Tropicana Remote Sensing and Vegetation Monitoring - 2023 Survey

Tropicana Joint Venture

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DOCUMENT TRACKING

Project Name	Tropicana Remote Sensing and Vegetation Monitoring - 2023 Survey
Project Number	600-23PER5732
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Status	**Final**
Version Number	**1**
Last saved on	**19 December 2023**

This report should be cited as 'Eco Logical Australia 2023. *Tropicana Remote Sensing and Vegetation Monitoring - 2023 Survey*. Prepared for Tropicana Joint Venture.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Tropicana

Template 2.8.1

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Abbreviations

Abbreviation	Description
AGAA	AngloGold Ashanti Australia
Borefield	Process Water Supply Borefield
°C	Degrees Celsius
CEO	Chief Executive Officer
CoA	Commonwealth of Australia
DEC	Department of Environment and Conservation
DPIRD	Department of Primary Industries and Regional Development
DMSI	Digital multispectral imagery
ELA	Eco Logical Australia
EPA	Environmental Protection Authority
GVD	Great Victoria Desert
IBRA	Interim Biogeographic Regionalisation of Australia
km	Kilometres
m	Metres
mm	Millimetres
PNAS	Proceedings of the National Academy of Sciences
SAVI	Soil Adjusted Vegetation Indices
The Project	The Tropicana Gold Mine Project
TJV	Tropicana Joint Venture
VMP	Vegetation Monitoring Program
VMS	Vegetation Monitoring Strategy
WAOL	Western Australian Organism List

Executive Summary

The Tropicana Gold Mine project is an approved and operational open pit and underground gold mining and processing operation, run by the Tropicana Joint Venture (TJV) that was formed in 2002 between AngloGold Ashanti Australia and an Independence Group NL - IGO Limited. As of 2021, the IGO stake was acquired by Regis Resources Ltd.

Condition 5-2 of Ministerial Statement 839 of the Tropicana Gold Mine (The Project) specifies that:

'*The proponent shall undertake monitoring of the condition and abundance of vegetation and flora at reference and potential impact sites in accordance with the 'Tropicana Gold Project Environmental Monitoring Strategy, Version 1.0, Author: B. Bastow, Issue Date: 18 February 2010' or subsequent revisions approved by the EPA CEO. This monitoring is to be carried out to the requirements of the EPA CEO on advice of the DEC*'.

From the overarching Environmental Monitoring Strategy mentioned in Condition 5-2, a Vegetation Monitoring Strategy (VMS) was prepared to specifically detail the annual vegetation monitoring approach to meet the requirements of Condition 5-2, and outline the triggers and actions required if triggers were reached or exceeded. Eco Logical Australia was commissioned to prepare and undertake a Vegetation Monitoring Program in accordance with the approach described in the VMS. The Vegetation Monitoring Program was prepared in 2011, with a survey (Year 1) also conducted in 2011.

This document reports results from the Vegetation Monitoring Program 2023 (Year 13). The document evaluates results against four of the vegetation monitoring triggers (Triggers 1, 2, 5 and 6) to determine whether trigger values have been exceeded and require further investigation into the potential cause. Trigger 1 is a 25% deviation in cover or productivity within monitoring (impact) sites relative to reference sites. Trigger 2 is a 25% deviation of indicator species within monitoring (impact) sites relative to reference sites. Triggers 5 and 6 refer to the presence, distribution, abundance and density/cover of invasive flora.

The 2023 field survey was undertaken from 11th to the 15th of September by two ELA Botanists, accompanied by two AGAA employees (acting as field assistants). A total of 110 monitoring sites located within 14 representative vegetation communities consisting of 55 reference and 55 impact sites were assessed during the 2023 survey.

Rainfall in the year preceding the survey was well below average, with a total of 104.4 mm rainfall recorded at Tropicana Gold Mine, compared to the long-term average (2007-2023) of 240.2 mm. Below average annual rainfall is a notable trend that has been recorded yearly since 2019.

Remote sensing analysis identified small scale vegetation loss limited mainly to normal operational activities such as track and drill pad development, mine expansion and clearing around pre-existing infrastructure. An exception to this involved a patch of vegetation health reduction adjacent to the airstrip in the Operations Area (observed in tile Trop_20), where tall vegetation was pruned in line with operational recommendations for the adjacent weather station.

Remote sensing observed two minor fire events, one associated with a vehicle turnaround in the Infrastructure Corridor, and one in the Borefield which was isolated and away from operational areas.

In most areas burned prior to 2022, there was no significant observable change in post-fire vegetation health from 2022 to 2023, while areas that did record change were found to show a mixture of vegetation recovery and decline.

The effects of road dust on surrounding vegetation from the Infrastructure Corridor have been evident through remote sensing since 2020, with six tiles in 2023 showing observable dust adjacent to the road. There is presently no observable decline in vegetative cover or condition directly related to dust coverage, however the successive years of drought conditions means the monitoring program is unlikely to show any impacts from operational activities; and impacts, if any, may not be realized by the remote sensing studies until sufficient rainfall occurs to promote widespread growth throughout the region, such as that received through one or more consecutive years of above average annual rainfall.

Broadscale variation in vegetative health and cover was observed by remote sensing across the study area. Majority of the changes observed can be explained by natural environmental influences such as extended dry conditions or lightning-initiated fires and are not likely to be related to operational activities. Broadscale changes were otherwise an artifact of photographic variability in the aerial photography with change-detection errors due to time of day or pixelation and were not related to operational activities.

Observations of Leaf Loss score and Browning scale in Operations Area sites recorded a higher proportion of sites with reduced condition scores compared to Infrastructure Corridor or Borefield sites. This was inferred to be due to lower rainfall in the Operations area compared to elsewhere.

An assessment of the monitoring sites against Trigger 1 identified a total of ten impact sites that exceeded the 25% deviation in overall foliar cover relative to both reference site and either 2022 or the baseline that triggered an investigation. The Operations Area recorded four sites with an exceedance, Infrastructure Corridor recorded two sites with an exceedance and the Borefield recorded four sites with an exceedance.

Exceedances in Trigger 1 were primarily attributed to natural processes and likely not due to operational activities. The primary causes of Trigger 1 exceedances were the natural growth of vegetation since the baseline was established, fire events initially reducing overall foliar cover followed by post-fire regeneration of the vegetation, senescence of vegetation due to drought conditions and the effect of slight changes in low cover values having a proportionately larger percentage deviation.

An assessment of the impact and reference sites against Trigger 2 identified a total of 36 impact sites that exceeded the 25% deviation in indicator species cover relative to the reference site and either 2022 or the baseline (2015). The Operations Area recorded exceedances in 10 sites, Infrastructure Corridor 14 sites and Borefield 10 sites. The original indicator species chosen for monitoring sites have been senescing due to a combination of drought, post fire succession, or natural lifespan in recent years, with ten sites recording an absence of the original indicator species.

All exceedances in Trigger 2 were primarily attributed to natural processes and likely not due to operational activities. Primary causes of Trigger 2 exceedance were determined to be a combination of fire events, extended drought conditions and low cover values. Fire events in previous years suddenly reduced the cover of all species in impacted sites between one year and the next. Consecutive years of drought conditions caused widespread senescence in certain areas and species. Thirdly, small changes

to low cover values can have a proportional effect where a minor adjustment to cover values between years can result in proportionately large deviation values.

There were no exceedances against Triggers 5 or 6, as no weed species were recorded within monitoring quadrats during the 2023 vegetation monitoring program.

Three primary recommendations from the 2023 Tropicana remote sensing and vegetation monitoring program were as follows:

- Continue to maintain weed hygiene practices for all incoming vehicles.
- Continue to undertake regular weed monitoring activities around commonly foot trafficked areas, i.e. site offices, process plant, village, aerodrome and major pedestrian pathways.
- Consider undertaking measurement and comparison of rainfall within the mine process area and Borefield in addition to the airfield to determine potential changes to localised precipitation.

1. Introduction

This document details data collection and analysis for the Tropicana Gold Mine (the Project) Vegetation Monitoring Program (VMP) for 2023 and examines changes that have occurred between 2022 and 2023, and 2023 and the baseline data. The VMP uses an integrated remote sensing and field assessment approach for the purpose of monitoring changes and detecting potential impacts to vegetation, if any, that may be related to the project.

1.1. Tropicana Gold Project

1.1.1. Background

The Project is a joint venture between AngloGold Ashanti Australia (70% stakeholder and manager) and Regis Resources Limited (30% stakeholder), collectively known as the Tropicana Joint Venture (TJV).

The Project is an approved and operational open pit and underground gold mining and processing operation. Mining activities commenced in July 2012 and processing commenced in the second half of 2013. The Project is located approximately 330 km northeast of Kalgoorlie and 200 km east of Laverton, on the western edge of the Great Victoria Desert in Western Australia (Figure 1-1).

The Project comprises three core areas:

- Operations Area: The Operations Area comprises the core mining area and supporting infrastructure. Specifically, this area contains open pits, underground portal, waste landforms, stockpiles, tailings storage facilities, a processing plant, village, aerodrome and other associated infrastructure.
- Infrastructure Corridor: The Infrastructure Corridor (also known as the Pinjin Infrastructure Corridor) is a 276km long access road and communications corridor which links the Operations Area to existing communications and road networks in Kalgoorlie.
- Process Water Supply Borefield: The Process Water Supply Borefield (herein referred to as the 'Borefield') is in the Minigwal Trough and provides water for the Project.

1.1.2. Study Area

The Project is located primarily within the Great Victoria Desert region of the Interim Biogeographic Regionalisation of Australia (IBRA) classification system (Commonwealth of Australia 2012). A small section of the western part of the Infrastructure Corridor is within the Murchison IBRA region.

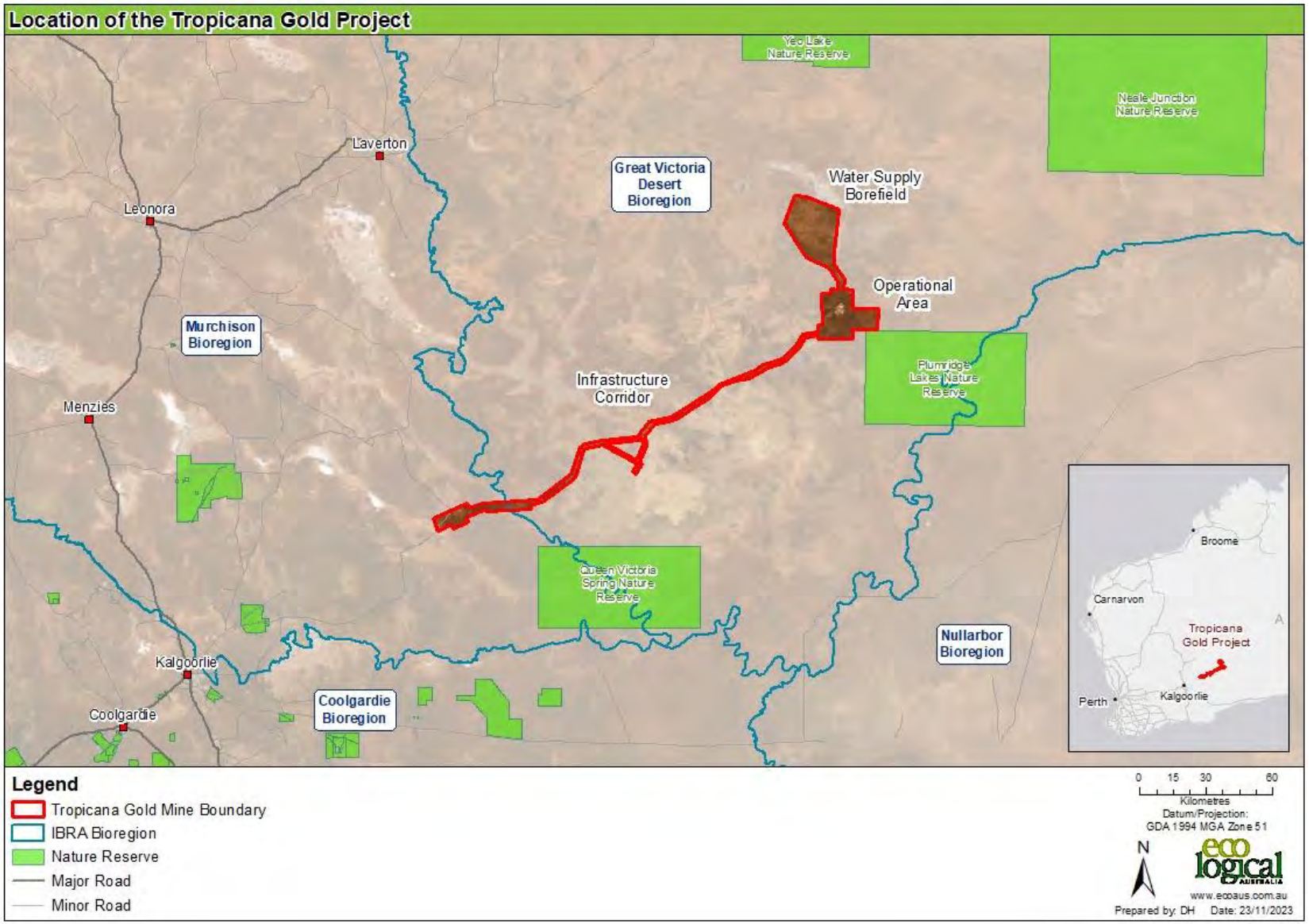

Figure 1-1: Location of the Tropicana Gold Project, showing location of the Operations Area, Infrastructure Corridor and Borefield

1.1.3. Climate

The climate of the Project area can be described as arid, generally receiving less than 250 mm of rainfall annually, which occurs sporadically throughout the year (Beard 1990). The region experiences sporadic thunderstorms, which on occasion cause large fires that burn inside the study area. In the year preceding the 2023 survey (October 2022 to September 2023), mean maximum and minimum temperatures were higher than the long-term average for the months of February, March, August and September, while a little lower than the long-term average for the 2022 months October through December. Other months in the preceding year recorded average minimum and maximum values similar to the long term mean values (Figure 1-2).

Total annual rainfall in the year preceding the survey (October 2022 to September 2023) was 104.4 mm, significantly below the long-term average (2007-2023) of 240.2 mm and the lowest on record for that time period (Tropicana Gold mine climate data 2023) (Figure 1-3). A more detailed overview of the existing environment and regional climate and weather is provided in the 2011 monitoring report (Eco Logical Australia [ELA] 2011).

Climate records from the TGM Aerodrome Weather Station show that total yearly rainfall from 2019 to present has been substantially below the long-term average (240.2 mm) with 2022 receiving just 97.6 mm for the calendar year (Tropicana Gold mine climate data 2023).

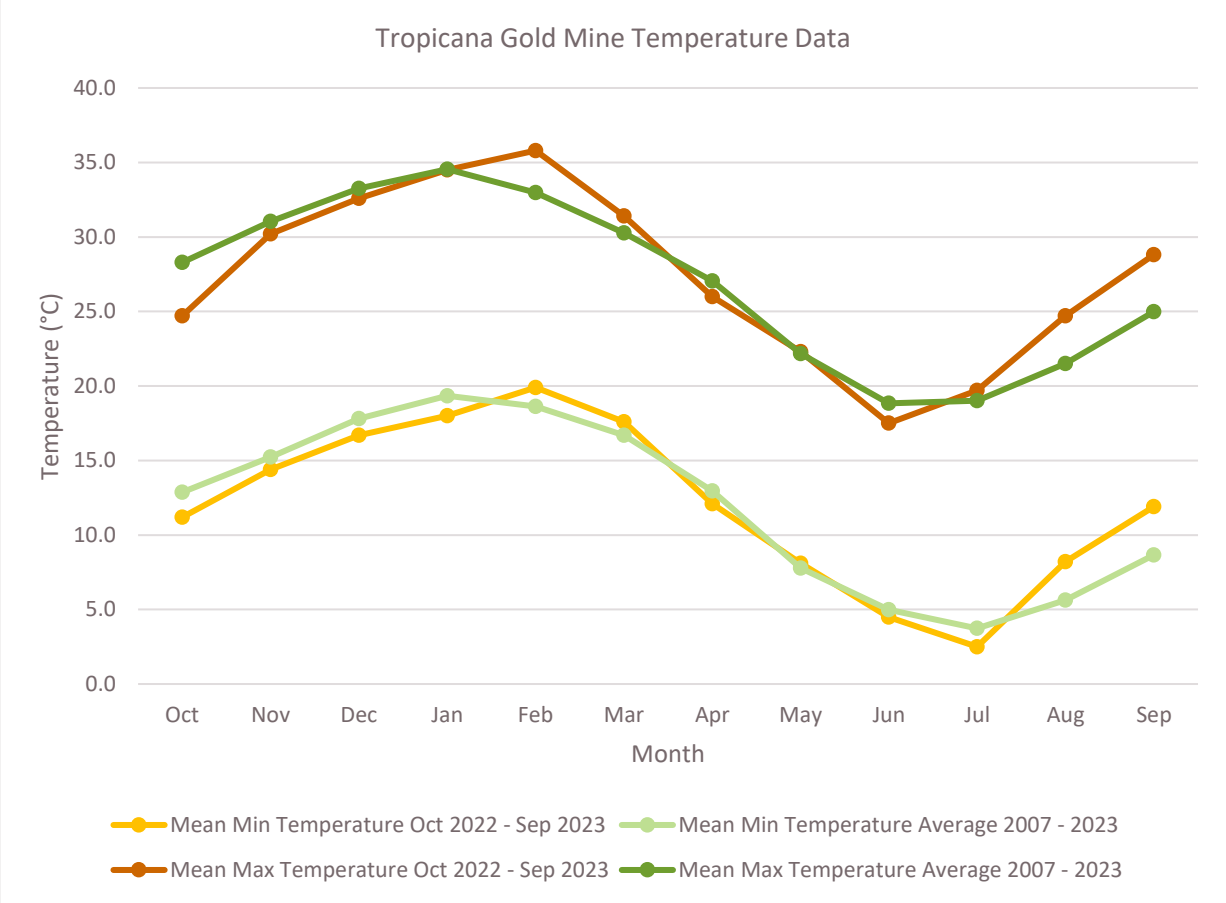

Figure 1-2: Temperature data from Tropicana Gold Mine Aerodrome Weather Station for the period 2007 to 2023

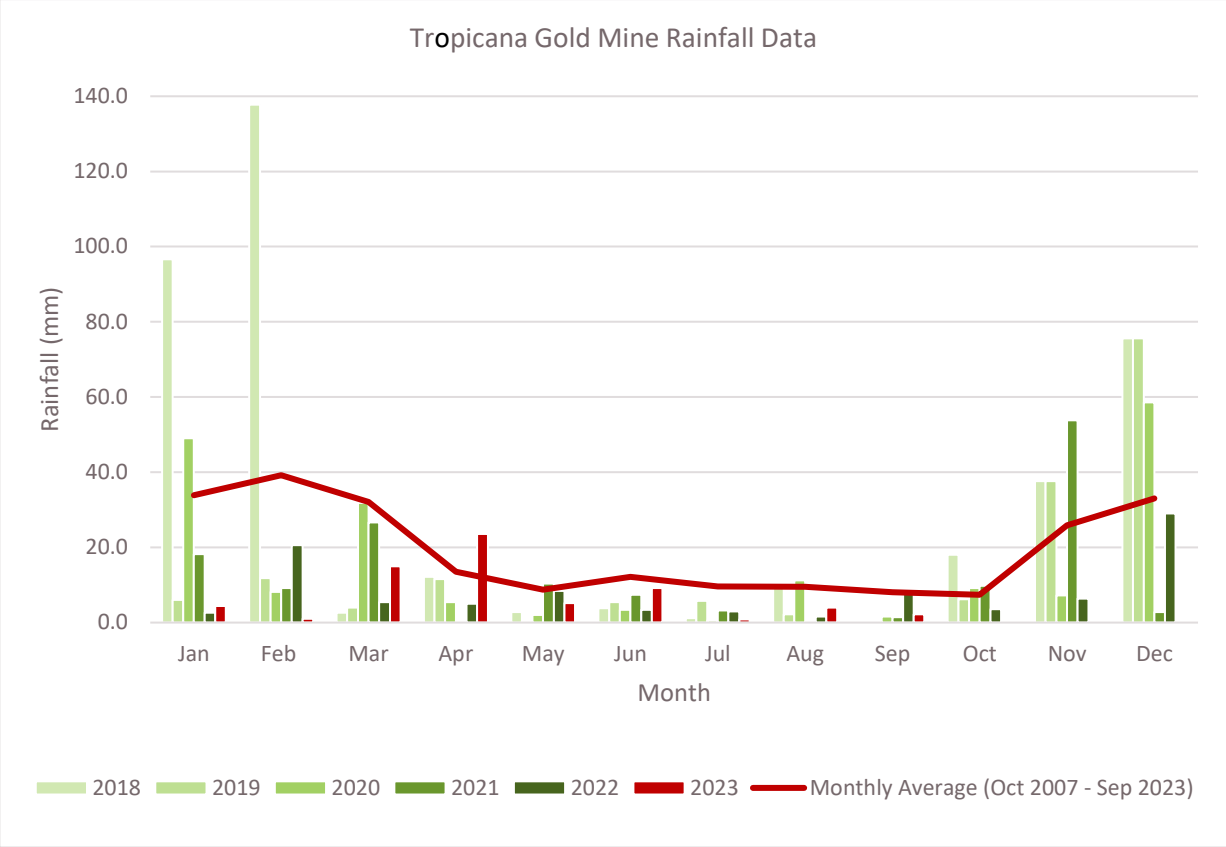

Figure 1-3: Monthly Rainfall recorded at Tropicana Gold Mine Aerodrome Weather Station from January 2017 to September 2023 with all years (2007 to 2023) monthly average

1.1.4. Ministerial approval and conditions

An environmental impact assessment to meet both State and Commonwealth requirements was completed in 2009 with approval (Ministerial Statement 839). Approval under the State Environmental Protection Act 1986 was obtained in September 2010, while approval under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 was obtained in December 2010.

Condition 5-2 of Ministerial Statement 839 for the Project specified that:

'*The proponent shall undertake monitoring of the condition and abundance of vegetation and flora at reference and potential impact sites in accordance with the 'Tropicana Gold Project Environmental Monitoring Strategy, Version 1.0, Author: B Bastow, Issue Date: 18 February 2010' or subsequent revisions approved by the EPA CEO. The monitoring is to be carried out to the requirements of the EPA CEO on advice of the DEC*' (Minister for Environment; Youth 2010).

The aim of this document is to meet the requirements of this condition.

1.2. Purpose of the Vegetation Monitoring Program

The VMP is being undertaken in part to assist in assessing environmental performance of the Project (acknowledging this is not the only tool being used to measure environmental performance), and also specifically meet Condition 5-2 of Statement 839.

The Environmental Monitoring Strategy referred to by Condition 5-2 provides an overview of environmental monitoring to be undertaken over the life of the Project (AngloGold Ashanti Australia [AGAA] 2010). The monitoring requirements, purposes, methods and frequencies from this Strategy that are applicable to vegetation are provided in the Vegetation Monitoring Strategy document (ELA and Tropicana JV 2011).

1.2.1. Potential Impacts

Operational activities may lead to vegetation decline/impact in areas adjacent to the active Project areas if not appropriately managed. Potential impacts from operational activities associated with vegetation include (both direct and indirect):

- Clearing native vegetation.
- Reduced sheet flow (water starving) down slope of infrastructure affecting sheet flow dependent communities.
- Concentrated water flow through diversion infrastructure, with potential to cause erosion and subsequent deposition.
- Runoff concentration and channel formation.
- Potential for dust deposition from vehicle movements, crushing, stockpiles and cleared areas to affect fringing vegetation.
- Escape of saline water to fringing vegetation due to inadequate management of activities associated with dust suppression.
- Introduction and increased germination and cover of non-native (weed) species.
- Compaction of off-road vehicles.
- Introduction and spread of plant pathogens.
- Non-adherence to clearing boundaries or delineated driving areas.
- Clearing related soil erosion and sediment deposition.
- Saline water release from infrastructure.
- Drawdown of the water table.
- Vehicle and other mechanical damage to vegetation; and
- Release of contaminated water from facilities such as the tailings storage facility and waste landforms.

The VMP was designed using an integrated remote sensing (entire site) and targeted field assessment (local scale) approach to quantitatively determine whether there is any decline in vegetation condition that may result from any of the identified impacting processes.

1.2.2. Vegetation Monitoring Triggers

The Project's Vegetation Monitoring Strategy outlines the vegetation monitoring triggers for the Project. Triggers relate to native vegetation cover and productivity, indicator species, clearing boundaries, weeds, and rehabilitation, and are outlined in Table 1. This report addresses results obtained in relation to Triggers 1, 2, 5 and 6.

Table 1: Vegetation monitoring triggers for the Project (extract from Tropicana Gold Project Vegetation Monitoring Strategy; ELA and Tropicana JV 2011)

Parameter	Monitoring Requirement	Trigger
Vegetation and flora condition	Monitoring vegetation and flora adjacent to the Project and road corridor to identify indirect impacts e.g., dust (includes internal and Mine Access Road)	1. 25% deviation in cover or productivity within monitoring (impact) sites relative to reference sites 2. 25% deviation of indicator species within monitoring (impact) sites relative to reference sites
Vegetation and flora condition	Monitor Project footprint boundaries	3. Clearing beyond boundary and/or clearing in the absence of marked boundary 4. Actual clearing beyond expected extent (GIS)
Presence, distribution, abundance and density/cover of invasive flora	Assessment of weeds present including: species, their distribution, abundance and density/cover of weeds.	5. Identification of a weed species in a site where it had not previously been recorded 6. 25% increase of weed species in a site where it had not previously been recorded.
Presence, distribution, abundance and density/cover of invasive flora	Monitor weed presence within the Project area and on roadsides.	7. Identification of a weed species in a site where it had not previously been recorded
Rehabilitation	Monitor vegetation establishment in rehabilitation areas. Following rehabilitation, areas will be monitored and treated for invasive flora invasion, if necessary.	8. N/A 9. Weed identified in rehabilitation

2. Methods

2.1. Remote sensing data analysis

2.1.1. Data capture and assessment

High resolution digital multispectral imagery (DMSI), with four bands (Blue, Green, Red and Near Infrared) was captured by Outline Imagery in September 2023. Images were resampled to a pixel resolution of 1 m. The 2023 imagery was compared to similar imagery captured in September 2022. The footprint of data capture is outlined in Figure 2-1. Appendix A provides the DMSI visual assessment outputs.

Each image was assessed for quality using visualisation of each image band, band ratios and band histograms. Image quality in terms of cloud effects, dust effects or incorrect offset and gains were assessed and recorded.

2.1.2. Data processing

All images were processed to create Soil Adjusted Vegetation Indices (SAVI) images (Equation 1).

$$Equation\ 1: SAVI = \left(\frac{NIR - Red}{NIR + Red + L}\right) \times (1 + L)$$

NIR = Near Infrared Band, R = Red Band, L = the soil cover adjustment factor (set to 0.8 in all cases). The value of 0.8 was used due to the large amount of bare soil within the images. By using this value, the aim was to reduce the effect that bare soils have on the analysis.

The corresponding SAVI images for each mosaic section were processed to create change detection images between the time periods. The images were analysed to detect year to year change by subtracting each Previous (2022) image from each Current (2023; Equation 2).

$$Equation\ 2: \Delta SAVI = Current\ SAVI - Previous\ SAVI$$

Each of the change detection images were divided into a colour spectrum using a piecewise contrast stretch to help define to areas of change (Redder colours = loss, Bluer colours = gain and White = little or no change).

All image processing and assessment was carried out using ENVI 5.0 image processing software.

2.1.3. Data assessment

A set of standard tiles was created over the entire project footprint at a scale of approximately 1:20,000 (ELA 2011). Each tile was designed to be 6,000 metres (m) by 3,200 m with approximately 100 m of overlap between adjoining tiles to facilitate on-screen assessment and ensure coverage of the entire area. A total of 118 tiles were created. Each tile was given a unique label to facilitate rapid identification and future comparison. This network of tiles forms the basis for detailed systematic evaluation of change in vegetation communities for ongoing monitoring. Additional tiles will be developed to facilitate analysis within the expanded image capture area.

Each change image was displayed on the screen at high resolution using the tile layout, with the image zoomed in to a viewing scale of 1:5,000 or higher. In addition to the change image, the true colour images for 2022 and 2023 were compared and assessed to identify areas of ‘significant change’ in

vegetation. Areas of 'significant change' in vegetation cover were documented using a GIS polygon and a table recording system. A minimum mapping unit of 40 x 40 m (1600 m^2) was used.

To determine a 'significant change', each change image was inspected on-screen using the tile layout. A contrast stretch was applied to the image to highlight areas of potentially significant change, being areas where the change in the SAVI index differed by more than 1 standard deviation from the average change between years. This enabled differentiation between possible mine impacts and broad seasonal variability between years.

All derived images and polygons were stored as .jpg files and shapefiles using the tile labelling file system to enable ease of display and further analysis and are presented with this report as an Attachment.

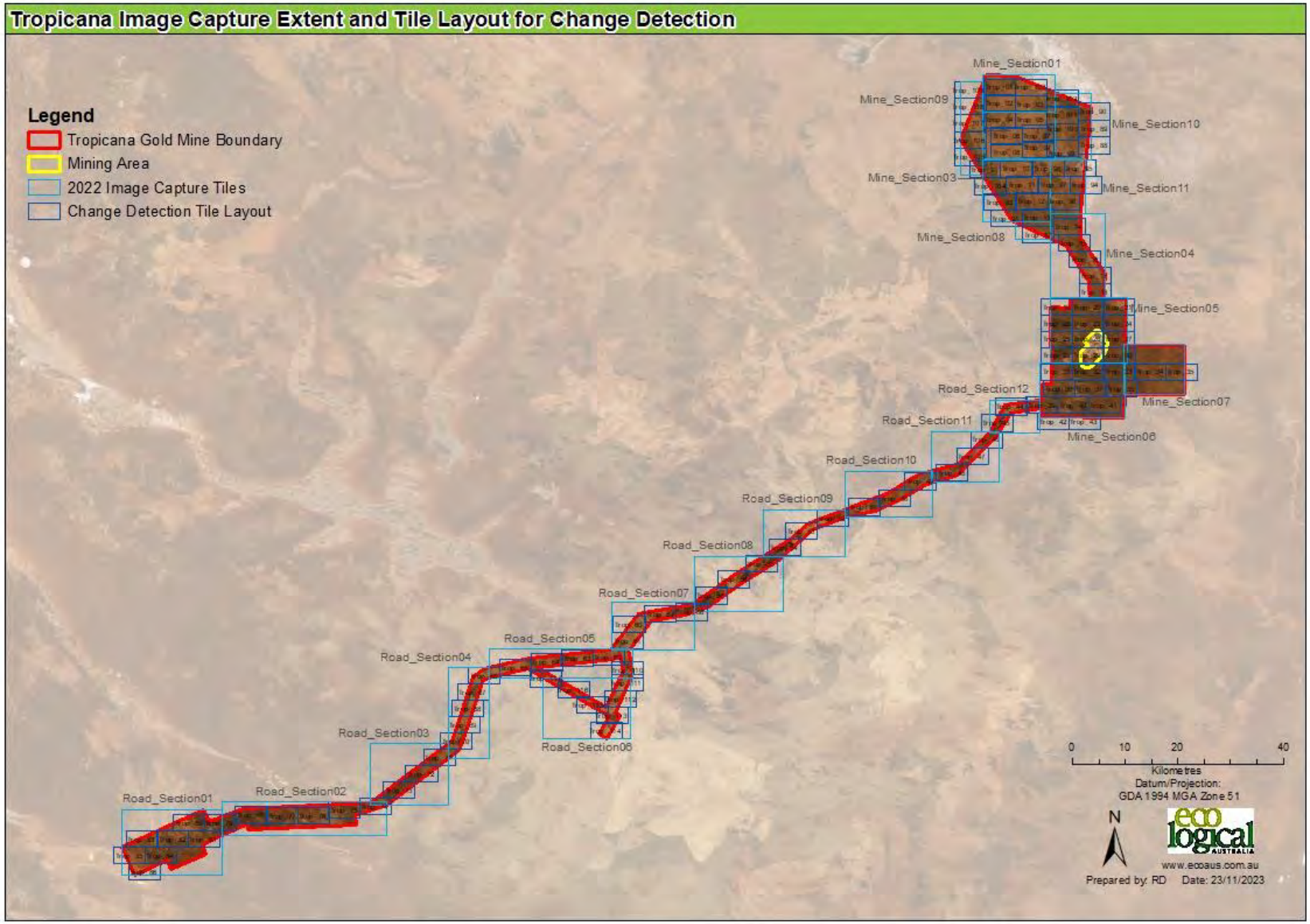

Figure 2-1: Image capture extent and tile layout for change detection

2.2. Floristic survey and vegetation condition assessment

The 2022 survey was undertaken from 11th to the 15th of September by ELA Botanists Daniel Brassington and Emily Chetwin, accompanied by two AGAA employees (acting as field assistants).

2.2.1. Survey design

A total of 110 monitoring sites (20 x 20 m quadrats) located within 14 representative vegetation communities consisting of 55 reference and 55 impact sites were assessed during the 2023 survey. This included the 102 of the 106 monitoring sites originally established in 2011, along with two new impact sites established in 2012 that replaced the two impacted by roadworks along the infrastructure corridor, four new sites in the Borefield (two impact and two reference) established in 2014 and two new sites in the Operations Area established in 2022 to replace two impact sites removed through expansion of the mine footprint (Waste Landform). There were no changes to survey effort undertaken in the 2023 program.

For the purposes of this report, monitoring sites have been grouped together into three core areas (Operational Area, Infrastructure Corridor, and Borefield) and listed by vegetation community. The reference and impact sites have then been paired together. The vegetation communities selected for monitoring and their representative sites (grouped in pairs) are listed in Table 2. The locations of the monitoring sites in each core area are shown in Figure 2-2. Site names, location coordinates and attributes are presented in Appendix B. More detailed maps of the site locations in each core area are provided in Appendix C.

Table 2: Vegetation communities included in the 2023 Project Vegetation Monitoring Program and associated monitoring sites.

Vegetation code (from ELA 2011)	Description of floristics	Sites		Number of sites
		Impact	Reference	
Operational Area				
A7a	*Acacia aneura* woodlands over grasses +/- *Triodia basedowii*	A7a-5	A7a-6	10
		A7a-10	A7a-9	
		A7a-8	A7a-7	
		A7a-1	A7a-4	
		A7a-2	A7a-3	
A7b	Open to moderately dense *Acacia aneura* over *Aluta maisonneuvei* subsp. *auriculata* / *Acacia ramulosa* var. *ramulosa* over *Eremophila forrestii* subsp. *forrestii* over *Triodia basedowii*	A7b-2	A7b-1	4
		A7b-4	A7b-3	
C9	Open to moderately dense *Casuarina pauper* woodland over open mixed shrubs and scattered soft grasses and/or *Triodia scariosa*	C9-1	C9-3	4
		C9-2	C9-4	
E1b	Open *Eucalyptus youngiana* and sparse *Callitris preissii* over mixed shrubs over open to moderately dense *Triodia basedowii*	E1b-1	E1b-2	10
		E1b-8	E1b-7	
		E1b-11	E1b-4	
		E1b-5	E1b-6	
		E1b-10	E1b-9	
E3	Occasional *Eucalyptus gongylocarpa* over mixed upper stratum over *Daviesia grahamii* / *Pityrodia loricata* / *Chrysocephalum puteale* low shrubland over sparse to open *Triodia desertorum* or *T. basedowii* and *Lomandra leucocephala* subsp. *robusta*	E3-1	E3-2	6
		E3-3	E3-4	
		E3-6	E3-7	
	Subtotal	17	17	34
Infrastructure Corridor				
A2	Low woodland to tall shrubland of *Acacia ayersiana* and *Acacia aneura* var. *aneura* with *Acacia aneura* var. *argentea* over *Eremophila* spp., *Aluta maisonneuvei* subsp. *auriculata* and *Prostanthera* spp. This community occurs on orange sandy loam	A2-6	A2-5	12
		A2-1	A2-7	
		A2-9	A2-8	
		A2-2	A2-10	
		A2-3	A2-11	
		A2-4	A2-12	
A3	Low open woodland to tall open shrubland of *Acacia ayersiana* and *Acacia aneura* var. *aneura* over *Acacia* spp. and mixed shrubs. This community occurs on orange sandy loams	A3-2	A3-1	6
		A3-4	A3-3	
		A3-5	A3-6	
A7b	Open to moderately dense *Acacia aneura* over *Aluta maisonneuvei* subsp. *auriculata* / *Acacia ramulosa* var. *ramulosa* over *Eremophila forrestii* subsp. *forrestii* over *Triodia basedowii*	A7b-6	A7b-5	4
		A7b-9	A7b-8	

Vegetation code (from ELA 2011)	Description of floristics	Sites		Number of sites
		Impact	Reference	
E4	Low woodland to low open woodland of *Eucalyptus gongylocarpa* with *Callitris preissii* and *Eucalyptus* spp. over mixed shrubs over *Triodia* spp. This community occurs on orange, red-orange, yellow-orange and yellow sandy loams on mixed topographies	E4-3	E4-4	14
		E4-5	E4-6	
		E4-2	E4-1	
		E4-7	E4-8	
		E4-9	E4-10	
		E4-11	E4-12	
		E4-14	E4-13	
E9	Low open woodland of *Eucalyptus concinna* with *Eucalyptus* spp. over *Eremophila scoparia*, *Acacia hemiteles*, *Acacia colletioides*, *Scaevola spinescens* and *Eremophila caperata* over *Triodia scariosa*. This community occurs on orange sandy loams on flats	E9-2	E9-1	4
		E9-6	E9-5	
S8	Low shrubland of *Acacia desertorum* var. *desertorum* with *Grevillea juncifolia*, low Myrtaceous shrubs and mixed low shrubs with occasional emergent *Eucalyptus youngiana* and *Eucalyptus* spp. This community occurs on pale orange sandy loams on flats	S8-2	S8-6	6
		S8-3	S8-1	
		S8-7	S8-5	
	Subtotal	23	23	46
Borefield				
E2	*Eucalyptus gongylocarpa* over mixed *Acacia* over mixed moderately open to moderately dense shrubs over *Triodia basedowii*	E2-5	E2-6	6
		E2-1	E2-4	
		E2-2	E2-3	
T1	Open to moderately open mixed shrubs over *Triodia basedowii*	T1-3	T1-1	4
		T1-4	T1-2	
X1	Mixed *Eucalypt* woodlands dominated by *Eucalyptus gongylocarpa* / *E. youngiana* over mixed open shrubs and *Triodia basedowii*	X1-1	X1-2	16
		X1-15	X1-16	
		X1-11	X1-12	
		X1-13	X1-14	
		X1-9	X1-10	
		X1-7	X1-8	
		X1-4	X1-6	
		X1-3	X1-5	
M1	Moderately dense to dense *Acacia aneura* woodland over isolated shrubs over scattered *Triodia basedowii*	M1-3	M1-4	4
		M1-1	M1-2	
	Subtotal	15	15	30
	Total	55	55	110

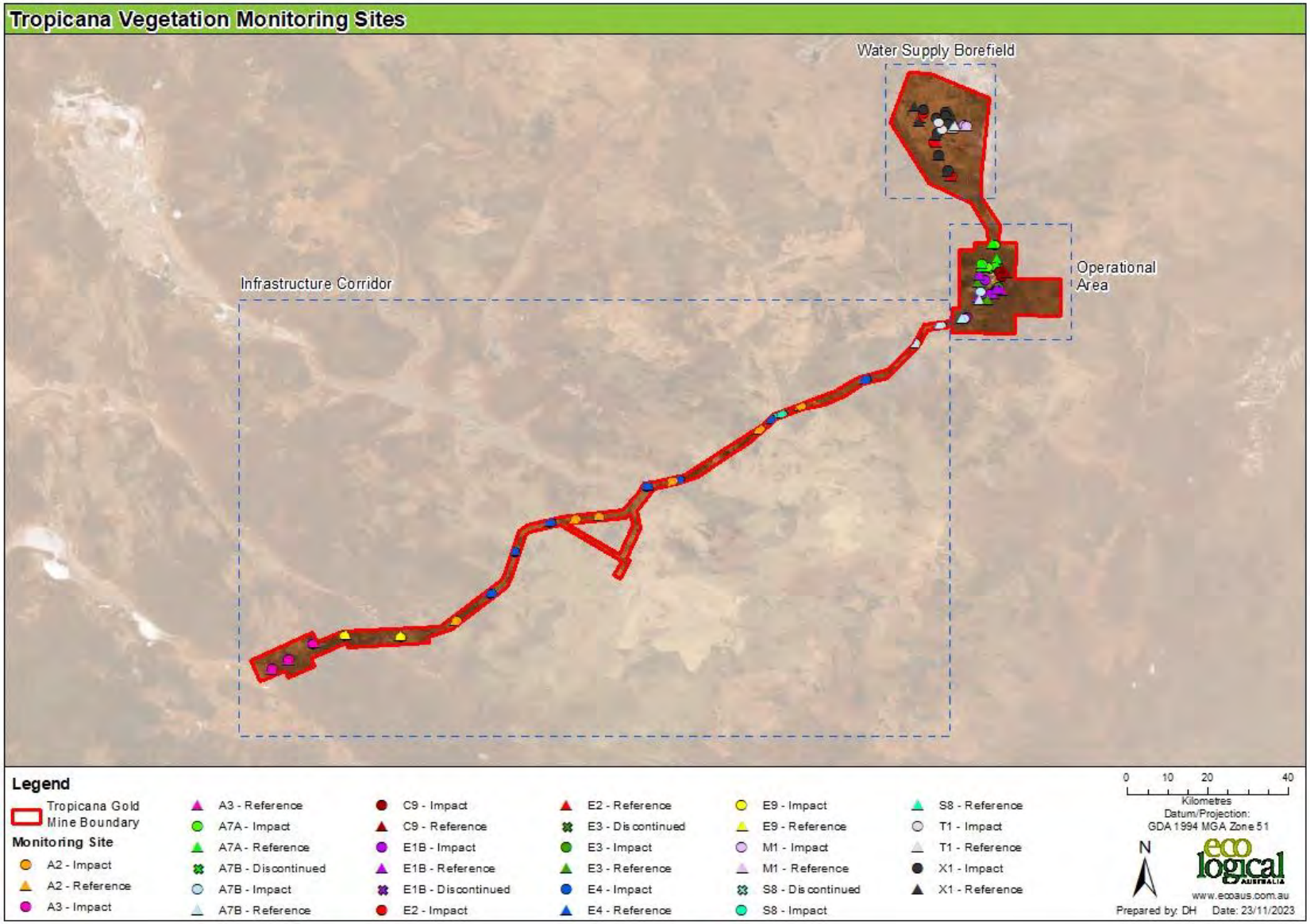

Figure 2-2: Tropicana Vegetation Monitoring Site Locations

2.2.2. Survey data collection

2.2.2.1. Vegetation condition

The following attributes were collected in each of the 110 monitoring sites:

- Overall % foliar cover (estimate)
- % foliar cover based on vegetation strata (e.g., overstorey, midstorey, understorey)
- % bare soil
- Foliar condition within the quadrat, measured using two qualitative scales:
    - Browning scale of Green (healthy), Yellow (senescent) or Brown (dead or dying foliage)
    - Leaf loss scale (1 through to 5 with 1 indicating denuded branches and 5 indicating a full canopy of leaves)
- Disturbance (location and dimensions of tracks etc., marked on a map of the quadrat)
- Depth of erosion rills or gullies, or depth and dimensions of sediment deposition
- Other observations (e.g., recent fire occurrence, storm damage, weeds, pest or pathogen attack)

2.2.2.2. Indicator species

The cover (%) and number of individuals were counted for each indicator species selected for each site during the 2023 round of monitoring.

Indicator species in several sites had senesced in previous years resulting in their absence from one or both impact/reference pair of monitoring sites. In these cases, a secondary indicator species was selected on a paired-sites basis and recorded, as well as the original indicator species if present. In the 2015 monitoring program (ELA 2015) several potential indicator species were recorded for most sites, so where possible, one of the 2015 secondary indicator species was utilised (not all secondary indicator species were still present in the 2023 monitoring program).

2.2.2.3. Photographic data

Photographic monitoring of each of the quadrats involved the following steps:

- A panoramic photograph was taken with the camera held at chest height directly above the northwest corner peg. A photo board, consisting of a small whiteboard with the site name and date written on it was placed within the quadrat to be visible in the photograph. A measuring pole was erected at the centre peg to a height of at least 2 m. Photographs were taken with digital cameras set on panorama. Note that for the 2011 and 2012 photographs, a Canon PowerShot SX30 IS digital camera with a focal length of 4.3 mm and for the 2013 to 2020 period two Sony DSC-HX50V digital cameras were used. From 2021 onwards any digital camera with suitable resolution and panoramic function was used. Prior to 2020 a clipboard and paper were used rather than a whiteboard.
- The panoramic photos started due east and swept east to south, ending due south, as follows:
    - Due east along the quadrat boundary
    - Southeast (towards the centre peg)
    - Due south along the quadrat boundary

2.2.3. Assessment of vegetation condition attributes

Vegetation condition was assessed to determine if any changes had occurred between 2022 and 2023 and to detect any obvious longer term trends or patterns in vegetation condition.

The assessment focussed on the following vegetation condition attributes:

- Comparisons of the percentage covers (overall) of each paired site, listed by each vegetation community in the three core areas.
- Comparisons of measures of foliar condition.
- Other observations, including erosion and weeds.

2.3. Evaluation of data against vegetation monitoring triggers

Assessment of quadrat observation data were undertaken against vegetation monitoring Trigger 1 (25% deviation in cover or productivity within monitoring (impact) sites relative to reference sites) and Trigger 2 (25% deviation of indicator species within monitoring (impact) sites relative to reference sites) as outlined in the Environmental Monitoring Strategy (AGAA 2010) and reproduced in the Vegetation Monitoring Strategy (ELA and Tropicana JV 2011; Table 1). Other assessments against monitoring Triggers 5 and 6 were also undertaken. Monitoring Triggers 5 and 6 refer to the presence, distribution, abundance and density/cover of invasive flora (Table 1).

Assessments against Triggers 3 and 4 relating to clearing boundaries, Trigger 7 relating to monitoring weeds and Triggers 8 and 9 relating to weeds in rehabilitation areas were not undertaken as these do not directly relate to data collection as part of the VMP.

Assessments for Trigger 1 were conducted through calculating the deviation in overall foliar cover (%) between 2022 and 2023 and the baseline compared against 2023. The baseline comprises the mean overall foliar cover (%) for the first three years of monitoring; for the original 102 sites currently included in the monitoring this is 2011, 2012 and 2013. Using a mean value for the baseline comparison is considered more appropriate as it captures the year-to-year variability of the Project area as a result of climatic influences. Sites established after the baseline (2011 – 2013): M1-1, M1-2, M1-3, M1-4 (established in 2014), E1b-11 and E3-7 (established in 2022) cannot be compared against the mean baseline (2011-2013). The percentage deviation values between each paired impact and reference site for both 2022 – 2023 and baseline - 2023 were plotted on bar charts. Where there are no bars plotted on a chart for a particular site or comparison type (i.e. 2022 – 2023, baseline – 2023), this indicates that there has been no change in overall foliar cover (%) of impact sites relative to reference sites and therefore there is no % deviation. The charts were also grouped according to vegetation community in each of the three core areas. Lines denoting 25% increase and 25% decrease thresholds for % deviation were also plotted on the charts so any exceedances of Trigger 1 for 2023 are obvious. If a deviation of greater than 25% occurred for monitoring (impact) sites, this site was also compared to its paired reference site to see if a similar trend was also occurring which may indicate external factors outside of the Project are influencing the condition of the sites (e.g. climate). Where an impact site had a decrease in % deviation greater than 25% which was not also reflected in the condition of its paired reference site then further investigation into the cause is required. This process is outlined in the flow diagram presented in Figure 2-3.

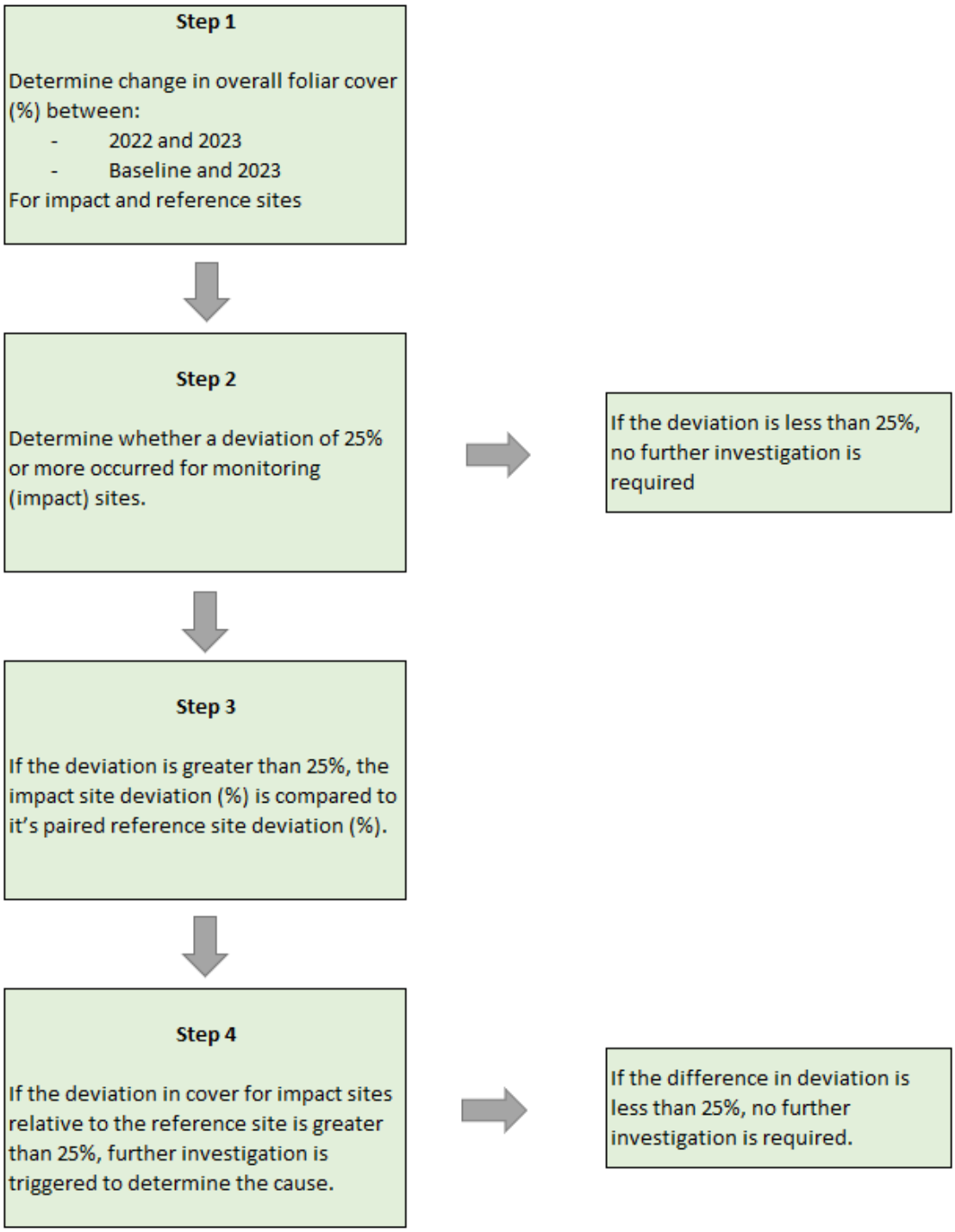

Figure 2-3: Flow diagram showing steps to investigate deviation in overall foliar cover (%) for Trigger 1

3. Results

3.1. Remote sensing

Aims of the 2023 remote sensing study were to observe the effect of mining activity on vegetation health and monitor the ongoing status of vegetation surrounding the Operations Area, Borefield, and Infrastructure Corridor.

There were no significant impacts to vegetation found to be directly attributed to operational activities during the 2023 remote sensing study. Small-scale vegetation loss associated with mining operations was limited mainly to normal operational activities such as track development (creation or widening), mining expansion and drill pad or pit expansion, and clearing around pre-existing infrastructure. Examples of this operational clearing are see in tile Trop_29 (Figure 3-1) and Trop_32 (Figure 3-2). Some vegetation loss appeared to have occurred directly adjacent to the airstrip in Trop_20, with further information supplied by TGM determined the change was due to pruning of taller vegetation in line with operational recommendations for the adjacent weather station (Figure 3-3).

Trends of vegetation decline were observed in many tiles throughout the study area; however, they did not appear to follow clear, discernible patterns, and were not linked to any specific vegetation types. Broadscale vegetation reduction was a common trend in many of the assessment tiles, however an assessment of true colour images did not show any clear canopy reduction of vegetation within the study area. In some small, isolated areas, vegetation appeared to undergo a more significant reduction in cover and/or vigour. Many of these areas were identified in the western portion of the Borefield and appear to be the senescence of understorey species that had appeared during previous years.

The 2023 remote sensing study identified two minor fire events occurring in Trop_75 in the Infrastructure Corridor, and Trop_103 in the Borefield. The fire in Trop_75 appears to be associated with a vehicle turnaround along the Infrastructure Corridor (Figure 3-4), whereas the fire in Trop_103 is isolated, away from operational areas and, as a result, may be due to a lightning strike.

The 2023 study showed minimal dust deposition compared to previous years' results and no significant decline in vegetation health were noted in any area previously associated with dust accumulation. Minor dust deposition was noted in the Infrastructure Corridor in Trop_46, Trop_47, Trop_48, Trop_49, Trop_50 and Trop_52 (Figure 3-5).

Other widespread patterns of change observed in the imagery were due to several factors:

- Image to image mis-registration (image registration was with a 3 m allowable error, resulting in some areas of expected pixel misalignment).
- Changes in shadow due to variation in sun angle due to time of image capture in the day and climatic conditions.
- Drier than usual conditions have resulted in less ground cover than usual. Due to the resolution limitations of the imagery, objects smaller than the pixel resolution size cannot be fully represented in the SAVI analysis. This created a 'mixed pixel' problem where a single pixel is trying to show results from bare ground and a small grass cluster/shrub. The resulting pixel is

the average value of the two – confusing the algorithm and potentially over/underrepresenting on the ground conditions.

