7 at SW corner of standalone weed monitoring plots (Sites 14 – 20)
- ▶ 20 x weed monitoring plots (1 ha)
  - 13 sites collocated at all habitat monitoring sites (Sites 01 – 13),
  - 7 sites (Sites 14 – 20) standalone weed monitoring plots
- ▶ 10 x rabbit monitoring plots (2 ha)
  - collocated with 10 of the habitat monitoring sites (Sites 01-05, 07-08, 10-11 and 13) and weed monitoring plots
- ▶ 8 x pig monitoring plots (15 ha) (Sites P01 – P08)
- ▶ 15 x pest animal fauna camera stations (Sites C01 – C15)
  - fauna camera stations were established along pest animal survey tracks

At each of the 13 habitat monitoring sites (Sites 01 – 13), a 1.8 m capped galvanised star picket is installed at the start (0 m) and central (50 m) points of the 100 m transect. At each of the standalone weed monitoring plots (Sites 14 – 20), a single 1.8 m capped galvanised star picket is installed at the SW corner of the plot. GPS locations are recorded for each of the sites in GDA94, Zone 55 projection.

Refer to Table A-2 in Appendix A for detailed locations of each of the monitoring sites at the Lexington offset site.



**Table 5: Monitoring locations at the Lexington offset site, surveyed as part of the 2019/20 post-wet season surveys.**

Site	Biomass monitoring	Photo monitoring	Weed monitoring	Pest animal monitoring		
				Rabbit plot	Feral pig plot	Camera trap
01 – 20	✓	✓	✓			
R01 – R10				✓		
P01 – P08					✓	
T01 – T20						✓



148°10'E

148°20'E

148°30'E

23°55'0"S

23°56'0"S

23°57'0"S



ML70145

ML70376

P07

P06

C13

P05

08

C12

C09

06

17

04

18

19

16

C04

02

C02

03

C07

15

P03

C05

14

C06

C01

01

07

C10

P04

C11

10

C03

P02

C02

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C02

01

C01

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Sojitz Blue Pty Ltd - Lexington offset

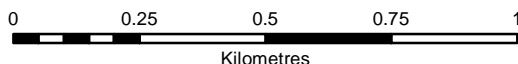
Location diagram

**Figure 5**  
**Lexington offset**  
**monitoring sites - west**

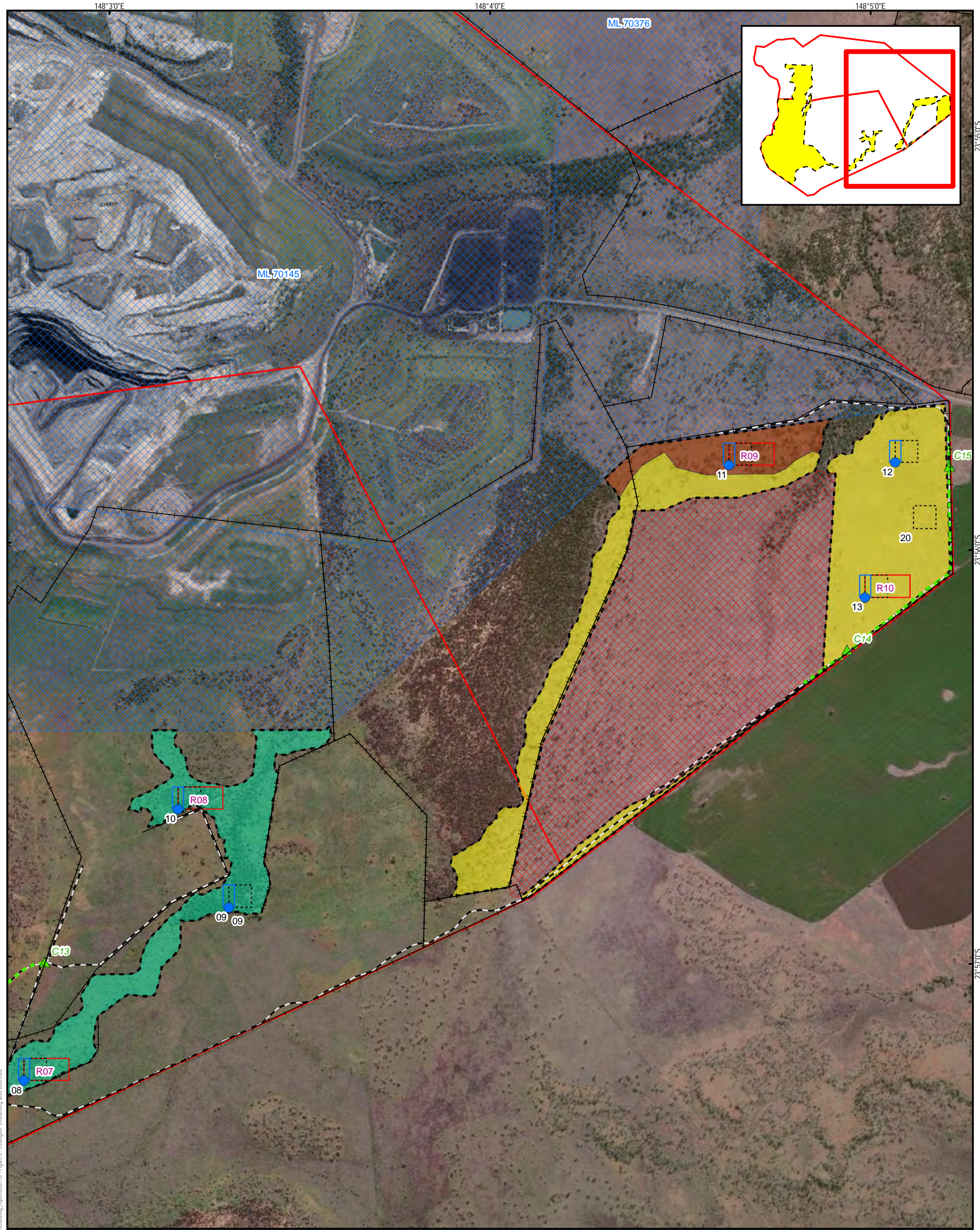
- |  |                                |                           |                         |
|--|--------------------------------|---------------------------|-------------------------|
| Minerva lots (lot 10 & 11 DN40126)     | Regional ecosystem RE 11.8.11  | Pest animal camera site   | Rabbit monitoring plots |
| Existing offset area (Category A area) | Regional ecosystem RE 11.8.11a | Pest animal survey tracks | Pig monitoring plots    |
| Mining leases (ML70376 and ML70145)    | Regional ecosystem RE 11.8.4   | Habitat monitoring sites  |                         |
| Offset area                            | Regional ecosystem RE 11.8.5   | Habitat monitoring plot   |                         |
| Access tracks                          |                                | Weed monitoring plots     |                         |
| Lexington existing fences              |                                |                           |                         |

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data  
- Mining Lease  
- Existing offset area

Date: 7/16/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:15,000@A3







**Figure 6**  
**Lexington offset**  
**monitoring sites - east**

Minerva lots (lot 10 & 11 DN40126)

Existing offset area (Category A area)

Mining leases (ML70376 and ML70145)

Offset area

Access tracks

Lexington existing fences

Regional ecosystem

RE 11.8.11

RE 11.8.11a

RE 11.8.4

RE 11.8.5

Pest animal camera site

Pest animal survey tracks

Habitat monitoring sites

Habitat monitoring plot

Weed monitoring plots

Rabbit monitoring plots

Pig monitoring plots

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CO<sub>2</sub>

Australia

and

Brisbane

Path: P:\GISData\Projects\Sojitz\18\_20200627\_Lex\_MDS\_pos\_vel\_monitoring\_report\200710 - Figure 6 - Lexington monitoring sites east.mxd  
© CO2 Australia. All Rights Reserved 2020. CO2 Australia gives no warranty about information recorded in this map and accepts no liability to any user for any loss, damage or costs (including consequential damage) relating to any use of this map, except as otherwise agreed between CO2 Australia and a user.



### 2.1.4 Lexington Rail Loop offset site

Post-wet season monitoring activities at the Lexington Rail Loop offset site comprised establishment and monitoring of the following:

- ▶ General offset site monitoring
- ▶ Habitat condition assessments
- ▶ Weed monitoring
- ▶ Photo monitoring
- ▶ Biomass monitoring

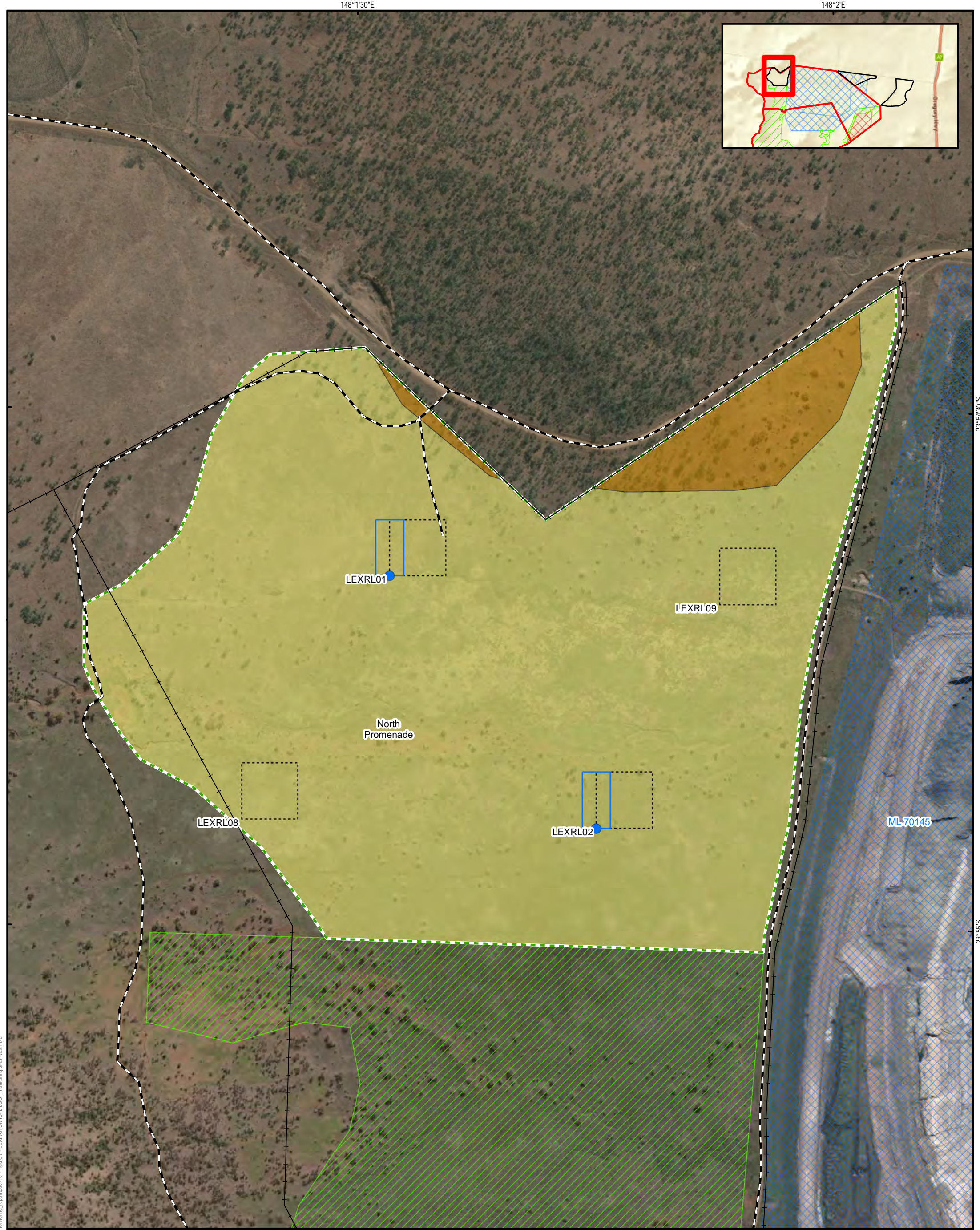
Table 6 shows activities at each monitoring location established at the Lexington Rail Loop offset site; divided into three ‘paddocks’ across the north of Lexington – ‘North Promenade’, ‘Harry’s’ and ‘Contours’. A total of 12 permanent monitoring sites/plots are monitored across the three paddocks (refer to Figure 7 and Figure 8). Permanent monitoring sites comprised a mix of nested and non-nested sites (Table 3), according to the following:

- ▶ 7 x habitat monitoring sites (50 m x 10 m)
  - collocated with weed monitoring plots (Sites LEXRL01 – LEXRL07)
- ▶ 19 x photo monitoring sites
  - 14 established at 0 m and 50 m points along habitat monitoring transect (Sites LEXRL01 – LEXRL07)
  - 5 at SW corner of standalone weed monitoring plots (Sites LEXRL08 – LEXRL12)
- ▶ 12 x weed monitoring plots (1 ha)
  - collocated with the seven habitat monitoring sites (Sites LEXRL01 – LEXRL07)
  - five additional, standalone weed monitoring plots (Sites LEXRL08 – LEXRL12)

**Table 6: Monitoring locations at the Lexington Rail Loop offset site, surveyed as part of the 2019/20 post-wet season surveys.**

Site	Habitat monitoring	Photo monitoring	Weed monitoring	Biomass monitoring
<b>North Promenade paddock</b>				
LEXRL01 – LEXRL02	✓	✓	✓	✓
LEXRL08 – LEXRL09		✓	✓	✓
<b>Harry’s paddock</b>				
LEXRL03 – LEXRL04	✓	✓	✓	✓
LEXRL10		✓	✓	✓
<b>Contours paddock</b>				
LEXRL05 – LEXRL07	✓	✓	✓	✓
LEXRL11 – LEXRL12		✓	✓	✓





**Sojitz Blue Pty Ltd - Lexington Rail Loop offset**

**Figure 7**  
**Lexington Rail Loop offset**  
**monitoring sites - west**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining leases  
The following datasets provided by Sojitz  
- Lexington Rail Loop offset areas

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:6,000@A3

—+— Lexington existing fences  
— Access tracks  
**Lexington Rail Loop offset**  
— Lexington offset area  
— Existing offset area (Category A area)  
— Mining leases (ML70376 and ML70145)  
— North Promenade paddock  
**Observed vegetation**  
RE 11.8.11  
RE 11.8.5

● Habitat monitoring sites  
□ Habitat monitoring plots  
□ Weed monitoring plots

0 50 100 150 200  
Metres

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**CO<sub>2</sub>**  
Australia

**Location diagram**

Path: P:\GISData\Projects\Sojitz\18\_20200627\_Lex\_MDS\_pos\_veg\_monitoring\_report\0200710 - Figure 7 - LEXINGTON RAIL LOOP offset monitoring sites west.mxd



148°4'E

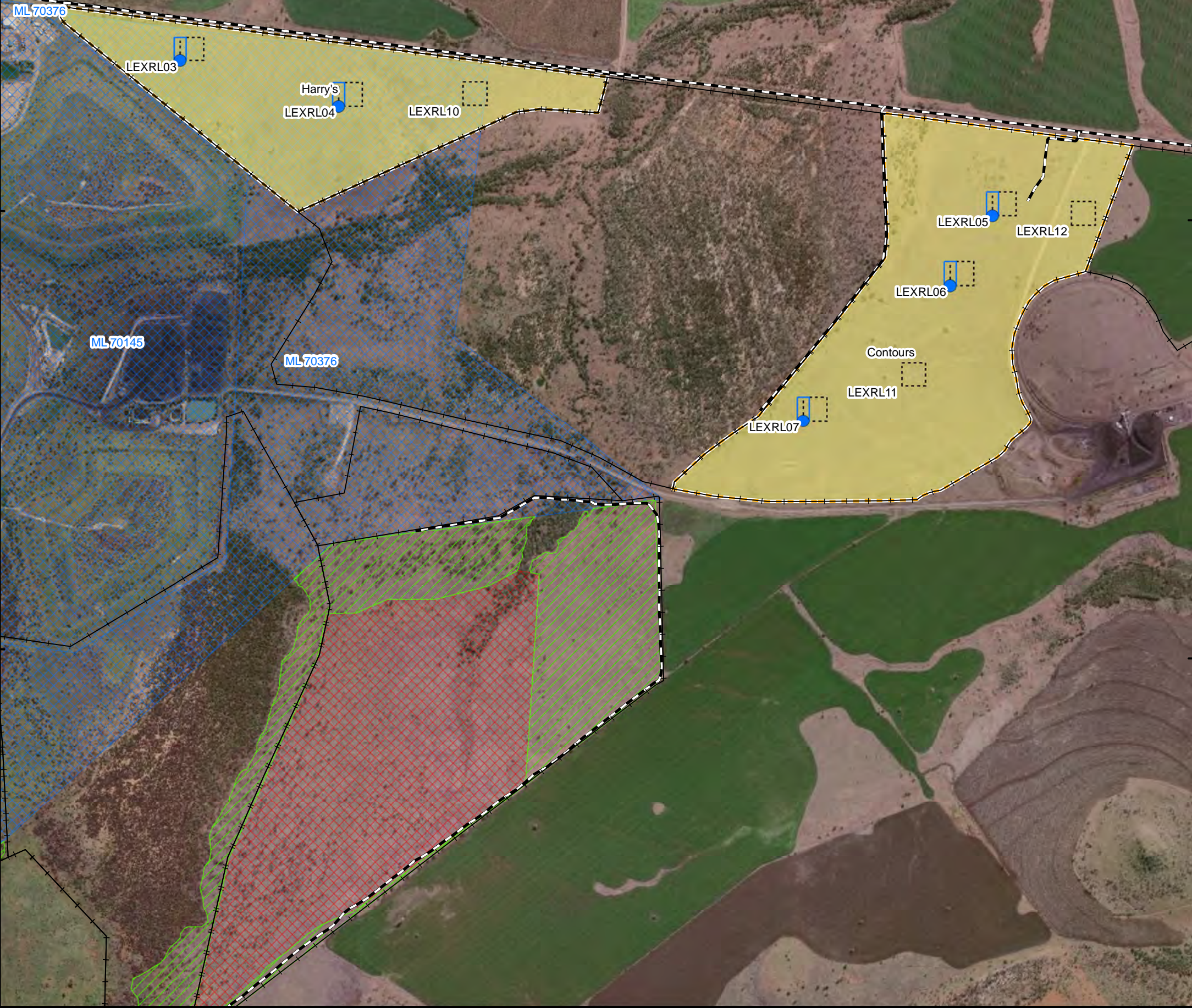
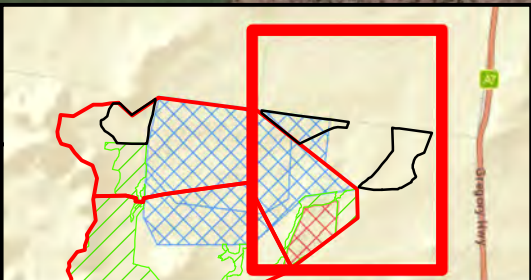
148°5'E

148°6'E

23°54'S

23°55'S

23°56'S



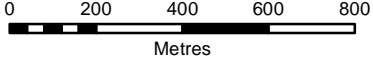
Sojitz Blue Pty Ltd - Lexington Rail Loop offset

Location diagram

**Figure 8**  
**Lexington Rail Loop offset**  
**monitoring sites - east**

- Lexington existing fences
- Access tracks
- Lexington Rail Loop offset**
- Harry's paddock
- Contours paddock
- Lexington offset area
- Existing offset area (Category A area)
- Mining leases (ML70376 and ML70145)
- Observed vegetation**
- RE 11.8.11
- RE 11.8.5
- Habitat monitoring sites
- Habitat monitoring plots
- Weed monitoring plots

DATA SOURCE:  
The following datasets are © State of Qld:  
- Mining leases  
The following datasets provided by Sojitz  
- Lexington Rail Loop offset areas  
Date: 7/16/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:17,500@A3





## 2.2 KING BLUE-GRASS AND BLUEGRASS SURVEYS (MDS PROJECT AND MDS RAIL LOOP SITES)

### 2.2.1 MDS Project site

Targeted surveys were undertaken for king blue-grass and bluegrass throughout the MDS Project site. This included incidental surveys while traversing the site on foot (e.g. weed monitoring, rabbit monitoring and pig monitoring plots) as well as targeted surveys along established transects previously surveyed in March 2018. While the survey period is later than the typical flowering season for king blue-grass and bluegrass, the two species can be successfully discerned from other grass species (particularly superficially-similar *Dichanthium* and *Bothriochloa* species) when not in flower through the morphology of the leaves and basal spikelet glumes.

Targeted transect surveys were undertaken along 12 of the 25 transects previously surveyed in March 2018, including the only two transects with previously confirmed records of the two species. Threatened grass surveys were undertaken targeting the presence, distribution and abundance of king blue-grass and bluegrass within 2 m of the centreline of the 12 transects.

Where king blue-grass or bluegrass was encountered within 2 m of the centreline of a transect, an estimate was made of the number of tussocks of each species considered to be within a contiguous population. A tussock was defined as a tuft or clump of a given species of grass growing from a common origin, whereas a population was defined as a collection of contiguous tussocks of a given species. The number of tussocks comprising a population was still estimated where populations extended beyond 2 m of the transect centreline. The number of tussocks in a population was estimated by assigning a population size to one of six abundance categories:

- ▶ 1 – 2 tussocks
- ▶ ≥2 – 5 tussocks
- ▶ ≥5 – 20 tussocks
- ▶ ≥20 – 50 tussocks
- ▶ ≥50 – 100 tussocks
- ▶ 100+ tussocks

An estimate of population size of a given species was calculated by summing the lower range interval of each population's tussock abundance category to represent the minimum estimate of abundance, with the upper range interval of each population's tussock abundance category summed to give an upper estimate of abundance. The resulting range represents a conservative estimate of tussock abundance across the survey area (i.e. survey area with four populations: 1-2 tussocks, 2-5 tussocks, 20-50 tussocks and 100+ tussocks equates to a survey area abundance range estimate of 123 – 157 tussocks from four populations). Based on the number of populations, a calculation was also made of the number of populations per kilometre of transect, which in combination with the estimate of total population size within the survey area allows for a comparison with monitoring events in subsequent years.



**Table 7: Threatened grass survey transect locations (UTM coordinates in GDA94) and lengths for the 12 transects surveyed in June 2020.**

Transect	Start point		End point		Length (m)
	Easting	Northing	Easting	Northing	
02	640990	7303811	640698	7303848	294
07	637991	7302726	637926	7302590	151
08	637777	7302305	637857	7302105	215
10	638634	7300462	638640	7300700	238
11	637417	7300418	637561	7299986	456
12	637935	7300289	638196	7300219	270
13	638328	7300164	638659	7299995	372
14	637336	7299852	637459	7299556	321
19	637123	7298983	637002	7298677	329
20	638076	7298778	638159	7298929	172
22	636545	7298529	636783	7298451	251
24	636562	7297408	636656	7297343	114
25	637273	7297385	637498	7297339	230
				<b>Total</b>	<b>3,413</b>

### 2.2.2 MDS Rail Loop site

Targeted surveys for king blue-grass were undertaken within the 50 m x 10 m plot of each of the four habitat quality assessment sites (MDSRL01 – MDSRL02). As noted above, the survey period is later than the typical flowering season for king blue-grass although the species is able to be successfully discerned from superficially-similar species when not in flower through the morphology of the leaves and basal spikelet glumes. Where king blue-grass was encountered within the plot, an estimate was made of the number of tussocks considered to be within a contiguous population in accordance with method outlined above (Section 2.2.1)

## 2.3 HABITAT AVAILABILITY ASSESSMENT FOR AUSTRALIAN PAINTED SNIPE (MDS PROJECT SITE)

Monitoring of habitat availability for Australian painted snipe was undertaken during the post-wet season surveys, which included:

- ▶ systematic surveying for Australian painted snipe by traversing habitat areas with the aim of detecting by sight or by flushing. Surveys were undertaken on three mornings over a five day period, totalling approximately eight hours
- ▶ quantification of the area of Australian painted snipe habitat.

The systematic survey included multiple circumnavigations of fringing habitat surrounding Naroo Dam, with access granted by Glencore via the Rolleston Mine to those parts of Naroo Dam not within the MDS lease.

The extent of Australian painted snipe habitat on the site was identified and quantified in the field in accordance with the following criteria, consistent with the known ecology of the species:

- ▶ Shallow water foraging habitat – calculated as the area of open water habitat (on the lease and adjacent lease).



- ▶ Muddy substrate foraging habitat – calculated as 10 m buffer adjacent open water habitat (on the lease and adjacent lease).
- ▶ Area of appropriate shelter habitat – calculated as areas of rank emergent tussocks of grass, sedges, rushes or reeds, samphire, clumps of lignum (*Muehlenbeckia*), canegrass or Melaleuca within 50 m of the boundary of open water habitat.

## 2.4 HABITAT CONDITION ASSESSMENT (MDS RAIL LOOP AND LEXINGTON RAIL LOOP OFFSET SITES)

Habitat condition assessment sites were established at the MDS Rail Loop site and Lexington Rail Loop offset sites based on the requirements of the *Guide to determining terrestrial habitat quality* (DEHP 2017). A total of four habitat condition assessment sites were established at the MDS Rail Loop site, with seven habitat condition assessment sites established at the Lexington Rail Loop offset site. Each of the habitat condition assessment sites comprise N – S running 100 m x 50 m transects, with the start (0 m) and central (50 m) points marked with a 1.8 m galvanised steel picket with plastic safety cap (refer to Figure 4 and Figure 7).

Habitat condition assessments for Natural Grasslands TEC and king blue-grass were undertaken at the habitat condition assessment sites generally in accordance with the *Guide to determining terrestrial habitat quality* (DEHP 2017). Through the application of the guide, a habitat quality score was calculated for each MNES based on the following key indicators:

- ▶ site condition: a general condition assessment of vegetation compared to a benchmark
- ▶ site context: an analysis of the site in relation to the surrounding environment

In the absence of the *Guide to determining terrestrial habitat quality* (DEHP 2017) including a species habitat index for flora species, the habitat condition scores for the MNES flora species (king blue-grass) included a species presence index out of three, whereby: 0 = absent/not confirmed, 2 = up to five tussocks confirmed, 2.5 = up to 20 tussocks confirmed, 3 = more than 20 tussocks confirmed. The habitat condition score for the king blue-grass was then calculated as a combination of site condition and site context for the RE assessment unit (representing 80% of the score), with species stocking rate converted to a score out of 10 and contributing 20%.

## 2.5 PHOTO MONITORING (ALL SITES)

Photo monitoring was undertaken at permanent sites established as part of baseline surveys on the MDS Project site, Lexington offset site, MDS Rail Loop site and Lexington Rail Loop site to give a representative indication of cover and species composition (including weeds) for the general area and enable visual assessment of habitat changes over time. Photo monitoring sites were established with a 1.8 m galvanised steel picket with plastic safety cap.

At each of the photo monitoring points, five photos were taken from 1.5 m height above ground level looking north, east, south and west with a ground photo taken looking down at an angle of 45° to the north-west of the star picket. Photo monitoring sites were delineated as follows:

- ▶ At the MDS project site, photo monitoring was undertaken at 30 sites, including two at each of the 10 habitat condition assessment sites (0 m and 50 m points: Site 01 – 10), with single photo monitoring points at the SW corner of the remaining 10 weed monitoring plots (Site 11 – 20) identified in Table 3 and shown in Figure 2 and Figure 3
- ▶ At the MDS Rail Loop site, photo monitoring was undertaken at nine sites, including two at each of the four habitat quality assessment sites (0 m and 50 m points: Site MDSRL01 – MDSRL04), with single



photo monitoring point at the SW corner of the remaining one standalone weed monitoring plot (Site MDSRL05) identified in Table 4 and shown in Figure 4

- ▶ At the Lexington offset site, photo monitoring was undertaken at 33 sites, including two at each of the 13 habitat condition assessment sites (0 m and 50 m points: Site 01 – 13), with single photo monitoring points at the SW corner of the remaining seven weed monitoring plots (Site 14 – 20) identified in Table 5 and shown in Figure 5 and Figure 6
- ▶ At the Lexington Rail Loop offset site, photo monitoring was undertaken at 19 sites, including two at each of the seven habitat condition assessment sites (0 m and 50 m points: Site LEXRL01 – LEXRL07), with single photo monitoring points at the SW corner of the remaining five weed monitoring plots (Site LEXRL08 – LEXRL12) identified in Table 6 and shown in Figure 7 and Figure 8.

A record of the photographs is shown in Appendix D to Appendix G for the MDS Project, Lexington offset, MDS Rail Loop and Lexington Rail Loop offset sites, respectively.

## 2.6 WEED MONITORING (ALL SITES)

For the purposes of this assessment, weeds were taken as any species of plant not considered by the Queensland Herbarium as being native to Queensland (i.e. not listed as either least concern, special least concern, near threatened, vulnerable, endangered, critically endangered or presumed extinct in the wild under the *Nature Conservation Act 1992* (Qld); NC Act), as well as species of plant not considered locally endemic to the region.

Weed monitoring was undertaken at 20 permanent plots at the MDS Project site, 20 permanent plots at the Lexington offset site, five permanent plots established at the MDS Rail Loop site and 12 permanent plots established at the Lexington Rail Loop offset site. Weed monitoring plots were located to incorporate natural variability such as aspect (e.g. a mix of north-, east-, south- and west-facing monitoring sites) and community type, while also targeting trafficable areas (e.g. entry gates, creek crossings, stock watering points) to monitor potential introduction and/or irruptions of prohibited and restricted weed species. At each weed monitoring plot, 3 x 100 m transects (traversing in an east-west direction) were traversed, keeping them parallel to one another, 50 m apart.

Figure 2 and Figure 3 show the location of the MDS Project site weed monitoring plots, Figure 4 shows the MDS Rail Loop weed monitoring plots, Figure 5 and Figure 6 show the Lexington offset site weed monitoring plots and Figure 7 shows the Lexington Rail Loop offset site weed monitoring plots.

At each of the permanent weed monitoring plots, monitoring of weeds was undertaken in accordance with the following method:

- ▶ At 10 m intervals along each of the three transects, a 2 m x 2 m plot frame was used to record the presence, species and cover of weeds
- ▶ Weed cover at each 2 m x 2 m survey site was recorded as one of five cover classes: 1 = 0%; 2 = 0-5%; 3 = 6-25%; 4 = 26-50%; 5 = 51-100% (Auld 2009)
- ▶ An average cover score for each weed species for each 1 ha site was calculated
- ▶ The average cover score was then calculated as the average percentage from the 30 plots surveyed from the three 100 m transects
- ▶ The mean cover score across all weed monitoring sites was then calculated.

For the purposes of the calculation of average percentage cover of weeds, each of the five weed cover classes (0 – 5) were converted to a quantitative weed cover value based on the average value of the range corresponding to that weed cover class, as outlined below:



- ▶ Weed cover class 1 (0%) retained a value of 0%
- ▶ Weed cover class 2 (0-5%) was converted to a value of 2.5%
- ▶ Weed cover class 3 (6-25%) was converted to a value of 15%
- ▶ Weed cover class 4 (26-50%) was converted to a value of 37.5%
- ▶ Weed cover class 5 (51-100%) was converted to a value of 75%.

In addition to permanent weed monitoring plots, where relevant, incidental observations were collated as part of general site monitoring, recording details of weeds (including location, species and extent) and areas of significant weed cover.

## 2.7 PEST ANIMAL MONITORING (MDS PROJECT SITE AND LEXINGTON OFFSET SITE)

For the purposes of this assessment, pest animals are defined as any species of fauna not native to Queensland, nor protected under the NC Act.

Pest animal monitoring was undertaken through a combination of:

- ▶ plot based monitoring, searching for direct presence (e.g. visual confirmation) or indirect evidence (e.g. tracks, diggings, scats, rubbings etc)
- ▶ infra-red, motion-detector fauna cameras, representing opportunities to visually confirm the presence of pest animals.

### 2.7.1 Rabbits

An assessment of the presence and impact of rabbits was undertaken generally in accordance with Cooke *et al.* (1990). Rabbit monitoring plots were established at the same location as habitat monitoring sites and weed monitoring plots (refer to Figure 2 and Figure 3 for locations at the MDS project site and Figure 5 and Figure 6 for locations at the Lexington offset site).

Each rabbit monitoring plot consisted of a 2 ha plot which was traversed for 15 to 20 minutes, assessing the following (refer to Cooke *et al.* 1990):

- ▶ Rabbit abundance – a measure of the presence and number of rabbit warrens and the abundance of any faecal pellets (including ‘buck-heaps’ or latrines) – measured on a scale of 0 – 5.
- ▶ Seedling abundance – a measure of the presence and abundance of native vegetation seedlings encountered during the 15-20-minute traverse – measured on a scale of 0 – 5.
- ▶ Rabbit damage – a measure of seedlings (< 0.5 m height) with evidence of rabbit damage, identified as 45° ‘secateurs-like’ cuts through smaller stems, defoliation and gnawing of bark – measured on a scale of 0 – 5.

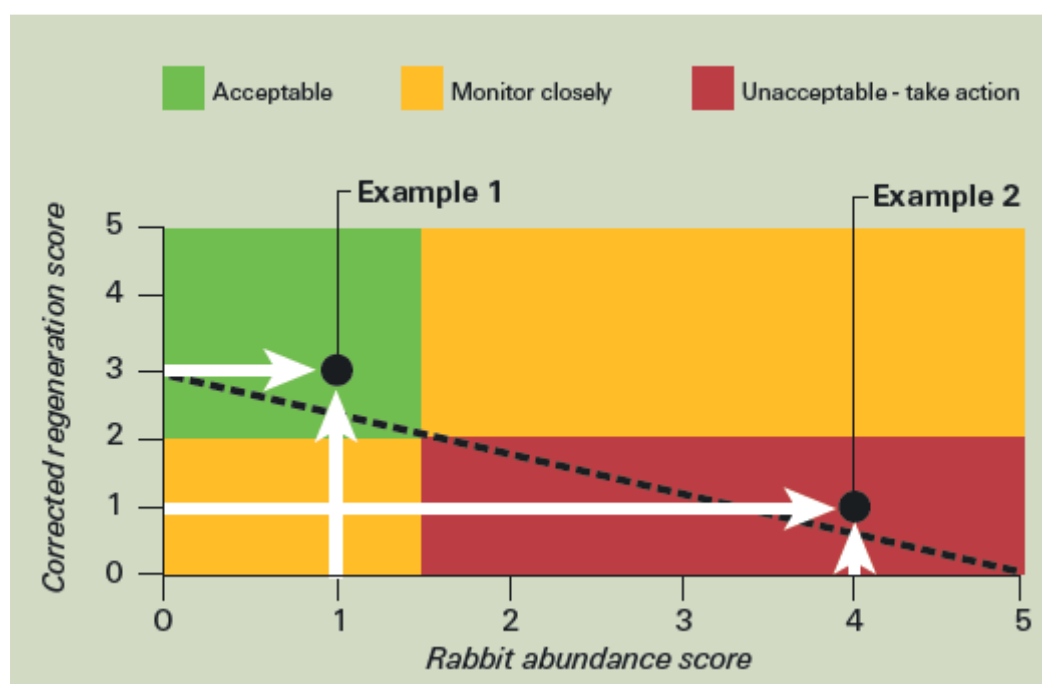
From this assessment, a ‘corrected regeneration score’ was calculated from the seedling abundance and rabbit damage score in accordance with Table 8. This measure corrects for seedling regeneration as a function of observed rabbit damage and is subsequently used to calculate overall rabbit impact with the rabbit abundance score.



