

# ANNUAL COMPLIANCE REPORT

EPBC 2021/9026

Carosue Dam TSF CELL 4

22 November 2023 - 21 November 2024

04 February 2025



**Prepared by:**

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## DECLARATION OF ACCURACY

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

<b>Signed</b>	<i>Trent Kerr</i>
<b>Full name:</b> (please print)	Trent Kerr
<b>Position</b> (please print)	Acting SSE - Carosue Dam Operations
<b>Organisation</b> (please print including ABN/ACN if applicable):	Northern Star Resources Ltd ABN 43 092 832 892
<b>Date:</b>	05/02/2025

## DOCUMENT CONTROL

Revision	Date	Prepared By	Reviewed by	Approved by
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2	04/02/2025		Stuart Mckinnon - Senior Environmental Advisor	

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# 1 INTRODUCTION

The Carosue Dam Operation (CDO) is located approximately 120km northeast of Kalgoorlie in the Pinjin area of the Eastern Goldfields. CDO is situated within both the Shire of Menzies and the Shire of Kalgoorlie- Boulder (Figure 1). The CDO Tailings Storage Facility (TSF) is located 1km north of the processing plant shown in Figure 2. The TSF Cell 4 and associated infrastructure was constructed in 2022 and 2023 under EPBC Approval EPBC 2021/9026 and developed as a paddock-type facility to the west of existing Cell 3 (Figure 2). The new cell was constructed as part of the approved strategy to provide an additional 10-year tailings storage capacity for underground operations.

## 1.1 EPBC Approval Details

<b>EPBC Approval Number</b>	EPBC 2021/9026
<b>Project Name</b>	Carosue Dam TSF Cell 4
<b>Approval Holder</b>	Northern Star (Carosue Dam) Pty Ltd
<b>ACN/ABN</b>	141 166 491 22
<b>Approval Date</b>	22 November 2022
<b>Duration</b>	This approval has effect until 1 November 2052
<b>Action</b>	To expand the Tailings Storage Facility (TSF) at the Carosue Dam Operations site with the construction of TSF Cell 4 and associated infrastructure, including roads, topsoil stockpiles, diversions, construction laydown and access.
<b>Reporting Period</b>	22 November 2023 - 21 November 2024
<b>Responsible Person</b>	John Albrecht (General Manager - Carosue Dam Operations)

## 1.2 Purpose

Condition 21 of EPBC 2021/9026 requires that an Annual Compliance Report (ACR) detailing the previous twelve-month period is prepared and submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW). The assessment review period for this ACR is 22 November 2023 - 21 November 2024. The ACR has been prepared in accordance with the DCCEEW's Annual Compliance Report Guidelines (2023) in compliance with Condition 22.

The purpose of this report is to document compliance for the reporting period with conditions under EPBC 2021/9026 as required by the conditions outlined below.

### "ANNUAL COMPLIANCE REPORTING

21. *The approval holder must prepare a compliance report for each 12-month period following the date of this approval, or as otherwise agreed to in writing by the Minister.*
22. *Each compliance report must be consistent with the department's annual compliance report guidelines (2014) or any subsequent version.*
23. *Each compliance report must include:*
  - a. *Accurate and complete details of compliance and any non-compliance with the conditions and the plans, and any incidents.*
  - b. *One or more shapefile showing all clearing of any protected matters, and/or their habitat, undertaken within the 12-month period at the end of which that compliance report is prepared.*
  - c. *prepared.*
  - d. *A schedule of all plans in existence in relation to these conditions and accurate and complete details of how each plan is being implemented.*
24. *The approval holder must:*
  - a. *Publish each compliance report on the website within 60 business days following the end of the 12-month period for which that compliance report is required*
  - b. *Notify the Department electronically, within 5 business days of the date of publication that a compliance report has been published on the website*
  - c. *Provide the weblink for the compliance report in the notification to the Department*
  - d. *Keep all published compliance reports required by these conditions on the website until the expiry date of this approval.*
  - e. *Exclude or redact sensitive ecological data from compliance reports published on the website or otherwise provided to a member of the public.*
  - f. *If sensitive ecological data is excluded or redacted from the published version, submit the full*

compliance report to the Department within 5 business days of its publication on the website and notify the Department in writing what exclusions and redactions have been made in the version published on the website.”

The compliance status and updates are provided in the Compliance Audit table (Table 1).

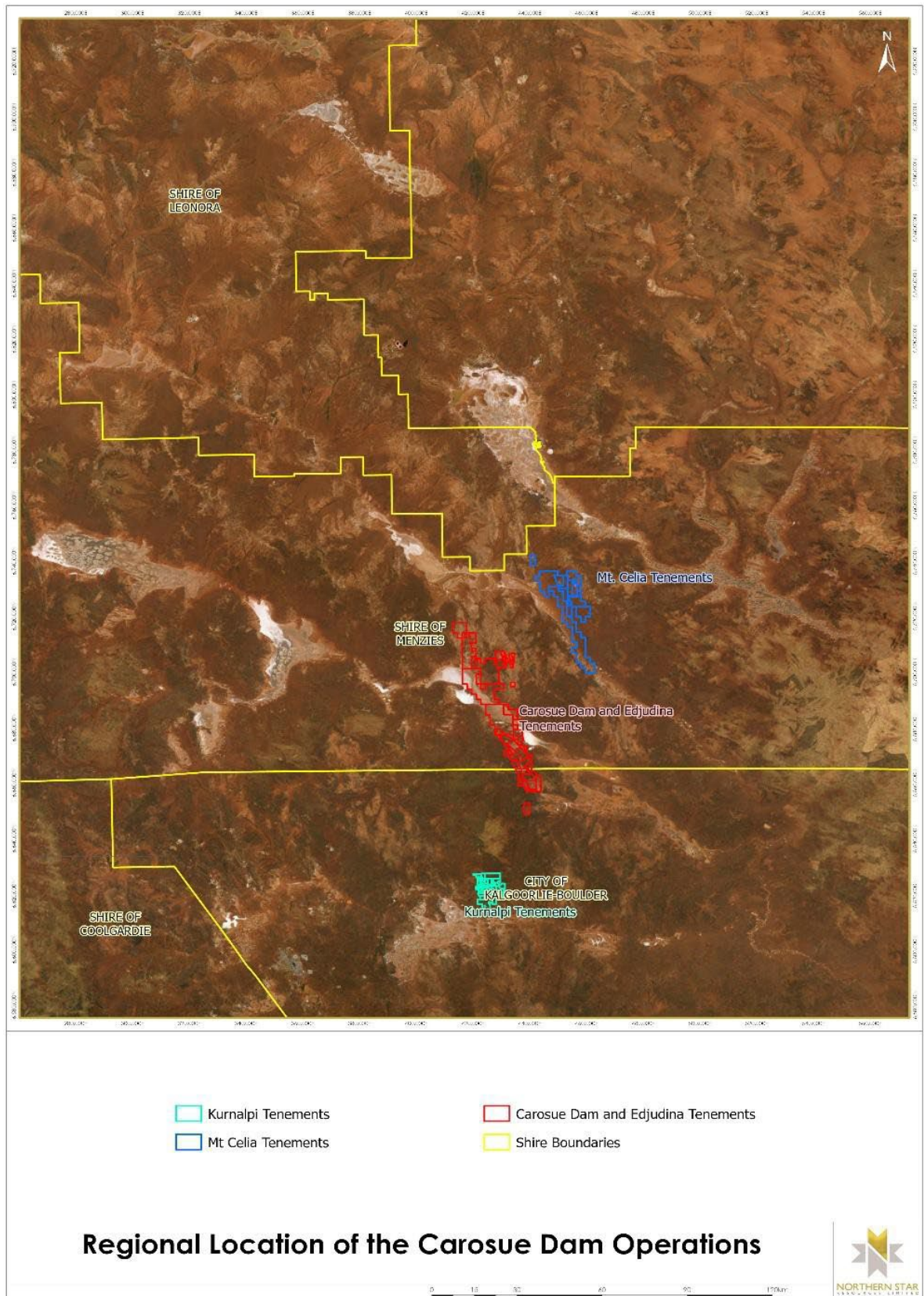


Figure 1 Regional Location of the Carosue Dam Operations.

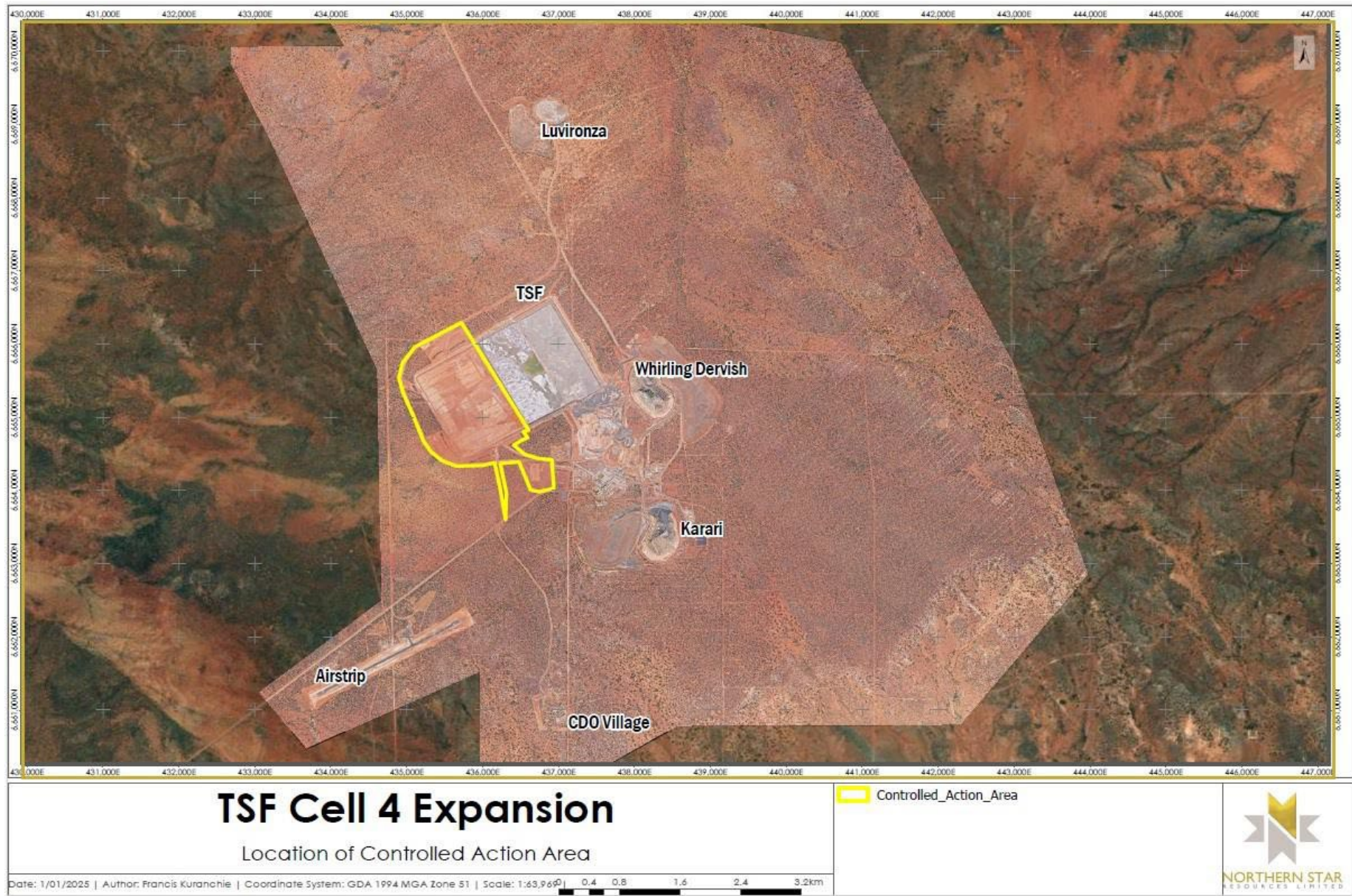


Figure 2 Location of the Controlled Action Area within the Carosue Dam Operations.

### 1.3 Description of Activities

All clearing and most of the construction works for TSF Cell 4 were completed during the 2022 - 2023 reporting period. For the period 22 November 2023 to 21 November 2024, the following works were completed for the TSF Cell 4 Project at Carosue Dam and the EEL 55 Offset Site:

- Heritage Survey of EEL 55 Completed with Marlinyu Ghoorlie in February 2024.
- Baseline weed survey carried out by Eren Reid (Native Vegetation Solutions) in November 2024. Draft received (Appendix 1).
- Baseline Predator Survey fieldwork completed by GNRBA (Report still pending).
- Two bait runs have been undertaken on DBCA Yallari Timber Reserve and EEL55 boundary.
- Annual Malleefowl monitoring completed.
- Stakeholder consultation held with DBCA and NMRG to discuss practical implementation of the offset management plan.
- TSF Cell 4 Pipeline installation (Plate 1).
- TSF Cell 4 Pond Construction (Plate 2).
- TSF/Haul Road drain construction (Plate 3).

All remaining activities associated with the action will involve the management of the EEL55 Offset Site. These activities will continue to be reported annually in accordance with conditions outlined in EPBC 2021/9026.

Plate 4 shows the image for commencement of tailings discharge into the new TSF Cell 4 in October 2024.



Plate 1 TSF Cell 4 Pipelines installation.





Plate 2 TSF Cell 4 Pond.



Plate 3 TSF/Hall Road drain.



*Plate 4 TSF Cell 4 - Commencement of Tailings discharge.*

## 2 COMPLIANCE AUDIT

Table 1 Compliance with conditions of EPBC 2021/9026 for the 2023/2024 Reporting Period.

Condition Number/Reference	Condition	Is the Project compliant with this condition? (Compliant or Non-Compliant or Not Applicable)	Evidence/Comments
Part A - Condition 1	To minimise impacts to protected matters, the approval holder must not clear: <ul style="list-style-type: none"> <li>a. outside the development envelope</li> <li>b. outside of daylight hours</li> <li>c. any active mounds</li> <li>d. more than 152.6ha of Malleefowl habitat</li> </ul>	Compliant	There has been no clearing in this reporting period.  Compliant - No clearing of Malleefowl habitat in the reporting period
Part A - Condition 2	The approval holder must not clear: <ul style="list-style-type: none"> <li>a. more than 52.5ha foraging and cover habitat</li> <li>b. more than 100.1ha critical Malleefowl habitat</li> <li>c. more than seven inactive mounds</li> </ul>	Compliant	There was no clearing of foraging and cover habitat.  There was no clearing of critical Malleefowl Habitat.  There was no clearing for inactive mounds.
Part A - Condition 3	Prior to clearing, the approval holder must: <ul style="list-style-type: none"> <li>a. undertake at least one pre-clearance survey of the development envelope within 10 business days prior to clearing, and</li> <li>b. notify the Department in writing of the locations and numbers of each type of nesting mounds (i.e., active mounds and inactive mounds) identified during each pre-clearance survey</li> </ul>	N/A	There was no clearing in the current reporting period.