A tile-by-tile comparison is included in Appendix D**.** Maps of all tiles (colour 2022, colour 2023 and change 2022-2023) have been supplied separately to this report as Attachment 1. The location of each tile is shown in Figure 2-1**.**

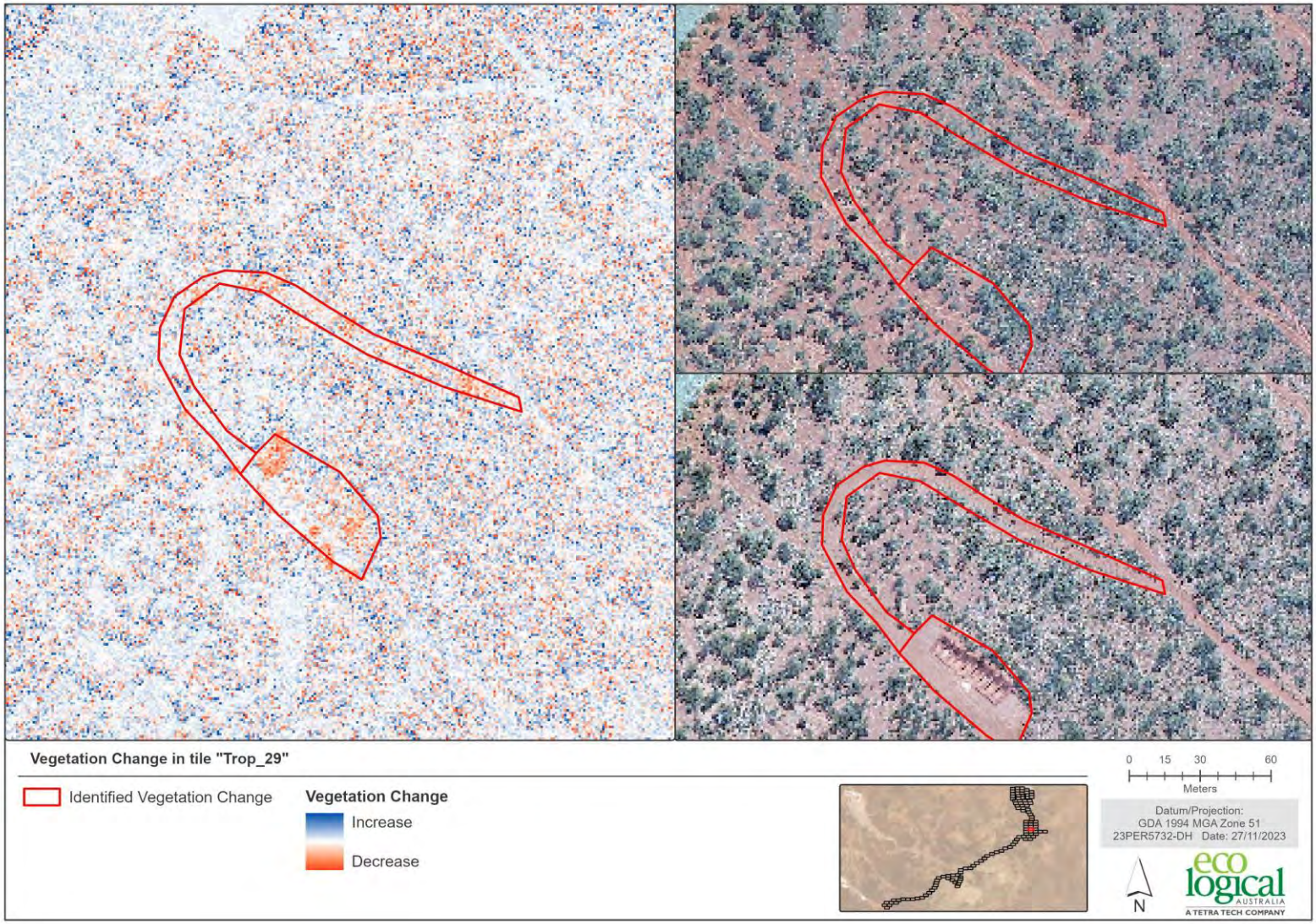

Figure 3-1: Creation of tracks in the Operation Area

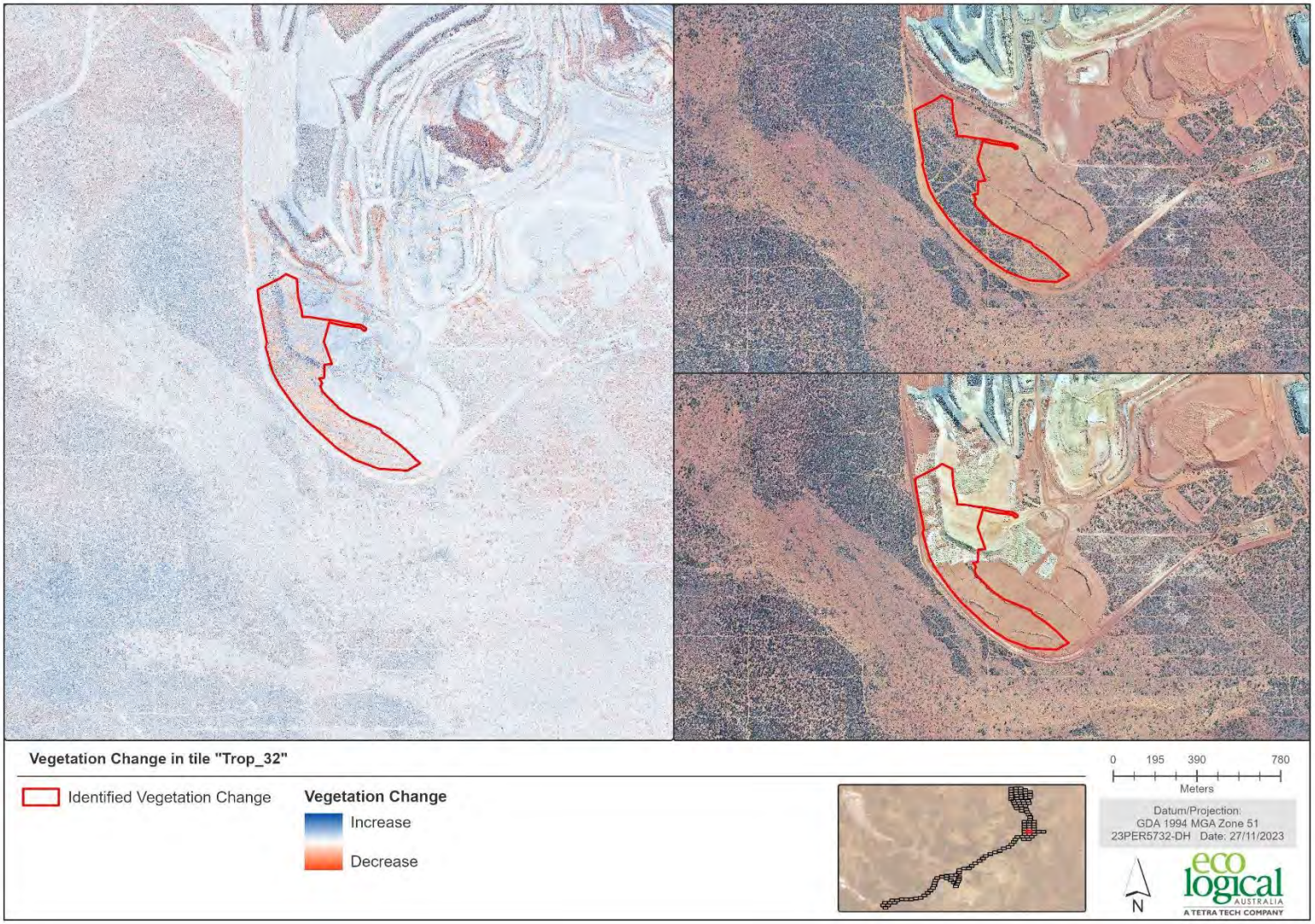

Figure 3-2: Clearing activities associated with mine expansion

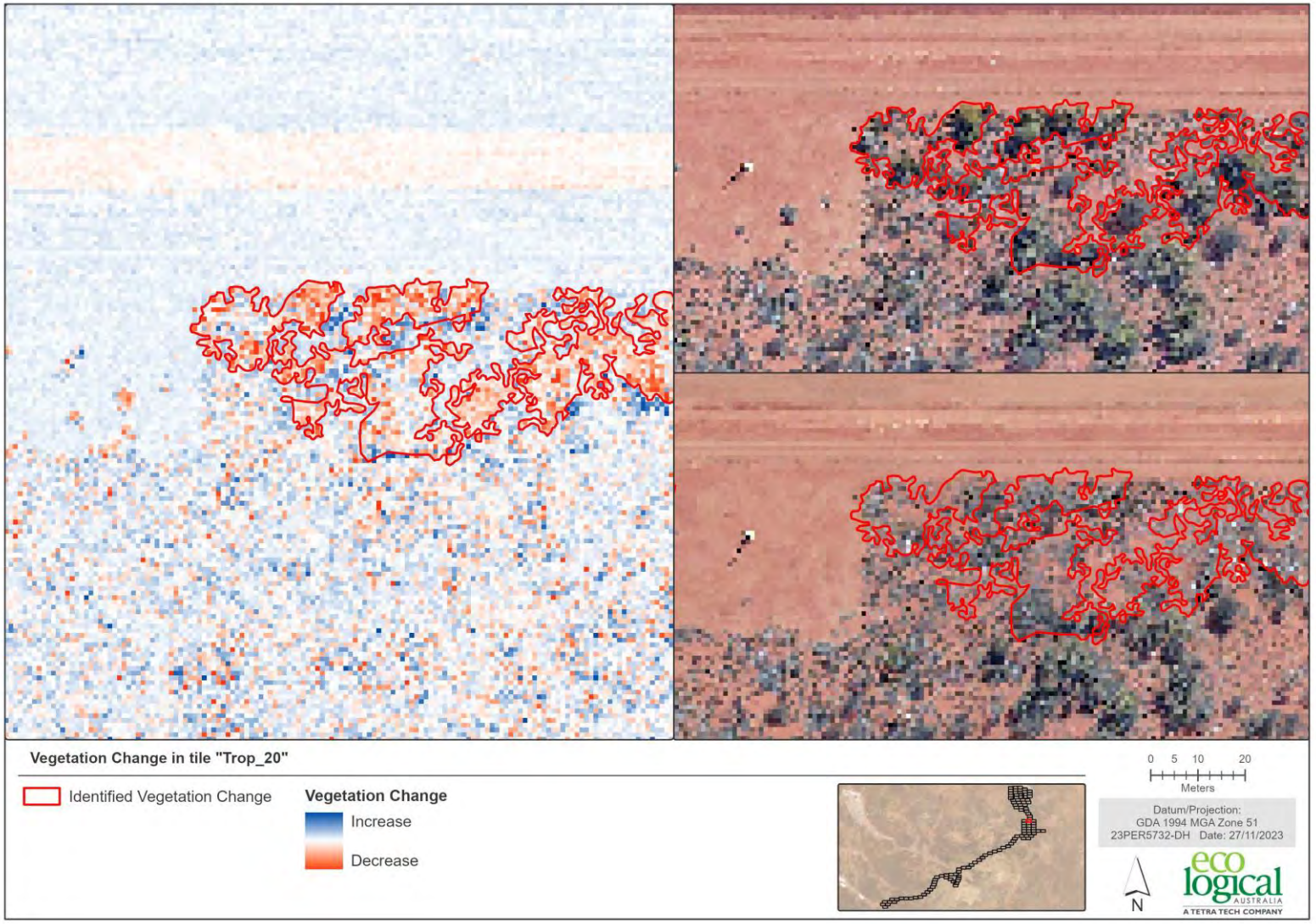

Figure 3-3: Example of vegetation reduction directly adjacent to the airstrip

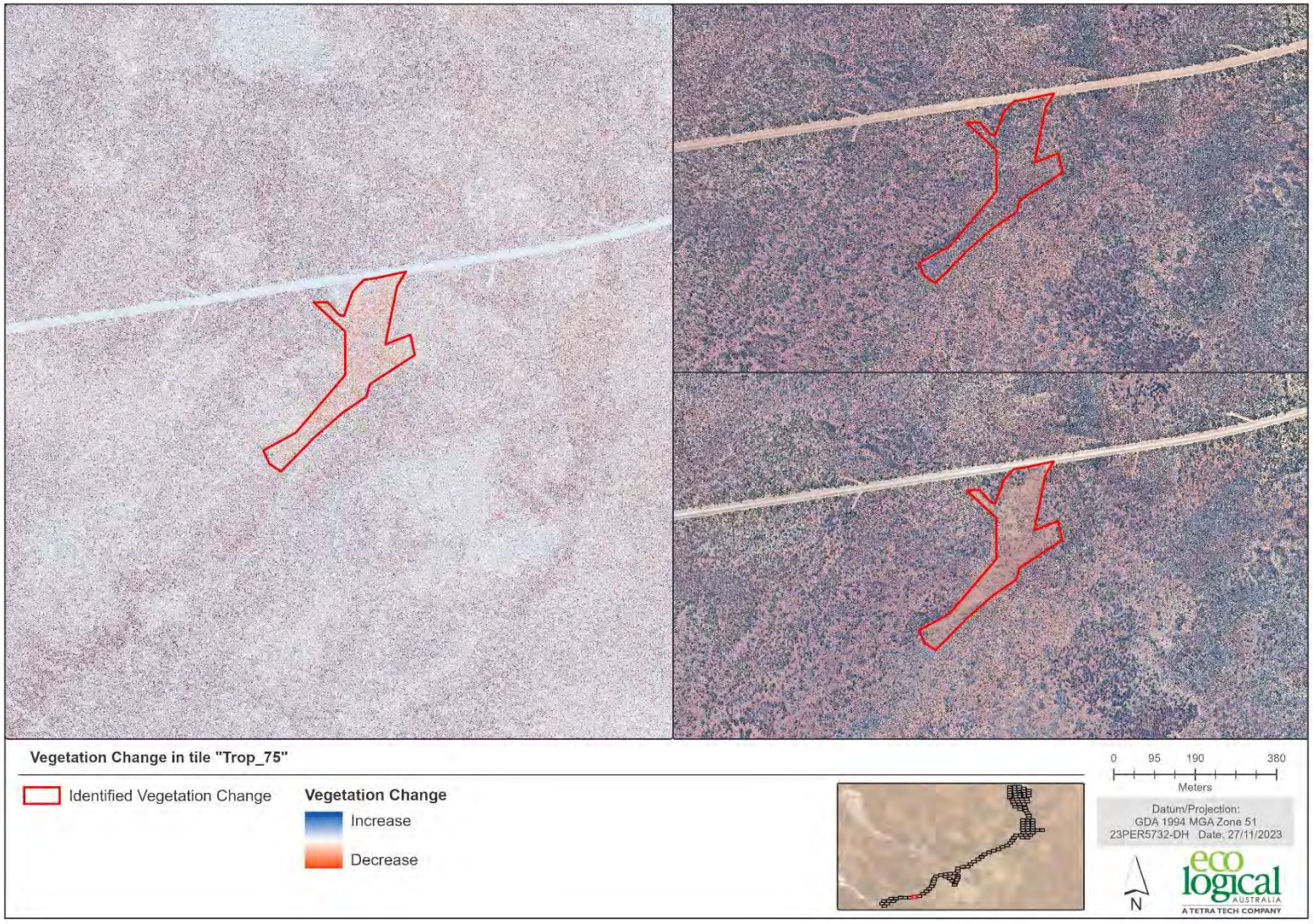

Figure 3-4: Example of vegetation reduction as a result of a fire in 2023

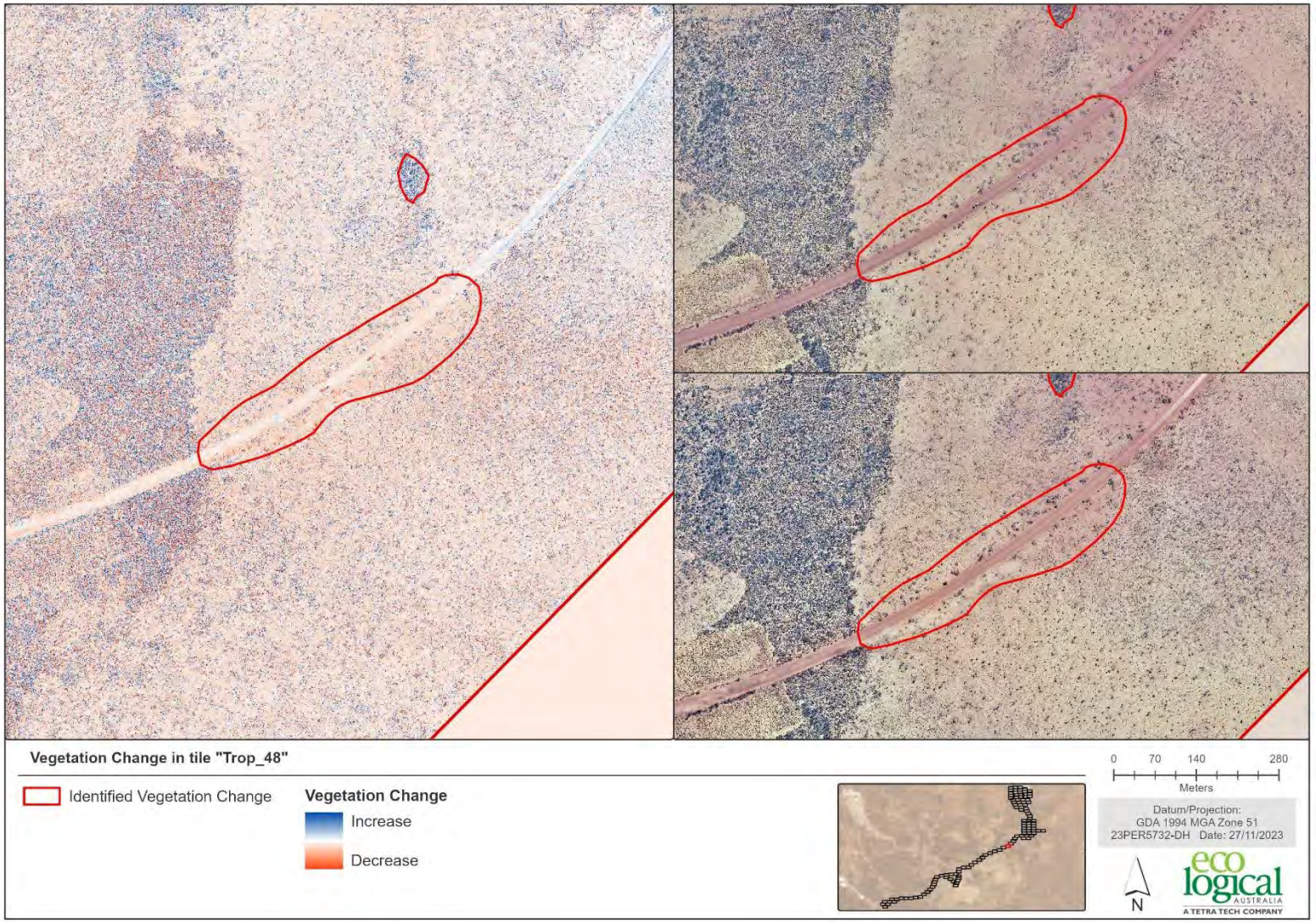

Figure 3-5: Example of dust deposition in the Infrastructure Corridor

3.2. Vegetation condition and assessment against Trigger 1

Results of the vegetation condition assessment are provided according to the three core areas (Operational Area, Infrastructure Corridor and Borefield). Field data compiled during the 2023 field survey are provided in Appendix E.

3.2.1. Operations Area

3.2.1.1. Foliar cover, condition and other attributes

A total of 34 monitoring sites in the Operations Area were evaluated in the 2023 vegetation monitoring program. Multiple Operations Area sites showed signs of vegetative water stress and noticeably dry conditions leading to senescence of many species. *Eucalyptus* trees were observed to be the exception throughout the area. Several sites showed evidence of fauna presence such as broken foliage, disturbed soil and scats from camels and kangaroos. Impact site E1b-11 was partially cleared, with the southwest corner cleared and a bund pushed up for a row of sumps next to a track.

Overall foliar cover (%) values decreased in almost half of Operations Area sites, with no sites showing an increase. 15 sites (10 impact, 5 reference) recorded a decrease in overall foliar cover, with four of those sites (all impact sites; A7a-10, A7a-1, C9-2 and E3-3) showing decreases in overall foliar cover for a period of three or more years.

22 sites recorded a change in overall foliar condition values (leaf loss score), with 21 of those recording declining condition in at least one stratum. 22 sites (10 reference, 11 impact) recorded a decline in at least one vegetation stratum, with eight of those (2 reference, 6 impact) recording a decline in either two or more strata. Three sites (all reference) recorded an improvement in at least one vegetation stratum, although two of those sites also recorded a concurrent decline in a different stratum. Only sites in the C9 vegetation type were entirely unchanged.

21 sites recorded a change in Leaf Browning in at least one stratum, of which three sites (2 reference, 1 impact) recorded an improvement in the overstory stratum. 17 sites (8 reference, 9 impact) recorded a decline in at least one stratum; of which, 12 sites were paired reference and impact (six pairs) and five (2 reference, 3 impact) recorded a decline in condition in two strata.

13 sites recorded a change in the Bare Soil Cover, of which 10 sites (5 reference, 5 impact) recorded an increase and three sites (1 reference, 2 impact) recorded a decrease in bare soil cover. The change in all 13 sites was considered a minor adjustment in cover (≤10%).

No evidence of major erosion or dust deposition was recorded during the 2023 survey. Six impact sites and four reference sites recorded some surface staining on the ground or dust accumulation on the foliage, but not to an extent where the vegetation or general condition of the sites were obviously impacted.

The raw data for foliar cover and foliar condition (browning scale and leaf loss scale) from 2011 to 2023 is presented in Appendix F, Appendix G and Appendix H respectively.

3.2.1.2. Evaluation of data against Trigger 1

A total of four paired sites within the Operations Area exceeded the 25% deviation in overall foliar cover relative to both each other and either 2022 or the baseline that triggered an investigation. An evaluation of vegetation changes against Trigger 1 for sites within each vegetation community in the Operations Area is detailed in Table 3. Where an investigation was triggered, details are discussed in Section 4.3.1

Table 3: Operations Area monitoring sites recording an exceedance in deviation of overall foliar cover relative to either the baseline mean or the previous year

Vegetation Code	Paired sites with ≥25% deviation	Details	Investigation Triggered
A7a	A7a-5/ A7a-6	A7a-5 recorded -29% deviation of foliar cover relative to baseline mean, -49% difference between impact and reference	Yes
	A7a-8/ A7a-7	A7a-8 recorded -29% deviation of 2023 foliar cover relative to 2022 foliar cover, 11% difference between impact and reference	No
A7b	A7b-4/ A7b-3	A7b-4 recorded 40% deviation of foliar cover relative to baseline mean, 23% difference between impact and reference	No
C9	Nil		
E1b	E1b-8/ E1b-7	E1b-8 recorded -57% deviation of foliar cover relative to baseline mean, -46% difference between impact and reference (same as 2022)	Yes
	E1b-10/ E1b-9	E1b-10 recorded -68% deviation of foliar cover relative to baseline mean, -136% difference between impact and reference (same as 2022)	Yes
E3	E3-6/ E3-7	E3-6 recorded -76% deviation of foliar cover relative to baseline mean, -67% difference between impact and reference (same as 2022) E3-6 recorded -25% deviation of 2023 foliar cover relative to 2022 foliar cover, 8% difference between impact and reference	Yes

For each vegetation community within the Operations Area, the percent deviation in overall foliar cover between 2022 and 2023, and between the baseline data and 2023, is presented in Figure 3-6, Figure 3-8, Figure 3-10, Figure 3-12, Figure 3-14 and in Appendix I. Raw values for overall foliar cover across each site are presented in Figure 3-7, Figure 3-9, Figure 3-11, Figure 3-13, Figure 3-15 and in Appendix F.

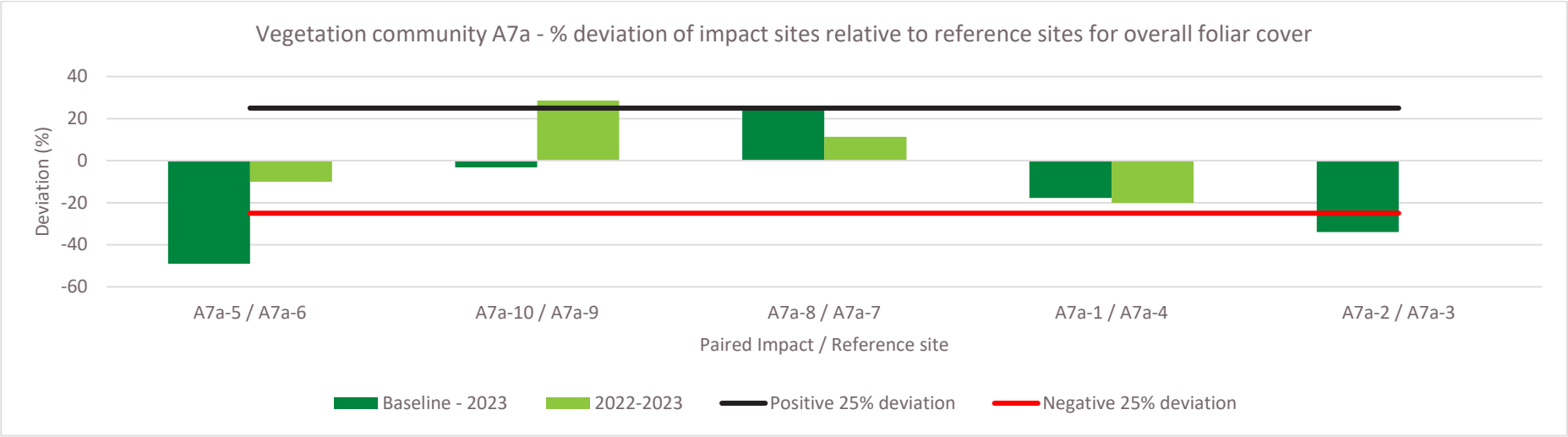

Figure 3-6: Deviation (%) in overall vegetation cover (%) for sites in vegetation community A7a between 2023 and 2022 and between 2023 and the baseline.

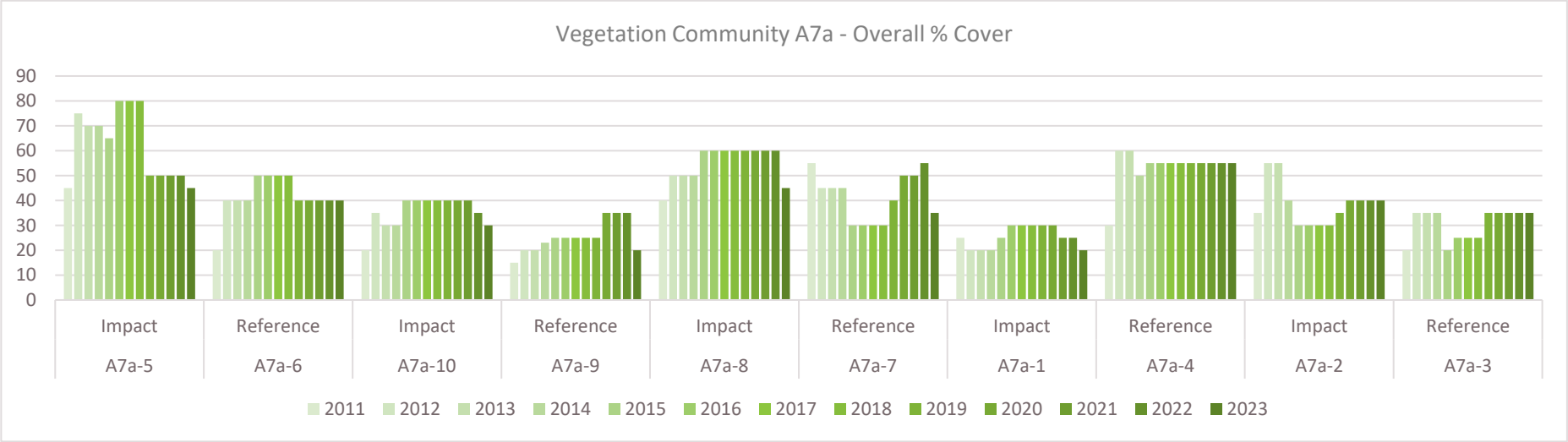

Figure 3-7: Raw values for overall vegetation cover (%) for sites in vegetation community A7a across all years of monitoring since 2011.

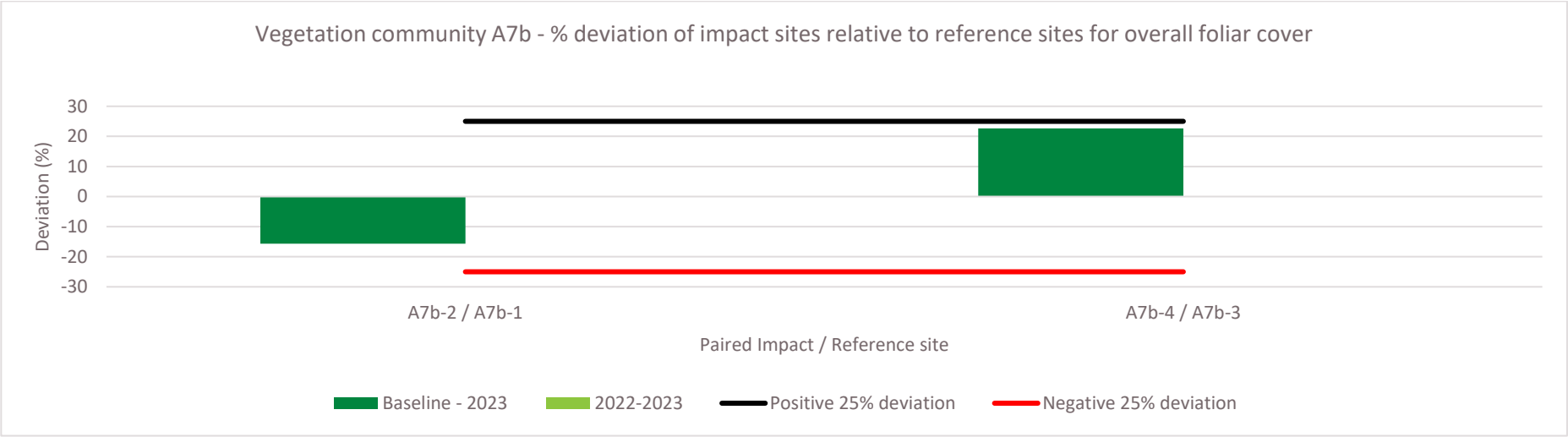

Figure 3-8: Deviation (%) in overall vegetation cover (%) for sites in vegetation community A7b between 2023 and 2022 and between 2023 and the baseline.

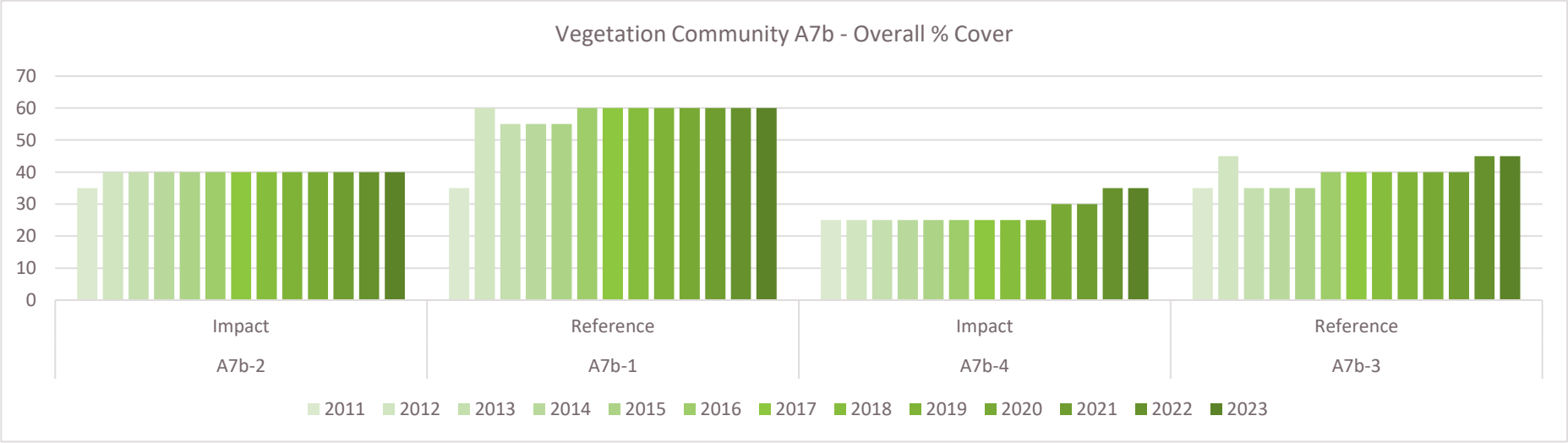

Figure 3-9: Raw values for overall vegetation cover (%) for sites in vegetation community A7b across all years of monitoring since 2011.

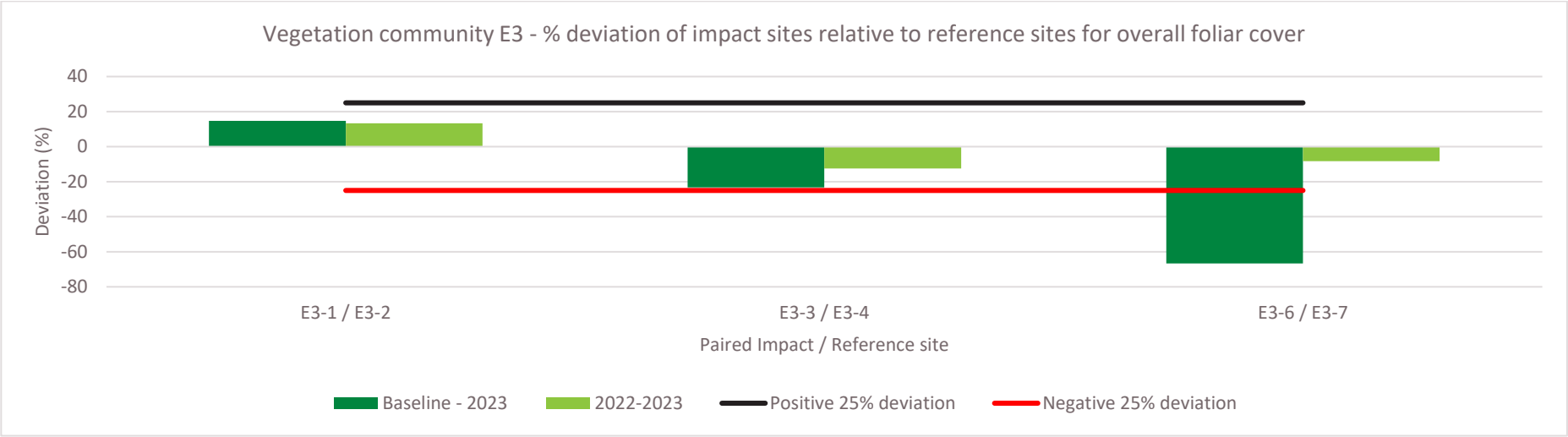

Figure 3-10: Deviation (%) in overall vegetation cover (%) for sites in vegetation community E3 between 2023 and 2022 and between 2023 and the baseline.

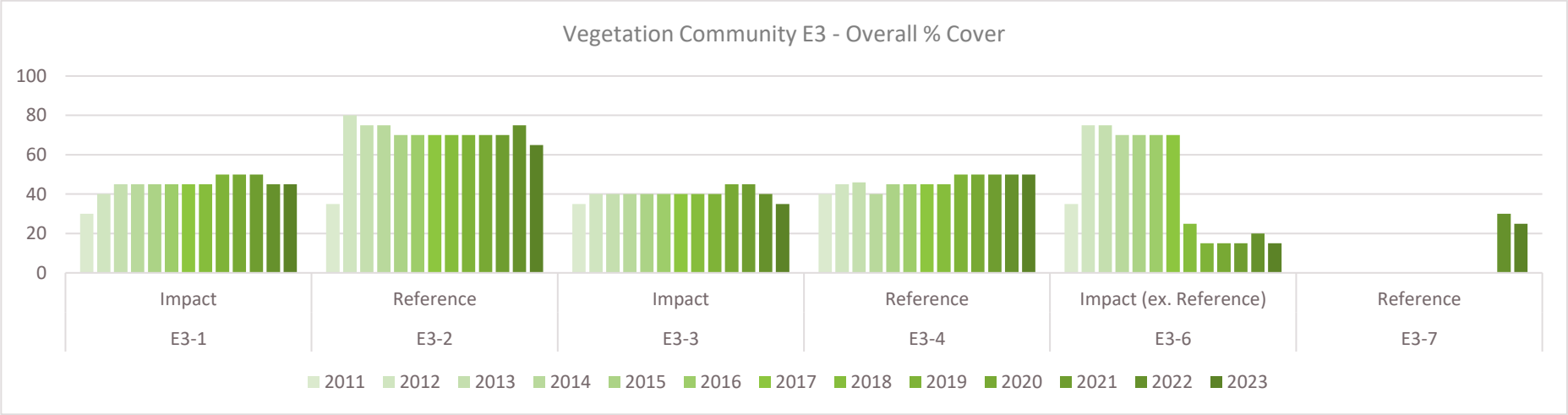

Figure 3-11: Raw values for overall vegetation cover (%) for sites in vegetation community E3 across all years of monitoring

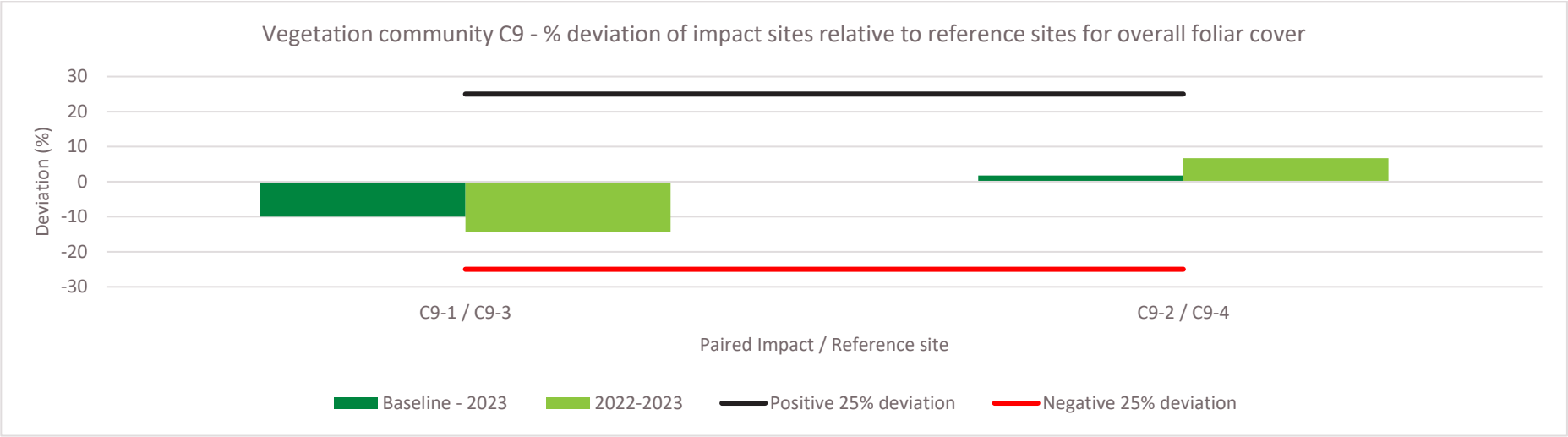

Figure 3-12: Deviation (%) in overall vegetation cover (%) for sites in vegetation community C9 between 2023 and 2022 and between 2023 and the baseline

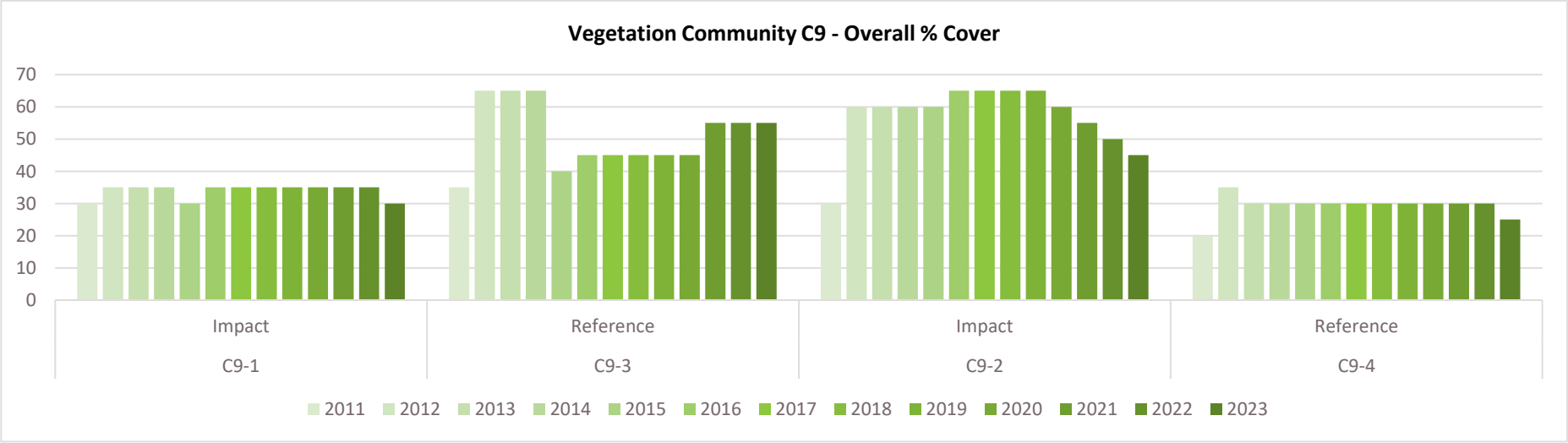

Figure 3-13: Raw values for overall vegetation cover (%) for sites in vegetation community C9 across all years of monitoring since 2011.

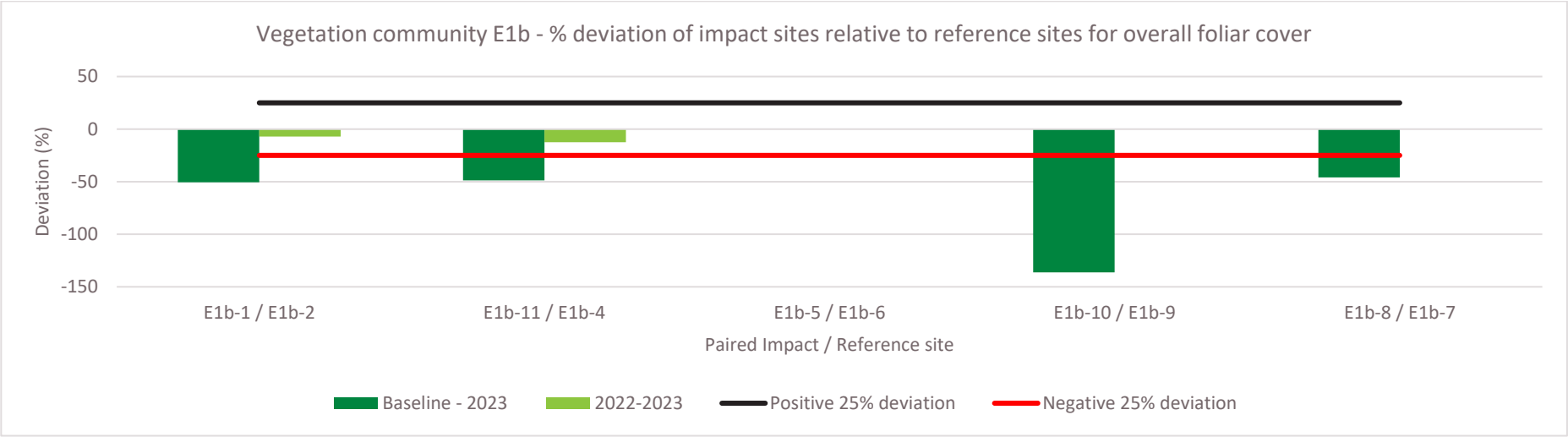

Figure 3-14: Deviation (%) in overall vegetation cover (%) for sites in vegetation community E1b between 2023 and 2022 and between 2023 and the baseline.

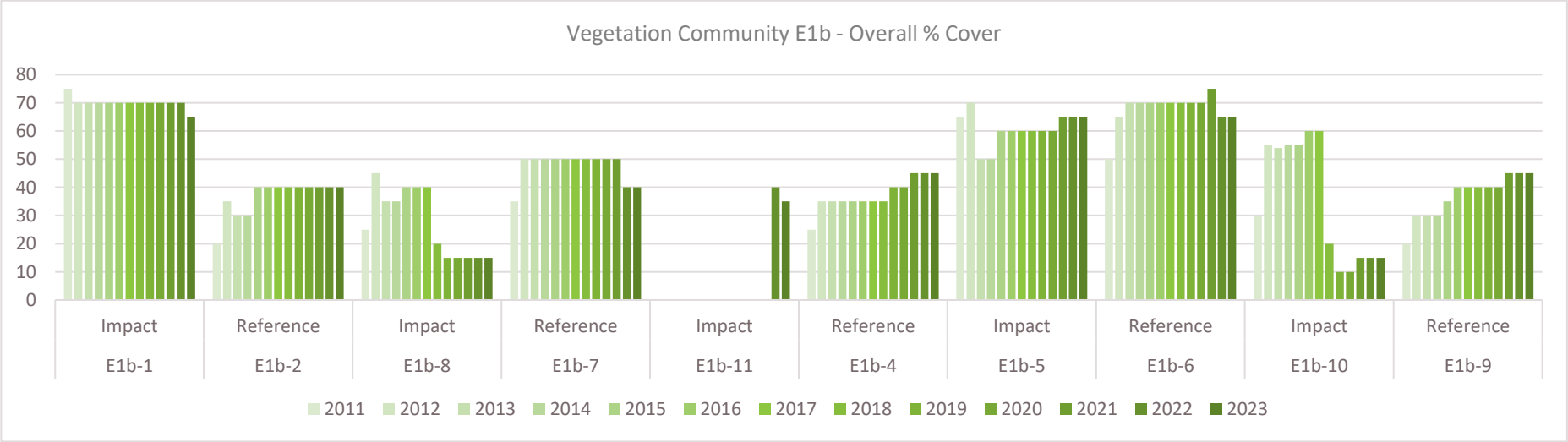

Figure 3-15: Raw values for overall vegetation cover (%) for sites in vegetation community E1b across all years of monitoring since 2011.

3.2.2. Infrastructure Corridor

3.2.2.1. Foliar cover, condition and other attributes

A total of 46 monitoring sites in the Infrastructure Corridor were evaluated in the 2023 vegetation monitoring program. General observations of the Infrastructure Corridor noted that limited areas received sufficient summer rainfall to promote some recovery of previously water stressed and senescing vegetation. Conditions at the time of the survey were still dry and most areas continued the senescing trend through consecutive years of water stress. Multiple sites contained shrubs that died in previous years but remained as dry standing material that still contributed to cover values.

A third of sites (15 sites; 6 impact and 9 reference) in the Infrastructure Corridor recorded a decrease in overall foliar cover values between 2022 values and 2023. Two sites (both impact) recorded an increase in overall foliar cover values.

Leaf Loss scores in the Infrastructure Corridor showed an overall improvement in foliar condition compared to 2022 with 25 sites recording a change in at least one stratum. 12 sites (8 reference, 4 impact) recorded a decline in at least one stratum and 17 sites (7 reference, 10 impact) recorded an improvement in at least one stratum, of which four sites also recorded a simultaneous decline in leaf loss score in a different stratum.

18 sites recorded a change in Leaf Browning values with a greater number of sites showing an improvement in browning values. Eight sites (2 reference, 6 impact) recorded a decline in condition represented by the leaf browning scale, with Site A3-6 recoding a decline in both understory and midstorey. 11 sites (6 reference, 5 impact) recorded an improvement, of which two sites showed an improvement in both the understorey and midstorey (Paired impact/reference sites A2-2 / A2-10). Site A7b-5 recorded simultaneous improvement and decline in different strata.

13 sites recorded a change to Bare Soil Cover. One impact site recorded a decrease in cover and 12 sites (7 reference, 5 impact) recorded an increase in Bare Soil Cover. The change in 12 of the 13 sites was considered a minor adjustment in cover (≤10%)., while site A2-11 recorded a 20% increase in the cover of bare soil.

Signs of erosion and deposition observed during the survey were limited to minor shifting of sand on the ground surface by wind vectors, some soil surface staining from road dust in both impact and reference sites and road dust observed on foliage in both impact and reference sites.

The raw data for foliar cover and foliar condition (browning scale and leaf loss scale) in the infrastructure corridor for all years are presented in Appendix J, Appendix K and Appendix L respectively.

3.2.2.2. Evaluation of data against Trigger 1

A total of two paired sites within the Infrastructure Corridor exceeded the 25% deviation in overall foliar cover relative to both each other and the baseline mean that triggered an investigation. No paired sites exceeded the 25% deviation in overall foliar cover relative to both the previous monitoring year and each other. An evaluation of vegetation changes against Trigger 1 for sites within each vegetation community in the Infrastructure Corridor detailed in Table 4. Where an investigation was triggered, details are discussed in Section 4.3.2.

Table 4: Infrastructure Corridor monitoring sites recording an exceedance in deviation of overall foliar cover relative to either the baseline mean or the previous year

Vegetation Code	Paired sites with ≥25% deviation	Details	Investigation Triggered
A2	A2-1/ A2-7	A2-1 recorded 71% deviation of foliar cover relative to baseline mean, -79% difference between impact and reference	Yes
A3	A3-4/ A3-3	A3-4 recorded -37% deviation of foliar cover relative to baseline mean, -20% difference between impact and reference	No
E4	E4-2/ E4-1	E4-2 recorded 30% deviation of foliar cover relative to baseline mean, 13% difference between impact and reference	No
	E4-9/ E4-10	E4-9 recorded -63% deviation of foliar cover relative to baseline mean, 8% difference between impact and reference	No
	E4-11/ E4-12	E4-11 recorded -25% deviation of foliar cover relative to baseline mean, -6% difference between impact and reference	No
	E4-14/ E4-13	E4-14 recorded 29% deviation of foliar cover relative to baseline mean, 109% difference between impact and reference	Yes
S8	S8-2/ S8-6	S8-2 recorded -49% deviation of foliar cover relative to baseline mean, 6% difference between impact and reference	No
	S8-3/ S8-1	S8-3 recorded -40% deviation of foliar cover relative to baseline mean, -9% difference between impact and reference	No
	S8-7/ S8-5	S8-7 recorded -30% deviation of foliar cover relative to baseline mean, 1% difference between impact and reference	No

For each vegetation community within the Infrastructure Corridor (A3, E9, A2, E4, S8 and A7b), the percentage deviation in overall foliar cover (%) for each site, between 2022 and 2023, and the baseline data and 2023, is presented in Figure 3-16, Figure 3-18, Figure 3-20, Figure 3-22, Figure 3-24, Figure 3-26 and in Appendix M. Raw values for overall foliar cover (%) across each site are presented in Figure 3-17, Figure 3-19, Figure 3-21, Figure 3-23, Figure 3-25, Figure 3-27 and in Appendix J.