**Table 8: Calculation of corrected regeneration score.**

Rabbit damage	Seedling abundance					
	0	1	2	3	4	5
0	0.20	1.00	2.00	3.00	4.00	5.00
1	0.20	0.50	1.00	1.50	2.00	2.50
2	0.20	0.34	0.70	1.00	1.30	1.70
3	0.20	0.28	0.50	0.80	1.00	1.30
4	0.20	0.20	0.40	0.60	0.80	1.00
5	0.20	0.20	0.30	0.50	0.70	0.80

As illustrated in Figure 9, overall rabbit impact was assigned as one of three categories – ‘acceptable’, ‘monitor closely’ or ‘unacceptable’, as determined from a combination of the score for rabbit abundance and the corrected regeneration score. Note that it was assumed that any site with a rabbit abundance score of ‘0’ was assumed to be ‘acceptable’, irrespective of corrected regeneration score. This is to avoid the situation where, with an absence of rabbits, and a corrected regeneration score of  $\leq 2$  (attributable to no rabbit damage and less than 20 seedlings), a given site may be identified as one to ‘monitor closely’ only by virtue of the fact that the few seedlings are attributable to the site being a grassland, rather than it reflecting rabbit grazing.



**Figure 9: Calculation of overall rabbit impact based on rabbit abundance score and corrected regeneration score.**

### 2.7.2 Fauna camera stations

An assessment of pest animal presence and activity was conducted using infra-red cameras. Infra-red fauna cameras were placed approximately 1.3 m above the ground at 15 fauna camera stations at the MDS Project site, and 15 fauna camera stations at the Lexington offset site. Once established, the fauna cameras were left unattended for a minimum of 3 days/nights to be able to intercept any active fauna using trails in the surveyed area.



Cameras were represented by 12 x Browning Dark Ops 940 HD 16 mega-pixel digital cameras (BTC-6HD-940) and three x LTL-6310 Acorn 12 mega-pixel digital cameras (LTL-6310M). Both camera models were supported by 940nm infra-red night vision and motion sensor capabilities to allow for capture of fauna during the day and night.

The camera settings were set to capture a series of images in succession following a motion trigger. If motion continued after this series of images were captured, then the camera would continue to capture images (in sets of four), followed by at least a one-minute pause, after which any new the camera could be triggered again. Secure Digital (SD) memory cards of 32 gigabyte capacity were used in the cameras for storing captured images.

For each pest animal species, a measure of pest animal presence/activity (Catling Index value) was calculated for the site by summing the number of operable fauna camera stations with evidence of the targeted pest animal by the sum of all operable station days/nights (refer to Mitchell and Balogh 2007a).

Refer to Figure 2 and Figure 3 for locations at the MDS Project site and Figure 5 and Figure 6 for locations at the Lexington offset site.

### 2.7.3 Feral pigs

An assessment of the presence of feral pig signs (as a measure of feral pig presence or activity) was undertaken generally in accordance with (Mitchell & Balogh 2007b) and (Hone 1988).

Randomly stratified, 500 m x 300 m (15 ha) plots were established in environments that are more regularly impacted included plots within and traversing ephemeral watercourses. A total of eight pig monitoring plots were established at the project site (Figure 2 and Figure 3) including plots within the immediate vicinity of Naroo Dam in the east of the site. Eight pig monitoring plots were also established at the offset site (Figure 4 and Figure 5), one of which was relocated (P03) following a recommendation in the 2018/19 monitoring report (NRC 2019).

Each 15-ha plot comprised 3 x 500 m transects spaced 100 m apart. At each plot, the following method was used for each of the transects:

- ▶ traversing in an east-west direction, surveying for the presence of any feral pig signs (rooting, wallows, dung, footprints, travel pads, plant damage and tree rubs, as well as the physical presence of feral pigs) 1 m either side of the transect in 50 m sections
- ▶ calculating an abundance score for each transect as the percentage of 'present' feral pig signs from the 10 sections along the 500 m transect
- ▶ calculating the mean abundance score (and variance) across all transects.

## 2.8 BIOMASS MONITORING FOR FIRE MANAGEMENT (ALL SITES)

Biomass monitoring for fire management is undertaken annually to determine the risk of fire and to inform fire management strategies. Biomass is at its greatest at the end of the wet season (around April) with fire risk greatest towards the end of the dry season (September/October). Biomass is monitored using appropriate photo standards<sup>1</sup> to determine dry matter yields and subsequently fuel loads. Biomass monitoring is undertaken at permanent weed monitoring sites at the MDS Project site, MDS Rail Loop site, Lexington offset site and Lexington Rail Loop offset site.

<sup>1</sup> See <https://futurebeef.com.au/knowledge-centre/pastures-forage-crops/pasture-photo-standards/>



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## 2.9 GENERAL SITE INSPECTIONS (ALL SITES)

General site inspections across all project and offset sites was undertaken, to assess:

- ▶ Observations of fencing condition, including any repair/upgrades
- ▶ Access track conditions, including location of watercourse crossings, grids, erosion, etc
- ▶ Fire management, including assessment of existing firebreaks, access tracks and roads, fuel loads, and any recent burning activities
- ▶ Livestock management including assessment of signs of land degradation and over-grazing
- ▶ Erosion management, including assessment of the incidence of erosion, especially around permanent and semi-permanent water bodies or areas subject to inundation or waterlogging
- ▶ Incidental fauna observations, including presence, traces and/or abundance of pest animals
- ▶ Signs of dust deposition on vegetation located adjacent to the MDS Project and MDS Rail Loop footprints
- ▶ Locations of known king blue-grass and bluegrass specimens throughout all sites
- ▶ Any additional risks to fauna (i.e. evidence of vehicle strike)



## 3 RESULTS: MDS PROJECT SITE

### 3.1 HABITAT MONITORING

Habitat condition assessments were undertaken in December as part of the dry-season surveys and were previously reported. Post-wet season, targeted surveys were undertaken for king blue-grass, bluegrass, squatter pigeon and Australian painted snipe; the results for which are described below.

#### 3.1.1 King blue-grass and bluegrass

Targeted surveys confirmed the presence of king blue-grass and bluegrass at transects and incidentally throughout the MDS Project site. Records of king blue-grass were confirmed from four (33%) of the 12 threatened grass survey transects (transect 12, 19, 22 and 25) (Table 9 and Figure 10 to Figure 12), with two incidentally recorded populations in the vicinity of transect 19 and 22 (Figure 10). Eight populations of king blue-grass were recorded along transect 25, where two populations were confirmed in 2018. A further five populations were confirmed from the three other transects, reflecting a total population size of 95-275 tussocks across the 13 populations in four transects. The two king blue-grass population observed outside of the targeted survey transects totalled 52 – 105 tussocks.

**Table 9: King blue-grass populations and their estimated size from transects at the MDS Project site.**

Transect number	King blue-grass population size range								Population per transect
12	5-20								5-20
19	20-50								20-50
22	5-20			5-20			5-20		15-60
25	2-5	2-5	2-5	2-5	2-5	5-20	20-50	20-50	55-145
<b>Total survey area population (range)</b>	<b>95-275</b>								
<b>Number of populations (#/km)</b>	<b>13 (3.8/km)</b>								

Records of bluegrass were confirmed from one (8%) of the 12 threatened grass survey transects (transect 07), with six incidentally recorded populations (Table 10, Figure 10 and Figure 11).

Four populations of bluegrass were recorded along transect 7, where two populations were confirmed in 2018. The four populations along transect 7 comprised a total population size of 150 – 220 tussocks. The six bluegrass populations observed outside of the targeted survey transects totalled 59 – 140 tussocks.

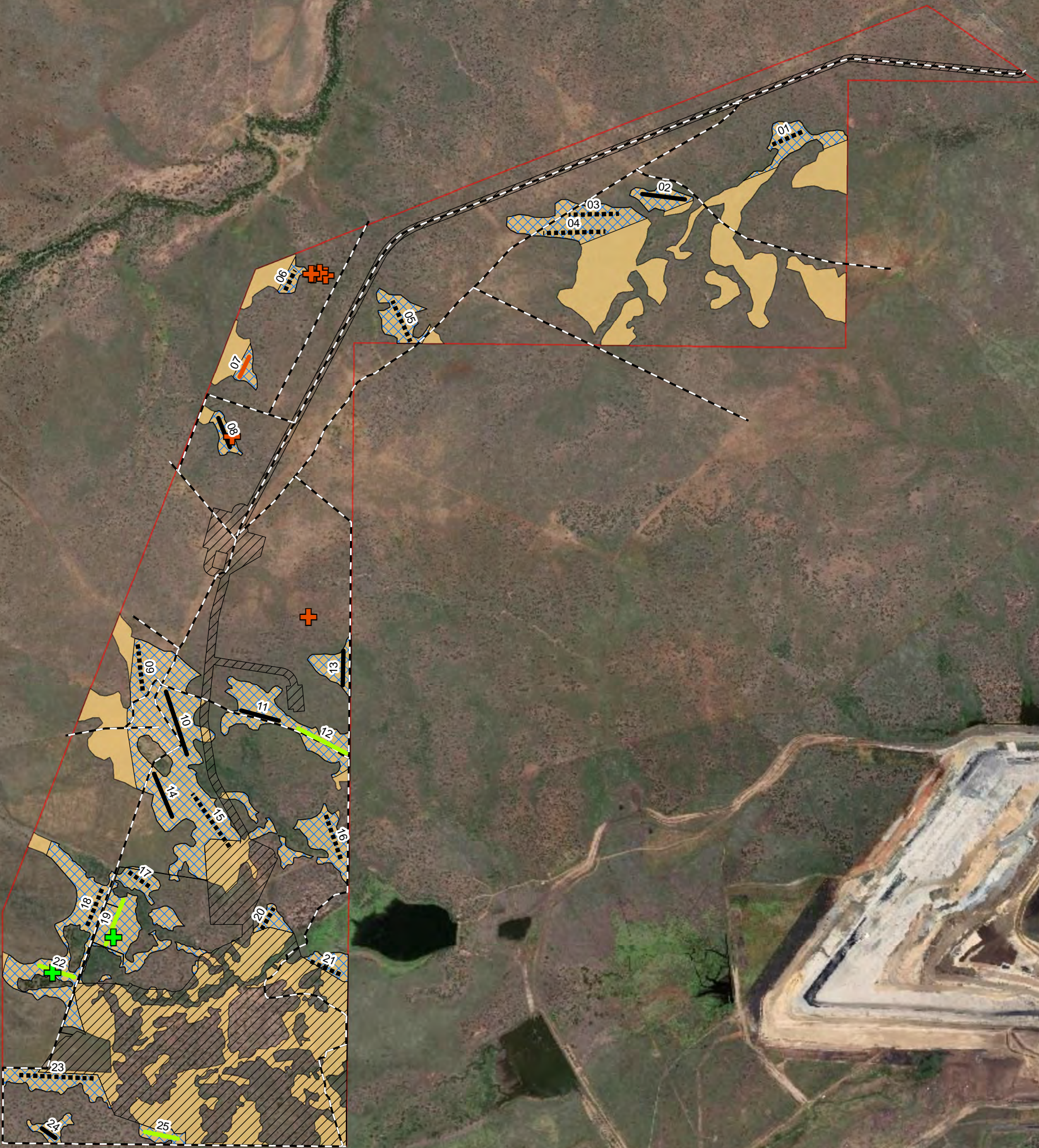
Previous surveys in 2018 confirmed the presence of a previously undescribed species of *Dichanthium* with the interim name *Dichanthium sp. affine. serecium*. Given the subtleties in difference between the undescribed species and *Dichanthium setosum*, mostly relating to morphological differences in flower morphology, the observed populations could not easily be delineated so were instead assumed to be *Dichanthium setosum*. Investigations into the morphological attributes of the two species is currently underway by the Queensland Herbarium. Once formally described, delineation of the two species will be more readily possible during the flowering season.



**Table 10: Bluegrass populations and their estimated size from transects at the MDS Project site.**

Transect number	Bluegrass population size range				Population per transect
7	15-20	100+	20-50	20-50	150-220
Total survey area population (range)	150-220				
Number of populations (#/km)	4 (1.2/km)				





Sojitz Blue Pty Ltd - MDS Project

Location diagram

**Figure 10**  
**MDS Project**  
**Threatened grass survey**  
**results overview**

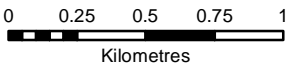
DATA SOURCE:  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz  
- Disturbance areas  
- Habitat for king blue-grass and bluegrass

Date: 7/16/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:27,500@A3

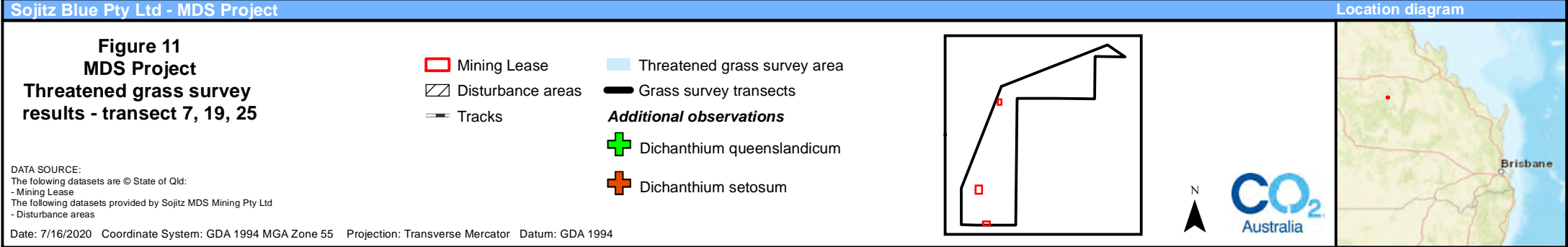
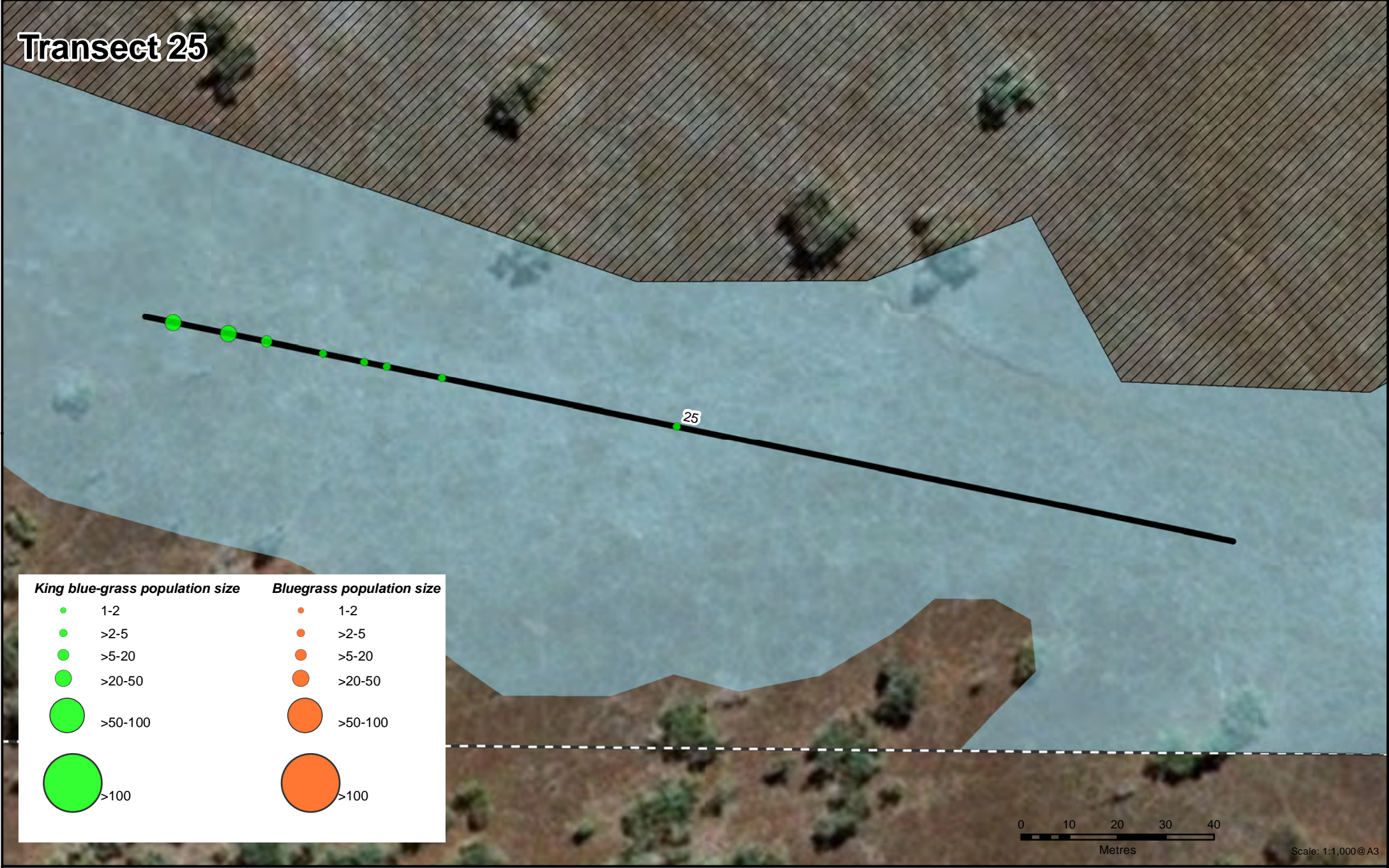
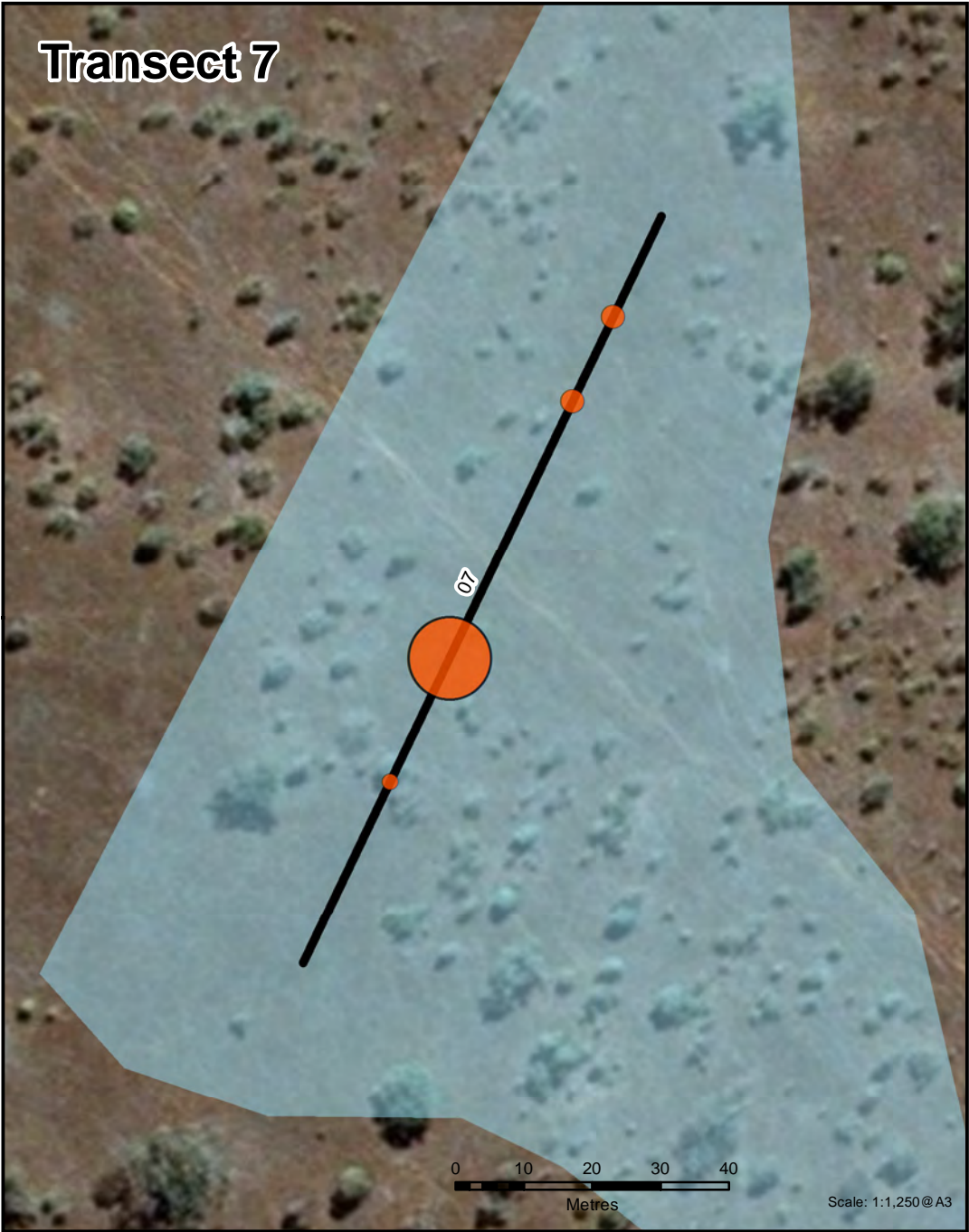
- Mining Lease
- Disturbance areas
- Access tracks
- Habitat for King blue-grass and bluegrass
- Threatened grass survey area

- Grass survey transects**
- Transect not surveyed
  - No threatened grasses
  - King blue-grass
  - Bluegrass

- Additional observations**
- Dichanthium queenslandicum
  - Dichanthium setosum

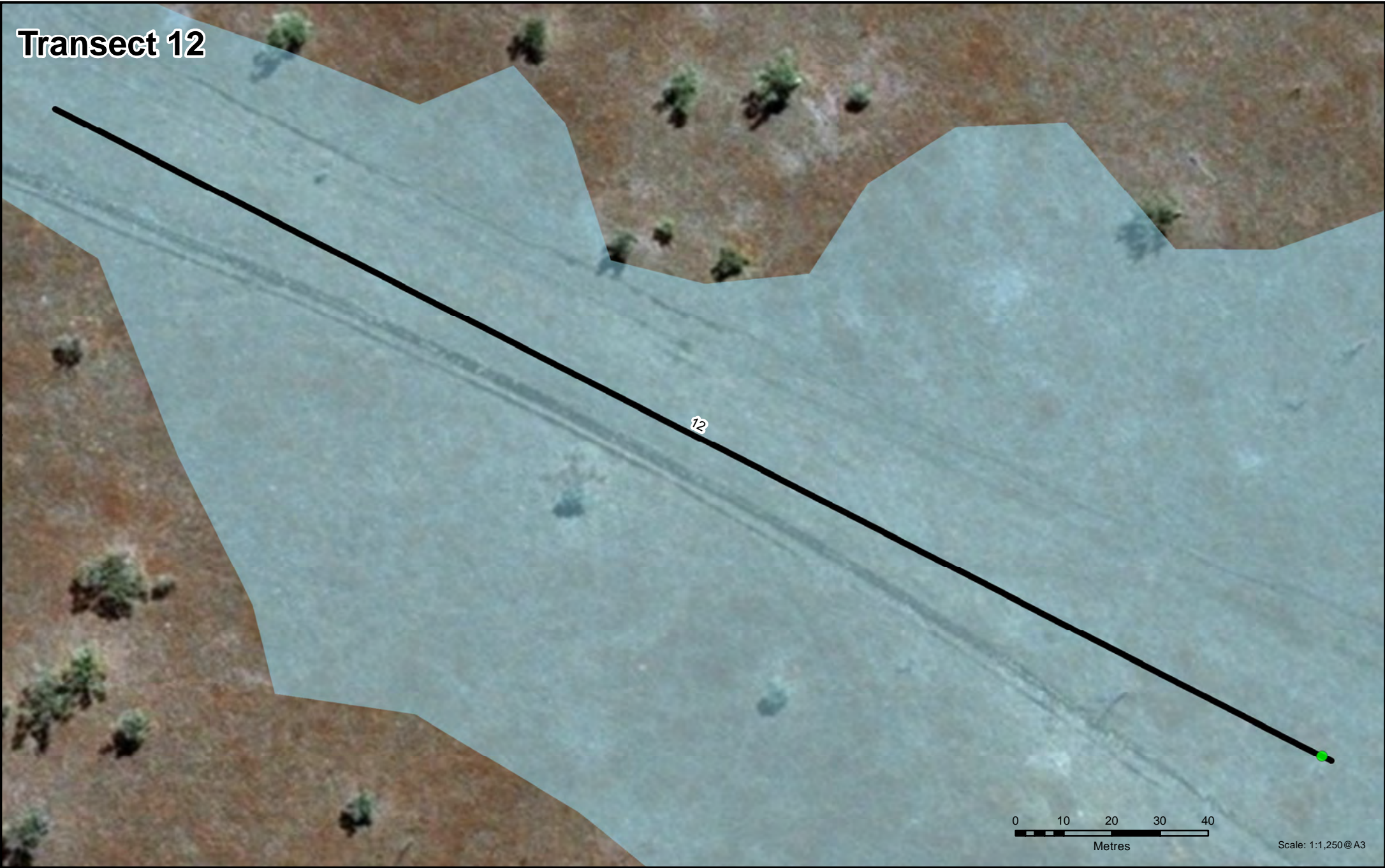




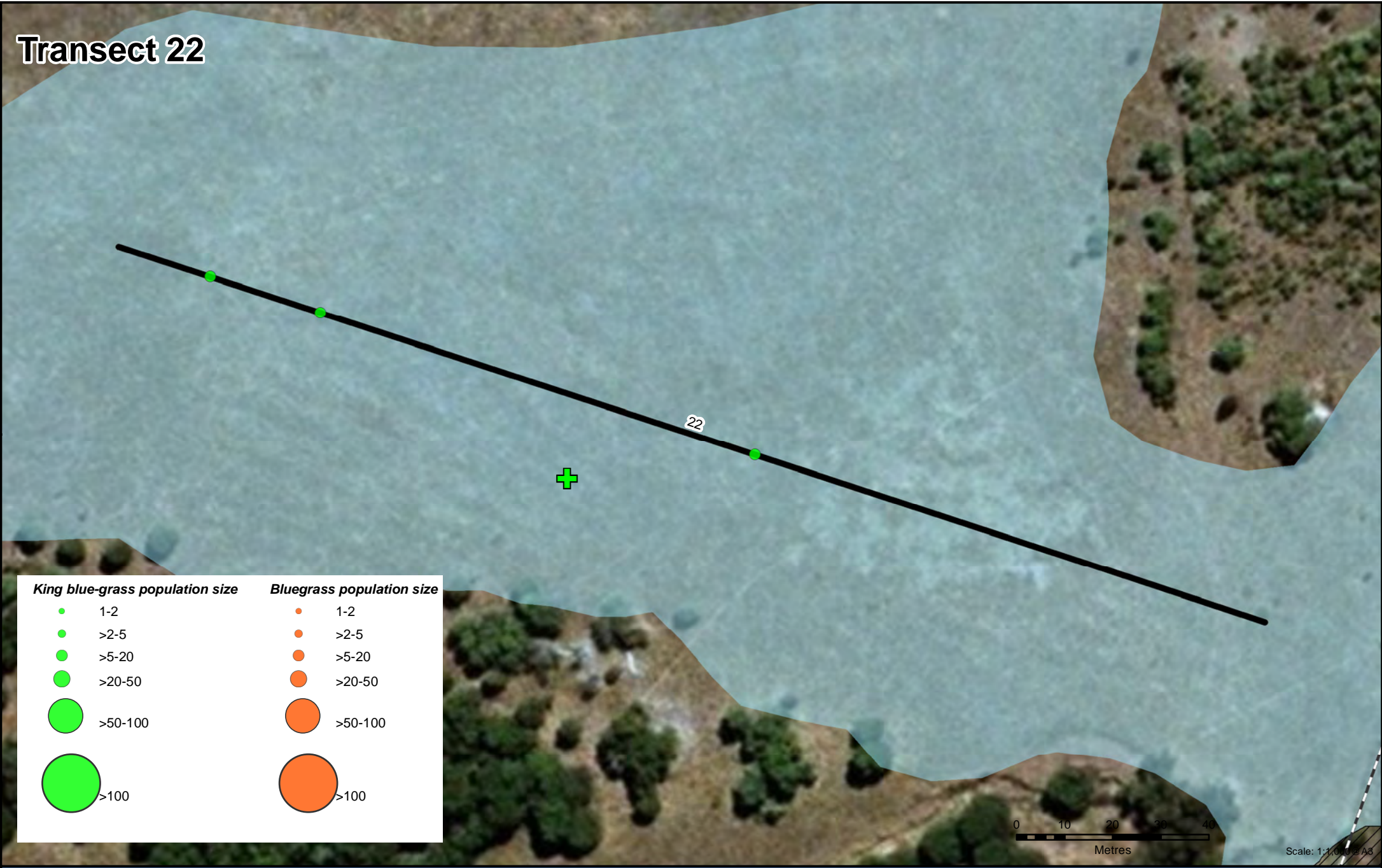




Transect 12



Transect 22



Sojitz Blue Pty Ltd - MDS ProjectLocation diagram

**Figure 12**  
**MDS Project**  
**Threatened grass survey**  
**results - transect 12, 22**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz MDS Mining Pty Ltd  
- Disturbance areas

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994

Mining Lease

Disturbance areas

Tracks

Threatened grass survey area

Grass survey transects

**Additional observations**

Dichanthium queenslandicum

Dichanthium setosum

N



### 3.1.2 Squatter pigeon

Incidental searches for the squatter pigeon were conducted opportunistically from over 200 km of driving during the five days of field surveys on the project site, however, no squatter pigeons were recorded.

### 3.1.3 Australian painted snipe

Surveying was undertaken around Naroo Dam for Australian painted snipe across three mornings (19, 22 and 23 June 2020), for up to three hours each morning from sunrise (~6.30am). Access was granted to Naroo Dam via the Glencore Rolleston Mine, which allowed for the complete circumnavigation of the dam and its fringing habitat. Surveys involved a combination of binocular scanning of fringing mudflats and shallow water habitat, as well as traversing surrounding fringing vegetation, including *Melaleuca* thickets and rank grasses (e.g. *Megathyrus maximus*). While surveying for Australian painted snipe was outside of the wet season (defined as between 1 November in one year to 31 May in the following year), and not following any significant inundation event, there was still an appreciable amount of water within the dam and the low-lying channels feeding into it to support habitat for Australian painted snipe (Figure 13 and Figure 14).

While a total of 43 species of birds were encountered utilising or occupying the dam and immediate surrounds, no Australian painted snipe were confirmed during the targeted surveying.

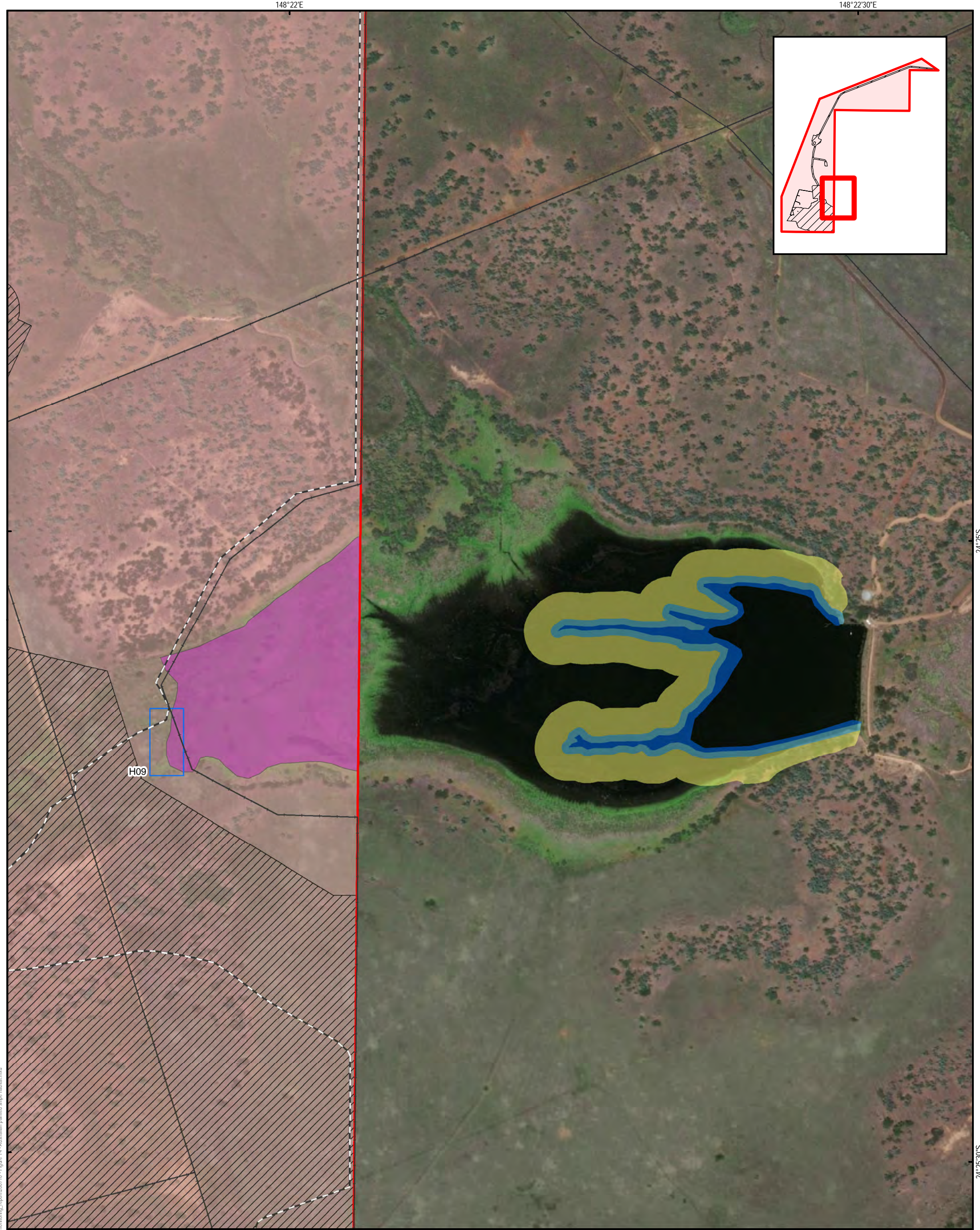
At the time of surveying, Naroo Dam supported a moderate number of shallow-water and open-water dependent waterbird species including small numbers of brolga (*Grus rubicunda*), black swan (*Cygnus atratus*), hardhead (*Aythya australis*), pacific black duck (*Anas superciliosa*), grey teal (*Anas gracilis*) and Australasian grebe (*Tachybaptus novaehollandiae*). Fringing vegetation was sparse, although where present, supported species such as plum-headed finch (*Neochmia modesta*), double-barred finch (*Taeniopygia bichenovii*), zebra finch (*Taeniopygia guttata*), chestnut-breasted mannikin (*Lonchura castaneothorax*) and Australian reed-warbler (*Acrocephalus australis*), with fringing grasslands supporting numerous family groups of brown quail (*Coturnix ypsilophora*). Notably, four species of raptor were hunting around the dam at the time of surveying, including white-bellied sea-eagle (*Haliaeetus leucogaster*), whistling kite (*Haliastur sphenurus*), black kite (*Milvus migrans*) and brown falcon (*Falco berigora*).