Condition 01	The approval holder must implement the approved construction environmental management plan (Appendix 3) from the date of this approval until the completion of the action.	Compliant.	CEMP has been implemented. Status is detailed in Section 3.
Condition 02	<p>To compensate for residual significant impacts to Malleefowl, the approval holder must:</p> <ul style="list-style-type: none"> <li>a. control the EEL55 offset site within 6 months of the date of this approval decision,</li> <li>b. legally secure the EEL55 offset site within 6 months of the date of Offset Management Plan being accepted by the Department,</li> <li>c. within 10 business days of legally securing the EEL55 offset site, provide the Department with: <ul style="list-style-type: none"> <li>i. written evidence demonstrating that the EEL55 offset site has been legally secured, and</li> <li>ii. shapefiles and offset attributes of the EEL55 offset site,</li> </ul> </li> <li>d. once the EEL55 offset site has been legally secured, report annually on the presence of Malleefowl at the EEL55 offset site for the life of the approval, and</li> <li>e. provide the Department with evidence demonstrating the presence of Malleefowl at the EEL55 offset site within 5 years of this approval.</li> </ul>	Compliant	<p>Northern Star has ownership of EEL55. Ownership was held prior to the date of the approval decision.</p> <p>The Offset Management Plan was submitted 17 May 2023 and approved by the Department on 6 March, 2024.</p> <p>The site was legally secured through a conservation covenant which was placed on EEL55 in September 2023 and has been registered on the Certificate of Title (Appendix 2). The Department was sent written notification and associated documentation on 8 September 2023 to demonstrate that EEL55 had been legally secured.</p> <p>This included providing shapefiles and environmental offset attributes of the site.</p> <p>Section 5 of this document reports on the presence of Malleefowl satisfying Condition 02d and other information.</p> <p>Presence of Malleefowl has been recorded within the EEL55 Offset Site. Evidence has been provided within the Preliminary Documentation, Offset Strategy, Offset Management Plan (OMP), associated targeted Malleefowl Surveys and subsequent monitoring information included in Section 4 of this report.</p>
Condition 03	To compensate for significant residual impacts to Malleefowl the approval holder must submit, within 6 months of commencement of	Compliant	An Offset Management Plan was submitted on 17 May 2023, which is within 6 months of the commencement of the Action (28 November 2022). This plan was

	the Action, an Offset Management Plan to the Department for the Minister's approval. The Offset Management Plan must, to the satisfaction of the Minister, meet the requirements specified in Attachment D. The approval holder must implement the approved Offset Management Plan for the life of the approval.		drafted in accordance with Attachment D of the approval and the Environmental Management Plan Guidelines.  The Offset Management Plan was approved on 6 March 2024 and implementation commenced.
Condition 04	If the approval holder does not submit the Offset Management Plan for approval by the Minister within 6 months of commencement of the Action, the approval holder must cease all clearing and construction immediately. If the Minister does not approve the Offset Management Plan within 4 months of the date of which it was submitted to the Department, the approval holder must cease all clearing and construction immediately. The approval holder may only recommence clearing and/or construction once the Offset Management Plan is approved in writing by the Minister.	Compliant	The Offset Management Plan was submitted to the Department on 17 May 2023 for approval by the Minister. Approval was received on 6th March, 2024.  There was no clearing or construction work while the offset management plan was being assessed.
Condition 05	If the Offset Management Plan has not been approved by the Minister in writing within 4 months of the date on which it was submitted to the Department, and the Minister notifies the approval holder that the Offset Management Plan is not suitable for approval, the Minister may, at least two months after so notifying the approval holder, approve a version of the Offset Management Plan revised by the Department. The approval holder must implement the approved Offset Management Plan for the remainder of the life of the approval	N/A	The OMP was not approved within the required timeframe. However, approval was received on 6th March, 2024. Status of the Offset Management Plan is provided in Section 4.
Condition 06	If the approval holder is unable to demonstrate the presence of	N/A	Presence of Malleefowl has been recorded within the EEL55 Offset Site. Evidence has been provided within

	<p>Malleefowl at the EEL55 offset site within 7 years of this approval, the approval holder must:</p> <ol style="list-style-type: none"> <li>a. submit an alternative offset site proposal, which meets the requirements of the Environmental Offsets Policy, to the Department</li> <li>b. submit an Offset Management Plan for the alternative offset site in accordance with the requirement specified in Attachment D</li> <li>c. not recommence undertaking the Action unless the Offset Management Plan for the alternative offset site is approved in writing by the Minister,</li> <li>d. legally secure the alternative offset site, and</li> <li>e. within 6 months of the Offset Management Plan for the alternative offset site being approved by the Minister, provide the Department with: <ol style="list-style-type: none"> <li>i. written evidence to the demonstrating that the alternative offset site has been legally secured,</li> </ol> and <ol style="list-style-type: none"> <li>ii. shapefiles and offset attributes of the alternative offset site.</li> </ol> </li> </ol> <p>Note: The approval holder should commence seeking an alternative offset site if the presence of Malleefowl at the EEL55 offset site has not been demonstrated 5 years after this approval decision and initiate discussions with the Department about what measures it</p>		<p>the Preliminary Documentation, Offset Strategy, OMP, associated targeted Malleefowl Surveys and subsequent monitoring reports all previously submitted to the Department.</p>
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	should take to avoid any interruption to implementation of the approved Action. The alternative offset site proposal and Offset Management Plan for the alternative offset site may be submitted to the Department well before 7 years after this approval decision.		
Condition 7	If the approval holder wishes to carry out any activity otherwise than in accordance with the Action management plans referred to in these conditions, the approval holder must submit to the Department for the Minister's written approval a revised version of that plan. The approval holder must not commence the varied activity until the Minister has approved the revised plan in writing. If the Minister approves such a revised plan, that version of the plan must be implemented in place of the version previously approved.	Compliant	Activities were carried out in accordance with the approval and associated plans. In accordance with this condition, a revised version of the Offset Management Plan have been submitted to the Department after consultation with Department of Biodiversity, Conservation and Attractions (DBCA) and the National Malleefowl Recovery Group. Details are included in Section 4.
Condition 08	If the Minister believes that it is necessary or convenient for the better protection of Malleefowl to do so, the Minister may request that the approval holder make specified revisions to a plan referred to in these conditions and submit the revised plan for the Minister's written approval. The approval holder must comply with any such request. The approval holder must implement the revised plan approved by the Minister. Unless the Minister has approved the revised plan then the approval holder must continue to implement the plan originally approved, as specified in the conditions.	N/A	No request has been received from the Minister.

Condition 09	The approval holder must submit all plans required by these conditions electronically to the Department	Compliant	Construction Environmental Management Plan (CEMP) was submitted electronically to the Department as part of the Preliminary Documentation for EPBC2021/9026.  The OMP was submitted electronically to the Department on 17 May 2023 and was approved on 6 March 2024. A revised Offset Management Plan has been submitted to the Department for assessment on 20 December, 2024.
Condition 10	Unless otherwise agreed to in writing by the Minister, the approval holder must publish each plan on the website  within 15 business days of the date:  a. of the approval, if the version of the plan to be implemented is specified in these conditions; or  b. the Plan is approved by the Minister in writing, if the plan requires the approval of the Minister; or  c. the plan is submitted to the Department in accordance with a requirement of these conditions, if the plan does not require the approval of the Minister	Compliant	The CEMP was published on the Company website on 12 December 2022, which is within 15 business days of its approval on 22 November 2022.  The Offset Management Plan was also published on Northern Star's website
Condition 11	The approval holder must keep all published plans required by these conditions on the website until the expiry date of this approval.	Compliant	Approval plans are published on the Northern Star Website. <a href="https://www.nsrld.com/about-us/corporate-governance/">https://www.nsrld.com/about-us/corporate-governance/</a>
Condition 12	The approval holder is required to exclude or redact sensitive ecological data from plans published on the website or otherwise provided to a member of the public.	Compliant	No sensitive ecological data has been included within plans published on the website or provided to the public.
Condition 13	If sensitive ecological data is excluded or redacted from a plan in accordance with condition 12, the approval holder must notify	N/A	No sensitive ecological data has been included within plans published on the website or provided to the



	the Department in writing what exclusions and redactions have been made in the version published on the website.		public
Condition 14	The approval holder must notify the Department electronically of the date of commencement of the Action, within 5 business days of commencement of the action.	Compliant	Notification was provided to the Department on 29 November 2022 to inform the Department of the commencement of the action on 28 November 2022.
Condition 15	If the commencement of the Action does not occur within 5 years from the date of this approval, then the approval holder must not commence the Action without the prior written agreement of the Minister.	N/A	The Action commenced on 28 November 2022.
Condition 16	The approval holder must maintain accurate and complete compliance records, in sufficient detail, to allow for the Department to monitor its effectiveness.	Compliant	All records are kept within the company's SharePoint system. Spatial data is maintained within the ArcGIS platforms (ArcGIS Pro, ArcGIS Online & Field Maps). Compliance data is supplied as part of this Annual Compliance Report.
Condition 17	If the Department makes a request in writing, the approval holder must provide electronic copies of compliance records to the Department within the timeframe specified in the request	N/A	Compliance records have not been requested.
Condition 18	The approval holder must ensure that any monitoring data (including sensitive ecological data, surveys, maps, and other spatial and metadata required under the conditions of this approval are prepared in accordance with the Department's Guidelines for biological survey and mapped data (2018), or any subsequent official version or as otherwise specified by the Minister in writing.	Compliant	Monitoring data has been prepared in accordance with relevant Department guidelines.

Condition 19	The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under the conditions of this approval are prepared in accordance with the Department's Guide to providing maps and boundary data for EPBC Act projects (2021), or any subsequent official version or as otherwise specified by the Minister in writing.	Compliant	Monitoring data has been prepared in accordance with relevant Department guidelines.
Condition 20	The approval holder must submit all monitoring data (including sensitive ecological data), surveys, maps, other spatial and metadata and all species occurrence record data (sightings and evidence of presence) electronically to the Department within 12 months of the approval.	Compliant	This data was supplied as part of the Offset Management Plan submission in August 2023. Subsequent monitoring data is provided annually in this Annual Compliance Report.
Condition 21	The approval holder must prepare a compliance report for each 12-month period following the date of this approval, or as otherwise agreed to in writing by the Minister.	Compliant	This document fulfills this requirement.
Condition 22	Each compliance report must be consistent with the department's annual compliance report guidelines (2014) or any subsequent version.	Compliant	This compliance report is consistent with the Department's annual compliance report guidelines (2023).
Condition 23	Each compliance report must include: <ul style="list-style-type: none"> <li>a. Accurate and complete details of compliance and any non-compliance with the conditions and the plans, and any incidents.</li> <li>b. One or more shapefile showing all clearing of any protected matters, and/or their habitat, undertaken within the 12-month period at the end of which that</li> </ul>	Compliant	Compliance details and evidence is included in Table 1 of this document (this table). There were no non-compliances during the reporting period.  Details demonstrating the success of previous corrective actions have been included in Section 2.  A shapefile showing all clearing was sent to the Department via email as part of the previous compliance report. There was no clearing in the

	<p>compliance report is prepared</p> <p>c. A schedule of all plans in existence in relation to these conditions and accurate and complete details of how each plan is being implemented</p>		<p>current reporting period.</p> <p>Details relating to the implementation of the CEMP have been included in Section 3. No clearing was conducted in the current reporting period.</p>
Condition 24	<p>The approval holder must:</p> <p>a. Publish each compliance report on the website within 60 business days following the end of the 12-month period for which that compliance report is required</p> <p>b. Notify the Department electronically, within 5 business days of the date of publication that a compliance report has been published on the website</p> <p>c. Provide the weblink for the compliance report in the notification to the Department</p> <p>d. Keep all published compliance reports required by these conditions on the website until the expiry date of this approval.</p> <p>e. Exclude or redact sensitive ecological data from compliance reports published on the website or otherwise provided to a member of the public.</p> <p>f. If sensitive ecological data is excluded or redacted from the published version, submit the full compliance report to the Department within 5 business days of its publication on the website and notify the</p>	Compliant	<p>The requirements of Condition 24 a-d will achieve compliance following submission of the annual compliance report for 2023/2024 (this document).</p> <p>No information is being redacted from this report that requires further submission to the Department.</p>

	Department in writing what exclusions and redactions have been made in the version published on the website.		
Condition 25	The approval holder must notify the Department electronically, within 2 business days of becoming aware of any incident and/or potential non-compliance and/or actual non-compliance with the conditions or commitments made in a plan.	Compliant	There were no non-compliances identified in the current reporting period.
Condition 26	The approval holder must specify in the notification: <ul style="list-style-type: none"> <li>a. Any condition or commitment made in a plan which has been or may have been breached</li> <li>b. A short description of the incident and/or potential non-compliance and/or actual non-compliance</li> <li>c. The location (including coordinates), date, and time of the incident and/or potential non-compliance and/or actual non-compliance</li> </ul>	Compliant	There were no non-compliances in the current reporting period.
Condition 27	The approval holder must provide to the Department in writing, within 12 business days of becoming aware of any incident and/or potential non-compliance and/or actual non-compliance, the details of that incident and/or potential non-compliance and/or actual non-compliance with the conditions or commitments made in a plan. The approval holder must specify:	Compliant	There were no non-compliances in the current reporting period.

	<ul style="list-style-type: none"> <li>a. Any corrective Action or investigation which the approval holder has already taken</li> <li>b. The potential impacts of the incident and/or non-compliance and the actual impacts of the incident and/or non-compliance</li> <li>c. The method and timing of any corrective Action that will be undertaken by the approval holder</li> </ul>		
Condition 28	The approval holder must ensure that an independent audit of compliance with the conditions is conducted for every three-year period following the commencement of the Action until this approval expires, unless otherwise specified in writing by the Minister	N/A	It has been two years since the action was approved. An independent audit will be coordinated as required for the next reporting cycle (2024/2025).
Condition 29	<p>For each independent audit, the approval holder must:</p> <ul style="list-style-type: none"> <li>a. Provide the name and qualifications of the nominated independent auditor, the draft audit criteria, and proposed timeframe for submitting the audit report to the Department prior to commencing the independent audit</li> <li>b. Only commence the independent audit once the nominated independent auditor, audit criteria and timeframe for submitting the audit report have been approved in writing by the Department</li> <li>c. Submit the audit report to the Department for approval within the timeframe specified. Have the audit report approved in writing by the Department</li> </ul>	N/A	It has been two years since the action was approved. An independent audit will be coordinated as required for the next reporting cycle (2024/2025).