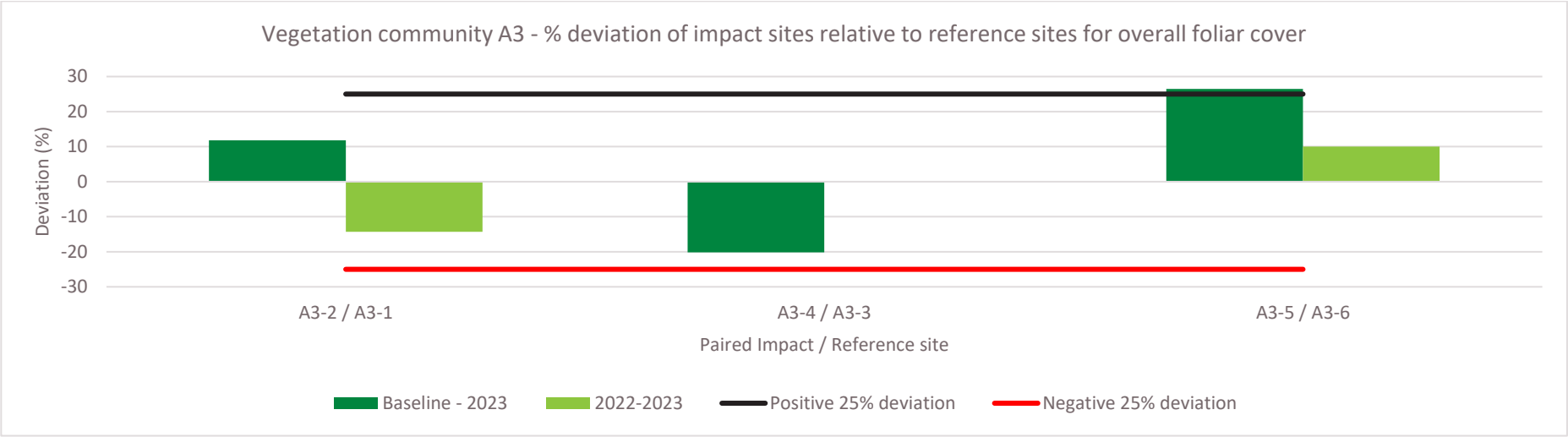

Figure 3-16: Deviation (%) in overall vegetation cover (%) for sites in vegetation community A3 between 2023 and 2022 and between 2023 and the baseline

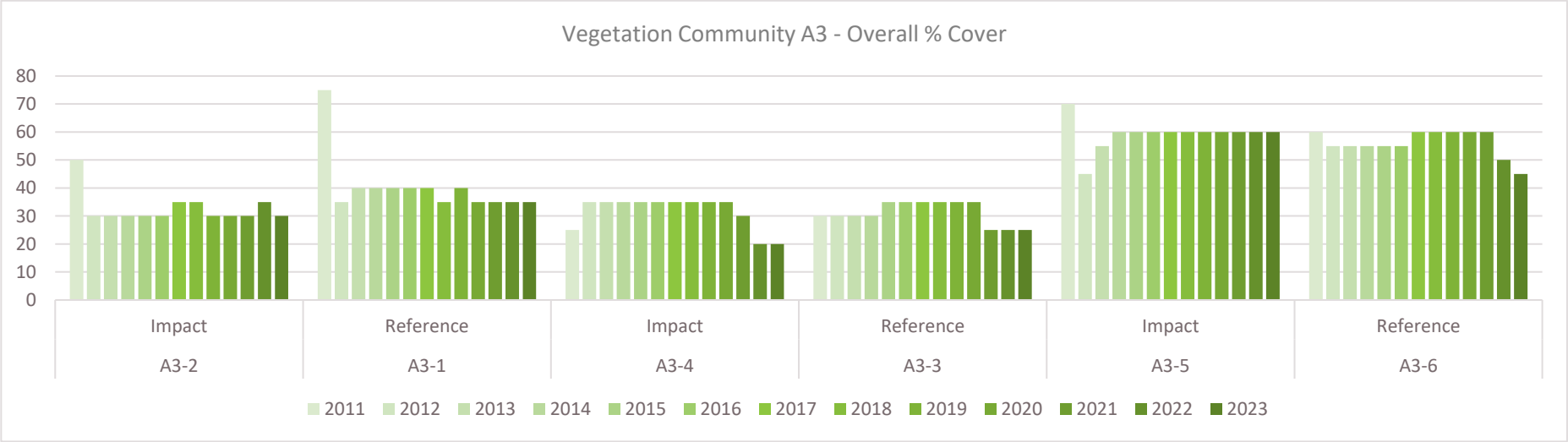

Figure 3-17: Raw values for overall vegetation cover (%) for sites in vegetation community A3 across all years of monitoring

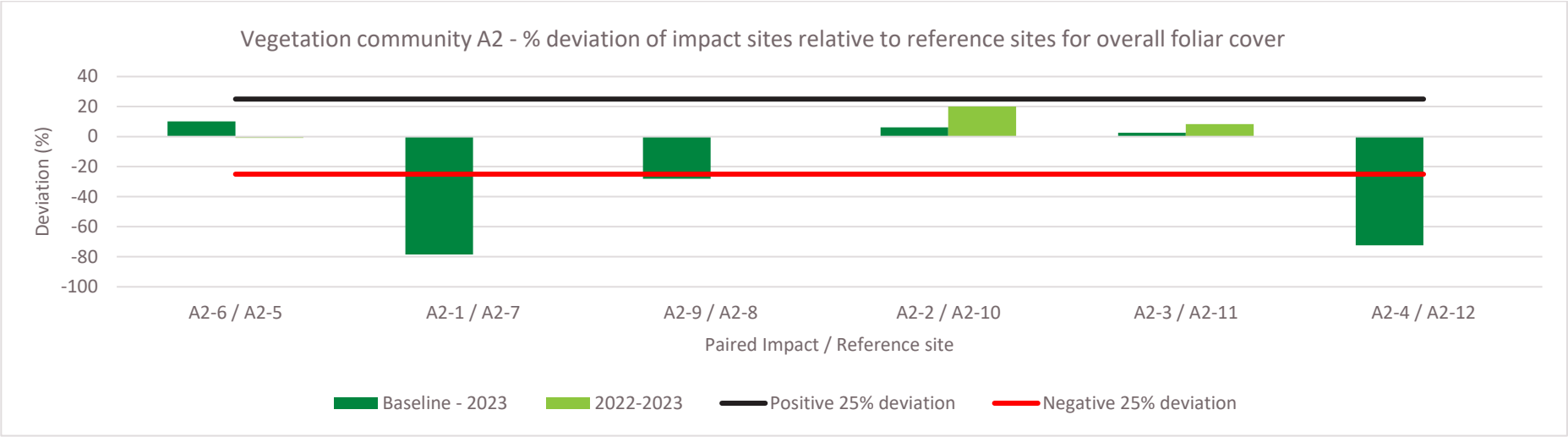

Figure 3-18: Deviation (%) in overall vegetation cover (%) for sites in vegetation community A2 between 2023 and 2022 and between 2023 and the baseline.

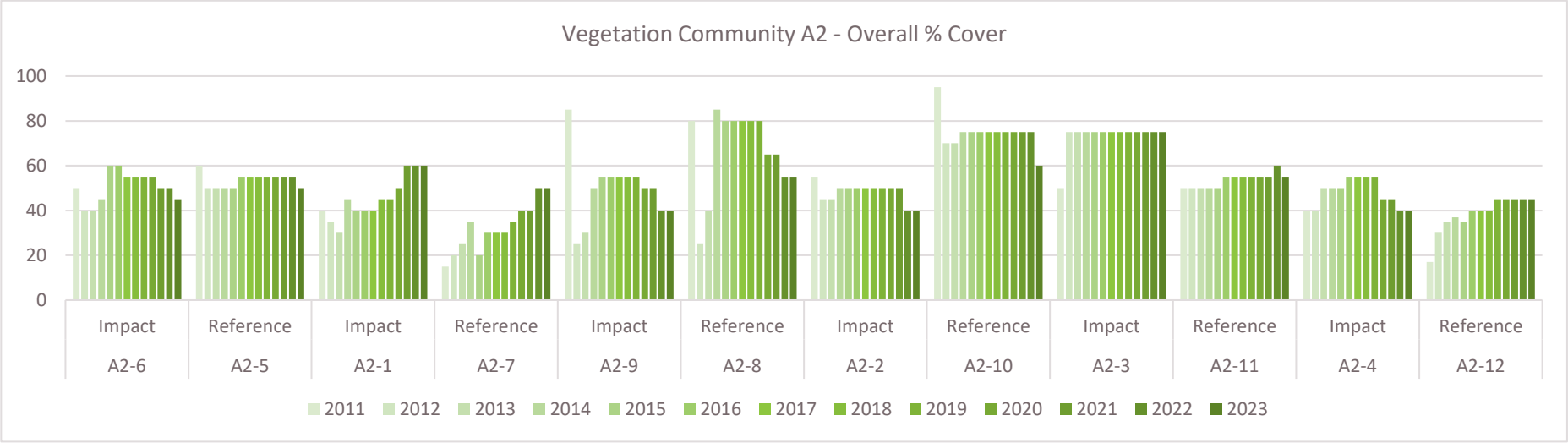

Figure 3-19: Raw values for overall vegetation cover (%) for sites in vegetation community A2 across all years of monitoring.

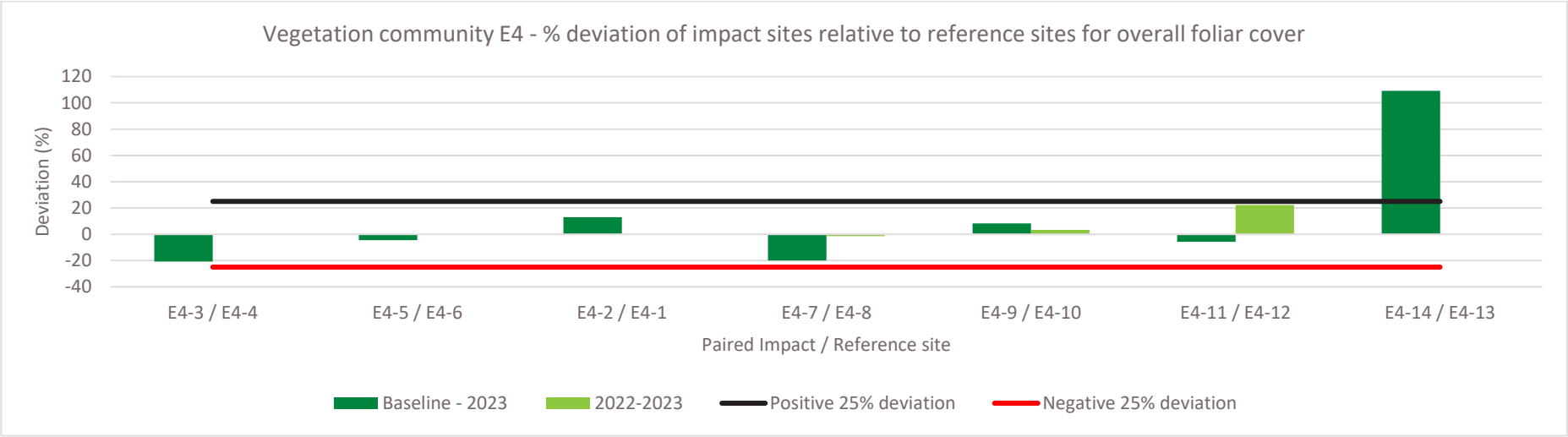

Figure 3-20: Deviation (%) in overall vegetation cover (%) for sites in vegetation community E4 between 2023 and 2022 and between 2023 and the baseline.

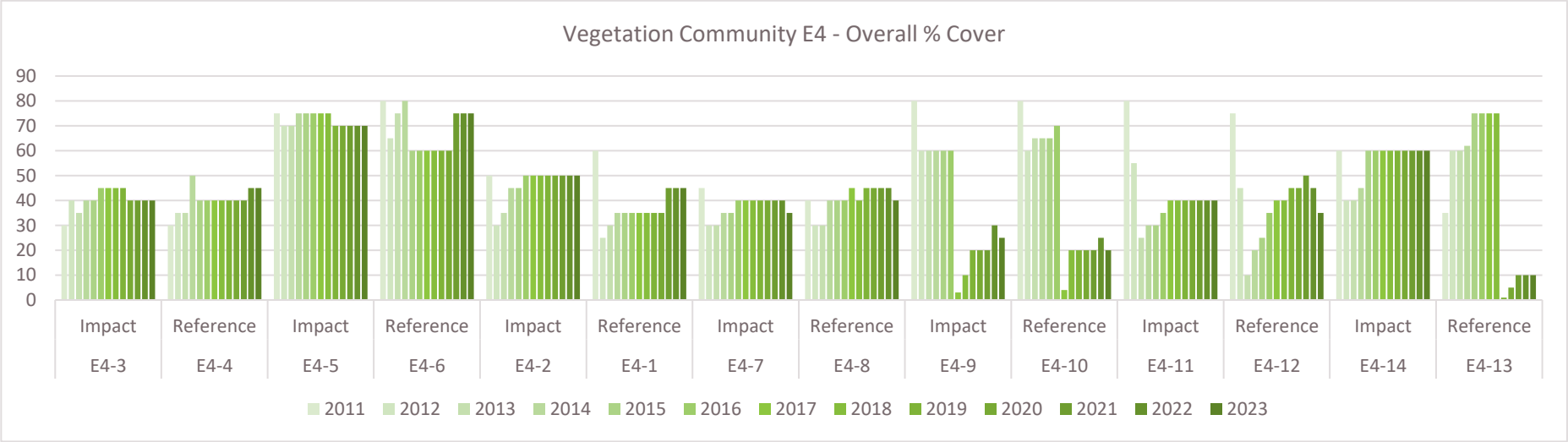

Figure 3-21: Raw values for overall vegetation cover (%) for sites in vegetation community E4 across all years of monitoring.

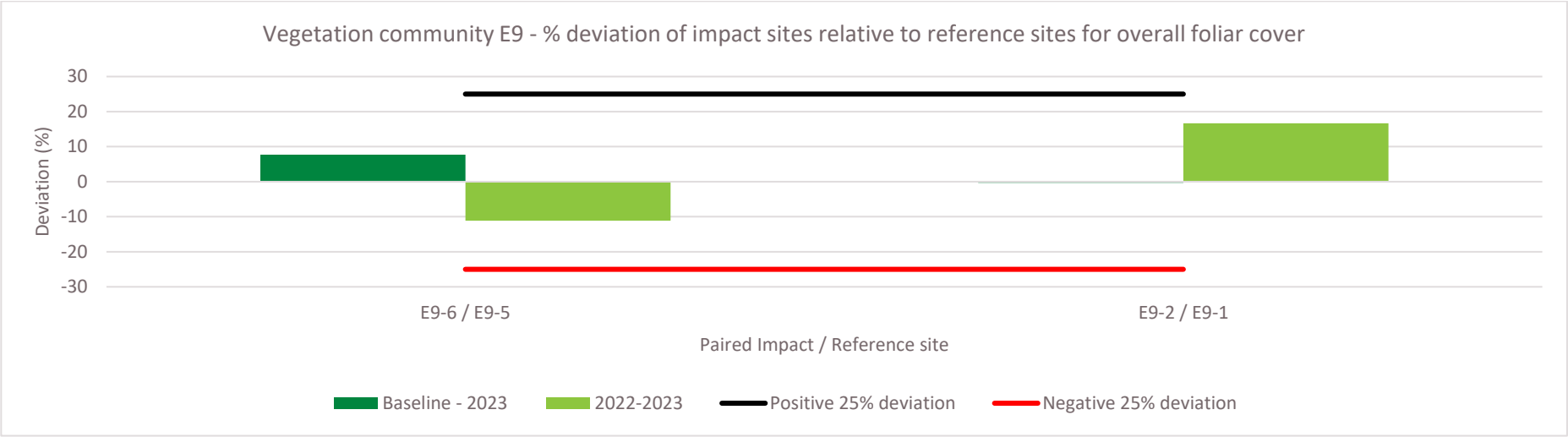

Figure 3-22: Deviation (%) in overall vegetation cover (%) for sites in vegetation community E9 between 2023 and 2022 and between 2023 and the baseline

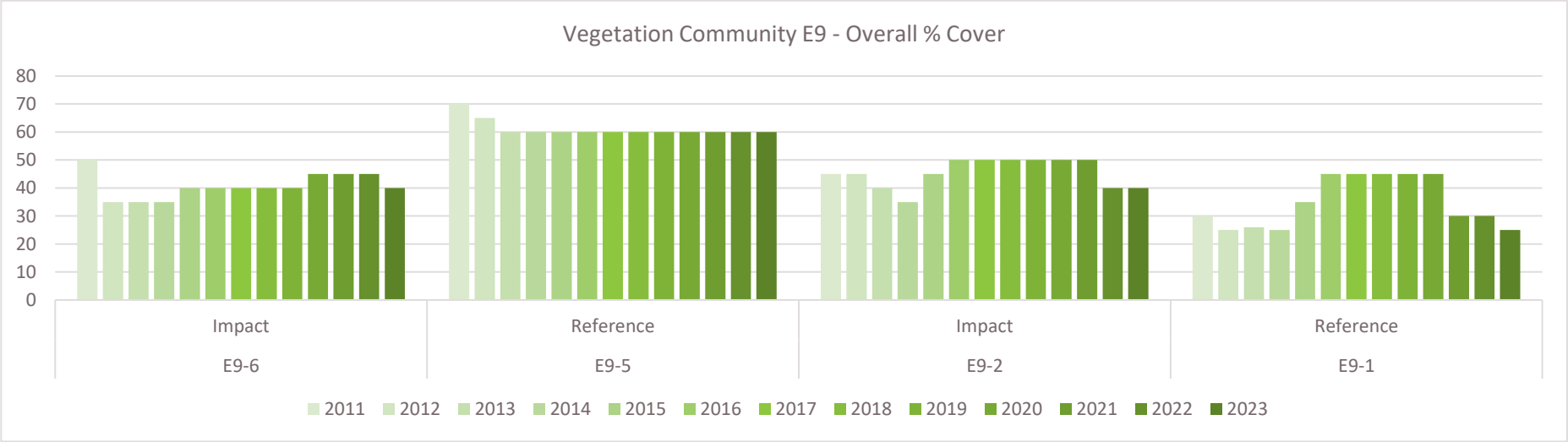

Figure 3-23: Raw values for overall vegetation cover (%) for sites in vegetation community E9 across all years of monitoring.

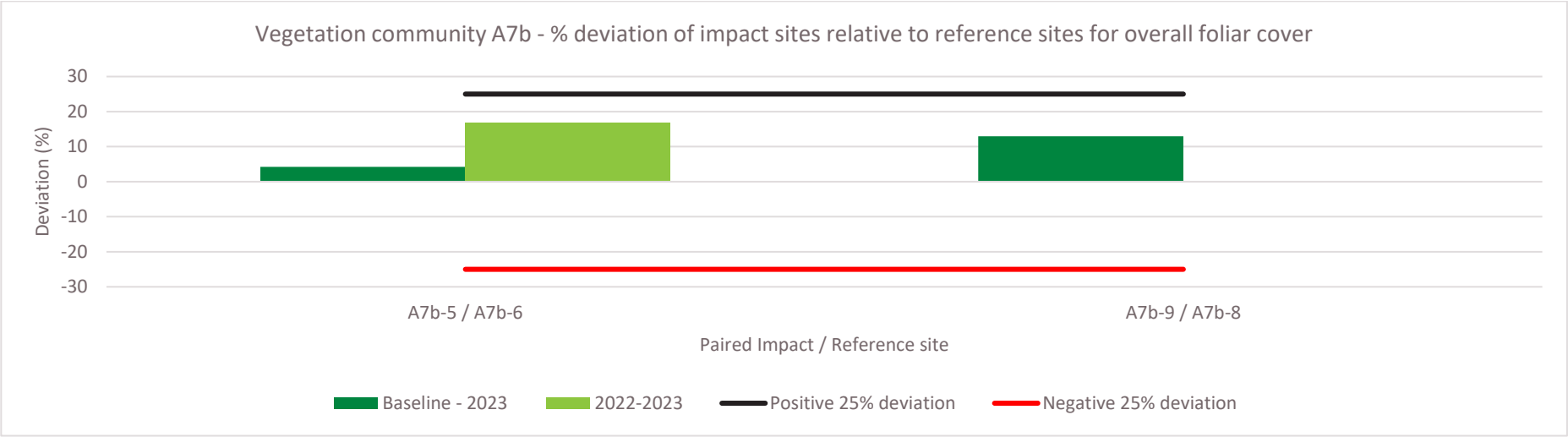

Figure 3-24: Deviation (%) in overall vegetation cover (%) for sites in vegetation community A7b between 2023 and 2022 and between 2023 and the baseline

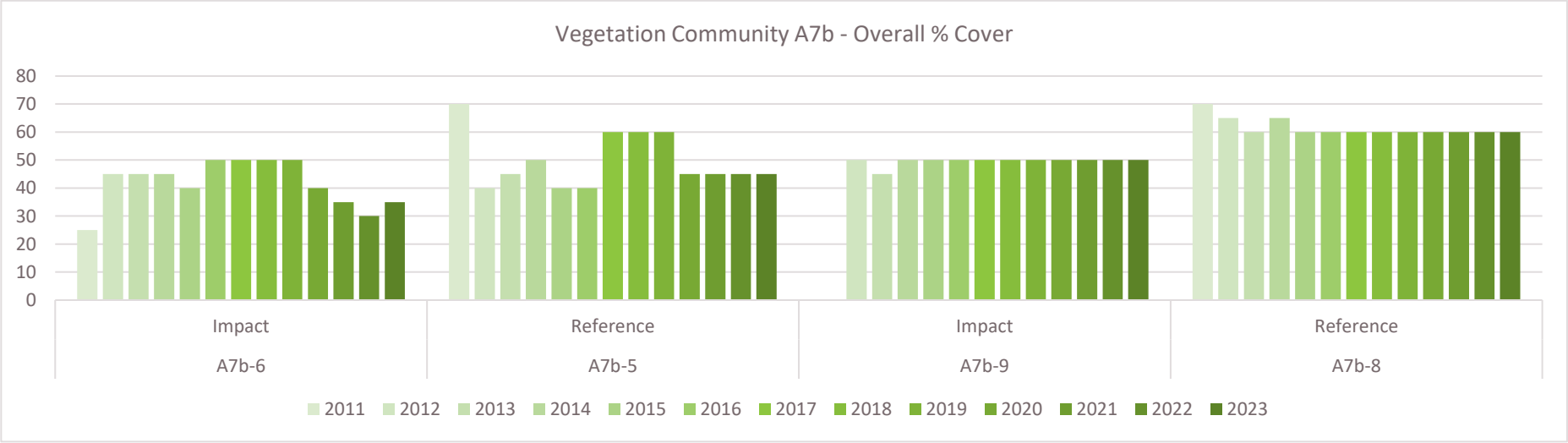

Figure 3-25: Raw values for overall vegetation cover (%) for sites in vegetation community A7b across all years of monitoring

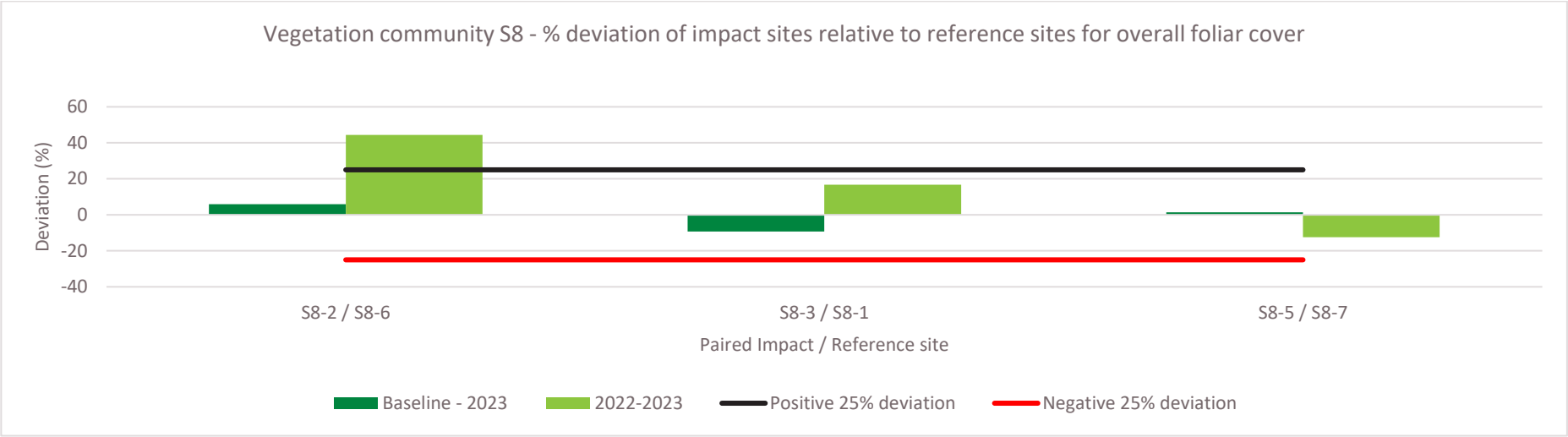

Figure 3-26: Deviation (%) in overall vegetation cover (%) for sites in vegetation community S8 between 2023 and 2022 and between 2023 and the baseline.

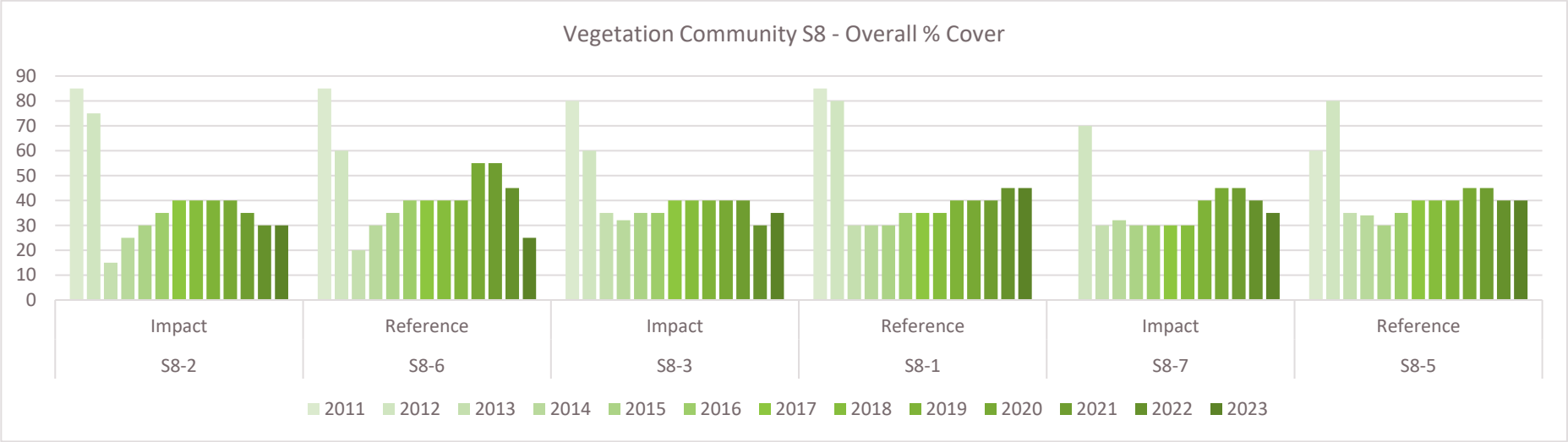

Figure 3-27: Raw values for overall vegetation cover (%) for sites in vegetation community S8 across all years of monitoring.

3.2.3. Borefield

3.2.3.1. Foliar cover, condition and other attributes

A total of 30 monitoring sites in the Borefield were evaluated in the 2023 vegetation monitoring program.

Eight sites recorded a change in overall foliar cover values. Three sites (1 impact, 2 reference) recorded an increase, and five sites (4 reference, 1 impact) recorded a decrease in overall foliar cover. Three of the four sites in vegetation type M1 have recorded a continuous decline in understorey cover since 2019, with the fourth M1 site also recording a decrease over the same period.

20 sites recorded a change in overall foliar condition values (represented by the leaf loss scale) in at least one vegetation stratum. 11 sites (6 reference, 5 impact) recorded an improvement, two of which recorded improvement in two different strata. Ten sites (7 reference, 3 impact) recorded a decline in foliar condition values, while one site recorded a simultaneous improvement and decline in different vegetation stratum. There were no obvious trends in overall foliar condition values between impact and reference sites noted.

16 sites recorded a change in leaf browning, with a general improvement being noted across the Borefield sites. 10 sites (3 reference, 7 impact) recorded an improvement, with site E2-2 recording an improvement in both the mid and over storey. Eight sites (6 reference, 2 impact) recorded a decline in leaf browning scores, with two sites (T1-1 and X1-13) recording a simultaneous improvement and decline in different vegetation stratum. No obvious trends in leaf browning scores between vegetation type or reference / impact sites were noted.

13 sites in the Borefield recorded a change in Bare Soil Cover values between 2022 and 2023. Seven sites (5 reference, 2 impact) recorded an increase, and six sites (2 reference, 4 impact) recorded a decrease in the cover of bare soil.

There were no obvious signs of erosion or deposition observed in Borefield sites beyond minor windblown sand in some areas. Dry conditions were observed throughout the Borefield, with most sites showing some degree of water stress in the vegetation, although deeper rooted shrubs and trees, such as *Eucalyptus* and *Acacia* in some areas were noted as not being water stressed. A significant observation was the continued senescence of less drought tolerant, fire responsive species such as *Leptosema chambersii* and *Seringia velutina*. There were no obvious trends between impact and reference sites.

The raw data for foliar cover and foliar condition (browning scale and leaf loss scale) in the Borefield for all years are presented in Appendix N, Appendix O and Appendix P respectively.

3.2.3.2. Evaluation of data against Trigger 1

A total of four paired sites within the Borefield exceeded the 25% deviation in overall foliar cover relative to both each other and either 2022 or the baseline that triggered an investigation. An evaluation of vegetation changes against Trigger 1 for sites within each vegetation community in the Borefield is as follows: Table 5. Where an investigation was triggered, details are discussed in Section 4.3.3.

Table 5: Borefield monitoring sites recording an exceedance in deviation of overall foliar cover relative to either the baseline mean or the previous year

Vegetation Code	Paired sites with ≥25% deviation	Details	Investigation Triggered
E2	E2-1/ E2-4	E2-1 recorded 59% deviation of foliar cover relative to baseline mean, 72% difference between impact and reference	Yes
T1	Nil		
X1	X1-7/ X1-8	X1-7 recorded 65% deviation of foliar cover relative to baseline mean, 37% difference between impact and reference	Yes
	X1-4/ X1-6	X1-4 recorded 29% deviation of foliar cover relative to baseline mean, 93% difference between impact and reference	Yes
M1	M1-3/ M1-4	M1-3 recorded -57% deviation of foliar cover relative to baseline mean, -5% difference between impact and reference M1-3 recorded -33% deviation of 2023 foliar cover relative to 2022 foliar cover, 0% difference between impact and reference	No
	M1-1/ M1-2	M1-1 recorded -31% deviation of foliar cover relative to baseline mean, -201% difference between impact and reference	Yes

For each vegetation community within the Borefield (E2, X1, M1 and T1) the percentage deviation in overall foliar cover (%) for each site, between 2022 and 2023 and the baseline data and 2023, is presented in Figure 3-28, Figure 3-30, Figure 3-32, Figure 3-34 and Appendix Q. Raw values for overall foliar cover (%) across each site are presented in Figure 3-29, Figure 3-31, Figure 3-33, Figure 3-35 and Appendix N.

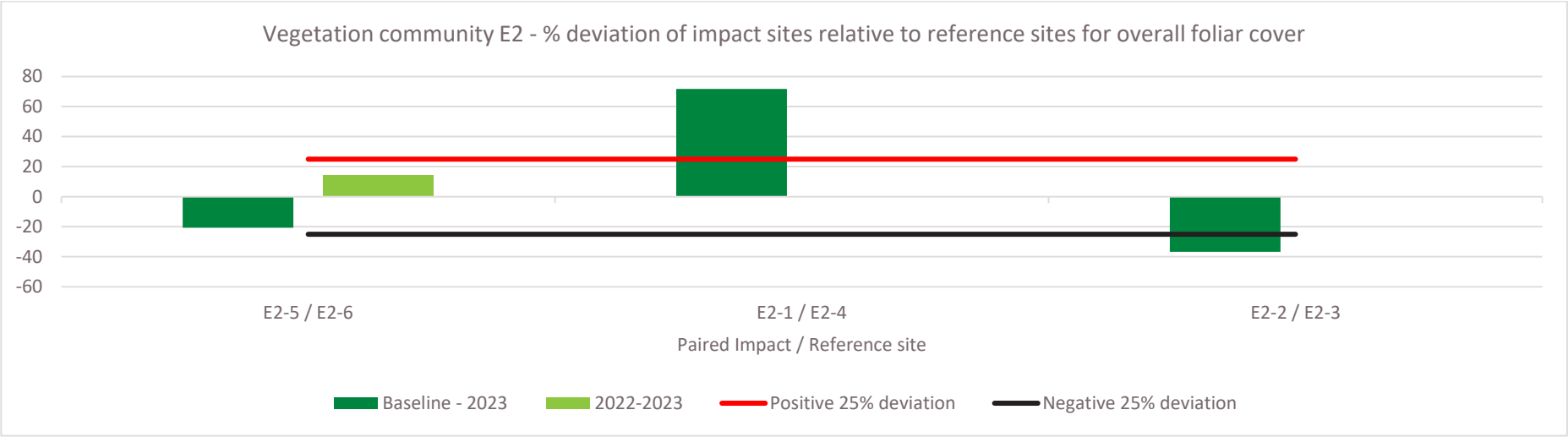

Figure 3-28: Deviation (%) in overall vegetation cover (%) for sites in vegetation community E2 between 2023 and 2022 and between 2023 and the baseline.

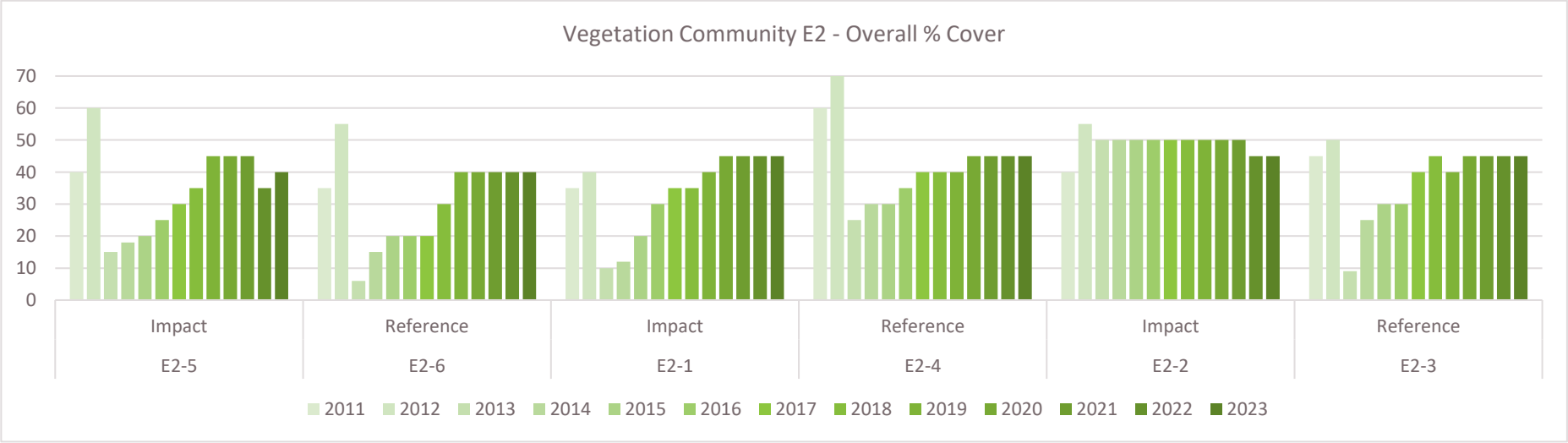

Figure 3-29: Raw values for overall vegetation cover (%) for sites in vegetation community E2 across all years of monitoring

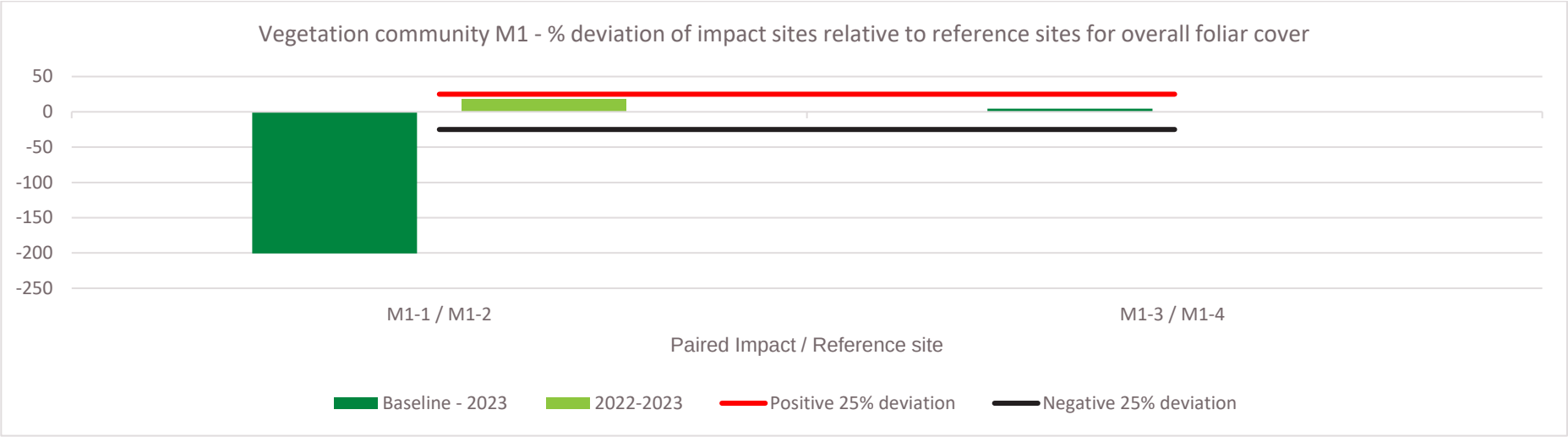

Figure 3-30: Deviation (%) in overall vegetation cover (%) for sites in vegetation community M1 between 2023 and 2022 (baseline data utilised from first three survey years).

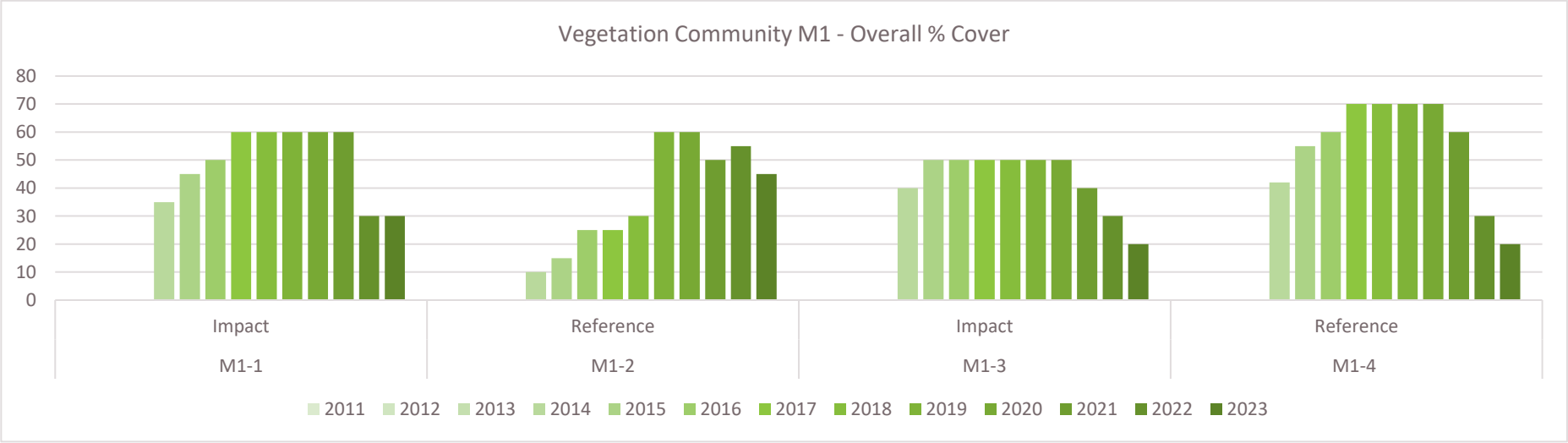

Figure 3-31: Raw overall vegetation cover values (%) for sites in vegetation community M1 across all years of monitoring (Quadrats established in 2014).

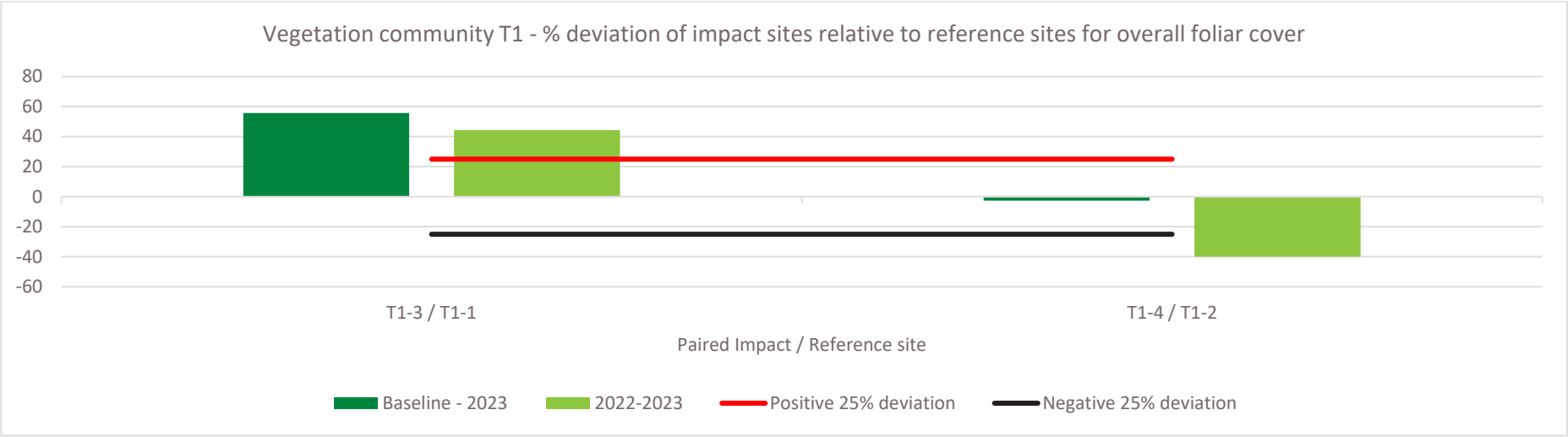

Figure 3-32: Deviation (%) in overall vegetation cover (%) for sites in vegetation community T1 between 2023 and 2022 and between 2023 and the baseline.

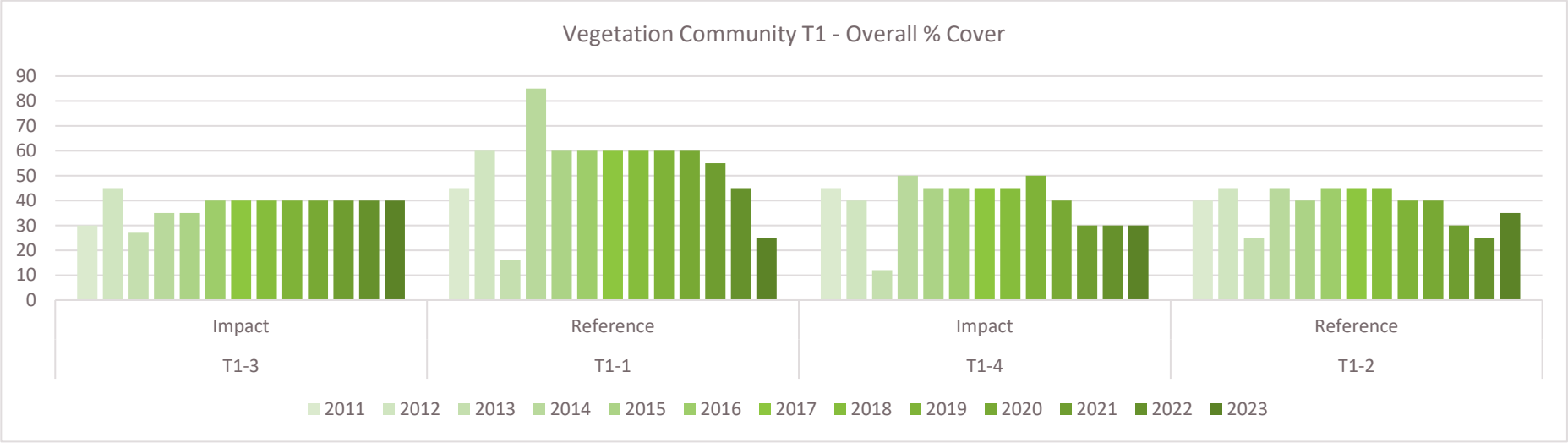

Figure 3-33: Raw values for overall vegetation cover (%) for sites in vegetation community T1 across all years of monitoring.

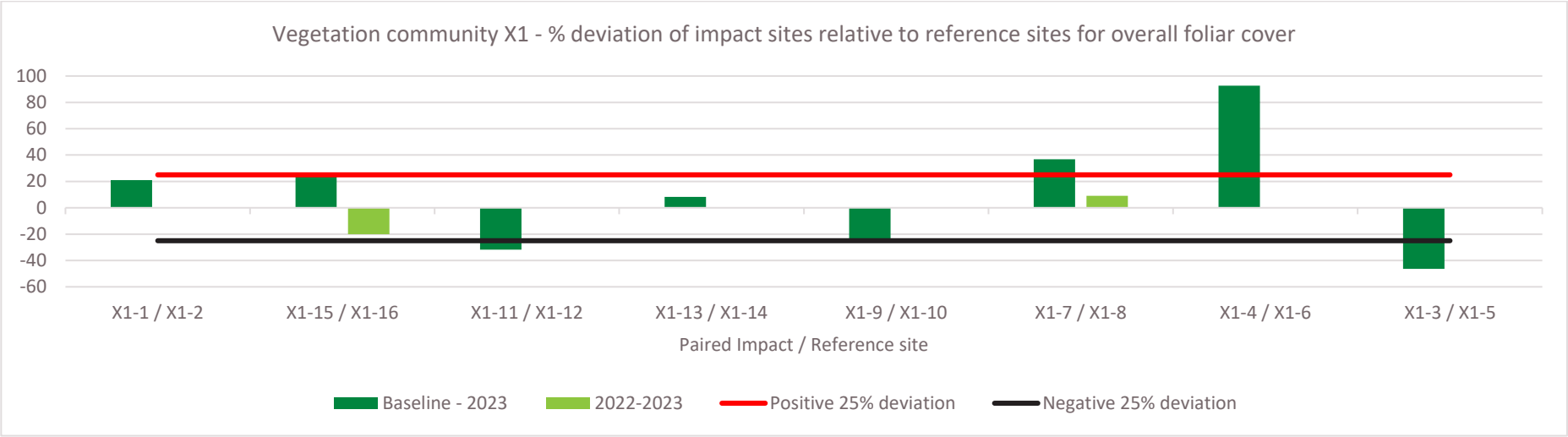

Figure 3-34: Deviation (%) in overall vegetation cover (%) for sites in vegetation community X1 between 2023 and 2022 and between 2023 and the baseline.

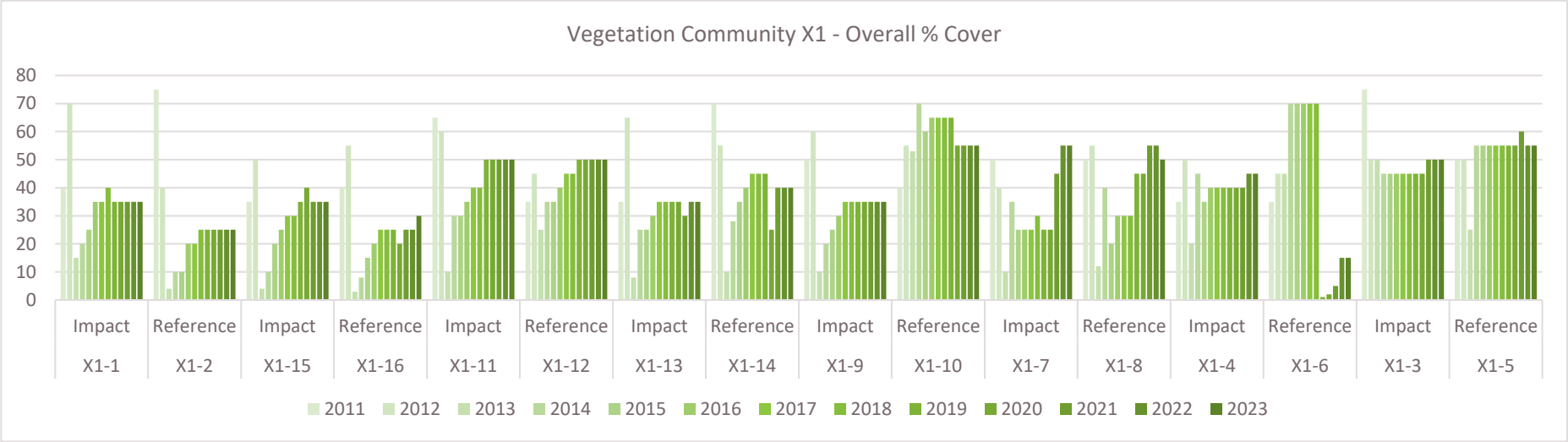

Figure 3-35: Raw values for overall vegetation cover (%) for sites in vegetation community X1 across all years of monitoring

3.3. Indicator species and assessment against Trigger 2

A total of 36 sites throughout the three areas recorded deviations in indicator species cover between impact and reference site of greater than 25% when compared to the 2022 survey or the 2015 baseline data. All sites where a deviation of their nominated indicator species which exceeded 25% relative to their paired reference site was observed in the 2023 survey are summarised in Table 6. The indicator species at several sites were observed to have senesced so that they were absent or likely to be absent within the site within a few years. In these sites along with their pair a secondary indicator species was recorded, chosen where possible from the secondary indicators recorded in 2015 (ELA 2015) or an appropriate indicator selected from those currently present. Several secondary indicators chosen in 2021 recorded their third year of observations. The raw cover and abundance data for all sites is listed in Appendix R and the deviation values for all sites are listed in Appendix S.

3.3.1. Operations Area

A total of 10 impact sites in the Operations Area exceeded the 25% deviation in indicator species foliar cover relative to both each other and either 2022 or the baseline (2015) that triggered an investigation.

Between 2023 and 2022, six impact sites (A7a-5, A7a-1, C9-2, E1b-8, E3-3 and E3-6) exceeded the 25% deviation in indicator species foliar cover relative to the reference site. Of those, only sites E1b-8 and E3-3 recorded a positive deviation between 2022 and 2023 due to increased foliar cover of secondary indicator species *Acacia aneura* and *Eremophila latrobei* respectively.

Between 2015 (the first year of indicator species monitoring) and 2023, eight impact sites (A7a-5, A7a-1, A7b-4, C9-1, C9-2, E1b-8, E1b-10 and E3-3) exceeded the 25% deviation in indicator species foliar cover relative to the reference site. Of those, only sites A7b-4 and C9-1 recorded a positive deviation between 2015 and 2023.

The original indicator species were absent (fully senesced) in sites A7a-1 and E3-3, with an additional eight sites where the original indicator species was recorded with less than one percent foliar cover.

Several pairs of sites recorded a secondary indicator species in 2023, namely A7a-2 / A7a-4 (*Acacia tetragonophylla*), A7a-5 / A7a-6 (*Ptilotus obovatus*), A7b-4 / A7b-3 (*Acacia aneura*), C9-2 / C9-4 (*Senna artemisioides* subsp. *filifolia*), E1b-8 / E1b-7 (*Acacia aneura*) and E3-3 / E3-4 (*Eremophila latrobei*).

3.3.2. Infrastructure Corridor

A total of 14 impact sites in the Infrastructure Corridor exceeded the 25% deviation in indicator species foliar cover relative to both each other and either 2022 or the baseline (2015) that triggered an investigation.

Between 2023 and 2022, seven impact sites (A2-2, A2-3, A3-5, A7b-9, E4-3, E4-5 and E4-7) exceeded the 25% deviation in indicator species foliar cover relative to the reference site. No sites recorded a positive deviation in cover between 2022 and 2023.

Between 2015 and 2023, 12 impact sites (A2-1, A2-2, A2-3, A7b-6, A7b-9, E4-3, E4-7, E4-14, E9-2, S8-2, S8-3 and S8-7) exceeded the 25% deviation in indicator species foliar cover relative to the reference site. Of those, A2-1, E9-2, S8-3 and S8-7 recorded a positive deviation in cover between 2015 and 2023.

Sites where the original indicator species were absent included A3-6, E4-4, S8-2 and S8-6 with an additional five sites recording less than 1% cover of the original cover.

Several pairs of sites recorded a secondary indicator species in 2023, consisting of A3-2 / A3-1 (*Ptilotus obovatus*), A3-5 / A3-6 (*Scaevola spinescens*), E4-3 / E4-4 (*Triodia desertorum*) and S8-2 / S8-6 (*Grevillea juncifolia*). All of these, except A3-5 / A3-6 (*Scaevola spinescens*), were secondary indicator species originally recorded in 2015. It is noted that *Grevillea juncifolia* may not be an appropriate indicator species as it was absent from site S8-2 in both 2022 and 2023.

3.3.3. Borefield

A total of 12 impact sites in the Borefield exceeded the 25% deviation in indicator species foliar cover relative to both each other and either 2022 or the baseline (2015) that triggered an investigation.

Between 2023 and 2022, three impact sites (E2-5, T1-3 and X1-15) recorded a deviation in indicator foliar cover in that exceeded 25% that also differed from the reference deviation by greater than 25%. Of those, only T1-3 recorded a negative deviation in cover between 2023 and 2022.

Between 2015 and 2023, 11 impact sites (E2-5, E2-1, T1-4, X1-15, X1-11, X1-13, X1-9, X1-7, X1-4, M1-3 and M1-1) exceeded the 25% deviation relative to both reference and baseline (2015) that triggered an investigation. All impact sites recorded a positive deviation in foliar cover between 2023 and 2015 in at least one indicator species, with only X1-13 recording a negative deviation in foliar cover of the original indicator species *Seringia velutina*.

The original selection of indicator species showed strong trends in cover based on species chosen, as 18 of 20 sites (considering both impact and reference sites) which recorded *Triodia basedowii* as an indicator species recorded positive deviations in cover between 2015 and 2023. Conversely, 11 of 12 sites utilizing the indicator *Seringia velutina* recorded a negative exceedance in deviation between 2015 and 2023. One of the two cases where cover of *Triodia basedowii* decreased in cover between 2015 and 2023 was directly attributable to a fire event.

Sites where the original indicator species were absent included T1-1, X1-14, X1-3 and X1-5, all of which utilised *Seringia velutina* as the indicator.

Several pairs of sites recorded a secondary indicator species in 2023, namely M1-3 / M1-4 (*Triodia basedowii*), X3-3 / X3-5 (*Anthotroche pannosa*), X1-13 / X1-14 (*Triodia basedowii*) and X1-11 / X1-12 (*Eucalyptus gongylocarpa*). All these sites, except X1-5, previously recorded these species as secondary indicator species in 2015.

Table 6: Impact sites that exceeded the Trigger 2 deviation threshold for its nominated species foliar cover.