In addition to birds, a number of pig wallows were found along the shoreline of Naroo Dam, with a family of three pigs flushed from vegetation fringing the base of the dam wall during surveying.



**Figure 13: Naroo Dam looking west from the dam wall showing open water areas grading to shallow fringing habitat.**





**Figure 14**  
**MDS Project**  
**Australian painted snipe**  
**habitat**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:5,000@A3

Disturbance areas

Mining Lease

Fences

Access tracks

Habitat for Australian painted snipe

Habitat monitoring transect

**Australian painted snipe habitat**

Shallow water foraging habitat

Muddy substrate foraging habitat

Shelter habitat

0    50    100    150    200

Metres

N

**CO<sub>2</sub>**  
Australia

Location diagram



---

## 3.2 PHOTO MONITORING

Photo monitoring of the MDS Project site showed a variety of levels of cover ranging from dense grassy understorey (Site 06: refer to Photo D-56 in Appendix D) through to relatively open areas with evidence of grazing (Site 13: Photo D-112 in Appendix D) resulting in reduced grass cover. The results of the photo monitoring in the MDS Project site is presented in Appendix D.

## 3.3 WEED MONITORING

A total of 24 weed species were identified from the weed monitoring plots. No additional species of weeds were observed on the MDS Project site outside of those identified within the weed monitoring plots. Across the 20 weed monitoring plots, the average number of weed species observed per plot was 5.2 species, ranging between one species (Site 14) and 13 species (Site 09). Weed cover across the 20 weed monitoring plots averaged 13.3%; ranging between 1.1% (Site 03) and 57.6% (Site 17)(Table 11 and Figure 15).

The most commonly encountered weed was *Parthenium hysterophorus*, recorded from 14 of the 20 sites, followed by buffel grass (*Cenchrus ciliaris*) at 11 of the 20 sites (Table 11), with eight of the 24 weed species only encountered at single sites. While encountered at a large number of sites, the average cover of *Parthenium hysterophorus* and *Cenchrus ciliaris* across those encountered sites averaged 5.3% and 4.5%, respectively. For those weeds found from at least two sites, Angleton grass (*Dichanthium aristatum*) was the weed species with the highest average cover, averaging 10.9% cover across the three sites it was recorded from (Table 11). Although only encountered from a single site, Lippia (*Phyla canescens*) was the weed with the highest cover at any single site, represented by 42.8% cover at Site 09; located immediately adjacent Naroo Dam.

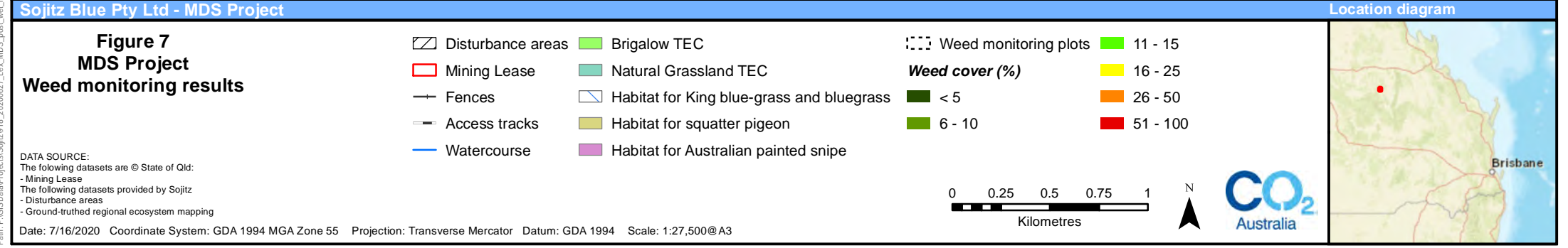
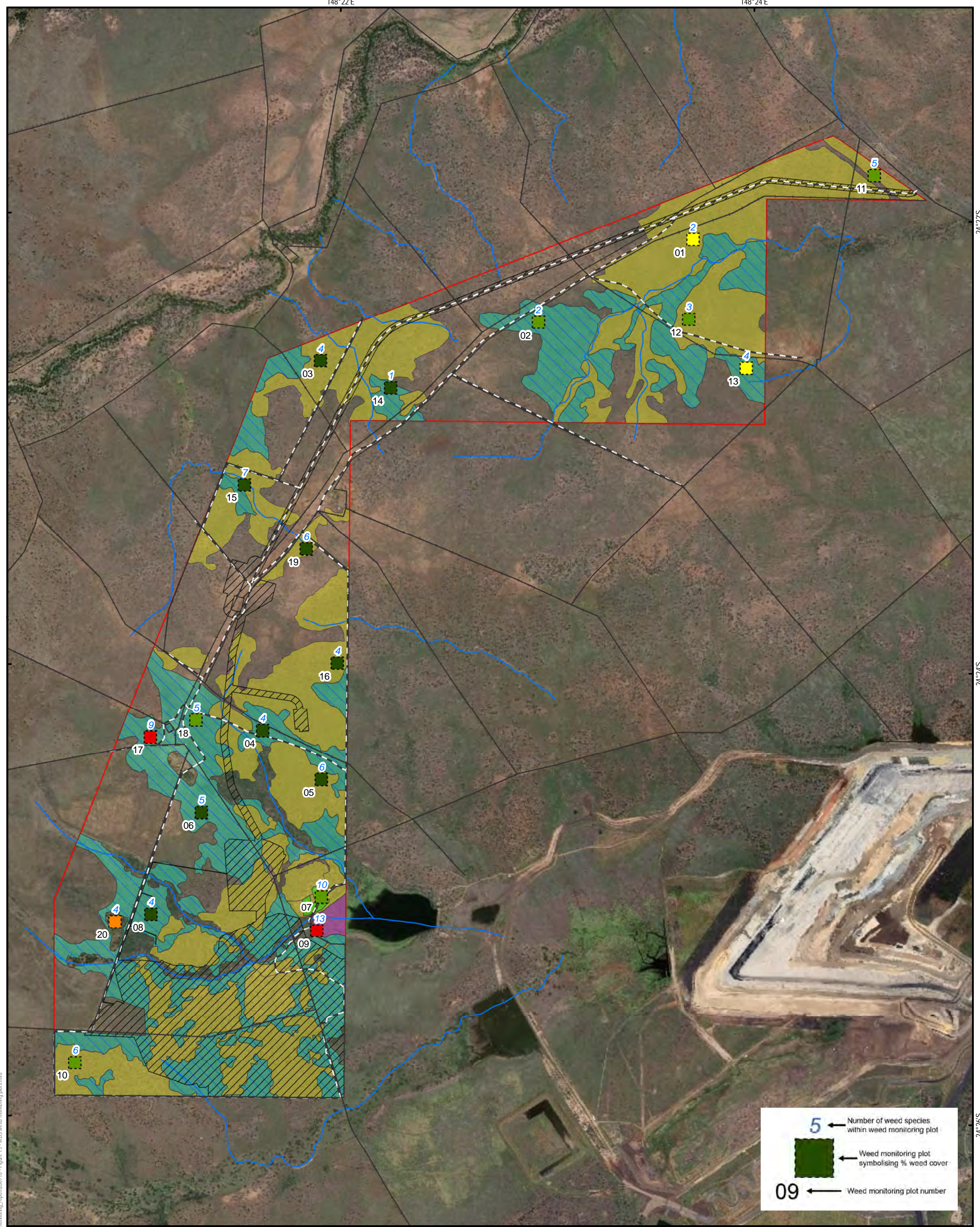


**Table 11: Results of weed monitoring assessments at the MDS Project site.**

Scientific name	Common name	Family name	Percentage cover of weed species from given site																				# sites	Avg cover (%) <sup>a</sup>
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20		
<i>Alternanthera pungens</i>	Khaki Weed	Amaranthaceae			0.3				0.3				0.2				0.2						4	0.3
<i>Bidens bipinnata</i>	Bipinnate Beggar's Ticks	Asteraceae			0.4		0.2	0.3	1.1	0.8	1.8	1.2											7	0.8
<i>Lactuca serriola</i>	Prickly Lettuce	Asteraceae						0.4		0.3	0.1						0.2		0.6				5	0.3
<i>Parthenium hysterophorus</i>	Parthenium Weed	Asteraceae				1.0	2.1	0.2	0.3	0.2	3.2	0.1	0.1		20.9		0.5	0.9	35.4	2.1		7.1	14	5.3
<i>Xanthium pungens</i>	Noogoora Burr	Asteraceae									0.4												1	0.4
<i>Xanthium spinosum</i>	Bathurst Burr	Asteraceae													0.2								1	0.2
<i>Crotalaria juncea</i>	Sunhemp	Fabaceae			0.3	0.1	0.4				0.1						0.2	0.1	0.1		0.1		8	0.2
<i>Stylosanthes viscosa</i>	Sticky Stylo	Fabaceae							0.2												0.3		2	0.3
<i>Vachellia farnesiana</i>	Mimosa Bush	Fabaceae	0.1						0.2								0.2		0.2	2.5	0.1		6	0.6
<i>Sida cordifolia</i>	Flannel weed	Malvaceae										0.1	0.1										2	0.1
<i>Sida spinosa</i>	Sida	Malvaceae				0.3	0.3		0.3		0.6			0.1			0.1		0.3	0.5	0.1		9	0.3
<i>Waltheria indica</i>	Sleepy Morning	Malvaceae									0.5				1.3							0.1	3	0.6
<i>Bothriichloa pertusa</i>	Indian Bluegrass	Poaceae											2.5								3.0		2	2.8
<i>Cenchrus ciliaris</i>	Buffel Grass	Poaceae	15.4	9.7			0.1	0.5	2.9		0.2	3.1	2.5	5.8					1.2			8.1	11	4.5
<i>Dichanthium aristatum</i>	Angleton Grass	Poaceae							1.0		19.9								11.9				3	10.9
<i>Megathyrsus maximus</i>	Guinea Grass	Poaceae							0.5														1	0.5
<i>Sorghum halepense</i>	Johnson Grass	Poaceae															0.1		0.1		0.1		3	0.1
<i>Urochloa decumbens</i>	Signal Grass	Poaceae													0.5								1	0.5
<i>Rumex crispus</i>	Curled Dock	Polygonaceae									0.1												1	0.1
<i>Portulaca oleracea</i>	Pigweed	Portulacaceae							0.1														1	0.1
<i>Datura ferox</i>	Fierce Thornapple	Solanaceae																	0.1				1	0.1
<i>Physalis lanceifolia</i>	Goosberry	Solanaceae						1.2			6.5	0.1							8.4			18.2	5	6.9
<i>Phyla canescens</i>	Lippia	Verbenaceae									42.8												1	42.8
<i>Verbena officinalis</i>	Common Verbena	Verbenaceae		0.1	0.1	0.5	0.8			0.1	0.2	0.5		0.1		2.1	0.5	0.1		1.0			12	0.5
		# species	2	2	4	4	6	5	10	4	13	6	5	3	4	1	7	4	9	5	6	4		
		Weed cover (%) <sup>b</sup>	15.5	9.8	1.1	1.9	3.9	2.6	6.9	1.4	76.2	5.1	5.4	6.0	22.9	2.1	1.8	1.3	57.6	6.7	3.7	33.5		

<sup>a</sup> Avg cover (%) represents the average percentage cover of a given weed species across encountered sites. <sup>b</sup> Weed cover represents the sum of the average weed cover percentages of all weed species.







### 3.4 PEST ANIMAL MONITORING

#### 3.4.1 Rabbits

Results of rabbit monitoring confirmed the presence of rabbit/hare scats from six of the ten rabbit monitoring plots (R02, R05, R07, R08, R09, R10; Figure 17). Across these plots, pellet abundance ranged from isolated pellets and small clumps more than 10 m apart, to scattered pellets and clumps less than 10 m apart. European rabbits (*Oryctolagus cuniculus*) were also visually confirmed (Figure 16) at one fauna camera station (Site C10), while brown hares (*Lepus europaeus*) were considerably more commonly encountered; being confirmed from seven of the 15 fauna camera stations (C03, C04, C05, C08, C11, C12, C13)(Figure 20).



**Figure 16: European rabbit (*Oryctolagus cuniculus*) captured at fauna camera station C10 at the MDS Project site.**

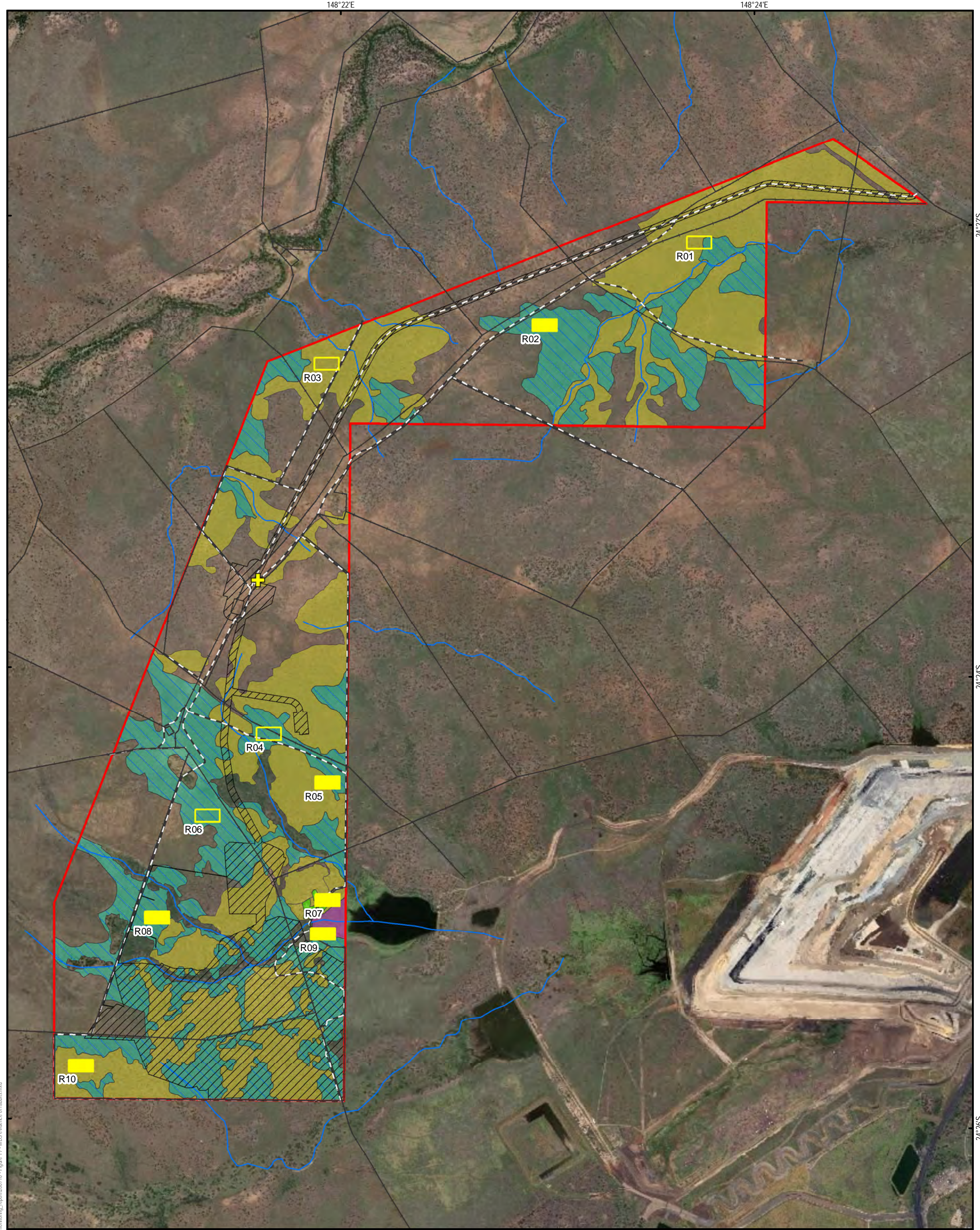
Table 12 shows the results of the assessment of overall rabbit impact. The results indicate that over half of the sites displayed evidence of rabbit abundance. The assessment of overall rabbit impact was denoted as 'Monitor closely' or 'Acceptable' for the majority of sites, with site R02 denoted as 'Unacceptable' due to higher rabbit abundance.



**Table 12: Assessment of overall rabbit impact at the MDS Project site.**

Site	Rabbit abundance score (0 – 5)	Seedling abundance score (0 – 5)	Rabbit damage score (0 – 5)	Corrected regeneration score (0 – 5)	Overall rabbit impact
R01	0	1	0	1.0	Acceptable
R02	2	0	0	0.2	Unacceptable
R03	0	3	0	3.0	Acceptable
R04	0	0	0	0.0	Acceptable
R05	1	3	0	3.0	Acceptable
R06	0	0	0	0.0	Acceptable
R07	1	3	0	3.0	Acceptable
R08	2	2	0	2.0	Monitor closely
R09	1	1	0	1.0	Monitor closely
R10	2	2	0	2.0	Monitor closely





**Sojitz Blue Pty Ltd - MDS Project**

**Figure 17**  
**MDS Project**  
**Evidence of rabbits/hares**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:27,500@A3

**Location diagram**

**Legend**

Disturbance areas	Brigalow TEC	Observed rabbit
Mining Lease	Natural Grassland TEC	<b>Rabbit monitoring plots (R01 - R10)</b>
Fences	Habitat for King blue-grass and bluegrass	No evidence for rabbits/hares
Tracks	Habitat for squatter pigeon	Evidence of rabbits/hares
Watercourse	Habitat for Australian painted snipe	

0 0.25 0.5 0.75 1  
Kilometres

N



### 3.4.2 Feral pigs

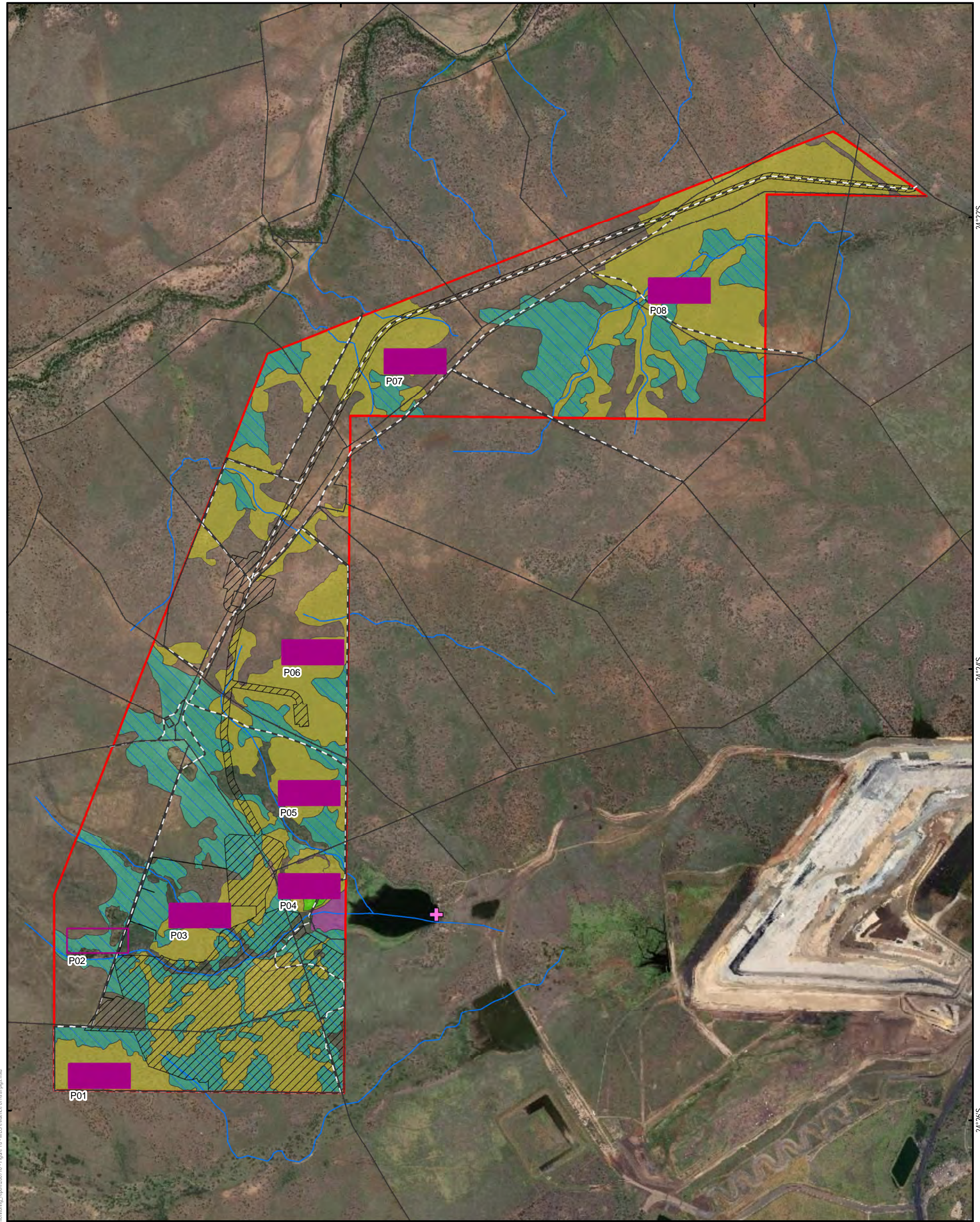
Across all eight pig monitoring plots, represented by a total of 12 km of transects, there was confirmed evidence for the presence of feral pigs in seven plots (Figure 18). However, the only visual evidence for feral pigs through direct observation was from the base of the Naroo Dam wall, with a family of three pigs flushed from low vegetation. Evidence of feral pig presence within plots ranged from 0% (Site P02) to 17% (Site P01 and P08) and, on average, was observed across 10% of the transect sections surveyed within each plot (Table 13). Opportunistic surveying through ephemeral watercourses, including observation efforts during weed and rabbit monitoring, as well as around Naroo Dam revealed additional evidence of feral pigs.

**Table 13: Assessment of overall feral pig presence and activity at the MDS Project site, denoted as either rooting (R), footprints (F), travel pads (P), or dung (D).**

Monitoring plot survey section (50 m)													
Plot	Transect	1	2	3	4	5	6	7	8	9	10	Transect	Plot % (record/30)
P01	1	-	-	-	-	-	-	-	R	-	R	20%	17%
	2	-	-	-	-	-	-	-	-	-	R	10%	
	3	-	R	-	-	-	-	-	R	-	-	20%	
P02	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P03	1	-	-	-	-	-	-	-	-	-	-	0%	7%
	2	-	-	-	F	F	-	-	-	-	-	20%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P04	1	-	-	R	-	-	-	-	-	-	-	10%	13.33%
	2	R	-	-	-	-	-	-	-	-	-	10%	
	3	-	-	-	-	R	-	-	-	-	R	20%	
P05	1	-	-	-	-	-	-	-	-	-	-	0%	7%
	2	R F	-	-	-	-	-	P	-	-	-	20%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P06	1	-	-	P	-	-	-	-	-	-	-	10%	7%
	2	-	P	-	-	-	-	-	-	-	-	10%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P07	1	-	-	-	-	-	-	-	-	-	-	10%	13.33%
	2	-	-	-	-	-	-	-	-	-	-	10%	
	3	-	-	-	-	-	-	-	-	-	-	20%	
P08	1	-	-	-	-	-	-	-	-	P F	P F	20%	17%
	2	-	-	-	-	-	-	-	P F	-	-	10%	
	3	-	-	D	-	-	-	P F	-	-	-	20%	
												<b>Total</b>	<b>10.0%</b>



Path: P:\GISData\Projects\Sojitz\918\_20200627\_Lex\_MDS\_pos\_well\_monitoring\_report\020710 - Figure 18 - MDS evidence of feral pigs.mxd



Sojitz Blue Pty Ltd - MDS Project Location diagram

**Figure 10**  
**MDS Project**  
**Evidence of feral pigs**

**DATA SOURCE:**  
The following datasets are © State of Qld:  
- Mining Lease  
The following datasets provided by Sojitz:  
- Disturbance areas  
- Ground-truthed regional ecosystem mapping

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:27,500@A3

Disturbance areas	Brigalow TEC	Observed feral pigs
Mining Lease	Natural Grassland TEC	
Fences	Habitat for King blue-grass and bluegrass	
Tracks	Habitat for squatter pigeon	
Watercourse	Habitat for Australian painted snipe	

**Pig monitoring plots (P01 - P08)**

No evidence of feral pigs

Evidence of feral pigs

0 0.25 0.5 0.75 1  
Kilometres



### 3.4.3 Fauna camera stations

Of the 15 fauna camera stations, all 15 were considered operable stations across at least four consecutive nights, resulting in a total of 68 operable station nights for the purposes of calculating Catling Index values for pest animal species. As indicated in Table 14, the fauna cameras confirmed the presence of three pest animal species, namely brown hare (*Lepus capensis*), European rabbit (*Oryctolagus cuniculus*) and feral dog (*Canis familiaris/lupus*). The highest Catling Index score was 22.1, which was calculated for feral dog, with the lowest Catling Index recorded for European rabbit (2.9). Non-pest animals were also detected from the fauna camera stations, including eastern grey kangaroo (*Macropus giganteus*), rufous bettong (*Aepyprymnus rufescens*), willie wagtail (*Rhipidura leucophrys*), Australian magpie (*Cracticus tibicen*) and crested pigeon (*Ocyphaps lophotes*).

Overall, there were 27 individual pest animal detections, recorded from 13 of the 15 fauna camera stations (Figure 20). Four of the 15 cameras detected two pest animal species, which the remaining nine cameras detecting pest animals detected only a single species.

No additional pest animals (e.g. cats or feral pigs) were confirmed via direct observation or through indirect evidence (e.g. scats).

**Table 14: Pest animal results for the MDS Project site.**

Pest animal species	Confirmed incidence of pest animal species from given site															Catling Index
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	
Nights camera operable*	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	
Dog																
18/06/20					✓											22.1
19/06/20		✓														
20/06/20		✓		✓			✓	✓						✓	✓	
21/06/20								✓			✓			✓	✓	
22/06/20						✓	✓									
23/06/20		✓														
European rabbit																
18/06/20																2.9
19/06/20																
20/06/20										✓						
21/06/20										✓						
22/06/20																
23/06/20																
Brown hare																
18/06/20												✓				14.7
19/06/20			✓									✓	✓			
20/06/20				✓												
21/06/20											✓	✓	✓			
22/06/20					✓			✓								
23/06/20																

\* 68 camera nights for the purposes of calculating Catling Index.





**Figure 19: Pest animals captured from the fauna camera including wild dog (top, Camera 08) and brown hare (bottom, Camera 12).**







### 3.5 BIOMASS MONITORING

Brigalow Belt pasture photo standards were used for all biomass monitoring points. ‘Downs country’ photo standards were used for monitoring sites comprising RE 11.8.11, whilst photo monitoring results from areas of RE 11.8.5 were assessed against ‘Eucalypt woodlands’, RE 11.4.3 was assessed against ‘Blue grass, wire grass’ and RE 11.3.3a was assessed against ‘Alluvial’ photo standards (Table 15). The photo standards used to calculate biomass are different to previous years’ assessments, although these photo standards are considered more representative of the actual vegetation communities observed on the MDS Project site. Where the observed biomass at a site was mid-way between two photos within a given biomass standard, the middle of the corresponding range was reported (i.e. observed biomass between 2,500 kg/ha and 3,600 kg/ha ‘Eucalypt woodlands’ photo standards was reported as 3,050 kg/ha).

Photo monitoring showed some variability in biomass of ground cover across all 10 photo monitoring sites. Sites in RE 11.8.11 supported the greatest biomass ( $\geq 3,850$  kg/ha, averaging 4,743 kg/ha), with Site 07 (RE 11.4.3) supporting the lowest biomass (2,230 kg/ha) (Table 26). Areas of RE 11.8.5 supported  $\geq 2,500$  kg/ha, averaging 2,638 kg/ha, while the one RE 11.3.3a photo monitoring site supported 3,405 kg/ha biomass.

**Table 15: Results of biomass monitoring on the MDS Project site using Brigalow Belt Future Beef pasture photo standards.**

Photo monitoring site*	RE type	Brigalow Belt Future Beef pasture photo standard type				Biomass kg/ha
		Eucalypt woodlands	Blue grass, wire grass	Alluvial	Downs country	
01	11.8.5	✓				3,050
02	11.8.11				✓	5,040
03	11.8.5	✓				2,500
04	11.8.11				✓	3,850
05	11.8.5	✓				2,500
06	11.8.11				✓	5,040
07	11.4.3		✓			2,230
08	11.8.11				✓	5,040
09	11.3.3a			✓		3,405
10	11.8.5	✓				2,500

\* taken from the 0 m point of the permanent habitat monitoring transects.

### 3.6 GENERAL SITE INSPECTION

The condition of fencing and access gates across the MDS site was good, with no requirement for repair at the time of surveying. Existing access tracks including firebreaks were of a similar standard having recently been re-graded.

Field traverses in the south-west of the MDS Project site noted areas of RE 11.8.11a under stress, with the majority of *Melaleuca bracteata* in these areas showing signs of dieback (Figure 21). However, it was noted that much of this vegetation community was showing evidence of epicormic regrowth. It is therefore likely that this vegetation community is in a state of recovery following the drought prior to the 2019/2020 wet season. Notwithstanding, the condition of these communities will need to continue to be monitored to exclude alternative reasons for the dieback (e.g. whether a consequence of hydrological changes).





**Figure 21: Evidence of dieback of *Melaleuca bracteata* in areas of RE 11.8.11a.**

Site assessments revealed that areas that were identified as being subject to overgrazing during the dry-season surveys in December 2019 had shown considerable recovery. Notwithstanding, it is acknowledged that MDS is responsible for the management of activities within the MDS Project site only and does not have any responsibility for grazing regimes in the mining lease area that is outside of the MDS Project site.

Site traverses as part of all monitoring activities on the MDS Project site showed no obvious evidence of any dust deposition, nor any impacts attributable to dust deposition on king blue-grass, bluegrass or other vegetation communities. Aside from the dieback of *Melaleuca bracteata* woodland, likely associated with a drought response of this vegetation community (see above), results of targeted king blue-grass and bluegrass surveys would indicate an increase in populations of those species within 500 m of the project footprint since the baseline survey in March 2018.



## 4 RESULTS: MDS RAIL LOOP SITE

### 4.1 HABITAT MONITORING

Results of habitat condition assessments identified an average site condition score of 6.71 out of 10 across all four habitat monitoring sites, with scores ranging between 4.83 (Site MDSRL03) and 8.50 (Site MDSRL01 and MDSRL02). Site context scores varied from 8.85 out of 10 (MDSRL02, MDSRL03 and MDSRL04) up to 10 out of 10 (MDSRL01). Appendix B outline details of the site condition assessments, summarised below in Table 16.

**Table 16: MDS Rail Loop site habitat monitoring sites: site condition and site context scores calculated in accordance with the *Guide to determining terrestrial habitat quality* (DEHP 2017).**

Site	RE	Easting	Northing	Site condition score (/10)	Site context score (/10)
MDSRL01	11.8.11	645575	7303101	8.50	10.00
MDSRL02	11.8.11	646410	7303007	8.50	8.85
MDSRL03	11.8.11	646666	7303114	4.83	8.85
MDSRL04	11.8.11	646834	7303291	5.00	8.85
			<b>Average score</b>	<b>6.71</b>	<b>9.13</b>

### MNES habitat condition assessments

Based on the results of the site condition and assessments, habitat condition scores for the two MNES averaged 7.83 out of 10 for Natural grasslands TEC and 6.27 out of 10 for king blue-grass (Table 17). King blue-grass had the lower score of the two MNES (6.13) on account of the absence of any confirmed king-blue grass tussocks within the surveyed plots at the time of surveying. (refer to Appendix B for site condition raw data contributing to site condition score).

**Table 17: MDS Rail Loop site monitoring sites showing their habitat condition scores contributing to MNES.**

Site	RE	Natural Grasslands TEC	King blue-grass
MDSRL01	11.8.11	9.20	7.36
MDSRL 02	11.8.11	8.66	6.93
MDSRL 03	11.8.11	6.70	5.36
MDSRL 04	11.8.11	6.79	5.43
<b>Average score</b>		<b>7.83</b>	<b>6.27</b>

### Natural Grasslands habitat

Natural Grasslands TEC habitat condition scores for the four habitat monitoring sites ranged between 6.70 and 9.20 (Table 17). The four assessment sites supported between four and five TEC indicator grass species (Table 18). While additional species are likely to have been present, some individuals could not be identified to species level due to the dry conditions and as a consequence, lack of fertile material.