	<p>d. Publish each audit report on the website within 15 business days of the date of the Department's approval of the audit report</p> <p>e. Keep every audit report published on the website until this approval expires</p>		
Condition 30	Each audit report must report for the three-year period preceding that audit report	N/A	It has been two years since the action was approved. An independent audit will be coordinated as required for the next reporting cycle (2024/2025).
Condition 31	Each audit report must be completed to the satisfaction of the Minister and be consistent with the Department's <i>Environment Protection and Biodiversity Conservation Act 1999</i> Independent Audit and Audit Report Guidelines (2019), or any subsequent official version	N/A	It has been two years since the action was approved. An independent audit will be coordinated as required for the next reporting cycle (2024/2025).
Condition 32	The Approval holder must notify the Department Electronically 60 business days prior to the Expiry Date of this approval, that the approval is due to expire.	N/A	The Approval is due to expire in 2052.
Condition 33	Within 20 business days after the completion of the Action and, in any event, before this approval expires, the approval holder must notify the Department electronically of the date of completion of the Action and provide completion data.	N/A	Activities associated with the action include management of the EEL55 Offset site. These actions are ongoing and will continue to be reported on annually as required under EPBC approval 2021/9026

## 2.1 Non-Compliances and Corrective Actions

No non-compliance has been identified in the current reporting period. An update of non-compliance involving a clearing of 0.1383 ha outside the development envelope already reported to the Department in the previous reporting period is presented in section 2.1.1.

### 2.1.1 Review of Corrective Actions

Photo monitoring points established at the A2 (Figure 3) have been used to determine success of rehabilitation. Photo monitoring is demonstrating the re-establishment of vegetation within rehabilitated areas. Monitoring in January 2025 highlights significant vegetation establishment and growth in the rehabilitated areas demonstrating successful implementation of previous corrective action in Table 3

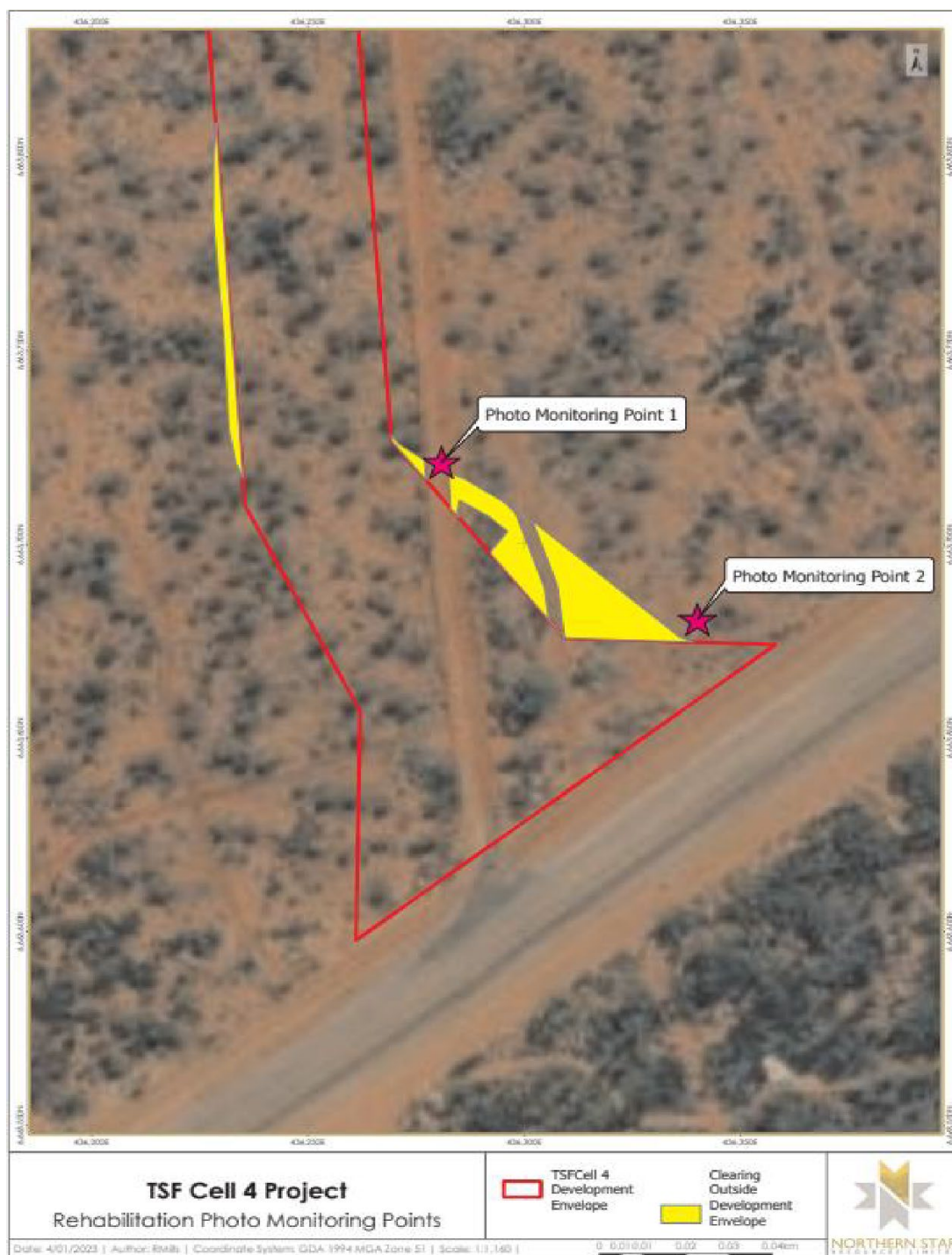







Figure 3 Photo Monitoring Points A2.

Table 2 Photo Monitoring Points at A2.

	Photo Point 1	Photo Point 2
January 2023		
August 2023		
October 2023		
November 2023		



7<sup>th</sup> January, 2025



### 3 STATUS OF ENVIRONMENTAL MANAGEMENT PLANS

Condition 23 (c) requires a summary of the schedule of all plans in existence in relation to these conditions and accurate and complete details of how each plan is being

implemented. Two Management Plans; Offset Management Plan and the Construction Environmental Management Plan are currently applicable.

#### 3.1 Construction Environmental Management Plan

The Approved Construction Environmental Management Plan (Appendix 3) has been for activities associated with the clearing and construction of the TSF Cell 4.

All clearing and most construction works associated with this Action were completed during the previous reporting period. Remaining works that were completed during the reporting period involved the construction of the required surface water drainage channel. This drain has been constructed as shown in Plate 3. The summary of the schedule of clearing and construction of TSF Cell 4 is provided in Table 3.

Table 3 Schedule of Clearing and Construction Activities associated with Controlled Action.

Activity Description	Status
Clearing of impact area	Completed - 16 February 2023
Construction of Embankments	Completed - 19 July 2023
Compaction & construction of roads	Completed - 29 April 2023
Redirection of surface water flows through construction of drainage channels	Completed in February 2024

Table 4 Compliance with Environmental Management Objectives.

Objectives	Performance Criteria	Compliant (Y/N/NA)	Evidence
Minimise the potential of vehicle strike causing injury or death to terrestrial fauna, including the Malleefowl.	No deaths of fauna/Malleefowl attributable to vehicle strike.	Y	Malleefowl fauna signs installed on roads in area (Plate 5). Speed limits in place (Plate 5). Dozer speed limited to 10km/hr. No injury or death of fauna was recorded during clearing activities.

Objectives	Performance Criteria	Compliant (Y/N/NA)	Evidence
Minimise entrapment leading to injury or death of terrestrial fauna, including the Malleefowl.	No Malleefowl (adult or chick) death due to entrapment in water holding facilities.	Y	No Malleefowl deaths recorded due to entrapment in water holding facilities.  Fauna egress is installed on internal embankments of facilities (Plate 6).  The Turkeys Nest Dam is fenced, and gates
			remained shut prior to filling with hypersaline water (unsuitable for Malleefowl or other bird life consumption) during construction phase. This fence will remain for the life of the facility (Plate 6).  No water deposition occurred during the reporting period. Water present in Turkeys Nest due to rainfall.
Minimise requirements for clearing which results in habitat loss and fragmentation.	No unauthorised clearing and/or clearing outside approved clearing areas.  No unauthorised clearing of active Malleefowl mounds.	Y	No clearing during the reporting period.
Minimise increases to predator abundance.	No increase in predator abundance.  No fauna/Malleefowl deaths due to predation.	Y	No increase in predators has been recorded.  No fauna/Malleefowl death due to predation has been recorded.
No increase in fire frequency or intensity.	No fires attributed to construction/mining and associated activities.	Y	No fires were within the Controlled Action Area or surrounding areas during clearing or construction.
Minimise potential impacts to terrestrial fauna, including the Malleefowl by training staff to increase awareness on the Identification, monitoring and management of Malleefowl.	All relevant staff and contractors to be trained through inductions/pre-start meetings on Malleefowl/fauna management.	Y	The General Site Induction is completed by all personnel visiting Carosue Dam. The induction was updated to include more detailed information on Malleefowl awareness.  Fauna and CEMP training was delivered by Site Environmental Advisors with operators working on the project. Northern Star manage training records through INX InTuition and LMS.



*Plate 5 Malleefowl signage and speed limit in place.*



*Plate 6 Fencing and Fauna egress netting around water holding facility.*

### **3.2 EEL55 OFFSET Management Plan**

The Offset Management Plan was approved on 6 March 2024 and outlines the key management actions at EEL55 to achieve the offset outcomes.

This reporting period is the first year of the approved offset management plan being implemented. Table 6 below summarises the compliance assessment of the offset management plan requirements for the current reporting period.

Key actions conducted as part of the Offset Management Plan include:

- Annual Malleefowl Monitoring
- Baseline predator survey
- Baseline weed survey
- Consultation with key stakeholders

Table 5 Compliance Assessment of the Offset Management Plan.

Completion Criteria	Actions	Schedule & Timeframes	Management Actions Implemented Evidence/Comments	Date	Compliance (Y/N)	Monitoring Completed	Management Triggers Actioned	Corrective Actions Implemented
Conservation covenant granted.	<ul style="list-style-type: none"> <li>Conservation covenant applied for and granted.</li> </ul>	<ul style="list-style-type: none"> <li>Application made within 6 months of approval of EPBC 2021/9026</li> <li>(Condition 2a)</li> <li>Conservation covenant granted within 6 months of approval of the OMP (Condition 2b).</li> </ul>	<ul style="list-style-type: none"> <li>Application for Conservation Covenant submitted to the Soil Commissioner on 18/08/2023.</li> <li>Conservation Covenant accepted on 04/09/2023 and registered on the Certificate of Title. Documentation received and retained on [<a href="#">App. A_EEL55 Conservation Covenant.pdf</a>].</li> </ul>	04/09/2023	Y	N/A	N/A	N/A
Fencing installed and capable of excluding livestock	<ul style="list-style-type: none"> <li>Exclusion fencing installed and maintained</li> </ul>	<ul style="list-style-type: none"> <li>Fencing installed within 1 year of approval of OMP.</li> <li>Fencing maintained for life of the approval.</li> </ul>	<ul style="list-style-type: none"> <li>Heritage survey completed along EEL55 boundary (with the exception of the southern section) in February 2024.</li> <li>Consultation with DBCA &amp; National Malleefowl Recovery Group.</li> <li>Revised OMP under assessment.</li> </ul>	N/A	N/A	N/A	N/A	N/A

Completion Criteria	Actions	Schedule & Timeframes	Management Actions Implemented Evidence/Comments	Date	Compliance (Y/N)	Monitoring Completed	Management Triggers Actioned	Corrective Actions Implemented
Decrease in predator activity	<ul style="list-style-type: none"> <li>Predator control program.</li> <li>Annual predator activity surveys.</li> </ul>	<ul style="list-style-type: none"> <li>Review of effectiveness of program conducted annually</li> </ul>	<ul style="list-style-type: none"> <li>Baseline predator survey completed.</li> <li>GNRBA have undertaken two bait runs on DBCA's Yallari Timber Reserve and EEL55 boundary</li> <li>Predator activity is noted during annual Malleefowl monitoring and reported in the ACR (Section 4). No predator activity was observed during monitoring on 10 December 2024.</li> <li>Records of predator activity are registered within the Malleefowl Monitoring Database.</li> </ul>	11/06/2024  29/11/2024	Y	Yes	N/A	N/A
Firebreaks established and maintained	<ul style="list-style-type: none"> <li>Firebreak is installed around offset site</li> </ul>	<ul style="list-style-type: none"> <li>Firebreak installation within 1 year</li> <li>of approval of the OMP</li> </ul>	<ul style="list-style-type: none"> <li>Heritage survey completed along EEL55 boundary (with the exception of the southern section) in February 2024.</li> <li>Consultation undertaken with DBCA &amp; National Malleefowl Recovery Group.</li> <li>Revised OMP under assessment</li> </ul>	N/A	N/A	Yes	N/A	N/A

Completion Criteria	Actions	Schedule & Timeframes	Management Actions Implemented Evidence/Comments	Date	Compliance (Y/N)	Monitoring Completed	Management Triggers Actioned	Corrective Actions Implemented
	<ul style="list-style-type: none"> <li>Firebreak maintained in accordance with industry standards</li> </ul>	<ul style="list-style-type: none"> <li>Biannual maintenance inspections for life of the approval</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	N/A	N/A	N/A	N/A	N/A
No degradation to habitat quality due to increased weed cover	<ul style="list-style-type: none"> <li>Weed control program</li> <li>Annual weed monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Annual inspection for life of the approval</li> </ul>	<ul style="list-style-type: none"> <li>Baseline weed survey completed November 2024 (Draft received).</li> </ul>	November 2024	Y	Yes	N/A	N/A

## 4 ANNUAL REPORT ON MALLEEFOWL PRESENCE WITHIN EEL55

This Section satisfies Condition 2d of EPBC2021/9026:

*"To compensate for residual significant impacts to Malleefowl, the approval holder must once the EEL55 offset site has been legally secured, report annually on the presence of Malleefowl at the EEL55 offset site for the life of the approval."*

The 2024 breeding season runs from September 2024 until February 2025. on-ground monitoring was undertaken in line with the national malleefowl monitoring manual (national malleefowl recovery team, 2022), on 10 December 2024 with all known mounds in EEL 55 visited.

### 4.1 Results

#### 4.1.1 Current Mound Status

Of the 16 mounds monitored within EEL55, one mound (EEL55\_006, photo in plate 7) was considered 'Active', four 'Inactive' and 11 'Long Unused'. Figure 4 below shows updated Malleefowl activity in 2024 on the EEL55 Site.