Paired Sites	Indicator Species	Deviation in impact site relative to reference site – 2022 to 2023	Deviation in impact site relative to reference site – 2015 to 2023
Operations Area			
A7a-5 / A7a-6	*Ptilotus obovatus* [1]	40	20
A7a-5 / A7a-6	*Senna artemisioides subsp. filifolia*	0	-255
A7a-10 / A7a-9	*Dodonaea rigida*	-17	33
A7a-1 / A7a-4	*Ptilotus obovatus*	-50	-50
A7b-4 / A7b-3	*Triodia basedowii*	-33	100
C9-1 / C9-3	*Senna artemisioides subsp. filifolia*	0	100
C9-2 / C9-4	*Ptilotus obovatus*	-47	-30
C9-2 / C9-4	*Senna artemisioides subsp. filifolia* [1]	n/a	-1250
E1b-8 / E1b-7	*Acacia aneura* [1]	150	n/a
E1b-8 / E1b-7	*Triodia basedowii*	-150	-247
E1b-10 / E1b-9	*Triodia basedowii*	0	-31
E3-3 / E3-4	*Anthotroche pannosa*	-100	-100
E3-3 / E3-4	*Eremophila latrobei* [1]	400	n/a
E3-6 / E3-7	*Anthotroche pannosa* [2]	-30	n/a
Infrastructure Corridor			
A2-1 / A2-7	*Triodia desertorum*	0	-800
A2-2 / A2-10	*Aluta maisonneuvei subsp. auriculata*	-25	-28
A2-3 / A2-11	*Acacia aneura*	-50	-50
A3-5 / A3-6	*Dodonaea lobulata*	50	10
A7b-6 / A7b-5	*Aluta maisonneuvei subsp. auriculata*	25	-27
A7b-9 / A7b-8	*Aluta maisonneuvei subsp. auriculata*	-25	-125
E4-3 / E4-4	*Leptosema chambersii*	-75	8
E4-3 / E4-4	*Triodia desertorum* [1]	0	-65
E4-5 / E4-6	*Callitris preissii*	-50	-700
E4-7 / E4-8	*Triodia desertorum*	-33	-110
E4-14 / E4-13	*Triodia rigidissima*	-13	60
E9-2 / E9-1	*Acacia aneura*	0	83
S8-2 / S8-6	*Grevillea juncifolia* [1]	-400	-500
S8-3 / S8-1	*Triodia rigidissima*	0	-200
S8-7 / S8-5	*Chrysitrix distigmatosa*	0	300

Paired Sites	Indicator Species	Deviation in impact site relative to reference site – 2022 to 2023	Deviation in impact site relative to reference site – 2015 to 2023
Process Water Supply Borefield			
E2-1 / E2-4	*Triodia basedowii*	50	-500
E2-5 / E2-6	*Triodia basedowii*	25	-875
M1-1 / M1-2	*Triodia basedowii*	25	450
M1-3 / M1-4	*Triodia basedowii*	0	1667
T1-3 / T1-1	*Seringia velutina*	50	20
T1-4 / T1-2	*Seringia velutina*	60	130
X1-4 / X1-6	*Triodia basedowii*	-50	2494
X1-7 / X1-8	*Triodia basedowii*	25	-5300
X1-11 / X1-12	*Eucalyptus gongylocarpa* [1]	n/a	148
X1-13 / X1-14	*Seringia velutina*	0	40
X1-13 / X1-14	*Triodia basedowii*	-50	-500
X1-9 / X1-10	*Triodia basedowii*	0	261
X1-15 / X1-16	*Triodia basedowii*	100	-500

[1] Secondary indicator species

[2] New site in 2022 which lacks 2015 data

3.4. Weed species and assessment against Triggers 5 and 6

No weed species were recorded within any of the reference or impact quadrats.

3.5. Photographic monitoring

Photographs for each site from 2011 to 2023 are presented in Appendix U. Overall, photographic monitoring shows conditions between 2022 and 2023 are largely unchanged throughout the monitoring sites. No obvious signs of change were evident in the photographs, with the majority clearly showing the dry conditions evident from 2019 onwards. The few sites that did show change in the photographic monitoring included thinning of dead materiel, greening of vegetation, spinifex growth and varied fire successional response.

Drought conditions since 2019 have resulted in extensive vegetative senescence over that time, and some photographs show evidence of gradual thinning of previously senesced foliage or dead standing vegetative material. An example of this can be observed in photographic monitoring of site M1-4 (Appendix U). In contrast, Infrastructure Corridor sites A2-8, A2-9 and E4-2 show noticeable greening of living vegetation, apparently due to higher quantities summer rainfall than was observed at the TGM aerodrome weather station further to the east.

No sites were impacted by fire events between 2022 and 2023, with sites burned in previous years displaying varied successional responses. Sites E1b-8 and to a lesser extent E3-6 recorded the rapid growth of initial fire responding species after an early 2018 fire event, but the drought conditions

present since have restricted secondary successional species from recruiting. Conversely, some sites affected by fire in recent years show very slow but steady post-fire recovery, such as sites E4-13 and E4-10. Site E4-10 in particular, showed the initial rapid colonisation of fire responsive species such as *Codonocarpus cotinifolius* (Native Poplar) with secondary growth of *Eucalyptus*, *Acacia* and *Grevillea* species.

Other photographic monitoring points of note:

- A *Eucalyptus gongylocarpa* tree in Borefield site E2-2 dropped a large branch in 2022 and is showing good epicormic resprouting in 2023.
- Site E1b-4 shows the slow growth of spinifex from 2011 through to the present.
- Site E1b-11 shows a recently cleared drill pad which cleared a portion of the quadrat's southwest corner and pushed up vegetation.

4. Discussion

4.1. General observations

Extremely dry conditions were observed by the Tropicana aerodrome weather station in the 12 months preceding the survey, continuing a drought period observed since 2019. In the 2023 calendar year, only the month of April received above average rainfall with all other months being substantially below average. Climate records observed at the Tropicana Aerodrome (see section 1.1.3) support evidence for extended drought conditions from 2019 onwards (Figure 4-1).

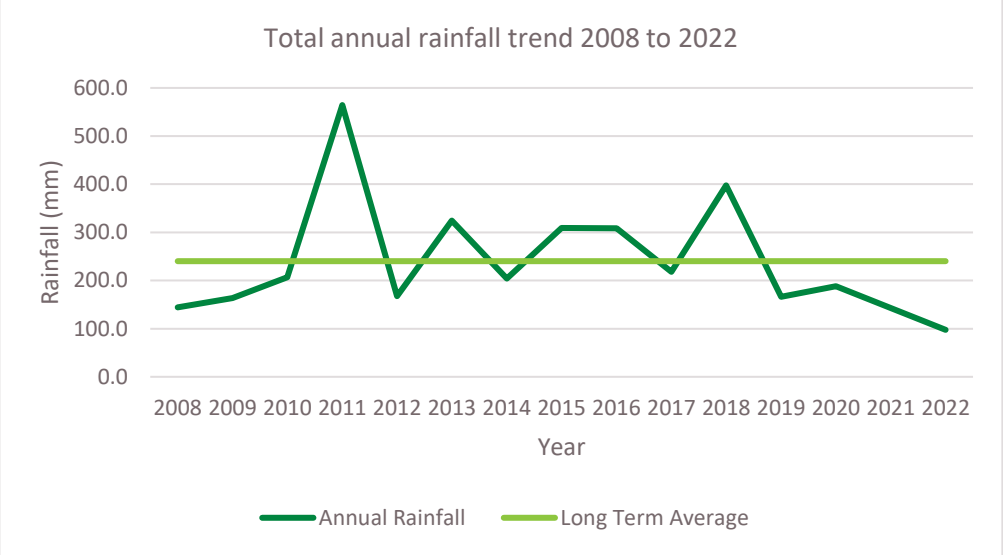

Figure 4-1: Total rainfall at Tropicana for all years with complete data (2008 to 2022) with the long-term average

Vegetation health decline due to sustained and ongoing dry conditions has been observed throughout the study area for several years, with the trend most noticeably occurring within the Operations Area. Observations of noticeable greening in perennial species in some sites in the Borefield and Infrastructure Corridor indicate better rainfall in those areas, however this noticeable greening of perennial species was not observed within the Operations Area. Measurements of foliar condition (Leaf Loss score and Browning scale) in the 2023 monitoring program were compared with 2022 values to determine the proportion of sites showing improvement or decline in foliar condition, as shown in Table 7. A much lower proportion of Operations Area sites showed an improvement in condition within at least one stratum and a much higher proportion of Operations Area sites showed a decline in condition within at least one stratum as compared to Borefield or Infrastructure Corridor sites. This supported the field observation that improvements in condition in some parts of the Infrastructure Corridor and Borefield were not reflected in Operations area sites and indicated that the Operations Area received lower rainfall than other areas.

Table 7: Proportion of sites showing change in at least one stratum for Browning scale and Leaf Loss score.

	Proportion (%) of sites displaying an improvement in condition		Proportion (%) of sites displaying a decline in condition	
	Browning scale	Leaf Loss score	Browning scale	Leaf Loss score
Operations Area	9%	9%	50%	62%
Infrastructure Corridor	24%	37%	17%	36%
Borefield	33%	37%	27%	33%

For comparison, three of the closest BoM weather stations with complete data for the year preceding the 2023 VMP; Ilkurlka weather station located 305 km east-northeast, Laverton Aero located 216 km west-northwest and Tjukayirla weather station located 225 km north of the TGM Aero station, have monthly rainfall for the 12 months preceding the 2023 monitoring program shown below in Figure 4-2. Regional rainfall records indicate that the TGM weather station received rainfall at similar times to surrounding areas, but with the exception of December, generally did not receive the peaks of rainfall, shown more clearly in October 2022, April 2023 and August 2023.

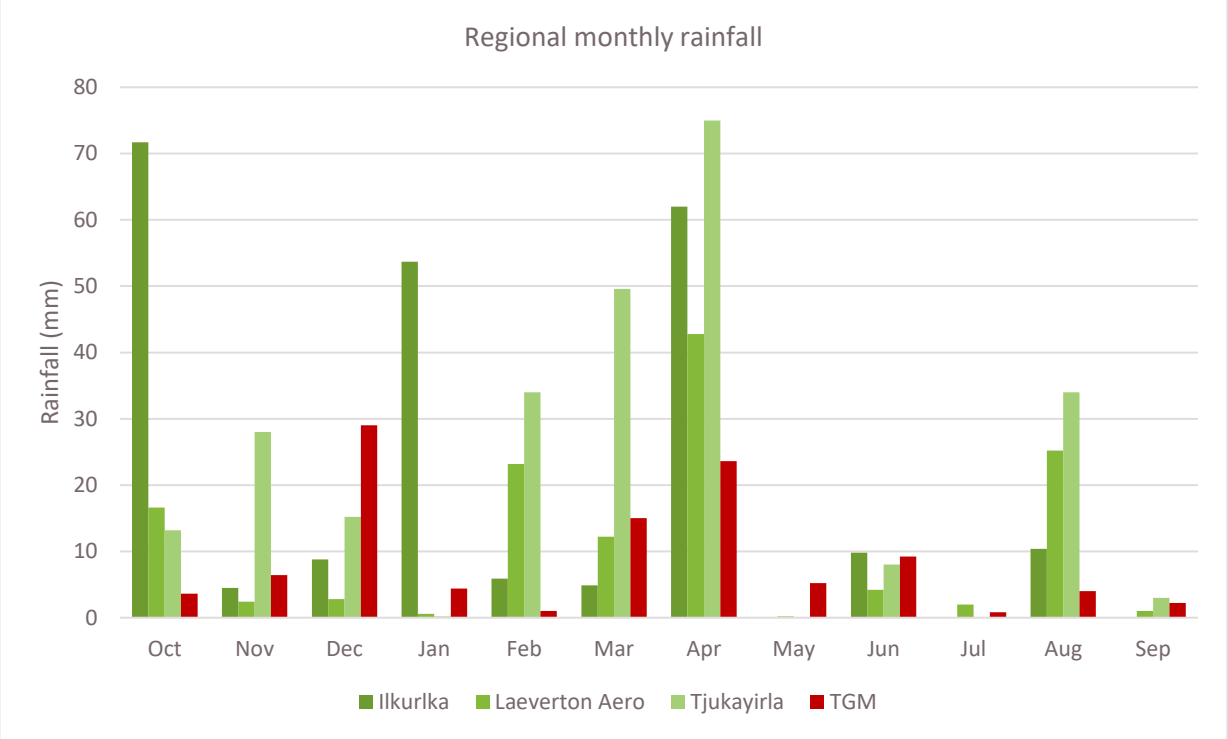

Figure 4-2: Comparison of monthly rainfall between TGM Aero and three regional weather stations for 12 months preceding the 2023 monitoring program.

Observations of dust deposition at monitoring sites recorded multiple impact and two reference sites within the Operations Area with visible fine grey dust accumulated within the monitoring site, indicating that while the dust may not travel far in visible concentrations, there is airborne movement of fine particulates.

Multiple studies have concluded that particulates and aerosols can have an inhibitory effect on localised and downwind precipitation (Rosenfield et. al., 2001, Kaufman et. al., 2005 and Bigg, 2008). There may be some correlation between dust particulates and/or aerosolised chemicals generated by operational activities and slightly reduced precipitation local to the Operations Area.

As the TGM weather station is located approximately 4 km north of the development footprint and 6 km north of the site offices, it is recommended that TGM consider undertaking additional monitoring of rainfall at the Borefield workshop (or other Borefield infrastructure) and comparison of rainfall between existing gauges at the Site Administration offices, Active mining area, Airfield and Borefields in order to determine whether a precipitation gradient correlated to distance from active mining and processing areas may be present.

4.2. Remote Sensing

Changes detected in the remote sensing analysis include track and infrastructure maintenance and new drill tracks and pads, loss of vegetation from fire events, and variation in vegetative health and cover across the study area. Many of the changes observed can be explained by natural environmental influences such as dry conditions or lightning-initiated fires and are not likely related to operational activities. Operational activities were observed to have a minor impact on vegetation loss from factors such as pit expansion, track maintenance activities and creation of new drill tracks and drill pads.

4.2.1. Fire

A large portion of the study area has been impacted by fire events since the monitoring program commenced, with a significant proportion of the observable vegetation within the study area being in a post-fire regenerative phase. In most of these burned areas, there was no significant observable change in post-fire vegetation health from 2022 to 2023, while areas that did show change were found to show a mixture of vegetation recovery and decline. The 2023 remote sensing study identified two minor fire events occurring in Trop_75 in the Infrastructure Corridor, and Trop_103 in the Borefield. The fire in Trop_75 appears to be associated with a vehicle turnaround along the Infrastructure Corridor, whereas the fire in Trop_103 is isolated, away from operational areas and, as a result, may be due to a lightning strike. These two small fires contrasts with results from earlier surveys such as 2018 and 2019, where large portions of the study area were burnt.

4.2.2. Rainfall

A general reduction in vegetation vigour was observed in 2023 in comparison to 2022, which follows a similar trend across the study area that has been observed since 2019 in both the remote sensing and field assessments. Due to the widespread nature of these observations, it is unlikely that this trend can be attributed to mining operations and are more likely due to the natural response of surrounding ecosystems to ongoing successive dry years, whereby species drop their leaves during times of water-stress and then regain foliar cover following significant rainfall. Furthermore, there may be a reduction in overall vegetation cover due to a failure of ephemeral species to germinate during the dry conditions that have been observed in the study area since 2019. The areas showing this reduction in vigour and cover are widespread and do not follow any obvious pattern that would suggest a significant impact from mining operations.

The 2022 remote sensing (ELA 2022) observed isolated small patches of vegetative growth in the Borefield, potentially due to restricted rainfall patterns within the region. The 2023 remote sensing observed many similar isolated patches of vegetation which displayed a reduction in cover and vigour in the Borefield. This result is likely the natural senescence of annual species detected in 2022 as a result of variable rainfall throughout the region.

One exception to the widespread reduction that was determined to be a direct impact of operational activities, is the patch of vegetation health reduction adjacent to the airstrip in the Operations Area (observed in tile Trop_20 and shown in Figure 3-3), where taller vegetation was pruned in line with operational recommendations for the adjacent weather station.

4.2.3. Dust

The effects of dust on surrounding vegetation from the Infrastructure Corridor have been evident in previous surveys including 2020, 2021, and 2022. Some apparent dust effects of dust were observed during the 2023 survey, in tiles Trop_46, Trop_47, Trop_48, Trop_49, Trop_50, and Trop_52. This includes colouration on vegetation either side of the main road and, in some cases, some localised tree deaths and vegetation reduction in directly adjacent vegetation. While coloration of the areal imagery can indicate dusty areas, it is not quantifiable or mappable and relies on ground truthing to determine the extent. While there are presently no observable declines in vegetative cover or condition directly related to dust coverage, the successive years of drought conditions means the monitoring program is unlikely to show any impacts from operational activities; and impacts, if any, may not be realized by the remote sensing studies until sufficient rainfall occurs to promote widespread growth throughout the region, such as that received through one or more consecutive years of above average annual rainfall. Consequently, effects such as dust deposition along roadsides should be monitored and rectified where possible to avoid compounding effects of drought and mining operations that may worsen if dry conditions continue in future years.

4.2.4. Photographic variability

Image capture for the 2023 study was undertaken at a different time of day compared to the 2022 imagery for some parts of the study area. This resulted in some minor errors in vegetation change detection, with some areas showing increases or decreases in vegetative health that were likely a result of shadowing or differing light conditions. While there were some areas with change-detection errors, broadscale effects were observable during analysis and able to be accounted for, therefore these errors did not significantly affect outcomes of the study. TGM have advised that image capture was completed as close as possible to previous years to minimize photographic variability as much as possible. It is recommended that TGM and Outline Imagery continue efforts to ensure the timing for image capture is consistent with previous years to keep change-detection errors minimal.

4.3. Investigation of Trigger 1 Exceedances

A total of four paired sites within the Operations Area exceeded the 25% deviation in overall foliar cover relative to both each other and either 2022 or the baseline that triggered an investigation. None of the investigations determined that a direct impact from operational activities was responsible, with exceedances determined to be due to natural causes such as drought and fire events with subsequent regrowth of vegetation.

4.3.1. Operations Area

The exceedance in paired sites A7a-5 / A7a-6 was triggered relative to the baseline mean for overall foliar cover. A 5% decrease in overall cover for Impact A7a-5, caused by long term drought conditions, was responsible for a -29% deviation relative to the baseline mean, while Reference A7a-6 baseline was established not long post fire, while covers were quite low. Overall, both sites have been relatively stable since 2019 and the exceedance is indicative of a combination of fire recovery in the reference site and drought conditions slightly affecting the impact site.

The exceedances in deviation of overall foliar cover recorded by impact sites E1b-8 and E1b-10 can be attributed to fire events in 2018. In both cases, the impact site but not the reference site were burned, causing a drop in overall foliar cover compared to both reference site and baseline. The below average rainfall experienced following 2018 (see section 1.1.3) has slowed vegetative regeneration in these areas, so that current foliar values remain low. If the current drought conditions continue, it can be expected to take several more years before post-fire recovery returns the overall foliar cover values to pre-fire event levels.

The exceedance in paired sites E3-6 / E3-7 relative to the baseline is an artifact of fire events and the uneven age between the sites. Reference site E3-7 was established in 2022 in habitat similar to E3-6, a recently burned dune community. Baseline data for E3-6 was taken pre fire between 2011 and 2013, when covers were higher. Drought conditions have prevented good recovery post fire, keeping cover much lower than the baseline, while E3-7 baseline is currently being established in the post fire, drought affected vegetation.

4.3.2. Infrastructure Corridor

The exceedance in deviation of overall foliar cover in paired sites A2-1 / A2-7 is due to natural recovery and proportionate growth rates of vegetation post fire. Both sites were recently burned in 2011 and steadily increased in overall foliar cover through to 2023. A2-1 had a greater baseline cover, so the proportionate growth and low starting values have resulted in a greater than 25% proportionate difference between sites. This difference is an effect of variable natural growth rates in the vegetation and not due to operational impacts.

The impact site E4-14 showed a positive deviation exceedance relative to the baseline, while the reference site E4-13 showed a negative deviation exceedance. Site E4-13 was completely burned in 2019, while E4-14 was not impacted by fire and has shown some slow growth in vegetation cover since the baseline, leading to the exceedance. This is a natural process and is not impacted by operational activities.

4.3.3. Borefield

Site E2-1 recorded a positive 59% deviation in 2023 overall foliar cover relative to the baseline mean that was not reflected in reference site E2-4. This is due to differences between sites prior to a fire event in 2013. Initial cover values for E2-1 were much lower than E2-4, so following fire events in 2013, both sites regenerated cover values similar to each other until both stabilised at 45% cover in 2020. The deviation exceedance therefore is an artifact of early low cover values and has not been affected by operational activities.

Site X1-4 recorded a positive 29% deviation in 2023 overall foliar cover from the baseline mean as opposed to the reference site X1-6 which recorded a negative 64% deviation. These exceedances are directly due to different fire events, with both sites displaying a similar starting fire age in the monitoring photography (see Appendix U). Only site X1-4 burned in 2013, which lowered the baseline mean value for that site. X1-4 has not been burned since and overall foliar cover values are relatively stable at 45% foliar cover. Site X1-6 was burned in 2019, with below average rainfall limiting the regeneration, so that the site is currently at 15% overall cover. Operational activities are not considered to have an impact on this exceedance.

Impact Site X1-7 recorded a positive 65% deviation compared to the baseline, while Reference site X1-8 recorded a positive 28% deviation compared to the baseline. Both sites were burned in the same fire event in 2013, resulting in a lowered baseline cover value, with gradual recovery in both sites causing the positive deviation. Thinning of mostly juvenile *Eucalyptus gongylocarpa* in reference site X1-8 which are not present to the same extent in X1-7 lowered the overall cover by 5% which caused a greater than 25% disparity between the sites. This is an effect of ongoing drought conditions and is not considered to be an impact of operational activities.

Impact site M1-1 recorded a negative 31% deviation from baseline cover, while Reference site M1-2 recorded a positive 170% deviation from baseline cover. Both sites were installed in 2014 in recently burned mulga woodland, as indicated by the photo monitoring records from that year (see Appendix U). Site M1-2 has since regenerated into a mulga dominated shrubland, while site M1-1 did not have the mulga return and regenerated into a spinifex grassland with low shrubs of shorter lived, fire responsive species such as *Seringia velutina* and *Leptosema chambersii*. These low shrubs have largely senesced in the drought conditions evident since 2019, while mulga are well adapted to low rainfall conditions and have shown a steady, slow growth. This transition of the landscape into different vegetation communities is a natural process due to minor variances between the sites and is not considered to be an impact of operational processes.

4.4. Investigation of Trigger 2 Exceedances

A total of 36 pairs of sites exceeded the 25% deviation threshold for indicator species cover and triggered an investigation. This continues an increasing trend in exceedances, with 35 pairs in 2022, 28 pairs in 2021 and nine pairs of sites in 2020. The continued increase in the number of exceedances can mostly be attributed to consecutive years of below average rainfall which led to an extended drought period, combined with the varying responses of the chosen indicator species to past fire events such as growth rates, germination response and natural senescence. There have been an increasing number of sites requiring a secondary indicator species due to the original indicator senescing or dying out entirely.

4.4.1. Operations Area

Seven pairs of sites triggered an investigation for an exceedance in indicator species cover deviation between impact and reference sites relative to 2022 and eight pairs of sites triggered an investigation for deviation between impact and reference site relative to 2015 cover values. There were three primary drivers for exceedances in Operations Area impact sites relative to 2022 and/or 2015. Firstly, fire events that reduced the cover of indicator species between one year and the next, secondly drought conditions that have occurred since 2019 and thirdly the proportional effect that slight changes in low numbers can have. In most cases, a combination of these drivers have resulted in the larger number of exceedances.

Fire events in 2018 unevenly impacted paired sites E1b-8 / E1b-7 and E1b-10 / E1b-9 where the impact site but not reference site was burned which was directly responsible for the exceedance in deviation.

The below average rainfall experienced at Tropicana from 2019 onwards has caused widespread senescence in vegetation and has reduced foliage cover in many species. Many species enter dormancy in drought conditions and can remain viable for a few years before senescing. This is particularly evident with *Ptilotus obovatus*, which has shown decreases in cover or has died entirely in all Operations Area sites utilising it as an indicator. The long-term dry conditions have contributed to the exceedances in paired sites A7a-5 / A7a-6, A7a-1 / A7a-4, C9-2 / C9-4, E3-3 / E3-4 and E3-6 / E3-7.

The proportional impact of minor variations in low covers is evident in site A7b-3, where indicator cover decreased from 1% in 2015 to 0.5% in 2023, while the paired reference site A7b-4 increased in cover from 10% in 2015 to 15% in 2020 and has remained stable since. These minor shifts result in deviations greater than 25% due to the low base figures, but in practise, do not represent a significant change. Paired sites that recorded exceedances due to this include A7b-4/A7b-3, C9-1 / C9-3 and C9-2 / C9-4, while a combination of drought and small cover values include paired sites A7a-1 / A7a-4, A7a-5 / A7a-6 and E3-3 / E3-4.

4.4.2. Infrastructure Corridor

Seven pairs of sites triggered an investigation for deviation between impact and reference site relative to 2022 and 12 pairs of sites triggered an investigation for deviation between impact and reference site relative to 2015. Similar to the Operations Area, a combination of previous fire events, ongoing drought conditions and the proportionate effects of low cover values on deviation percentages have been the primary drivers behind exceedances in the Infrastructure Corridor.

A combination of low cover values and a decline in cover due to drought, were responsible for exceedances in indicator cover deviations between 2023 and 2015 and/or 2023 and 2022 in paired sites A3-5 / A3-6, A7b-6 / A7b-5, A7b-9 / A7b-8, E4-5 / E4-6 and E4-7 / E4-8. Paired sites E4-3 / E4-4 and S8-2 / S8-6 which utilised *Leptosema chambersii* as the indicator species recorded large decreases in cover over the last few years, as the species readily senesces in periods of extended water stress and is now completely absent from sites E4-4, S8-2 and S8-6.

Similarly, paired sites A2-2 / A2-10 utilising the indicator *Aluta maisonneuvei* have seen extensive drought senescence leading to an exceedance, although cover of senesced material remains standing for several years where it is not readily determinable whether the plant is dead or dormant.

Paired sites S8-2 / S8-6 secondary indicator *Grevillea juncifolia*, was also recorded in 2015, however it was absent from S8-2 when surveyed in 2023, causing an exceedance with the secondary indicator. *Triodia* sp. was selected during the 2023 survey to replace *G. juncifolia* as a secondary indicator in future vegetation monitoring programs.

Paired sites A2-1 / A2-7, E9-2 / E9-1, S8-3 / S8-1 and S8-7 / S8-5 recorded a positive deviation in cover between 2015 and 2023 due to the growth over time of the indicator species, where small differences in growth between impact and reference led to a proportionally larger deviation, or in the case of E9-1, a slight decline in *Acacia aneura* cover due to the drought.

A 2019 fire event is responsible for the exceedance in paired sites E4-14 / E4-13, where the impact has seen a slow decline in cover due to the drought conditions, while the reference site was burned in 2019 and shown a very slow recovery ever since.

Site A2-3 recorded a 50% reduction in cover of indicator species *Acacia aneura*, however this was due to a slight change in methodology and not an actual decline in cover. *Acacia aneura* is a member of the Mulga group and the name can be used colloquially to refer to mulgas as a whole. In 2023, the specific species was counted, excluding other members of the mulga group, thereby halving the cover recorded. To rectify this, *Acacia aneura* in the field data sheets will be written as '*Acacia aneura* group' to avoid similar confusion in the future.

Dust was observed on foliage and staining the ground in numerous sites along the infrastructure corridor, however any potential impacts of dust are indistinguishable from the impact of the drought conditions throughout the area.

4.4.3. Borefield

Three pairs of sites triggered an investigation for deviation between impact and reference site 2022-2023 and 11 pairs of sites triggered an investigation for deviation between impact and reference site between 2015 and 2023. The primary cause for exceedances in the Borefield were the response of indicator species to drought conditions and the proportionate effect of low cover values on minor changes in growth or senescence over time.

There were some general trends evident related to indicator species selection, as *Triodia basedowii* has increased in cover across nearly all sites since 2015, while conversely *Seringia velutina* has decreased in cover across nearly all sites since 2015.

Seringia velutina generally shows a positive germination response to disturbance and is commonly seen as an early re-coloniser species on the margins of disturbed areas (pers. obs.). Populations tends to boom in optimum conditions and rapidly senesce when conditions are poor. The drought conditions experienced at Tropicana since 2018 have led to widespread senescence in *Seringia velutina* and are directly responsible for the exceedances in paired sites T1-4 / T1-2 and X1-13 / X1-14.

In contrast, *Triodia basedowii* is an exceptionally drought tolerant species and can continue to grow, if very slowly, in low rainfall conditions. The majority of Borefield sites that utilised *T. basedowii* as an indicator species were recently burned in 2015 so starting values were very low. Steady growth and the proportionate effects low cover values can have on deviation percentages (discussed above in section 4.4.1) have led to the exceedances in paired sites E2-1 / E2-4, E2-5 / E2-6, X1-15 / X1-16, X1-13 / X1-14, X1-9 / X1-10, X1-7 / X1-8, X1-4 / X1-6, M1-3 / M1-4 and M1-1 / M1-2.

Paired sites X1-11 / X1-12 recorded an exceedance in cover of the secondary indicator species *Eucalyptus gongylocarpa* relative to 2015. This indicator species was monitored for the first time since 2015 following the majority senescence of *Seringia velutina* in both impact and reference. Both sites were burned in 2013 and had abundant seedlings of *E. gongylocarpa* present in 2015. Since then, most seedlings present in reference site X1-12 have senesced, while survival in impact site X1-11 was much higher. This appears to be a natural thinning of individuals and not related to operational activities.

4.5. Weed species

The findings of the 2023 monitoring program are consistent with previous programs with no weed species recorded in any sites. While introduced species including *Sonchus oleraceus*, *Carrichtera annua* and *Citrullus* sp. have been noted in the Operations Area and/or the Infrastructure Corridor, none occurred within any monitoring quadrats.

The two most likely vectors for the spread of weedy species are the Infrastructure Corridor and associated vehicle traffic, and seed or vegetative material carried on personal items (such as boots and bags) of personnel flying to site. Weeds have been observed in previous years beyond the western border of the study area and several weedy species are reportedly being controlled around the Operations Area. Continued maintenance of weed hygiene practices on incoming vehicles and ongoing monitoring and control of species present is recommended.

4.6. Recommendations

Three primary recommendations from the 2023 Tropicana remote sensing and vegetation monitoring program were as follows:

- Continue to maintain weed hygiene practices for all incoming vehicles.
- Continue to undertake regular weed monitoring activities around commonly foot trafficked areas, i.e. site offices, process plant, village, aerodrome and major pedestrian pathways.
- Consider undertaking measurement and comparison of rainfall within the mine process area and Borefield in addition to the airfield to determine potential changes to localised precipitation.

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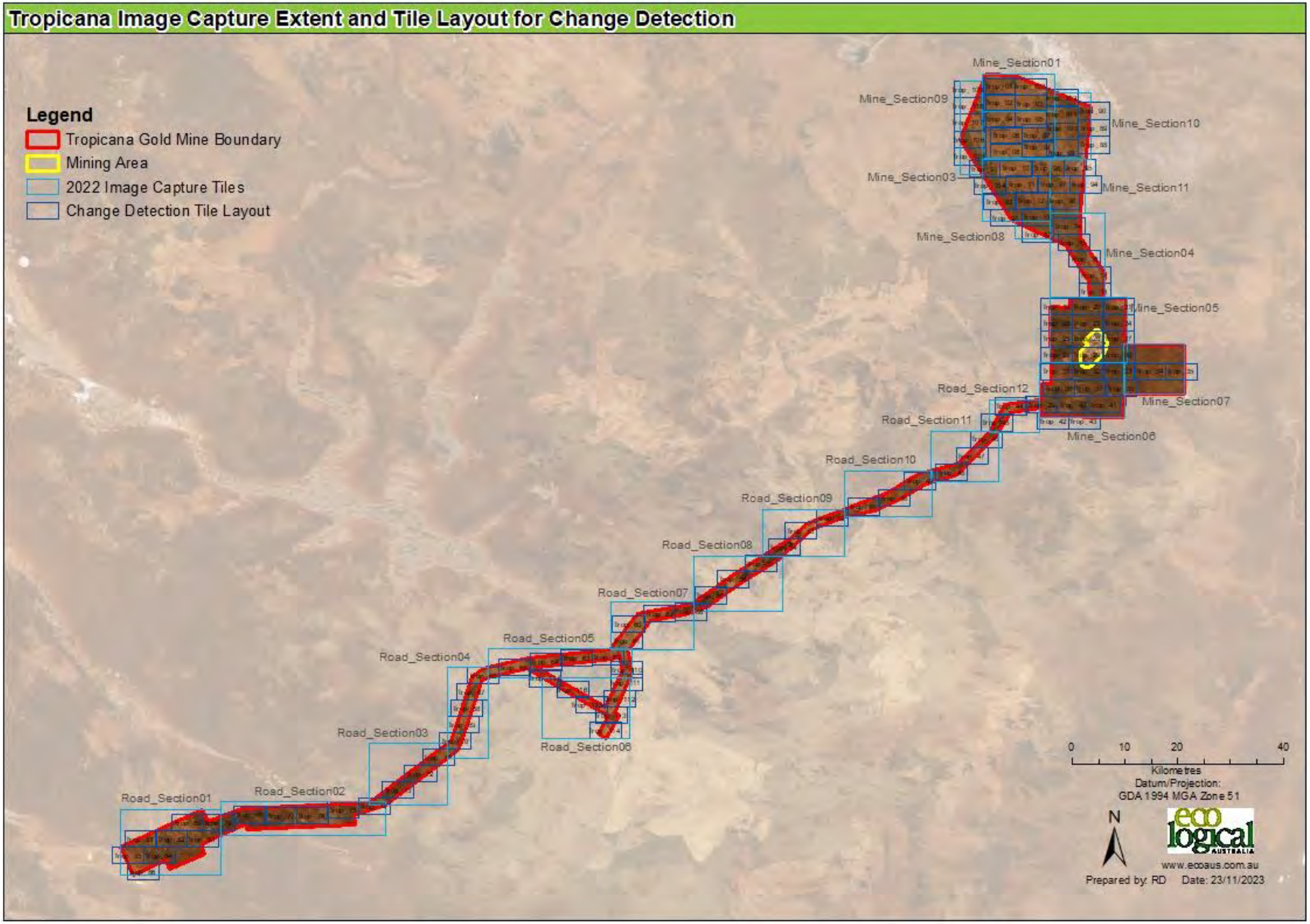
Appendix A DMSI Visual Assessment Outputs

Images for the remotely sensed data for 2022-2023 and the SAVI change detection are provided in a separate download file. Data are separated into separate tiles. The tile layout is shown below.


Tropicana Image Capture Extent and Tile Layout for Change Detection
Legend
Tropicana Gold Mine Boundary
Mining Area
2022 Image Capture Tiles
Change Detection Tile Layout
Mine_Section01
Mine_Section09
Mine_Section10
Mine_Section03
Mine_Section11
Mine_Section08
Mine_Section04
Mine_Section05
Mine_Section07
Mine_Section06
Road_Section12
Road_Section11
Road_Section10
Road_Section09
Road_Section08
Road_Section07
Road_Section05
Road_Section04
Road_Section03
Road_Section06
Road_Section01
Road_Section02
0 10 20 40
Kilometres
Datum/Projection:
GDA 1994 MGA Zone 51
N
www.ecoaus.com.au
Prepared by: RD Date: 23/11/2023

Appendix B Quadrat Locations and details

Site name	Latitude	Longitude	Site type	Vegetation community
Operations Area				
A7A-1	-29.22353	124.54416	Impact	*Acacia aneura* woodlands over grasses +/- *Triodia basedowii*
A7A-4	-29.20206	124.55977	Reference	
A7A-2	-29.22067	124.55582	Impact	
A7A-3	-29.21881	124.55957	Reference	
A7A-5	-29.17022	124.55268	Impact	
A7A-6	-29.1686	124.54745	Reference	
A7A-8	-29.22079	124.53609	Impact	
A7A-7	-29.22108	124.52236	Reference	
A7A-10	-29.21327	124.5229	Impact	
A7A-9	-29.21453	124.52184	Reference	
E3-1	-29.26139	124.51906	Impact	Occasional *Eucalyptus gongylocarpa* over mixed upper stratum over *Daviesia grahamii*/*Pityrodia loricate* / *Chrysocephalum puteale* low shrubland over sparse to open *Triodia desertorum* or *T. basedowii* and *Lomandra leucocephala* subsp. *robusta*
E3-2	-29.25589	124.51441	Reference	
E3-3	-29.26533	124.56357	Impact	
E3-4	-29.26552	124.56877	Reference	
E3-5	-29.27398	124.55448	Impact (Buried)	
E3-6	-29.2877	124.53194	Impact (ex. Reference)	
E3-7	-29.293821	124.536982	Reference	
E1B-1	-29.24937	124.53009	Impact	Open *Eucalyptus youngiana* and sparse *Callitris preissii* over mixed shrubs over open to moderately dense *Triodia basedowii*
E1B-2	-29.23972	124.51599	Reference	
E1B-3	-29.27014	124.55874	Impact (Buried)	
E1B-4	-29.27303	124.5738	Reference	
E1B-5	-29.28137	124.54474	Impact	
E1B-6	-29.28119	124.55158	Reference	
E1B-8	-29.2807	124.52136	Impact	
E1B-7	-29.29069	124.51486	Reference	
E1B-10	-29.33537	124.48317	Impact	
E1B-9	-29.33378	124.47629	Reference	
E1b-11	-29.271244	124.560274	Impact	
A7B-2	-29.27574	124.51965	Impact	Open to moderately dense *Acacia aneura* over *Aluta maisonneuvei* subsp. *auriculata* / *Acacia ramulosa* var.
A7B-1	-29.29621	124.51709	Reference	
A7B-4	-29.33791	124.47997	Impact	

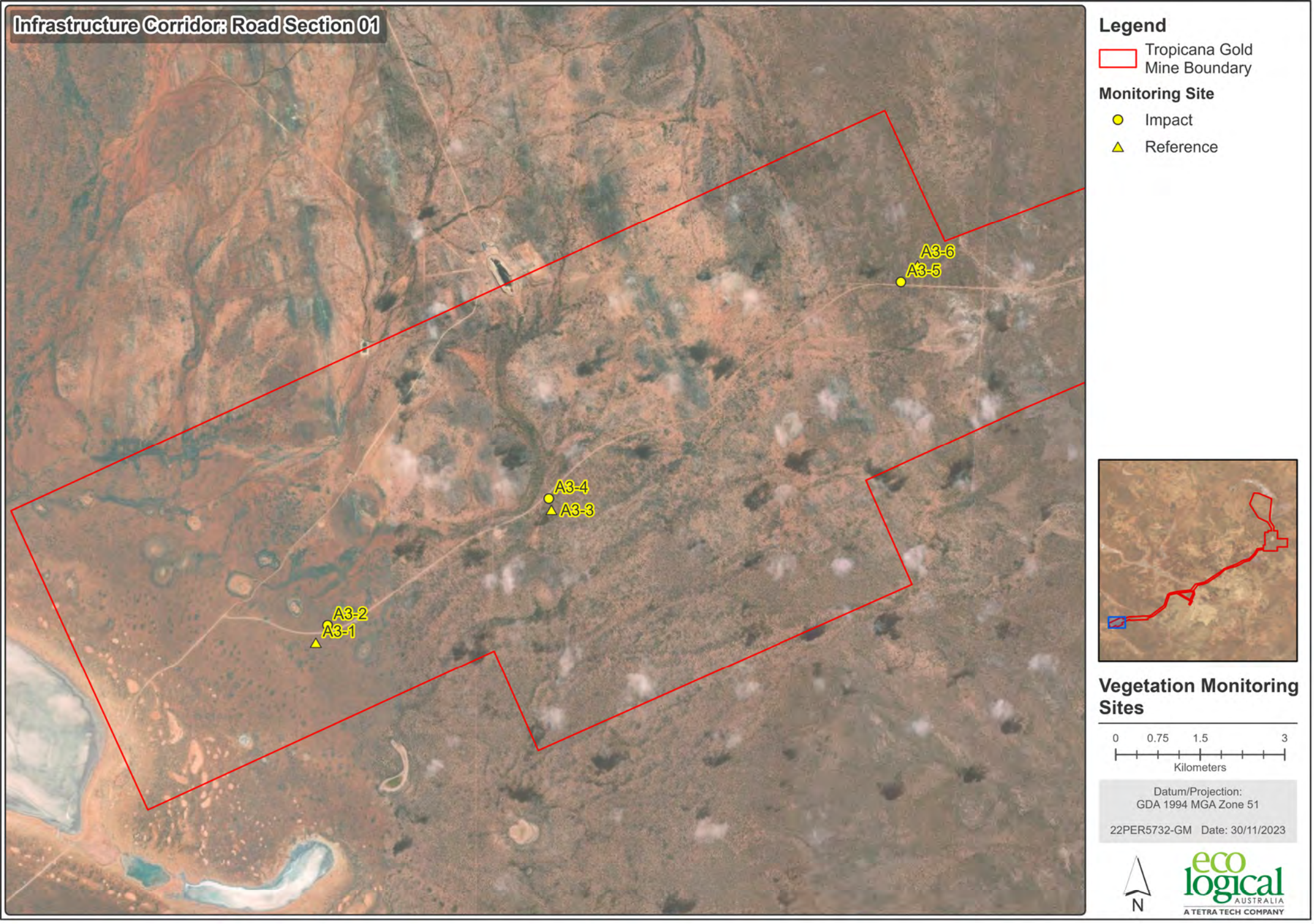
Site name	Latitude	Longitude	Site type	Vegetation community
A7B-3	-29.33805	124.47349	Reference	*ramulosa* over *Eremophila forrestii* subsp. *forrestii* over *Triodia basedowii*
C9-1	-29.232	124.56774	Impact	Open to moderately dense *Casuarina pauper* woodland over open mixed shrubs and scattered soft grasses and/or *Triodia scariosa*
C9-3	-29.22669	124.57865	Reference	
C9-2	-29.24138	124.57154	Impact	
C9-4	-29.2331	124.58527	Reference	
Infrastructure Corridor				
E9-2	-30.06177	123.02964	Impact	Low open woodland of *Eucalyptus concinna* with *Eucalyptus* spp. over *Eremophila scoparia*, *Acacia hemiteles*, *Acacia colletioides*, *Scaevola spinescens* and *Eremophila caperata* over *Triodia scariosa*. This community occurs on orange sandy loams on flats.
E9-1	-30.05935	123.03026	Reference	
E9-6	-30.05983	122.88569	Impact	
E9-5	-30.05797	122.88797	Reference	
A3-2	-30.13366	122.69965	Impact	Low open woodland to tall open shrubland of *Acacia ayersiana* and *Acacia aneura* var. *aneura* over *Acacia* spp. and mixed shrubs. This community occurs on orange sandy loams
A3-1	-30.13646	122.69748	Reference	
A3-4	-30.1135	122.74053	Impact	
A3-3	-30.11531	122.74101	Reference	
A3-5	-30.07888	122.80564	Impact	
A3-6	-30.07624	122.80871	Reference	
S8-3	-29.5601	124.00667	Impact	Low shrubland of *Acacia desertorum* var. *desertorum* with *Grevillea juncifolia*, low Myrtaceous shrubs and mixed low shrubs with occasional emergent *Eucalyptus youngiana* and *Eucalyptus* spp. This community occurs on pale orange sandy loams on flats
S8-1	-29.55902	124.00424	Reference	
S8-2	-29.56185	124.00079	Impact	
S8-6	-29.56442	123.99559	Reference	
S8-4	-29.55795	124.01273	Impact (Discontinued)	
S8-7	-29.5567	124.01356	Impact	
S8-5	-29.55566	124.01362	Reference	
E4-2	-29.80427	123.42075	Impact	Low woodland to low open woodland of *Eucalyptus gongylocarpa* with *Callitris preissii* and *Eucalyptus* spp. over mixed shrubs over *Triodia* spp. This community occurs on orange, red-orange, yellow-orange and yellow sandy loams on mixed topographies
E4-1	-29.80187	123.41777	Reference	
E4-3	-29.96562	123.26614	Impact	
E4-4	-29.96245	123.27089	Reference	
E4-5	-29.87154	123.32471	Impact	
E4-6	-29.86894	123.32907	Reference	
E4-7	-29.72284	123.66718	Impact	
E4-8	-29.71848	123.67104	Reference	
E4-9	-29.70646	123.75116	Impact	
E4-10	-29.70804	123.75318	Reference	
E4-11	-29.56846	123.98227	Impact	

Site name	Latitude	Longitude	Site type	Vegetation community
E4-12	-29.56914	123.98532	Reference	
E4-14	-29.47712	124.22753	Impact	
E4-13	-29.47554	124.22452	Reference	
A2-1	-29.7975	123.4812	Impact	Low woodland to tall shrubland of *Acacia ayersiana* and *Acacia aneura* var. *aneura* with *Acacia aneura* var. *argentea* over *Eremophila* spp., *Aluta maisonneuvei* subsp. *auriculata* and *Prostanthera* spp. This community occurs on orange sandy loam
A2-7	-29.79695	123.4785	Reference	
A2-2	-29.70986	123.7316	Impact	
A2-10	-29.71198	123.7317	Reference	
A2-3	-29.59098	123.95703	Impact	
A2-11	-29.59075	123.9545	Reference	
A2-4	-29.53945	124.06095	Impact	
A2-12	-29.53954	124.05796	Reference	
A2-6	-30.02674	123.17591	Impact	
A2-5	-30.02572	123.17397	Reference	
A2-9	-29.79068	123.54344	Impact	
A2-8	-29.78967	123.54379	Reference	
A7B-6	-29.39442	124.35442	Impact	Open to moderately dense *Acacia aneura* over *Aluta maisonneuvei* subsp. *auriculata* / *Acacia ramulosa* var. *ramulosa* over *Eremophila forrestii* subsp. *forrestii* over *Triodia basedowii*
A7B-5	-29.39369	124.35364	Reference	
A7B-7	-29.35357	124.41985	Impact (Discontinued)	
A7B-9	-29.35352	124.41888	Impact	
A7B-8	-29.35167	124.4156	Reference	
Borefield				
E2-1	-28.94181	124.39672	Impact	*Eucalyptus gongylocarpa* over mixed *Acacia* spp. over mixed moderately open to moderately dense shrubs over *Triodia basedowii*
E2-4	-28.94109	124.40065	Reference	
E2-2	-28.87624	124.36713	Impact	
E2-3	-28.88708	124.35986	Reference	
E2-5	-29.01685	124.44234	Impact	
E2-6	-29.01686	124.43948	Reference	
X1-1	-29.00525	124.43319	Impact	Mixed Eucalypt woodlands dominated by *Eucalyptus gongylocarpa* / *E. youngiana* over mixed open shrubs and *Triodia basedowii*
X1-2	-29.00674	124.43163	Reference	
X1-3	-28.87242	124.42353	Impact	
X1-5	-28.87106	124.43335	Reference	
X1-4	-28.88026	124.42482	Impact	
X1-6	-28.8887	124.44297	Reference	
X1-7	-28.90014	124.43136	Impact	

Site name	Latitude	Longitude	Site type	Vegetation community
X1-8	-28.89963	124.44631	Reference	
X1-9	-28.86753	124.36771	Impact	
X1-10	-28.86117	124.34488	Reference	
X1-11	-28.92043	124.40539	Impact	
X1-12	-28.92559	124.39786	Reference	
X1-13	-28.88746	124.39931	Impact	
X1-14	-28.89446	124.35574	Reference	
X1-15	-28.97024	124.40909	Impact	
X1-16	-28.97075	124.40729	Reference	
M1-1	-28.9017	124.4733	Impact	Moderately dense to dense *Acacia aneura* woodland over isolated shrubs over scattered *Triodia basedowii*
M1-2	-28.9054	124.4746	Reference	
M1-3	-28.9029	124.479	Impact	
M1-4	-28.9054	124.4782	Reference	
T1-3	-28.91184	124.41574	Impact	Open to moderately open mixed shrubs over *Triodia basedowii*
T1-1	-28.9089	124.44324	Reference	
T1-4	-28.89736	124.40519	Impact	
T1-2	-28.90475	124.44995	Reference	

Appendix C Quadrat location maps

Note: Road Section and Mine Section maps that do not contain quadrats are not displayed.



Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 0.75 1.5 3

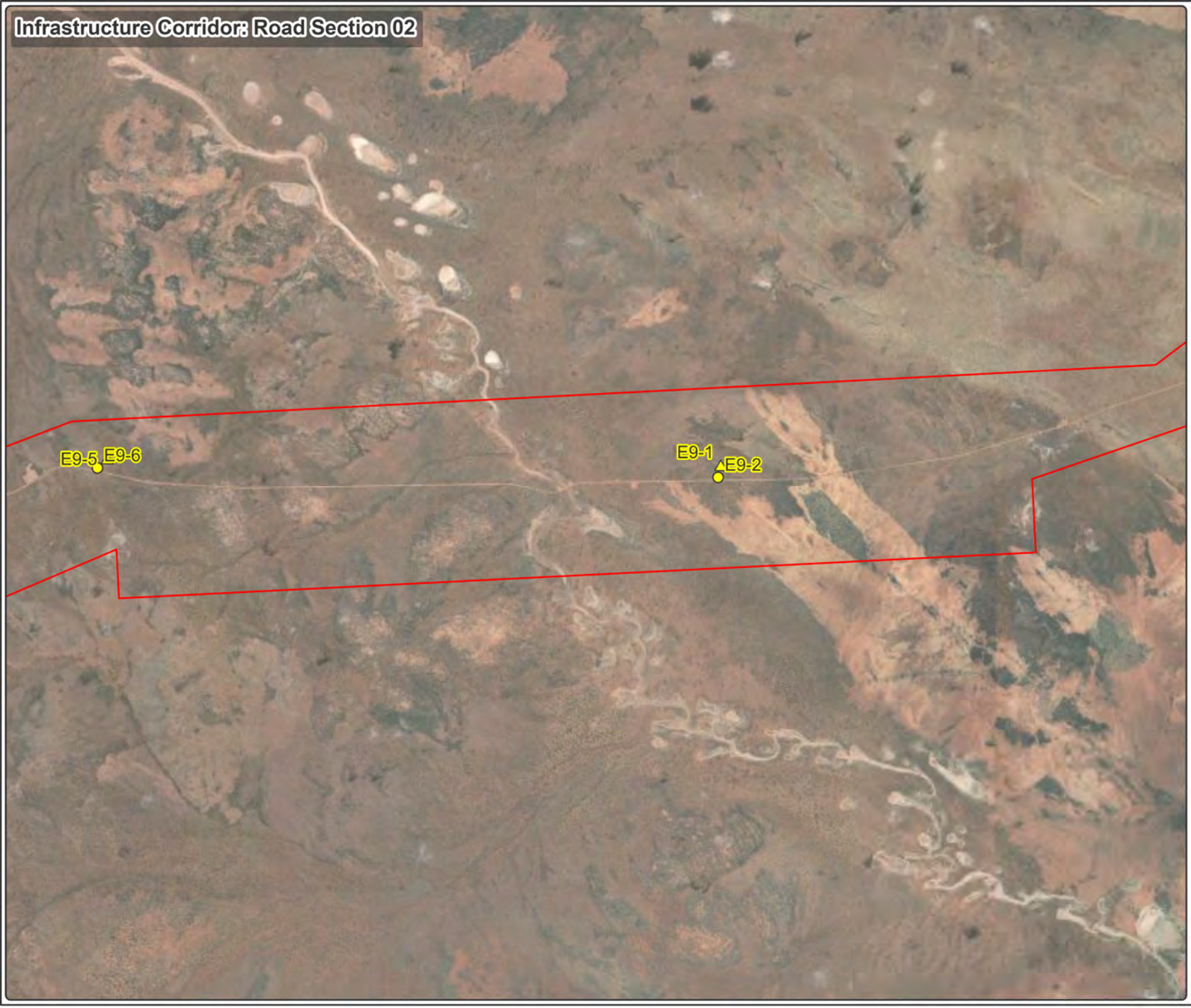
Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

ecological AUSTRALIA
A TETRA TECH COMPANY



Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 1 2 4

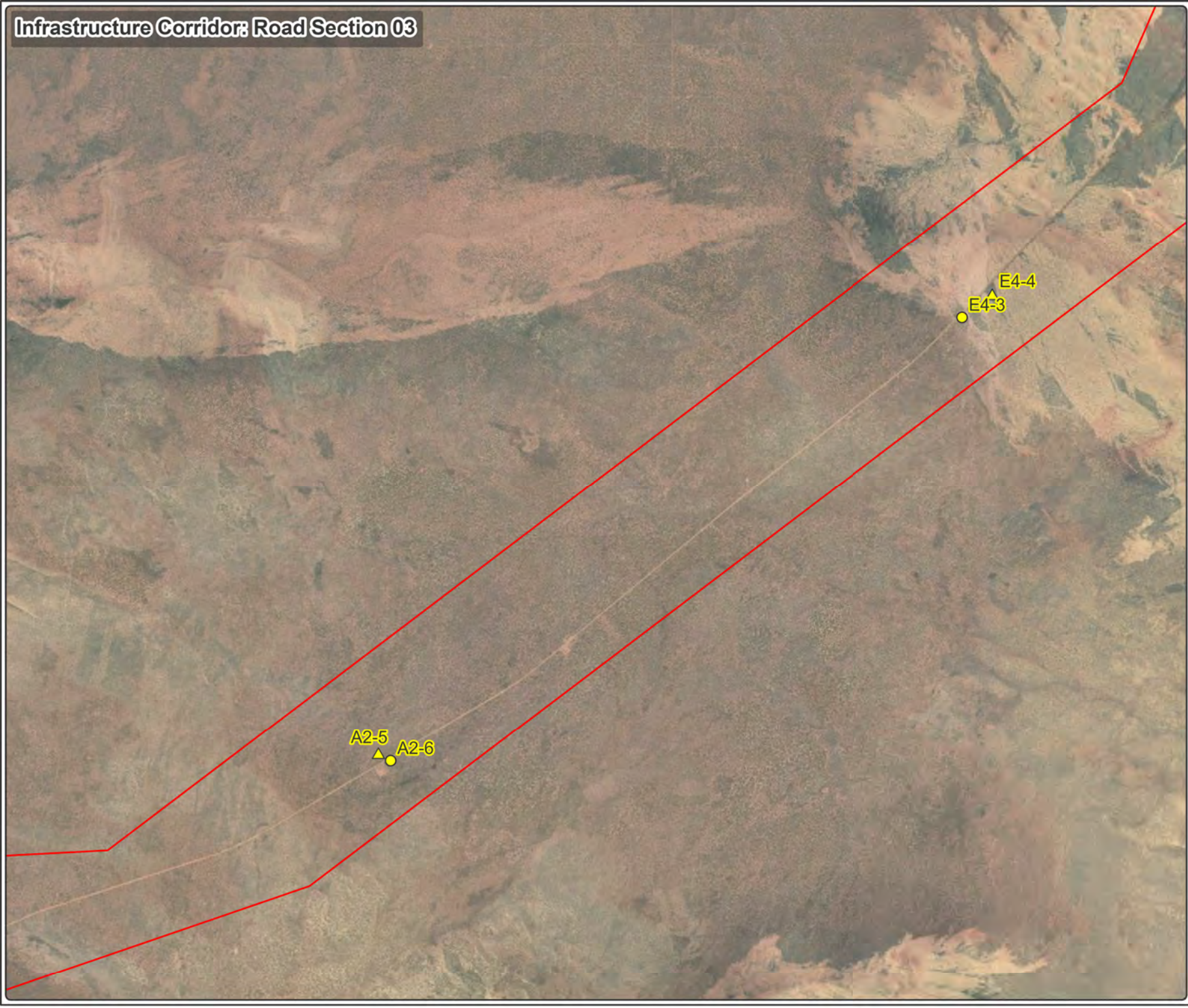
Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

ecological AUSTRALIA
A TETRA TECH COMPANY



Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 0.5 1 2

Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

eco logical AUSTRALIA
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Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 1 2 4

Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

ecological AUSTRALIA
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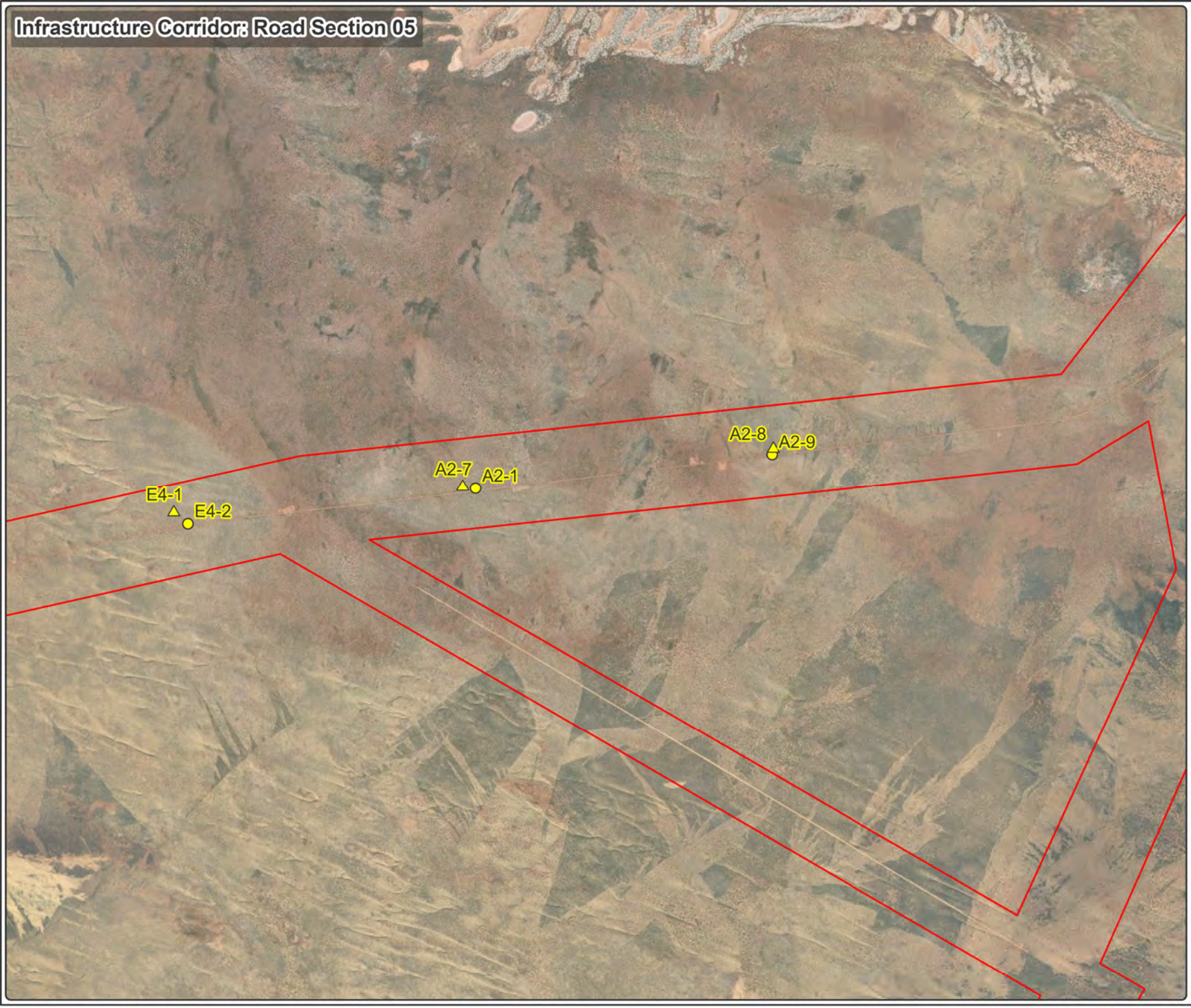

Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 0.75 1.5 3

Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

ecological AUSTRALIA
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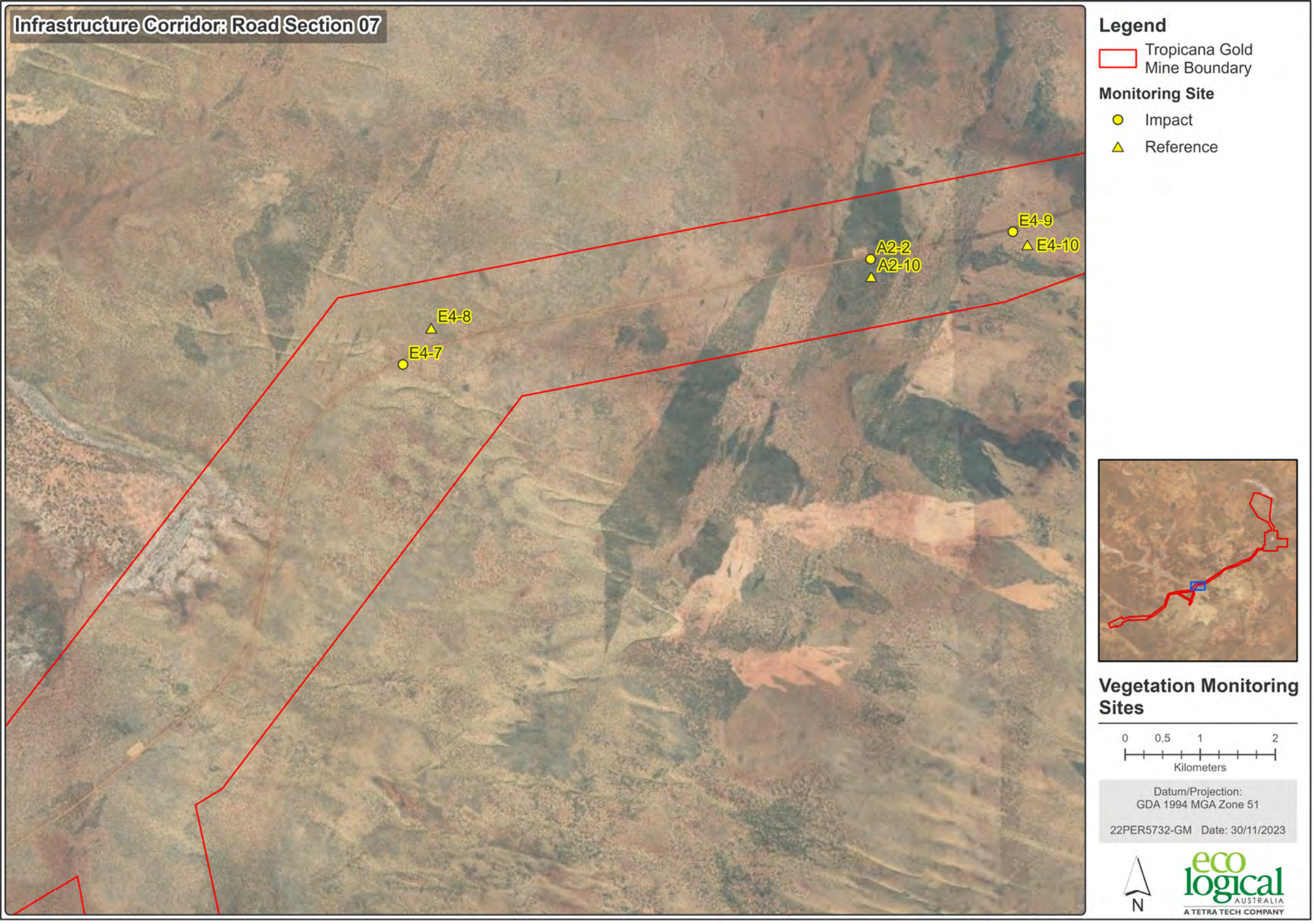
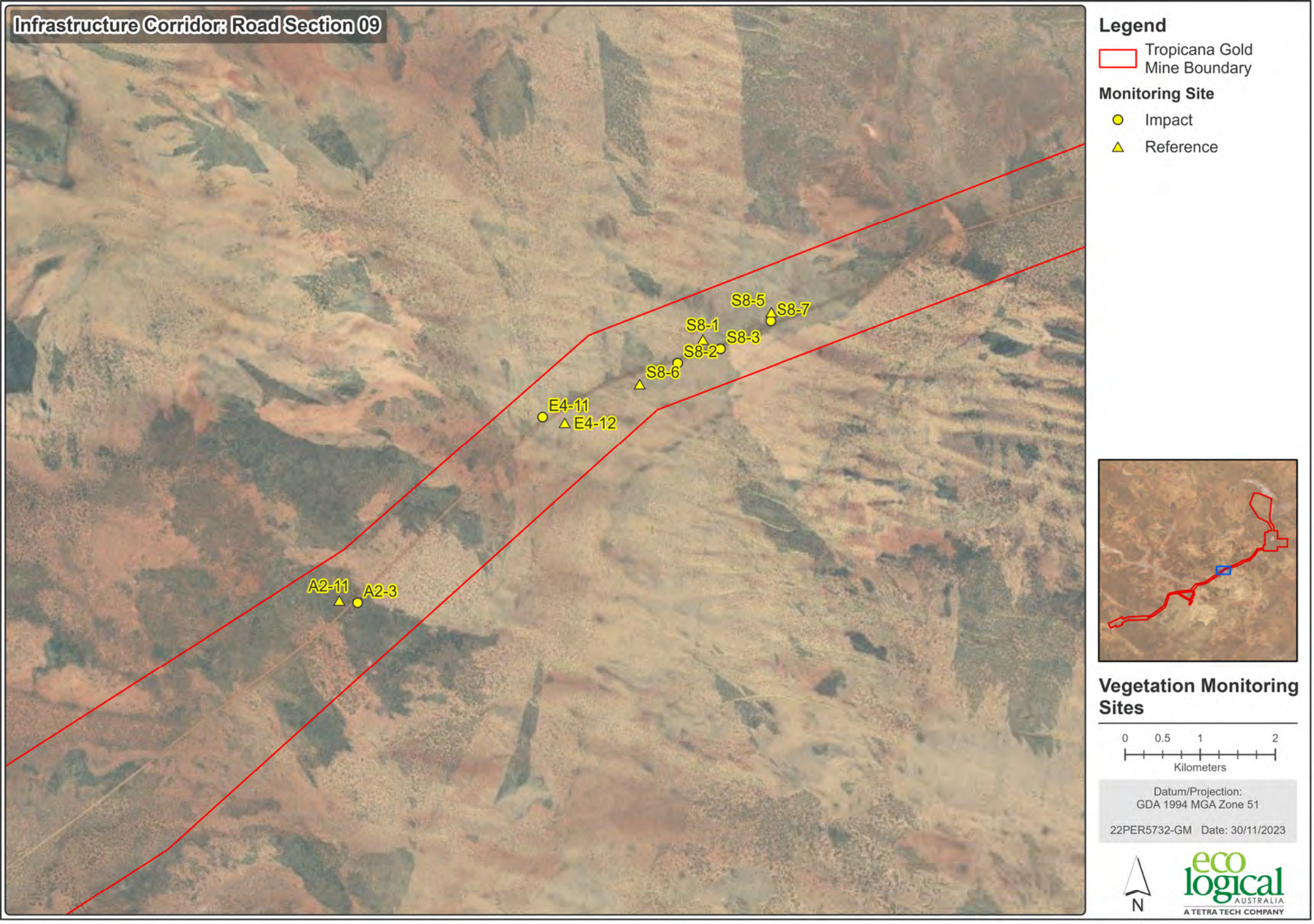
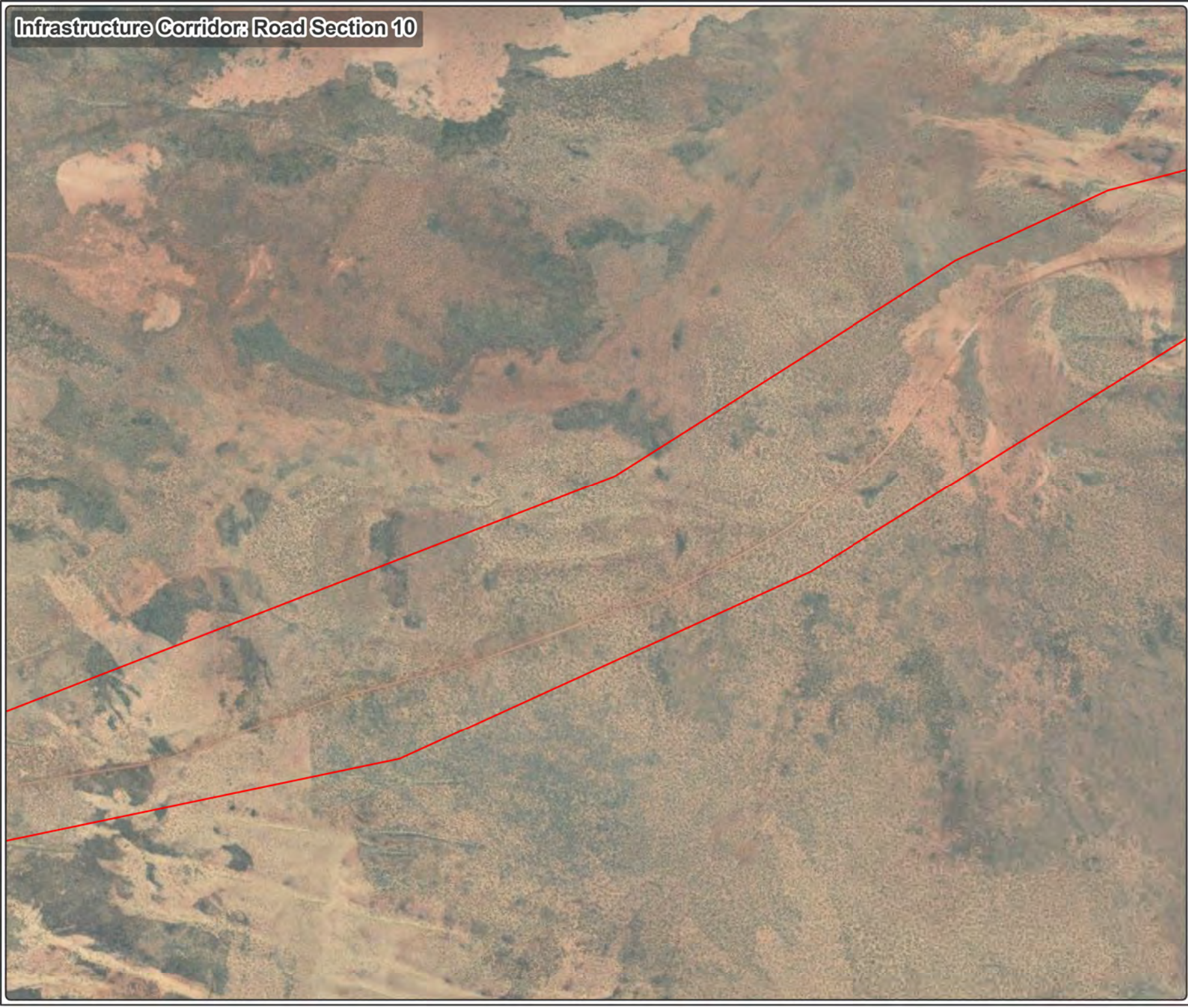

Infrastructure Corridor: Road Section 07
E4-9
E4-10
A2-2
A2-10
E4-8
E4-7
Legend
Tropicana Gold Mine Boundary
Monitoring Site
Impact
Reference
Vegetation Monitoring Sites
0 0.5 1 2
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51
22PER5732-GM Date: 30/11/2023
N
eco logical AUSTRALIA
A TETRA TECH COMPANY


Infrastructure Corridor: Road Section 09
S8-5
S8-7
S8-1
S8-3
S8-2
S8-6
E4-11
E4-12
A2-11
A2-3
Legend
Tropicana Gold Mine Boundary
Monitoring Site
Impact
Reference
Vegetation Monitoring Sites
0 0.5 1 2
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51
22PER5732-GM Date: 30/11/2023
N
ecological AUSTRALIA
A TETRA TECH COMPANY



Legend

Tropicana Gold Mine Boundary

Vegetation Monitoring Sites

0 0.5 1 2

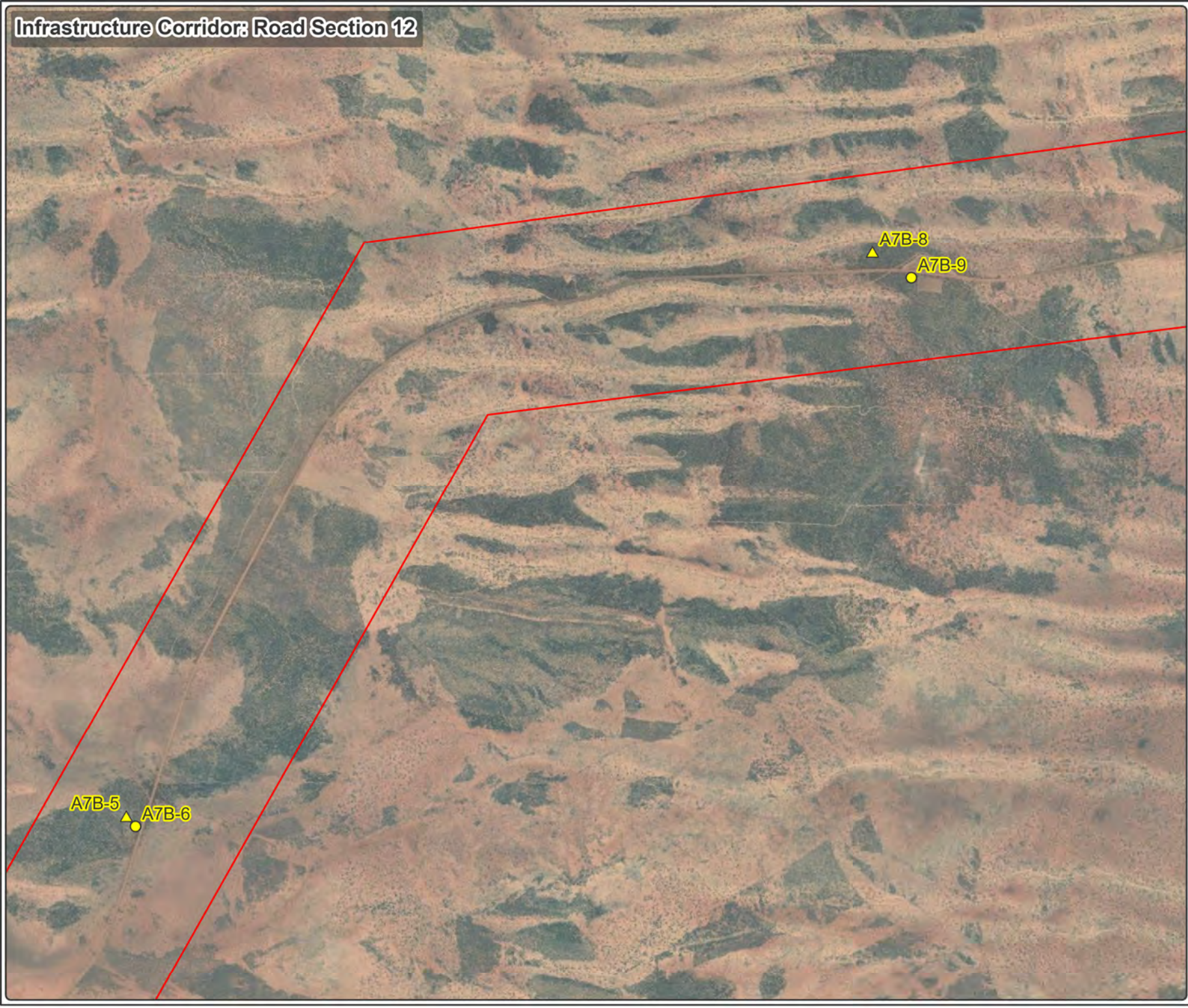
Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

eco logical AUSTRALIA
A TETRA TECH COMPANY



Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 0.35 0.7 1.4

Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

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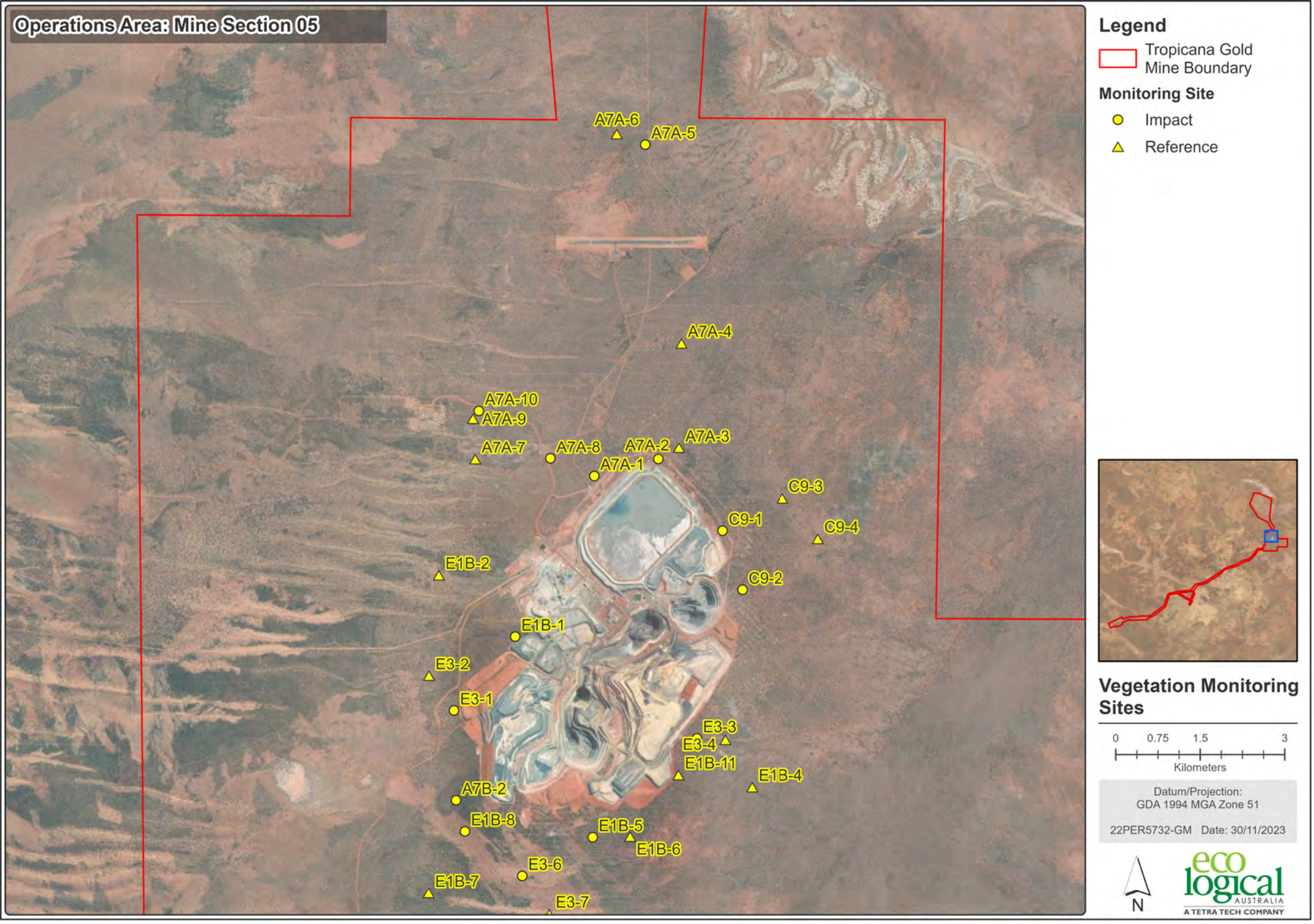
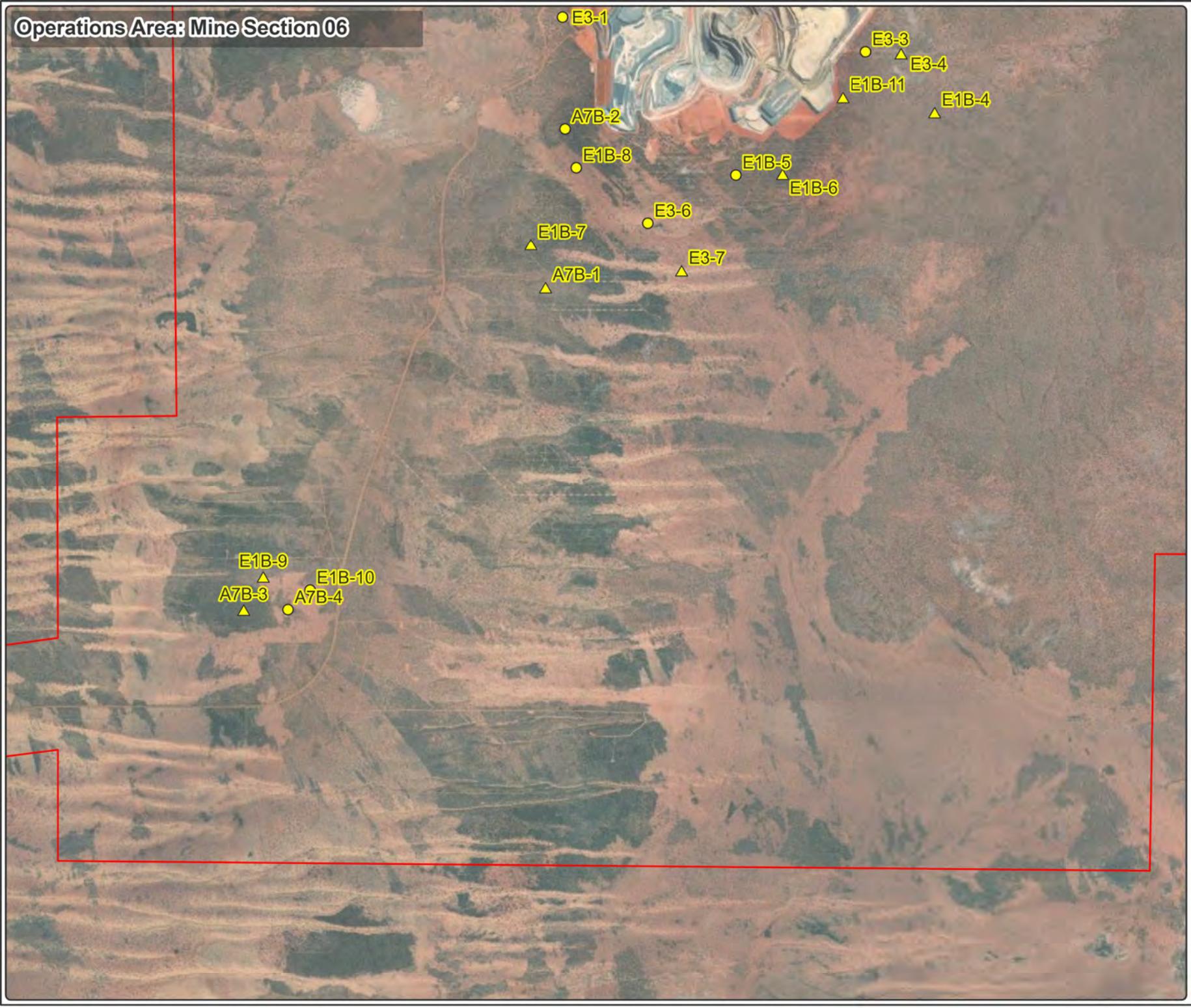

Operations Area: Mine Section 05
A7A-6
A7A-5
A7A-4
A7A-10
A7A-9
A7A-7
A7A-8
A7A-2
A7A-3
A7A-1
C9-3
C9-1
C9-4
E1B-2
C9-2
E1B-1
E3-2
E3-1
E3-3
E3-4
E1B-11
E1B-4
A7B-2
E1B-8
E1B-5
E1B-6
E3-6
E1B-7
E3-7
Legend
Tropicana Gold Mine Boundary
Monitoring Site
Impact
Reference
Vegetation Monitoring Sites
0 0.75 1.5 3
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51
22PER5732-GM Date: 30/11/2023
N
ecological AUSTRALIA
A TETRA TECH COMPANY



Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 0.5 1 2

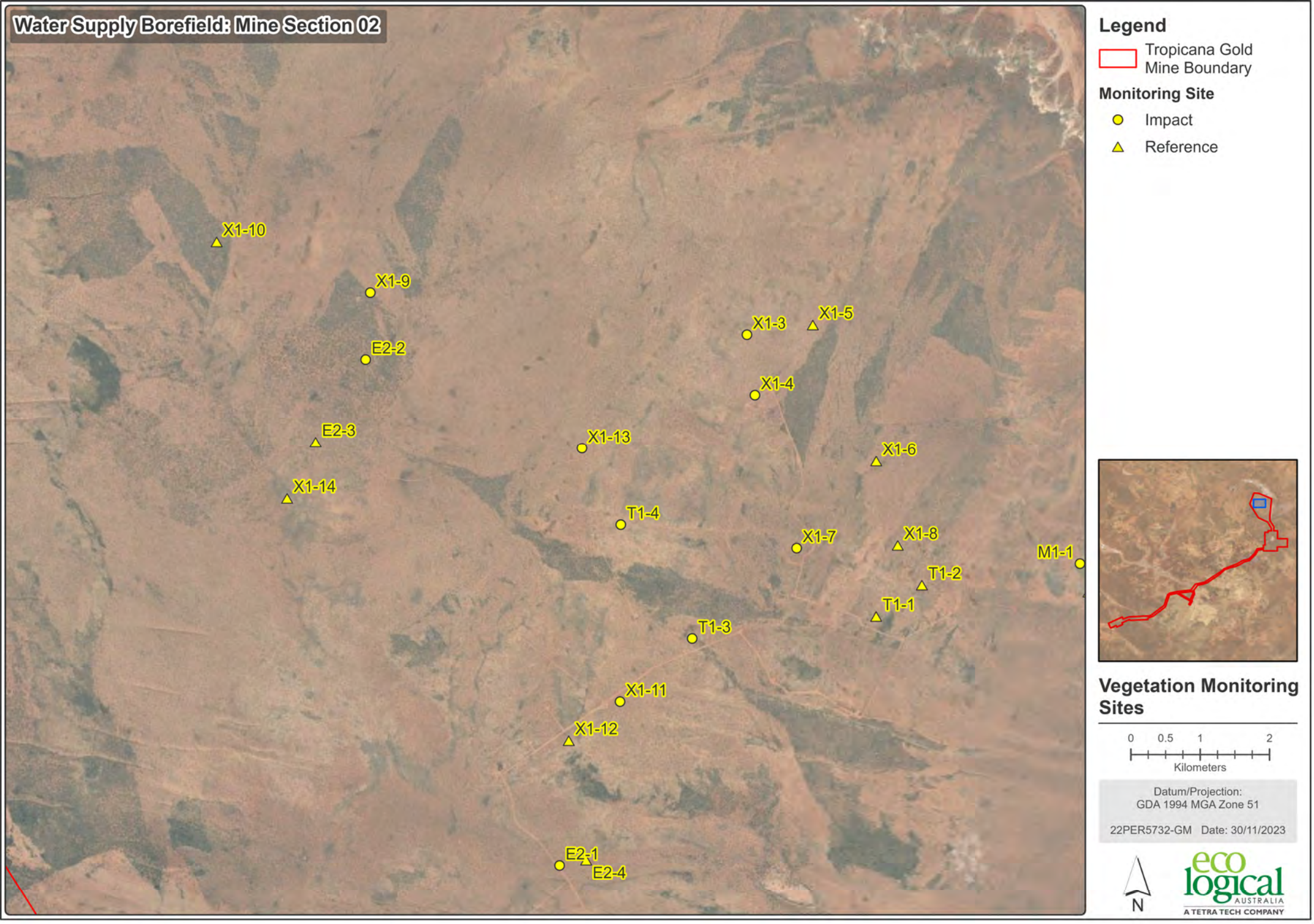
Kilometers

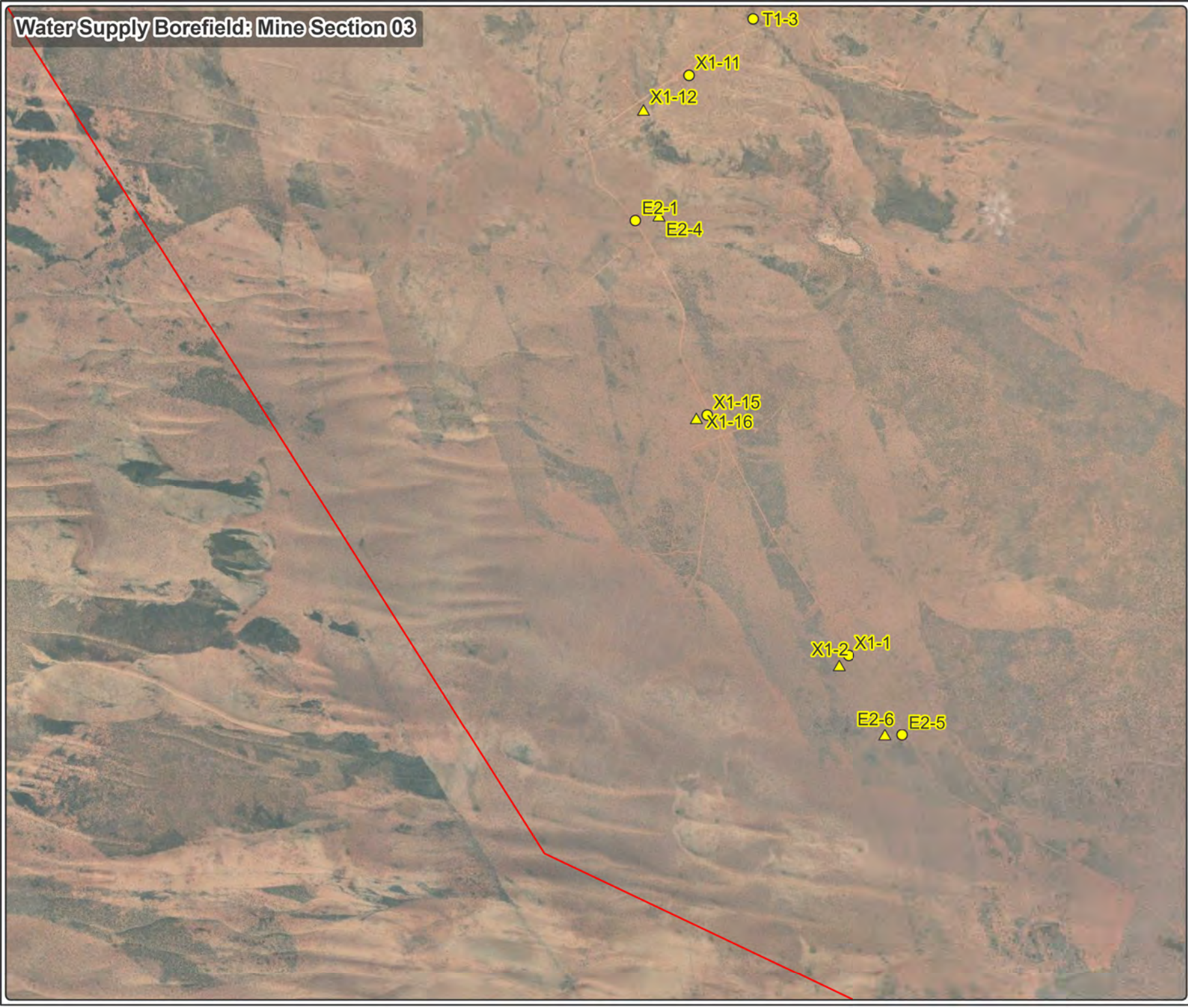
Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

eco logical AUSTRALIA
A TETRA TECH COMPANY


Water Supply Borefield: Mine Section 02
X1-10
X1-9
E2-2
E2-3
X1-14
X1-13
T1-4
X1-3
X1-5
X1-4
X1-6
X1-7
X1-8
M1-1
T1-2
T1-1
T1-3
X1-11
X1-12
E2-1
E2-4
Legend
Tropicana Gold Mine Boundary
Monitoring Site
Impact
Reference
Vegetation Monitoring Sites
0 0.5 1 2
Kilometers
Datum/Projection:
GDA 1994 MGA Zone 51
22PER5732-GM Date: 30/11/2023
N
eco logical AUSTRALIA
A TETRA TECH COMPANY



Legend

Tropicana Gold Mine Boundary

Monitoring Site

- Impact
- Reference

Vegetation Monitoring Sites

0 0.75 1.5 3

Kilometers

Datum/Projection:
GDA 1994 MGA Zone 51

22PER5732-GM Date: 30/11/2023

N

eco logical AUSTRALIA
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Appendix D Remote sensing tile comparisons

Tile	Location	Comment	General Notes
Trop_01	Water Supply Borefield	No significant changes	
Trop_02	Water Supply Borefield	No significant changes	
Trop_03	Water Supply Borefield	No significant changes	
Trop_04	Water Supply Borefield	No significant changes	
Trop_05	Water Supply Borefield	No significant changes	
Trop_06	Water Supply Borefield	No significant changes	General vegetation reduction in south and east
Trop_07	Water Supply Borefield	No significant changes	General overall vegetation reduction
Trop_08	Water Supply Borefield	No significant changes	General overall vegetation reduction
Trop_09	Water Supply Borefield	Two areas of isolated vegetation reduction adjacent to roadsides	General overall vegetation reduction
Trop_10	Water Supply Borefield	No significant changes	
Trop_11	Water Supply Borefield	No significant changes	
Trop_12	Water Supply Borefield	Isolated patches of apparent understory vegetation reduction	
Trop_13	Water Supply Borefield	Multiple isolated patches of apparent understory vegetation reduction, potentially swales adjacent to dunes	General vegetation reduction in west and south
Trop_14	Water Supply Borefield	No significant changes	
Trop_15	Water Supply Borefield	Isolated patches of vegetation reduction	
Trop_16	Water Supply Borefield	No significant changes	Some vegetation change adjacent to drainage area in east
Trop_17	Water Supply Borefield	Patch of vegetation reduction in west	
Trop_18	Water Supply Borefield	Isolated patch of vegetation reduction	General overall vegetation reduction
Trop_19	Operations Area	No significant changes	
Trop_20	Operations Area	Patches of vegetation reduction around airstrip and removal of vegetation around operational area	General overall vegetation reduction
Trop_21	Operations Area	Clearing for tracks and operational areas	General overall vegetation reduction

Tile	Location	Comment	General Notes
Trop_22	Operations Area	No significant changes	Varying vegetation increase and reduction across tile
Trop_23	Operations Area	Clearing for tracks and operational areas	
Trop_24	Operations Area	Clearing for tracks and operational areas	
Trop_25	Operations Area	No significant changes	General vegetation reduction particularly on dunetops
Trop_26	Operations Area	Clearing for tracks and operational areas	General vegetation reduction particularly on dunetops
Trop_27	Operations Area	Clearing for tracks and operational areas	
Trop_28	Operations Area	Clearing for tracks and operational areas	
Trop_29	Operations Area	Clearing for tracks and operational areas	
Trop_30	Operations Area	Clearing for tracks and operational areas	
Trop_31	Operations Area	Clearing for tracks and operational areas	General vegetation reduction across tile
Trop_32	Operations Area	Clearing for tracks and operational areas	
Trop_33	Operations Area	No significant changes	
Trop_34	Operations Area	No image	
Trop_35	Operations Area	No image	
Trop_36	Operations Area	Clearing for tracks and operational areas	Vegetation increase in centre and east of tile, reduction of vegetation in west of tile
Trop_37	Operations Area	Clearing for tracks and operational areas	Vegetation decrease across tile
Trop_38	Operations Area	No significant changes	
Trop_39	Infrastructure Corridor	No significant changes	Vegetation increase in south-west of tile, vegetation decrease along dunetops
Trop_40	Operations Area	No significant changes	
Trop_41	Operations Area	No significant changes	Overall vegetation decrease across tile
Trop_42	Operations Area	No significant changes	Overall vegetation decrease across tile

Tile	Location	Comment	General Notes
Trop_43	Operations Area	No significant changes	
Trop_44	Infrastructure Corridor	No significant changes	Reduction of vegetation on dunetops in east
Trop_45	Infrastructure Corridor	No significant changes	Vegetation increase across tile
Trop_46	Infrastructure Corridor	Isolated areas of vegetation reduction	
Trop_47	Infrastructure Corridor	Isolated areas of vegetation reduction adjacent to roadside	Vegetation increase in areas west of corridor, decrease in areas east of corridor. Increase of vegetation appears due to shadows in image from image captured at different time of day.
Trop_48	Infrastructure Corridor	Areas of vegetation reduction potentially associated with dust along roadside	Areas of vegetation reduction in the west
Trop_49	Infrastructure Corridor	Isolated areas of vegetation reduction along roadside	Overall reduction of vegetation across tile
Trop_50	Infrastructure Corridor	Areas of vegetation reduction along roadside	
Trop_51	Infrastructure Corridor	No significant changes	
Trop_52	Infrastructure Corridor	Areas of vegetation reduction along roadside	Vegetation reduction in west
Trop_53	Infrastructure Corridor	No significant changes	Vegetation reduction in east
Trop_54	Infrastructure Corridor	No significant changes	Varying degrees of vegetation increase and decrease within tile
Trop_55	Infrastructure Corridor	Isolated vegetation reduction in small area within tile	Overall reduction of vegetation in tile
Trop_56	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_57	Infrastructure Corridor	No significant changes	
Trop_58	Infrastructure Corridor	No significant changes	
Trop_59	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_60	Infrastructure Corridor	Areas of localized vegetation regrowth in isolated areas	Vegetation reduction across tile
Trop_61	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_62	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_63	Infrastructure Corridor	No significant changes	Vegetation reduction across tile

Tile	Location	Comment	General Notes
Trop_64	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_65	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_66	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_67	Infrastructure Corridor	Isolated area of vegetation reduction	
Trop_68	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_69	Infrastructure Corridor	No significant changes	
Trop_70	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_71	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_72	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_73	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_74	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_75	Infrastructure Corridor	Fire in tile Trop_75 along roadside	Vegetation reduction across tile
Trop_76	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_77	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_78	Infrastructure Corridor	No significant changes	
Trop_79	Infrastructure Corridor	No significant changes	
Trop_80	Infrastructure Corridor	No significant changes	Isolated vegetation reduction across tile
Trop_81	Infrastructure Corridor	Area of isolated vegetation reduction	Vegetation reduction across tile
Trop_82	Infrastructure Corridor	Areas of isolated vegetation increase	
Trop_83	Infrastructure Corridor	Isolated areas of vegetation decrease and increase	
Trop_84	Infrastructure Corridor	Clearing associated with track creation activities and areas of isolated vegetation reduction	

Tile	Location	Comment	General Notes
Trop_85	Infrastructure Corridor	Isolated areas of vegetation reduction	
Trop_86	Infrastructure Corridor	No significant changes	
Trop_87	Water Supply Borefield	Isolated areas of vegetation reduction	
Trop_88	Water Supply Borefield	No significant changes	
Trop_89	Water Supply Borefield	No significant changes	
Trop_90	Water Supply Borefield	No significant changes	
Trop_91	Water Supply Borefield	Isolated areas of vegetation reduction	
Trop_92	Water Supply Borefield	Isolated areas of vegetation reduction	
Trop_93	Water Supply Borefield	Isolated areas of vegetation reduction	
Trop_94	Water Supply Borefield	No significant changes	
Trop_95	Water Supply Borefield	No significant changes	
Trop_96	Water Supply Borefield	No significant changes	
Trop_97	Water Supply Borefield	No significant changes	
Trop_98	Water Supply Borefield	Isolated area of vegetation reduction	
Trop_99	Water Supply Borefield	Isolated area of vegetation reduction	
Trop_100	Water Supply Borefield	No significant changes	
Trop_101	Water Supply Borefield	No significant changes	
Trop_102	Water Supply Borefield	No significant changes	
Trop_103	Water Supply Borefield	Isolated area of vegetation reduction from possible small fire	
Trop_104	Water Supply Borefield	Isolated areas of vegetation reduction	
Trop_105	Water Supply Borefield	No significant changes	
Trop_106	Water Supply Borefield	No significant changes	

Tile	Location	Comment	General Notes
Trop_107	Water Supply Borefield	No significant changes	
Trop_108	Water Supply Borefield	No significant changes	
Trop_109	Water Supply Borefield	No significant changes	
Trop_110	Infrastructure Corridor	No significant changes	
Trop_111	Infrastructure Corridor	No significant changes	
Trop_112	Infrastructure Corridor	No significant changes	
Trop_113	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_114	Infrastructure Corridor	No significant changes	
Trop_115	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_116	Infrastructure Corridor	No significant changes	Vegetation reduction across tile
Trop_117	Infrastructure Corridor	No significant changes	
Trop_118	Water Supply Borefield	No significant changes	

Appendix E Field data

Site	Date	Photo	Indicator Species	Indicator cover	No. plants	Bare Soil %	Cover under	Cover mid	Cover over	Cover overall	BS Over	BS Mid	BS U	LLS Over	LLS Mid	LLS U	Deposition	Erosion	Observations	Notes
A2-1	12/09/2023	a2-1	*Triodia desertorum*	10	50 to 100	50	15	45	5	60	G	G	Y	4	4	3				
A2-2	13/09/2023	db090421 to db090447	*Aluta maisonneuvei* subsp. *auriculata*	3	40 to 50	75	30	10	0	40		G	Y		4	2	Soil surface-stained orange from road dust		Majority of ground and mid layer dead, but what's alive has greened up some from summer rainfall. Dead material from last year making up some cover still.	
A2-3	13/09/2023	a2-3	*Acacia aneura*	35	20 to 30	65	0.25	10	70	75	Y	Y	Y	4	3	2	Heavy red dust staining of ground, leaf litter and bushes			
A2-4	13/09/2023	db113540	*Aluta maisonneuvei* subsp. *auriculata*	35	100 to 200	65	2	40	1	40	G	Y	Y	4	3	2	Red surface staining from dust		Long term dry conditions, but enough summer rain to green up the vegetation a little. Mulga in mid storey almost in upper.	
A2-5	12/09/2023	a2-5	*Triodia scariosa*	10	100 to 200	40	10	25	15	50	G	Y	Y	3	3	3				
A2-6	12/09/2023	a2-6	*Triodia scariosa*	10	50 to 100	45	10	5	30	45	G	Y	Y	4	3	2				
A2-7	12/09/2023	a2-7	*Triodia desertorum*	10	50 to 100	55	10	40	5	50	Y	G	G	3	5	4				
A2-8	13/09/223	db082345	*Allocasuarina spinosissima*	30	200 to 300	60	35	35	0	55		G	B		4	2	Faint surface staining from road dust, vegetation has some dust on it.		A lot of dead *Allocasuarina*, but alive ones are quite green, looks like site had adequate summer rainfall. everything that's alive has some green on it, but previous years of drought have killed a lot. decent portion of ground storey dead, but still providing cover.	
A2-9	13/09/223	db080608 to db080723	*Allocasuarina spinosissima*	25	100 to 200	65	25	30	0	40		G	B		4	2	Dust on all vegetation, orange soil surface staining.		A lot of dead *Allocasuarina*, but alive ones are quite green, looks like site had adequate summer rainfall. everything that's alive has some green on it, but previous years of drought have killed a lot. Majority of ground storey dead, but still providing cover.	Waypoint in wrong spot, dropped new waypoint & called it A2-9 Actual
A2-10	13/09/223	db092540 to db092551	*Aluta maisonneuvei* subsp. *auriculata*	10	50 to 100	70	45	5	3	60	G	G	Y	4	4	2			Vegetation slowly transitioning to a Mulga woodland. Lots of low and mid storey deaths in prior years, but rainfall in summer adequate to green up all perennials still alive. Majority dead but still providing cover.	Expect to see covers continue to decrease as dead shrubs decompose. Very windy this morning, two photos just in case
A2-11	13/09/2023	a2-11	*Acacia aneura*	25	20 to 30	90	0.25	4	50	55	Y	Y	B	3	4	1	Faint surface staining from road dust		Dry, everything dormant. Young mulgas in understorey slowly growing	Understorey mostly dead
A2-12	13/09/2023	db115026	*Aluta maisonneuvei* subsp. *auriculata*	35	100 to 200	60	2	40	4	45	G	Y	Y	5	2	2	Faint soil surface staining		Long term dry conditions. Enough rain to green up some of the shrubs, but *Aluta* still greeny brown for the most part.	
A3-1	12/09/2023	a3-1	*Eremophila clarkei* *Ptilotus obovatus*	0.25 0.5	2 20 to 30	60	5	30	0	35		G	G		4	3			Site looking pretty healthy, things flowering, but a few mid shrubs have senesced over the last year or two. Both indicator species are flowering	Roo & reptiles signs
A3-2	12/09/2023	a3-2	*Eremophila clarkei* *Ptilotus obovatus*	0.25 0.1	1 2	85	5	25	0	30		G	Y		4	3			Some of the mid shrubs now tall enough to consider upper storey. Has had some decent rain in the last year.	
A3-3	12/09/2023	db095954	*Acacia tetragonophylla*	1	4	85	3	10	15	25	Y	Y	B	3	3	2			Site had summer rain, perennials showing signs of resprouting, but currently dry and dormant	
A3-4	12/09/2023	db094610	*Acacia tetragonophylla*	2	4	80	2	5	15	20	G	G	Y	4	4	2			It's dry but looks like it's had ok rain earlier in the year. No annuals but perennials are relatively healthy. old cattle scats, fresh rabbit scats.	
A3-5	12/09/2023	a3-5	*Dodonaea lobulata* *Scaevola spinescens*	1 10	3 20 to 30	55	2	15	45	60	G	G	Y	4	4	3			Good rain in these parts, annuals contributing to ground layer, senescence (natural thinning) in occasional mid shrubs, maybe died over the dry period. Most dead shrubs are *Dodonaea lobulata*. Mass die off.	*Dodonaea* not healthy
A3-6	12/09/2023	a3-6	*Dodonaea lobulata* *Scaevola spinescens*	0 5	0 10 to 20	70	0.25	10	40	45	G	Y	Y	4	3	3			Area has had rain, but there's been a big die-off of *Dodonaea* throughout the area. Mid storey is mostly *Scaevola spinescens* now, everything alive looks healthy. Ground layer is mostly annuals.	as for 2022

Site	Date	Photo	Indicator Species	Indicator cover	No. plants	Bare Soil %	Cover under	Cover mid	Cover over	Cover overall	BS Over	BS Mid	BS U	LLS Over	LLS Mid	LLS U	Deposition	Erosion	Observations	Notes
A7a-1	11/09/2023	a7a-1	*Ptilotus obovatus* *Acacia tetragonophylla*	0 0.5	0 1	90	0.5	15	4	20	Y	B	B	3	2	1			Still dry. Roo and rabbit scats. Everything is dying	
A7a-2	9/11/2023	a7a-2	*Triodia basedowii*	30	100 to 200	50	30	0	25	40	G		Y	4		3				
A7a-3	11/09/2023	a7a-3	*Triodia basedowii*	25	100 to 200	45	25	0.75	15	35	G	Y	Y	4	4	3			Lots of kangaroo scats	
A7a-4	14/09/2023	db154022	*Ptilotus obovatus* *Acacia tetragonophylla*	0.5 0.1	5 to 10 1	60	40	10	4	55	G	Y	Y	5	3	3			Seasonally dry conditions, perennials got enough summer rain to resprout a bit, now all dormant. Big *Eucalyptus* has dropped a large branch, losing cover.	*Acacia tetragonophylla* here not actually *A. tetragonophylla*, instead a very similar spp. Will fill the same indicator role.
A7a-5	14/09/2023	a7a-5	*Senna artemisioides* subsp. *filifolia* *Ptilotus obovatus*	0.25 0.1	4 4	65	30	10	30	45	G	G	Y	4	4	3				Ptilotus obovatus almost all dead
A7a-6	14/09/2023	a7a-6	*Senna artemisioides* subsp. *filifolia* *Ptilotus obovatus*	5 0	50 to 100 0	75	15	30	5	40	G	Y	Y	4	3	4			Everything is dry but more or less healthy	*Senna artemisioides* larger plants dying off but lots of recruitment
A7a-7	11/09/2023	db132559	*Triodia basedowii*	3	20 to 30	70	10	20	10	35	Y	B	B	3	2	2			Dry. *Eucalyptus* ok, everything else dying	
A7a-8	11/09/2023	db130127	*Triodia basedowii*	1	10 to 20	50	2	30	15	45	Y	Y	B	2	2	1			Extremely dry, lots mid story deaths	
A7a-9	11/09/2023	db123802	*Dodonaea rigida*	2	20 to 30	90	4	10	5	20	Y	Y	B	2	2	2			Very dry, all the grasses look dead, most shrubs too	
A7a-10	11/09/2023	db122153	*Dodonaea rigida*	0.5	5	90	0.25	15	15	30	Y	Y	B	3	3	1			Too dry.	
A7b-1	13/09/2023	a7b-1	*Acacia aneura*	40	50 to 100	40	15	45	0	60		G	Y		4	3				
A7b-2	11/09/2023	db154834	*Acacia aneura*	30	10 to 20	55	20	2	35	40	Y	Y	Y	4	4	3	Grey dust coating vegetation		Very dry	Indicator *A. aneura* counted only, not *A. mulganeura*
A7b-3	13/09/2023	db141642	*Triodia basedowii* *Acacia aneura*	1 35	5 to 10 20 to 30	70	1	25	25	45	Y	B	B	3	2	3			Long term dry conditions. Big mulga and *Aluta* dying, smaller mulga fine, occasional clumps of dead grass with green sprouts	
A7b-4	13/09/2023	db144051	*Triodia basedowii* *Acacia* sp. (mulga)	15 20	50 to 100 20 to 30	70	15	1	20	35	Y	Y	Y	3	4	3			Long term dry conditions, everything in poor condition, although small mulgas seem fine	Two species of mulga, likely *A. caesaneura* and *A. incurvaneura*, counted all of them as the mulga. I think the *A. incurvaneura* was not previously counted
A7b-5	13/09/2023	db134006 to db134048	*Aluta maisonneuvei* subsp. *auriculata*	3	10 to 20	60	40	3	3	45	Y	B	Y	1	2	4			Lots of baby mulgas. Long term dry conditions, *Aluta* mostly dying.	
A7b-6	13/09/2023	db132557	*Aluta maisonneuvei* subsp. *auriculata*	1	2	55	15	4	10	35	Y	Y	Y	3	2	3	Ground and veg red stained and very dusty		Long term dry conditions. Nearly all *Aluta* dead. A lot of baby mulgas	Will need a new indicator next year, generic mulga appropriate
A7b-7																				Discontinued
A7b-8	13/09/2023	a7b-8	*Aluta maisonneuvei* subsp. *auriculata*	10	30 to 40	50	0.1	15	55	60	Y	Y	B	4	3	1			Area is pretty dry, everything not mulga looks a bit water stressed. Numerous animal diggings in area surrounding quadrat	Some *Aluta* dying or dead
A7b-9^	13/09/2023	a7b-9	*Aluta maisonneuvei* subsp. *auriculata*	15	30 to 40	70	0.1	20	30	50	Y	B	B	4	2	2	Soil surface staining from road dust, bushes with built up dust as well		Very dry, plenty of the *Aluta* is partially dead or water stressed. Kangaroo scats in plot.	Lots of *Aluta* dead or dying
C9-1	9/11/2023	c9-1	*Senna artemisioides* subsp. *filifolia*	10	20 to 30	90	1	20	5	30	Y	Y	B	4	3	2			Kangaroo and rabbit scats	
C9-2	9/11/2023	c9-2	*Ptilotus obovatus* *Senna artemisioides* subsp. *filifolia*	0.1 15	1 20 to 30	60	3	35	10	45	G	Y	B	4	3	2	Bushes quite dusty, ground with pale grey surface staining		Rabbit burrows	
C9-3	9/11/2023	c9-3	*Senna artemisioides* subsp. *filifolia*	15	30 to 40	45	5	25	35	55	G	Y	Y	4	3	3			Quite a few dead or dying *Senna artemisioides* subsp. *filifolia*	