**Table 18: Natural Grasslands TEC indicator species at the MDS Rail Loop site.**

Scientific name	Common name	MDSRL01 RE 11.8.11	MDSRL02 RE 11.8.11	MDSRL03 RE 11.8.11	MDSRL04 RE 11.8.11
<i>Aristida latifolia</i>	Feather-top wiregrass	✓		✓	✓
<i>Aristida leptopoda</i>	White speargrass	✓	✓	✓	
<i>Astrebla elymoides</i>	Hoop mitchell grass				
<i>Astrebla lappacea</i>	Curly mitchell grass				
<i>Astrebla squarrosa</i>	Bull mitchell grass				
<i>Bothriochloa erianthoides</i>	Satin-top grass	✓	✓	✓	✓
<i>Dichanthium queenslandicum</i>	King blue-grass				
<i>Dichanthium sericeum</i>	Queensland bluegrass	✓	✓	✓	✓
<i>Eriochloa crebra</i>	Cup grass				
<i>Panicum decompositum</i>	Native millet	✓	✓	✓	✓
<i>Panicum queenslandicum</i>	Yabila grass				
<i>Paspalidium globoideum</i>	Shot grass				
<i>Thellungia advena</i>	Coolibah grass				
<b>TOTAL</b>		<b>5</b>	<b>4</b>	<b>5</b>	<b>4</b>

Natural Grassland quality assessments were conducted at each of the four habitat condition sites within a 50 m x 20 m plot. This included an assessment of the species richness of Natural Grassland TEC indicator species, density of grass tussocks, shrub cover and non-native plant cover. The results of this assessment (Table 19) indicated that two of the condition sites (MDSRL01 and MDSRL02) were in ‘best’ condition, with the remaining two sites (MDSRL03 and MDSRL04) being only in ‘good’ condition, largely attributed to the high weed cover in these plots, particularly *Setaria incrassata* and *Physalis lanceifolia*.

**Table 19: Condition classes for the Natural Grasslands TEC**

TEC quality criteria	MDSRL01 RE 11.8.11	MDSRL02 RE 11.8.11	MDSRL03 RE 11.8.11	MDSRL04 RE 11.8.11
Perennial indicator grass species	5	4	5	4
Number of native grass tussocks	>200	>200	>200	>200
Woody shrub canopy cover (%)	<5	<5	<5	<5
Perennial non-native plant cover (%)	4.5	4.8	13.4	21.6
<b>Condition class</b>	<b>Best</b>	<b>Best</b>	<b>Good</b>	<b>Good</b>

### King blue-grass habitat

King blue-grass habitat condition scores for the four habitat monitoring sites ranged between 5.36 and 7.36 (Table 17). No King-blue grass were positively identified from the four habitat condition assessment plots at the time of surveying, accounting for the lower MNES habitat condition score compared with Natural Grassland TEC scores.



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## 4.2 PHOTO MONITORING

Photo monitoring of the MDS Rail Loop site showed a relative consistent levels of biomass, characterised by a moderate grass cover. Whereas many areas of comparable areas of RE 11.8.11 on the MDS project site showed dense grass cover, the MDS Rail Loop site was not consistent with this, despite being represented by the same vegetation community. This is likely a consequence of historical disturbance, with the current condition an indication that the site is in a state of recovery. Ongoing management and concurrent photo monitoring should detect that change over time, as the grassland continues to recover. The results of the photo monitoring in the MDS Rail Loop site is presented in Appendix E.

## 4.3 WEED MONITORING

A total of 10 weed species were identified from the five weed monitoring plots. No additional species of weeds were observed on the site outside of those identified within the weed monitoring plots. Across the five weed monitoring plots, the average number of weed species observed per plot was 5.2 species, ranging between four species (Site MDSRL03 and MDSRL05) and seven species (Site MDSRL01), with four weed species only encountered at single sites. Weed cover across the five weed monitoring plots averaged 15.43%; ranging between 7.7% (Site MDSRL05) and 31.4% (Site MDSRL02)(Table 20 and Figure 22).

The most commonly encountered weeds were *Setaria incrassata* and *Verbena officinalis*, each recorded from all five sites (Table 20). However, while encountered at a large number of sites, the average cover of *Verbena officinalis* across those five encountered sites averaged only 0.3%, whereas *Setaria incrassata* had the highest average cover of 9.0%. *Cenchrus ciliaris* was encountered at three of the five sites, but had the second highest average cover, averaging 5.4% cover across the three sites it was recorded from (Table 20).



Table 20: Results of weed monitoring assessments at the MDS Rail Loop site.

Scientific name	Common name	Family name	Percentage cover of weed species from given site					# sites	Avg cover (%) <sup>a</sup>
			MDSRL01	MDSRL02	MDSRL03	MDSRL04	MDSRL05		
<i>Alternanthera pungens</i>	Khaki weed	Amaranthaceae	0.8			0.8		2	0.8
<i>Parthenium hysterophorus</i>	Parthenium weed	Asteraceae	0.9		0.5	1.3		3	0.9
<i>Opuntia tomentosa</i>	Velvety tree pear	Cactaceae	0.1					1	0.1
<i>Cucumis myriocarpus</i>	Paddy melon	Cucurbitaceae		0.1				1	0.1
<i>Leucaena leucocephala</i>	Leucaena	Fabaceae		0.6				1	0.6
<i>Cenchrus ciliaris</i>	Buffel grass	Poaceae	0.3	15.6			0.4	3	5.4
<i>Melinis repens</i>	Red natal grass	Poaceae		1.2				1	1.2
<i>Setaria incrassata</i>	Purple pigeon grass	Poaceae	3.9	13.7	16.2	6.4	4.7	5	9.0
<i>Physalis lanceifolia</i>	Gooseberry	Solanaceae	2.4		1.7	2.3	1.7	4	2.0
<i>Verbena officinalis</i>	Common verbena	Verbenaceae	0.1	0.2	0.4	0.1	0.9	5	0.3
		# species	7	6	4	5	4		
		Weed cover (%) <sup>b</sup>	8.5	31.4	18.8	10.9	7.7		

<sup>a</sup> Avg cover (%) represents the average percentage cover of a given weed species across encountered sites.

<sup>b</sup> Weed cover represents the sum of the average weed cover percentages of all weed species.



Path: P:\GISData\Project\Sojitz\18\_20200627\_Lex\MDS\_pos\_veg\_monitoring\_plots.mxd Figure 22 - MDS RAIL LOOP weed monitoring plots.mxd



Sojitz Blue Pty Ltd - MDS Rail Loop Location diagram

### Figure 22

#### MDS Rail Loop

#### Weed monitoring results

Disturbance areas

MDS Rail Loop site

Watercourse

**Ground-truthed REs**

RE 11.8.11

RE 11.8.11/11.8.5

RE 11.3.3a

Weed monitoring plots

**Weed cover (%)**

< 5

6 - 10

11 - 15

16 - 25

26 - 50

51 - 100

DATA SOURCE:  
The following datasets provided by Sojitz

- Disturbance areas
- Ground-truthed REs

Date: 7/16/2020    Coordinate System: GDA 1994 MGA Zone 55    Projection: Transverse Mercator    Datum: GDA 1994    Scale: 1:9,000@A3

0 100 200 300 400  
Metres

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## 4.4 BIOMASS MONITORING

Brigalow Belt pasture photo standards were used for all biomass monitoring points. ‘Downs country’ photo standards were used for monitoring all four of the sites comprising RE 11.8.11 (Table 21). Where the observed biomass at a site was mid-way between two photos within a given biomass standard, the middle of the corresponding range was reported (i.e. observed biomass between 3,015 kg/ha and 3,850 kg/ha ‘Downs country’ photo standards was reported as 3,433 kg/ha).

Photo monitoring showed limited variability in biomass of ground cover across all four photo monitoring sites. Overall, there was a moderate biomass for the vegetation type, with a biomass ranging between 2,140 kg/ha and 3,015 kg/ha.

**Table 21: Results of biomass monitoring on the MDS Project site using Brigalow Belt Future Beef pasture photo standards.**

Photo monitoring site*	RE type	Brigalow Belt Future Beef pasture photo standard type	
		Downs country	Biomass kg/ha
MDSRL01	11.8.11	✓	3,015
MDSRL02	11.8.11	✓	2,578
MDSRL03	11.8.11	✓	2,140
MDSRL04	11.8.11	✓	3,015

\* taken from the 50 m point of the permanent habitat monitoring transect.

## 4.5 GENERAL SITE INSPECTION

At the time of the monitoring, the rail loop was under construction, with extensive heavy machinery and earthworks. No development was observed outside of the extent of disturbance, and no rubbish or other matters likely to impact on the monitoring area was observed. This included no evidence of dust or other particulate material on the vegetation within the MDS Rail Loop monitoring area.



## 5 RESULTS: LEXINGTON OFFSET SITE

### 5.1 PHOTO MONITORING

Photo monitoring of the Lexington offset site showed a variety of levels of cover consistent within the varying vegetation communities. Photo monitoring in natural grassland areas (RE 11.8.11) ranged from a dense understorey in the eastern parts of the offset (Site 20: refer to Photo F-158 in Appendix F) through to relatively open areas with evidence of weeds in the western areas (Site 06: F-55 in Appendix F) resulting in reduced grass cover. Even in upslope areas characterised by shallower skeletal soils over basalt, there was still an appreciable grass cover for the vegetation type (Site 05: refer to Photo F-50 in Appendix F); indicative of a relatively good wet season. The results of the photo monitoring in the Lexington offset site is presented in Appendix F.

### 5.2 WEED MONITORING

A total of 30 weed species were identified from the 20 weed monitoring plots. No additional species of weeds were observed on the site outside of those identified within the weed monitoring plots. Across the 20 weed monitoring plots, the average number of weed species observed per plot was 9.3 species, ranging between four species (Site 13) and 15 species (Site 09), with six weed species only encountered at single sites. Weed cover across the 20 weed monitoring plots averaged 31.3%; ranging between 2.7% (Site 13) and 69.3% (Site 09; Table 22; Figure 23).

The most commonly encountered weed was *Cenchrus ciliaris* and *Parthenium hysterophorus*, both recorded from 17 of the 20 sites (Table 22). While recorded from only two weed monitoring plots, *Megathyrus maximus* had the highest average cover from the two sites of 13.1%.



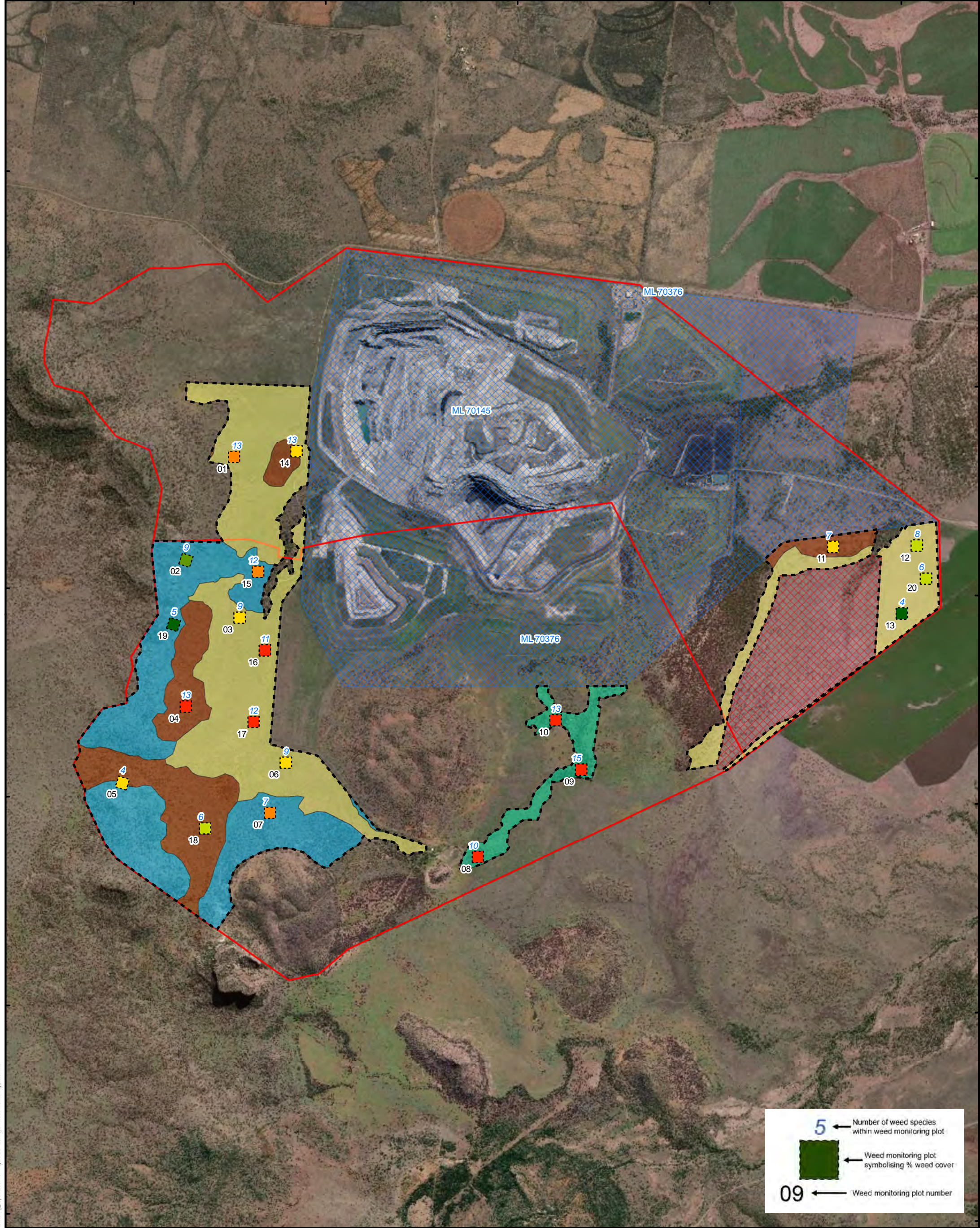
Table 22: Results of weed monitoring assessments at the Lexington offset site.

Scientific name	Common name	Family name	Percentage cover of weed species from given site																				# sites	Avg cover (%) <sup>a</sup>
			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20		
<i>Alternanthera pungens</i>	Khaki weed	Amaranthaceae													1.0							1	1.0	
<i>Cryptostegia grandiflora</i>	Rubber vine	Apocynaceae									1.1											1	1.1	
<i>Gomphocarpus physocarpus</i>	Ballon cotton-bush	Apocynaceae									0.1											1	0.1	
<i>Bidens bipinnata</i>	Bipinnate beggar's ticks	Asteraceae		0.5	0.2					0.2	13.2	1.8				0.6	2.0	0.5				8	2.4	
<i>Lactuca serriola</i>	Prickly lettuce	Asteraceae				0.2										0.3						2	0.3	
<i>Parthenium hysterophorus</i>	Parthenium weed	Asteraceae	11.8	0.2	2.0	1.0		11.9	1.8	3.6	0.2	12.3	5.6	3.9	1.6	2.7	11.7	10.7	12.4			7.0	17	5.9
<i>Sonchus oleracea</i>	Sow thistle	Asteraceae			0.2	0.1		0.2			0.1	0.3		0.1	0.2	0.5		0.1	0.7			0.5	11	0.3
<i>Tridax procumbens</i>	Tridax daisy	Asteraceae														0.1						1	0.1	
<i>Verbesina encelioides</i>	Goldweed	Asteraceae	0.6			0.5					0.7	0.4				0.1	0.6		0.1			7	0.4	
<i>Xanthium pungens</i>	Noogoora burr	Asteraceae									0.1							0.5	0.5			3	0.4	
<i>Opuntia tomentosa</i>	Velvety tree pear	Cactaceae								0.1		0.5					0.1					3	0.2	
<i>Cucumis myriocarpus</i>	Paddy melon	Cucurbitaceae	0.2		0.1			0.1		0.1			0.1	1.3	0.7	12.6	0.5		0.2			0.1	11	1.5
<i>Clitoria ternatea</i>	Butterfly pea	Fabaceae								11.5	6.5	4.3							0.1			4	5.6	
<i>Crotalaria juncea</i>	Sunhemp	Fabaceae	0.2	0.2		0.8	0.1													0.1		5	0.3	
<i>Macroptilium atropurpureum</i>	Siratro	Fabaceae									0.1											1	0.1	
<i>Stylosanthes viscosa</i>	Sticky stylo	Fabaceae		0.1		1.8	1.7		3.8									0.1		0.5	0.9	7	1.3	
<i>Vachellia farnesiana</i>	Mimosa bush	Fabaceae	3.1			0.1		0.3		5.9		0.4	0.5			0.3	3.1	3.8	10.1	0.7		11	2.6	
<i>Sida cordifolia</i>	Flannel weed	Malvaceae	0.5	0.4		0.2			2.8		0.8	2.3					0.2	0.1	0.1		0.1	10	0.8	
<i>Sida spinosa</i>	Sida	Malvaceae	0.7						0.4				0.1	0.1			0.2		0.7			6	0.4	
<i>Waltheria indica</i>	Sleepy morning	Malvaceae								0.5												1	0.5	
<i>Bothrichloa pertusa</i>	Indian bluegrass	Poaceae	2.5	2.6		1.0											0.5					4	1.7	
<i>Cenchrus ciliaris</i>	Buffel grass	Poaceae	2.0	0.6	1.3	44.9	14.4		26.6	17.9	0.5	21.1	13.3	3.0		0.6	8.7	28.7	6.2	8.1	1.5	17	11.7	
<i>Dichanthium aristatum</i>	Angleton grass	Poaceae									4.2	4.4										2	4.3	
<i>Megathyrsus maximus</i>	Guinea grass	Poaceae									37.5	18.2										2	27.9	
<i>Melinis repens</i>	Red natal grass	Poaceae	2.6	1.2		2.2	2.0	0.1	0.6				0.1	0.1	0.2				0.1	2.7	0.9	12	1.1	
<i>Sorghum halepense</i>	Johnson grass	Poaceae			0.3			0.1		1.1	1.5	0.2				0.1		0.1				7	0.5	
<i>Rumex crispus</i>	Curled dock	Polygonaceae	0.5		0.1			1.0						2.0							2.1	5	1.1	
<i>Capsicum sp.</i>	Chilli	Solanaceae						0.1			2.8											2	1.5	
<i>Physalis lanceifolia</i>	Gooseberry	Solanaceae	5.5		16.3	0.2		9.5	0.1	13.4		0.6	0.2			5.3	17.2	13.4	26.9		0.2	0.4	14	7.8
<i>Verbena officinalis</i>	Common verbena	Verbenaceae	2.0	0.2	0.1	1.2								0.2		0.6	0.8	0.1		0.7		0.2	10	0.6
		# species	13	9	9	13	4	9	7	10	15	13	7	8	4	13	12	11	12	6	5	6		
		Weed cover (%) <sup>b</sup>	32.1	6.0	20.6	54.2	18.1	23.3	36.0	54.1	69.3	66.6	19.9	10.6	2.7	24.7	45.5	58.1	58.0	12.8	3.6	10.3		

<sup>a</sup> Avg cover (%) represents the average percentage cover of a given weed species across encountered sites.

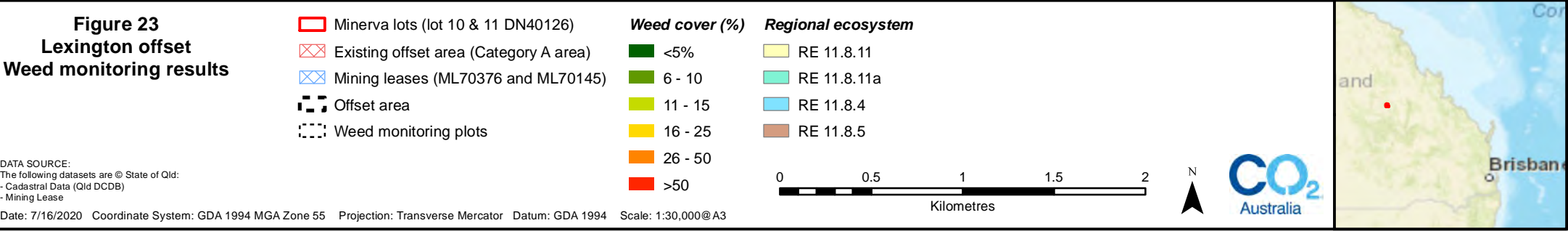
<sup>b</sup> Weed cover represents the sum of the average weed cover percentages of all weed species.





Sojitz Blue Pty Ltd - Lexington offset

Location diagram





## 5.3 PEST ANIMAL MONITORING

### 5.3.1 Rabbits

Results of rabbit monitoring confirmed the presence of rabbit/hare scats from nine of the 10 rabbit monitoring plots (R01 – R09)(Figure 27). Across these plots, pellet abundance ranged from isolated pellets and small clumps more than 10 m apart, to abundant pellets, often in large clumps and buck-heaps. Brown hares (*Lepus europaeus*) and European rabbits (*Oryctolagus cuniculus*) (Figure 24) were also visually confirmed at six separate fauna camera stations (Site C01, C02, C04, C10, C13, C15), which were spread across the whole Lexington offset site (Table 25). Brown hares and European rabbits were found evenly across the Lexington offset site, with five captures of each species recorded from three fauna camera sites; however both species were never captured from the same fauna camera site.



**Figure 24: Brown hare (*Lepus europaeus*) captured at fauna camera station C13 on the Lexington offset site.**

Table 23 shows the results of the assessment of overall rabbit impact. The results indicate that all of the sites displayed evidence of rabbit abundance with the exception of R10. The assessment of overall rabbit impact was denoted as 'unacceptable' for three sites, due to moderate levels of rabbit abundance (identified through the presence of scats; Figure 25), with rabbit damage only encountered at one site in the form of 45° seedling damage (Figure 26). Remaining sites were either denoted as 'monitor closely', with two sites (R05 and R10) denoted as 'acceptable'.



**Table 23: Assessment of overall rabbit impact at the Lexington offset site.**

Site	Rabbit abundance score (0 – 5)	Seedling abundance score (0 – 5)	Rabbit damage score (0 – 5)	Corrected regeneration score (0 – 5)	Overall rabbit impact
R01	1	1	0	1.0	Monitor closely
R02	2	3	0	3.0	Monitor closely
R03	2	2	0	2.0	Unacceptable
R04	2	3	0	3.0	Monitor closely
R05	1	3	0	3.0	Acceptable
R06	2	3	1	1.5	Unacceptable
R07	1	2	0	2.0	Monitor closely
R08	3	3	0	3.0	Monitor closely
R09	3	2	0	2.0	Unacceptable
R10	0	0	0	0.2	Acceptable

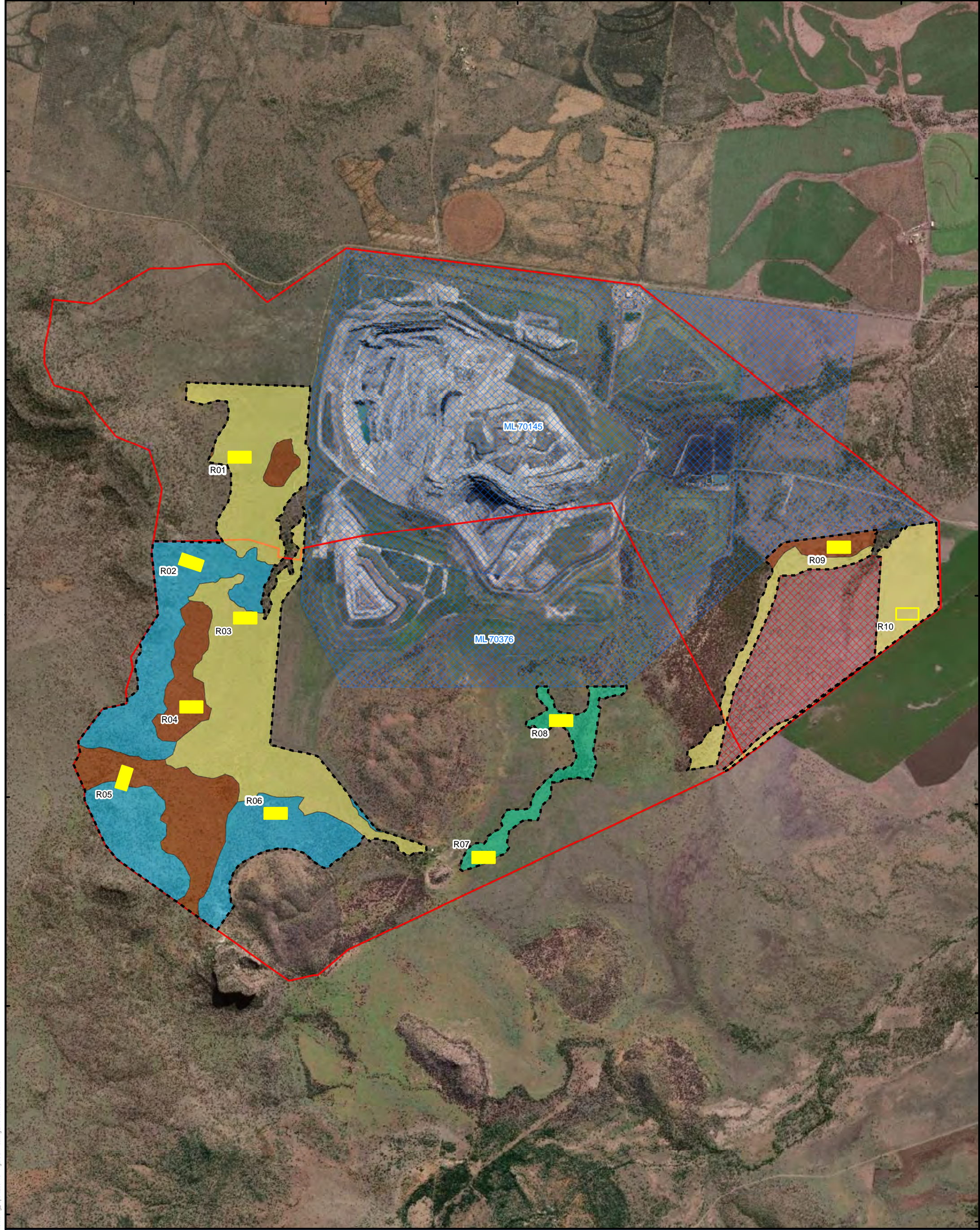


**Figure 25: Rabbit scats and diggings seen at the Lexington offset.**



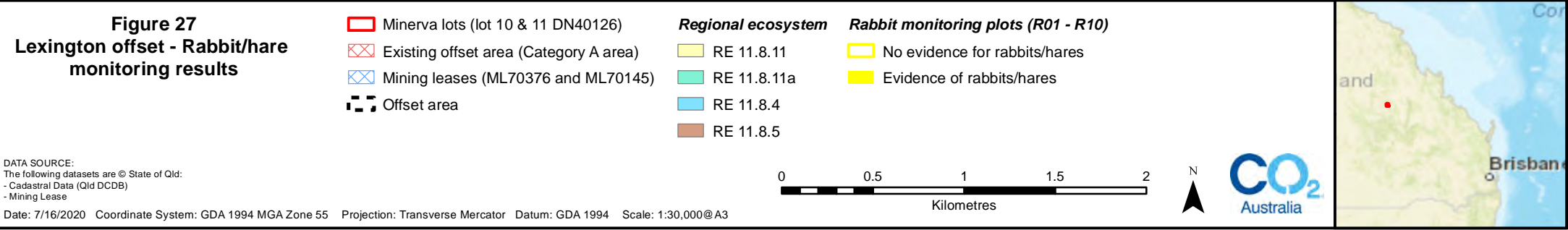
**Figure 26: Evidence of rabbit damage in the form of 45-degree angled clipping of young stems, found at the Lexington offset.**





Sojitz Blue Pty Ltd - Lexington offset

Location diagram





### 5.3.2 Feral pigs

Across the eight pig monitoring plots, there was confirmed evidence for the presence of feral pigs in five plots. There was evidence of feral pigs through direct observation (P07), observed as a single young piglet, although no pigs were confirmed via and of the 15 fauna cameras. Evidence of feral pig presence within plots ranged from 0% (Sites P03 and P05) to 37% (Site P01) and, on average, was observed across 13.33% of the available transect sections within each plot (Table 24). Indicators of pig presence were often observed within the direct vicinity of areas mapped as RE 11.8.11a (Figure 28). These areas are represented by *Melaleuca bracteata* woodland along ephemeral watercourse and as such, are likely to be favoured by feral pigs given they afford greater cover compared to the surrounding woodland and grassland habitat.

**Table 24: Assessment of overall feral pig presence and activity at the Lexington offset site, denoted as either rooting (R), footprints (F), travel pads (P) or physical presence (+).**

Monitoring plot survey section (50 m)													
Plot	Transect	1	2	3	4	5	6	7	8	9	10	Transect	Plot % (record/30)
P01	1	-	R F	-	-	-	-	-	-	R	-	20%	37%
	2	-	P	-	-	R	-	-	R	P	P R	50%	
	3	-	-	R	R	R	F	-	-	-	-	40%	
P02	1	-	-	-	-	-	-	-	-	-	-	0%	3%
	2	D	-	-	-	-	-	-	-	-	-	10%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P03	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P04	1	-	-	P	-	R	-	-	-	-	-	20%	13.33%
	2	-	-	-	-	-	R	-	-	-	-	10%	
	3	-	-	-	-	-	-	P	-	-	-	10%	
P05	1	-	-	-	-	-	-	-	-	-	-	0%	0%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P06	1	-	-	-	-	-	-	R	P R	-	P F R	30%	20%
	2	-	-	-	D R	-	-	-	P	-	P	30%	
	3	-	-	-	-	-	-	-	-	-	-	0%	
P07	1	-	-	-	R	-	F R	R	R	-	-	40%	16.67%
	2	-	-	-	-	-	-	-	-	-	-	0%	
	3	-	+ R	-	-	-	-	-	-	-	-	10%	
P08	1	-	-	-	-	-	-	-	-	-	-	0%	16.67%
	2	-	R	P	R	R	-	-	-	-	-	40%	
	3	-	-	-	-	F P	-	-	-	-	-	10%	
												<b>Total</b>	<b>13.33%</b>



148°1'0"E 148°2'0"E 148°3'0"E 148°4'0"E 148°5'0"E

23°54'0"S

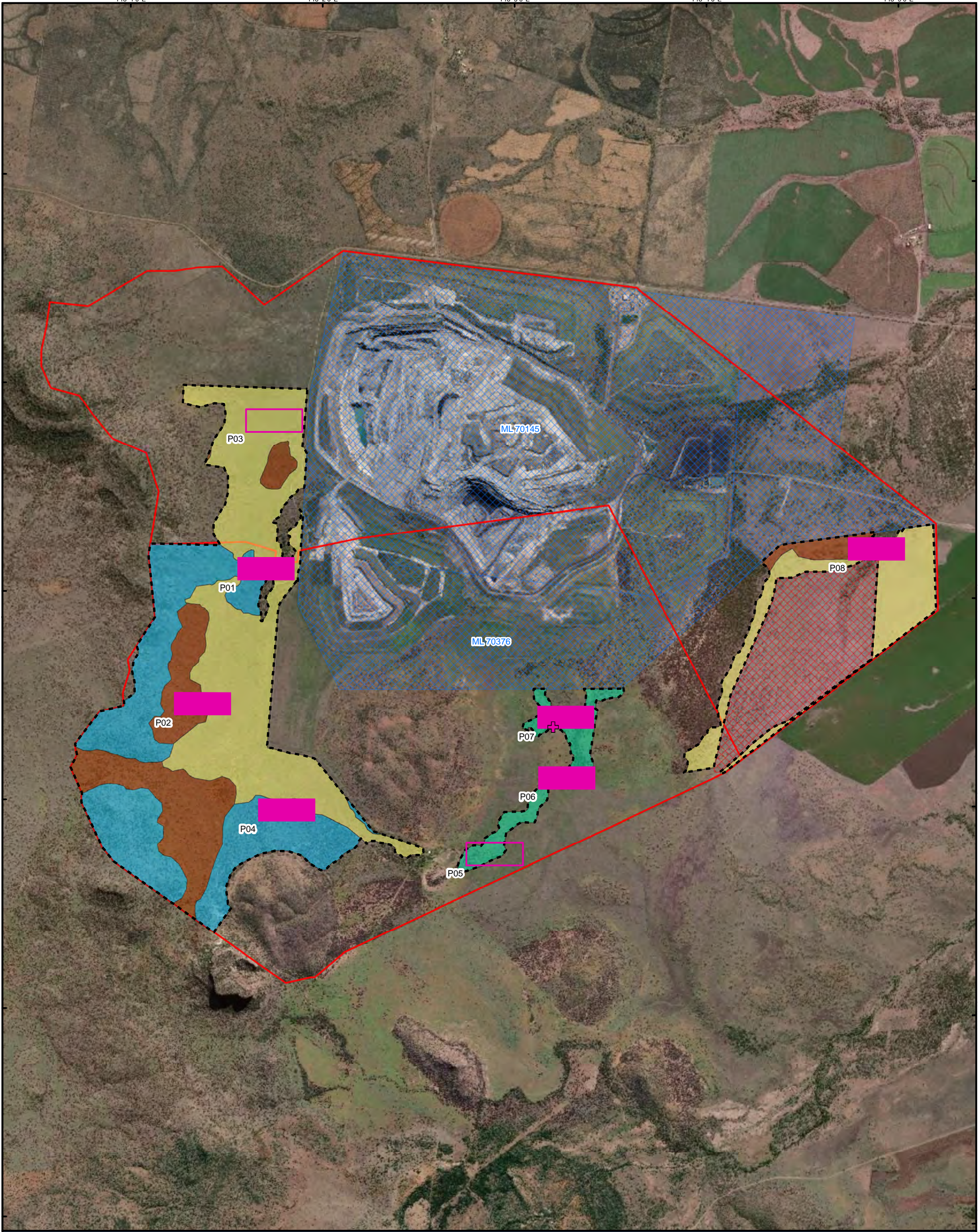
23°55'0"S

23°56'0"S

23°57'0"S

23°58'0"S

23°59'0"S



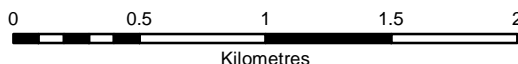
Sojitz Blue Pty Ltd - Lexington offset Location diagram

**Figure 28**  
**Lexington offset**  
**Evidence of feral pigs**

- |  |                           |   |
|--|---------------------------|---|
| Minerva lots (lot 10 & 11 DN40126)     | <b>Regional ecosystem</b> | <b>Pig monitoring plots (P01 - P08)</b> |
| Incidental observations of feral pigs  | RE 11.8.11                | No evidence of feral pigs               |
| Existing offset area (Category A area) | RE 11.8.11a               | Evidence of feral pigs                  |
| Mining leases (ML70376 and ML70145)    | RE 11.8.4                 |   |
| Offset area                            | RE 11.8.5                 |   |

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data (Qld DCDB)  
- Mining Lease

Date: 7/16/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:30,000@A3





### 5.3.3 Fauna camera station

Of the 15 fauna camera stations, 14 were operable across each of the three consecutive nights, resulting in a total of 42 operable station nights for the purposes of calculating Catling Index values for pest animal species. The fauna camera at site C05 did not display any captures due to a camera error and was deemed inoperable. The fauna cameras confirmed the presence of four pest animal species, namely feral cat (*Felis catus*; Figure 29), brown hare (*Lepus capensis*), European rabbit (*Oryctolagus cuniculus*) and wild dog (*Canis familiaris*; Figure 30). The highest Catling Index score was 21.4 for the feral cat, followed by European rabbit and brown hare (11.9) and wild dog (7.1). Non-pest animals were also detected from the fauna camera stations, including eastern grey kangaroo (*Macropus giganteus*), rufous bettong (*Aepyprymnus rufescens*), Australian magpie (*Cracticus tibicen*), Australian raven (*Corvus coronoides*), galah (*Eolophus roseicapilla*), emu (*Dromaius novaehollandiae*) and horse (*Equus caballus*).