Plate 7 Active Malleefowl mound (EEL55\_006).



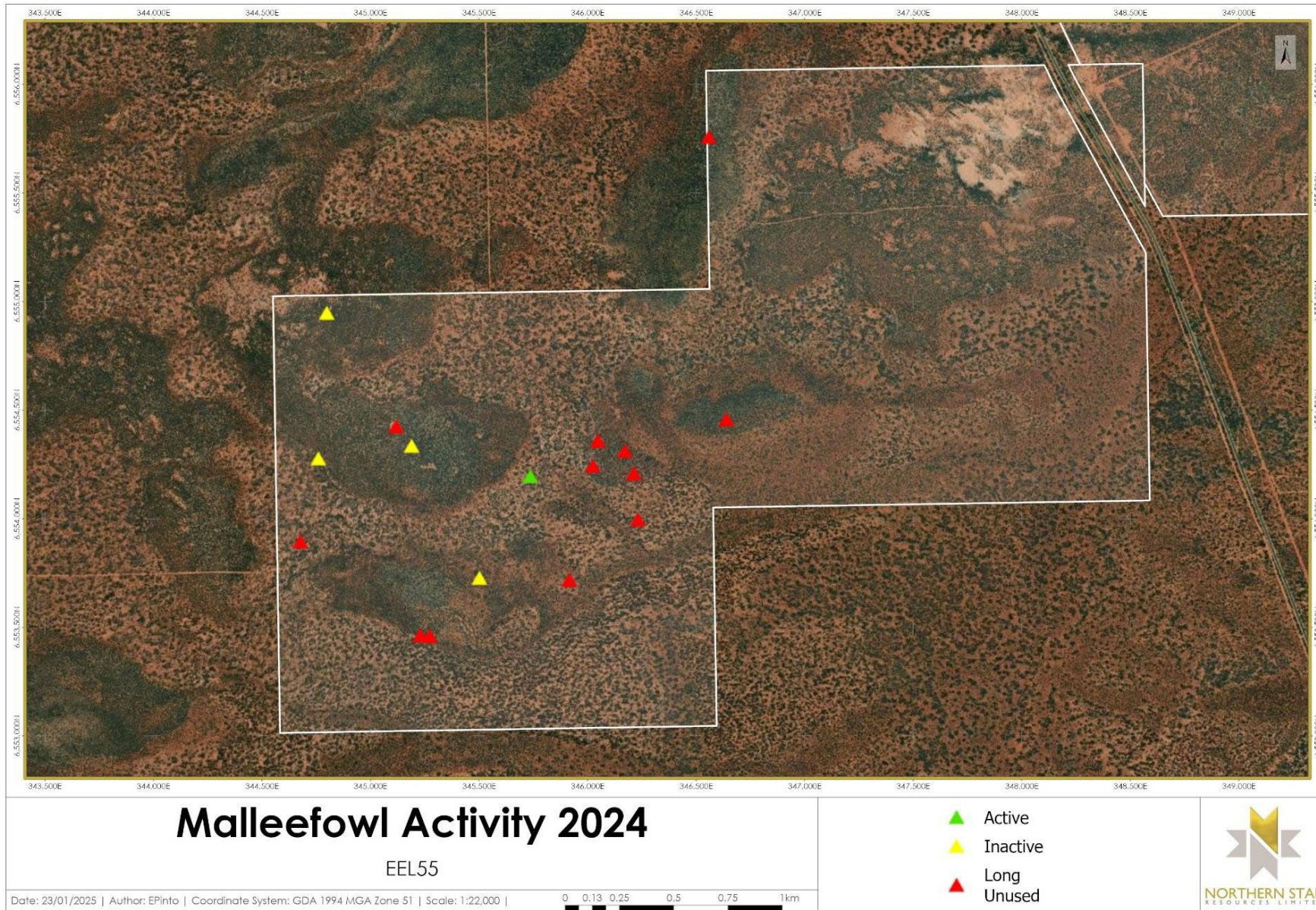


Figure 4 Malleefowl Activity 2024 on EEL55.

### 4.1.2 Camera Monitoring

Motion-sensitive cameras are placed on mounds determined to be active during that breeding season in order to confirm activity status and obtain more data on Malleefowl trends within the site.

During the 2023-2024 breeding season, cameras were placed on two of the mounds between November 2023 and May 2024, to confirm field observations at EEL55\_007 and EEL55\_009. The camera placed at EEL55\_009 was to determine activity of the mound after a suspected predation event. Camera footage showed that none of these two mounds are active and no Malleefowl activity was identified.

The camera was relocated to EEL55\_006 after the 10th December, 2024 monitoring round showed Mound EEL55\_006 was active. Data from the cameras were analysed confirming EEL55\_006 to be an active mound (Plate 7).



Plate 7: Camera image at EEL55\_006.

## 4.2 General Environmental Observations

### 4.2.1 Predator Activity

No Evidence of predator activity was identified during the monitoring period.

### 4.2.2 Livestock Activity

No evidence of livestock activity was recorded during the monitoring period.

## 5 REFERENCES

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023) Annual Compliance Report Guidelines, Canberra. CC BY 4.0.

Holm, A (2022) Pre-clearance survey of Malleefowl activity within proposed expansion of Carosue Dam Tailings Storage Facility (Cell 4). Prepared for Northern Star Resources Limited, 24 November 2022.

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## **6 APPENDICES**

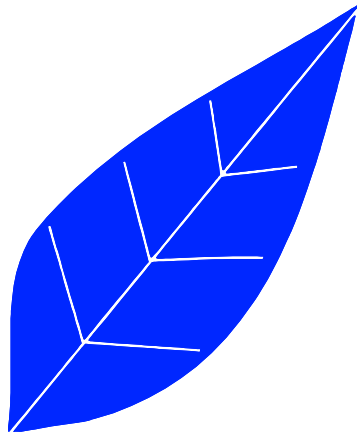
**Appendix 1 Baseline Weed Survey Report.**

**Appendix 2 Certificate of Title EEL55.**

**Appendix 3 EPBC 2021 - 9026 Construction Environmental Management Plan.**

**Appendix 4 Approved Offset Management Plan.**



**Appendix 1 Baseline Weed Survey Report.**



# Native Vegetation Solutions

ABN 63 584 896 400

## Targeted Weed Survey of Location EEL55- November 2024

APPROVAL STATUS					
PREPARED BY:			APPROVED BY:		
Native Vegetation Solutions			Northern Star (Carosue Dam) Pty Ltd		
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NAME	Eren Reid		Francis Atta Kuranchie		
POSITION	Botanist/Proprietor		Environmental Superintendent		
SIGNATURE					
DATE	24/01/2025				
Created	December 2024	Reviewed	January 2025	Version	2.0

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# 1 Introduction

## 1.1 Project Description

Northern Star (Carosue Dam) Pty Ltd has approval to develop a new cell (Cell 4) at its Tailings Storage Facility (TSF) at Carosue Dam Operations. Approval to construct Cell 4 was granted under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 22 November 2022 (EPBC 2021/9026). The approval was granted with Environmental Offset Conditions.

Northern Star has since developed an Offset Management Plan (OMP) for Land parcel “EEL55” (NSRL, 2023).

The OMP objectives are to protect Malleefowl habitat in Land parcel “EEL55” from future development by securing the site for long term conservation management and to improve Malleefowl habitat quality within the site through implementation of management measures.

Land parcel “EEL55” is 800 ha of Freehold land owned by Northern Star (Carosue Dam) Pty Ltd and holds a special land category ‘Exempt East Location’ (EEL) allowing mining and/or exploration activities to occur on the land under agreement, exempt from the provisions of the *Mining Act 1978* and *Mining Regulations 1981*.

EEL55 is surrounded by mining and exploration tenure, and pastoral leases. A pastoral licence agreement overlies the Freehold land. There has previously been no formal protection and/or management over EEL55 for the purposes of conservation, to prevent pastoral, mining and/or exploration activities.

EEL55 is located within a continuous patch of vegetation and abuts the Department of Biodiversity, Conservation and Attractions’ (DBCA) managed Yallari Timber Reserve, providing a connection to regional flora and fauna habitat.

Native Vegetation Solutions (NVS) was commissioned by Northern Star on 19<sup>th</sup> November 2024 to conduct baseline weed monitoring within EEL55, to identify problem areas that may require intervention and management, under the existing OMP.

## 1.2 Topography and Soils

The survey area is located within the south-west interzone within the Coolgardie Botanical District (Beard, 1990). The relief is subdued and comprises of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas.

## 1.3 Vegetation

The composition of vegetation communities within the Coolgardie Botanical District (Beard, 1990) range from *Eucalyptus* woodlands with layers of *Eremophila* species or low chenopod shrublands to heath or open hummock grasslands of *Triodia scariosa* with emergent trees (*Eucalyptus* and *Callitris*) and shrubs of *Acacia*, *Grevillea*, *Hakea* and *Melaleuca* species.

---

## 1.4 Monitoring Objectives

This Offset Management Plan (OMP) has been prepared to meet the requirements of Condition 3 of EPBC 2021/9026. The objectives of this OMP are to:

- Protect Malleefowl habitat in EEL55 from future development by securing the site for long term conservation management.
- Improve Malleefowl habitat quality within the site through implementation of management measures.

The management approach outlined in this OMP has incorporated recovery actions identified in the National Malleefowl Recovery Plan (Benshemesh, 2007). The primary strategies to achieve these objectives are:

- Securing a conservation covenant over EEL55
- Environmental management to improve Malleefowl habitat quality at the site, including:
  - Exclusion of grazing
  - Feral predator control
  - Bushfire prevention
  - Weed control

## 2 Monitoring Methodology

Below outlines the steps undertaken:

The first step involved gathering relevant background information. The following was undertaken and results documented prior to conducting the field assessment:

- A review of existing weed location information for Florabase (WAHERB, 2024) for the area and relevant information on the existing physical environment; and
- A review of aerial photography and GIS information to assist in the delineation of existing/new disturbances.

The second step involved performing the field survey (19/11/2024) to verify the locations of weeds for potential future comparison and assessment. The field survey included the following:

- Providing a flexible method of monitoring to allow for changes and additional information for possible future progressive work.

- Compiling an initial inventory of GPS Locations of already recorded and potential new locations of introduced flora along access corridor disturbances, and other associated disturbances.
- The number of sites selected for monitoring depends on the number and type of weed populations present on site. Where the number of plants within populations is relatively small (<50 plants), all sites can potentially be monitored visually with a GPS location and a count. Where large numbers of plants within populations are present and wide spread, representative sites may be selected, and monitored via quadrat analysis. If the spread of the weed population is limited to a small area (i.e. road corridor), then sites can be monitored visually with a GPS location and population count.
- Sites should be inspected and controlled annually; however additional monitoring may be beneficial following significant rainfall events.
- Percentage weed cover of each species will be stated via geospatial analysis of locations with a 20 metre buffer applied.

## **2.1 Personnel Involved**

- Eren Reid (BSc- Biological Science)- Botanist/Proprietor, NVS, Conducted field work, prepared the report and responsible for QA/QC of the report.

## **2.2 Limitations**

Whilst survey methods adopted by NVS were thorough, it should be noted that weed monitoring can require multiple surveys, at different times of the year, and over a period of a number of years, to enable observation of all species present for the purposes of controlling weed outbreaks. The timing of the monitoring was applied when climatic conditions were considered optimal.

## **3 Results**

Results of the weed monitoring revealed a total of twelve non-native weed species present within EEL55. These weed species were recorded at a total of 45 sites and captured as a GPS point. Sometimes more than one weed species was captured per GPS site. The majority of weed species were concentrated next to the Coolgardie-Esperance Highway and the access track extending west from the Highway.

The species recorded were *Asphodelus fistulosus*, *Avena barbata*, *Carrichtera annua*, *Carthamus lanatus*, *Cenchrus ciliaris*, *Centaurea melitensis*, *Erodium botrys*, *Mesembryanthemum crystallinum*, *Oncosiphon suffruticosum*, *Salvia verbenaca*, *Sisymbrium irio* and *Sonchus oleraceus*.



Figure 1: *Asphodelus fistulosus*



Figure 2: *Avena barbata*



Figure 3: *Carrichtera annua*



Figure 4: *Carthamus lanatus*



Figure 5: *Cenchrus ciliaris*



Figure 6: *Centaurea melitensis*



Figure 7: *Erodium botrys*



Figure 8: *Mesembryanthemum crystallinum*



Figure 9: *Oncosiphon suffruticosum*





Figure 10: *Salvia verbenaca*



Figure 11: *Sisymbrium irio*



Figure 12: *Sonchus oleraceus*

None of the species recorded in the survey area are classified as a Declared Pest under the *Biosecurity and Agriculture Management Act 2007* (BAM Act).

Table 1 below summarizes the number of recorded locations of each weed species as well as the total abundance from these locations.

**Table 1: Summary of weed locations and abundance**

<b>Taxon</b>	<b>Locations Recorded</b>	<b>Abundance (lower- upper estimates)</b>	<b>Area within EEL55 (hectares)</b>	<b>Percentage area of EEL55</b>
<i>Asphodelus fistulosus</i> *	3	12 - 70	0.375	0.046%
<i>Avena barbata</i> *	2	20 - 100	0.250	0.031%
<i>Carrichtera annua</i> *	31	12,500 – 24,500	3.330	0.411%
<i>Carthamus lanatus</i> *	1	50 - 100	0.125	0.015%
<i>Cenchrus ciliaris</i> *	1	1 - 10	0.125	0.015%
<i>Centaurea melitensis</i> *	19	948 – 1,780	2.082	0.257%
<i>Erodium botrys</i> *	2	2 - 20	0.250	0.031%
<i>Mesembryanthemum crystallinum</i> *	1	1,000 – 2,000	0.125	0.015%
<i>Oncosiphon suffruticosum</i> *	5	761 – 1,460	0.573	0.071%
<i>Salvia verbenaca</i> *	28	4,133 – 8,030	3.222	0.398%
<i>Sisymbrium irio</i> *	19	566 – 1,260	2.129	0.263%
<i>Sonchus oleraceus</i> *	9	45 - 250	1.073	0.133%
<b>All species combined</b>	<b>45</b>	<b>20,038 – 39,580</b>	<b>4.897</b>	<b>0.61%</b>

Mapping of the weed species locations recorded in 2024 are available in Appendix 1. The total weed percentage cover of each species is included below.

Individual weed species, locations and numbers recorded on site in 2024 can be seen in Appendix 2 below.

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## 4 Conclusions and Recommendations

The first round of weed monitoring in 2024 revealed a total of 12 weed species from 45 locations, with a total weed cover of 4.897 ha, which makes up 0.61% of the EEL55 survey area.