Site	Date	Photo	Indicator Species	Indicator cover	No. plants	Bare Soil %	Cover under	Cover mid	Cover over	Cover overall	BS Over	BS Mid	BS U	LLS Over	LLS Mid	LLS U	Deposition	Erosion	Observations	Notes
C9-4	9/11/2023	c9-4	*Ptilotus obovatus* *Senna artemisioides* subsp. *filifolia*	0.5 2	5 to 10 10 to 20	80	1	25	2	25	G	B	B	4	2	2	A little wind blown		Lots of dead and dying plants	
E1b-1	11/09/2023	db143554	*Triodia basedowii*	50	200 to 300	35	50	30	1	65	G	B	B	4	2	2	Grey dust coating all vegetation and staining the soil surface		Very dry, everything except *Eucalyptus* dying	
E1b-2	11/09/2023	db140422	*Triodia basedowii*	10	50 to 100	60	35	10	0	40		B	B		3	2	Surface windblown sand	Surface windblown sand	Very dry, everything is dying. sand dune	
E1b-3																				Buried
E1b-4	15/09/2023	e1b-4	*Triodia basedowii*	30	100 to 200	60	30	10	10	45	G	G	B	5	3	2			Camel and kangaroo scats	Triodia sad
E1b-5	15/09/2023	e1b-5	*Triodia basedowii*	15	100 to 200	60	20	40	25	65	G	Y	B	5	4	2	Some pale surface staining from crushed rock fines		Whole site very dry, lots of *Senna* and *Acacia* quite water stressed, *Eucalyptus* doing fine though. Some decent leaf litter under *Acacia* and *Eucalyptus*	*Triodia* sad. Suggest *Senna artemisioides* subsp. *filifolia* for new indicator in 2024
E1b-6	15/09/2023	e1b-6	*Triodia basedowii*	5	100 to 200	50	10	55	5	65	G	Y	B	5	4	2	Some pale soil surface staining, bushes visibly dusty when brushed		Lots of old stags in the upper storey but plenty of healthy *Eucalyptus* as well. Whole site is otherwise dry and looking water stressed. Dense with 1.5m high mulga	*Triodia* sad. Suggest *Senna artemisioides* subsp. *filifolia* if need new indicator in 2024
E1b-7	13/09/2023	db155100	*Triodia basedowii* *Acacia aneura*	0.25 30	5 to 10 10 to 20	45	0.5	10	30	40	G	Y	B	4	3	2			Everything very dry	*Acacia aneura* counted all mulgas
E1b-8	13/09/2023	db161828	*Triodia basedowii* *Acacia aneura*	0.1 0.25	1 2	90	1	10	0	15		Y	Y		4	3	All vegetation very dusty		No overstorey alive.	
E1b-9	13/09/2023	db150348	*Triodia basedowii*	1	5	70	2	45	5	45	G	G	B	5	5	1			Long term very dry, essentially a mulga grove. Mulga on verge between mid and over storey. Ground layer almost entirely dead	
E1b-10	13/09/2023	e1b-10	*Triodia basedowii*	1	100 to 200	80	5	10	0	15		G	Y		4	3			Dry. Early stage fire succession. Overstory is just a few dead stags	Overstorey is all dead
E1b-11	15/09/2023	e1b-11	*Triodia basedowii*	20	200 to 300	60	25	5	10	35	G	Y	B	5	3	2	Ground with a layer of pale dust below scattered windblown sand, shrubs and spinifex with visible dust when touched			Southwest corner has been cleared (approx. 3x6m triangle), probably *Triodia* and definitely some midstory cleared. Reset this quadrat in 2024.
E2-1	14/09/2023	db131623	*Triodia basedowii*	10	100 to 200	75	15	30	4	45	G	G	Y	5	4	3			Dry conditions, perennials mostly looking healthy	
E2-2	14/09/2023	db084315	*Eucalyptus gongylocarpa*	10	2	55	25	15	10	45	G	G	Y	3	4	4			*Eucalyptus* with previously dropped branch resprouting epicormically	This is meant to be an impact site, except there is no disturbance/bore anywhere near.
E2-3	14/09/2023	db092428	*Eucalyptus gongylocarpa*	5	1	60	35	10	5	45	G	G	Y	5	5	3			Seasonally dry, but there was clearly rain earlier in year. *Eucalyptus* healthy, *Eremophila* in full flower, perennials generally green. No annuals.	Not sure where the previous 10% *E. gongylocarpa* cover came from
E2-4	14/09/2023	db133059	*Triodia basedowii*	15	100 to 200	65	15	30	2	45	G	G	Y	4	4	3	A little windblown sand		Conditions pretty dry but the vegetation in the quadrat is generally healthy	needs a tag
E2-5	14/09/2023	db143513	*Triodia basedowii*	25	100 to 200	65	30	1	10	40	G	Y	Y	4	3	3			Seasonally dry, but perennials generally healthy	
E2-6	14/09/2023	db144656	*Triodia basedowii*	30	200 to 300	60	35	2	2	40	G	Y	Y	5	4	3			Seasonally dry, vegetation in general a little water stressed, though *Eucalyptus* all look healthy	
E3-1	11/09/2023	db152144	*Triodia desertorum*	35	100 to 200	50	35	0.1	10	45	Y	B	Y	3	2	3	Slight pale grey soil staining		Pale dust coating all vegetation. Very dry.	
E3-2	11/09/2023	db150140	*Triodia desertorum*	55	300 to 400	45	55	15	1	65	G	Y	B	5	3	2			Old *Callitris* all dead, only a couple healthy *Eucalyptus* in overstory now. Conditions very dry	
E3-3	9/11/2023	e3-3	*Anthotroche pannosa* *Eremophila latrobei*	0 0.5	0 4	45	5	30	0	35		Y	Y		3	2	Some pale soil surface staining from mine dust		Quite a lot of herbivory and broken bushes from kangaroos and/or camels	Has a tag. Suggest a new indicator species: *Dodonaea* (check original quadrat data) =6 plants, 1% cover
E3-4	9/11/2023	e3-4	*Anthotroche pannosa*	0.1	2	60	15	35	10	50	G	Y	B	5	4	2	Some pale surface staining of soil from mine dust	Camel tracks throughout area causing surface	Very dry, though upper storey looks healthy (*Eucalyptus* & *Santalum*)	Camel tracks, snake holes

Site	Date	Photo	Indicator Species	Indicator cover	No. plants	Bare Soil %	Cover under	Cover mid	Cover over	Cover overall	BS Over	BS Mid	BS U	LLS Over	LLS Mid	LLS U	Deposition	Erosion	Observations	Notes
			Eremophila latrobei	2	10 to 20													impacts to soil and kangaroos nesting beneath tree digging and pushing sand downhill		
E3-5																				Buried
E3-6	15/09/2023	e3-6	*Anthotroche pannosa*	5	50 to 100	90	15	3	0	15		G	Y		4	3				Some *Anthotroche* attacked by insects and in poor condition
E3-7	13/09/2023	e3-7	*Anthotroche pannosa*	4	50 to 100	75	20	3	0	25		G	Y		4	3				Some *Anthotroche* dead or dying
E4-1	12/09/2023	db144755	*Allocasuarina spinosissima*	4	10 to 20	60	35	15	1	45	G	Y	Y	4	4	3			Summer rainfall greened all the surviving perennials up, though dry conditions recently	
E4-2	12/09/2023	db143059	*Allocasuarina spinosissima*	30	100 to 200	55	10	40	4	50	G	Y	Y	5	4	3			Summer rainfall greened all the surviving perennials up, though dry conditions recently	
E4-3	12/09/2023	db133132	*Leptosema chambersii* *Triodia desertorum*	0.25 15	4 100 to 200	60	30	5	15	40	G	Y	Y	5	2	3	A little bit of dust on vegetation		*Leptosema* nearly all died off, likely natural senescence. Summer rain brought all the still alive shrubs back to life but quite a few were already dead. Dry conditions recently.	Photos from SW corner again
E4-4	12/09/2023	db135200	*Leptosema chambersii* *Triodia desertorum*	0 35	0 200 to 300	50	35	10	15	45	G	Y	Y	5	2	2			*Leptosema* long dead and slowly disappearing. Summer rainfall evident but plenty of mid shrubs have died.	
E4-5	12/09/2023	e4-5	*Callitris preissii*	1	10 to 20	25	55	3	20	70	G	G	Y	4	4	3				
E4-6	12/09/2023	e4-6	*Callitris preissii*	2	10 to 20	15	65	5	10	75	G	Y	Y	4	3	2				
E4-7	13/09/2023	e4-7	*Triodia desertorum*	10	50 to 100	70	25	5	4	35	G	Y	B	5	3	3			*Triodia* yellow but sedges brown	*Triodia* green but Restio's brown
E4-8	13/09/2023	e4-8	*Triodia desertorum*	15	100 to 200	60	30	10	2	40	G	Y	Y	5	3	3			Allocasuarina makes up 15% of mid storey but is almost all dead. A few other species are green and make up 5%.	Dead *Allocasuarina* has been removed from midstorey count
E4-9	13/09/2022	e4-9	*Triodia rigidissima*	0.5	10 to 20	85	25	1	0	25		G	G		5	4			Burnt 5yrs	Lots of *Eremophila*, *Myoporum* in flower. Camel tracks
E4-10	13/09/2023	e4-10	*Triodia rigidissima*	0.5	20 to 30	90	15	3	2	20	G	G	Y	3	4	3			Burnt 5yrs	
E4-11	13/09/2023	db102055	*Triodia rigidissima*	20	100 to 200	60	30	4	3	40	G	Y	Y	5	4	3	Windblown sand over red stained soil surface, vegetation very dusty		Looks very dry here, insufficient rain	
E4-12	13/09/2023	db103338	*Triodia rigidissima*	15	100 to 200	60	30	1	3	35	G	Y	B	5	3	2	Vegetation a bit dusty, faint soil surface staining, windblown sand		Very dry, summer rainfall insufficient but vegetation is holding on.	
E4-13	13/09/2023	e4-13	*Triodia rigidissima*	5	300 to 400	90	10	1	0.5	10	G	G	Y	5	5	4	Windblown sand	Windblown sand	Still early-stage post fire succession. About half the understorey looking water stressed.	
E4-14	13/09/2023	e4-14	*Triodia rigidissima*	35	100 to 200	45	40	15	15	60	G	Y	Y	5	3	3	Minor surface staining from road dust		Lots of leaf litter beneath *Eucalyptus* tree. Everything else is looking pretty dry.	Some *Triodia* dying or dead. waypoint for start out by about 10m. New waypoint EC gps E4-14.
E9-1	12/09/2023	db124702	*Acacia aneura*	10	5 to 10	75	4	2	20	25	G	G	G	1	4	5			Most of the big mulgas are dead. Area has had rain and ground has good annuals and shrub/herb cover. Big mulga stags included in cover still	All mulga spp counted as indicator
E9-2	12/09/2023	db123316	*Acacia aneura*	15	20 to 30	60	2	10	30	40	G	G	Y	3	4	4			Plenty of annuals, but old mulgas have died and mid-sized ones have lost a lot of leaves but are green and growing atm. Dense leaf litter under all the big *Acacias*. a bunch of mid storey shrubs are now over story. Still some big mulga stags	
E9-5	12/09/2023	db105033	*Triodia scariosa*	30	200 to 300	50	35	15	20	60	G	G	Y	4	3	3			Dry at the moment but looks like there was reasonable summer rain. A few mid shrub deaths still	
E9-6	12/09/2023	db103552	*Triodia scariosa*	20	50 to 100	60	25	10	10	40	G	G	Y	4	4	3	Some windblown sand	Some windblown sand	Dry at the moment, but looks like there were good summer rains - a few spinifex are flowering	
M1-1	14/09/2023	m1-1	*Triodia basedowii*	30	100 to 200	30	30	0.25	0	30		G	Y		5	3				
M1-2	14/09/2023	m1-2	*Triodia basedowii*	3	10 to 20	55	5	40	0	45		G	B		5	2				No tag on nw peg. wrote on with paint pen. *Triodia* in poor condition
M1-3	14/09/2023	m1-3	*Seringia velutina*	3	30 to 40	70	20	0.5	0	20		G	Y		4	2			Half *Seringia* dead or close to, rest stressed	as for 2022

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			Triodia basedowii	20	200 to 300															
M1-4	14/09/2023	m1-4	*Seringia velutina* *Triodia basedowii*	10 5	100 to 200 20 to 30	60	15	5	0	20		G	B		4	2			Most *Seringia* in poor condition	
S8-1	13/09/2023	db105736	*Triodia rigidissima*	35	300 to 400	60	40	5	1	45	Y	Y	Y	2	3	3			Long term dry conditions	Very windy today so photos may be a bit sketchy
S8-2	13/09/2023	s8-2	*Leptosema chambersii* *Grevillea juncifolia* *Triodia sp.*	0 0 15	0 0 100 to 200	65	25	3	2	30	Y	Y	Y	3	3	3	A little surface staining from road dust		A few dead *Leptosema* still recognisable but none alive	*Leptosema* all dead.
S8-3	13/09/2023	db111024	*Triodia rigidissima*	10	100 to 200	65	30	5	0	35		Y	Y		4	3	Surface staining, dust on vegetation, a little windblown sand		Long term dry conditions	
S8-4																				Discontinued
S8-5	13/09/2023	s8-5	*Chrysitrix distigmatosa*	10	500 to 1000	70	35	5	0	40		Y	Y		4	3			Pretty dry	Lots of *Chrysitrix* almost dead
S8-6	13/09/2023	s8-6	*Leptosema chambersii* *Grevillea juncifolia* *Triodia sp.*	0 10 5	0 50 to 100 50 to 100	65	15	10	0	25		Y	Y		4	2			*Leptosema* has reached end if life and all dead or dying	*Leptosema* all dead. *Triodia* 85 plants, 5%
S8-7^	13/09/2023	s8-7	*Chrysitrix distigmatosa*	10	500 to 1000	70	30	5	0	35		Y	Y		3	2	Soil surface staining of red dust		Pretty dry	
T1-1	14/09/2023	t1-1	*Seringia velutina* *Triodia* sp.	0 5	0 100 to 200	75	10	10	2	25	G	G	B	5	4	2			*Seringia* resprouting from base	*Seringia* is dead
T1-2	14/09/2023	t1-2	*Seringia velutina* *Triodia* sp.	2 20	40 to 50 300 to 400	60	25	10	2	35	G	Y	Y	5	3	3			*Seringia* resprouting from base	*Seringia* dying off
T1-3	14/09/2023	db110917	*Seringia velutina*	2	40 to 50	60	35	5	0	40		Y	Y		4	3			Seasonally dry, *Seringia* are dying off. Perennials mostly healthy but dormant, lots of shrub stags	Needs a hammer to knock the NW peg in properly. took a NW point wpt labelled T1-3 ACTUAL
T1-4	14/09/2023	db104410	*Seringia velutina*	3	40 to 50	65	25	10	0	30		Y	Y		3	3			Seasonally dry, what's alive is healthy, if dormant, *Seringia* mostly old or stags but a few patches juveniles around.	
X1-1	14/09/2023	x1-1	*Triodia basedowii*	20	100 to 200	75	20	25	5	35	G	Y	Y	3	3	3			Quite a few mid storey *Acacias* have died	Needs a new tag (burnt/melted)
X1-2	14/09/2023	x1-2	*Triodia basedowii*	20	100 to 200	80	20	10	5	25	G	G	Y	5	4	3			Dry condition but site pretty healthy	
X1-3	14/09/2013	x1-3	*Seringia velutina* *Anthotroche pannosa*	0 1	0 10 to 20	45	45	4	2	50	G	G	Y	5	4	3				No *Seringia*, *Anthotroche* in decline. *Eucalyptus* 2 plants, 2% cover - mallee not *E. gongylocarpa*.
X1-4	14/09/2023	x1-4	*Triodia basedowii*	25	300 to 400	50	25	15	4	45	G	Y	Y	5	4	3				
X1-5	14/09/2023	x1-5	*Seringia velutina* *Anthotroche pannosa*	0 1	0 5 to 10	45	35	15	15	55	Y	Y	G	5	3	4			Spiderholes present	No *Seringia*. *Anthotroche* in poor condition. *E. gongylocarpa* 20 to 30, 15% cover
X1-6	14/09/2023	x1-6	*Triodia basedowii*	3	300 to 400	85	10	2	0	15		Y	Y		3	3			Midstorey is resprouting *Eucalyptus*	as for 2022
X1-7	14/09/2023	x1-7	*Triodia basedowii*	35	300 to 400	50	35	20	4	55	G	G	Y	5	4	3				
X1-8	14/09/2023	x1-8	*Triodia basedowii*	15	200 to 300	65	20	30	3	50	G	G	Y	5	4	3				
X1-9	14/09/2023	db081608	*Triodia basedowii*	35	300 to 400	60	35	4	2	35	G	G	Y	5	4	4			Recent dry conditions but overall vegetation is looking healthy. Quite a few stags of shrubs but they are all old and do not contribute to cover any more.	
X1-10	14/09/2023	db074450	*Triodia basedowii*	40	400 to 500	50	40	30	0	55		Y	B		3	2			Site looks very dry, even the spinifex is dying off	No change from last year
X1-11	14/09/2023	db114151	*Seringia velutina* *Eucalyptus gongylocarpa*	0.25 15	5 40 to 50	65	20	30	0.5	50	G	G	Y	5	4	3			*Seringia* nearly all senesced. Conditions seasonally dry, *Acacia Eucalyptus* and *Triodia* generally healthy.	Replaced the tag. added *Eucalyptus* as indicator, they're all pretty young.
X1-12	14/09/2023	db125706	*Seringia velutina* *Eucalyptus gongylocarpa*	5 0.1	200 to 300 0	75	25	10	5	50	G	Y	Y	4	3	3			*Seringia* all dead or almost so, couple young *Eucalyptus gongylocarpa* recently dead. Generally pretty dry.	Need to check distance from active bore, this may need to be assigned as impact

Site	Date	Photo	Indicator Species	Indicator cover	No. plants	Bare Soil %	Cover under	Cover mid	Cover over	Cover overall	BS Over	BS Mid	BS U	LLS Over	LLS Mid	LLS U	Deposition	Erosion	Observations	Notes
X1-13	14/09/2023	db102121	*Seringia velutina* *Triodia basedowii*	2 20	10 to 20 100 to 200	75	25	10	2	35	G	Y	Y	4	3	3	A little windblown sand		Seasonally dry with most vegetation looking slightly water stressed, *Seringia* generally old and on their way out, *Acacias* and *Eucalyptus* looking healthy	
X1-14	14/09/2023	db095136	*Seringia velutina* *Triodia basedowii*	0 15	0 200 to 300	60	35	10	2	40	G	Y	Y	5	4	3			Conditions dry, perennials generally doing fine, still lots of cover from dead *Leptosema* and Seringia	
X1-15	14/09/2023	db135828	*Triodia basedowii*	10	40 to 50	75	15	15	5	35	G	Y	Y	5	3	3			Dry conditions, *Eucalyptus* are healthy, everything else a bit water stressed	
X1-16	14/09/2023	db141010	*Triodia basedowii*	15	100 to 200	75	20	10	4	30	G	Y	Y	4	3	3			Dry conditions, *Eucalyptus* and some *Acacias* healthy, the rest a little water stressed	Note canopy loss in background trees

Appendix F All year's raw foliar cover data for Operations Area

Site name	Site type	Cover (%)																								
		Overall													Overstorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A7A-1	I	25	20	20	20	25	30	30	30	30	30	25	25	20	3	2	2	2	3	5	5	5	5	5	4	4	4
A7A-10	I	20	35	30	30	40	40	40	40	40	40	40	35	30	15	15	20	20	25	25	25	25	25	25	25	20	15
A7A-2	I	35	55	55	40	30	30	30	30	35	40	40	40	40	25	20	20	35	25	25	25	25	25	25	25	25	25
A7A-3	R	20	35	35	35	20	25	25	25	35	35	35	35	35	15	10	10	15	15	15	15	15	15	15	10	15	15
A7A-4	R	30	60	60	50	55	55	55	55	55	55	55	55	55	6	5	5	5	10	5	5	5	5	5	5	5	4
A7A-5	I	45	75	70	70	65	80	80	80	50	50	50	50	45	25	25	30	35	35	35	35	35	35	35	35	30	30
A7A-6	R	20	40	40	40	50	50	50	50	40	40	40	40	40	8	10	10	20	20	20	20	20	10	10	5	5	5
A7A-7	R	55	45	45	45	30	30	30	30	40	50	50	55	35	20	10	20	20	15	15	15	15	15	15	15	20	10
A7A-8	I	40	50	50	50	60	60	60	60	60	60	60	60	45	17	30	30	30	30	30	30	30	30	30	20	20	15
A7A-9	R	15	20	20	23	25	25	25	25	25	35	35	35	20	7	2	10	10	10	10	10	10	10	10	10	10	5
A7B-1	R	35	60	55	55	55	60	60	60	60	60	60	60	60	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0
A7B-2	I	35	40	40	40	40	40	40	40	40	40	40	40	40	20	35	35	35	35	35	35	35	35	35	35	35	35
A7B-3	R	35	45	35	35	35	40	40	40	40	40	40	45	45	25	25	25	25	20	20	20	20	20	20	20	20	25
A7B-4	I	25	25	25	25	25	25	25	25	25	30	30	35	35	15	15	15	15	15	15	15	15	15	15	15	20	20
C9-1	I	30	35	35	35	30	35	35	35	35	35	35	35	30	15	8	8	8	10	40	10	10	10	10	10	10	5
C9-2	I	30	60	60	60	60	65	65	65	65	60	55	50	45	7	15	15	15	15	10	10	10	10	10	10	10	10
C9-3	R	35	65	65	65	40	45	45	45	45	45	55	55	55	25	30	30	35	30	4	4	4	25	25	35	35	35
C9-4	R	20	35	30	30	30	30	30	30	30	30	30	30	25	7	3	3	1	1	1	1	1	1	1	2	2	2
E1B-1	I	75	70	70	70	70	70	70	70	70	70	70	70	65	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1
E1B-10	I	30	55	54	55	55	60	60	20	10	10	15	15	15	5	2	2	2	2	5	5	2	0.5	0.5	0.5	0	0
E1B-11	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40	35	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	10
E1B-2	R	20	35	30	30	40	40	40	40	40	40	40	40	40	n/a	n/a	n/a	n/a	n/a	30	n/a	n/a	n/a	n/a	0	0	0
E1B-3	I	45	70	74	75	75	75	75	75	50	50	50	n/a	n/a	10	7	7	8	5	5	5	5	5	5	5	n/a	n/a
E1B-4	R	25	35	35	35	35	35	35	35	40	40	45	45	45	20	10	10	10	10	10	10	10	10	10	10	10	10
E1B-5	I	65	70	50	50	60	60	60	60	60	60	65	65	65	15	5	5	5	5	5	5	5	10	15	20	20	25
E1B-6	R	50	65	70	70	70	70	70	70	70	70	75	65	65	10	5	5	10	10	10	10	10	10	5	5	5	5
E1B-7	R	35	50	50	50	50	50	50	50	50	50	50	40	40	25	30	30	30	30	30	30	30	30	30	35	30	30
E1B-8	I	25	45	35	35	40	40	40	20	15	15	15	15	15	15	10	10	10	15	15	15	5	n/a	2	0.25	0	0
E1B-9	R	20	30	30	30	35	40	40	40	40	40	45	45	45	4	2	2	2	4	5	5	5	5	5	5	5	5
E3-1	I	30	40	45	45	45	45	45	45	50	50	50	45	45	7	17	17	15	10	10	10	10	10	10	10	10	10
E3-2	R	35	80	75	75	70	70	70	70	70	70	70	75	65	4	2	2	2	2	3	3	3	3	3	3	4	1
E3-3	I	35	40	40	40	40	40	40	40	40	45	45	40	35	n/a	n/a	n/a	n/a	n/a	5	5	5	n/a	n/a	0	0	0
E3-4	R	40	45	46	40	45	45	45	45	50	50	50	50	50	20	6	6	6	5	5	5	5	10	10	10	10	10
E3-5	I	25	50	40	40	40	40	40	40	40	40	40	n/a	n/a	5	3	3	3	5	5	5	5	5	5	5	n/a	n/a
E3-6	R	35	75	75	70	70	70	70	25	15	15	15	20	15	4	3	3	2	1	2	1	n/a		n/a	0	0	0
E3-7	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30	25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0

Site name	Site type	Cover (%)																								
		Midstorey													Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A7A-1	I	20	20	20	20	20	20	20	20	20	20	20	20	15	10	5	2	3	2	5	5	5	5	5	2	2	0.5
A7A-10	I	5	10	10	10	15	15	15	15	15	15	15	15	15	2	2	1	1	1	0.75	0.75	0.75	0.5	0.5	0.5	1	0.25
A7A-2	I	n/a	5	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	20	30	65	20	25	25	25	25	30	30	30	30	30
A7A-3	R	2	2	2	2	5	4	4	4	2	2	1	1	0.75	10	20	25	20	20	20	25	25	30	30	30	30	25
A7A-4	R	8	10	10	10	20	20	20	20	20	20	10	10	10	30	50	55	45	45	45	45	45	45	40	40	40	40
A7A-5	I	7	10	10	15	15	15	15	15	15	15	10	10	10	25	30	30	35	40	45	45	30	30	30	30	30	30
A7A-6	R	15	25	25	25	30	30	30	30	30	30	30	30	30	5	15	15	10	10	10	15	15	15	15	15	15	15
A7A-7	R	10	25	20	20	20	20	20	20	20	25	20	25	20	30	10	15	15	10	10	10	10	15	15	15	10	10
A7A-8	I	15	25	25	30	25	30	30	30	30	30	30	30	30	30	20	10	8	5	5	5	5	5	4	4	3	2
A7A-9	R	5	10	5	5	10	15	15	15	15	15	15	15	10	10	10	15	10	5	5	10	10	10	10	10	5	4
A7B-1	R	30	30	30	35	35	40	40	40	40	40	45	45	45	30	30	25	25	25	25	25	25	25	25	15	15	15
A7B-2	I	10	1	1	1	1	1	1	1	1	2	2	2	2	15	15	15	15	15	15	15	15	20	20	20	20	20
A7B-3	R	20	15	15	15	20	20	20	20	20	20	20	25	25	10	2	2	2	2	3	3	3	3	3	2	2	1
A7B-4	I	15	1	1	1	1	1	1	1	1	1	1	1	1	5	12	12	12	10	10	10	10	10	15	15	15	15
C9-1	I	20	30	30	30	25	30	30	30	30	30	30	25	20	5	2	2	1	2	1	1	1	1	1	1	1	1
C9-2	I	25	30	30	40	45	45	45	45	45	40	40	40	35	15	10	15	15	10	10	20	20	20	15	10	5	3
C9-3	R	25	30	30	30	25	30	30	30	35	35	35	35	25	5	15	15	10	5	30	30	30	10	10	5	5	5
C9-4	R	20	15	30	30	30	30	30	30	30	30	30	30	25	5	20	3	2	0.5	0.5	0.5	0.5	3	3	2	2	1
E1B-1	I	60	50	50	50	55	55	55	55	55	55	40	40	30	60	50	45	45	60	60	60	60	60	60	60	60	50
E1B-10	I	7	15	15	15	15	15	20	10	10	10	15	10	10	25	40	40	40	40	40	40	10	1	4	3	5	5
E1B-11	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30	25
E1B-2	R	5	20	15	15	15	15	15	15	15	15	10	10	10	15	25	20	20	30	30	30	30	30	30	35	35	35
E1B-3	I	10	5	10	12	15	20	20	20	20	20	20	n/a	n/a	30	60	60	60	60	60	60	60	40	40	35	n/a	n/a
E1B-4	R	6	15	15	15	15	15	15	15	15	15	10	10	10	20	25	25	25	25	25	25	25	35	30	30	30	30
E1B-5	I	15	10	10	15	25	30	30	30	35	35	30	35	40	15	35	35	35	35	35	35	35	35	35	35	30	20
E1B-6	R	30	20	25	40	40	40	40	40	40	40	55	55	55	10	50	50	30	30	30	30	30	25	25	25	15	10
E1B-7	R	20	25	25	25	25	25	25	25	25	25	15	10	10	5	5	2	1	1	1	0.75	0.75	0.75	1	0.5	1	0.5
E1B-8	I	15	20	20	22	25	25	25	10	15	5	10	10	10	15	5	5	5	5	5	5	5	1	2	2	2	1
E1B-9	R	20	20	20	25	30	30	30	30	30	40	40	40	45	5	10	8	5	3	5	5	5	5	5	2	2	2
E3-1	I	3	4	3	2	1	1	0.5	0.5	0.5	0.5	0.5	1	0.1	25	40	45	45	45	45	45	45	45	45	45	35	35
E3-2	R	5	4	5	5	5	5	10	10	10	10	10	15	15	30	75	70	70	65	65	65	65	60	60	60	60	55
E3-3	I	30	35	35	35	35	35	35	35	40	40	40	35	30	20	5	5	5	5	5	5	5	5	5	5	5	5
E3-4	R	25	25	25	25	25	25	30	30	30	35	35	35	35	10	15	15	15	15	15	15	15	15	15	20	15	15
E3-5	I	20	20	20	20	20	20	20	20	20	20	20	n/a	n/a	10	15	15	15	15	15	15	15	10	15	15	n/a	n/a
E3-6	R	5	2	2	2	1	1	3	0.5	n/a	n/a	1	2	3	35	70	70	70	70	70	70	20	15	15	20	20	15
E3-7	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	25	20

Appendix G All year's Raw folia condition data (Browning Scale) for Operations Area

Site name	Type	Browning scale*																																					
		Overstorey													Midstorey														Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
A7A-1	I	1	1	1	1	1	1	1	1	1	1	2	2	**2**	1	1	1	1	1	1	1	1	2	2	3	3	**3**	1	2	2	2	3	2	2	2	2	2	3	3	**3**
A7A-10	I	1	1	1	1	1	1	1	1	1	2	2	2	**2**	1	1	1	2	1	1	1	1	2	2	2	2	**2**	1	1	2	2	1	2	2	2	3	3	3	3	**3**
A7A-2	I	1	1	1	1	1	1	1	1	1	1	2	1	**1**	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	2	2	2	2	2	2	2	2	2	2	2	**2**
A7A-3	R	1	1	1	1	1	1	1	1	1	1	2	1	**1**	1	1	1	1	1	1	1	1	2	2	2	2	**2**	1	2	2	2	2	2	2	2	2	2	2	2	**2**
A7A-4	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1	1	1	1	2	2	2	1	**2**	2	2	2	3	1	2	2	2	2	2	2	2	**2**
A7A-5	I	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1	1	1	1	2	2	2	1	**1**	1	2	2	2	1	2	2	2	2	2	2	2	**2**
A7A-6	R	1	1	1	1	1	1	1	1	1	2	2	2	**1**	1	2	1	1	1	1	1	1	2	2	2	2	**2**	1	2	2	2	2	2	2	2	2	2	2	2	**2**
A7A-7	R	1	1	1	1	1	1	1	1	1	2	2	2	**2**	1	1	1	1	1	1	1	1	2	2	2	2	**3**	1	2	2	2	2	2	2	2	2	3	3	3	**3**
A7A-8	I	1	1	1	1	1	1	1	1	1	2	2	2	**2**	1	2	1	1	1	1	1	1	2	2	2	2	**2**	1	2	2	2	2	2	2	2	2	2	2	2	**3**
A7A-9	R	1	1	1	1	1	1	1	1	1	2	2	3	**2**	1	1	1	1	2	1	1	1	2	2	2	2	**2**	1	2	2	3	2	2	2	2	2	3	3	3	**3**
A7B-1	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	2	2	1	1	2	1	2	2	2	2	2	**2**
A7B-2	I	1	1	1	1	1	1	1	1	1	1	1	1	**2**	1	1	1	1	1	1	2	2	1	1	1	1	**2**	1	2	1	2	2	2	2	2	2	2	2	2	**2**
A7B-3	R	1	1	1	1	1	1	1	1	1	1	2	2	**2**	1	1	1	2	2	1	1	1	1	2	2	2	**3**	1	2	2	2	2	2	2	2	2	2	3	3	**3**
A7B-4	I	1	1	1	1	1	1	1	1	1	1	1	2	**2**	1	3	2	2	2	1	1	1	1	2	2	2	**2**	1	2	2	1	2	2	2	2	2	2	2	2	**2**
C9-1	I	1	1	1	1	1	1	1	1	1	1	1	1	**2**	1	1	1	1	1	2	1	1	1	2	2	2	**2**	1	2	2	1	2	2	2	2	3	3	3	2	**3**
C9-2	I	1	1	1	1	1	1	1	1	1	1	2	2	**1**	1	1	1	2	2	1	1	1	2	2	2	2	**2**	2	2	2	2	2	2	2	2	3	3	3	3	**3**
C9-3	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	2	1	1	1	1	1	1	2	2	2	2	**2**	1	2	2	3	2	2	2	2	2	3	3	2	**2**
C9-4	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	3	2	2	2	2	2	2	2	2	2	3	**3**	1	2	2	2	2	3	3	3	3	3	3	3	**3**
E1B-1	I	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	**1**	1	1	1	1	1	1	1	1	1	2	2	2	**3**	1	2	2	2	1	2	2	2	2	2	2	2	**3**
E1B-10	I	1	1	1	1	1	1	1	2	1	2	3	3	**n/a**	1	1	1	1	1	1	1	2	1	2	2	1	**1**	1	2	2	2	2	2	2	2	2	2	2	2	**2**
E1B-11	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	**1**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	**2**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	**3**
E1B-2	R	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	1	1	1	1	1	1	1	1	1	1	2	2	**3**	1	2	2	2	1	1	1	1	2	2	2	2	**3**
E1B-3 (x)	I	1	1	1	1	1	1	1	1	1	1	1	n/a	**n/a**	1	1	1	1	1	1	1	1	2	2	2	n/a	**n/a**	1	2	2	2	2	2	2	2	2	2	2	n/a	**n/a**
E1B-4	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	2	2	1	1	2	2	2	2	2	2	2	**3**
E1B-5	I	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1	2	2	2	1	2	1	2	**2**	1	2	2	2	2	2	2	2	2	2	2	2	**3**
E1B-6	R	1	1	1	1	1	1	1	1	1	1	2	1	**1**	1	1	1	1	1	2	1	1	2	1	2	2	**2**	1	2	2	2	2	2	2	2	2	2	2	2	**3**
E1B-7	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	2	1	2	1	1	1	1	2	2	2	2	**2**	1	2	2	2	2	2	2	2	3	3	3	3	**3**
E1B-8	I	1	1	1	1	1	1	1	3	n/a	2	2	n/a	**n/a**	1	1	1	1	1	1	1	3	1	1	1	1	**2**	1	2	2	2	1	1	2	3	1	1	1	2	**2**
E1B-9	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1	1	1	1	1	2	1	1	**1**	1	2	2	1	2	2	2	2	2	2	3	3	**3**
E3-1	I	1	1	1	1	1	1	1	1	1	1	1	2	**2**	1	1	1	1	2	2	1	1	1	3	3	2	**3**	1	2	2	1	2	2	2	2	2	2	2	2	**2**
E3-2	R	1	1	1	1	1	1	1	2	1	1	1	1	**1**	1	1	1	1	1	1	1	1	1	1	1	1	**2**	1	2	2	2	1	1	2	2	2	2	2	2	**3**
E3-3	I	1	n/a	n/a	n/a	n/a	n/a	1	1	n/a	n/a	n/a	n/a	**n/a**	1	2	1	1	1	1	1	1	2	2	2	2	**2**	1	2	1	1	2	2	2	2	2	2	2	2	**2**
E3-4	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1	1	1	1	2	2	1	2	**2**	1	2	1	1	2	2	2	2	2	3	3	3	**3**
E3-5 (x)	I	1	1	1	1	1	1	1	1	1	1	1	n/a	**n/a**	1	1	1	1	1	1	1	1	2	3	1	n/a	**n/a**	1	2	2	2	2	2	2	2	2	2	2	n/a	**n/a**
E3-6	I (ex. R)	1	1	1	1	1	1	1	3	n/a	n/a	n/a	n/a	**n/a**	1	1	1	1	1	1	1	3	n/a	1	1	1	**1**	1	2	2	1	1	1	2	2	1	1	1	1	**2**
E3-7	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	**1**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	**2**

^I = Impact site, R = Reference Site, *Browning Scale 1 = Green (Healthy), 2 = Yellow (Senescent), 3 = Brown (Dead or dying foliage)

Appendix H All year's Raw foliar condition data (Leaf Loss Scale) for Operations Area

Site name	Type	Leaf loss*																																					
		Overstorey													Midstorey														Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
A7A-1	I	5	4	5	5	5	5	4	4	3	3	3	3	**3**	5	3	5	5	4	4	3	3	3	3	3	3	**2**	5	3	3	3	3	4	3	3	2	2	1	1	**1**
A7A-10	I	5	5	4	4	4	4	4	4	4	4	4	3	**3**	5	4	5	4	4	4	4	4	3	3	3	3	**3**	5	3	3	4	4	3	3	3	2	2	2	2	**1**
A7A-2	I	5	5	5	5	5	5	4	4	4	4	4	4	**4**	5	4	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	3	3	3	3	4	4	4	4	3	3	3	**3**
A7A-3	R	5	4	4	5	4	4	4	4	4	4	3	**4**	**4**	5	5	5	5	4	4	4	4	4	4	4	**4**	**4**	5	3	3	4	4	4	4	4	4	4	3	**3**	**3**
A7A-4	R	5	4	5	5	5	5	5	5	5	5	5	4	**5**	5	4	5	5	4	4	4	4	3	3	3	3	**3**	4	3	3	2	4	4	4	4	4	3	3	3	**3**
A7A-5	I	5	4	4	5	5	4	4	4	5	5	5	**5**	**4**	5	4	4	5	4	4	4	4	4	4	4	**4**	**4**	4	3	3	4	4	4	4	4	4	4	4	**4**	**3**
A7A-6	R	5	4	4	5	4	4	4	4	4	4	3	**4**	**4**	5	3	4	5	4	4	4	4	3	3	3	**4**	**3**	4	3	3	3	4	4	4	4	3	3	3	**4**	**4**
A7A-7	R	5	4	4	4	4	5	4	4	4	4	4	**3**	**3**	5	4	5	4	4	4	4	4	3	4	3	**4**	**2**	5	3	3	3	4	4	4	4	2	2	2	**2**	**2**
A7A-8	I	5	3	3	5	3	4	4	4	4	4	3	2	**2**	5	3	4	5	4	4	4	4	3	4	3	**3**	**2**	5	4	3	4	4	4	4	4	2	3	2	**2**	**1**
A7A-9	R	4	3	4	4	4	4	4	4	4	4	4	**2**	**2**	4	3	4	5	4	4	4	4	3	3	3	**3**	**2**	4	3	3	3	3	4	4	4	3	2	2	**2**	**2**
A7B-1	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	4	5	5	4	4	4	4	4	**4**	**4**	4	4	4	4	4	5	5	5	3	3	3	**3**	**3**
A7B-2	I	5	3	3	4	5	5	5	5	5	4	4	4	**4**	5	4	5	5	5	5	4	4	5	4	4	**4**	**4**	5	2	2	3	4	4	4	4	4	4	4	**4**	**3**
A7B-3	R	5	4	4	5	5	4	4	4	4	4	4	**3**	**3**	5	4	4	5	5	4	4	4	4	3	3	**3**	**2**	4	3	4	4	4	4	4	4	4	3	2	**2**	**3**
A7B-4	I	5	4	3	4	5	5	5	5	5	5	4	**4**	**3**	5	3	3	4	4	4	4	4	4	4	4	**4**	**4**	5	4	4	4	4	4	4	4	4	4	3	**3**	**3**
C9-1	I	5	4	5	5	5	5	5	5	5	5	5	4	**4**	4	4	5	5	4	4	4	4	4	3	3	**3**	**3**	4	3	4	5	4	4	4	4	3	3	2	**2**	**2**
C9-2	I	5	5	5	5	5	5	4	4	4	4	4	**4**	**4**	4	4	4	4	4	4	4	4	3	3	3	**3**	**3**	3	4	3	3	4	4	3	3	3	2	2	**2**	**2**
C9-3	R	5	4	4	4	4	4	4	4	4	4	4	4	**4**	4	3	4	5	4	4	4	4	3	3	3	**3**	**3**	4	3	3	4	3	3	3	3	3	2	2	**3**	**3**
C9-4	R	5	3	5	5	4	4	4	4	4	4	4	4	**4**	4	3	3	3	3	4	3	3	3	2	3	**2**	**2**	4	3	3	4	3	3	3	3	2	2	2	**2**	**2**
E1B-1	I	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	5	**4**	5	4	4	4	4	5	5	5	5	4	3	3	**2**	5	3	3	3	4	4	5	4	5	4	3	3	**2**
E1B-10	I	5	5	5	5	4	5	5	3	3	3	1	1	n/a	5	5	5	5	5	5	5	3	5	3	3	**4**	**4**	5	4	4	4	3	4	4	3	4	3	3	**3**	**3**
E1B-11	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	**5**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	**3**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	**2**
E1B-2	R	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	5	5	5	5	5	5	5	4	**4**	**3**	5	4	3	4	4	5	5	5	4	4	3	**3**	**2**
E1B-3 (x)	I	5	4	4	5	4	5	5	5	5	5	5	n/a	n/a	5	4	4	4	4	5	5	5	4	4	4	n/a	n/a	4	4	4	4	5	4	5	5	3	3	2	n/a	n/a
E1B-4	R	5	5	4	5	5	5	5	5	5	5	5	5	5	4	4	4	5	4	5	5	5	5	4	4	**4**	**3**	4	2	3	4	5	5	4	4	4	3	3	**3**	**2**
E1B-5	I	5	4	5	5	5	5	5	5	5	5	5	5	**5**	5	4	5	5	5	5	5	5	5	5	3	5	4	**4**	4	3	3	3	4	4	4	4	4	3	3	**2**
E1B-6	R	5	4	5	5	5	5	5	5	5	5	3	5	**5**	5	4	5	5	5	5	5	5	5	5	5	5	**4**	**4**	5	4	4	3	4	4	4	4	4	4	3	**2**
E1B-7	R	5	4	4	5	5	5	5	5	5	5	5	4	**4**	5	4	3	3	5	5	4	4	3	3	3	3	**3**	4	2	4	4	4	4	4	4	2	2	2	2	**2**
E1B-8	I	5	4	4	5	5	5	5	2	n/a	3	1	n/a	n/a	5	5	5	5	5	5	4	2	5	4	4	4	**4**	5	4	4	5	5	5	4	2	5	4	4	3	**3**
E1B-9	R	5	5	5	5	5	5	5	5	5	5	5	5	**5**	5	4	4	5	5	5	5	5	5	4	4	4	**5**	5	4	3	4	4	4	4	4	4	4	2	2	**1**
E3-1	I	5	4	5	5	5	5	5	5	5	4	4	**3**	**3**	5	4	4	4	3	5	5	5	5	1	1	**3**	**2**	4	3	3	4	4	4	4	4	4	4	4	**4**	**3**
E3-2	R	5	4	5	5	5	5	5	4	5	5	5	5	**5**	5	4	5	5	5	5	5	5	4	4	4	3	**3**	5	4	4	4	5	5	4	4	4	4	4	3	**2**
E3-3	I	5	n/a	n/a	n/a	n/a	n/a	5	5	n/a	n/a	n/a	n/a	n/a	5	3	4	4	5	5	5	5	4	4	3	**3**	**3**	5	4	4	5	4	4	4	4	3	3	2	**2**	**2**
E3-4	R	5	4	4	4	5	5	5	5	5	5	5	5	**5**	5	4	5	4	4	5	4	4	3	3	4	**4**	**4**	4	3	5	4	4	4	4	4	2	2	2	**2**	**2**
E3-5 (x)	I	5	5	5	5	5	5	5	5	5	2	5	n/a	n/a	5	4	5	5	5	5	5	5	4	3	3	n/a	n/a	5	3	3	3	4	4	4	4	3	3	2	n/a	n/a
E3-6	I (ex. R)	5	5	5	5	5	5	5	2	n/a	5	n/a	n/a	n/a	5	5	5	5	5	5	5	2	n/a	5	5	5	**4**	5	4	4	5	4	4	4	2	4	3	4	5	**3**
E3-7	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	**4**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	**3**

^I = Impact site, R = Reference Site, *Leaf loss scale (1 through to 5 with 1 indicating denuded branches and 5 indicating a full canopy of leaves).