Overall, there were 22 individual pest animal detections, recorded from 9 (64%) of the 14 fauna camera stations (Table 25). These detections were made throughout the site (Figure 31), although there was a notable lack of pest animal detections along Prickle Farm Road that traverses the centre of Lexington (Figure 31).

**Table 25: Pest animal results from the Lexington offset site.**

Pest animal species	Confirmed incidence of pest animal species from given site															Catling Index
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	
Nights camera operable*	3	3	3	3	0	3	3	3	3	3	3	3	3	3	3	
Wild dog																
25/06/20													✓			7.1
26/06/20																
27/06/20						✓							✓			
Feral cat																
25/06/20			✓										✓			21.4
26/06/20																
27/06/20	✓	✓	✓			✓				✓	✓		✓			
European rabbit																
25/06/20										✓						11.9
26/06/20		✓		✓												
27/06/20		✓								✓						
Brown hare																
25/06/20																11.9
26/06/20													✓		✓	
27/06/20	✓												✓		✓	

\* 42 camera nights for the purposes of calculating Catling Index.





Figure 29: Feral cat (*Felis catus*) captured at fauna camera station C11 on the Lexington offset site.



Figure 30: Wild dog (*Canis familiaris*) captured at fauna camera station C13 on the Lexington offset site.



148°1'0"E 148°2'0"E 148°3'0"E 148°4'0"E 148°5'0"E

23°54'0"S

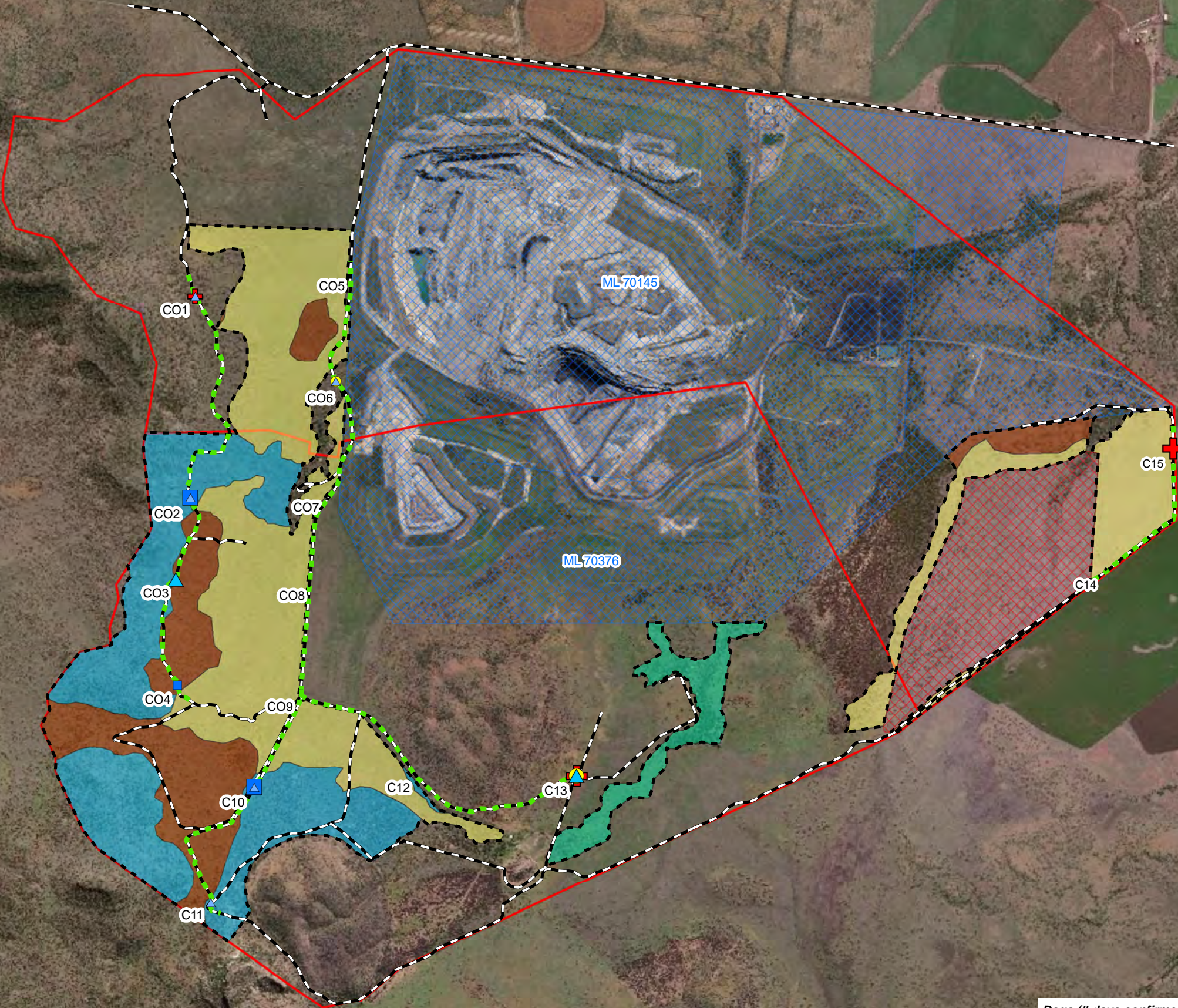
23°55'0"S

23°56'0"S

23°57'0"S

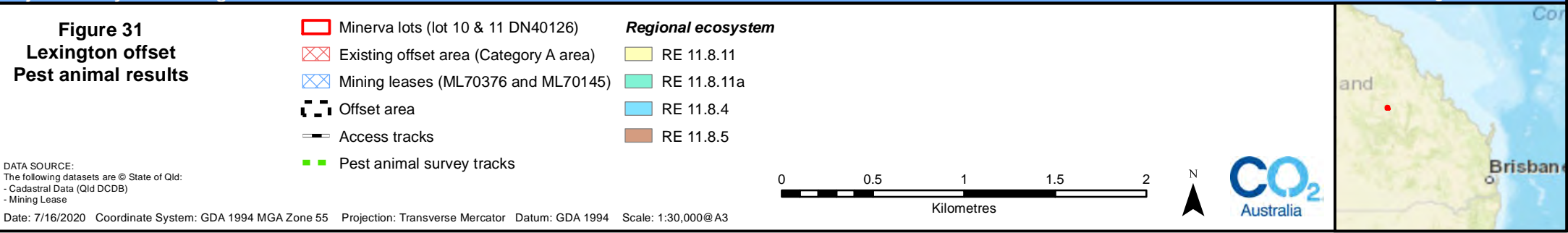
23°58'0"S

23°59'0"S



Sojitz Blue Pty Ltd - Lexington offset

Location diagram





## 5.4 BIOMASS MONITORING

### 5.4.1 Biomass monitoring for fire management

Brigalow Belt pasture photo standards were used for all biomass monitoring points. ‘Downs country’ photo standards were used for offset areas comprising of RE 11.8.11 and RE 11.8.11a, whilst photo monitoring results from areas of RE 11.8.4 and RE 11.8.5 were assessed against ‘Narrow-leaved Ironbark’ photo standards (Table 26).

Photo monitoring showed some variability in biomass of ground cover. Sites in RE 11.8.11 and 11.8.11a were all at least 2,578 kg/ha and up to 5,040 kg/ha (Site 20), while biomass in RE 11.8.4 and RE 11.8.5 ranged between 1,750 kg/ha in rockier upslope areas (Site 02) and 5,000 kg/ha in more open grassy woodland areas (Site 11; Table 26).

**Table 26: Results of biomass monitoring on the Lexington offset site using Brigalow Belt Future Beef pasture photo standards.**

Photo monitoring site*	RE type	Brigalow Belt pasture photo standard type		
		Narrow-leaved ironbark	Downs country	Biomass kg/ha
01	11.8.11		✓	3,850
02	11.8.4	✓		1,750
03	11.8.11		✓	3,015
04	11.8.5	✓		2,000
05	11.8.4	✓		3,625
06	11.8.11		✓	3,015
07	11.8.4	✓		1,750
08	11.8.11a		✓	3,015
09	11.8.11a		✓	3,850
10	11.8.11a		✓	4,445
11	11.8.5	✓		5,000
12	11.8.11		✓	4,445
13	11.8.11		✓	3,850
14	11.8.5	✓		3,625
15	11.8.4	✓		2,000
16	11.8.11		✓	2,578
17	11.8.11		✓	2,578
18	11.8.5	✓		2,250
19	11.8.4	✓		2,000
20	11.8.11		✓	5,040

\* taken from the 0 m point of the permanent habitat monitoring transects (Sites 01 – 12) and the SW corner of the standalone weed monitoring plots (Sites 13 – 20).



### 5.4.2 Biomass monitoring for sustainable grazing

While cattle were observed within the north-west of the offset area as part of the post-wet season survey, the results of the current biomass monitoring will be utilised as part of the Annual Land Condition-Pasture Budget Assessment, to be completed by Sojitz Blue. This will include an assessment of any proposed grazing management regimes in the offset area.

## 5.5 SIGNIFICANT SPECIES

While targeted survey for *Dichanthium queenslandicum* (king blue-grass) and *D. setosum* (bluegrass) were not scheduled to be undertaken during the post-west season surveys at the Lexington offset site, numerous populations of both species were confirmed throughout the offset area (Figure 32) during monitoring within weed plots, as well as across rabbit and pig monitoring plots.

Of particular significance was the presence of at least 38 populations of *D. setosum*<sup>2</sup> which were restricted to areas of RE 11.8.5 and RE 11.8.4 in the west of the offset area. A particularly large population was seen in the vicinity of the weed monitoring plot at site 02, with other populations confirmed from near sites 07 and 19.

Three populations of *Dichanthium queenslandicum* were confirmed from the Lexington offset site, including a large population of over 200 tussocks in the east of the Lexington offset area immediately to the south of site 13 (Figure 32). Another population was confirmed in the east of the offset area to the north-west of site 12, although since surveying in 2018, the eastern-most parts of Lexington have always supported appreciable populations of *D. queenslandicum*. Significantly, a population of *D. queenslandicum* was confirmed in the western expanse of RE 11.8.11 to the north-west of site 14 (Figure 32). While populations of *D. queenslandicum* are known from areas of RE 11.8.11 in North Promenade paddock to the north of the Lexington offset area, it is understood to be the first confirmed record of *D. queenslandicum* in this part of the Lexington offset area.

## 5.6 GENERAL SITE INSPECTION

Following the dry season monitoring in December 2019, many upgrades and installations of fencing has occurred throughout the Lexington offset site, with additional access tracks also installed. Where observed, updated fencing and access tracks are presented in the Lexington monitoring site figures (Figure 5 and Figure 6). Some of the fencing was being constructed at the time of surveying in June 2020. The additional fencing extent and access tracks outside of the extent of traversed areas in June 2020 could not be confirmed and will need to be supplied.

It is understood that a share-farming agreement is in place to limit the head of cattle per paddock. However, cattle were observed in the natural grassland areas in the west of the Lexington offset area during the post-west season monitoring. There was also evidence of previous cattle grazing in some of these offset areas.

Outside of the weed monitoring plots assessed as part of the post-wet season surveys, there were a number of areas away from surveyed plots where weed infestation was considered serious. Most noticeably was the

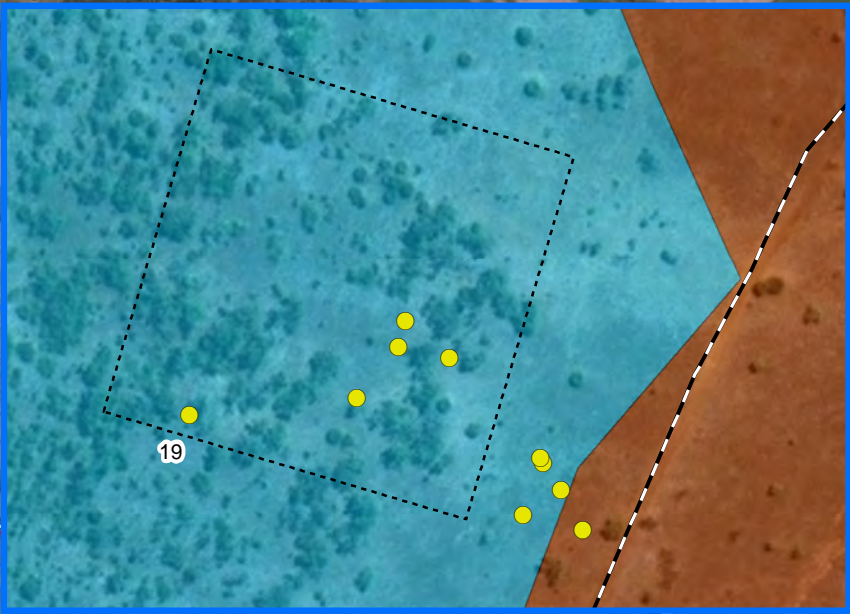
<sup>2</sup> Prior surveying by CO2 Australia ecologists in March 2018 confirmed the presence of a previously undescribed species of *Dichanthium* from the Lexington offset area. This species was given the interim name *Dichanthium sp. affine. sericeum* until such time as it is formally described. Since this initial 2018 survey, CO2 Australia ecologist Dr Jarrad Cousin has confirmed additional populations of this undescribed species from other properties in the greater Springsure - Rolleston area. While investigations into this undescribed species are continuing by botanists from the Queensland Herbarium, with assistance from CO2 Australia, discerning the two species in the field is difficult, especially when there is limited flowering material. Consequently, it is highly likely that many of the populations identified as *D. setosum* could in fact be the morphologically similar undescribed *Dichanthium* species. For the purposes of reporting however, and until such time as the species is formally described, any setosum-like species of *Dichanthium* is considered *D. setosum*.



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the extent and density of weeds within and adjacent the ephemeral drainage line and bore on Prickle Farm Road that flanks the western edge of the mining lease (ML 70376). In this area, the ephemeral drainage line was densely infested by Noogoora burr (*Xanthium occidentale*), with areas away from the drainage line characterised by dense, monospecific stands of *Parthenium hysterophorus*.





Sojitz Blue Pty Ltd - Lexington offset

Location diagram

**Figure 32**  
**Lexington offset**  
**Significant species**

- Access tracks
- Minerva lots (lot 10 & 11 DN40126)
- Existing offset area (Category A area)
- Mining leases (ML70376 and ML70145)
- Offset area
- Weed monitoring plots

**Regional ecosystem**

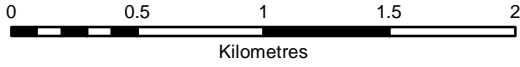
- RE 11.8.11
- RE 11.8.11a
- RE 11.8.4
- RE 11.8.5

**Significant species**

- Dichanthium queenslandicum
- Dichanthium setosum

DATA SOURCE:  
The following datasets are © State of Qld:  
- Cadastral Data (Qld DCDB)  
- Mining Lease

Date: 7/16/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:30,000@A3





## 6 RESULTS: LEXINGTON RAIL LOOP OFFSET SITE

### 6.1 HABITAT MONITORING

Results of habitat condition assessments identified an average site condition score of 7.57 out of 10 across all seven habitat monitoring sites, with scores ranging between 5.67 (Site LEXRL03) and 8.67 (Site LEXRL05). Site context scores varied from 6.54 out of 10 (LEXRL03) up to 10 out of 10 (LEXRL01 and LEXRL02). Appendix C outlines details of the site condition assessments, summarised below in Table 16.

**Table 27: Lexington Rail Loop offset site habitat monitoring sites: site condition and site context scores calculated in accordance with the *Guide to determining terrestrial habitat quality* (DEHP 2017).**

Offset paddock	Site	RE	Easting	Northing	Site condition score (/10)	Site context score (/10)
North Promenade	LEXRL01	11.8.11	604390	7355247	6.33	10.00
	LEXRL02	11.8.11	604758	7354797	8.00	10.00
Harry's	LEXRL03	11.8.11	608595	7355228	5.67	6.54
	LEXRL04	11.8.11	609262	7355036	8.00	7.31
Contours	LEXRL05	11.8.11	612011	7354575	8.67	7.31
	LEXRL06	11.8.11	611834	7354280	7.83	7.31
	LEXRL07	11.8.11	611215	7353711	8.50	7.31
				<b>Average score</b>	<b>7.57</b>	<b>7.97</b>

#### MNES habitat condition assessments

Based on the results of the site condition and assessments, habitat condition scores for the two MNES averaged 7.76 out of 10 for Natural grasslands TEC and 6.92 out of 10 for king blue-grass (Table 17). King blue-grass had the lower score of the two MNES (6.92) on account of the absence of confirmed king-blue grass tussocks from four of the seven surveyed plots. (refer to Appendix C for site condition raw data contributing to site condition score).

**Table 28: Lexington Rail Loop offset site monitoring sites showing their habitat condition scores contributing to MNES.**

Offset paddock	Site	RE	Natural Grasslands TEC	King blue-grass
North Promenade	LEXRL01	11.8.11	8.04	6.43
	LEXRL02	11.8.11	8.93	7.14
Harry's	LEXRL03	11.8.11	6.07	6.52
	LEXRL04	11.8.11	7.68	8.14
Contours	LEXRL05	11.8.11	8.04	7.76
	LEXRL06	11.8.11	7.59	6.07
	LEXRL07	11.8.11	7.95	6.36
<b>Average score</b>			<b>7.76</b>	<b>6.92</b>



## Natural Grasslands habitat

Natural Grasslands TEC habitat condition scores for the seven habitat monitoring sites ranged between 6.07 and 8.93 (Table 17). The seven assessment sites supported between three and four TEC indicator grass species (Table 18). While additional species are likely to have been present, some individuals could not be identified to species level due to the dry conditions and as a consequence, lack of fertile material. Notably, *Dichanthium queenslandicum* was confirmed at three of the seven sites, including both the Harry's paddock monitoring sites and one of the three Contours paddock monitoring sites.

**Table 29: Natural Grasslands TEC indicator species at the Lexington Rail Loop offset site.**

Scientific name	Common name	North Promenade		Harry's		Contours		
		LEXRL01	LEXRL02	LEXRL03	LEXRL04	LEXRL05	LEXRL06	LEXRL07
<i>Aristida latifolia</i>	Feather-top wiregrass							
<i>Aristida leptopoda</i>	White speargrass	✓	✓					✓
<i>Astrebla elymoides</i>	Hoop mitchell grass							
<i>Astrebla lappacea</i>	Curly mitchell grass							
<i>Astrebla squarrosa</i>	Bull mitchell grass							
<i>Bothriochloa erianthoides</i>	Satin-top grass	✓	✓			✓		✓
<i>Dichanthium queenslandicum</i>	King blue-grass			✓	✓	✓		
<i>Dichanthium sericeum</i>	Queensland bluegrass	✓	✓	✓	✓	✓	✓	✓
<i>Eriochloa crebra</i>	Cup grass							
<i>Panicum decompositum</i>	Native millet	✓	✓	✓	✓	✓	✓	✓
<i>Panicum queenslandicum</i>	Yabila grass						✓	
<i>Paspalidium globoideum</i>	Shot grass							
<i>Thellungia advena</i>	Coolibah grass							
<b>TOTAL</b>		<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>4</b>

Natural Grassland quality assessments were conducted at each of the seven habitat condition sites within a 50 m x 20 m plot. This included an assessment of the species richness of Natural Grassland TEC indicator species, density of grass tussocks, shrub cover and non-native plant cover. The results of this assessment (Table 19) indicated that four of the condition sites (LEXRL01, LEXRL02, LEXRL05 and LEXRL07) were in 'best' condition, with the remaining three sites (LEXRL03, LEXRL04 and LEXRL06) being only in 'good' condition, largely attributed to the presence of only three perennial indicator grass species, with both of the Harry's paddock sites being in only 'good' condition despite the presence of *Dichanthium queenslandicum*.



**Table 30: Condition classes for the Natural Grasslands TEC at the Lexington Rail Loop offset site.**

TEC quality criteria	North Promenade		Harry's		Contours		
	LEXRL01	LEXRL02	LEXRL03	LEXRL04	LEXRL05	LEXRL06	LEXRL07
Perennial indicator grass species	4	4	3	3	4	3	4
Number of native grass tussocks	>200	>200	>200	>200	>200	>200	>200
Woody shrub canopy cover (%)	<5	<5	<5	<5	<5	<5	<5
Perennial non-native plant cover (%)	9.1	1.15	9.8	2.25	0	0.5	3.4
<b>Condition class</b>	<b>Best</b>	<b>Best</b>	<b>Good</b>	<b>Good</b>	<b>Best</b>	<b>Good</b>	<b>Best</b>

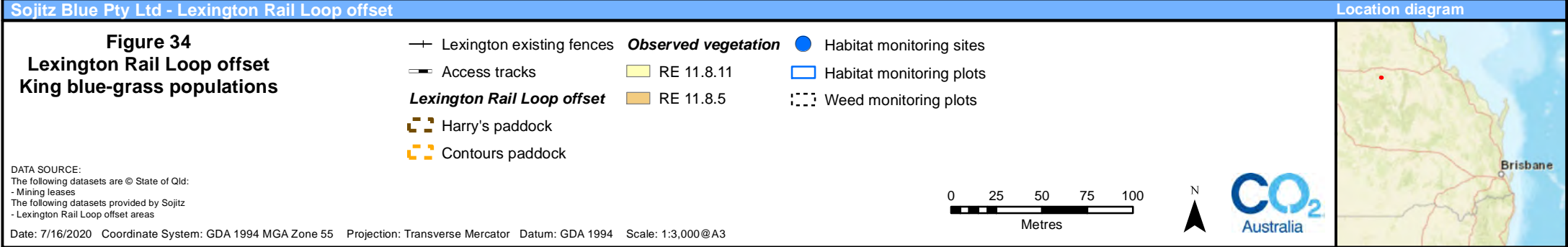
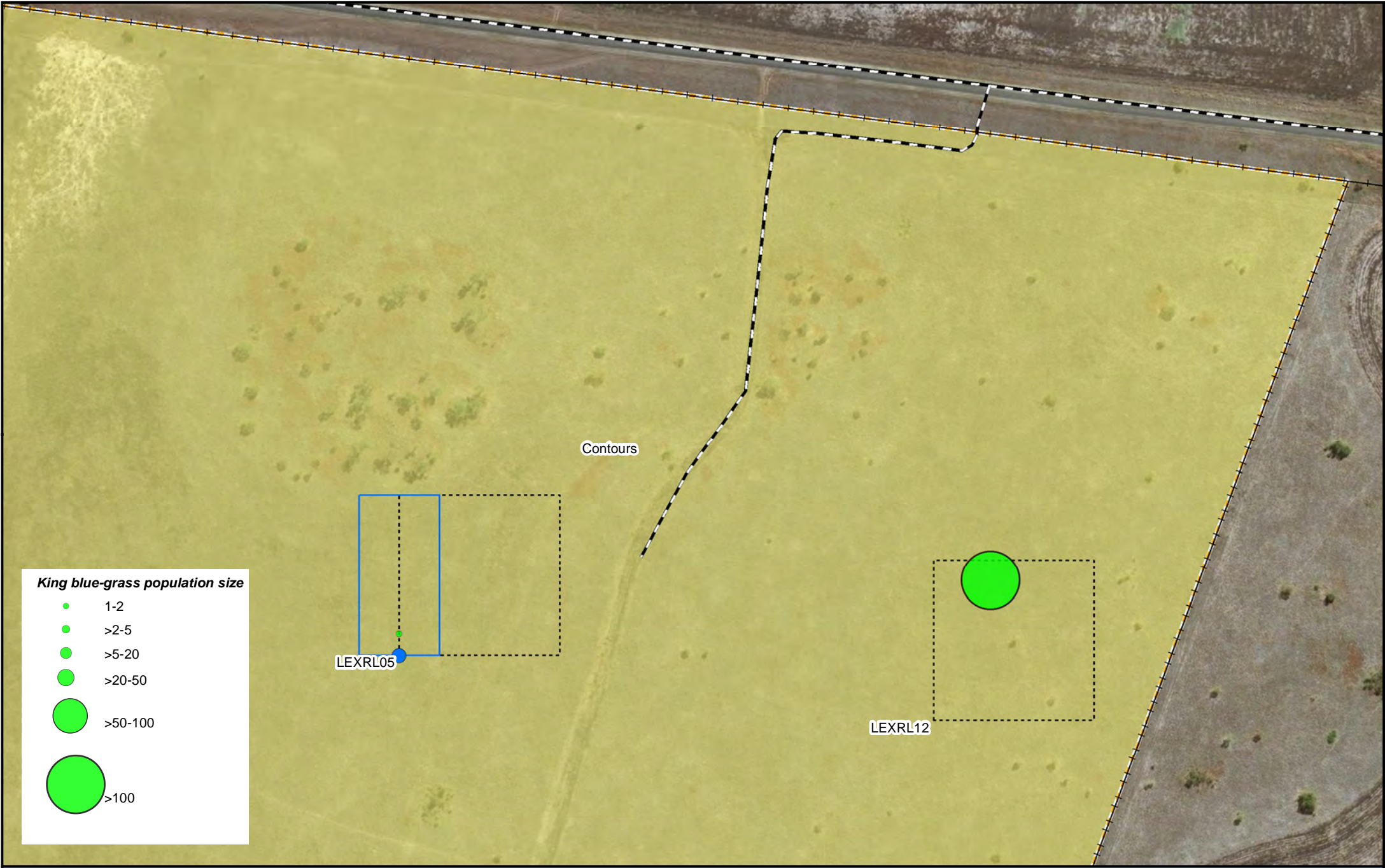
### King blue-grass habitat

King blue-grass habitat condition scores for the seven habitat monitoring sites ranged between 6.07 and 8.93 (Table 17). King-blue grass was positively identified from three of the seven habitat condition assessment plots at the time of surveying, present as single tussocks (Site LEXRL06) up to a population at LEXRL04 of 20-50 tussocks (Figure 34). Outside of the habitat condition assessment plots, the only confirmed population of king blue-grass was within the LEXRL12 weed monitoring plot, where a population of over 100 tussocks was confirmed (Figure 33).



**Figure 33: Population of >100 king blue-grass (*Dichanthium queenslandicum*) tussocks in the foreground, with the taller, more upright *Dichanthium sericeum* in the background.**







## 6.2 PHOTO MONITORING

Photo monitoring of the Lexington Rail Loop offset sites showed consistent levels of high grass cover across the Harry's and Contours paddocks (Site LEXRL05: refer to Photo G-43 in Appendix G), with slightly reduced grass cover in the North Promenade paddock (Site LEXRL09: refer to Photo G-80 in Appendix G). Variability in the ground cover within the North Promenade and Harry's paddocks is likely a consequence of cattle grazing and horse grazing (respectively) in the two paddocks. Ongoing management and concurrent photo monitoring should detect improvements in these paddocks over time, as the grassland continues to mature and recover from these disturbances. The results of the photo monitoring in the MDS Rail Loop site is presented in Appendix G.

## 6.3 WEED MONITORING

A total of 15 weed species were identified from the 12 weed monitoring plots. No additional species of weeds were observed on the site outside of those identified within the weed monitoring plots. Across the 12 weed monitoring plots, the average number of weed species observed per plot was 4.8 species, ranging between one species (Site LEXRL05, LEXRL07 and LEXRL11) and 10 species (Site LEXRL02 and LEXRL09), with three weed species only encountered at single sites. Weed cover across the 12 weed monitoring plots averaged 11.5%; ranging between 0.1% (Site LEXRL07) and 39.1% (Site LEXRL09) (Table 31 and Figure 35).

The number of weed species differed by offset paddock, with the North Promenade paddock having a higher weed species richness and average cover (8.75 species and 24.2% cover) than Harry's (5 species and 10.0% cover), with Contours having the lowest weed species richness and average cover of all three paddocks (1.6 species and 2.3% cover).

The most commonly encountered weed was *Parthenium hysterophorus* which was recorded from eight of the 12 sites (Table 31). *Parthenium hysterophorus* also had the highest average cover of 8.2%, followed by *Cucumis myriocarpus* which from the four sites it was encountered at, had an average cover of 7.5%. Nine of the 15 weed species (60%) had average covers <0.5%.



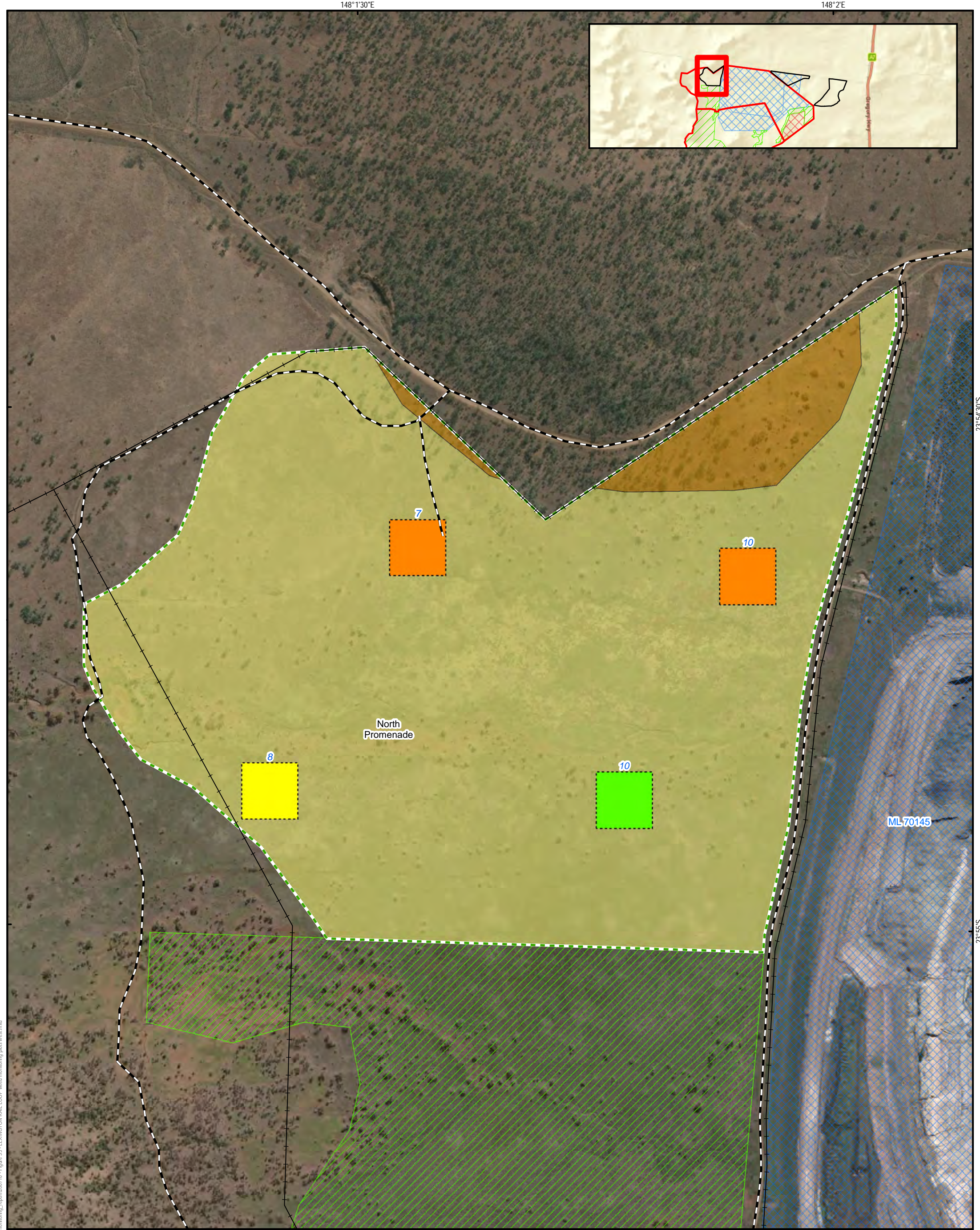
**Table 31: Results of weed monitoring assessments at the Lexington Rail Loop offset site.**

Scientific name	Common name	Family name	Percentage cover of weed species from given site												# sites	Avg cover (%) <sup>a</sup>
			LEXRL01	LEXRL02	LEXRL03	LEXRL04	LEXRL05	LEXRL06	LEXRL07	LEXRL08	LEXRL09	LEXRL10	LEXRL11	LEXRL12		
<i>Bidens bipinnata</i>	Bipinnate Beggar's Ticks	Asteraceae		0.2						0.1					2	0.2
<i>Lactuca serriola</i>	Prickly Lettuce	Asteraceae		0.1						0.1	0.2				3	0.1
<i>Parthenium hysterophorus</i>	Parthenium Weed	Asteraceae	19.2	2.8	0.8	6.4				8.0	15.1	4.3	8.8		8	8.2
<i>Sonchus oleracea</i>	Sow Thistle	Asteraceae		0.2						0.1	0.1				3	0.1
<i>Verbesina encelioides</i>	Goldweed	Asteraceae	0.1												1	0.1
<i>Cucumis myriocarpus</i>	Paddy Melon	Cucurbitaceae	5.2	0.6						3.6	20.9				4	7.5
<i>Vachellia farnesiana</i>	Mimosa Bush	Fabaceae	1.9	4.5				0.5		5.5	0.1				5	2.5
<i>Sida spinosa</i>	Sida	Malvaceae		0.1											1	0.1
<i>Cenchrus ciliaris</i>	Buffel Grass	Poaceae	0.6	0.5						1.0	0.5			1.1	5	0.7
<i>Dichanthium aristatum</i>	Angleton Grass	Poaceae				8.0	0.5					5.1			3	4.5
<i>Melinis repens</i>	Red Natal Grass	Poaceae			0.1	0.3						0.7		0.4	4	0.4
<i>Sorghum halepense</i>	Johnson Grass	Poaceae	0.1		0.3	0.1					0.1	0.1			5	0.1
<i>Rumex crispus</i>	Curled Dock	Polygonaceae									0.1				1	0.1
<i>Physalis lanceifolia</i>	Goosberry	Solanaceae	1.2	0.9	2.9						2.0				4	1.7
<i>Verbena officinalis</i>	Common Verbena	Verbenaceae		0.4	0.4	0.1		0.1	0.1	1.0	0.1	0.3		0.1	9	0.3
		# species	7	10	5	5	1	2	1	8	10	5	1	3		
		Weed cover (%) <sup>b</sup>	28.2	10.2	4.5	14.9	0.5	0.6	0.1	19.3	39.1	10.5	8.8	1.6		

<sup>a</sup> Avg cover (%) represents the average percentage cover of a given weed species across encountered sites.