These results will form the basis for future monitoring trends.

Continued monitoring in 2025 will provide further result comparisons regarding the number of weed locations as well as the abundance of each weed species, and the total weed cover percentage.

---

## 5 References

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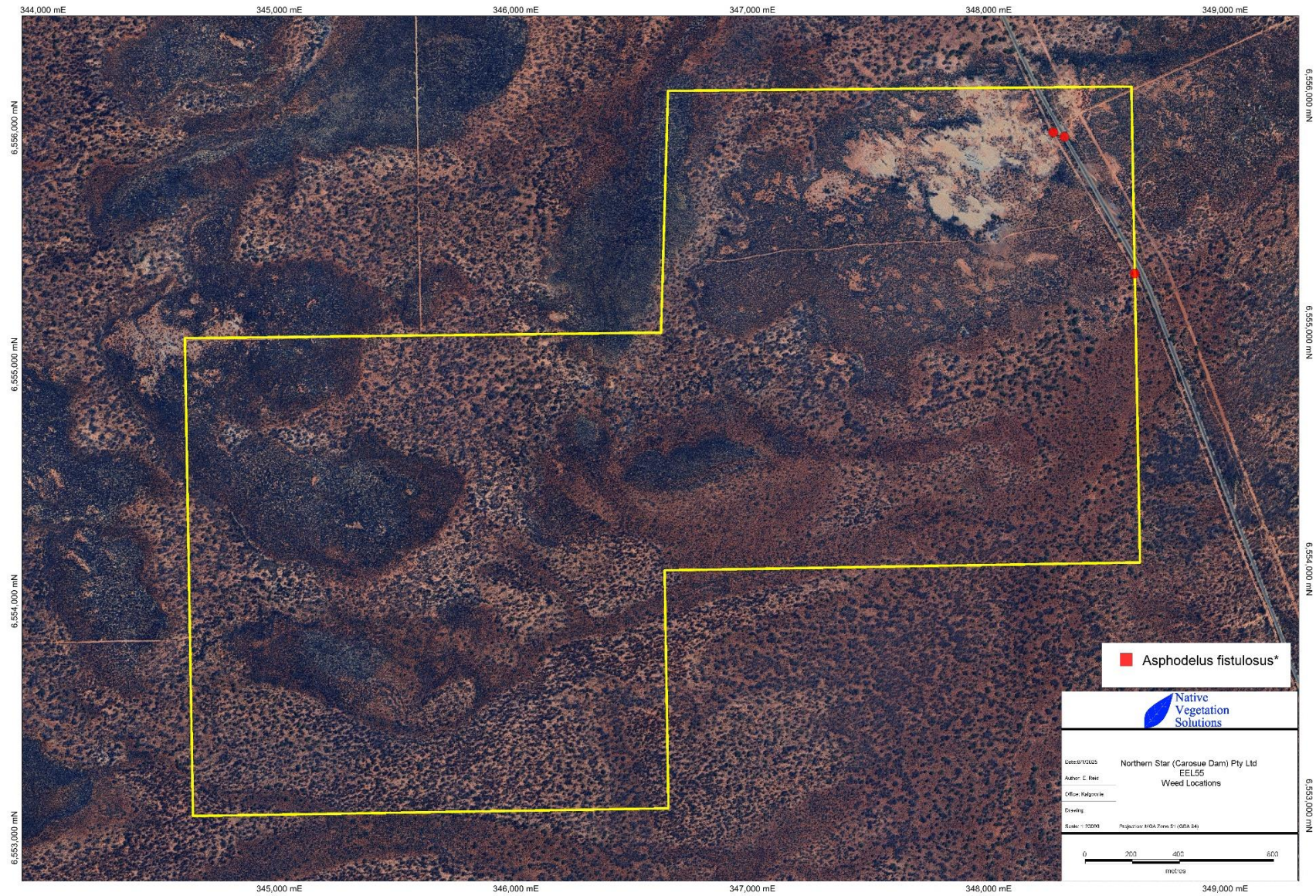
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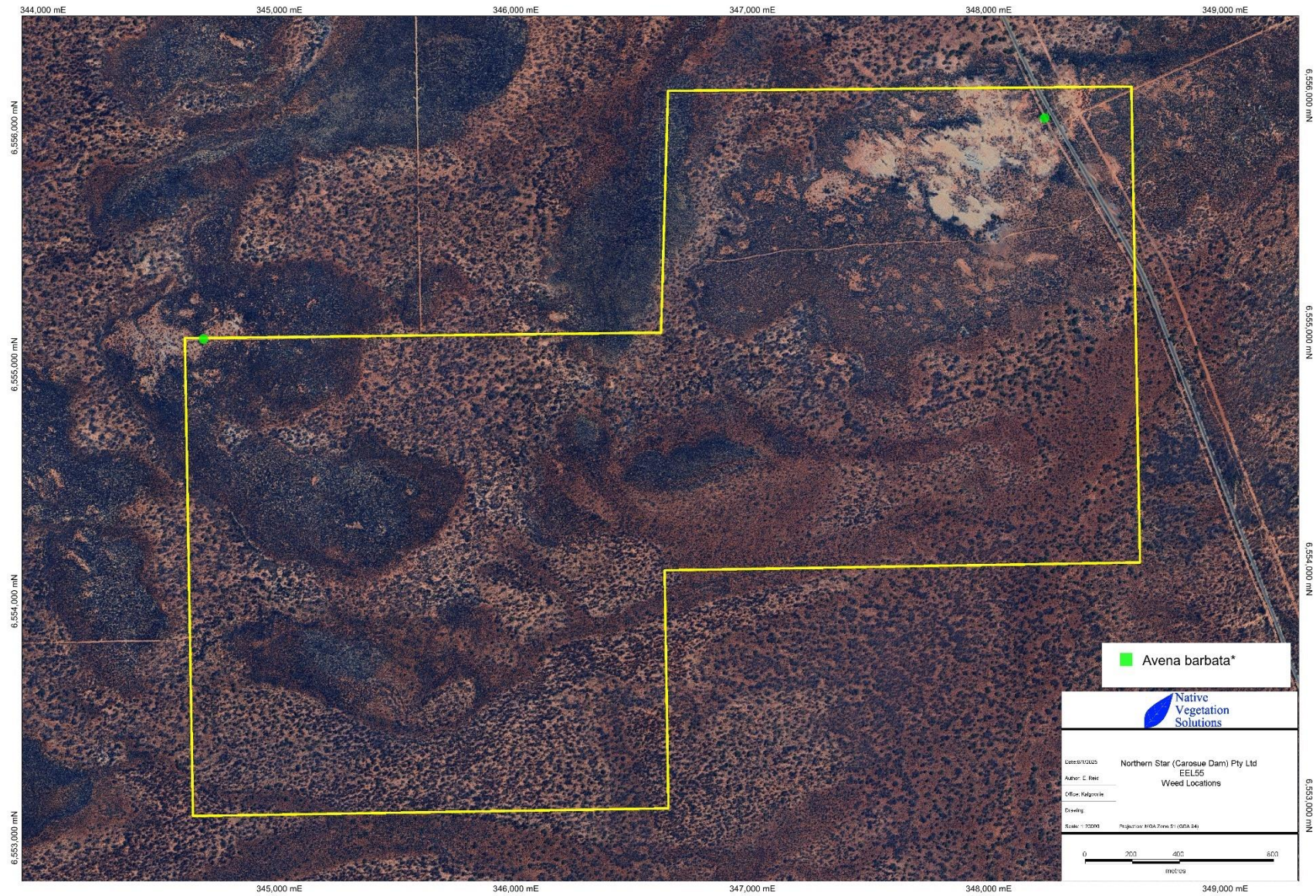
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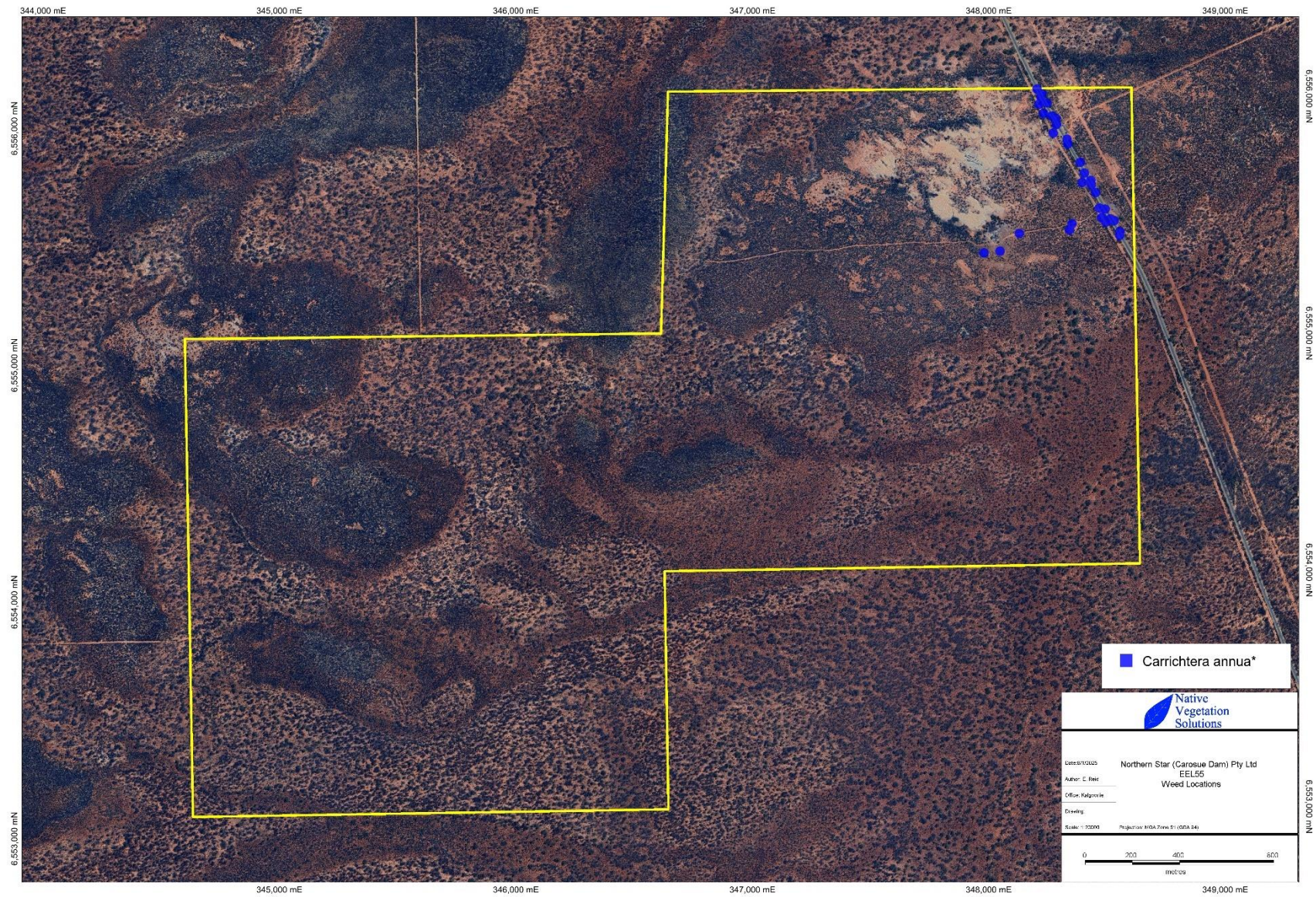
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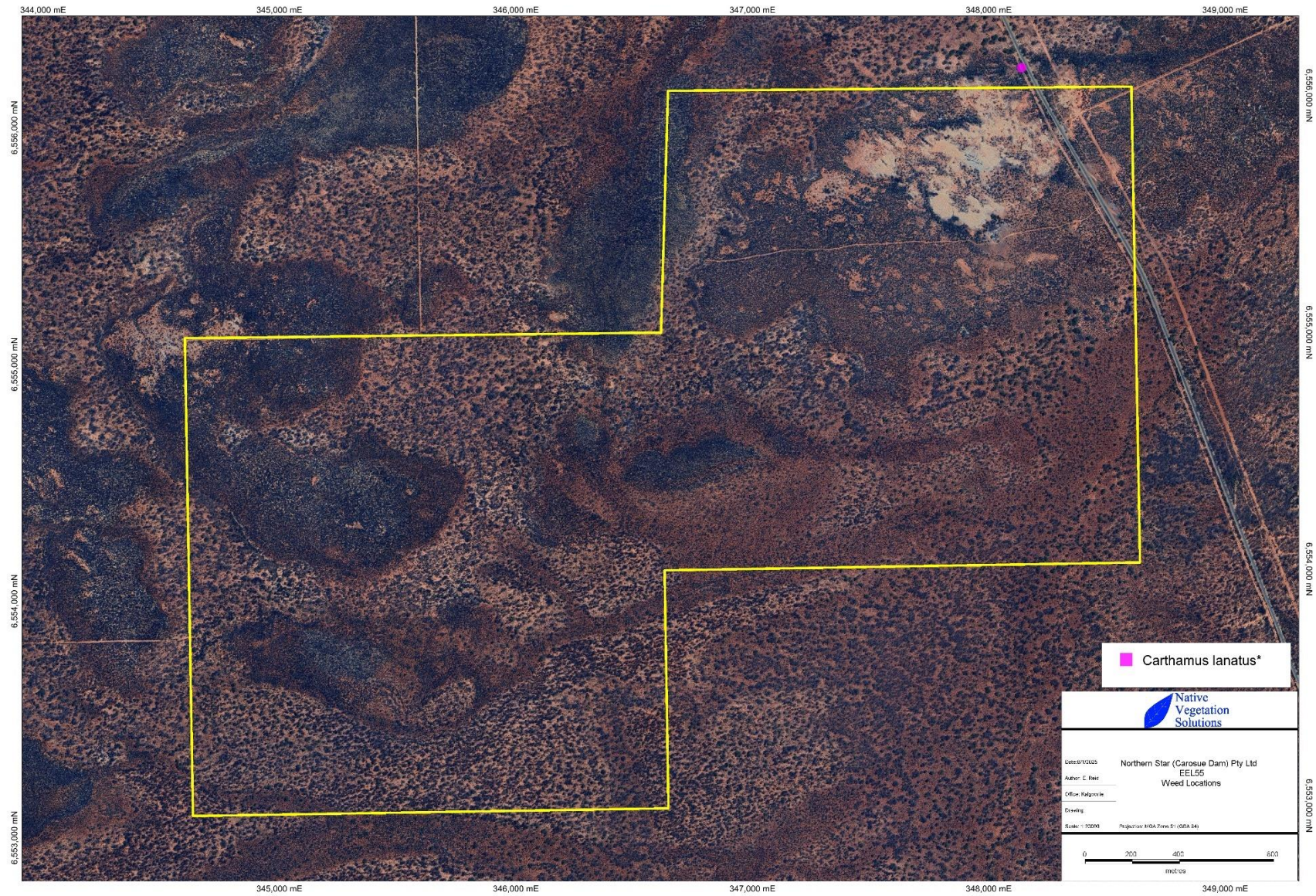
## **Appendix 1: Relevant Mapping**