Appendix I Operations Area deviation values for overall foliar cover (%)

Site	Site Type	Deviation (%)												
		2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	Baseline - 2023
A7a-5	Impact	67	-7	0	-7	23	0	0	-38	0	0	0	-10	-29
A7a-6	Reference	100	0	0	25	0	0	0	-20	0	0	0	0	20
A7a-10	Impact	75	-14	0	33	0	0	0	0	0	0	-13	-14	6
A7a-9	Reference	33	0	15	9	0	0	0	0	40	0	0	-43	9
A7a-8	Impact	25	0	0	20	0	0	0	0	0	0	0	-25	-4
A7a-7	Reference	-18	0	0	-33	0	0	0	33	25	0	10	-36	-28
A7a-1	Impact	-20	0	0	25	20	0	0	0	0	-17	0	-20	-8
A7a-4	Reference	100	0	-17	10	0	0	0	0	0	0	0	0	10
A7a-2	Impact	57	0	-27	-25	0	0	0	17	14	0	0	0	-17
A7a-3	Reference	75	0	0	-43	25	0	0	40	0	0	0	0	17
C9-1	Impact	14	0	0	0	0	0	0	0	0	0	0	-14	-10
C9-3	Reference	71	-8	0	0	9	0	0	0	0	22	0	0	0
C9-2	Impact	0	0	0	0	0	0	0	0	-8	-8	-9	-10	-10
C9-4	Reference	29	-22	0	0	14	0	0	0	0	0	0	-17	-12
E1b-1	Impact	17	0	0	-14	17	0	0	0	0	0	0	-7	-9
E1b-2	Reference	86	0	0	-38	13	0	0	0	0	0	0	0	41
E3-1	Impact	100	0	0	0	8	0	0	11	0	0	-10	0	17
E3-2	Reference	75	-14	0	0	0	0	0	0	0	0	7	-13	3
E1b-8	Impact	-7	0	0	0	0	0	-50	-25	0	0	0	0	-57
E1b-7	Reference	75	-14	0	33	0	0	0	0	0	0	-20	0	-11
A7b-2	Impact	80	-22	0	14	0	0	0	0	0	0	0	0	4
A7b-1	Reference	43	0	0	0	0	0	0	0	0	0	0	0	20
E3-3	Impact	56	6	1	0	0	0	0	0	13	0	-11	-13	-9
E3-4	Reference	40	0	0	0	0	0	0	11	0	0	0	0	15
A7b-4	Impact	8	-29	0	20	0	0	0	0	20	0	17	0	40
A7b-3	Reference	30	8	0	0	0	0	0	0	0	0	13	0	17
E1b-3	Impact	83	-2	2	0	9	0	0	-33	0	0	-100	n/a	-100
E1B-11	Impact											n/a	-13	-7

Site	Site Type	Deviation (%)												
		2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	Baseline - 2023
E1b-4	Reference	50	0	0	17	14	0	0	14	0	13	0	0	42
E1b-5	Impact	33	13	0	0	0	0	0	0	0	8	0	0	5
E1b-6	Reference	129	-6	0	-7	0	0	0	0	0	7	-13	0	5
E1b-10	Impact	14	0	0	0	0	0	-67	-50	0	50	0	0	-68
E1b-9	Reference	13	2	-13	13	0	0	0	0	0	13	0	0	69
E3-5	Impact	100	-20	0	0	0	0	0	0	0	0	-100	n/a	-100
E3-7	Reference											n/a	-25	-76
E3-6	Impact (ex. Reference)	114	0	-7	0	0	0	-64	-40	0	0	33	-17	-9

Appendix J All year's Raw foliar cover data for Infrastructure Corridor

Site name	Site type	Cover (%)																									
		Overall													Overstorey												
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
A2-1	I	40	35	30	45	40	40	40	45	45	50	60	60	60	5	5	5	5	5	5	5	5	10	10	5	5	5
A2-10	R	95	70	70	75	75	75	75	75	75	75	75	75	60	10	10	15	15	15	15	15	15	15	15	3	5	3
A2-11	R	50	50	50	50	50	55	55	55	55	55	55	60	55	35	50	50	50	50	50	50	50	50	50	50	50	50
A2-12	R	17	30	35	37	35	40	40	40	45	45	45	45	45	2	5	5	2	0.5	0.5	0.5	1	1	2	3	4	4
A2-2	I	55	45	45	50	50	50	50	50	50	50	50	40	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0
A2-3	I	50	75	75	75	75	75	75	75	75	75	75	75	75	40	75	75	75	70	70	70	70	70	70	70	70	70
A2-4	I	40	40	50	50	50	55	55	55	55	45	45	40	40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1
A2-5	R	60	50	50	50	50	55	55	55	55	55	55	55	50	20	20	20	20	20	20	20	20	20	20	15	15	15
A2-6	I	50	40	40	45	60	60	55	55	55	55	50	50	45	30	30	30	35	35	35	30	35	35	35	30	30	30
A2-7	R	15	20	25	35	20	30	30	30	35	40	40	50	50	5	7	8	5	5	5	5	5	5	5	5	5	5
A2-8	R	80	25	40	85	80	80	80	80	80	65	65	55	55	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0
A2-9	I	85	25	30	50	55	55	55	55	55	50	50	40	40	n/a	0.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0
A3-1	R	75	35	40	40	40	40	40	35	40	35	35	35	35	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0
A3-2	I	50	30	30	30	30	30	35	35	30	30	30	35	30	n/a	n/a	10	n/a	n/a	n/a	n/a	n/a	n/a	0	0	3	0
A3-3	R	30	30	30	30	35	35	35	35	35	35	25	25	25	20	20	20	20	20	20	20	20	20	20	15	15	15
A3-4	I	25	35	35	35	35	35	35	35	35	35	30	20	20	15	25	25	25	25	25	25	25	25	25	15	15	15
A3-5	I	70	45	55	60	60	60	60	60	60	60	60	60	60	40	30	55	55	55	55	55	55	55	55	55	45	45
A3-6	R	60	55	55	55	55	55	60	60	60	60	60	50	45	20	35	35	35	35	35	40	40	40	40	40	40	40
A7B-5	R	70	40	45	50	40	40	60	60	60	45	45	45	45	40	35	35	40	30	5	5	5	5	5	5	3	3
A7B-6	I	25	45	45	45	40	50	50	50	50	40	35	30	35	13	30	35	40	25	15	15	15	15	10	10	10	10
A7B-7	I	30	n/a	2	10	20	20	25	25	30	35	35	n/a	n/a	15	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	n/a
A7B-8	R	70	65	60	65	60	60	60	60	60	60	60	60	60	60	55	55	55	55	55	55	60	55	55	55	55	55
A7B-9	I	n/a	50	45	50	50	50	50	50	50	50	50	50	50	n/a	8	8	10	10	10	10	10	30	30	30	30	30
E4-1	R	60	25	30	35	35	35	35	35	35	35	45	45	45	1	0.5	n/a	1	1	1	1	1	1	1	1	1	1
E4-10	R	80	60	65	65	65	70	4	20	20	20	20	25	20	4	7	7	7	5	5	1	1	2	2	2	3	2
E4-11	I	80	55	25	30	30	35	40	40	40	40	40	40	40	1	2	2	1	1	1	2	3	3	3	3	3	3
E4-12	R	75	45	10	20	25	35	40	40	45	45	50	45	35	10	4	n/a	n/a	n/a	n/a	n/a	n/a	2	2.5	3	3	3
E4-13	R	35	60	60	62	75	75	75	75	1	5	10	10	10	2	4	4	4	5	5	5	5	0.3	0.3	0	0.25	0.5
E4-14	I	60	40	40	45	60	60	60	60	60	60	60	60	60	15	20	20	20	20	20	20	20	20	20	20	15	15
E4-2	I	50	30	35	45	45	50	50	50	50	50	50	50	50	2	n/a	n/a	5	5	4	4	4	4	4	4	4	4
E4-3	I	30	40	35	40	40	45	45	15	15	40	40	40	40	5	n/a	25	25	20	20	20	20	20	20	20	20	15

Site name	Site type	Cover (%)																									
		Overall													Overstorey												
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
E4-4	R	30	35	35	50	40	40	40	40	40	40	40	45	45	3	15	15	15	25	25	25	25	15	15	15	15	15
E4-5	I	75	70	70	75	75	75	75	75	70	70	70	70	70	5	25	25	25	20	25	25	25	20	20	20	20	20
E4-6	R	80	65	75	80	60	60	60	60	60	60	75	75	75	15	25	3	5	20	20	20	20	15	15	15	10	10
E4-7	I	45	30	30	35	35	40	40	40	40	40	40	40	35	5	2	3	3	5	5	5	5	5	5	4	5	4
E4-8	R	40	30	30	40	40	40	45	40	45	45	45	45	40	n/a	1	1	1	n/a	n/a	n/a	n/a	5	5	2	2	2
E4-9	I	80	60	60	60	60	60	3	10	20	20	20	30	25	5	3	3	5	5	10	n/a	n/a	0.3	0	0	0	0
E9-1	R	30	25	26	25	35	45	45	45	45	45	30	30	25	1	1	1	n/a	0.5	3	3	3	3	30	25	25	20
E9-2	I	45	45	40	35	45	50	50	50	50	50	50	40	40	10	20	20	15	10	10	10	10	10	10	10	10	30
E9-5	R	70	65	60	60	60	60	60	60	60	60	60	60	60	35	10	15	20	20	20	20	20	20	20	20	20	20
E9-6	I	50	35	35	35	40	40	40	40	40	45	45	45	40	20	15	15	15	15	15	15	15	15	15	10	10	10
S8-1	R	85	80	30	30	30	35	35	35	40	40	40	45	45	5	5	2	2	2	n/a	2	2	2	2	2	2	1
S8-2	I	85	75	15	25	30	35	40	40	40	40	35	30	30	4	4	n/a	n/a	n/a	n/a	n/a	n/a	2	3	3	3	2
S8-3	I	80	60	35	32	35	35	40	40	40	40	40	30	35	4	5	n/a	n/a	n/a	n/a	n/a	n/a	2	2	2	0	0
S8-4	I	65	30	30	30	40	40	40	40	40	50	45	n/a	n/a	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0	n/a	n/a
S8-5	R	60	80	35	34	30	35	40	40	40	45	45	40	40	n/a	3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0
S8-6	R	85	60	20	30	35	40	40	40	40	55	55	45	25	35	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0
S8-7	I	n/a	70	30	32	30	30	30	30	40	45	45	40	35	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0

Site name	Site type	Cover (%)																									
		Midstorey													Understorey												
		2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
A2-1	I	**40**	**7**	**7**	**30**	**15**	**15**	**15**	**20**	**35**	**40**	**45**	**45**	**45**	**5**	**25**	**20**	**10**	**25**	**25**	**25**	**25**	**5**	**5**	**5**	**10**	**15**
A2-10	R	**95**	**25**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**5**	**5**	**5**	**5**	**35**	**45**	**50**	**50**	**55**	**55**	**50**	**60**	**50**	**50**	**45**	**45**
A2-11	R	**20**	**5**	**5**	**5**	**2**	**4**	**4**	**4**	**4**	**4**	**3**	**5**	**4**	**5**	**2**	**1**	**1**	**0.5**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0.25**
A2-12	R	**4**	**2**	**2**	**2**	**3**	**4**	**5**	**5**	**40**	**40**	**40**	**40**	**40**	**13**	**30**	**35**	**35**	**30**	**40**	**40**	**40**	**1**	**1**	**1**	**1**	**2**
A2-2	I	**50**	**35**	**35**	**20**	**20**	**20**	**20**	**20**	**20**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**30**	**30**	**30**	**30**	**30**	**30**	**40**	**40**	**35**	**30**
A2-3	I	**10**	**7**	**7**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**10**	**10**	**5**	**3**	**2**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**1**	**0.25**
A2-4	I	**10**	**15**	**20**	**20**	**15**	**15**	**15**	**15**	**35**	**45**	**45**	**40**	**40**	**30**	**25**	**40**	**40**	**45**	**45**	**45**	**45**	**1**	**1**	**2**	**2**	**2**

Site name	Site type	Cover (%)																										
		Midstorey													Understorey													
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A2-5	R	60	25	25	30	35	30	30	30	30	30	30	25	25	20	15	15	10	20	20	20	20	20	20	15	15	10
A2-6	I	50	10	10	10	15	15	15	15	15	15	10	10	5	20	10	10	10	20	15	20	20	20	20	20	15	10
A2-7	R	10	1	1	1	20	20	30	20	25	30	30	40	40	5	20	22	30	3	5	5	5	5	5	10	10	10
A2-8	R	75	2	2	2	40	40	40	40	40	35	35	35	35	60	25	40	85	40	40	40	40	40	40	35	35	35
A2-9	I	30	n/a	n/a	n/a	30	30	30	30	35	35	35	30	30	60	25	30	50	25	25	25	25	30	30	30	30	25
A3-1	R	40	25	30	30	30	30	30	30	30	30	30	30	30	20	10	10	10	10	10	10	5	10	5	5	5	5
A3-2	I	10	10	2	15	15	15	15	15	25	25	25	25	25	50	20	20	20	20	20	25	20	10	10	10	10	5
A3-3	R	15	8	10	10	10	10	10	10	10	10	10	10	10	5	10	10	8	10	10	10	10	10	5	5	4	3
A3-4	I	5	2	2	2	4	4	5	5	5	5	5	5	5	5	15	15	15	15	15	15	15	5	5	2	2	2
A3-5	I	55	15	15	15	20	20	20	20	20	20	20	15	15	20	5	5	5	5	5	5	5	3	1	1	3	2
A3-6	R	40	20	20	20	20	20	20	20	20	20	15	10	10	50	5	5	5	5	5	5	5	3	1	1	0.25	0.25
A7B-5	R	20	15	15	15	10	10	30	30	30	5	4	5	3	50	20	20	15	5	25	25	25	25	40	40	40	40
A7B-6	I	5	7	7	10	15	15	25	25	20	10	5	4	4	7	15	15	15	20	20	20	20	20	20	20	20	15
A7B-7	I	30	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	5	5	n/a	n/a	15	n/a	2	10	20	20	25	25	30	30	30	n/a	n/a
A7B-8	R	35	8	10	10	10	15	15	15	20	20	15	15	15	7	4	4	2	2	2	0.5	0.5	0.5	0.5	0.3	0.1	0.1
A7B-9	I	n/a	40	35	40	40	40	40	40	30	30	30	25	20	n/a	5	5	4	5	5	3	3	1	1	1	0.5	0.1
E4-1	R	1	4	2	30	30	30	30	30	30	40	25	15	15	60	25	28	5	5	5	5	5	5	5	20	35	35
E4-10	R	5	20	25	25	25	30	n/a	10	4	1	2	3	3	75	40	45	45	45	45	3	10	15	20	20	20	15
E4-11	I	40	7	5	5	5	5	5	5	10	10	10	5	4	80	45	20	25	30	30	35	35	35	35	30	30	30
E4-12	R	90	20	n/a	2	2	5	10	10	5	5	2	1	1	70	20	10	20	25	30	30	30	40	45	45	35	30
E4-13	R	2	2	2	2	3	5	10	10	0.3	0.3	1	1	1	30	60	60	60	70	70	70	70	0.5	5	10	10	10
E4-14	I	8	4	4	4	20	20	20	20	20	20	20	20	15	50	40	40	40	50	50	50	50	50	45	45	40	40
E4-2	I	20	7	7	30	35	40	40	40	40	40	40	40	40	40	25	30	10	10	10	10	10	10	10	10	10	10
E4-3	I	n/a	25	8	10	10	10	10	10	20	20	10	10	5	25	20	10	15	20	20	20	20	20	20	25	30	30
E4-4	R	5	2	2	20	15	15	15	15	15	15	10	10	10	30	30	30	40	25	25	30	30	30	40	40	35	35
E4-5	I	1	1	1	1	5	10	10	10	10	10	5	5	3	75	50	50	65	60	60	60	60	50	50	55	55	55
E4-6	R	7	2	2	5	3	5	5	5	5	5	5	5	5	80	50	70	80	50	50	55	55	50	50	65	65	65
E4-7	I	40	3	2	2	2	5	5	5	5	5	5	5	5	10	30	30	35	35	35	35	35	35	35	30	30	25
E4-8	R	30	4	4	5	10	10	15	10	15	20	20	20	10	20	25	25	35	35	35	35	35	35	35	35	30	30
E4-9	I	30	20	20	20	20	20	n/a	5	20	1	1	2	1	80	50	50	50	50	50	3	5	0.1	20	25	30	25
E9-1	R	25	25	25	25	25	30	30	30	30	2	2	2	2	10	2	1	1	5	5	5	5	2	4	4	4	4

Site name	Site type	Cover (%)																								
		Midstorey													Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
E9-2	I	30	25	25	30	30	30	30	30	30	30	30	30	10	5	2	1	1	2	2	2	2	2	2	2	2	2
E9-5	R	20	15	15	15	15	15	15	15	15	15	15	15	15	40	40	40	40	40	40	40	40	40	40	40	35	35
E9-6	I	15	10	10	10	15	15	15	15	15	15	15	15	10	20	20	20	20	20	20	20	20	20	20	25	25	25
S8-1	R	35	10	n/a	1	n/a	n/a	n/a	1	4	4	4	4	5	75	75	30	30	30	35	35	35	35	35	35	40	40
S8-2	I	30	4	n/a	2	2	5	5	5	5	5	5	5	3	75	75	15	25	30	30	35	35	35	35	30	25	25
S8-3	I	30	15	2	2	2	3	3	3	20	20	10	5	5	75	50	35	30	35	35	40	40	20	25	25	25	30
S8-4	I	7	10	10	10	10	30	30	30	20	20	10	n/a	n/a	50	25	25	25	30	10	10	10	20	25	35	n/a	n/a
S8-5	R	50	60	n/a	4	5	5	5	5	5	10	10	10	5	55	40	35	30	30	30	35	35	35	35	35	35	35
S8-6	R	n/a	30	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	15	15	10	80	55	20	30	35	40	40	40	40	50	40	35	15
S8-7	I	n/a	3	n/a	2	2	2	2	3	5	10	10	10	5	n/a	65	30	30	30	30	30	30	35	35	35	30	30

Appendix K All year's Raw folia condition data (Browning Scale) for Infrastructure Corridor

Site name	Type	Browning scale*																																							
		Overstorey													Midstorey																Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
A2-1	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	1	1	2	2	1	2	2	2	2
A2-10	R	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	2	2	2	2	1	1	2	2	2	1	1	1	1	2	3	3	3	2
A2-11	R	1	1	2	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	1	1	1	1	1	2	2	2	1	1	2	2	2	1	1	2	2	3	3	3	3
A2-12	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2	3	3	3	2
A2-2	I	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	2	1	1	2	2	3	3	3	2
A2-3	I	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
A2-4	I	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	1	1	1	1	1	3	3	3	3	2
A2-5	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
A2-6	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
A2-7	R	1	1	1	2	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	1	1	1	1	1	2	1	1	1
A2-8	R	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	2	1	1	1	1	1	2	3	2	2	1	1	2	2	2	2	2	2	2	2	3	3	3	3
A2-9	I	n/a	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a	1	1	1	1	2	3	3	3	1	1	1	2	2	2	1	2	2	2	3	3	3	3
A3-1	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	2	1	2	1	3	1	1	1
A3-2	I	n/a	n/a	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	2	2	1	2	1	2	3	3	1	1	2
A3-3	R	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	2	1	2	1	2	1	3	3	3	3
A3-4	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	3	2	2	2
A3-5	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	2	2	1	2	3	3	2	1	2
A3-6	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	2	2	2	1	1	1	2	1	3	3	1	2
A7B-5	R	1	1	2	1	3	1	1	2	2	2	3	3	2	1	1	1	2	2	1	1	1	2	2	2	2	3	3	2	2	2	1	1	2	2	2	3	2	2	2
A7B-6	I	1	1	2	1	2	2	1	2	1	2	2	2	2	1	1	2	1	1	1	1	1	2	3	3	3	2	3	2	2	2	2	1	2	2	2	3	3	2	2
A7B-7 (x)	I	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	2	2	n/a	n/a	1	n/a	1	1	1	1	1	1	2	3	3	n/a	n/a
A7B-8	R	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	2	2	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	3	3	3	3	3
A7B-9	I	n/a	1	1	1	1	1	1	1	1	1	2	2	2	n/a	1	2	1	1	1	1	1	2	2	3	3	3	n/a	1	2	2	2	2	2	2	2	2	3	3	3
E4-1	R	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	1	1	2	2	2	1	2	2	2	2	2	2	2
E4-10	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	n/a	1	2	1	1	1	1	2	2	2	2	2	2	1	1	2	2	1	1	2	2
E4-11	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	1	1	2	2	2	2	2
E4-12	R	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	1	1	n/a	1	1	1	1	1	2	2	2	3	2	2	2	1	2	2	1	1	2	2	2	3	3	3
E4-13	R	1	1	1	1	1	1	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	2	2	2	1	2	2	2	3	1	1	2	2
E4-14	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2
E4-2	I	1	n/a	n/a	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2
E4-3	I	1	n/a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	1	2	2	2	2	2	2	2	2	2
E4-4	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	2	2	1	1	1	2	1	2	2	2	2	3	3	2	2	2
E4-5	I	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	2	2	2	1	2	2	2	2	2	2	2	2
E4-6	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	2	2	2	3	2	2
E4-7	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	2	2	1	2	2	2	1	1	1	1	2	2	2	3	3	
E4-8	R	1	1	1	1	n/a	n/a	n/a	n/a	1	1	1	1	1	1	1	1	2	2	1	1	1	1	3	3	3	2	1	1	2	2	2	2	1	2	2	2	2	2	2
E4-9	I	1	1	1	1	2	1	n/a	n/a	1	n/a	n/a	n/a	n/a	1	1	1	1	1	1	n/a	2	1	1	1	1	1	2	2	2	2	2	2	1	1	n/a	1	1	2	1
E9-1	R	1	1	2	n/a	1	1	1	1	1	3	1	1	1	1	1	2	2	1	1	1	1	1	3	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1
E9-2	I	1	1	2	1	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	3	2	2	2	1	2	2	3	3	1	1	2
E9-5	R	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	2	2	2	2	2	2	2
E9-6	I	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	2	2	2	2	2	2
S8-1	R	1	1	1	1	1	n/a	1	1	2	2	2	2	2	1	1	n/a	1	n/a	n/a	n/a	1	1	2	2	2	2	2	2	1	2	2	1	1	2	1	1	1	2	2
S8-2	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	2	2	1	2	1	1	n/a	1	1	1	1	1	2	2	2	2	2	1	2	1	2	2	1	1	2	2	2	2	2	2
S8-3	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	n/a	n/a	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	1	1	2	1	1	2	2	2
S8-4 (x)	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a	1	1	2	1	1	1	1	1	2	2	2	n/a	n/a	1	2	2	1	3	1	1	2	2	2	2	n/a	n/a
S8-5	R	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	2	1	1	1	1	1	1	1	1	2	2	1	2	1	2	1	1	1	2	2	2	2	2	2
S8-6	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	2	2	2	2	2	1	2	2	1	1	2	2	2	2	2	2
S8-7	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	3	1	1	1	1	1	2	2	2	2	2	n/a	2	1	2	1	1	1	1	2	2	2	2	2

^I = Impact site, R = Reference Site, *Browning Scale 1 = Green (Healthy), 2 = Yellow (Senescent), 3 = Brown (Dead or dying foliage)

Appendix L All year's Raw foliar condition data (Leaf Loss Scale) for Infrastructure Corridor

Site name	Type	Leaf loss**																																					
		Overstorey													Midstorey														Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
A2-1	I	5	4	4	4	4	5	5	5	5	5	4	4	**4**	5	5	5	5	5	5	5	5	5	4	4	4	**4**	5	4	4	5	5	5	4	4	4	4	3	**3**
A2-10	R	5	4	4	5	5	5	5	5	5	3	3	**4**	**4**	5	4	4	5	5	5	5	5	4	4	3	**4**	**4**	5	4	4	5	4	4	5	5	3	3	2	**2**
A2-11	R	5	4	4	5	5	5	5	4	5	4	4	4	**3**	5	4	4	5	3	5	5	5	5	4	4	4	**4**	5	4	3	4	3	5	5	4	5	4	3	**2**
A2-12	R	5	4	5	5	5	5	5	5	5	5	5	**5**	**5**	5	4	5	5	5	5	5	5	5	4	4	**3**	**2**	5	4	4	5	4	5	5	5	5	1	1	**2**
A2-2	I	5	n/a	n/a	n/a	n/a	5	5	n/a	4	n/a	n/a	n/a	n/a	5	4	4	4	5	5	5	5	4	3	3	**3**	**4**	5	4	4	4	5	n/a	n/a	4	2	2	2	**2**
A2-3	I	4	3	3	4	5	5	5	4	5	4	4	4	**4**	4	2	3	4	4	5	5	4	5	5	4	3	**3**	4	3	2	3	3	4	4	4	4	3	2	**2**
A2-4	I	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	4	**4**	**4**	5	4	5	5	5	5	5	5	5	3	3	**3**	**3**	5	4	3	5	5	5	5	5	2	2	2	**1**	**2**
A2-5	R	5	4	4	4	5	5	5	5	5	5	4	3	**3**	4	4	4	3	4	3	3	3	4	4	4	3	**3**	3	3	3	3	3	3	3	3	3	3	3	**3**
A2-6	I	4	4	4	4	4	5	5	5	5	5	4	**4**	**4**	4	4	4	4	4	4	4	4	4	4	4	**3**	**3**	3	3	3	3	3	3	3	3	3	3	2	**2**
A2-7	R	5	4	4	4	5	5	5	5	5	5	4	3	**3**	5	4	4	5	5	5	5	5	5	4	5	5	**5**	4	5	5	5	4	5	5	5	5	4	4	**4**
A2-8	R	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4	4	5	5	5	5	5	4	3	3	**3**	**4**	4	3	3	4	4	5	4	4	3	3	3	**1**	**2**
A2-9	I	n/a	3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	n/a	n/a	5	5	5	5	4	3	3	**3**	**4**	4	4	3	4	4	5	4	4	3	3	2	**2**	**2**
A3-1	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	4	3	4	5	5	5	5	5	5	5	4	**4**	3	3	2	3	3	4	5	4	5	2	4	4	**3**
A3-2	I	n/a	n/a	5	n/a	5	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	4	4	5	4	4	5	5	5	4	4	5	5	**4**	3	3	4	3	n/a	4	5	4	1	1	4	4	**3**
A3-3	R	5	4	4	5	5	5	5	5	5	5	4	3	**3**	5	4	4	4	5	5	5	5	4	4	3	3	**3**	3	3	3	3	4	4	5	3	3	2	2	2	**2**
A3-4	I	5	4	4	5	5	5	5	5	5	5	5	**4**	**4**	5	4	4	4	5	5	5	5	4	4	4	**4**	**4**	3	3	3	3	4	4	5	4	3	2	3	**2**	**2**
A3-5	I	4	4	4	5	5	5	5	5	5	5	5	4	**4**	4	4	4	4	5	5	5	5	4	3	3	3	**4**	3	4	3	3	4	4	5	4	1	1	3	3	**3**
A3-6	R	4	4	4	4	5	5	5	5	5	5	5	**4**	**4**	4	4	4	5	5	5	5	5	4	2	2	**2**	**3**	3	4	3	3	4	5	5	4	1	1	2	**5**	**3**
A7B-5	R	4	3	4	3	3	3	3	3	3	2	1	**1**	**1**	4	4	4	4	2	3	3	3	3	3	3	**4**	**2**	2	2	3	3	4	4	4	4	4	2	2	**3**	**4**
A7B-6	I	5	4	4	4	3	3	4	3	4	4	3	3	**3**	5	4	4	5	4	4	4	4	4	2	2	**1**	**2**	3	2	3	3	4	4	4	4	4	3	2	**3**	**3**
A7B-7 (x)	I	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	4	4	n/a	n/a	3	n/a	5	5	5	4	4	4	3	1	2	n/a	n/a
A7B-8	R	5	4	4	5	4	4	4	4	4	4	4	4	**4**	4	4	3	4	3	4	4	4	3	3	3	3	**3**	4	3	4	4	3	3	3	3	2	2	1	**1**	**1**
A7B-9	I	n/a	4	4	4	4	4	4	4	4	4	4	**4**	**4**	n/a	4	4	5	4	4	4	4	3	3	2	**2**	**2**	n/a	3	4	4	3	3	3	3	2	2	2	**2**	**2**
E4-1	R	3	4	4	4	5	5	5	5	5	5	3	3	**4**	4	5	4	5	5	5	5	5	4	4	3	3	**4**	4	4	3	5	4	5	5	5	3	3	3	**3**	**3**
E4-10	R	4	5	3	3	4	5	5	5	5	5	5	5	**5**	**3**	4	4	5	5	5	5	n/a	5	2	2	4	**4**	**4**	3	4	4	4	4	5	5	5	4	4	4	**3**	**3**
E4-11	I	5	4	3	5	5	5	5	5	5	5	5	5	**5**	4	4	3	3	4	5	5	5	5	3	3	3	**3**	**4**	4	4	4	4	5	5	4	3	3	3	**3**	**3**
E4-12	R	4	4	n/a	n/a	n/a	n/a	n/a	n/a	5	5	4	5	**5**	4	4	n/a	4	5	5	5	5	3	3	3	2	**3**	3	4	3	5	4	5	5	4	3	3	2	**2**	**2**
E4-13	R	5	4	4	5	5	5	5	5	1	2	5	5	**5**	5	4	4	4	5	5	5	5	1	1	5	5	**5**	4	4	3	4	4	3	3	3	1	5	4	4	**4**
E4-14	I	4	4	4	5	5	5	5	5	5	5	5	5	**5**	4	4	4	5	5	4	4	4	4	4	4	4	**3**	4	4	4	4	4	4	4	4	4	4	3	**3**	**3**
E4-2	I	4	n/a	n/a	5	5	5	5	5	5	5	5	5	**5**	4	5	4	5	5	5	5	5	4	4	3	3	**4**	4	5	3	4	4	5	4	4	3	4	3	**3**	**3**
E4-3	I	5	n/a	5	5	5	5	5	5	5	5	5	5	**5**	4	4	4	4	5	5	5	5	5	4	3	3	**2**	4	4	4	4	4	4	4	4	3	3	3	3	**3**
E4-4	R	5	4	5	4	5	5	5	5	5	5	5	5	**5**	4	4	4	5	5	5	4	4	4	3	2	2	**2**	4	4	4	5	4	4	4	4	4	3	2	2	**2**
E4-5	I	4	4	4	4	4	5	5	5	5	5	5	4	**4**	4	5	5	4	5	5	5	5	5	5	4	4	**4**	3	4	4	3	4	4	4	4	4	4	3	3	**3**
E4-6	R	4	5	5	5	4	5	5	5	5	5	5	4	**4**	4	5	5	5	5	5	5	5	5	5	4	3	**3**	3	4	4	4	4	4	4	4	4	4	3	2	**2**
E4-7	I	5	5	5	5	5	5	5	5	5	5	5	5	**5**	4	5	5	4	4	5	5	5	4	4	4	3	**3**	4	4	4	4	4	4	4	4	4	4	3	3	**3**
E4-8	R	5	5	5	5	n/a	5	5	n/a	5	5	5	5	**5**	5	5	5	4	4	4	5	5	5	3	3	2	**3**	4	4	4	4	4	n/a	n/a	4	4	4	4	3	**3**
E4-9	I	4	2	2	4	4	5	n/a	n/a	5	n/a	n/a	n/a	n/a	4	4	4	5	5	5	n/a	4	5	5	4	4	**5**	3	4	4	4	4	3	5	5	n/a	4	4	3	**4**
E9-1	R	5	4	4	n/a	4	4	4	4	4	2	3	1	**1**	5	4	4	5	4	4	4	4	4	2	3	3	**4**	4	3	3	4	4	3	3	3	2	4	5	5	**5**
E9-2	I	5	4	4	4	4	4	4	4	4	2	3	2	**3**	4	4	4	5	5	5	5	5	5	4	4	3	**4**	4	2	3	4	3	4	4	4	2	1	3	4	**4**
E9-5	R	4	4	4	5	5	5	5	5	5	5	5	4	**4**	4	4	4	5	5	5	5	5	5	5	5	4	**3**	4	3	4	4	4	4	5	4	5	5	4	3	**3**
E9-6	I	5	4	4	5	5	5	5	5	5	5	4	4	**4**	4	4	4	4	5	5	5	5	5	5	5	4	**4**	3	3	4	4	4	4	5	5	5	5	4	3	**3**
S8-1	R	3	4	4	4	4	n/a	5	5	5	5	4	2	**2**	5	4	n/a	4	n/a	n/a	n/a	5	5	5	4	3	**3**	3	4	5	5	4	5	5	4	5	5	5	3	**3**
S8-2	I	4	4	n/a	n/a	n/a	n/a	n/a	n/a	5	5	4	4	**3**	4	4	n/a	5	5	5	5	5	4	4	3	3	**3**	4	4	5	5	4	5	5	5	3	3	2	2	**3**
S8-3	I	5	4	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	n/a	n/a	4	4	5	5	5	5	5	5	5	5	4	4	**4**	3	4	4	5	4	5	5	4	5	5	4	3	**3**
S8-4 (x)	I	5	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	n/a	n/a	5	4	3	5	5	5	5	5	4	4	4	n/a	n/a	4	3	4	4	4	5	5	4	4	4	3	n/a	n/a
S8-5	R	4	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4	3	4	5	5	5	5	4	4	4	4	**4**	5	4	5	4	4	5	5	5	4	4	3	3	**3**
S8-6	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	4	4	**4**	4	4	3	5	5	5	5	5	4	3	3	3	**2**	**2**
S8-7	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	1	5	5	5	5	5	4	4	3	3	**3**	n/a	3	5	5	5	5	5	5	4	4	3	2	**2**

^I = Impact site, R = Reference Site, *Leaf loss scale (1 through to 5 with 1 indicating denuded branches and 5 indicating a full canopy of leaves).

Appendix M Infrastructure Corridor deviation values for overall foliar cover (%)

Site	Site Type	Deviation (%)												
		2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021 - 2022	2022 - 2023	Baseline - 2023
A2-6	Impact	-20	0	13	33	0	-8	0	27	0	-9	0	-10	4
A2-5	Reference	-17	0	0	0	10	0	0	3	-13	0	0	-9	-6
A2-1	Impact	-13	-14	50	-11	0	0	13	0	0	20	0	0	71
A2-7	Reference	33	25	40	-43	50	0	0	17	0	0	25	0	150
A2-9	Impact	-71	20	67	10	0	0	0	0	0	0	-20	0	-14
A2-8	Reference	-69	60	113	-6	0	0	0	0	0	0	-15	0	14
A2-2	Impact	-18	0	11	0	0	0	0	0	13	0	-20	0	-17
A2-10	Reference	-26	0	7	0	0	0	0	0	0	0	0	-20	-23
A2-3	Impact	50	0	0	0	0	0	0	0	0	0	0	0	13
A2-11	Reference	0	0	0	0	10	0	0	0	0	0	9	-8	10
A2-4	Impact	0	25	0	0	10	0	0	0	0	0	-11	0	-8
A2-12	Reference	76	17	6	-5	14	0	0	13	0	0	0	0	65
A3-2	Impact	-40	0	0	0	0	17	0	-14	-11	0	17	-14	-18
A3-1	Reference	-53	14	0	0	0	0	-13	14	0	0	0	0	-30
A3-4	Impact	40	0	0	0	0	0	0	0	0	-14	-33	0	-37
A3-3	Reference	0	0	0	17	0	0	0	0	0	-29	0	0	-17
A3-5	Impact	-36	22	9	0	0	0	0	0	0	0	0	0	6
A3-6	Reference	-8	0	0	0	0	9	0	0	0	0	-17	-10	-21
A7b-6	Impact	80	0	0	-11	25	0	0	0	11	-13	-14	17	-9
A7b-5	Reference	-43	13	11	-20	0	50	0	0	14	0	0	0	-13
A7b-7 (x)	Impact	n/a	n/a	400	100	0	25	0	20	-9	0	n/a	n/a	n/a
A7b-9	Impact	n/a	-10	11	0	0	0	0	0	-19	0	0	0	5
A7b-8	Reference	-7	-8	8	-8	0	0	0	0	0	0	0	0	-8
E4-3	Impact	33	-13	14	0	13	0	0	0	0	0	0	0	14
E4-4	Reference	17	0	43	-20	0	0	0	0	0	0	13	0	35
E4-5	Impact	-7	0	7	0	0	0	0	-7	0	0	0	0	-2
E4-6	Reference	-19	15	7	-25	0	0	0	0	0	25	0	0	2
E4-2	Impact	-40	17	29	0	11	0	0	0	0	0	0	0	30
E4-1	Reference	-58	20	17	0	0	0	0	0	0	29	0	0	17

E4-7	Impact	-33	0	17	0	14	0	0	0	0	0	0	-13	0
E4-8	Reference	-25	0	33	0	0	13	-11	13	0	0	0	-11	20
E4-9	Impact	-25	0	0	0	0	-95	233	100	0	0	50	-17	-63
E4-10	Reference	-25	8	0	0	8	-94	400	0	0	0	25	-20	-71
E4-11	Impact	-31	-55	20	0	17	14	0	0	38	0	0	0	-25
E4-12	Reference	-40	-78	100	25	40	14	0	13	0	11	-10	-22	-19
E4-14	Impact	-33	0	13	33	0	0	0	0	0	0	0	0	29
E4-13	Reference	71	0	3	21	0	0	0	-99	25	100	0	0	-81
E9-6	Impact	-30	0	0	14	0	0	0	0	13	0	0	-11	0
E9-5	Reference	-7	-8	0	0	0	0	0	0	13	0	0	0	-8
E9-2	Impact	0	-11	-13	29	11	0	0	0	-18	0	-20	0	-8
E9-1	Reference	-17	4	-4	40	29	0	0	0	0	-33	0	-17	-7
S8-2	Impact	-12	-80	67	20	17	14	0	0	0	-13	-14	0	-49
S8-6	Reference	-29	-67	50	17	14	0	0	0	400	0	-18	-44	-55
S8-3	Impact	-25	-42	-9	9	0	14	0	0	-20	0	-25	17	-40
S8-1	Reference	-6	-63	0	0	17	0	0	14	-25	0	13	0	-31
S8-4 (x)	Impact	-54	0	0	33	0	0	0	0	17	-10	n/a	n/a	n/a
S8-7	Impact	n/a	-57	7	-6	0	0	0	33	0	0	-11	-13	-30
S8-5	Reference	33	-56	-3	-12	17	14	0	0	0	0	-11	0	-31

Appendix N All year's Raw foliar cover data for Borefield

Site name	Site type	Cover (%)																								
		Overall													Overstorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
E2-1	I	35	40	10	12	20	30	35	35	40	45	45	**45**	**45**	n/a	n/a	n/a	n/a	n/a	n/a	2	10	3	5	5	**5**	**4**
E2-2	I	40	55	50	50	50	50	50	50	50	50	50	**45**	**45**	20	10	10	15	15	15	15	15	15	15	15	**10**	**10**
E2-3	R	45	50	9	25	30	30	40	45	40	45	45	**45**	**45**	11	15	3	5	10	10	10	10	10	10	10	**10**	**5**
E2-4	R	60	70	25	30	30	35	40	40	40	45	45	**45**	**45**	4	n/a	n/a	n/a	n/a	n/a	n/a	10	n/a	1	1	**2**	**2**
E2-5	I	40	60	15	18	20	25	30	35	45	45	45	**35**	**40**	n/a	1	n/a	n/a	n/a	n/a	n/a	20	5	25	10	**10**	**10**
E2-6	R	35	55	6	15	20	20	20	30	40	40	40	**40**	**40**	5	4	n/a	n/a	n/a	2	5	15	5	5	2	**2**	**2**
M1-1	I	n/a	n/a	n/a	35	45	50	60	60	60	60	60	**30**	**30**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0**
M1-2	R	n/a	n/a	n/a	10	15	25	25	30	60	60	50	**55**	**45**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0**
M1-3	I	n/a	n/a	n/a	40	50	50	50	50	50	50	40	**30**	**20**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0**
M1-4	R	n/a	n/a	n/a	42	55	60	70	70	70	70	60	**30**	**20**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0**
T1-1	R	45	60	16	85	60	60	60	40	60	60	55	**45**	**25**	10	5	n/a	n/a	n/a	2	n/a	40	n/a	2	2	**2**	**2**
T1-2	R	40	45	25	45	40	45	45	45	40	40	30	**25**	**35**	2	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**2**
T1-3	I	30	45	27	35	35	40	40	45	40	40	40	**40**	**40**	1	1	n/a	n/a	n/a	n/a	n/a	1	n/a	0	0	**0**	**0**
T1-4	I	45	40	12	50	45	45	45	60	50	40	30	**30**	**30**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0**
X1-1	I	40	70	15	20	25	35	35	40	35	35	35	**35**	**35**	10	10	5	5	5	5	5	5	5	5	5	**5**	**5**
X1-10	R	40	55	53	70	60	65	65	65	65	55	55	**55**	**55**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0**
X1-11	I	65	60	10	30	30	35	40	40	50	50	50	**50**	**50**	4	5	n/a	n/a	n/a	n/a	n/a	15	n/a	2	0	**0.25**	**0.5**
X1-12	R	35	45	25	35	35	40	45	45	50	50	50	**50**	**50**	15	5	n/a	n/a	n/a	n/a	3	40	3	5	5	**5**	**5**
X1-13	I	35	65	8	25	25	30	35	35	35	35	30	**35**	**35**	n/a	n/a	n/a	n/a	n/a	n/a	2	2	2	3	2	**3**	**2**
X1-14	R	70	55	10	28	35	40	45	45	45	25	40	**40**	**40**	2	3	n/a	n/a	n/a	n/a	n/a	n/a	2	2	2	**2**	**2**
X1-15	I	35	50	4	10	20	25	30	30	35	40	35	**35**	**35**	10	3	n/a	n/a	n/a	n/a	n/a	10	3	10	10	**10**	**5**
X1-16	R	40	55	3	8	15	20	25	25	25	20	25	**25**	**30**	3	n/a	n/a	n/a	n/a	n/a	n/a	10	n/a	3	4	**4**	**4**
X1-2	R	75	40	4	10	10	20	20	25	25	25	25	**25**	**25**	3	2	n/a	1	1	3	5	10	5	5	5	**5**	**5**
X1-3	I	75	50	50	45	45	45	45	45	45	45	50	**50**	**50**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	3	2	**2**	**2**
X1-4	I	35	50	20	45	35	40	40	40	40	40	40	**45**	**45**	8	7	n/a	n/a	n/a	n/a	n/a	n/a	4	4	4	**4**	**4**
X1-5	R	50	50	25	55	55	55	55	55	55	55	60	**55**	**55**	3	2	n/a	n/a	n/a	n/a	n/a	n/a	20	20	20	**15**	**15**
X1-6	R	35	45	45	70	70	70	70	70	1	2	5	**15**	**15**	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	0	0	**0**	**0**
X1-7	I	50	40	10	35	25	25	25	30	25	25	45	**55**	**55**	3	7	5	5	3	n/a	1	20	2	2	2	**4**	**4**
X1-8	R	50	55	12	40	20	30	30	30	45	45	55	**55**	**50**	5	5	1	2	n/a	n/a	n/a	n/a	2	2	2	**2**	**3**
X1-9	I	50	60	10	20	25	30	35	35	35	35	35	**35**	**35**	5	2	n/a	n/a	n/a	n/a	n/a	n/a	2	2	2	**2**	**2**

Site name	Site type	Cover (%)																								
		Midstorey													Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
E2-1	I	5	2	5	2	20	25	25	25	25	35	35	**30**	**30**	35	40	5	10	2	5	10	5	15	10	15	**15**	**15**
E2-2	I	40	20	20	25	25	25	25	25	25	20	20	**15**	**15**	40	25	25	20	20	20	20	20	20	25	25	**25**	**25**
E2-3	R	10	5	1	1	2	2	5	10	5	5	5	**5**	**10**	35	30	5	20	25	25	35	35	35	35	35	**35**	**35**
E2-4	R	5	20	10	10	15	20	25	30	25	30	30	**30**	**30**	30	60	15	20	15	15	15	n/a	15	15	15	**15**	**15**
E2-5	I	35	25	n/a	10	15	15	20	25	20	5	1	**1**	**1**	15	50	15	8	10	20	20	n/a	30	15	20	**25**	**30**
E2-6	R	5	3	n/a	10	15	15	15	20	5	5	2	**2**	**2**	30	50	6	5	5	5	10	5	40	40	35	**35**	**35**
M1-1	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0.25**	n/a	n/a	n/a	35	45	50	60	60	60	60	60	**30**	**30**
M1-2	R	n/a	n/a	n/a	2	4	2	25	30	40	40	40	**50**	**40**	n/a	n/a	n/a	8	10	25	10	10	20	20	15	**10**	**5**
M1-3	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	**0**	**0.5**	n/a	n/a	n/a	40	50	50	50	50	50	50	40	**30**	**20**
M1-4	R	n/a	n/a	n/a	2	5	3	5	5	5	5	3	**3**	**5**	n/a	n/a	n/a	40	50	60	70	70	70	70	60	**25**	**15**
T1-1	R	10	15	1	1	2	2	5	5	15	10	10	**10**	**10**	30	40	15	80	60	60	60	n/a	50	50	45	**35**	**10**
T1-2	R	3	6	2	2	3	5	5	5	10	10	10	**10**	**10**	40	40	25	45	40	40	40	40	30	25	20	**15**	**25**
T1-3	I	25	7	2	5	5	5	5	10	5	5	5	**5**	**5**	20	40	25	30	30	35	35	40	35	35	35	**35**	**35**
T1-4	I	35	20	2	1	5	5	5	10	15	15	10	**10**	**10**	10	20	12	50	40	40	40	60	25	25	25	**25**	**25**
X1-1	I	25	15	n/a	15	25	25	30	35	30	30	30	**25**	**25**	35	60	12	3	3	5	5	5	20	20	20	**20**	**20**
X1-10	R	14	25	20	30	30	30	30	30	30	30	30	**30**	**30**	27	50	45	50	45	45	45	45	45	45	45	**40**	**40**
X1-11	I	12	6	5	20	25	35	30	30	35	35	30	**30**	**30**	30	55	5	15	5	4	10	n/a	15	15	15	**15**	**20**
X1-12	R	5	2	1	1	4	5	5	5	10	10	10	**10**	**10**	25	40	25	35	35	35	40	5	30	35	35	**35**	**25**
X1-13	I	7	3	3	2	2	5	10	10	10	10	10	**10**	**10**	25	65	5	25	25	25	25	25	25	25	20	**25**	**25**
X1-14	R	25	15	3	3	1	2	5	10	5	5	10	**10**	**10**	45	40	7	25	35	40	40	40	40	20	35	**35**	**35**
X1-15	I	30	5	2	8	20	20	20	20	25	20	15	**15**	**15**	5	45	2	2	2	5	10	5	10	10	10	**10**	**15**
X1-16	R	35	1	1	4	15	15	15	20	15	10	10	**10**	**10**	10	55	3	4	2	5	10	n/a	10	10	15	**15**	**20**
X1-2	R	10	6	n/a	5	5	10	15	15	15	15	15	**15**	**10**	25	40	4	4	4	5	5	5	20	20	20	**20**	**20**
X1-3	I	2	4	2	5	5	5	10	10	10	10	5	**5**	**4**	75	45	15	40	40	40	40	40	40	40	45	**45**	**45**
X1-4	I	8	6	1	5	3	5	10	10	10	25	20	**15**	**15**	25	40	20	45	45	35	35	35	30	25	25	**25**	**25**
X1-5	R	10	5	n/a	25	25	25	25	30	15	15	15	**15**	**15**	40	45	25	30	30	30	30	30	25	30	35	**35**	**35**
X1-6	R	5	5	5	25	25	25	25	25	5	5	5	**3**	**2**	25	45	45	55	50	50	50	50	0.1	2	4	**10**	**10**
X1-7	I	5	7	1	5	5	5	10	10	20	25	20	**15**	**20**	40	25	7	25	20	20	20	1	30	30	35	**35**	**35**
X1-8	R	25	6	1	2	5	10	15	20	25	25	25	**30**	**30**	20	50	10	35	20	20	25	25	25	25	30	**25**	**20**
X1-9	I	15	15	2	2	2	3	5	5	5	5	5	**4**	**4**	30	50	8	20	25	30	35	35	25	30	30	**30**	**35**

Appendix O All year's Raw folia condition data (Browning Scale) for Borefield

Site name	Type	Browning scale*																																					
		Overstorey													Midstorey														Understorey											
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
E2-1	I	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	2	**2**	**1**	1	2	1	2	2	1	1	1	2	2	2	**2**	**2**
E2-2	I	1	1	1	1	1	1	1	1	1	1	1	**2**	**1**	1	1	1	1	1	1	1	1	1	1	1	**2**	**1**	2	2	2	2	2	2	1	2	2	2	2	**2**	**2**
E2-3	R	1	1	1	1	1	1	1	1	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	1	**1**	**1**	1	2	1	2	2	1	1	2	1	2	2	**2**	**2**
E2-4	R	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	1	**1**	**1**	1	2	1	2	2	1	1	1	2	2	2	**2**	**2**
E2-5	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	**1**	**1**	1	1	n/a	1	1	1	1	1	2	3	3	**3**	**2**	1	2	1	2	2	2	2	2	2	2	2	**2**	**2**
E2-6	R	1	1	n/a	n/a	n/a	1	1	1	1	1	1	1	**1**	1	1	n/a	1	1	1	1	1	2	2	2	1	**2**	1	2	1	2	1	2	2	2	2	2	2	**2**	**2**
M1-1	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a	2	2	2	2	2	2	3	3	3	**2**
M1-2	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	3	1	1	2	2	1	**1**	**1**	n/a	n/a	n/a	2	1	2	2	2	3	3	3	**2**	**3**
M1-3	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	n/a	n/a	2	1	2	2	2	2	3	3	3	**2**
M1-4	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	2	2	2	1	2	2	**1**	**1**	n/a	n/a	n/a	2	2	2	2	2	3	3	3	**3**	**3**
T1-1	R	1	1	n/a	n/a	n/a	1	n/a	n/a	n/a	1	1	**1**	**1**	1	1	3	1	1	2	1	1	2	3	2	**2**	**1**	2	2	1	2	2	n/a	2	1	2	3	2	**2**	**3**
T1-2	R	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**1**	1	1	1	1	1	1	1	1	1	2	2	**1**	**2**	1	2	1	3	1	2	2	2	2	3	2	**2**	**2**
T1-3	I	1	1	n/a	n/a	n/a	n/a	n/a	2	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	1	1	1	2	2	2	**1**	**2**	1	1	2	2	1	1	1	1	1	2	2	**2**	**2**
T1-4	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	2	1	1	1	1	2	2	2	2	**2**	1	2	1	2	1	2	1	2	1	2	2	**2**	**2**
X1-1	I	1	1	2	1	1	1	1	1	1	2	2	**1**	**1**	1	1	n/a	1	1	1	1	1	2	2	2	2	**2**	1	2	1	2	2	2	2	2	2	2	2	**2**	**2**
X1-10	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	2	1	1	1	1	1	1	2	2	**2**	1	2	2	2	2	2	2	2	2	2	2	**3**	**3**
X1-11	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	n/a	**1**	**1**	1	1	1	1	1	1	1	1	1	1	2	**1**	**1**	1	2	1	2	2	1	1	1	1	2	2	**2**	**2**
X1-12	R	1	1	n/a	n/a	n/a	n/a	1	1	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	2	**1**	**2**	1	2	1	2	2	1	2	2	2	3	2	**2**	**2**
X1-13	I	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	1	1	**2**	**1**	1	1	1	1	1	1	1	1	1	1	1	**1**	**2**	1	2	1	2	2	1	1	1	2	2	2	**2**	**2**
X1-14	R	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	2	**2**	**2**	1	2	1	3	1	1	1	1	2	3	3	**3**	**2**
X1-15	I	1	1	n/a	n/a	n/a	n/a	n/a	1	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	2	**2**	**2**	1	2	2	2	2	2	1	1	1	1	2	**2**	**2**
X1-16	R	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	2	2	**2**	**2**	1	2	2	2	2	2	1	1	1	2	2	**2**	**2**
X1-2	R	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	n/a	1	1	1	1	1	1	1	2	1	**1**	1	2	2	2	1	2	2	2	2	2	2	2	**2**
X1-3	I	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	2	2	2	**1**	**1**	1	2	2	2	1	2	2	2	2	3	2	**2**	**2**
X1-4	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	2	1	**2**	**2**	1	2	1	2	1	2	2	2	2	2	2	**2**	**2**
X1-5	R	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	2	**2**	1	1	n/a	1	1	1	1	1	2	2	2	2	**2**	1	2	1	2	2	2	2	2	2	3	3	2	**1**
X1-6	R	n/a	n/a	n/a	n/a	n/a	n/a	1	1	3	n/a	n/a	n/a	n/a	1	1	1	1	1	1	1	1	1	3	3	2	2	**2**	1	2	2	1	2	2	2	2	3	1	1	1	**2**
X1-7	I	1	1	1	1	1	1	1	1	1	n/a	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	1	1	**1**	**1**	1	2	1	2	1	1	2	2	2	2	2	**2**	**2**
X1-8	R	1	1	1	1	n/a	n/a	n/a	n/a	1	1	1	1	**1**	1	1	1	1	1	1	1	1	1	1	1	1	**1**	**1**	1	2	1	2	1	2	2	2	2	2	2	**2**	**2**
X1-9	I	1	1	n/a	n/a	n/a	n/a	n/a	n/a	1	1	1	**1**	**1**	1	1	1	1	1	1	1	1	1	1	2	**2**	**1**	1	2	1	2	1	1	1	1	2	2	2	**2**	**2**

^I = Impact site, R = Reference Site, *Browning Scale 1 = Green (Healthy), 2 = Yellow (Senescent), 3 = Brown (Dead or dying foliage)

Appendix P All year's Raw foliar condition data (Leaf Loss Scale) for Borefield

Site name	Type	Leaf loss**																																					
		Overstorey													Midstorey													Understorey													
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	**2022**	**2023**
E2-1	I	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	5	4	**5**	**5**	4	4	4	5	5	5	5	5	5	4	4	**3**	**4**	4	3	4	4	4	5	5	5	4	4	4	**3**	**3**
E2-2	I	4	4	4	5	5	5	5	5	5	5	5	**3**	**3**	4	4	4	5	5	5	5	5	5	5	4	**4**	**4**	3	3	3	3	4	4	4	4	4	4	4	**3**	**4**
E2-3	R	5	5	3	5	4	5	5	5	5	5	5	**5**	**5**	4	5	5	5	5	5	5	5	5	5	4	**4**	**5**	4	3	5	4	5	5	5	4	5	5	4	**3**	**3**
E2-4	R	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4	**5**	**4**	5	5	5	5	5	5	5	5	5	4	4	**4**	**4**	5	4	5	4	4	5	5	5	4	3	3	**3**	**3**
E2-5	I	5	5	n/a	n/a	n/a	n/a	n/a	n/a	5	5	4	**4**	**4**	5	5	n/a	4	5	5	5	5	3	2	1	**1**	**3**	5	4	4	3	5	5	4	4	3	3	3	**3**	**3**
E2-6	R	5	4	n/a	n/a	n/a	5	5	5	5	5	4	4	**5**	5	4	n/a	5	5	5	5	5	3	3	3	4	**4**	5	2	5	4	5	4	4	4	3	3	3	**3**	**3**
M1-1	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**5**	n/a	n/a	n/a	4	4	1	4	4	3	2	2	2	**3**
M1-2	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	2	4	4	4	4	5	**5**	**5**	n/a	n/a	n/a	4	4	4	4	4	2	2	2	**3**	**2**
M1-3	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**4**	n/a	n/a	n/a	3	4	4	4	4	3	2	2	2	**2**
M1-4	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	2	3	3	4	4	3	3	**4**	n/a	n/a	n/a	5	4	4	4	4	2	2	2	1	**2**
T1-1	R	5	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	5	5	4	1	5	5	5	5	5	4	2	2	3	**4**	5	3	5	4	4	4	4	4	3	2	3	**3**	**2**
T1-2	R	5	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	4	5	5	5	5	5	5	5	4	4	4	**3**	5	3	5	3	4	4	4	4	3	2	2	3	**3**
T1-3	I	5	4	n/a	n/a	n/a	n/a	n/a	4	n/a	n/a	n/a	n/a	n/a	5	4	3	4	5	5	5	5	4	4	4	4	**4**	4	4	3	4	5	5	5	5	5	4	3	3	**3**
T1-4	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4	5	3	5	5	5	5	4	3	3	3	**3**	4	3	5	3	5	4	5	4	5	5	3	3	**3**
X1-1	I	5	4	4	3	5	5	5	5	4	3	3	4	3	5	4	n/a	4	5	4	4	5	4	3	3	3	**3**	5	4	4	4	5	4	4	4	3	3	3	3	**3**
X1-10	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	4	5	5	5	5	5	5	5	4	3	**3**	4	4	3	4	4	5	4	4	4	4	4	2	**2**
X1-11	I	4	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	n/a	5	5	4	4	5	5	4	5	5	4	5	3	4	4	**4**	4	4	5	4	4	5	5	5	5	5	3	3	**3**
X1-12	R	5	4	n/a	n/a	n/a	n/a	5	5	5	5	4	4	**4**	5	4	5	5	5	5	5	5	5	5	4	4	**3**	4	3	5	4	4	5	4	4	3	3	3	3	**3**
X1-13	I	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	4	4	**4**	**4**	5	4	5	5	5	5	5	5	5	5	4	4	**4**	3	5	4	5	4	4	5	5	5	5	4	3	**3**	**3**
X1-14	R	4	3	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	**5**	**5**	4	4	5	5	5	5	5	5	5	5	4	4	**4**	4	4	4	4	5	5	5	4	4	2	2	**2**	**3**
X1-15	I	5	4	n/a	n/a	n/a	n/a	n/a	5	5	5	5	**5**	**5**	5	4	3	4	5	5	5	5	5	5	4	4	**3**	5	4	3	4	4	4	5	5	5	5	4	3	**3**
X1-16	R	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4	4	**4**	5	4	5	5	5	5	5	5	5	3	3	4	**3**	5	3	3	4	5	5	5	5	5	3	3	3	**3**
X1-2	R	5	4	5	4	5	5	5	5	5	5	5	5	**5**	5	4	n/a	5	5	4	4	4	4	4	4	4	**4**	5	4	4	4	5	4	4	5	3	3	3	3	**3**
X1-3	I	4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	**5**	**5**	4	5	5	5	4	5	5	5	4	**3**	**3**	**4**	**4**	4	4	4	4	4	4	4	4	3	2	3	**3**	**3**
X1-4	I	5	4	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	**5**	**5**	5	4	5	5	5	5	5	5	4	**3**	**4**	**4**	**4**	5	4	4	3	4	4	4	4	3	3	3	**3**	**3**
X1-5	R	4	4	n/a	n/a	n/a	n/a	n/a	n/a	5	4	4	4	**5**	4	4	n/a	5	4	5	5	5	4	**3**	**3**	**3**	**3**	4	4	5	4	4	4	4	4	3	3	3	**3**	**4**
X1-6	R	n/a	n/a	n/a	n/a	n/a	n/a	5	5	1	1	n/a	n/a	n/a	5	4	4	5	5	5	5	5	1	**1**	**3**	**3**	**3**	5	4	3	4	4	4	4	4	1	4	4	4	**3**
X1-7	I	5	4	4	5	4	5	5	5	5	5	5	5	**5**	4	4	4	5	5	4	5	5	4	**4**	**4**	**4**	**4**	4	3	5	3	4	4	4	4	3	3	3	**3**	**3**
X1-8	R	4	4	5	5	n/a	n/a	n/a	n/a	5	5	5	5	**5**	4	4	4	5	5	5	5	5	5	**4**	**4**	**4**	**4**	4	3	5	3	4	4	4	4	3	2	3	3	**3**
X1-9	I	4	5	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	5	**5**	5	5	5	5	5	5	5	5	5	**5**	**4**	**3**	**4**	5	4	4	4	5	5	5	5	5	5	4	**4**	**4**

^I = Impact site, R = Reference Site, *Leaf loss scale (1 through to 5 with 1 indicating denuded branches and 5 indicating a full canopy of leaves).