<sup>b</sup> Weed cover represents the sum of the average weed cover percentages of all weed species.





**Figure 35**  
**Lexington Rail Loop offset**  
**Weed monitoring results - west**

— Lexington existing fences  
— Access tracks  
— Lexington offset area  
— Mining leases (ML70376 and ML70145)

**Lexington Rail Loop offset**

— North Promenade paddock

**Observed vegetation**

RE 11.8.11  
RE 11.8.5

**Weed cover (%)**

< 5  
6 - 10

11 - 15  
16 - 25  
26 - 50  
51 - 100

**Legend**

— Weed monitoring plots

**Scale**

0 50 100 150 200  
Metres

**North**

**CO2 Australia**

**Location diagram**

**Sojitz Blue Pty Ltd - Lexington Rail Loop offset**



148°4'E

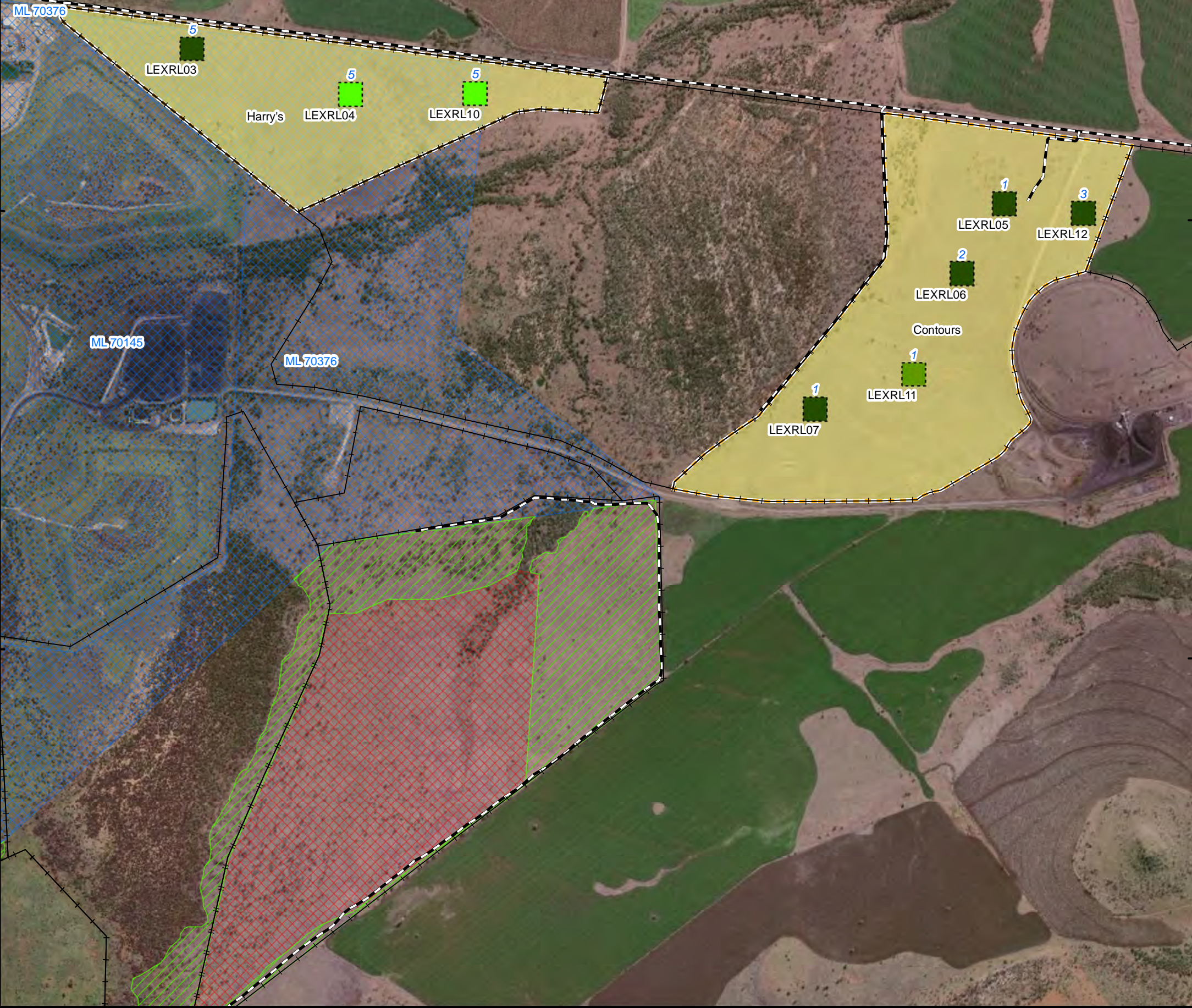
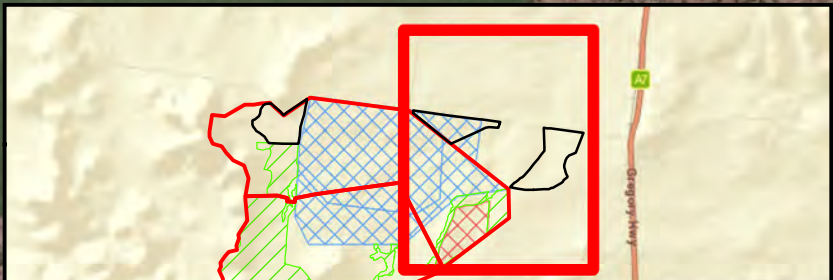
148°5'E

148°6'E

23°54'S

23°55'S

23°56'S



Sojitz Blue Pty Ltd - Lexington Rail Loop offset

**Figure 36**  
**Lexington Rail Loop offset**  
**Weed monitoring results - east**

— Lexington existing fences  
— Access tracks  
**Lexington Rail Loop offset**  
— Harry's paddock  
— Contours paddock

**Observed vegetation**  
RE 11.8.11  
RE 11.8.5

**Weed cover (%)**  
< 5  
6 - 10  
11 - 15  
16 - 25  
26 - 50  
51 - 100

**Weed monitoring plots**  
LEXRL03  
LEXRL04  
LEXRL10  
LEXRL05  
LEXRL06  
LEXRL07  
LEXRL11  
LEXRL12

DATA SOURCE:  
The following datasets are © State of Qld:  
- Mining leases  
The following datasets provided by Sojitz  
- Lexington Rail Loop offset areas

Date: 7/16/2020 Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator Datum: GDA 1994 Scale: 1:17,500@A3

0 200 400 600 800  
Metres

N

CO<sub>2</sub>  
Australia

Brisbane



## 6.4 BIOMASS MONITORING

Brigalow Belt pasture photo standards were used for all biomass monitoring points. ‘Downs country’ photo standards were used for monitoring all twelve of the sites comprising RE 11.8.11 (Table 32). Where the observed biomass at a site was mid-way between two photos within a given biomass standard, the middle of the corresponding range was reported (i.e. observed biomass between 3,015 kg/ha and 3,850 kg/ha ‘Downs country’ photo standards was reported as 3,433 kg/ha).

Photo monitoring showed some variability in biomass of ground cover across all 12 photo monitoring sites. Overall, there was a high biomass for the grassland vegetation type, with a biomass ranging between 3,015 kg/ha and 5,040 kg/ha. The average biomass varied considerably between the offset paddocks, with the average biomass at Contours (4,921 kg/ha) greater than at Harry’s (4,365 kg/ha) and greater again than at North Promenade (3,681 kg/ha).

**Table 32: Results of biomass monitoring on the Lexington Rail Loop offset site using Brigalow Belt Future Beef pasture photo standards.**

Photo monitoring site*	RE type	Brigalow Belt Future Beef pasture photo standard type	
		Downs country	Biomass kg/ha
LEXRL01 – North Promenade paddock	11.8.11	✓	4,445
LEXRL02 – North Promenade paddock	11.8.11	✓	3,850
LEXRL03 – Harry’s paddock	11.8.11	✓	3,015
LEXRL04 – Harry’s paddock	11.8.11	✓	5,040
LEXRL05 – Contours paddock	11.8.11	✓	5,040
LEXRL06 – Contours paddock	11.8.11	✓	4,445
LEXRL07 – Contours paddock	11.8.11	✓	5,040
LEXRL08 – North Promenade paddock	11.8.11	✓	3,850
LEXRL09 – North Promenade paddock	11.8.11	✓	2,578
LEXRL10 – Harry’s paddock	11.8.11	✓	5,040
LEXRL11 – Contours paddock	11.8.11	✓	5,040
LEXRL12 – Contours paddock	11.8.11	✓	5,040

\* taken from the 0 m point of the permanent habitat monitoring transects (Sites LEXRL01 – LEXRL07) and the SW corner of the standalone weed monitoring plots (Sites LEXRL08 – LEXRL12).

## 6.5 GENERAL SITE INSPECTION

It is understood that a share-farming agreement is in place to limit the head of cattle per paddock. A herd of 5 – 6 horses was encountered on a number of days within Harry’s Paddock, with evidence throughout the paddock of horse manure. Likewise, cattle were observed within Contours paddock and in the vicinity of the southern boundary of North Promenade paddock.

All fences bounding the paddocks were in good condition. Access to many of the monitoring sites in the Contours paddock was via an access track outside of and adjacent to the western boundary of the paddock, whereas access to monitoring sites in Harry’s paddock was via Wurba Road and access to the North Promenade monitoring sites was via existing access tracks into Lexington.





Figure 37: Horses in Harry's paddock.



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## APPENDIX A MONITORING SITE LOCATIONS

### MDS PROJECT SITE

Table A-1: Post-wet-season monitoring site locations and purpose on the MDS Project site.

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
01	H01_0m	641462	7304249	✓	Squatter pigeon	✓				
	H01_50m	641462	7304301	✓		✓				
	W01_01	641462	7304249	✓		✓	✓			
	W01_02	641462	7304301				✓			
	W01_03	641462	7304348				✓			
	R01	641462	7304249	✓				✓		
02	H02_0m	640199	7303572	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓		✓		
	H02_50m	640203	7303621	✓		✓		✓		
	W02_01	640199	7303572	✓		✓	✓			
	W02_02	640203	7303621				✓			
	W02_03	640210	7303627				✓			
	R02	640199	7303572	✓				✓		
03	H03_0m	638418	7303259	✓	Squatter pigeon	✓				
	H03_50m	638425	7303308	✓		✓				
	W03_01	638418	7303259	✓		✓	✓			
	W03_02	638425	7303308				✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
	W03_03	638430	7303358				✓			
	R03	638418	7303259	✓				✓		
04	H04_0m	637945	7300236	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓				
	H04_50m	637951	7300287	✓		✓				
	W04_01	637945	7300236	✓		✓	✓			
	W04_02	637951	7300287				✓			
	W04_03	637950	7300338				✓			
	R04	637945	7300236	✓				✓		
05	H05_0m	638426	7299836	✓	Squatter pigeon	✓				
	H05_50m	638420	7299885	✓		✓				
	W05_01	638426	7299836	✓		✓	✓			
	W05_02	638420	7299885				✓			
	W05_03	638416	7299937				✓			
	R05	638426	7299836	✓				✓		
06	H06_0m	637445	7299566	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓				
	H06_50m	637447	7299615	✓		✓				
	W06_01	637445	7299566	✓		✓	✓			
	W06_02	637447	7299615				✓			
	W06_03	637443	7299668							
	R06	637445	7299566	✓				✓		



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Pest animal monitoring				
						Photo monitoring	Weed monitoring	Rabbit plot	Feral pig plot	Fauna camera
07	H07_0m	638426	7298876	✓	Brigalow TEC	✓				
	H07_50m	638419	7298926	✓		✓				
	W07_01	638426	7298876	✓		✓	✓			
	W07_02	638419	7298926				✓			
	W07_03	638423	7298974				✓			
	R07	638426	7298876	✓				✓		
08	H08_0m	637032	7298735	✓	Natural Grasslands TEC, King blue-grass, bluegrass	✓				
	H08_50m	637034	7298785	✓		✓				
	W08_01	637032	7298735	✓		✓	✓			
	W08_02	637034	7298785				✓			
	W08_03	637039	7298835				✓			
	R08	637032	7298735	✓				✓		
09	H09_0m	638387	7298599	✓	Australian painted snipe	✓				
	H09_50m	638380	7298648	✓		✓				
	W09_01	638387	7298599	✓		✓	✓			
	W09_02	638380	7298648				✓			
	W09_03	638372	7298699				✓			
	R09	638387	7298599	✓				✓		
10	H10_0m	636412	7297523	✓	Squatter pigeon	✓				
	H10_50m	636415	7297571	✓		✓				



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
	W10_01	636412	7297523	✓		✓	✓			
	W10_02	636415	7297571				✓			
	W10_03	636413	7297617				✓			
	R10	636412	7297523	✓				✓		
11	W11_01	642941	7304772	✓		✓	✓			
	W11_02	642937	7304825				✓			
	W11_03	642938	7304876				✓			
12	W12_01	641428	7303597	✓		✓	✓			
	W12_02	641426	7303646				✓			
	W12_03	641429	7303696				✓			
13	W13_01	641896	7303196	✓		✓	✓			
	W13_02	641899	7303247				✓			
	W13_03	641900	7303297				✓			
14	W14_01	638991	7303038	✓		✓	✓			
	W14_02	638987	7303090				✓			
	W14_03	638988	7303140				✓			
15	W15_01	637797	7302245	✓		✓	✓			
	W15_02	637796	7302296				✓			
	W15_03	637796	7302347				✓			
16	W16_01	638556	7300785	✓		✓	✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
	W16_02	638560	7300832				✓			
	W16_03	638566	7300882				✓			
17	W17_01	637029	7300184	✓		✓	✓			
	W17_02	637028	7300231				✓			
	W17_03	637024	7300282				✓			
18	W18_01	637401	7300321	✓		✓	✓			
	W18_02	637401	7300368				✓			
	W18_03	637398	7300421				✓			
19	W19_01	638301	7301720	✓		✓	✓			
	W19_02	638295	7301771				✓			
	W19_03	638290	7301821				✓			
20	W20_01	636740	7298674	✓		✓	✓			
	W20_02	636746	7298723				✓			
	W20_03	636752	7298771				✓			
21	P01_01	636412	7297523						✓	
	P01_02	636412	7297423						✓	
	P01_03	636412	7297323						✓	
22	P02_01	636397	7298627						✓	
	P02_02	636397	7298527						✓	
	P02_03	636397	7298427						✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
23	P03_01	637232	7298835						✓	
	P03_02	637232	7298735						✓	
	P03_03	637232	7298635						✓	
24	P04_01	638126	7299076						✓	
	P04_02	638126	7298976						✓	
	P04_03	638126	7298876						✓	
25	P05_01	638126	7299836						✓	
	P05_02	638126	7299736						✓	
	P05_03	638126	7299637						✓	
26	P06_01	638156	7300985						✓	
	P06_02	638156	7300885						✓	
	P06_03	638156	7300785						✓	
27	P07_01	638992	7303366						✓	
	P07_02	638992	7303266						✓	
	P07_03	638992	7303166						✓	
28	P08_01	641150	7303945						✓	
	P08_02	641150	7303845						✓	
	P08_03	641150	7303745						✓	
29	C01	642069	7303364							✓
30	C02	641096	7303802							✓



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Pest animal monitoring		
								Rabbit plot	Feral pig plot	Fauna camera
31	C03	639777	7303065							✓
32	C04	638324	7301905							✓
33	C05	638692	7301073							✓
34	C06	638685	7300013							✓
35	C07	638679	7299497							✓
36	C08	638419	7298830							✓
37	C09	637498	7300708							✓
38	C10	637519	7300049							✓
39	C11	637050	7299119							✓
40	C12	636843	7298531							✓
41	C13	636494	7297829							✓
42	C14	636293	7297414							✓
43	C15	636936	7297300							✓

<sup>a</sup> Start points with prefix H = habitat assessment sites (HXX\_0m and HXX\_50m corresponds to 0 m and 50 m point of north-south habitat assessment transect), W = start point (west) of each site's weed monitoring plot transects (WXX\_01, WXX\_02 and WXX\_03 corresponds to transect 1, 2 and 3), R = start point (south-west) of 2 ha rabbit monitoring plot, P = start point (west) of each site's pig monitoring plot transects (PXX\_01, PXX\_02 and PXX\_03 corresponds to transect 1, 2 and 3), C = fauna camera station. Start points for habitat assessment, weed monitoring and rabbit monitoring plots are the same for sites 01 – 10, with sites 11 – 20 only corresponding to weed monitoring plots.



## LEXINGTON OFFSET SITE

Table A-2: Post-wet season monitoring site locations and purpose on the Lexington offset site

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
01	W01_01	604331	7354000	✓	✓	✓			
	W01_02	604331	7353950			✓			
	W01_03	604331	7353900			✓			
	R01	604331	7353900	✓			✓		
02	W02_01	603925	7353100	✓	✓	✓			
	W02_02	603908	7353053			✓			
	W02_03	603892	7353005			✓			
	R02	603892	7353005	✓			✓		
03	W03_01	604380	7352577	✓	✓	✓			
	W03_02	604380	7352527			✓			
	W03_03	604380	7352477			✓			
	R03	604380	7352477	✓			✓		
04	W04_01	603904	7351791	✓	✓	✓			
	W04_02	603904	7351741			✓			
	W04_03	603904	7351691			✓			
	R04	603904	7351691	✓			✓		
05	W05_01	603360	7351127	✓	✓	✓			
	W05_02	603345	7351079			✓			
	W05_03	603330	7351031			✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
	R05	603426	7351001	✓			✓		
06	W06_01	604790	7351295	✓	✓	✓			
	W06_02	604790	7351245			✓			
	W06_03	604790	7351195			✓			
07	W07_01	604649	7350850	✓	✓	✓			
	W07_02	604649	7350800			✓			
	W07_03	604649	7350750			✓			
	R06	604649	7350750	✓			✓		
08	W08_01	606488	7350461	✓	✓	✓			
	W08_02	606488	7350411			✓			
	W08_03	606488	7350361			✓			
	R07	606488	7350361	✓			✓		
09	W09_01	607401	7351233	✓	✓	✓			
	W09_02	607401	7351183			✓			
	W09_03	607401	7351133			✓			
10	W10_01	607175	7351671	✓	✓	✓			
	W10_02	607175	7351621			✓			
	W10_03	607175	7351571			✓			
	R08	607175	7351571	✓			✓		
11	W11_01	609631	7353204	✓	✓	✓			
	W11_02	609631	7353154			✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
	W11_03	609631	7353104			✓			
	R09	609631	7353104	✓			✓		
12	W12_01	610371	7353217	✓	✓	✓			
	W12_02	610371	7353167			✓			
	W12_03	610371	7353117			✓			
13	W13_01	610237	7352615	✓	✓	✓			
	W13_02	610237	7352565			✓			
	W13_03	610237	7352515			✓			
	R10	610237	7352515	✓			✓		
14	W14_01	604883	7354051	✓	✓	✓			
	W14_02	604883	7354001			✓			
	W14_03	604883	7353951			✓			
15	W15_01	604543	7352984	✓	✓	✓			
	W15_02	604543	7352934			✓			
	W15_03	604543	7352884			✓			
16	W16_01	604604	7352289	✓	✓	✓			
	W16_02	604604	7352239			✓			
	W16_03	604604	7352189			✓			
17	W17_01	604503	7351656	✓	✓	✓			
	W17_02	604503	7351606			✓			
	W17_03	604503	7351556			✓			



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
18	W18_01	604074	7350714	✓	✓	✓			
	W18_02	604074	7350664			✓			
	W18_03	604074	7350614			✓			
19	W19_01	603812	7352530	✓	✓	✓			
	W19_02	603798	7352482			✓			
	W19_03	603784	7352434			✓			
20	W20_01	610453	7352923	✓	✓	✓			
	W20_02	610453	7352873			✓			
	W20_03	610453	7352823			✓			
21	P01_01	604442	7353084					✓	
	P01_02	604442	7352984					✓	
	P01_03	604442	7352884					✓	
22	P02_01	603879	7351891					✓	
	P02_02	603879	7351791					✓	
	P02_03	603879	7351691					✓	
23	P03_01	604513	7354397					✓	
	P03_02	604513	7354297					✓	
	P03_03	604513	7354197					✓	
24	P04_01	604624	7350950					✓	
	P04_02	604624	7350850					✓	
	P04_03	604624	7350750					✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
25	P05_01	606463	7350561					✓	
	P05_02	606463	7350461					✓	
	P05_03	606463	7350361					✓	
26	P06_01	607101	7351233					✓	
	P06_02	607101	7351133					✓	
	P06_03	607101	7351033					✓	
27	P07_01	607092	7351771					✓	
	P07_02	607092	7351671					✓	
	P07_03	607092	7351571					✓	
28	P08_01	609840	7353261					✓	
	P08_02	609840	7353161					✓	
	P08_03	609840	7353061					✓	
29	C01	604003	7354128						✓
30	C02	604006	7353171						✓
31	C03	603871	7352215						✓
32	C04	603885	7351500						✓
33	C05	605051	7354267						✓
34	C06	604978	7353531						✓
35	C07	604885	7352747						✓
36	C08	604776	7352174						✓
37	C09	604705	7351408						✓



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Photo monitoring	Weed monitoring	Pest animal monitoring		
							Rabbit plot	Feral pig plot	Fauna camera
38	C10	604402	7350811						✓
39	C11	604107	7350032						✓
40	C12	605496	7350889						✓
41	C13	606580	7350889						✓
42	C14	610156	7352282						✓
43	C15	610612	7353100						✓

<sup>a</sup> Start points with prefix W = start point (west) of each site's weed monitoring plot transects (WXX\_01, WXX\_02 and WXX\_03 corresponds to transect 1, 2 and 3), R = start point (south-west) of 2 ha European rabbit monitoring plot, P = start point (west) of each site's feral pig monitoring plot transects (PXX\_01, PXX\_02 and PXX\_03 corresponds to transect 1, 2 and 3), C = fauna camera station. Start points for weed monitoring and European rabbit monitoring plots are the same for sites 01 – 10, with sites 11 – 20 only corresponding to weed monitoring plots.



## MDS RAIL LOOP SITE

Table A-3: Post-wet-season monitoring site locations and purpose on the MDS Rail Loop site

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Biomass monitoring
MDSRL01	H01_0m	645575	7303101	✓	Natural Grasslands TEC, King blue-grass	✓		
	H01_50m	645575	7303151	✓		✓		✓
	W01_01	645575	7303101	✓		✓	✓	
	W01_02	645575	7303151				✓	
	W01_03	645575	7303201				✓	
MDSRL02	H02_0m	646410	7303007	✓	Natural Grasslands TEC, King blue-grass	✓		
	H02_50m	646410	7303057	✓		✓		✓
	W02_01	646410	7303007	✓		✓	✓	
	W02_02	646410	7303057				✓	
	W02_03	646410	7303107				✓	
MDSRL03	H03_0m	646666	7303114	✓	Natural Grasslands TEC, King blue-grass	✓		
	H03_50m	646666	7303164	✓		✓		✓
	W03_01	646666	7303114	✓		✓	✓	
	W03_02	646666	7303164				✓	
	W03_03	646666	7303214				✓	
MDSRL04	H04_0m	646834	7303291	✓	Natural Grasslands TEC, King blue-grass	✓		
	H04_50m	646834	7303341	✓		✓		✓
	W04_01	646834	7303291	✓		✓	✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Biomass monitoring
	W04_02	646834	7303341				✓	
	W04_03	646834	7303391				✓	
MDSRL05	W05_01	646409	7303255	✓		✓	✓	
	W05_02	646409	7303305				✓	
	W05_03	646409	7303355				✓	

<sup>a</sup> Start points with prefix H = habitat assessment sites (HXX\_0m and HXX\_50m corresponds to 0 m and 50 m point of north-south habitat assessment transect), W = start point (west) of each site's weed monitoring plot transects (WXX\_01, WXX\_02 and WXX\_03 corresponds to transect 1, 2 and 3). Start points for habitat assessment and weed monitoring plots are the same for sites 01 – 04, with site 05 only corresponding to a standalone weed monitoring plot.



## LEXINGTON RAIL LOOP SITE

Table A-4: Post-wet-season monitoring site locations and purpose on the MDS Rail Loop site

Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Biomass monitoring
LEXRL01	H01_0m	604390	7355247	✓	Natural Grasslands TEC, King blue-grass	✓		
	H01_50m	604390	7355297	✓		✓		
	W01_01	604390	7355247	✓		✓	✓	
	W01_02	604390	7355297				✓	
	W01_03	604390	7355347				✓	
LEXRL02	H02_0m	604758	7354797	✓	Natural Grasslands TEC, King blue-grass	✓		
	H02_50m	604758	7354847	✓		✓		
	W02_01	604758	7354797	✓		✓	✓	
	W02_02	604758	7354847				✓	
	W02_03	604758	7354897				✓	
LEXRL03	H03_0m	608595	7355228	✓	Natural Grasslands TEC, King blue-grass	✓		
	H03_50m	608595	7355278	✓		✓		
	W03_01	608595	7355228	✓		✓	✓	
	W03_02	608595	7355278				✓	
	W03_03	608595	7355328				✓	
LEXRL04	H04_0m	609262	7355036	✓	Natural Grasslands TEC, King blue-grass	✓		
	H04_50m	609262	7355086	✓		✓		
	W04_01	609262	7355036	✓		✓	✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Biomass monitoring
	W04_02	609262	7355086				✓	
	W04_03	609262	7355136				✓	
LEXRL05	H05_0m	612011	7354575	✓	Natural Grasslands TEC, King blue-grass	✓		
	H05_50m	612011	7354625	✓		✓		
	W05_01	612011	7354575	✓		✓	✓	
	W05_02	612011	7354625				✓	
	W05_03	612011	7354675				✓	
LEXRL06	H06_0m	611834	7354280	✓	Natural Grasslands TEC, King blue-grass	✓		
	H06_50m	611834	7354330	✓		✓		
	W06_01	611834	7354280	✓		✓	✓	
	W06_02	611834	7354330				✓	
	W06_03	611834	7354380				✓	
LEXRL07	H07_0m	611215	7353711	✓	Natural Grasslands TEC, King blue-grass	✓		
	H07_50m	611215	7353761	✓		✓		
	W07_01	611215	7353711	✓		✓	✓	
	W07_02	611215	7353761				✓	
	W07_03	611215	7353811				✓	
LEXRL08	W08_01	604126	7354813	✓		✓	✓	
	W08_02	604126	7354863				✓	
	W08_03	604126	7354913				✓	



Site	Start point name <sup>a</sup>	Easting	Northing	Star picket?	Habitat condition MNES values	Photo monitoring	Weed monitoring	Biomass monitoring
LEXRL09	W09_01	604978	7355196	✓		✓	✓	
	W09_02	604978	7355246				✓	
	W09_03	604978	7355296				✓	
LEXRL10	W010_01	609785	7355039	✓		✓	✓	
	W010_02	609785	7355089				✓	
	W010_03	609785	7355139				✓	
LEXRL11	W11_01	611630	7353857	✓		✓	✓	
	W11_02	611630	7353907				✓	
	W11_03	611630	7353957				✓	
LEXRL12	W12_01	612344	7354534	✓		✓	✓	
	W12_02	612344	7354584				✓	
	W12_03	612344	7354634				✓	

<sup>a</sup> Start points with prefix H = habitat assessment sites (HXX\_0m and HXX\_50m corresponds to 0 m and 50 m point of north-south habitat assessment transect), W = start point (west) of each site's weed monitoring plot transects (WXX\_01, WXX\_02 and WXX\_03 corresponds to transect 1, 2 and 3). Start points for habitat assessment and weed monitoring plots are the same for sites 01 – 07, with sites 08 – 12 only corresponding to a standalone weed monitoring plot.



## APPENDIX B MDS RAIL LOOP SITE – YEAR 1 HABITAT CONDITION ASSESSMENT

The following tables provide details of the habitat condition assessments undertaken during the Year 1 monitoring period at the MDS Rail Loop site. Habitat condition scores were calculated in accordance with the *Guide to Determining Terrestrial Habitat Quality version 1.2* (DEHP, 2017). The data required to inform the site condition and flora species stocking rates were collected as part of detailed field surveys in June 2020. The site context score was calculated in accordance with the method prescribed in the *Guide to Determining Terrestrial Habitat Quality version 1.2* (DEHP, 2017), derived from ground-truthed regional ecosystem mapping within the extent of the MDS Rail Loop, as presented in the MDS Rail Loop ecological assessment (SLR 2019b).

**Table B-1: Site condition raw data for each RE assessment unit**

Ecological condition indicators	Site MDSRL01 RE 11.8.11			Site MDSRL02 RE 11.8.11			Site MDSRL03 RE 11.8.11			Site MDSRL04 RE 11.8.11		
	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score
Recruitment of woody perennial species	-	-	-	-	-	-	-	-	-	-	-	-
Native plant species richness - trees	-	-	-	-	-	-	-	-	-	-	-	-
Native plant species richness - shrubs	-	-	-	-	-	-	-	-	-	-	-	-
Native plant species richness - grasses	7	11	3	6	11	3	8	11	3	8	11	3
Native plant species richness - forbs	4	17	2.5	3	17	2.5	4	17	2.5	5	17	3
Tree canopy height	-	-	-	-	-	-	-	-	-	-	-	-
Tree sub canopy height	-	-	-	-	-	-	-	-	-	-	-	-
Tree canopy cover	-	-	-	-	-	-	-	-	-	-	-	-
Tree sub canopy cover	-	-	-	-	-	-	-	-	-	-	-	-
Shrub canopy cover	-	-	-	-	-	-	-	-	-	-	-	-
Native perennial grass cover	67	43	5	44	43	5	21	43	1	21	43	1
Organic litter	23	13	5	22	13	5	38.6	13	3	28	13	3
Large eucalypt trees	-	-	-	-	-	-	-	-	-	-	-	-
Large non-eucalypt trees	-	-	-	-	-	-	-	-	-	-	-	-
Coarse woody debris	-	-	-	-	-	-	-	-	-	-	-	-
Non-native plant cover	4.45	0	10	4.75	0	10	13.4	0	5	21.6	0	5
Total			25.5			25.5			14.5			15
/10			8.50			8.50			4.83			5.00



**Table B-2: Summary of the site condition, site context and fauna species habitat index scores used to calculate the habitat condition score for each RE assessment unit**

	Site MDSRL01	Site MDSRL02	Site MDSRL03	Site MDSRL04
	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11
MNES values	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass
<b>Site condition</b>				
Recruitment of woody perennial species	-	-	-	-
Native plant species richness - trees	-	-	-	-
Native plant species richness - shrubs	-	-	-	-
Native plant species richness - grasses	3	3	3	3
Native plant species richness - forbs	2.5	2.5	2.5	3
Tree canopy height	-	-	-	-
Tree canopy cover	-	-	-	-
Shrub canopy cover	-	-	-	-
Native perennial grass cover	5	5	1	1
Organic litter	5	5	3	3
Large trees	-	-	-	-
Coarse woody debris	-	-	-	-
Non-native plant cover	10	10	5	5
Total of BioCondition attributes	25.5	25.5	14.5	15
MAX ecological condition score	30	30	30	30
<b>Score /10</b>	<b>8.50</b>	<b>8.50</b>	<b>4.83</b>	<b>5.00</b>
<b>Site context</b>				
Size of patch (fragmented bioregions)	10	10	10	10
Connectivity (fragmented bioregions)	5	5	5	5
Context (fragmented bioregions)	5	4	4	4
Distance to permanent watering point (intact bioregions)	-	-	-	-
Ecological corridors	6	4	4	4
Total of site context attributes	26	23	23	23
MAX site condition score	26	26	26	26
<b>Score /10</b>	<b>10.00</b>	<b>8.85</b>	<b>8.85</b>	<b>8.85</b>



**Table B-3: Summary of the species stocking rate index for king blue-grass**

Species stocking rate /3 <sup>a</sup>	Site MDSRL01 RE 11.8.11	Site MDSRL02 RE 11.8.11	Site MDSRL03 RE 11.8.11	Site MDSRL04 RE 11.8.11
King blue-grass				
– Absent/not confirmed = 0				
– up to 2 tussocks = 2	0	0	0	0
– between 3 and 20 tussocks = 2.5				
– 20 or more tussocks = 3				

<sup>a</sup> species stocking rate contributes 20% toward the habitat condition score for King blue-grass, with the remaining 80% made up of site condition and site context.

**Table B-4: Summary of the MNES habitat condition score for each RE assessment unit**

Assessment unit habitat condition score /10	Site MDSRL01 RE 11.8.11	Site MDSRL02 RE 11.8.11	Site MDSRL03 RE 11.8.11	Site MDSRL04 RE 11.8.11	Average habitat condition score
Natural Grasslands TEC					
– calculated based on site condition (/80) + site context (/26) converted to score out of 10	9.20	8.66	6.70	6.79	<b>7.83</b>
King blue-grass					
– calculated based on combination of:					
– habitat quality (site condition + site context) – 80%	7.36	6.93	5.36	5.43	<b>6.27</b>
– species stocking rate (score out of 3) – 20%					



## APPENDIX C LEXINGTON RAIL LOOP OFFSET SITE – YEAR 1 HABITAT CONDITION ASSESSMENT

The following tables provide details of the habitat condition assessments undertaken during the Year 1 monitoring period at the Lexington Rail Loop offset site. Habitat condition scores were calculated in accordance with the *Guide to Determining Terrestrial Habitat Quality version 1.2* (DEHP, 2017). The data required to inform the site condition and flora species stocking rates were collected as part of detailed field surveys in June 2020. The site context score was calculated in accordance with the method prescribed in the *Guide to Determining Terrestrial Habitat Quality version 1.2* (DEHP, 2017), derived from ground-truthed regional ecosystem mapping within the extent of the Lexington Rail Loop offset sites, as presented in the Lexington Rail Loop ecological assessment (SLR 2019b).