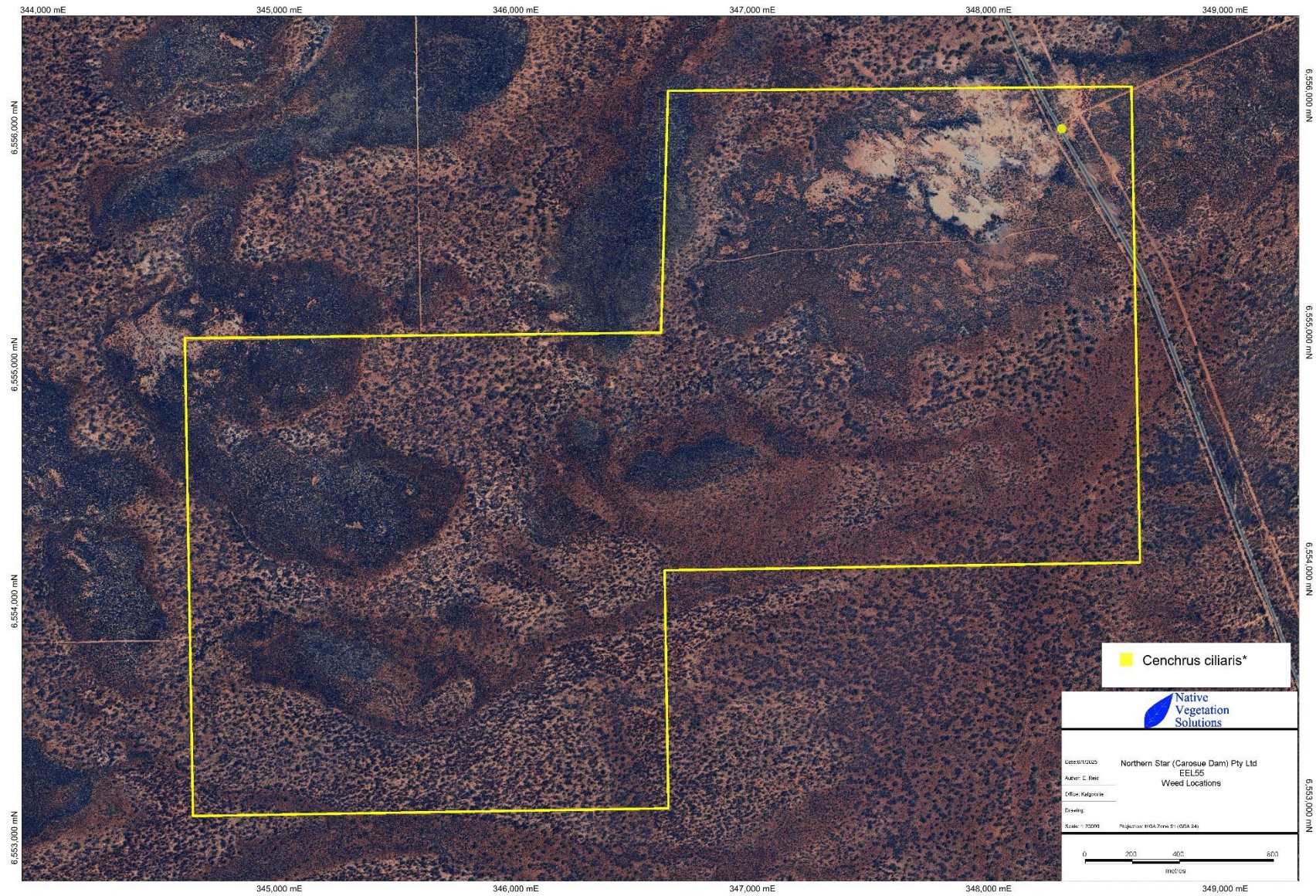


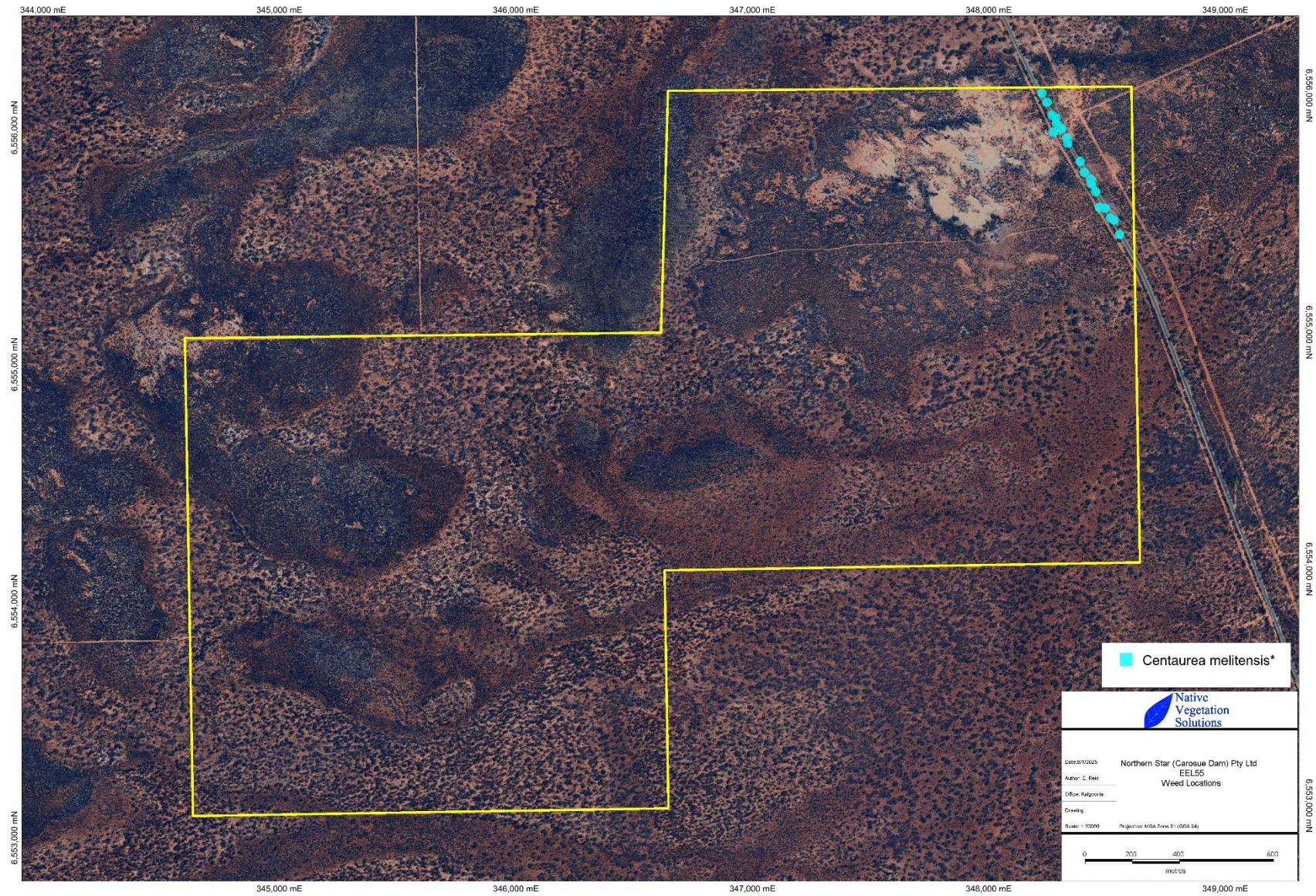


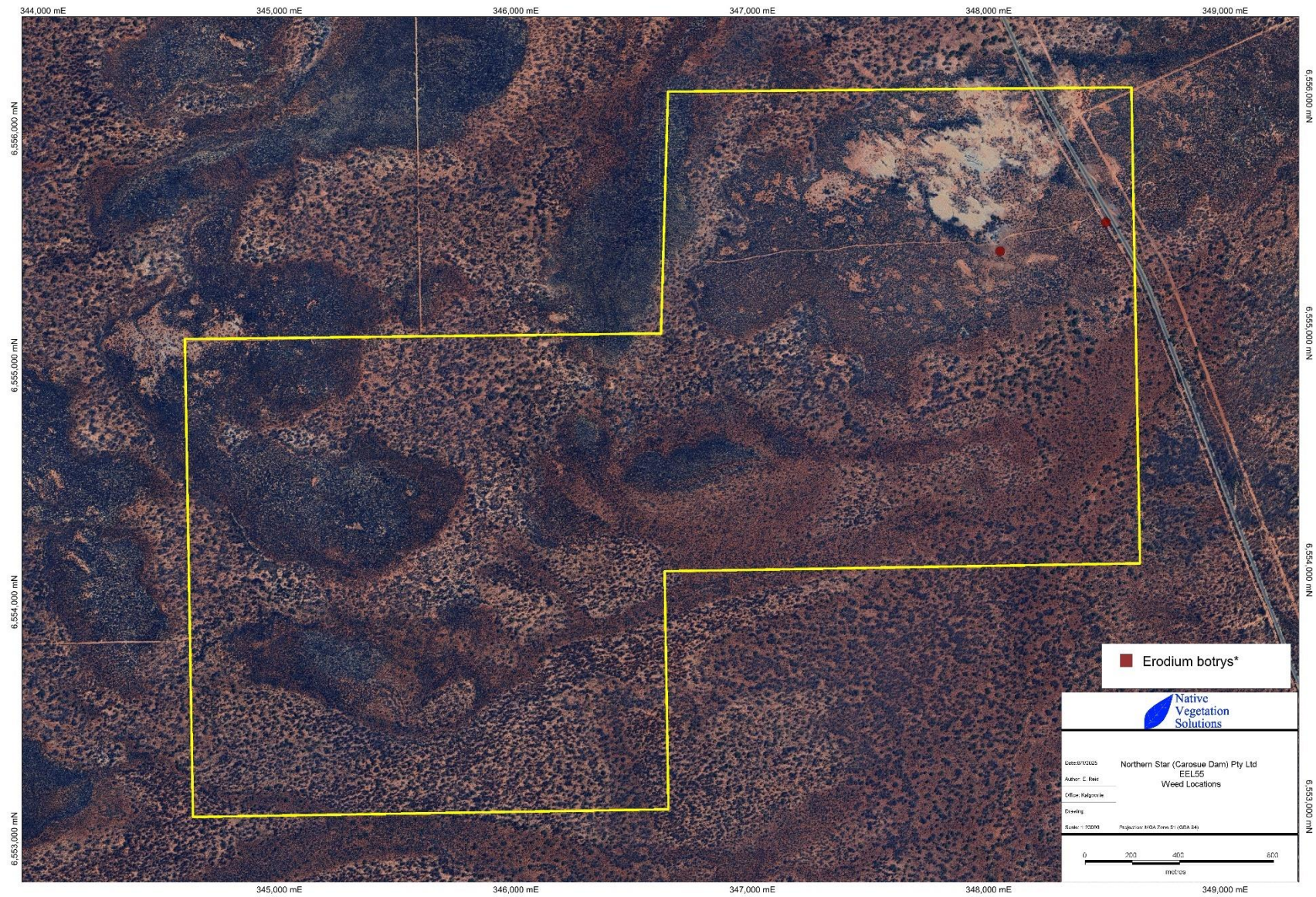


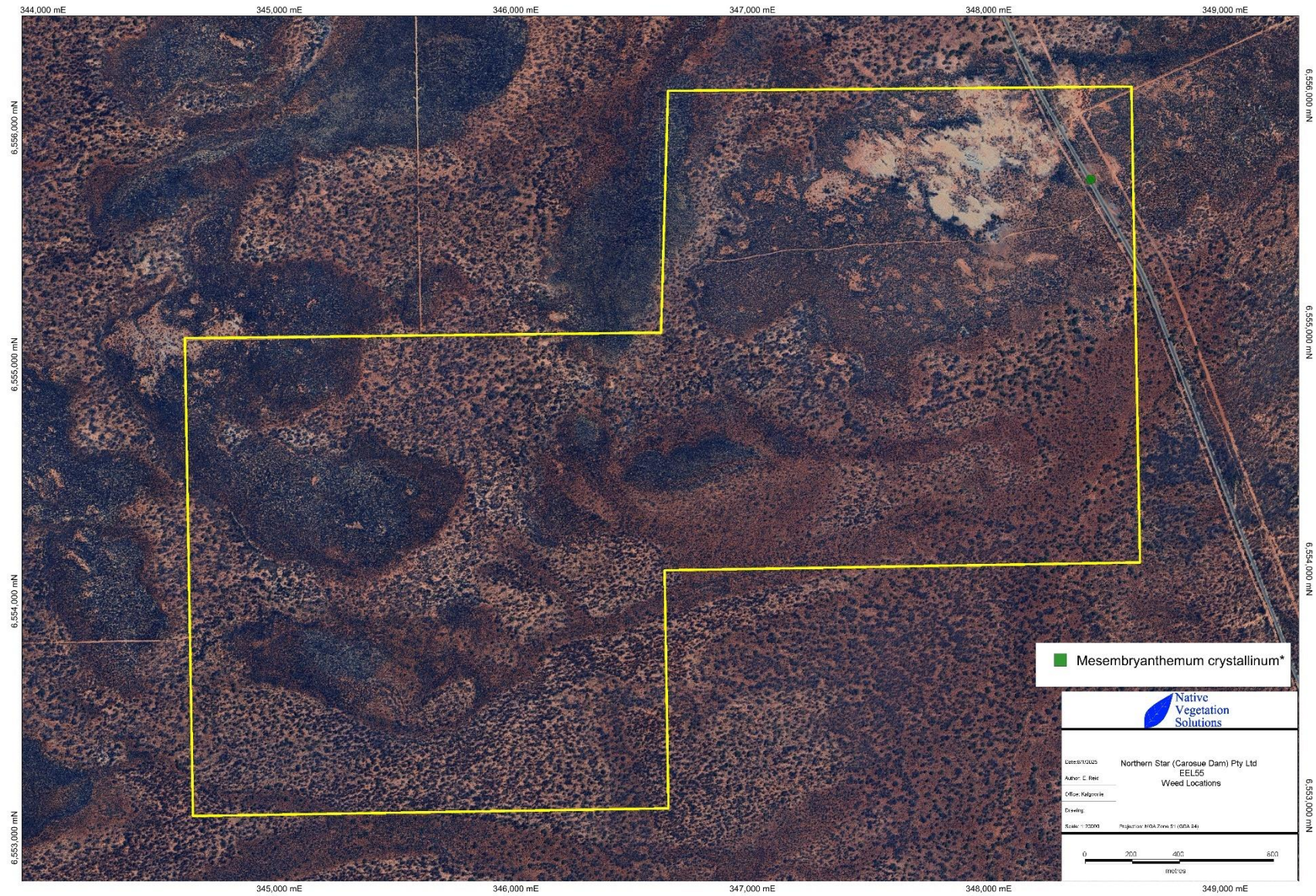


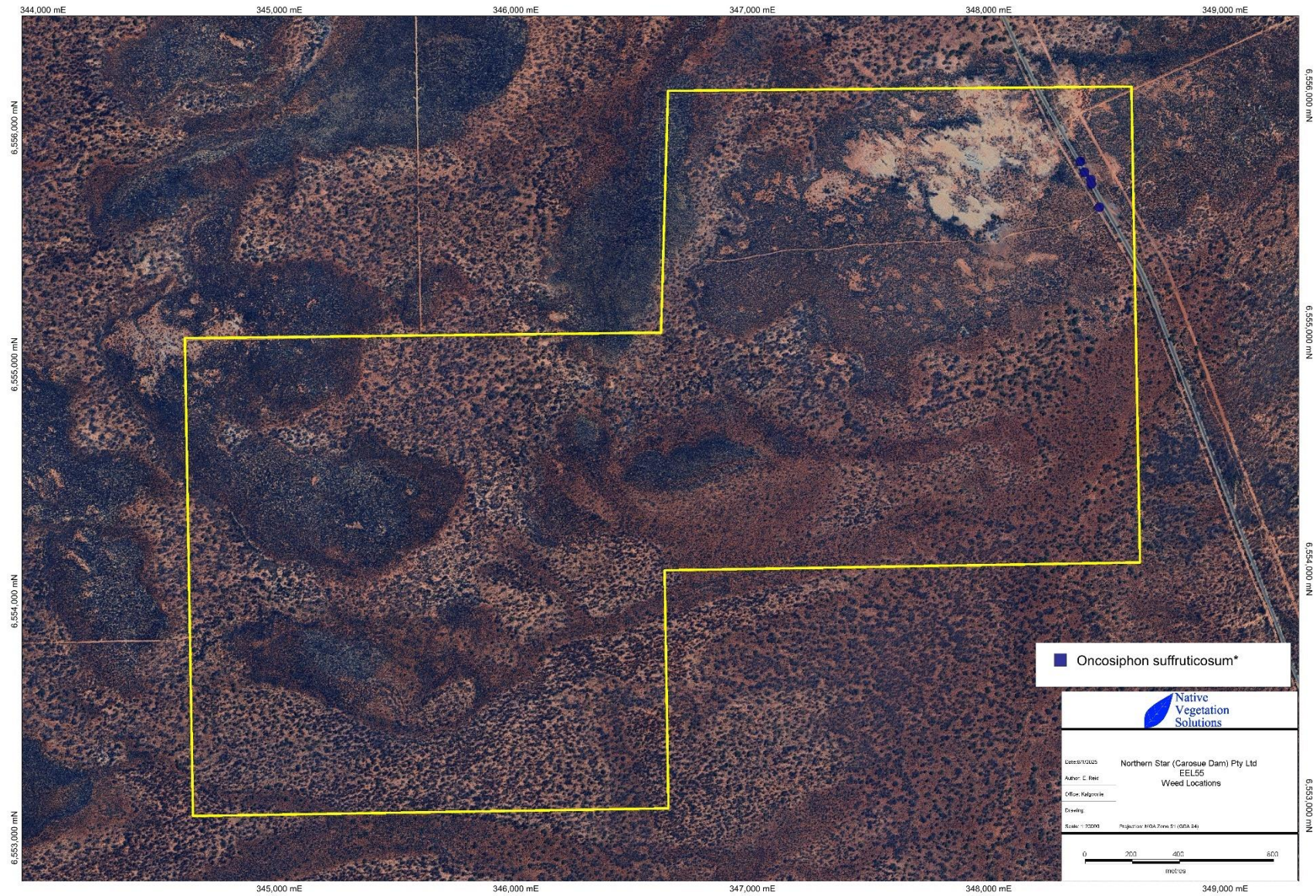


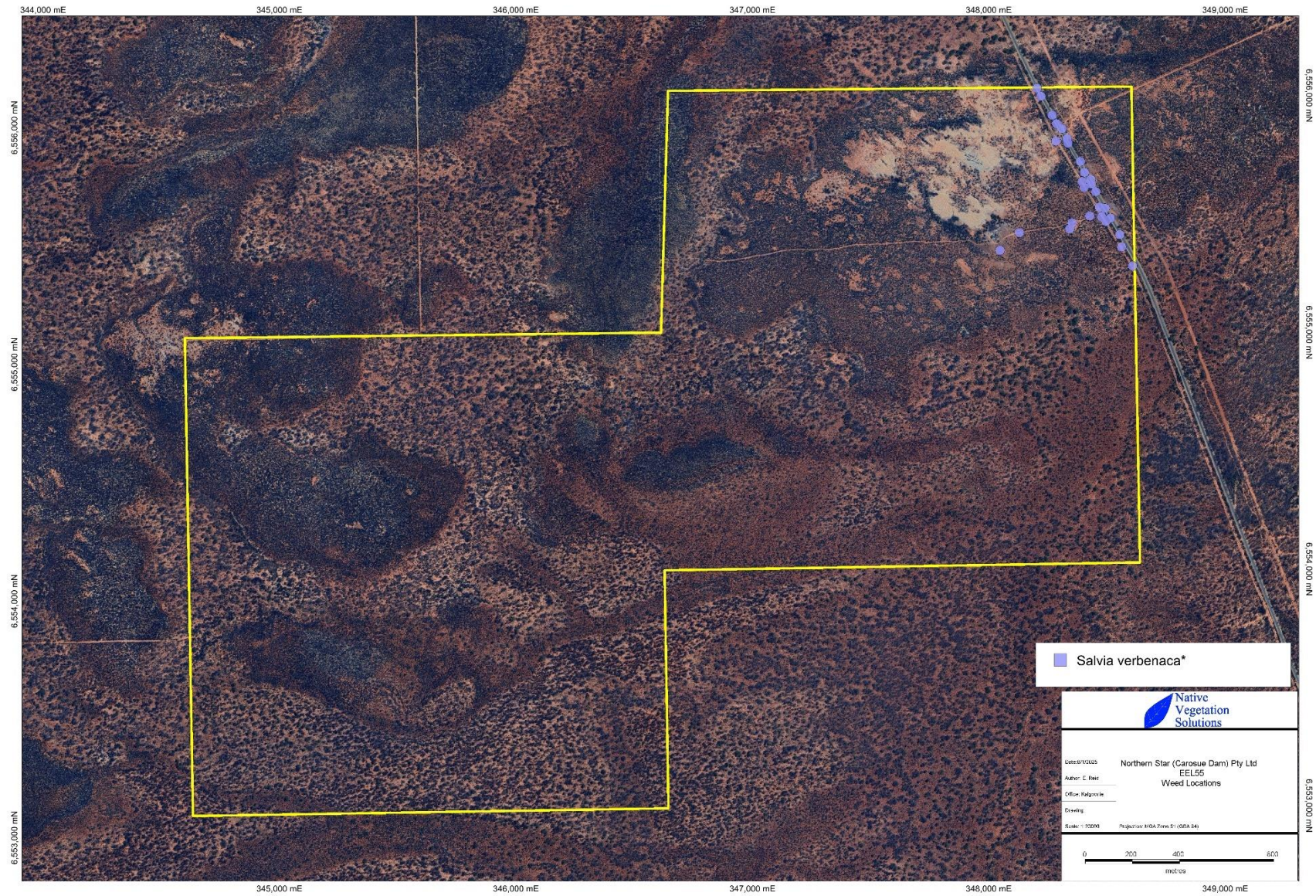




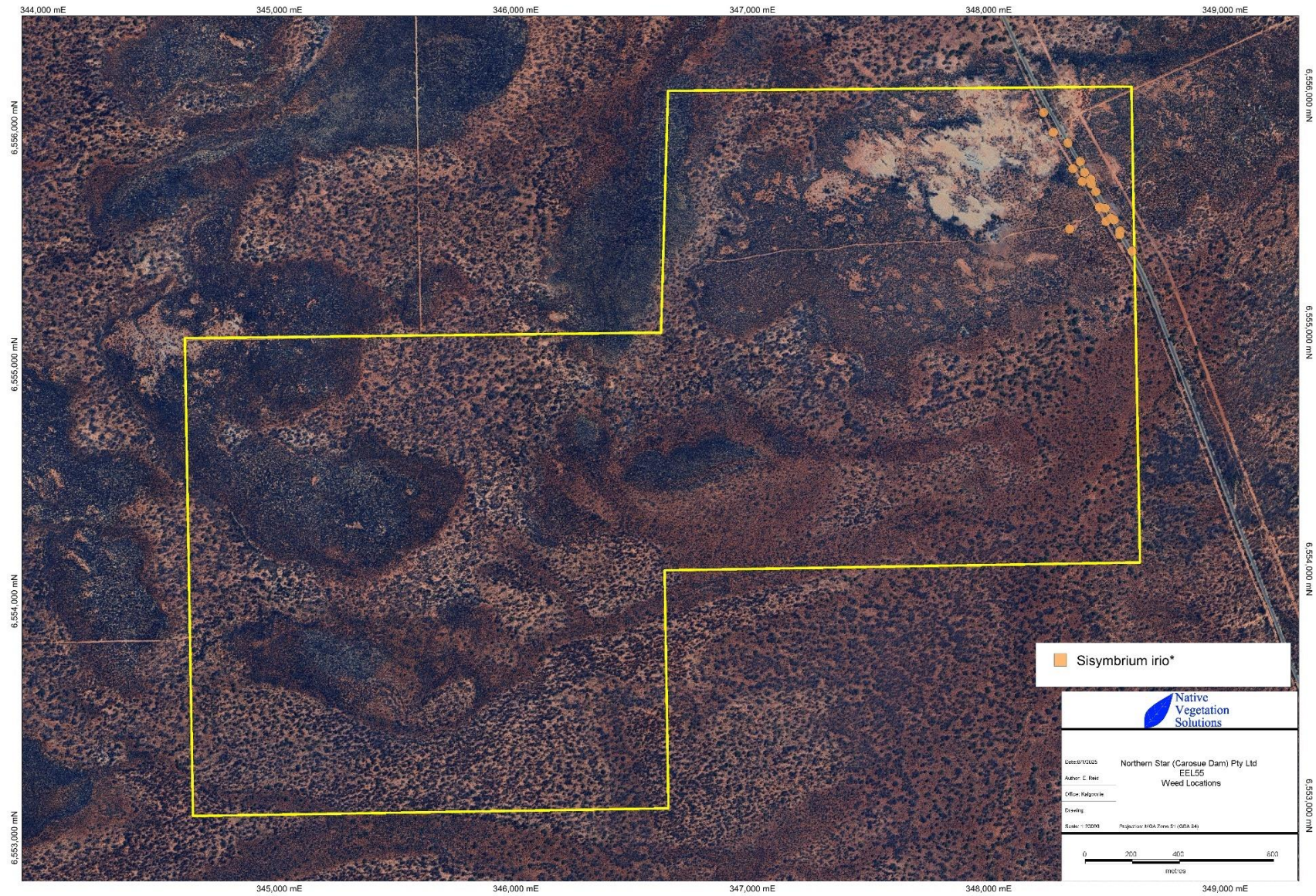


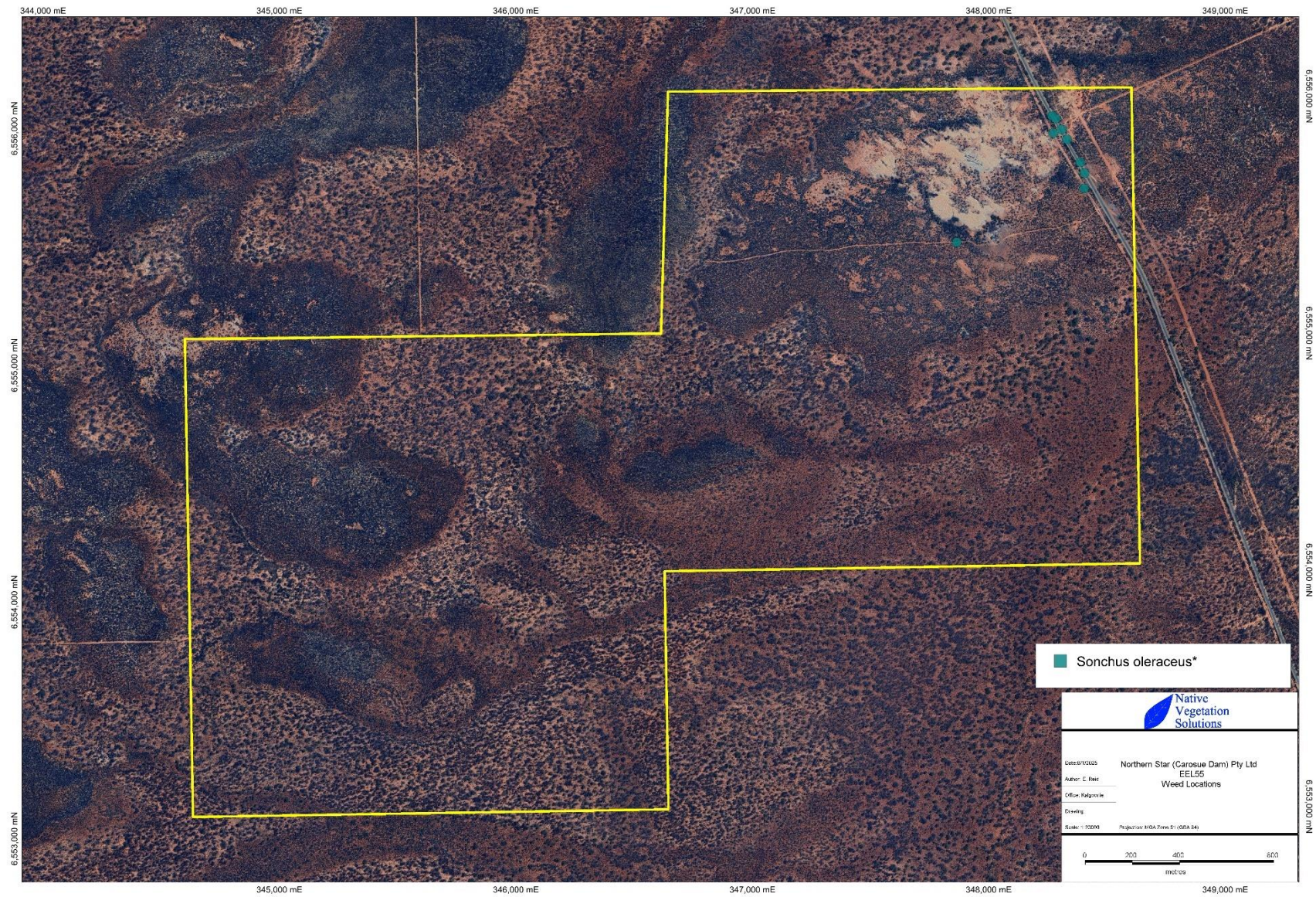












## **Appendix 2: Coordinates of Weeds and Relevant Locations**

TAXONNAME	SITENAME	Total Abundance	DATEOBS	LONGITUDE	LATITUDE
<i>Centaurea melitensis</i> *	wpt001	10-50	19/11/2024	121.410228	-31.123830
<i>Sisymbrium irio</i> *	wpt001	50-100	19/11/2024	121.410228	-31.123830
<i>Salvia verbenaca</i> *	wpt001	300-500	19/11/2024	121.410228	-31.123830
<i>Oncosiphon suffruticosum</i> *	wpt001	10-50	19/11/2024	121.410228	-31.123830
<i>Carrichtera annua</i> *	wpt001	200-300	19/11/2024	121.410228	-31.123830
<i>Sonchus oleraceus</i> *	wpt002	1-10	19/11/2024	121.408232	-31.120948
<i>Centaurea melitensis</i> *	wpt002	1-10	19/11/2024	121.408232	-31.120948
<i>Sisymbrium irio</i> *	wpt002	1-10	19/11/2024	121.408232	-31.120948
<i>Carrichtera annua</i> *	wpt002	50-100	19/11/2024	121.408232	-31.120948
<i>Carrichtera annua</i> *	wpt003	300-500	19/11/2024	121.407618	-31.119838
<i>Carthamus lanatus</i> *	wpt004	50-100	19/11/2024	121.406871	-31.118468
<i>Carrichtera annua</i> *	wpt005	500-1000	19/11/2024	121.407815	-31.120190
<i>Sisymbrium irio</i> *	wpt005	10-50	19/11/2024	121.407815	-31.120190
<i>Asphodelus fistulosus</i> *	wpt002	1-10	19/11/2024	121.408232	-31.120948
<i>Salvia verbenaca</i> *	wpt006	100-200	19/11/2024	121.409486	-31.122846
<i>Sisymbrium irio</i> *	wpt006	10-50	19/11/2024	121.409486	-31.122846
<i>Carrichtera annua</i> *	wpt006	300-500	19/11/2024	121.409486	-31.122846
<i>Sisymbrium irio</i> *	wpt007	1-10	19/11/2024	121.410513	-31.124376
<i>Carrichtera annua</i> *	wpt007	500-1000	19/11/2024	121.410513	-31.124376
<i>Salvia verbenaca</i> *	wpt007	500-1000	19/11/2024	121.410513	-31.124376
<i>Erodium botrys</i> *	wpt007	1-10	19/11/2024	121.410513	-31.124376
<i>Salvia verbenaca</i> *	wpt008	10-50	19/11/2024	121.411190	-31.125355
<i>Salvia verbenaca</i> *	wpt009	10-50	19/11/2024	121.411663	-31.126086
<i>Salvia verbenaca</i> *	wpt010	1-10	19/11/2024	121.411115	-31.124885
<i>Carrichtera annua</i> *	wpt010	50-100	19/11/2024	121.411115	-31.124885
<i>Centaurea melitensis</i> *	wpt010	1-10	19/11/2024	121.411115	-31.124885
<i>Sisymbrium irio</i> *	wpt010	10-50	19/11/2024	121.411115	-31.124885
<i>Sisymbrium irio</i> *	wpt011	10-50	19/11/2024	121.410713	-31.124253
<i>Centaurea melitensis</i> *	wpt011	1-10	19/11/2024	121.410713	-31.124253
<i>Carrichtera annua</i> *	wpt011	500-1000	19/11/2024	121.410713	-31.124253
<i>Salvia verbenaca</i> *	wpt011	10-50	19/11/2024	121.410713	-31.124253
<i>Sisymbrium irio</i> *	wpt012	50-100	19/11/2024	121.410487	-31.123875
<i>Centaurea melitensis</i> *	wpt012	100-200	19/11/2024	121.410487	-31.123875
<i>Carrichtera annua</i> *	wpt012	500-1000	19/11/2024	121.410487	-31.123875
<i>Salvia verbenaca</i> *	wpt012	500-1000	19/11/2024	121.410487	-31.123875
<i>Sisymbrium irio</i> *	wpt013	1-10	19/11/2024	121.410077	-31.123238
<i>Centaurea melitensis</i> *	wpt013	1-10	19/11/2024	121.410077	-31.123238
<i>Carrichtera annua</i> *	wpt013	100-200	19/11/2024	121.410077	-31.123238