Appendix Q Borefield deviation values for overall foliar cover (%)

Site	Site Type	Deviation (%)												
		2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020	2020 - 2021	2021- 2022	2022 - 2023	Baseline - 2023
E2-5	Impact	50	-75	20	11	25	20	17	29	0	0	-22	14	4
E2-6	Reference	57	-89	150	33	0	0	50	33	0	0	0	0	25
E2-1	Impact	14	-75	20	67	50	17	0	14	0	0	0	0	59
E2-4	Reference	17	-64	20	0	17	14	0	0	0	0	0	0	-13
E2-2	Impact	38	-9	0	0	0	0	0	0	13	0	-10	0	-7
E2-3	Reference	11	-82	178	20	0	33	13	-11	13	0	0	0	30
M1-1	Impact	n/a	n/a	n/a	29	11	20	0	0	0	0	-50	-33	-57
M1-2	Reference	n/a	n/a	n/a	50	67	0	20	100	13	-17	10	-33	-62
M1-3	Impact	n/a	n/a	n/a	25	0	0	0	0	14	-20	-25	0	-31
M1-4	Reference	n/a	n/a	n/a	31	9	17	0	0	-20	-14	-50	-18	170
T1-3	Impact	50	-40	30	0	14	0	0	0	0	0	0	0	18
T1-1	Reference	33	-73	431	-29	0	0	0	0	0	-8	-18	-44	-38
T1-4	Impact	-11	-70	317	-10	0	0	0	11	0	-25	0	0	-7
T1-2	Reference	13	-44	80	-11	13	0	0	-11	0	-25	-17	40	-5
X1-1	Impact	75	-79	33	25	40	0	14	-13	-20	0	0	0	-16
X1-2	Reference	-47	-90	150	0	100	0	25	0	0	0	0	0	-37
X1-15	Impact	43	-92	150	100	25	20	0	17	0	-13	0	0	18
X1-16	Reference	38	-95	167	88	33	25	0	0	-44	25	0	20	-8
X1-11	Impact	-8	-83	200	0	17	14	0	25	0	0	0	0	11
X1-12	Reference	29	-44	40	0	14	13	0	11	-15	0	0	0	43
X1-13	Impact	86	-88	213	0	20	17	0	0	0	-14	17	0	-3
X1-14	Reference	-21	-82	180	25	14	13	0	0	0	60	0	0	-11
X1-9	Impact	20	-83	100	25	20	17	0	0	0	0	0	0	-13
X1-10	Reference	38	-4	32	-14	8	0	0	0	100	0	0	0	11
X1-7	Impact	-20	-75	250	-29	0	0	20	-17	0	80	22	0	65
X1-8	Reference	10	-78	233	-50	50	0	0	50	0	22	0	-9	28
X1-4	Impact	43	-60	125	-22	14	0	0	0	0	0	13	0	29
X1-6	Reference	29	0	56	0	0	0	0	-99	0	150	200	0	-64
X1-3	Impact	-33	0	-10	0	0	0	0	0	0	11	0	0	-14
X1-5	Reference	0	-50	120	0	0	0	0	0	0	9	-8	0	32

Appendix R All year's Indicator species cover and abundance data

Area	Site type	Site	Indicator species*	2015 Cover (%)	2016 Cover (%)	2017 Cover (%)	2018 Cover (%)	2019 Cover (%)	2020 Cover (%)	2021 Cover (%)	2022 Cover (%)	2023 Cover (%)	2015 No. plants	2016 No. plants	2017 No. plants	2018 No. plants	2019 No. plants	2020 No. Plants	2021 No. Plants	2022 No. Plants	2023 No. Plants
Borefield	Impact	E2-1	*Triodia basedowii*	1	3	5	5	4	5	10	10	10	30 to 40	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	100 to 200	100 to 200
Borefield	Impact	E2-2	*Eucalyptus gongylocarpa*	15	15	15	15	15	15	15	10	10	2	2	2	2	2	2	2	2	2
Borefield	Reference	E2-3	*Eucalyptus gongylocarpa*	10	10	10	10	10	10	10	10	5	1	1	1	1	1	1	1	1	1
Borefield	Reference	E2-4	*Triodia basedowii*	1	3	3	5	10	10	10	10	15	40 to 50	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	100 to 200	100 to 200
Borefield	Impact	E2-5	*Triodia basedowii*	4	4	4	10	15	15	15	20	25	400 to 500	400 to 500	400 to 500	400 to 500	200 to 300	200 to 300	100 to 200	100 to 200	100 to 200
Borefield	Reference	E2-6	*Triodia basedowii*	2	2	2	2	25	30	30	30	30	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300
Borefield	Impact	M1-1	*Triodia basedowii*	5	5	10	10	20	20	20	30	30	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Borefield	Reference	M1-2	*Triodia basedowii*	2	2	5	5	5	5	4	4	3	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20
Borefield	Impact	M1-3	*Seringia velutina*	40	50	50	50	35	35	20	10	3	100 to 200	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	100 to 200	30 to 40
Borefield	Impact	M1-3	*Triodia basedowii*	0.75							20	20	20 to 30							200 to 300	200 to 300
Borefield	Reference	M1-4	*Seringia velutina*	40	50	50	50	50	50	40	20	10	100 to 200	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	100 to 200
Borefield	Reference	M1-4	*Triodia basedowii*	0.5							5	5	5 to 10							20 to 30	20 to 30
Borefield	Reference	T1-1	*Seringia velutina*	5	5	5	5	5	2	2	2	0	50 to 100	50 to 100	50 to 100	50 to 100	40 to 50	40 to 50	50 to 100	40 to 50	0
Borefield	Reference	T1-1	*Triodia sp.*									5									100 to 200
Borefield	Reference	T1-2	*Seringia velutina*	10	20	20	20	20	15	10	5	2	50 to 100	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	40 to 50
Borefield	Reference	T1-2	*Triodia sp.*									20									300 to 400
Borefield	Impact	T1-3	*Seringia velutina*	10	10	10	10	10	10	5	4	2	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	40 to 50
Borefield	Impact	T1-4	*Seringia velutina*	2	8	8	10	10	5	5	3	3	10 to 20	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	40 to 50	40 to 50
Borefield	Impact	X1-1	*Triodia basedowii*	3	3	3	5	20	20	20	20	20	200 to 300	200 to 300	200 to 300	200 to 300	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Borefield	Reference	X1-10	*Triodia basedowii*	45	45	45	45	45	45	45	40	40	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	400 to 500	400 to 500
Borefield	Impact	X1-11	*Eucalyptus gongylocarpa*	10								15	30 to 40								40 to 50
Borefield	Impact	X1-11	*Seringia velutina*	1	2	2	3	2	2	2	1	0.25	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	20 to 30	10 to 20	5
Borefield	Reference	X1-12	*Eucalyptus gongylocarpa*	5								0.1	5 to 10								0
Borefield	Reference	X1-12	*Seringia velutina*	20	25	25	25	20	20	15	15	5	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	200 to 300	200 to 300	200 to 300
Borefield	Impact	X1-13	*Seringia velutina*	5	5	5	5	5	5	1	2	2	100 to 200	100 to 200	100 to 200	50 to 100	100 to 200	100 to 200	10 to 20	10 to 20	10 to 20
Borefield	Impact	X1-13	*Triodia basedowii*	2						15	20	20	100 to 200						100 to 200	100 to 200	100 to 200
Borefield	Reference	X1-14	*Seringia velutina*	10	15	15	15	15	0	0	0	0	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	0	0	0
Borefield	Reference	X1-14	*Triodia basedowii*	1						10	10	15	100 to 200						200 to 300	200 to 300	200 to 300
Borefield	Impact	X1-15	*Triodia basedowii*	1	2	5	5	4	5	5	5	10	40 to 50	40 to 50	40 to 50	40 to 50	40 to 50	40 to 50	40 to 50	40 to 50	40 to 50
Borefield	Reference	X1-16	*Triodia basedowii*	1	3	3	5	4	10	15	15	15	30 to 40	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	100 to 200	100 to 200
Borefield	Reference	X1-2	*Triodia basedowii*	3	3	3	5	20	20	20	20	20	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400	200 to 300	100 to 200	100 to 200	100 to 200
Borefield	Impact	X1-3	*Anthotroche pannosa*	5						2	2	1	10 to 20						20 to 30	20 to 30	10 to 20
Borefield	Impact	X1-3	*Seringia velutina*	0.5	5	5	5	5	1	0	0	0	10 to 20	10 to 20	10 to 20	10 to 20	20 to 30	10 to 20	0	0	0
Borefield	Impact	X1-4	*Triodia basedowii*	1	3	3	3	20	20	25	25	25	100 to 200	100 to 200	100 to 200	100 to 200	200 to 300	200 to 300	200 to 300	200 to 300	300 to 400
Borefield	Reference	X1-5	*Anthotroche pannosa*							2	2	1							10 to 20	10 to 20	5 to 10
Borefield	Reference	X1-5	*Seringia velutina*	0.75	0.75	0.75	1	5	3	0	0	0	10 to 20	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	0	0	0
Borefield	Reference	X1-6	*Triodia basedowii*	50	50	50	50	0	0	0.5	2	3	500 to 1000	500 to 1000	500 to 1000	500 to 1000	0	200 to 300	200 to 300	300 to 400	300 to 400
Borefield	Impact	X1-7	*Triodia basedowii*	5	5	5	10	25	30	35	35	35	50 to 100	50 to 100	50 to 100	100 to 200	200 to 300	200 to 300	300 to 400	300 to 400	300 to 400
Borefield	Reference	X1-8	*Triodia basedowii*	0	5	5	10	20	20	25	20	15	10 to 20	50 to 100	50 to 100	50 to 100	200 to 300	200 to 300	300 to 400	200 to 300	200 to 300
Borefield	Impact	X1-9	*Triodia basedowii*	10	15	20	20	25	30	30	35	35	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	300 to 400	300 to 400	300 to 400
Inf. Corridor	Impact	A2-1	*Triodia desertorum*	5	5	5	5	5	5	5	10	10	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100
Inf. Corridor	Reference	A2-10	*Aluta maisonneuvei* subsp. *auriculata*	25	25	25	25	25	25	10	10	10	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100
Inf. Corridor	Reference	A2-11	*Acacia aneura*	25	25	25	25	25	25	25	25	25	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	20 to 30
Inf. Corridor	Reference	A2-12	*Aluta maisonneuvei* subsp. *auriculata*	25	30	30	30	35	35	35	35	35	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Inf. Corridor	Impact	A2-2	*Aluta maisonneuvei* subsp. *auriculata*	25	25	25	25	30	30	5	4	3	300 to 400	300 to 400	300 to 400	300 to 400	200 to 300	50 to 100	50 to 100	40 to 50	40 to 50
Inf. Corridor	Impact	A2-3	*Acacia aneura*	70	70	70	70	70	70	70	35	35	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	20 to 30	20 to 30	20 to 30
Inf. Corridor	Impact	A2-4	*Aluta maisonneuvei* subsp. *auriculata*	25	30	30	30	30	40	35	35	35	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Inf. Corridor	Reference	A2-5	*Triodia scariosa*	20	20	20	20	20	20	15	10	10	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Inf. Corridor	Impact	A2-6	*Triodia scariosa*	20	20	20	20	20	20	15	10	10	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100
Inf. Corridor	Reference	A2-7	*Triodia desertorum*	1	3	3	3	4	5	5	10	10	40 to 50	40 to 50	40 to 50	40 to 50	40 to 50	50 to 100	50 to 100	50 to 100	50 to 100
Inf. Corridor	Reference	A2-8	*Allocasuarina spinosissima*	35	35	35	35	35	35	30	30	30	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400	200 to 300	200 to 300
Inf. Corridor	Impact	A2-9	*Allocasuarina spinosissima*	25	25	25	30	30	30	30	30	25	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400	100 to 200	100 to 200

Area	Site type	Site	Indicator species*	2015 Cover (%)	2016 Cover (%)	2017 Cover (%)	2018 Cover (%)	2019 Cover (%)	2020 Cover (%)	2021 Cover (%)	2022 Cover (%)	2023 Cover (%)	2015 No. plants	2016 No. plants	2017 No. plants	2018 No. plants	2019 No. plants	2020 No. Plants	2021 No. Plants	2022 No. Plants	2023 No. Plants
Inf. Corridor	Reference	A3-1	*Eremophila clarkei*	1	1	1	1	1	1	1	0.75	0.25	5 to 10	5 to 10	5 to 10	5 to 10	3	3	3	2	2
Inf. Corridor	Reference	A3-1	*Ptilotus obovatus*	5						1	2	0.5	40 to 50						10 to 20	20 to 30	20 to 30
Inf. Corridor	Impact	A3-2	*Eremophila clarkei*	1	1	1	1	0	0	0.1	0.25	0.25	5 to 10	5 to 10	5 to 10	5 to 10	0	0	1	1	1
Inf. Corridor	Impact	A3-2	*Ptilotus obovatus*	10						0.25	0.25	0.1	100 to 200						5 to 10	5 to 10	2
Inf. Corridor	Reference	A3-3	*Acacia tetragonophylla*	2	2	2	2	2	2	2	1	1	3	3	3	3	4	4	3	3	4
Inf. Corridor	Impact	A3-4	*Acacia tetragonophylla*	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	3	4	4
Inf. Corridor	Impact	A3-5	*Dodonaea lobulata*	10	10	10	10	10	10	5	2	1	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	5 to 10	3	3
Inf. Corridor	Impact	A3-5	*Scaevola spinescens*									10									20 to 30
Inf. Corridor	Reference	A3-6	*Dodonaea lobulata*	15	15	15	15	15	10	4	1	0	50 to 100	50 to 100	50 to 100	50 to 100	40 to 50	30 to 40	5 to 10	2	0
Inf. Corridor	Reference	A3-6	*Scaevola spinescens*									5									10 to 20
Inf. Corridor	Reference	A7b-5	*Aluta maisonneuvei* subsp. *auriculata*	5	5	5	5	5	5	4	4	3	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	10 to 20	10 to 20	10 to 20	10 to 20
Inf. Corridor	Impact	A7b-6	*Aluta maisonneuvei* subsp. *auriculata*	3	3	3	3	3	3	3	1	1	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	10 to 20	3	2
Inf. Corridor	Impact	A7b-7	*Aluta maisonneuvei* subsp. *auriculata*	3	3	3	3	20	25	25			100 to 200	100 to 200	100 to 200	100 to 200	200 to 300	200 to 300	200 to 300	<Null>	<Null>
Inf. Corridor	Reference	A7b-8	*Aluta maisonneuvei* subsp. *auriculata*	5	5	5	5	15	15	10	10	10	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40
Inf. Corridor	Impact	A7b-9^	*Aluta maisonneuvei* subsp. *auriculata*	20	20	20	30	25	25	20	20	15	50 to 100	50 to 100	50 to 100	50 to 100	40 to 50	40 to 50	40 to 50	40 to 50	30 to 40
Inf. Corridor	Reference	E4-1	*Allocasuarina spinosissima*	2	2	2	5	4	4	3	4	4	5 to 10	5 to 10	5 to 10	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20
Inf. Corridor	Reference	E4-10	*Triodia rigidissima*	45	50	0	0	0	0	0.25	0.5	0.5	500 to 1000	500 to 1000	5 to 10	5 to 10	20 to 30	10 to 20	20 to 30	20 to 30	20 to 30
Inf. Corridor	Impact	E4-11	*Triodia rigidissima*	20	20	20	20	20	20	20	20	20	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Inf. Corridor	Reference	E4-12	*Triodia rigidissima*	5	6	6	5	10	15	15	15	15	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	100 to 200
Inf. Corridor	Reference	E4-13	*Triodia rigidissima*	50	50	50	50	0	2	4	5	5	500 to 1000	500 to 1000	500 to 1000	500 to 1000	0	50 to 100	300 to 400	300 to 400	300 to 400
Inf. Corridor	Impact	E4-14	*Triodia rigidissima*	50	50	50	50	50	50	50	40	35	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400	200 to 300	100 to 200
Inf. Corridor	Impact	E4-2	*Allocasuarina spinosissima*	25	30	30	25	25	25	25	25	30	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400	200 to 300	100 to 200
Inf. Corridor	Impact	E4-3	*Leptosema chambersii*	3	3	3	3	3	3	3	1	0.25	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	30 to 40	4
Inf. Corridor	Impact	E4-3	*Triodia desertorum*	20							15	15	100 to 200							100 to 200	100 to 200
Inf. Corridor	Reference	E4-4	*Leptosema chambersii*	1	1	1	1	1	1	0.5	0	0	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	40 to 50	0	0
Inf. Corridor	Reference	E4-4	*Triodia desertorum*	25							35	35	200 to 300							200 to 300	200 to 300
Inf. Corridor	Impact	E4-5	*Callitris preissii*	1	1	1	1	1	1	2	2	1	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	20 to 30	20 to 30	10 to 20
Inf. Corridor	Reference	E4-6	*Callitris preissii*	0	1	1	1	1	1	1	2	2	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	10 to 20	10 to 20	10 to 20
Inf. Corridor	Impact	E4-7	*Triodia desertorum*	25	25	25	25	25	25	20	15	10	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	50 to 100
Inf. Corridor	Reference	E4-8	*Triodia desertorum*	10	10	10	10	10	15	15	15	15	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	100 to 200	100 to 200
Inf. Corridor	Impact	E4-9	*Triodia rigidissima*	50	50	0	0	0	0	0.1	0.5	0.5	500 to 1000	500 to 1000	5 to 10	5 to 10	1	5 to 10	5 to 10	10 to 20	10 to 20
Inf. Corridor	Reference	E9-1	*Acacia aneura*	15	15	15	15	15	15	15	10	10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10
Inf. Corridor	Impact	E9-2	*Acacia aneura*	10	10	10	10	15	15	15	15	15	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	20 to 30	20 to 30	20 to 30
Inf. Corridor	Reference	E9-5	*Triodia scariosa*	35	35	35	35	40	40	40	30	30	300 to 400	300 to 400	300 to 400	300 to 400	300 to 400	300 to 400	300 to 400	200 to 300	200 to 300
Inf. Corridor	Impact	E9-6	*Triodia scariosa*	20	20	20	20	20	20	20	20	20	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	50 to 100	50 to 100
Inf. Corridor	Reference	S8-1	*Triodia rigidissima*	5	5	5	5	35	35	35	35	35	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400
Inf. Corridor	Impact	S8-2	*Grevillea juncifolia*	1							0	0	1							0	0
Inf. Corridor	Impact	S8-2	*Leptosema chambersii*	2	2	2	0	4	4	2	0	0	40 to 50	40 to 50	40 to 50	5 to 10	40 to 50	40 to 50	20 to 30	0	0
Inf. Corridor	Impact	S8-3	*Triodia rigidissima*	2	2	5	5	5	10	10	10	10	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200	100 to 200
Inf. Corridor	Impact	S8-4	*Chrysitrix distigmatosa*	1	1	1	1	4	4	3			400 to 500	400 to 500	400 to 500	400 to 500	200 to 300	200 to 300	200 to 300		
Inf. Corridor	Reference	S8-5	*Chrysitrix distigmatosa*	5	5	5	5	10	10	10	10	10	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000
Inf. Corridor	Reference	S8-6	*Grevillea juncifolia*	2							2	10	30 to 40							20 to 30	50 to 100
Inf. Corridor	Reference	S8-6	*Leptosema chambersii*	15	20	20	20	30	30	20	5	0	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	400 to 500	50 to 100	0
Inf. Corridor	Impact	S8-7^	*Chrysitrix distigmatosa*	2	3	3	4	10	10	10	10	10	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000
Operations	Impact	A7a-1	*Acacia tetragonophylla*	0.1							1	0.5	1	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	1	1
Operations	Impact	A7a-1	*Ptilotus obovatus*	1	1	1	1	2	2	0.25	0.1	0	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	5 to 10	3	0
Operations	Impact	A7a-10	*Dodonaea rigida*	1	1	1	1	1	1	1	1	0.5	5	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5
Operations	Impact	A7a-2	*Triodia basedowii*	25	25	25	25	30	30	30	30	30	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	200 to300	100 to 200	100 to 200	100 to 200
Operations	Reference	A7a-3	*Triodia basedowii*	20	20	20	25	30	30	30	30	25	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	200 to 300	200 to 300	100 to 200
Operations	Reference	A7a-4	*Acacia tetragonophylla*	0								0.1	0								1
Operations	Reference	A7a-4	*Ptilotus obovatus*	1	2	2	2	2	1	1	1	0.5	10 to 20	20 to 30	20 to 30	20-30	20-30	10	10 to 20	10 to 20	5 to 10
Operations	Impact	A7a-5	*Ptilotus obovatus*	0.5							0.25	0.1	10 to 20							5 to 10	4

Area	Site type	Site	Indicator species*	2015 Cover (%)	2016 Cover (%)	2017 Cover (%)	2018 Cover (%)	2019 Cover (%)	2020 Cover (%)	2021 Cover (%)	2022 Cover (%)	2023 Cover (%)	2015 No. plants	2016 No. plants	2017 No. plants	2018 No. plants	2019 No. plants	2020 No. Plants	2021 No. Plants	2022 No. Plants	2023 No. Plants
Operations	Impact	A7a-5	*Senna artemisioides* subsp. *filifolia*	1	2	2	2	1	1	0.1	0.1	0.25	2	4	4	4	3	3	2	3	4
Operations	Reference	A7a-6	*Ptilotus obovatus*	0.5							0.25	0	5 to 10							10 to 20	0
Operations	Reference	A7a-6	*Senna artemisioides* subsp. *filifolia*	2	2	2	2	1	1	2	2	5	4	4	4	5	3	3	40 to 50	40 to 50	50 to 100
Operations	Reference	A7a-7	*Triodia basedowii*	1	1	1	1	2	5	5	4	3	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	20 to 30	30 to 40	20 to 30
Operations	Impact	A7a-8	*Triodia basedowii*	1	1	1	2	2	3	2.5	1	1	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20	10 to 20
Operations	Reference	A7a-9	*Dodonaea rigida*	3	3	3	3	4	4	4	3	2	5 to 10	5 to 10	5 to 10	5 to 10	10 to 20	10 to 20	10 to 20	20 to 30	20 to 30
Operations	Reference	A7b-1	*Acacia aneura*	30	40	40	40	40	40	40	40	40	50 to 100	50 to 100	100 to 200	50 to 100	100 to 200	100 to 200	50 to 100	50 to 100	50 to 100
Operations	Impact	A7b-2	*Acacia aneura*	30	30	30	30	30	30	30	30	30	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	10 to 20	10 to 20	10 to 20	10 to 20
Operations	Reference	A7b-3	*Acacia aneura*								35	35								10 to 20	20 to 30
Operations	Reference	A7b-3	*Triodia basedowii*	2	2	2	2	2	2	0.75	0.75	1	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10
Operations	Impact	A7b-4	*Acacia sp.* (mulga)								20	20								5 to 10	20 to 30
Operations	Impact	A7b-4	*Triodia basedowii*	10	10	10	15	10	15	15	15	15	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100
Operations	Impact	C9-1	*Senna artemisioides* subsp. *filifolia*	5	5	5	5	10	10	10	10	10	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	20 to 30
Operations	Impact	C9-2	*Ptilotus obovatus*	1	1	1	1	3	1	0.5	0.5	0.1	10 to 20	10 to 20	10 to 20	10 to 20	30 to 40	20 to 30	10 to 20	10 to 20	1
Operations	Impact	C9-2	*Senna artemisioides subsp. filifolia*	2								15	10 to 20								20 to 30
Operations	Reference	C9-3	*Senna artemisioides* subsp. *filifolia*	15	15	15	15	15	15	15	15	15	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	30 to 40	40 to 50	40 to 50	30 to 40
Operations	Reference	C9-4	*Ptilotus obovatus*	1	1	1	1	1	1	0.5	0.75	0.5	40 to 50	40 to 50	40 to 50	30 to 40	10 to 20	5	5	10 to 20	5 to 10
Operations	Reference	C9-4	*Senna artemisioides subsp. filifolia*	0.1								2	4								10 to 20
Operations	Impact	E1b-1	*Triodia basedowii*	60	60	60	60	60	60	60	60	50	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	300 to 400	300 to 400	200 to 300
Operations	Impact	E1b-10	*Triodia basedowii*	40	40	40	1	1	1	0.75	1	1	400 to 500	400 to 500	400 to 500	5 to 10	400 to 500	300 to 400	100 to 200	100 to 200	100 to 200
Operations	Impact	E1b-11	*Triodia basedowii*								25	20								200 to 300	200 to 300
Operations	Reference	E1b-2	*Triodia basedowii*	5	5	5	5	5	5	10	10	10	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	20 to 30	50 to 100	50 to 100	50 to 100
Operations	Impact	E1b-3	*Triodia basedowii*	60	60	60	60	40	40	35			200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	<Null>	<Null>
Operations	Reference	E1b-4	*Triodia basedowii*	25	25	25	25	30	30	30	30	30	200 to 300	200 to 300	300 to 400	300 to 400	300 to 400	100to200	100 to 200	100 to 200	100 to 200
Operations	Impact	E1b-5	*Triodia basedowii*	35	35	35	35	35	35	35	25	15	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	200to300	200 to 300	100 to 200	100 to 200
Operations	Reference	E1b-6	*Triodia basedowii*	25	25	25	25	25	25	20	10	5	200 to 300	200 to 300	200 to 300	200 to 300	200 to 300	100to200	100 to 200	100 to 200	100 to 200
Operations	Reference	E1b-7	*Acacia aneura*	30						30	30	30	10 to 20						10 to 20	10 to 20	10 to 20
Operations	Reference	E1b-7	*Triodia basedowii*	0	1	1	1	1	1	0.25	0.1	0.25	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10
Operations	Impact	E1b-8	*Acacia aneura*							0.1	0.1	0.25							2	2	2
Operations	Impact	E1b-8	*Triodia basedowii*	3	3	3	0	0	0	0.1	0.1	0.1	30 to 40	30 to 40	30 to 40	5	1	1	1	1	1
Operations	Reference	E1b-9	*Triodia basedowii*	3	3	3	5	5	2	1	1	1	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5	5
Operations	Impact	E3-1	*Triodia desertorum*	45	45	45	45	45	45	45	35	35	400 to 500	400 to 500	400 to 500	400 to 500	400 to 500	200 to 300	200 to 300	100 to 200	100 to 200
Operations	Reference	E3-2	*Triodia desertorum*	60	65	65	65	60	60	60	60	55	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	500 to 1000	400 to 500	400 to 500	300 to 400
Operations	Impact	E3-3	*Anthotroche pannosa*	1	1	1	1	1	1	0.25	0.1	0	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	5 to 10	4	2	0
Operations	Impact	E3-3	*Eremophila latrobei*								0.1	0.5								3	4
Operations	Reference	E3-4	*Anthotroche pannosa*	0	0	0	0	0	0	0.1	0.1	0.1	2	2	2	2	3	3	1	2	2
Operations	Reference	E3-4	*Eremophila latrobei*								2	2								20 to 30	10 to 20
Operations	Impact	E3-5	*Anthotroche pannosa*	4	4	4	4	4	3	3			20 to 30	20 to 30	20 to 30	20 to 30	10 to 20	10 to 20	20 to 30		
Operations	Impact (ex. Ref.)	E3-6	*Anthotroche pannosa*	1	1	1	1	5	5	10	10	5	5 to 10	5 to 10	10 to 20	10 to 20	50 to 100	50 to 100	40 to 50	50 to 100	50 to 100
Operations	Reference	E3-7	*Anthotroche pannosa*								5	4								50 to 100	50 to 100

Appendix S Indicator species deviation values

Area	Site type	Site	Indicator species	Percentage (%) deviation														
				2015 - 2016	2016 - 2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2015-2017	2015-2018	2015-2019	2015-2020	2015-2021	2015-2022	2015-2023
Operations	Impact	A7a-5	Ptilotus obovatus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-60						-50	-80
Operations	Reference	A7a-6	Ptilotus obovatus	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-100						-50	-100
Operations	Impact	A7a-5	Senna artemisioides subsp. filifolia	100	0	0	-50	0	-90	0	150	100	100	0	0	-90	-90	-75
Operations	Reference	A7a-6	Senna artemisioides subsp. filifolia	0	0	0	-75	0	300	0	150	0	0	-75	-75	0	0	150
Operations	Impact	A7a-10	Dodonaea rigida	100	0	-25	33	0	0	0	-50	100	50	100	100	100	100	0
Operations	Reference	A7a-9	Dodonaea rigida	0	0	0	33	0	0	-25	-33	0	0	33	33	33	0	-33
Operations	Impact	A7a-8	Triodia basedowii	0	0	100	0	25	0	-60	0	0	100	100	150	150	0	0
Operations	Reference	A7a-7	Triodia basedowii	0	0	-25	167	150	0	-20	-25	0	-25	100	400	400	300	200
Operations	Impact	A7a-1	Acacia tetragonophylla	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-50						0	400
Operations	Reference	A7a-4	Acacia tetragonophylla								n/a							n/a
Operations	Impact	A7a-1	Ptilotus obovatus	0	0	0	100	0	-88	-60	-100	0	0	100	100	-75	-90	-100
Operations	Reference	A7a-4	Ptilotus obovatus	100	0	0	0	-50	0	0	-50	100	100	100	0	0	0	-50
Operations	Impact	A7a-2	Triodia basedowii	0	0	0	20	0	0	0	0	0	0	20	20	20	20	20
Operations	Reference	A7a-3	Triodia basedowii	0	0	25	20	0	0	0	-17	0	25	50	50	50	50	25
Operations	Impact	A7b-2	Acacia aneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	Reference	A7b-1	Acacia aneura	33	0	0	0	0	0	0	0	33	33	33	33	33	33	33
Operations	Impact	A7b-4	Acacia sp.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0						n/a	n/a
Operations	Reference	A7b-3	Acacia aneura	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0						n/a	n/a
Operations	Impact	A7b-4	Triodia basedowii	0	0	50	-33	50	0	0	0	0	50	0	50	50	50	50
Operations	Reference	A7b-3	Triodia basedowii	0	0	0	0	0	-63	0	33	0	0	0	0	-63	-63	-50
Operations	Impact	C9-1	Senna artemisioides subsp. filifolia	0	0	0	100	0	0	0	0	0	0	100	100	100	100	100
Operations	Reference	C9-3	Senna artemisioides subsp. filifolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations	Impact	C9-2	Ptilotus obovatus	0	0	50	300	-67	-50	0	-80	0	50	500	100	0	0	-80
Operations	Reference	C9-4	Ptilotus obovatus	0	0	-25	33	0	-50	50	-33	0	-25	0	0	-50	-25	-50
Operations	Impact	C9-2	Senna artemisioides subsp. filifolia								n/a							650
Operations	Reference	C9-4	Senna artemisioides subsp. filifolia								n/a							1900
Operations	Impact	E1b-1	Triodia basedowii	0	0	0	0	0	0	0	-17	0	0	0	0	0	0	-17
Operations	Reference	E1b-2	Triodia basedowii	0	0	0	0	0	100	0	0	0	0	0	0	100	100	100
Operations	Impact	E1b-8	Acacia aneura	n/a	n/a	n/a	n/a	n/a	n/a	0	150						n/a	n/a
Operations	Reference	E1b-7	Acacia aneura	n/a	n/a	n/a	n/a	n/a	n/a	0	0						0	0
Operations	Impact	E1b-8	Triodia basedowii	0	0	-97	0	0	0	0	0	0	-97	-97	-97	-97	-97	-97
Operations	Reference	E1b-7	Triodia basedowii	900	0	-50	50	0	-67	-60	150	900	400	650	650	150	0	150
Operations	Impact	E1b-3 (x)	Triodia basedowii	0	0	0	-33	0	-13	-100	n/a	0	0	-33	-33	-42	-100	n/a
Operations	Impact	E1b-11	Triodia basedowii	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-20						n/a	n/a
Operations	Reference	E1b-4	Triodia basedowii	0	0	0	20	0	0	0	0	0	0	20	20	20	20	20
Operations	Impact	E1b-5	Triodia basedowii	0	0	0	0	0	0	-29	-40	0	0	0	0	0	-29	-57
Operations	Reference	E1b-6	Triodia basedowii	0	0	0	0	0	-20	-50	-50	0	0	0	0	-20	-60	-80
Operations	Impact	E1b-10	Triodia basedowii	0	0	-99	100	0	-25	33	0	0	-99	-98	-98	-98	-98	-97
Operations	Reference	E1b-9	Triodia basedowii	0	0	67	0	-60	-50	0	0	0	67	67	-33	-67	-67	-67
Operations	Impact	E3-1	Triodia desertorum	0	0	0	0	0	0	-22	0	0	0	0	0	0	-22	-22
Operations	Reference	E3-2	Triodia desertorum	8	0	0	-8	0	0	0	-8	8	8	0	0	0	0	-8
Operations	Impact	E3-3	Anthotroche pannosa	0	0	-25	33	0	-75	-60	-100	0	-25	0	0	-75	-90	-100
Operations	Reference	E3-4	Anthotroche pannosa	0	0	0	150	0	-60	0	0	0	0	150	150	0	0	0
Operations	Impact	E3-3	Eremophila latrobei	n/a	n/a	n/a	n/a	n/a	n/a	n/a	400						n/a	n/a
Operations	Reference	E3-4	Eremophila latrobei	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0						n/a	n/a
Operations	Impact	E3-5 (x)	Anthotroche pannosa	0	0	0	0	-25	0	-100	n/a	0	0	0	-25	-25	-100	n/a
Operations	Impact (ex. Ref.)	E3-6	Anthotroche pannosa	0	0	-50	900	0	100	0	-50	0	-50	400	400	900	900	400
Operations	Reference	E3-7	Anthotroche pannosa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-20						n/a	n/a
Inf. Corridor	Impact	A2-6	Triodia scariosa	0	0	0	0	0	-25	-33	0	0	0	0	0	-25	-50	-50

Area	Site type	Site	Indicator species	Percentage (%) deviation														
				2015 - 2016	2016 - 2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2015-2017	2015-2018	2015-2019	2015-2020	2015-2021	2015-2022	2015-2023
Inf. Corridor	Reference	A2-5	Triodia scariosa	0	0	0	0	0	-25	-33	0	0	0	0	0	-25	-50	-50
Inf. Corridor	Impact	A2-1	Triodia desertorum	0	0	0	0	0	0	100	0	0	0	0	0	0	100	100
Inf. Corridor	Reference	A2-7	Triodia desertorum	200	0	0	33	25	0	100	0	200	200	300	400	400	900	900
Inf. Corridor	Impact	A2-9	Allocasuarina spinosissima	0	0	20	0	0	0	0	-17	0	20	20	20	20	20	0
Inf. Corridor	Reference	A2-8	Allocasuarina spinosissima	0	0	0	0	0	-14	0	0	0	0	0	0	-14	-14	-14
Inf. Corridor	Impact	A2-2	Aluta maisonneuvei subsp. auriculata	0	0	0	20	0	-83	-20	-25	0	0	20	20	-80	-84	-88
Inf. Corridor	Reference	A2-10	Aluta maisonneuvei subsp. auriculata	0	0	0	0	0	-60	0	0	0	0	0	0	-60	-60	-60
Inf. Corridor	Impact	A2-3	Acacia aneura	0	0	0	0	0	0	0	-50	0	0	0	0	0	0	-50
Inf. Corridor	Reference	A2-11	Acacia aneura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inf. Corridor	Impact	A2-4	Aluta maisonneuvei subsp. auriculata	20	0	0	0	33	-13	0	0	20	20	20	60	40	40	40
Inf. Corridor	Reference	A2-12	Aluta maisonneuvei subsp. auriculata	20	0	0	17	0	0	0	0	20	20	40	40	40	40	40
Inf. Corridor	Impact	A3-2	Eremophila clarkei	0	0	0	-100	0	10	150	0	0	0	-100	-100	-90	-75	-75
Inf. Corridor	Reference	A3-1	Eremophila clarkei	0	0	0	0	0	0	-25	-67	0	0	0	0	0	-25	-75
Inf. Corridor	Impact	A3-2	Ptilotus obovatus							0	-60						-98	-99
Inf. Corridor	Reference	A3-1	Ptilotus obovatus							100	-75						-60	-90
Inf. Corridor	Impact	A3-4	Acacia tetragonophylla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inf. Corridor	Reference	A3-3	Acacia tetragonophylla	0	0	0	0	0	0	-50	0	0	0	0	0	0	-50	-50
Inf. Corridor	Impact	A3-5	Dodonaea lobulata	0	0	0	0	0	-50	-60	-50	0	0	0	0	-50	-80	-90
Inf. Corridor	Reference	A3-6	Dodonaea lobulata	0	0	0	0	-33	-60	-75	-100	0	0	0	-33	-73	-93	-100
Inf. Corridor	Impact	A3-5	Scaevola spinescens								n/a							n/a
Inf. Corridor	Reference	A3-6	Scaevola spinescens								n/a							n/a
Inf. Corridor	Impact	A7b-6	Aluta maisonneuvei subsp. auriculata	0	0	0	0	0	0	-67	0	0	0	0	0	0	-67	-67
Inf. Corridor	Reference	A7b-5	Aluta maisonneuvei subsp. auriculata	0	0	0	0	0	-20	0	-25	0	0	0	0	-20	-20	-40
Inf. Corridor	Impact	A7b-7 (x)	Aluta maisonneuvei subsp. auriculata	0	0	0	567	25	0	n/a	n/a	0	0	567	733	733	n/a	n/a
Inf. Corridor	Impact	A7b-9^	Aluta maisonneuvei subsp. auriculata	0	0	50	-17	0	-20	0	-25	0	50	25	25	0	0	-25
Inf. Corridor	Reference	A7b-8	Aluta maisonneuvei subsp. auriculata	0	0	0	200	0	-33	0	0	0	0	200	200	100	100	100
Inf. Corridor	Impact	E4-3	Leptosema chambersii	0	0	0	0	0	0	-67	-75	0	0	0	0	0	-67	-92
Inf. Corridor	Reference	E4-4	Leptosema chambersii	0	0	0	0	0	-50	-100	n/a	0	0	0	0	-50	-100	-100
Inf. Corridor	Impact	E4-3	Triodia desertorum							n/a	0						-25	-25
Inf. Corridor	Reference	E4-4	Triodia desertorum							n/a	0						40	40
Inf. Corridor	Impact	E4-5	Callitris preissii	0	0	0	0	0	100	0	-50	0	0	0	0	100	100	0
Inf. Corridor	Reference	E4-6	Callitris preissii	100	100	0	0	0	0	100	0	300	300	300	300	300	700	700
Inf. Corridor	Impact	E4-2	Allocasuarina spinosissima	20	0	-17	0	0	0	0	20	20	0	0	0	0	0	20
Inf. Corridor	Reference	E4-1	Allocasuarina spinosissima	0	0	150	-20	0	-25	33	0	0	150	100	100	50	100	100
Inf. Corridor	Impact	E4-7	Triodia desertorum	0	0	0	0	0	-20	-25	-33	0	0	0	0	-20	-40	-60
Inf. Corridor	Reference	E4-8	Triodia desertorum	0	0	0	0	50	0	0	0	0	0	0	50	50	50	50
Inf. Corridor	Impact	E4-9	Triodia rigidissima	0	-100	0	0	0	0	400	0	-100	-100	-100	-100	-100	-99	-99
Inf. Corridor	Reference	E4-10	Triodia rigidissima	11	-100	0	150	0	0	100	0	-100	-100	-99	-99	-99	-99	-99
Inf. Corridor	Impact	E4-11	Triodia rigidissima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inf. Corridor	Reference	E4-12	Triodia rigidissima	20	0	-17	100	50	0	0	0	20	0	100	200	200	200	200
Inf. Corridor	Impact	E4-14	Triodia rigidissima	0	0	0	0	0	0	-20	-12	0	0	0	0	0	-20	-30
Inf. Corridor	Reference	E4-13	Triodia rigidissima	0	0	0	-100	200	100	25	0	0	0	-100	-96	-92	-90	-90
Inf. Corridor	Impact	E9-2	Acacia aneura	0	0	0	50	0	0	0	0	0	0	50	50	50	50	50
Inf. Corridor	Reference	E9-1	Acacia aneura	0	0	0	0	0	0	-33	0	0	0	0	0	0	-33	-33
Inf. Corridor	Impact	E9-6	Triodia scariosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inf. Corridor	Reference	E9-5	Triodia scariosa	0	0	0	14	0	0	-25	0	0	0	14	14	14	-14	-14
Inf. Corridor	Impact	S8-2	Grevillea juncifolia							n/a	n/a						-100	-100
Inf. Corridor	Reference	S8-6	Grevillea juncifolia							n/a	400						0	400
Inf. Corridor	Impact	S8-2	Leptosema chambersii	0	0	-95	3900	0	-50	-100	n/a	0	-95	100	100	0	-100	-100
Inf. Corridor	Reference	S8-6	Leptosema chambersii	33	0	0	50	0	-33	-75	-100	33	33	100	100	33	-67	-100
Inf. Corridor	Impact	S8-3	Triodia rigidissima	0	150	0	0	100	0	0	0	150	150	150	400	400	400	400
Inf. Corridor	Reference	S8-1	Triodia rigidissima	0	0	0	600	0	0	0	0	0	0	600	600	600	600	600

Area	Site type	Site	Indicator species	Percentage (%) deviation														
				2015 - 2016	2016 - 2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2015-2017	2015-2018	2015-2019	2015-2020	2015-2021	2015-2022	2015-2023
Inf. Corridor	Impact	S8-4 (x)	Chrysitrix distigmatosa	0	0	0	300	0	-25	n/a	n/a	0	0	300	300	200	n/a	n/a
Inf. Corridor	Impact	S8-7^	Chrysitrix distigmatosa	50	0	33	150	0	0	0	0	50	100	400	400	400	400	400
Inf. Corridor	Reference	S8-5	Chrysitrix distigmatosa	0	0	0	100	0	0	0	0	0	0	100	100	100	100	100
Borefield	Impact	E2-5	Triodia basedowii	0	0	150	50	0	0	33	25	0	150	275	275	275	400	525
Borefield	Reference	E2-6	Triodia basedowii	0	0	0	1150	20	0	0	0	0	0	1150	1400	1400	1400	1400
Borefield	Impact	E2-1	Triodia basedowii	200	67	0	-20	25	100	0	0	400	400	300	400	900	900	900
Borefield	Reference	E2-4	Triodia basedowii	200	0	67	100	0	0	0	50	200	400	900	900	900	900	1400
Borefield	Impact	E2-2	Eucalyptus gongylocarpa	0	0	0	0	0	0	-33	0	0	0	0	0	0	-33	-33
Borefield	Reference	E2-3	Eucalyptus gongylocarpa	0	0	0	0	0	0	0	-50	0	0	0	0	0	0	-50
Borefield	Impact	T1-3	Seringia velutina	0	0	0	0	0	-50	-20	-50	0	0	0	0	-50	-60	-80
Borefield	Reference	T1-1	Seringia velutina	0	0	0	0	-60	0	0	-100	0	0	0	-60	-60	-60	-100
Borefield	Impact	T1-4	Seringia velutina	300	0	25	0	-50	0	-40	0	300	400	400	150	150	50	50
Borefield	Reference	T1-2	Seringia velutina	100	0	0	0	-25	-33	-50	-60	100	100	100	50	0	-50	-80
Borefield	Impact	X1-1	Triodia basedowii	0	0	67	300	0	0	0	0	0	67	567	567	567	567	567
Borefield	Reference	X1-2	Triodia basedowii	0	0	67	300	0	0	0	0	0	67	567	567	567	567	567
Borefield	Impact	X1-15	Triodia basedowii	100	150	0	-20	25	0	0	100	400	400	300	400	400	400	900
Borefield	Reference	X1-16	Triodia basedowii	200	0	67	-20	150	50	0	0	200	400	300	900	1400	1400	1400
Borefield	Impact	X1-11	Eucalyptus gongylocarpa								n/a							50
Borefield	Reference	X1-12	Eucalyptus gongylocarpa								n/a							-98
Borefield	Impact	X1-11	Seringia velutina	100	0	50	-33	0	0	-50	-75	100	200	100	100	100	0	-75
Borefield	Reference	X1-12	Seringia velutina	25	0	0	-20	0	-25	0	-67	25	25	0	0	-25	-25	-75
Borefield	Impact	X1-13	Seringia velutina	0	0	0	0	0	-80	100	0	0	0	0	0	-80	-60	-60
Borefield	Reference	X1-14	Seringia velutina	50	0	0	0	-100	0	n/a	n/a	50	50	50	-100	-100	-100	-100
Borefield	Impact	X1-13	Triodia basedowii							33	0						900	900
Borefield	Reference	X1-14	Triodia basedowii							0	50						900	1400
Borefield	Impact	X1-9	Triodia basedowii	50	33	0	25	20	0	17	0	100	100	150	200	200	250	250
Borefield	Reference	X1-10	Triodia basedowii	0	0	0	0	0	0	-11	0	0	0	0	0	0	-11	-11
Borefield	Impact	X1-7	Triodia basedowii	0	0	100	150	20	17	0	0	0	100	400	500	600	600	600
Borefield	Reference	X1-8	Triodia basedowii	1900	0	100	100	0	25	-20	-25	1900	3900	7900	7900	9900	7900	5900
Borefield	Impact	X1-4	Triodia basedowii	200	0	0	567	0	25	0	0	200	200	1900	1900	2400	2400	2400
Borefield	Reference	X1-6	Triodia basedowii	0	0	0	-100	25	100	300	50	0	0	-100	-100	-99	-96	-94
Borefield	Impact	X1-3	Anthotroche pannosa							0	-50						-60	-80
Borefield	Reference	X1-5	Anthotroche pannosa							0	-50						n/a	n/a
Borefield	Impact	X1-3	Seringia velutina	900	0	0	0	-80	-100	n/a	n/a	900	900	900	100	-100	-100	-100
Borefield	Reference	X1-5	Seringia velutina	0	0	33	400	-40	-100	n/a	n/a	0	33	567	300	-100	-100	-100
Borefield	Impact	M1-3	Seringia velutina	25	0	0	-30	0	-43	-50	-70	25	25	-13	-13	-50	-75	-92
Borefield	Reference	M1-4	Seringia velutina	25	0	0	0	0	-20	-50	-50	25	25	25	25	0	-50	-75
Borefield	Impact	M1-3	Triodia basedowii							n/a	0						2567	2567
Borefield	Reference	M1-4	Triodia basedowii							n/a	0						900	900
Borefield	Impact	M1-1	Triodia basedowii	0	100	0	100	0	0	50	0	100	100	300	300	300	500	500
Borefield	Reference	M1-2	Triodia basedowii	0	150	0	0	0	-20	0	-25	150	150	150	150	100	100	50

Appendix T All year's Bare Soil Cover for all areas

Area	Site name	Site type	Bare soil (%)												
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Borefield	E2-1	I	65	65	90	85	80	70	65	65	60	55	70	75	75
	E2-2	I	60	50	48	45	45	45	45	45	55	55	55	55	55
	E2-3	R	55	70	80	75	70	70	60	60	55	55	60	60	60
	E2-4	R	50	30	75	70	70	65	60	60	60	60	60	60	65
	E2-5	I	65	45	85	82	80	75	70	75	60	60	70	70	65
	E2-6	R	70	50	94	85	85	85	85	80	60	60	60	60	60
	M1-1	I	n/a	n/a	n/a	65	55	50	40	40	55	55	40	30	30
	M1-2	R	n/a	n/a	n/a	85	85	75	60	60	55	55	50	55	55
	M1-3	I	n/a	n/a	n/a	60	50	50	50	50	70	70	70	70	70
	M1-4	R	n/a	n/a	n/a	70	40	40	30	30	55	55	45	55	60
	T1-1	R	60	40	82	15	40	40	40	55	50	50	50	50	75
	T1-2	R	60	60	75	55	60	55	55	55	70	70	75	75	60
	T1-3	I	70	65	71	55	60	60	60	50	60	60	60	60	60
	T1-4	I	60	65	86	45	50	50	50	40	50	60	70	65	65
	X1-1	I	50	35	85	70	75	65	60	60	60	60	70	70	75
	X1-10	R	65	45	45	50	50	45	35	35	40	45	45	50	50
	X1-11	I	35	45	90	65	70	65	60	60	50	50	60	60	65
	X1-12	R	75	55	75	65	65	60	55	55	50	50	70	70	75
	X1-13	I	60	65	92	70	75	70	65	65	70	70	80	75	75
	X1-14	R	30	55	90	75	65	60	55	55	55	55	55	60	60
	X1-15	I	60	60	96	90	80	75	70	70	65	65	70	75	75
	X1-16	R	60	50	96	92	85	80	75	75	75	75	75	75	75
	X1-2	R	70	65	95	90	90	80	80	80	60	80	80	80	80
	X1-3	I	25	55	88	50	50	55	55	55	60	60	50	45	45
	X1-4	I	70	60	80	55	65	65	60	65	60	60	60	55	50
	X1-5	R	40	55	73	45	45	45	45	45	50	50	50	50	45
	X1-6	R	70	50	50	35	30	30	30	30	95	95	90	85	85
	X1-7	I	35	70	88	65	75	75	75	70	60	60	55	55	50
	X1-8	R	50	55	87	60	80	70	65	65	60	70	65	60	65
	X1-9	I	60	45	88	80	75	70	55	55	70	70	70	65	60

Area	Site name	Site type	Bare soil (%)												
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Infrastructure Corridor	A2-1	I	55	75	65	40	60	55	55	55	55	55	50	50	50
	A2-10	R	5	35	30	25	25	25	25	25	55	60	60	70	70
	A2-11	R	40	65	65	45	45	40	40	40	55	55	60	70	90
	A2-12	R	75	70	65	60	65	60	60	60	55	60	60	60	60
	A2-2	I	40	60	60	45	45	45	45	45	55	70	70	80	75
	A2-3	I	30	20	20	25	25	20	20	20	55	55	55	55	65
	A2-4	I	65	65	50	50	50	40	40	40	55	60	60	65	65
	A2-5	R	30	45	40	35	45	45	45	45	55	55	40	40	40
	A2-6	I	40	45	35	35	40	40	40	40	55	55	55	45	45
	A2-7	R	80	90	75	65	80	70	70	70	55	55	55	55	55
	A2-8	R	25	85	60	15	15	15	15	20	55	55	55	60	60
	A2-9	I	25	85	70	40	40	40	40	40	65	65	65	65	65
	A3-1	R	25	65	60	60	60	70	60	70	55	60	60	60	60
	A3-2	I	40	70	70	70	70	60	60	60	80	80	80	80	85
	A3-3	R	70	60	60	65	65	65	65	65	70	70	85	85	85
	A3-4	I	80	50	50	55	60	60	60	60	75	75	80	75	80
	A3-5	I	30	35	35	35	35	35	35	35	55	55	55	55	55
	A3-6	R	25	40	40	40	45	45	35	35	55	55	55	70	70
	A7B-5	R	25	30	30	30	60	60	40	60	55	55	55	50	60
	A7B-6	I	60	40	40	40	60	50	50	50	55	55	55	55	55
	A7B-7	I	70	100	98	90	85	80	75	80	80	65	65	n/a	n/a
	A7B-8	R	40	30	35	35	40	40	40	40	70	70	50	50	50
	A7B-9	I	n/a	50	50	45	50	50	50	50	70	70	70	70	70
	E4-1	R	40	80	70	60	60	60	60	60	55	55	55	55	60
	E4-10	R	20	35	30	30	30	30	95	95	55	90	90	90	90
	E4-11	I	20	50	75	70	70	65	60	60	60	60	50	50	60
	E4-12	R	25	60	90	80	75	65	60	60	60	60	60	60	60
	E4-13	R	70	35	35	35	25	25	25	25	100	95	90	90	90
	E4-14	I	40	60	50	50	40	40	40	40	55	55	55	50	45
	E4-2	I	50	75	65	30	35	35	35	35	55	55	55	55	55
	E4-3	I	70	70	65	60	60	55	55	55	55	55	55	60	60
	E4-4	R	60	70	70	55	60	65	60	60	55	40	40	50	50
	E4-5	I	25	25	35	20	25	25	25	25	50	50	30	25	25

Area	Site name	Site type	Bare soil (%)												
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	E4-6	R	20	35	25	15	40	40	35	35	50	50	20	15	15
	E4-7	I	35	65	65	60	60	60	60	60	55	70	70	70	70
	E4-8	R	60	70	70	60	60	60	55	55	55	60	60	60	60
	E4-9	I	10	45	45	40	40	40	95	95	80	90	85	85	85
	E9-1	R	70	80	76	70	65	65	55	65	70	70	70	70	75
	E9-2	I	50	60	65	55	50	50	50	50	55	60	60	60	60
	E9-5	R	30	45	35	35	35	35	35	35	55	55	45	45	50
	E9-6	I	50	70	65	65	60	60	60	60	55	55	55	60	60
	S8-1	R	15	15	70	70	70	65	65	65	55	55	55	50	60
	S8-2	I	15	20	85	75	70	65	60	60	60	60	60	65	65
	S8-3	I	20	35	65	68	65	65	60	60	55	55	60	65	65
	S8-4	I	40	75	75	70	60	60	60	60	60	55	60	n/a	n/a
	S8-5	R	35	20	65	65	70	65	60	60	60	55	60	70	70
	S8-6	R	15	40	80	70	65	60	60	60	60	40	55	60	65
	S8-7	I	n/a	35	70	70	70	70	70	70	60	60	60	70	70
Operations Area	A7A-1	I	85	80	80	80	75	70	70	70	80	80	85	85	90
	A7A-10	I	90	85	80	80	50	50	50	50	55	65	90	90	90
	A7A-2	I	70	50	65	60	70	70	70	70	55	60	60	60	50
	A7A-3	R	80	40	40	55	80	75	75	75	55	55	45	45	45
	A7A-4	R	65	30	30	35	45	45	45	45	55	60	60	60	60
	A7A-5	I	50	20	25	20	35	20	20	15	65	65	65	65	65
	A7A-6	R	85	40	55	55	50	50	50	50	80	80	80	80	75
	A7A-7	R	70	40	45	45	70	70	70	70	55	55	55	65	70
	A7A-8	I	60	45	45	40	40	40	40	40	55	55	55	45	50
	A7A-9	R	90	85	85	85	75	75	75	75	55	65	80	85	90
	A7B-1	R	55	30	30	30	30	35	35	35	70	70	60	40	40
	A7B-2	I	70	25	25	25	35	40	40	40	55	55	55	55	55
	A7B-3	R	70	60	60	60	60	60	60	60	55	60	70	70	70
	A7B-4	I	80	80	80	80	80	75	75	70	55	60	65	70	70
	C9-1	I	85	60	65	75	70	65	65	65	90	90	90	90	90
	C9-2	I	85	35	40	30	40	35	35	35	55	55	55	60	60
	C9-3	R	65	30	35	30	60	55	55	55	75	65	45	45	45
	C9-4	R	80	60	70	70	70	70	70	70	80	80	80	80	80

Area	Site name	Site type	Bare soil (%)												
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	E1B-1	I	55	40	40	30	30	30	30	30	40	40	30	30	35
	E1B-10	I	70	45	45	45	45	40	40	70	70	80	80	80	80
	E1B-11	I	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	55	60
	E1B-2	R	85	55	60	60	60	60	60	60	55	55	55	55	60
	E1B-3	I	60	30	30	30	25	25	25	25	60	60	60	n/a	n/a
	E1B-4	R	85	45	45	45	60	60	60	60	60	60	50	60	60
	E1B-5	I	30	40	40	40	35	35	35	35	55	55	50	60	60
	E1B-6	R	50	25	20	20	20	20	20	20	55	55	30	50	50
	E1B-7	R	70	35	40	40	45	45	45	45	70	70	65	45	45
	E1B-8	I	75	35	35	35	35	40	45	80	80	80	90	90	90
	E1B-9	R	85	60	60	60	60	60	60	60	55	55	55	70	70
	E3-1	I	70	50	45	45	50	50	50	50	55	55	55	50	50
	E3-2	R	60	25	25	25	30	30	30	30	50	40	40	40	45
	E3-3	I	65	35	35	35	40	40	45	45	55	55	45	50	45
	E3-4	R	70	30	35	35	55	45	45	45	55	55	55	60	60
	E3-5	I	80	60	60	60	60	60	60	60	80	90	70	n/a	n/a
	E3-6	I (ex. R)	70	25	25	25	25	25	25	75	90	90	90	85	90
	E3-7	R	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	70	75