**Table C-1: Site condition raw data for each RE assessment unit**

Ecological condition indicators	Site LEXRL01 RE 11.8.11			Site LEXRL02 RE 11.8.11			Site LEXRL03 RE 11.8.11			Site LEXRL04 RE 11.8.11			Site LEXRL05 RE 11.8.11			Site LEXRL06 RE 11.8.11			Site LEXRL07 RE 11.8.11		
	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score	Raw data	Benchmark (11.8.11)	Score
Recruitment of woody perennial species	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Native plant species richness - trees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Native plant species richness - shrubs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Native plant species richness - grasses	9	11	3	9	11	3	5	11	3	4	11	3	5	11	3	3	11	3	5	11	3
Native plant species richness - forbs	5	17	3	6	17	3	7	17	3	5	17	3	5	17	3	3	17	2.5	4	17	2.5
Tree canopy height	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tree sub canopy height	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tree canopy cover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tree sub canopy cover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shrub canopy cover	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Native perennial grass cover	50	43	5	54	43	5	23	43	3	47	43	5	73	43	5	37	43	5	75.6	43	5
Organic litter	35	13	3	28	13	3	43	13	3	41	13	3	21.8	13	5	30.6	13	3	18.4	13	5
Large eucalypt trees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Large non-eucalypt trees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coarse woody debris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-native plant cover	9.1	0	5	1.15	0	10	9.5	0	5	2.25	0	10	0	0	10	0.5	0	10	3.4	0	10
Total			19			24			17			24			26			23.5			25.5
/10			6.33			8.00			5.67			8.00			8.67			7.83			8.50



Table C-2: Summary of the site condition, site context and fauna species habitat index scores used to calculate the habitat condition score for each RE assessment unit

	Site LEXRL01	Site LEXRL02	Site LEXRL03	Site LEXRL04	Site LEXRL05	Site LEXRL06	Site LEXRL07
	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11
MNES values	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass	Natural Grasslands TEC, King blue-grass
<b>Site condition</b>							
Recruitment of woody perennial species	-	-	-	-	-	-	-
Native plant species richness - trees	-	-	-	-	-	-	-
Native plant species richness - shrubs	-	-	-	-	-	-	-
Native plant species richness - grasses	3	3	3	3	3	3	3
Native plant species richness - forbs	3	3	3	3	3	2.5	2.5
Tree canopy height	-	-	-	-	-	-	-
Tree canopy cover	-	-	-	-	-	-	-
Shrub canopy cover	-	-	-	-	-	-	-
Native perennial grass cover	5	5	3	5	5	5	5
Organic litter	3	3	3	3	5	3	5
Large trees	-	-	-	-	-	-	-
Coarse woody debris	-	-	-	-	-	-	-
Non-native plant cover	5	10	5	10	10	10	10
Total of BioCondition attributes	19	24	17	24	26	23.5	25.5
MAX ecological condition score	30	30	30	30	30	30	30
<b>Score /10</b>	<b>6.33</b>	<b>8.00</b>	<b>5.67</b>	<b>8.00</b>	<b>8.67</b>	<b>7.83</b>	<b>8.50</b>
<b>Site context</b>							
Size of patch (fragmented bioregions)	10	10	10	10	10	10	10
Connectivity (fragmented bioregions)	5	5	5	5	5	5	5
Context (fragmented bioregions)	5	5	2	4	4	4	4
Distance to permanent watering point (intact bioregions)	-	-	-	-	-	-	-
Ecological corridors	6	6	0	0	0	0	0
Total of site context attributes	26	26	17	19	19	19	19
MAX site condition score	26	26	26	26	26	26	26
<b>Score /10</b>	<b>10.00</b>	<b>10.00</b>	<b>6.54</b>	<b>7.31</b>	<b>7.31</b>	<b>7.31</b>	<b>7.31</b>



**Table C-3: Summary of the species stocking rate index for king blue-grass**

Species stocking rate /3 <sup>a</sup>	Site LEXRL01	Site LEXRL02	Site LEXRL03	Site LEXRL04	Site LEXRL05	Site LEXRL06	Site LEXRL07
	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11
King blue-grass							
– Absent/not confirmed = 0							
– up to 2 tussocks = 2							
– between 3 and 20 tussocks = 2.5							
– 20 or more tussocks = 3							
	0	0	2.5	3	2	0	0

<sup>a</sup> species stocking rate contributes 20% toward the habitat condition score for King blue-grass, with the remaining 80% made up of site condition and site context.

**Table C-4: Summary of the MNES habitat condition score for each RE assessment unit**

Assessment unit habitat condition score /10	Site LEXRL01	Site LEXRL02	Site LEXRL03	Site LEXRL04	Site LEXRL05	Site LEXRL06	Site LEXRL07	FINAL MNES habitat quality score
	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	RE 11.8.11	
Natural Grasslands TEC								
– calculated based on site condition (/80) + site context (/26) converted to score out of 10	8.04	8.93	6.07	7.68	8.04	7.59	7.95	<b>7.76</b>
King blue-grass								
– calculated based on combination of:								
– habitat quality (site condition + site context) – 80%								
– species stocking rate (score out of 3) – 20%								
	6.43	7.14	6.52	8.14	7.76	6.07	6.36	<b>6.92</b>