<i>Salvia verbenaca</i> *	wpt013	10-50	19/11/2024	121.410077	-31.123238
<i>Sisymbrium irio</i> *	wpt014	10-50	19/11/2024	121.409891	-31.122936
<i>Centaurea melitensis</i> *	wpt014	100-200	19/11/2024	121.409891	-31.122936
<i>Carrichtera annua</i> *	wpt014	500-1000	19/11/2024	121.409891	-31.122936
<i>Salvia verbenaca</i> *	wpt014	50-100	19/11/2024	121.409891	-31.122936

TAXONNAME	SITENAME	Total Abundance	DATEOBS	LONGITUDE	LATITUDE
<i>Oncosiphon suffruticosum</i> *	wpt014	1-10	19/11/2024	121.409891	-31.122936
<i>Sisymbrium irio</i> *	wpt015	10-50	19/11/2024	121.409590	-31.122490
<i>Centaurea melitensis</i> *	wpt015	200-300	19/11/2024	121.409590	-31.122490
<i>Carrichtera annua</i> *	wpt015	500-1000	19/11/2024	121.409590	-31.122490
<i>Salvia verbenaca</i> *	wpt015	50-100	19/11/2024	121.409590	-31.122490
<i>Oncosiphon suffruticosum</i> *	wpt015	50-100	19/11/2024	121.409590	-31.122490
<i>Sonchus oleraceus</i> *	wpt015	1-10	19/11/2024	121.409590	-31.122490
<i>Sisymbrium irio</i> *	wpt016	50-100	19/11/2024	121.408873	-31.121366
<i>Centaurea melitensis</i> *	wpt016	1-10	19/11/2024	121.408873	-31.121366
<i>Carrichtera annua</i> *	wpt016	500-1000	19/11/2024	121.408873	-31.121366
<i>Salvia verbenaca</i> *	wpt016	1-10	19/11/2024	121.408873	-31.121366
<i>Asphodelus fistulosus</i> *	wpt017	10-50	19/11/2024	121.408718	-31.121125
<i>Centaurea melitensis</i> *	wpt018	1-10	19/11/2024	121.408385	-31.120621
<i>Carrichtera annua</i> *	wpt018	500-1000	19/11/2024	121.408385	-31.120621
<i>Salvia verbenaca</i> *	wpt018	10-50	19/11/2024	121.408385	-31.120621
<i>Centaurea melitensis</i> *	wpt019	1-10	19/11/2024	121.408192	-31.120298
<i>Sonchus oleraceus</i> *	wpt019	10-50	19/11/2024	121.408192	-31.120298
<i>Carrichtera annua</i> *	wpt019	500-1000	19/11/2024	121.408192	-31.120298
<i>Salvia verbenaca</i> *	wpt019	10-50	19/11/2024	121.408192	-31.120298
<i>Carrichtera annua</i> *	wpt020	500-1000	19/11/2024	121.407712	-31.119568
<i>Salvia verbenaca</i> *	wpt020	10-50	19/11/2024	121.407712	-31.119568
<i>Carrichtera annua</i> *	wpt021	500-1000	19/11/2024	121.407538	-31.119260
<i>Salvia verbenaca</i> *	wpt021	50-100	19/11/2024	121.407538	-31.119260
<i>Centaurea melitensis</i> *	wpt022	10-50	19/11/2024	121.407761	-31.119448
<i>Carrichtera annua</i> *	wpt022	200-300	19/11/2024	121.407761	-31.119448
<i>Centaurea melitensis</i> *	wpt023	200-300	19/11/2024	121.407980	-31.119803
<i>Carrichtera annua</i> *	wpt023	500-1000	19/11/2024	121.407980	-31.119803
<i>Carrichtera annua</i> *	wpt024	500-1000	19/11/2024	121.408360	-31.120396
<i>Centaurea melitensis</i> *	wpt024	10-50	19/11/2024	121.408360	-31.120396
<i>Sonchus oleraceus</i> *	wpt024	1-10	19/11/2024	121.408360	-31.120396
<i>Cenchrus ciliaris</i> *	wpt025	1-10	19/11/2024	121.408615	-31.120818
<i>Centaurea melitensis</i> *	wpt025	1-10	19/11/2024	121.408615	-31.120818
<i>Salvia verbenaca</i> *	wpt025	1-10	19/11/2024	121.408615	-31.120818
<i>Sonchus oleraceus</i> *	wpt025	1-10	19/11/2024	121.408615	-31.120818
<i>Salvia verbenaca</i> *	wpt026	50-100	19/11/2024	121.408840	-31.121191
<i>Sonchus oleraceus</i> *	wpt026	10-50	19/11/2024	121.408840	-31.121191
<i>Carrichtera annua</i> *	wpt026	200-300	19/11/2024	121.408840	-31.121191
<i>Centaurea melitensis</i> *	wpt026	10-50	19/11/2024	121.408840	-31.121191