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## **APPENDIX D MDS PROJECT SITE PHOTO MONITORING**



## SITE 01 – H01\_0M

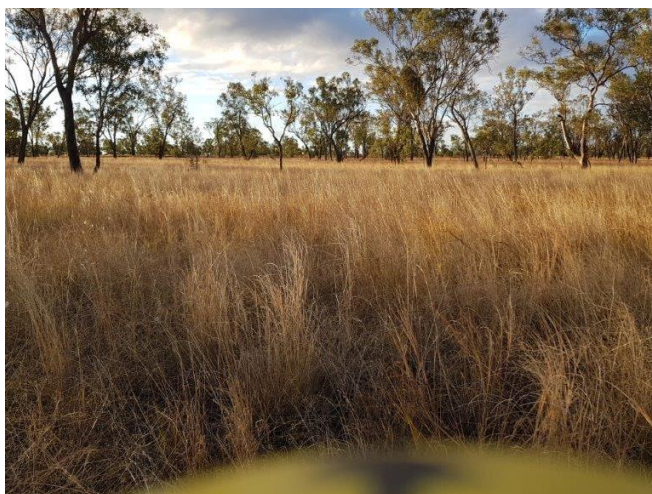


Photo D-1 North



Photo D-2 East



Photo D-3 South

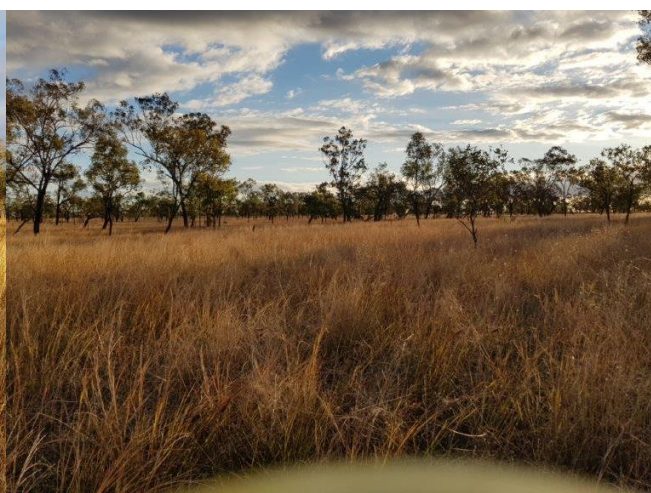


Photo D-4 West



Photo D-5 Ground



## SITE 01 – H01\_50M



Photo D-6 North

Photo D-7 East



Photo D-8 South

Photo D-9 West



Photo D-10 Ground



## SITE 02 – H02\_0 M



Photo D-11 North

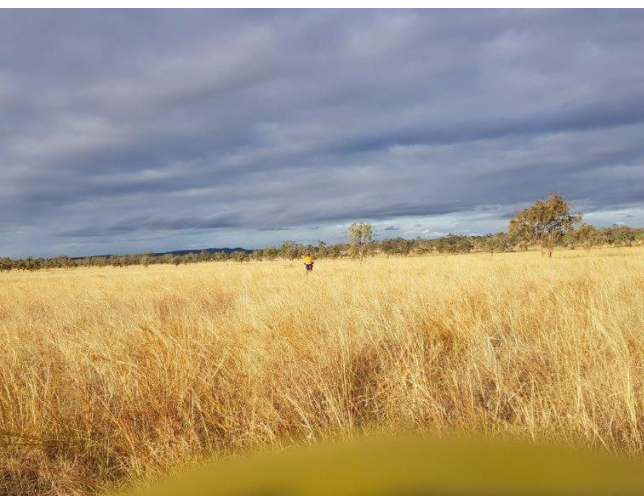


Photo D-12 East



Photo D-13 South



Photo D-14 West



Photo D-15 Ground



## SITE 02 – H02\_50M

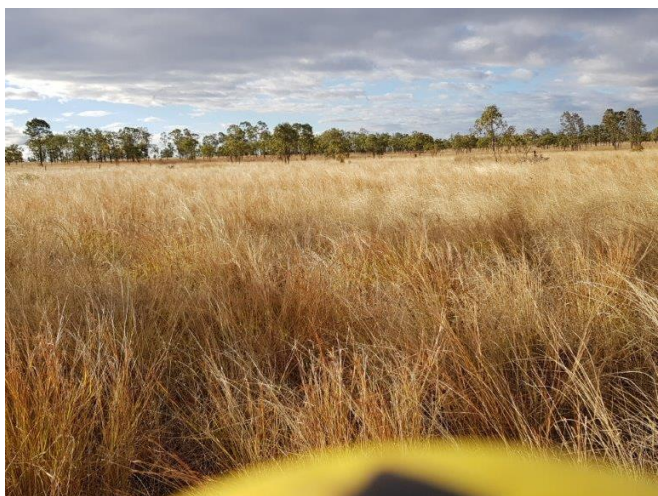


Photo D-16 North

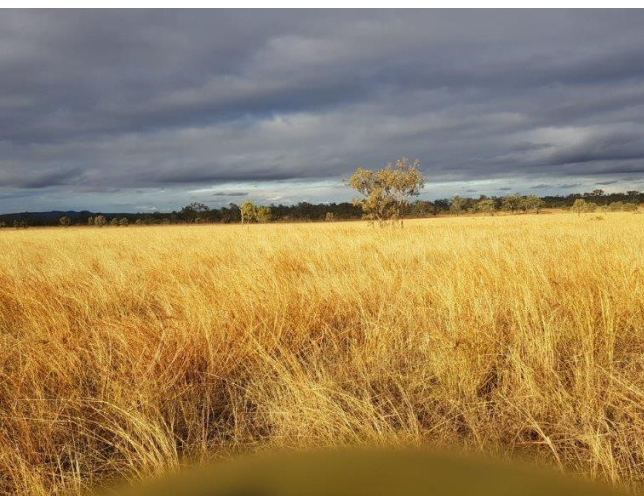


Photo D-17 East



Photo D-18 South



Photo D-19 West



Photo D-20 Ground



## SITE 03 – H03\_0M



Photo D-21 North



Photo D-22 East



Photo D-23 South



Photo D-24 West



Photo D-25 Ground



## SITE 03 – H03\_50M



Photo D-26 North



Photo D-27 East



Photo D-28 South

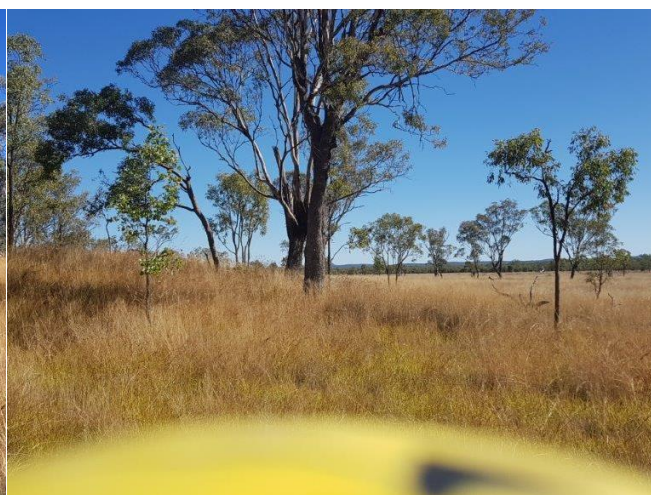


Photo D-29 West



Photo D-30 Ground



## SITE 04 – H04\_0M



Photo D-31 North



Photo D-32 East



Photo D-33 South



Photo D-34 West



Photo D-35 Ground



## SITE 04 – H04\_50M



Photo D-36 North



Photo D-37 East



Photo D-38 South



Photo D-39 West



Photo D-40 Ground



## SITE 05 – H05\_0M



Photo D-41 North



Photo D-42 East



Photo D-43 South



Photo D-44 West



Photo D-45 Ground



## SITE 05 – H05\_50M



Photo D-46 North



Photo D-47 East



Photo D-48 South



Photo D-49 West



Photo D-50 Ground



## SITE 06 – H06\_0M



Photo D-51 North



Photo D-52 East



Photo D-53 South



Photo D-54 West



Photo D-55 Ground



## SITE 06 – H06\_50M



Photo D-56 North



Photo D-57 East



Photo D-58 South



Photo D-59 West



Photo D-60 Ground



## SITE 07 – H07\_0M



Photo D-61 North



Photo D-62 East



Photo D-63 South



Photo D-64 West



Photo D-65 Ground



## SITE 07 – H07\_50M



Photo D-66 North

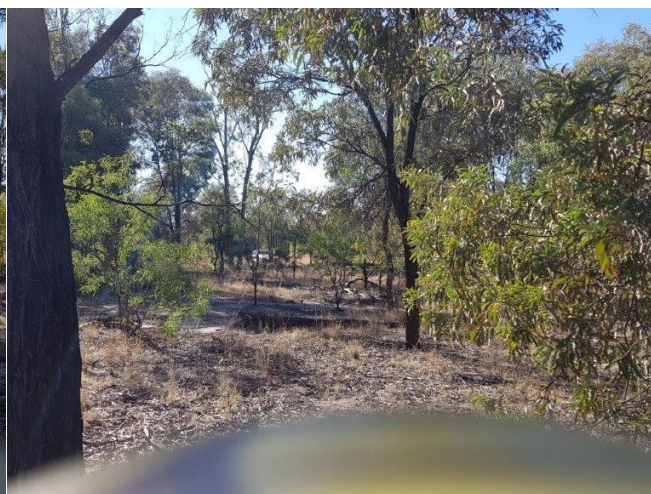


Photo D-67 East



Photo D-68 South



Photo D-69 West



Photo D-70 Ground



## SITE 08 – H08\_0M

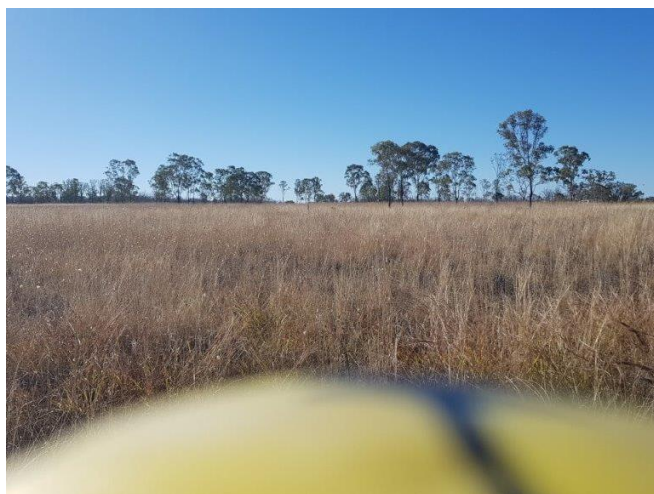


Photo D-71 North



Photo D-72 East



Photo D-73 South



Photo D-74 West



Photo D-75 Ground



## SITE 08 – H08\_50M



Photo D-76 North



Photo D-77 East



Photo D-78 South



Photo D-79 West



Photo D-80 Ground



## SITE 09 – H09\_0M



Photo D-81 North

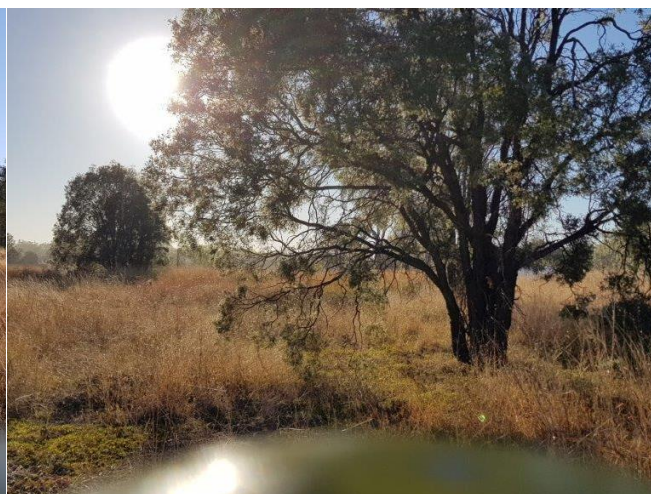


Photo D-82 East

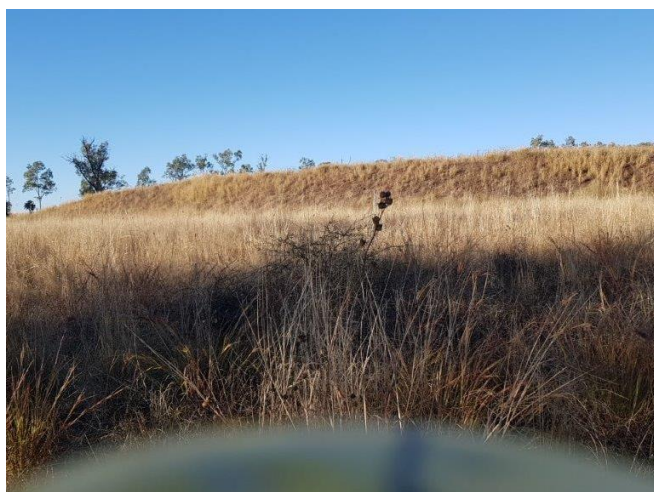


Photo D-83 South



Photo D-84 West



Photo D-85 Ground



## SITE 09 – H09\_50M



Photo D-86 North



Photo D-87 East

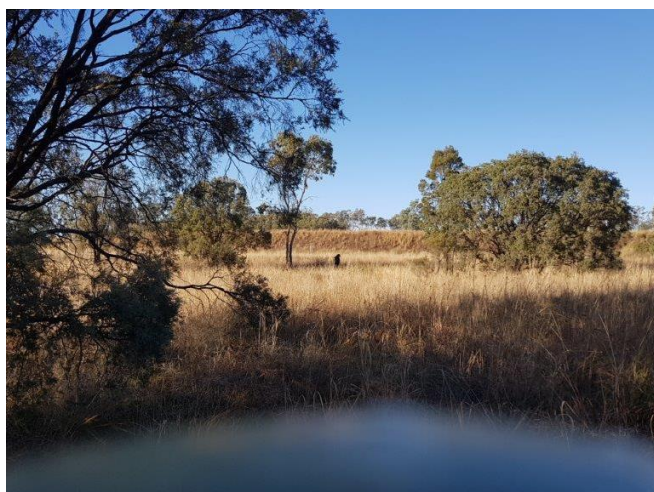


Photo D-88 South



Photo D-89 West



Photo D-90 Ground



## SITE 10 – H10\_0M



Photo D-91 North



Photo D-92 East

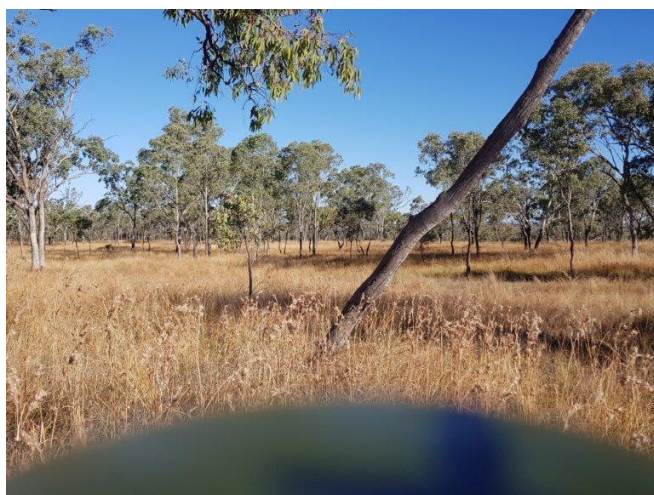


Photo D-93 South



Photo D-94 West



Photo D-95 Ground



## SITE 10 – H10\_50M



Photo D-96 North



Photo D-97 East



Photo D-98 South



Photo D-99 West



Photo D-100 Ground



## SITE 11 – W11\_0



Photo D-101 North



Photo D-102 East



Photo D-103 South



Photo D-104 West



Photo D-105 Ground



## SITE 12 – W12\_0



Photo D-106 North



Photo D-107 East



Photo D-108 South



Photo D-109 West



Photo D-110 Ground



## SITE 13 – W13\_0



Photo D-111 North



Photo D-112 East



Photo D-113 South



Photo D-114 West



Photo D-115 Ground



## SITE 14 – W14\_0



Photo D-116 North



Photo D-117 East



Photo D-118 South



Photo D-119 West



Photo D-120 Ground



## SITE 15 – W15\_0



Photo D-121 North



Photo D-122 East



Photo D-123 South



Photo D-124 West



Photo D-125 Ground



## SITE 16 – W16\_0



Photo D-126 North

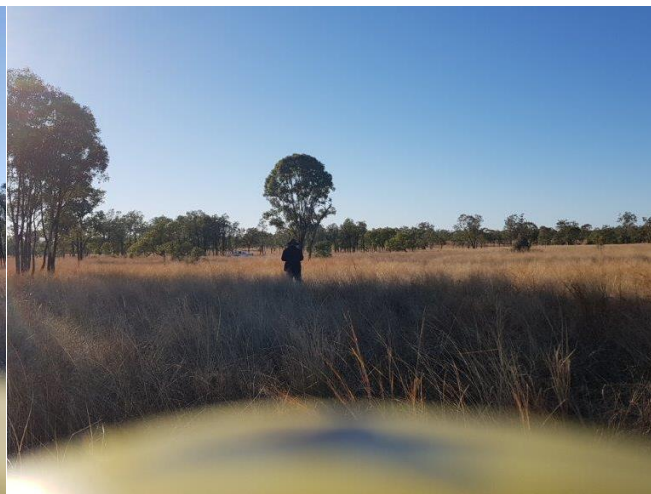


Photo D-127 East



Photo D-128 South



Photo D-129 West



Photo D-130 Ground



## SITE 17 – W17\_0



Photo D-131 North



Photo D-132 East



Photo D-133 South



Photo D-134 West



Photo D-135 Ground



## SITE 18 – W18\_0



Photo D-136 North

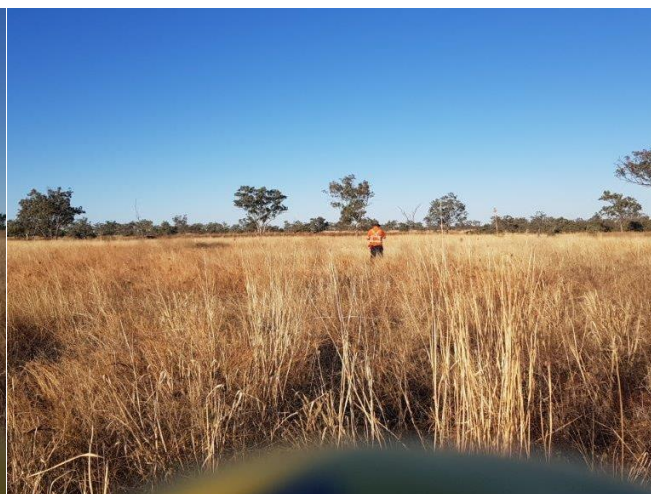


Photo D-137 East



Photo D-138 South



Photo D-139 West



Photo D-140 Ground



## SITE 19 – W19\_0



Photo D-141 North



Photo D-142 East



Photo D-143 South



Photo D-144 West



Photo D-145 Ground



## SITE 20 – W20\_0

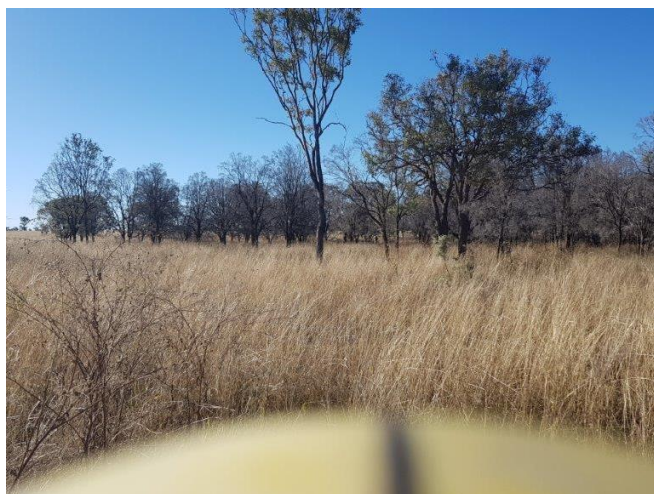


Photo D-146 North

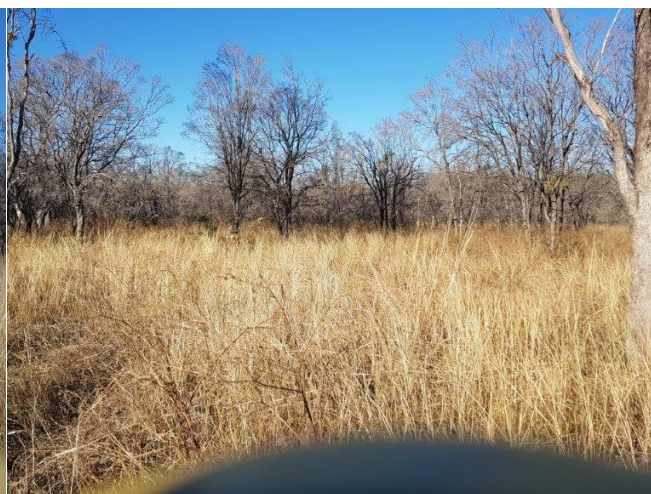


Photo D-147 East



Photo D-148 South

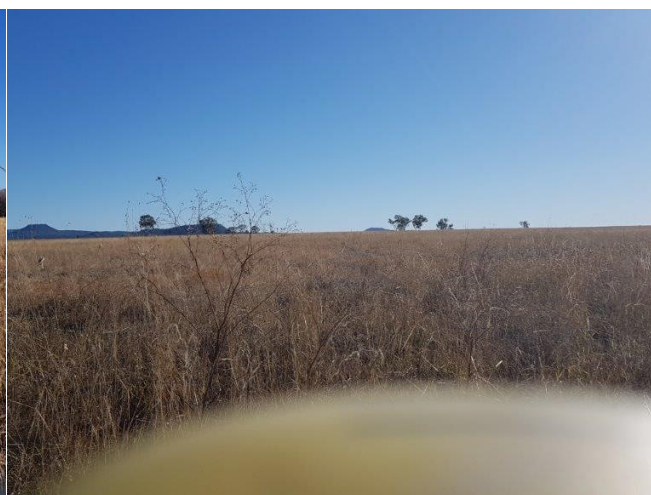


Photo D-149 West



Photo D-150 Ground



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## **APPENDIX E    MDS RAIL LOOP SITE PHOTO MONITORING**



## SITE MDSRL01 – H01\_0M



Photo E-1 North

Photo E-2 East



Photo E-3 South

Photo E-4 West



Photo E-5 Ground



## SITE MDSRL01 – H01\_50M



**Photo E-6 North**

**Photo E-7 East**



**Photo E-8 South**

**Photo E-9 West**



**Photo E-10 Ground**



## SITE MDSRL02 – H02\_0 M



Photo E-11 North

Photo E-12 East

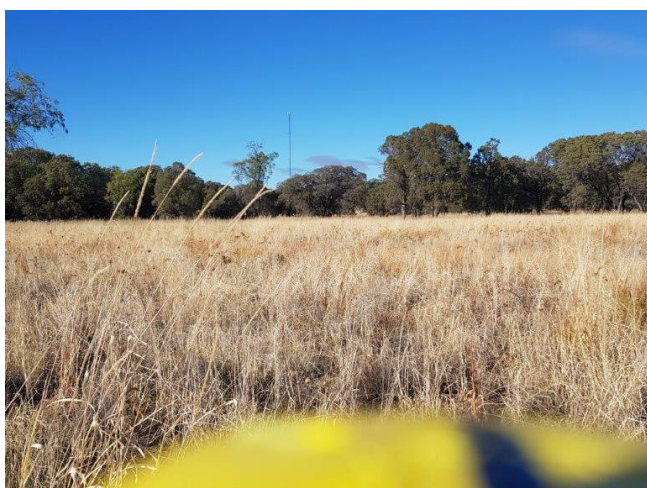


Photo E-13 South

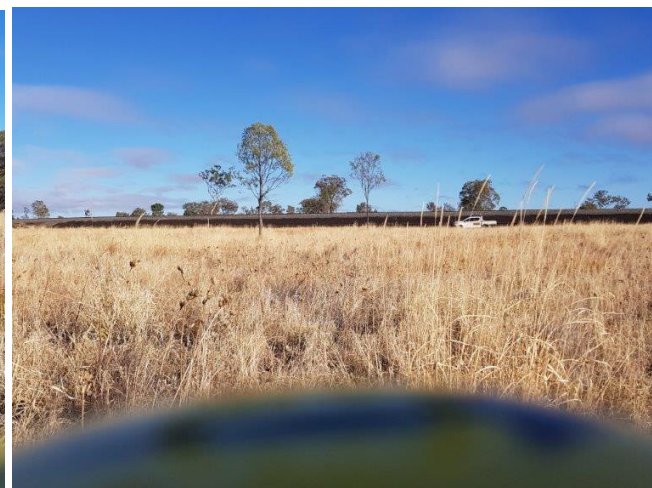


Photo E-14 West



Photo E-15 Ground



## SITE MDSRL02 – H02\_50M



Photo E-16 North



Photo E-17 East



Photo E-18 South



Photo E-19 West



Photo E-20 Ground



## SITE MDSRL03 – H03\_0M

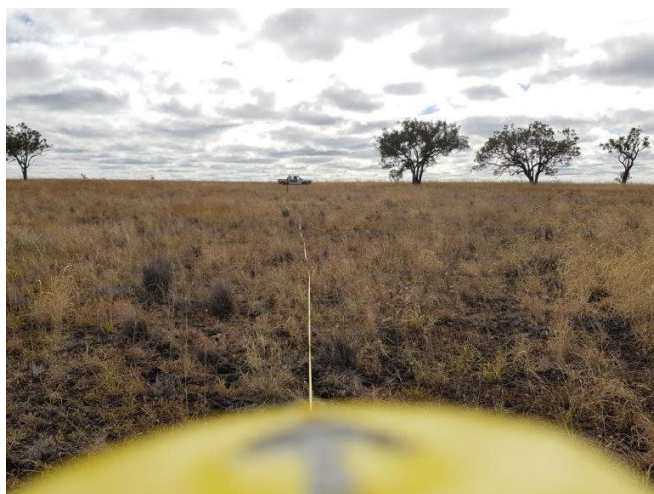


Photo E-21 North



Photo E-22 East

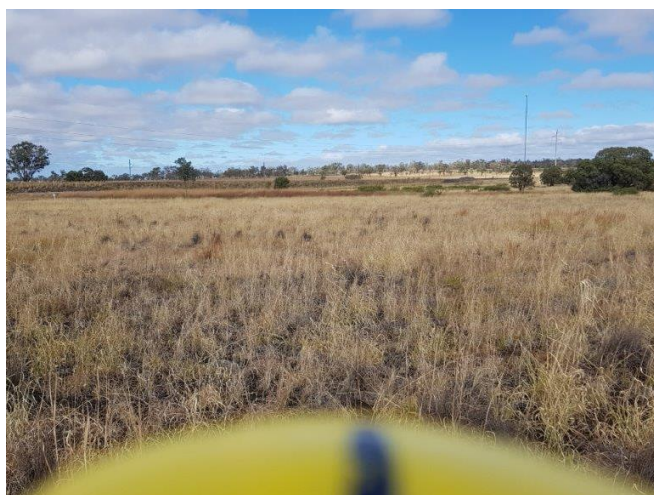


Photo E-23 South



Photo E-24 West



Photo E-25 Ground



## SITE MDSRL03 – H03\_50M



Photo E-26 North



Photo E-27 East



Photo E-28 South



Photo E-29 West



Photo E-30 Ground



## SITE MDSRL04 – H04\_0M



Photo E-31 North



Photo E-32 East



Photo E-33 South



Photo E-34 West



Photo E-35 Ground



## SITE MDSRL04 – H04\_50M



Photo E-36 North

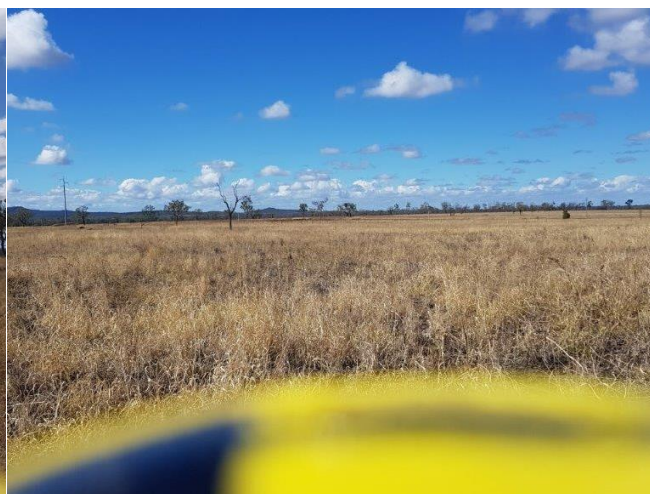


Photo E-37 East



Photo E-38 South



Photo E-39 West



Photo E-40 Ground



## SITE MDSRL05 – W05\_0



Photo E-41 North

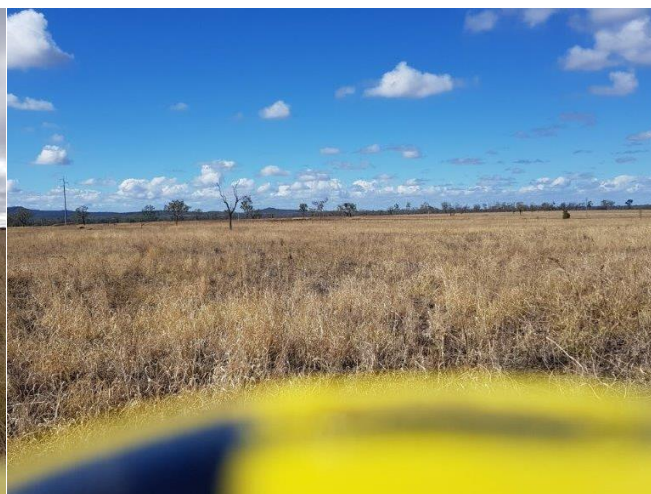


Photo E-42 East



Photo E-43 South



Photo E-44 West



Photo E-45 Ground



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## **APPENDIX F    LEXINGTON OFFSET SITE PHOTO MONITORING**



## SITE 01 – H01\_0M



Photo F-1 North



Photo F-2 East



Photo F-3 South



Photo F-4 West



Photo F-5 Ground



## SITE 01 – H01\_50M



Photo F-6 North



Photo F-7 East



Photo F-8 South



Photo F-9 West



Photo F-10 Ground



## SITE 02 – H02\_0M



Photo F-11 North



Photo F-12 East



Photo F-13 South



Photo F-14 West



Photo F-15 Ground



## SITE 02 – H02\_50M



Photo F-16 North



Photo F-17 East



Photo F-18 South



Photo F-19 West



Photo F-20 Ground



## SITE 03 – H03\_0M



Photo F-21 North

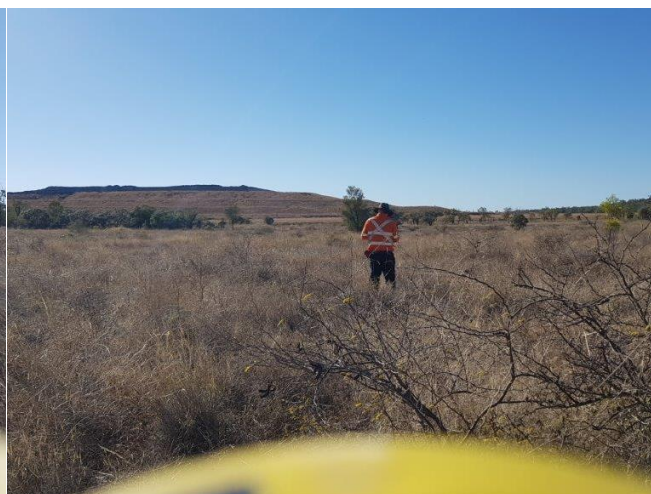


Photo F-22 East

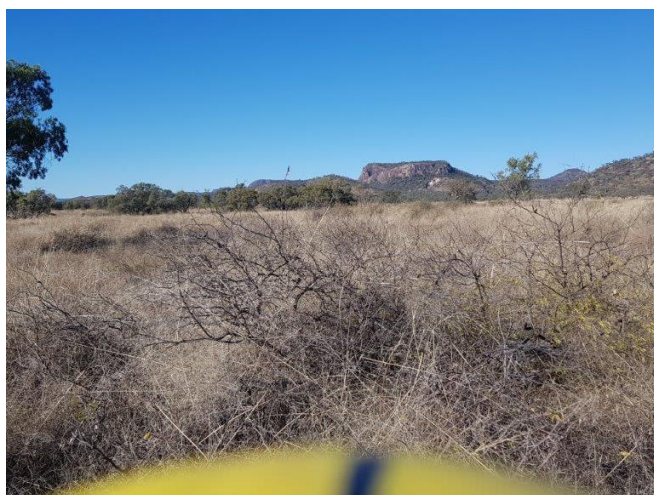


Photo F-23 South

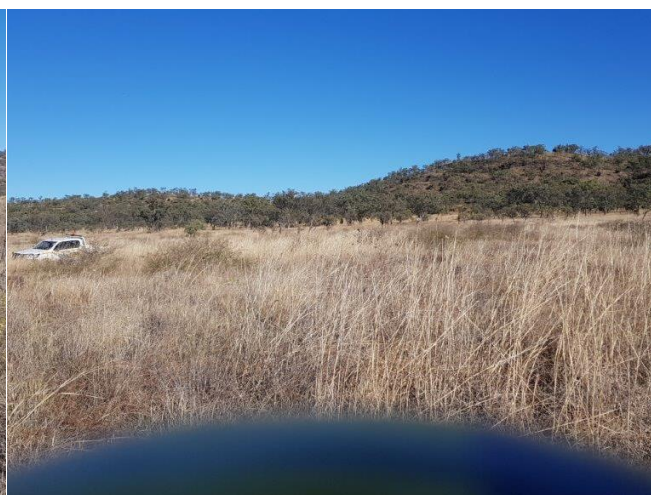


Photo F-24 West



Photo F-25 Ground



## SITE 03 – H03\_50M



Photo F-26 North



Photo F-27 East



Photo F-28 South



Photo F-29 West



Photo F-30 Ground



## SITE 04 – H04\_OM



Photo F-31 North



Photo F-32 East



Photo F-33 South

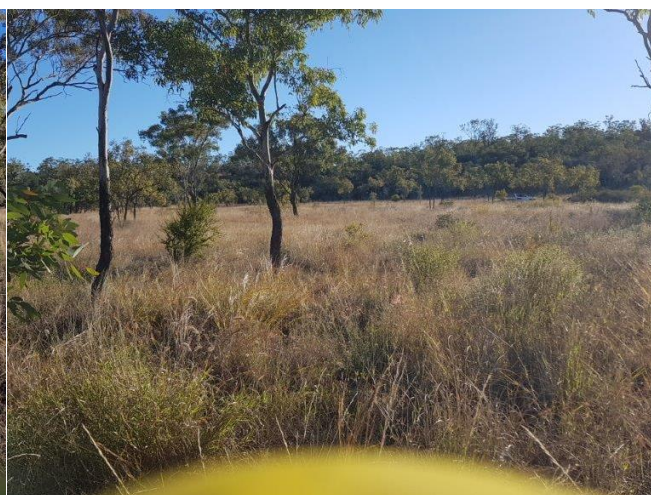


Photo F-34 West



Photo F-35 Ground



## SITE 04 – H04\_50M

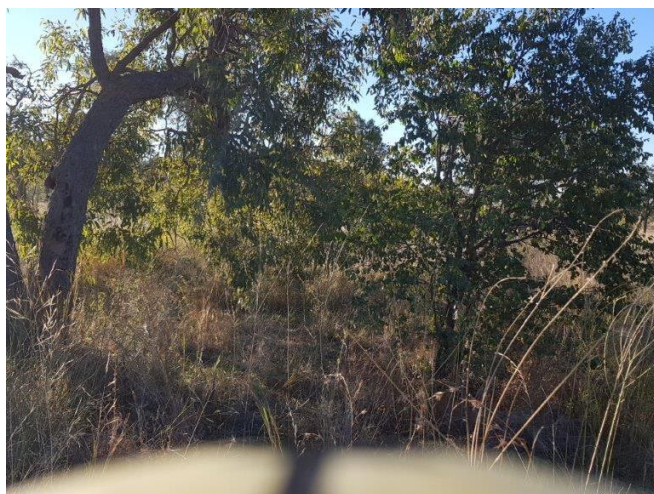


Photo F-36 North



Photo F-37 East



Photo F-38 South



Photo F-39 West



Photo F-40 Ground



## SITE 05 – H05\_0M



Photo F-41 North



Photo F-42 East



Photo F-43 South



Photo F-44 West



Photo F-45 Ground



## SITE 05 – H05\_50M



Photo F-46 North



Photo F-47 East



Photo F-48 South



Photo F-49 West



Photo F-50 Ground



## SITE 06 – H06\_0M



Photo F-51 North



Photo F-52 East



Photo F-53 South

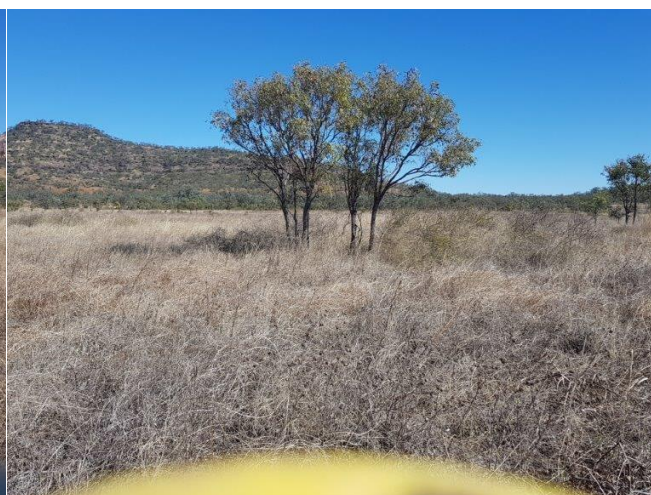


Photo F-54 West



Photo F-55 Ground



## SITE 06 – H06\_50M



Photo F-56 North



Photo F-57 East



Photo F-58 South



Photo F-59 West



Photo F-60 Ground



## SITE 07 – H07\_0M



Photo F-61 North



Photo F-62 East



Photo F-63 South



Photo F-64 West



Photo F-65 Ground



## SITE 07 – H07\_50M



Photo F-66 North



Photo F-67 East



Photo F-68 South



Photo F-69 West



Photo F-70 Ground



## SITE 08 – H08\_OM



Photo F-71 North



Photo F-72 East



Photo F-73 South



Photo F-74 West



Photo F-75 Ground



## SITE 08 – H08\_50M



Photo F-76 North



Photo F-77 East



Photo F-78 South



Photo F-79 West



Photo F-80 Ground



## SITE 09 – H09\_0M



Photo F-81 North



Photo F-82 East

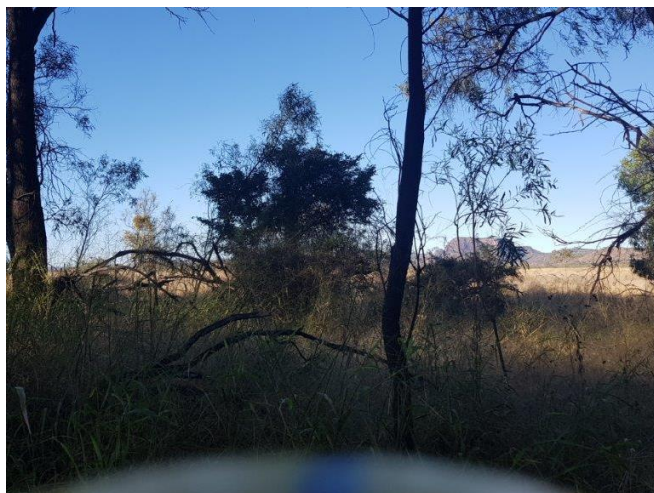


Photo F-83 South



Photo F-84 West



Photo F-85 Ground



## SITE 09 – H09\_50M



Photo F-86 North

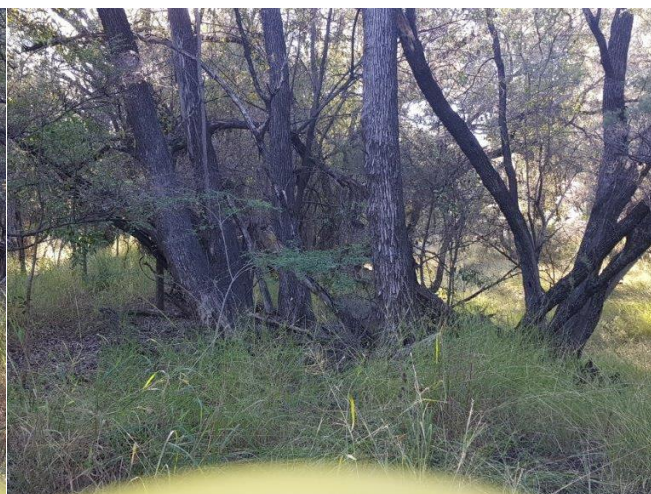


Photo F-87 East



Photo F-88 South



Photo F-89 West



Photo F-90 Ground



## SITE 10 – H10\_0M

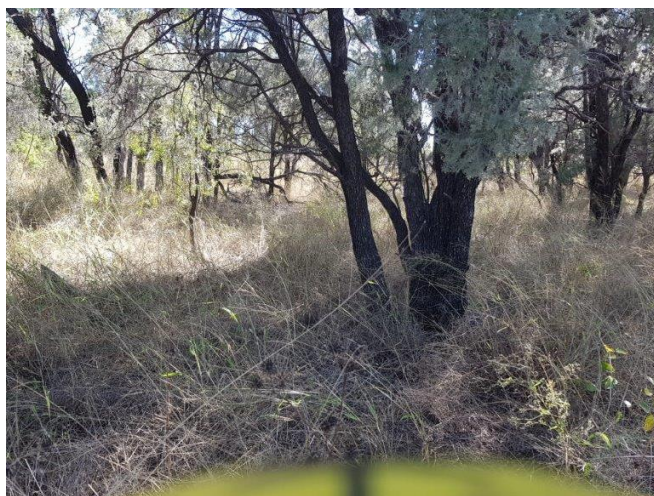


Photo F-91 North



Photo F-92 East



Photo F-93 South



Photo F-94 West



Photo F-95 Ground



## SITE 10 – H10\_50M



Photo F-96 North



Photo F-97 East



Photo F-98 South



Photo F-99 West



Photo F-100 Ground



## SITE 11 – H11\_0M



Photo F-101 North



Photo F-102 East



Photo F-103 South



Photo F-104 West



Photo F-105 Ground



## SITE 11 – H11\_50M



Photo F-106 North



Photo F-107 East



Photo F-108 South



Photo F-109 West



Photo F-110 Ground



## SITE 12 – H12\_OM



Photo F-111 North



Photo F-112 East



Photo F-113 South



Photo F-114 West



Photo F-115 Ground



## SITE 12 – H12\_50M



Photo F-116 North



Photo F-117 East



Photo F-118 South



Photo F-119 West



Photo F-120 Ground



## SITE 13 – H13\_0M



Photo F-121 North



Photo F-122 East



Photo F-123 South



Photo F-124 West



Photo F-125 Ground



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## **SITE 13 – H13\_0M**

No photos available.



## SITE 14 – W14\_0



Photo F-126 North



Photo F-127 East



Photo F-128 South



Photo F-129 West



Photo F-130 Ground



## SITE 15 – W15\_0



Photo F-131 North



Photo F-132 East



Photo F-133 South



Photo F-134 West



Photo F-135 Ground



## SITE 16 – W16\_0



Photo F-136 North



Photo F-137 East



Photo F-138 South



Photo F-139 West



Photo F-140 Ground



## SITE 17 – W17\_0



Photo F-141 North



Photo F-142 East



Photo F-143 South



Photo F-144 West



Photo F-145 Ground



## SITE 18 – W18\_0



Photo F-146 North

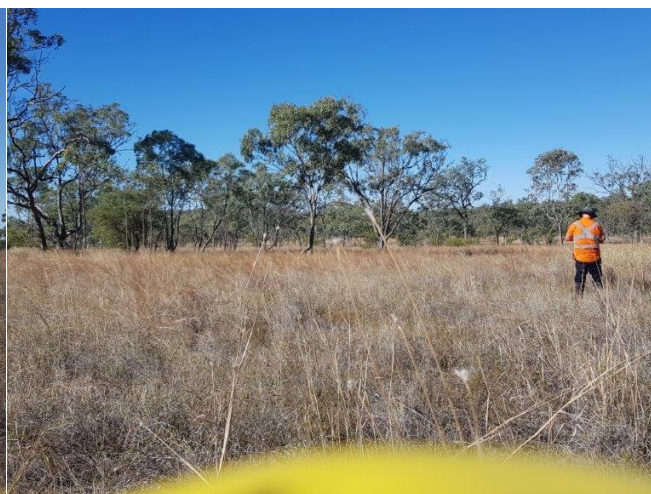


Photo F-147 East



Photo F-148 South

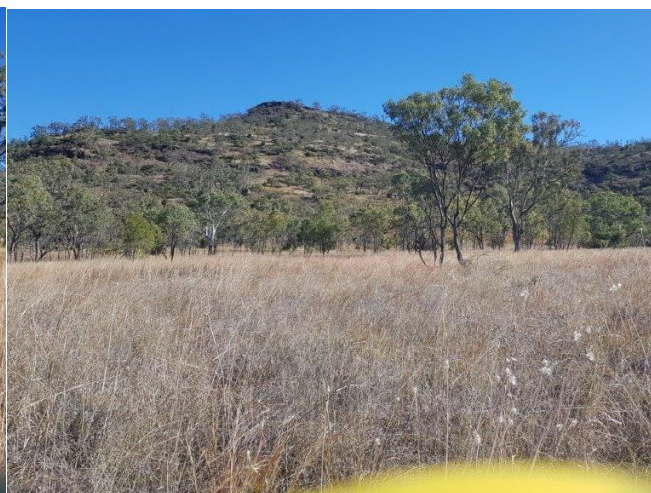


Photo F-149 West



Photo F-150 Ground



## SITE 19 – W19\_0



Photo F-151 North

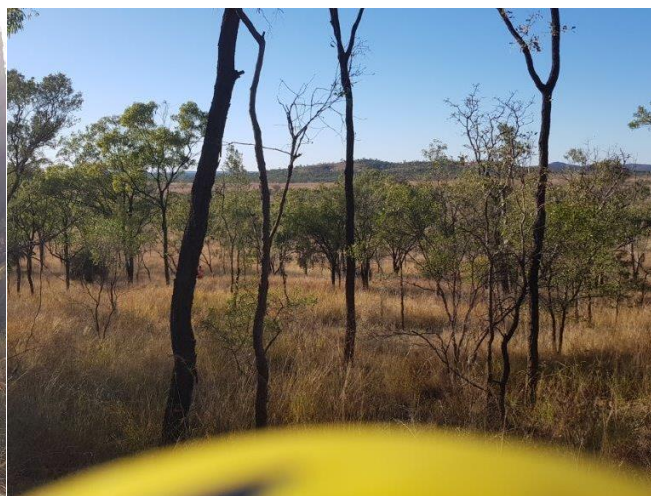


Photo F-152 East



Photo F-153 South



Photo F-154 West



Photo F-155 Ground



## SITE 20 – W20\_0



Photo F-156 North



Photo F-157 East



Photo F-158 South



Photo F-159 West



Photo F-160 Ground



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## **APPENDIX G   LEXINGTON RAIL LOOP OFFSET SITE PHOTO MONITORING**



## SITE LEXRL01 – H01\_OM



Photo G-1 North



Photo G-2 East



Photo G-3 South



Photo G-4 West



Photo G-5 Ground



## SITE LEXRL01 – H01\_50M



Photo G-6 North

Photo G-7 East



Photo G-8 South

Photo G-9 West



Photo G-10 Ground



## SITE LEXRL02 – H02\_0M



Photo G-11 North

Photo G-12 East



Photo G-13 South

Photo G-14 West



Photo G-15 Ground



## SITE LEXRL02 – H02\_50M



Photo G-16 North

Photo G-17 East



Photo G-18 South

Photo G-19 West



Photo G-20 Ground



## SITE LEXRL03 – H03\_OM



Photo G-21 North



Photo G-22 East



Photo G-23 South



Photo G-24 West



Photo G-25 Ground



## SITE LEXRL03 – H03\_50M



Photo G-26 North



Photo G-27 East



Photo G-28 South



Photo G-29 West



Photo G-30 Ground



## SITE LEXRL04 – H04\_OM



Photo G-31 North



Photo G-32 East



Photo G-33 South



Photo G-34 West



Photo G-35 Ground



## SITE LEXRL04 – H04\_50M



Photo G-36 North



Photo G-37 East



Photo G-38 South



Photo G-39 West



Photo G-40 Ground



## SITE LEXRL05 – H05\_OM



Photo G-41 North



Photo G-42 East

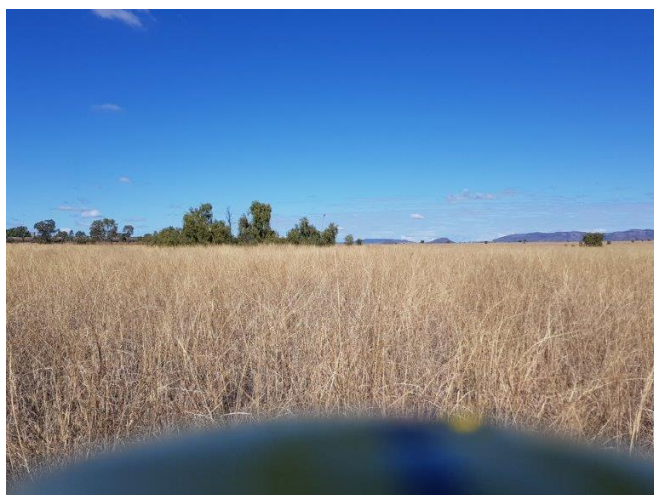


Photo G-43 South

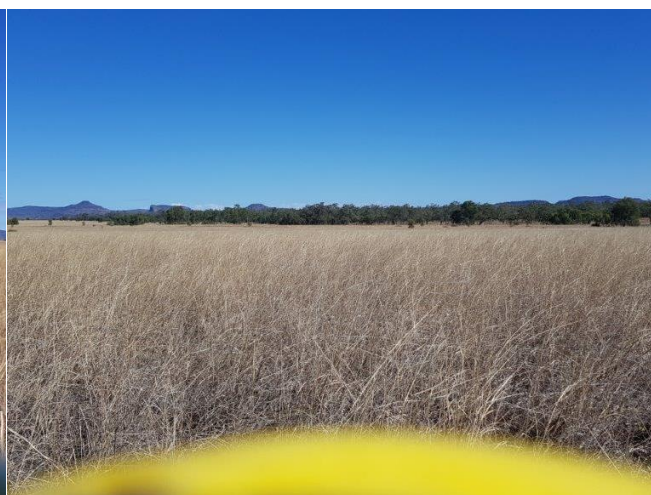


Photo G-44 West



Photo G-45 Ground



## SITE LEXRL05 – H05\_50M



Photo G-46 North



Photo G-47 East



Photo G-48 South

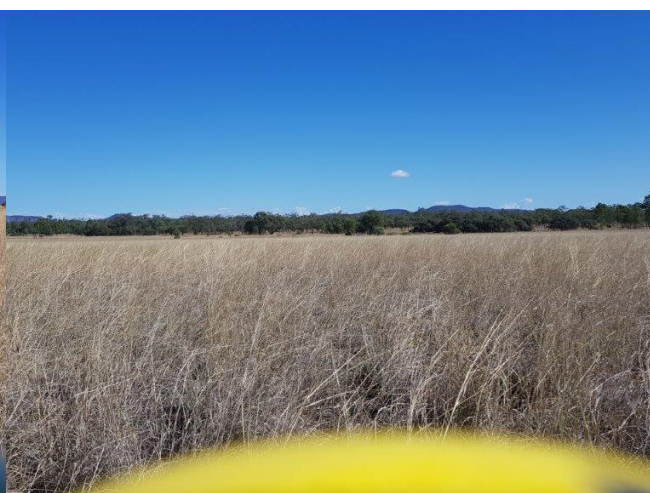


Photo G-49 West



Photo G-50 Ground



## SITE LEXRL06 – H06\_OM



Photo G-51 North

Photo G-52 East



Photo G-53 South

Photo G-54 West



Photo G-55 Ground



## SITE LEXRL06 – H06\_50M



Photo G-56 North

Photo G-57 East



Photo G-58 South

Photo G-59 West



Photo G-60 Ground



## SITE LEXRL07 – H07\_OM



Photo G-61 North

Photo G-62 East

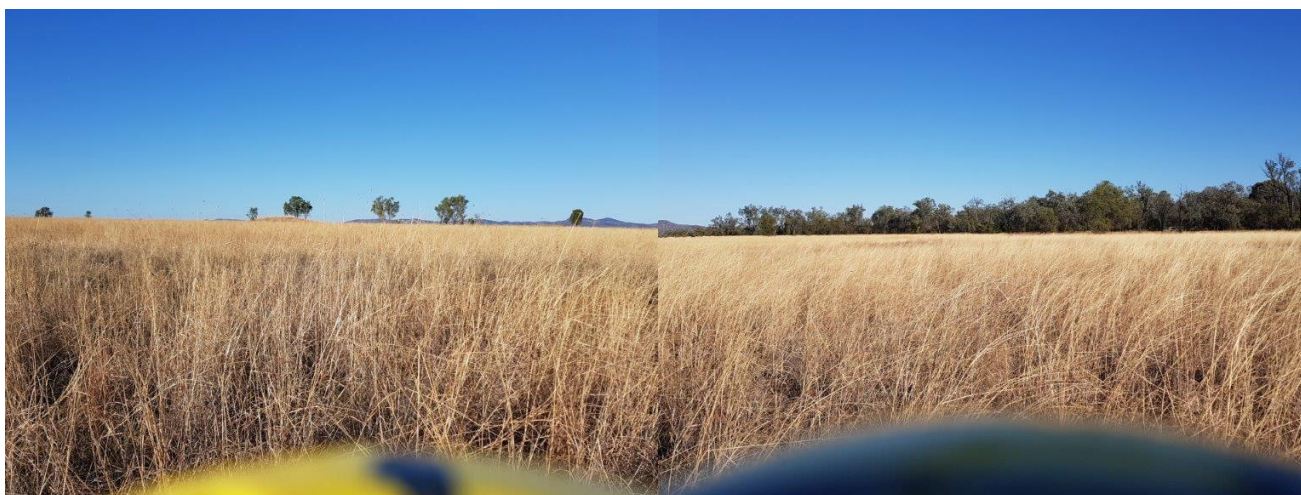


Photo G-63 South

Photo G-64 West



Photo G-65 Ground



## SITE LEXRL07 – H07\_50M



Photo G-66 North



Photo G-67 East



Photo G-68 South



Photo G-69 West



Photo G-70 Ground



## SITE LEXRL08 – W08\_0



Photo G-71 North



Photo G-72 East



Photo G-73 South

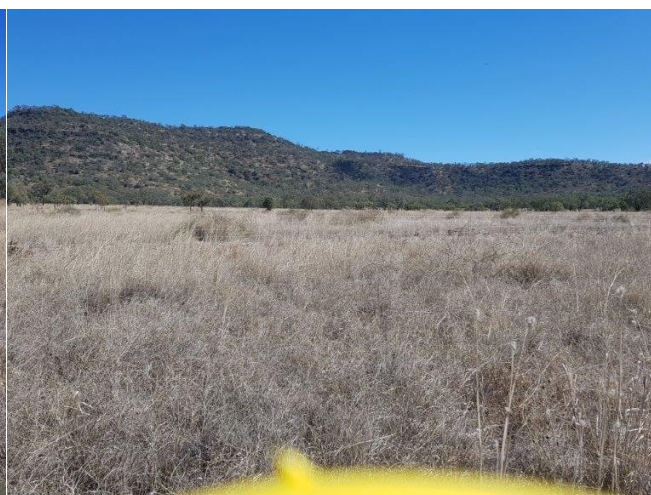


Photo G-74 West



Photo G-75 Ground



## SITE LEXRL09 – W09\_0



Photo G-76 North



Photo G-77 East



Photo G-78 South



Photo G-79 West



Photo G-80 Ground



## SITE LEXRL10 – W10\_0



Photo G-81 North



Photo G-82 East

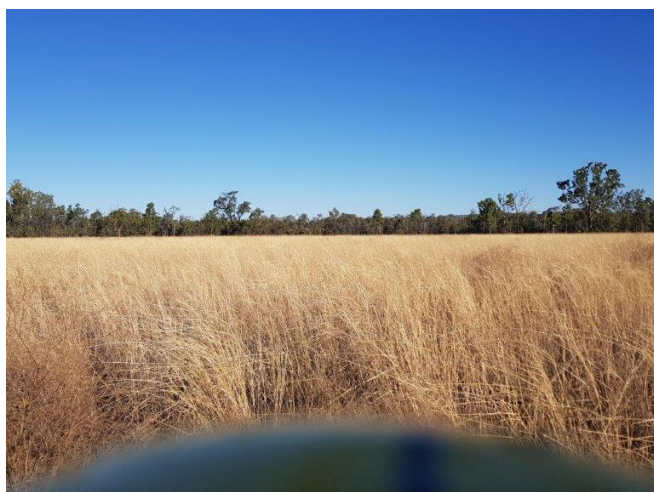


Photo G-83 South



Photo G-84 West



Photo G-85 Ground



## SITE LEXRL11 – W11\_0



Photo G-86 North



Photo G-87 East

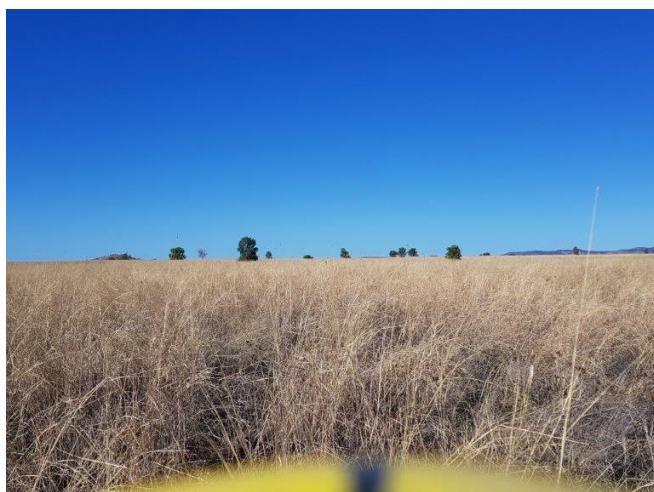


Photo G-88 South

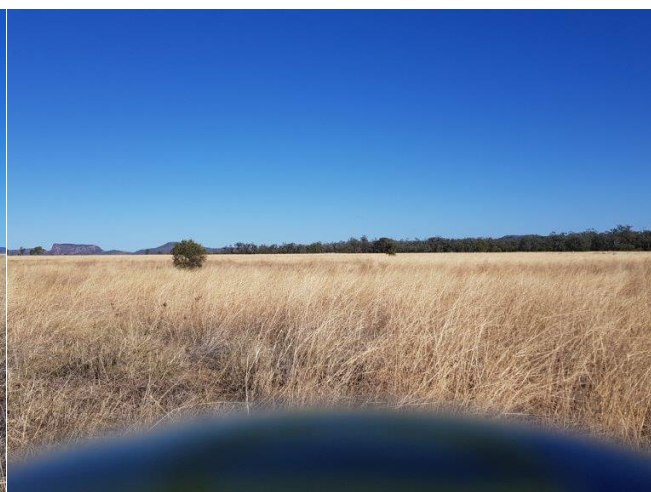


Photo G-89 West



Photo G-90 Ground



## SITE LEXRL12 – W12\_0



Photo G-91 North

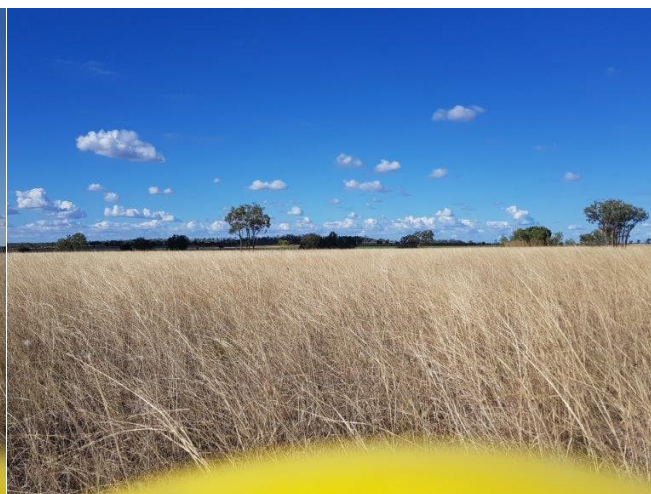


Photo G-92 East

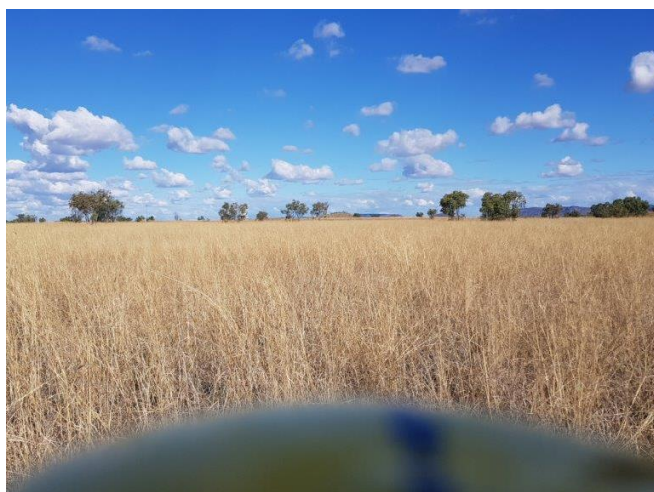


Photo G-93 South

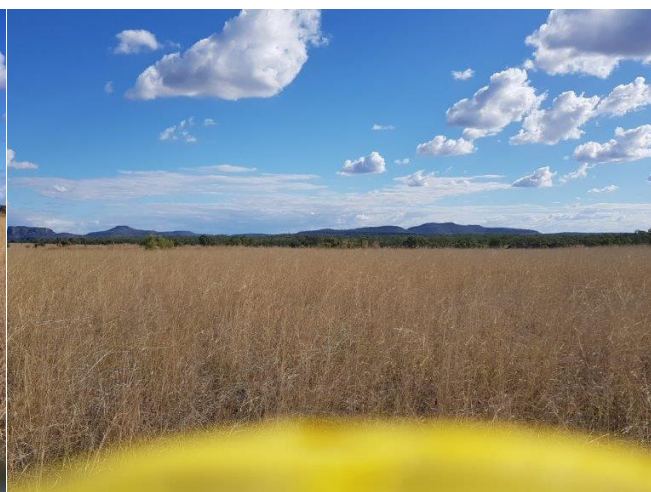


Photo G-94 West



Photo G-95 Ground