<i>Salvia verbenaca</i> *	wpt027	200-300	19/11/2024	121.409415	-31.122076
<i>Oncosiphon suffruticosum</i> *	wpt027	200-300	19/11/2024	121.409415	-31.122076
<i>Carrichtera annua</i> *	wpt027	500-1000	19/11/2024	121.409415	-31.122076
<i>Sonchus oleraceus</i> *	wpt027	10-50	19/11/2024	121.409415	-31.122076
<i>Sisymbrium irio</i> *	wpt027	50-100	19/11/2024	121.409415	-31.122076

TAXONNAME	SITENAME	Total Abundance	DATEOBS	LONGITUDE	LATITUDE
<i>Centaurea melitensis</i> *	wpt027	200-300	19/11/2024	121.409415	-31.122076
<i>Sisymbrium irio</i> *	wpt028	50-100	19/11/2024	121.409868	-31.122766
<i>Carrichtera annua</i> *	wpt028	500-1000	19/11/2024	121.409868	-31.122766
<i>Oncosiphon suffruticosum</i> *	wpt028	500-1000	19/11/2024	121.409868	-31.122766
<i>Salvia verbenaca</i> *	wpt028	200-300	19/11/2024	121.409868	-31.122766
<i>Centaurea melitensis</i> *	wpt028	50-100	19/11/2024	121.409868	-31.122766
<i>Mesembryanthemum crystallinum</i> *	wpt028	1000-2000	19/11/2024	121.409868	-31.122766
<i>Carrichtera annua</i> *	wpt029	500-1000	19/11/2024	121.410875	-31.124323
<i>Centaurea melitensis</i> *	wpt029	50-100	19/11/2024	121.410875	-31.124323
<i>Sisymbrium irio</i> *	wpt029	50-100	19/11/2024	121.410875	-31.124323
<i>Sisymbrium irio</i> *	wpt030	1-10	19/11/2024	121.411130	-31.124740
<i>Carrichtera annua</i> *	wpt030	50-100	19/11/2024	121.411130	-31.124740
<i>Sisymbrium irio</i> *	wpt031	1-10	19/11/2024	121.411650	-31.125523
<i>Salvia verbenaca</i> *	wpt032	10-50	19/11/2024	121.409798	-31.124160
<i>Salvia verbenaca</i> *	wpt033	50-100	19/11/2024	121.409013	-31.124413
<i>Carrichtera annua</i> *	wpt033	500-1000	19/11/2024	121.409013	-31.124413
<i>Carrichtera annua</i> *	wpt034	500-1000	19/11/2024	121.408895	-31.124645
<i>Salvia verbenaca</i> *	wpt034	500-1000	19/11/2024	121.408895	-31.124645
<i>Sisymbrium irio</i> *	wpt034	200-300	19/11/2024	121.408895	-31.124645
<i>Salvia verbenaca</i> *	wpt035	50-100	19/11/2024	121.406667	-31.124753
<i>Carrichtera annua</i> *	wpt035	50-100	19/11/2024	121.406667	-31.124753
<i>Erodium botrys</i> *	wpt036	1-10	19/11/2024	121.405798	-31.125420
<i>Carrichtera annua</i> *	wpt036	1000-2000	19/11/2024	121.405798	-31.125420
<i>Salvia verbenaca</i> *	wpt036	1000-2000	19/11/2024	121.405798	-31.125420
<i>Carrichtera annua</i> *	wpt037	500-1000	19/11/2024	121.405089	-31.125477
<i>Sonchus oleraceus</i> *	wpt038	10-50	19/11/2024	121.403886	-31.125055
<i>Avena barbata</i> *	wpt039	10-50	19/11/2024	121.370417	-31.128358
<i>Avena barbata</i> *	wpt040	10-50	19/11/2024	121.407858	-31.120400
<i>Salvia verbenaca</i> *	wpt041	200-300	19/11/2024	121.408352	-31.121285
<i>Sisymbrium irio</i> *	wpt042	1-10	19/11/2024	121.409080	-31.122343
<i>Salvia verbenaca</i> *	wpt043	200-300	19/11/2024	121.409568	-31.123073
<i>Sonchus oleraceus</i> *	wpt043	1-10	19/11/2024	121.409568	-31.123073
<i>Salvia verbenaca</i> *	wpt044	50-100	19/11/2024	121.410326	-31.124195
<i>Carrichtera annua</i> *	wpt044	500-1000	19/11/2024	121.410326	-31.124195
<i>Asphodelus fistulosus</i> *	wpt045	1-10	19/11/2024	121.411755	-31.126376

**Appendix 2 Certificate of Title EEL55**



**CONSERVATION COVENANT**  
SOIL AND LAND CONSERVATION ACT  
SECTION 30B

File: 22-09670

The registered proprietor, **NORTHERN STAR (HAMPTON GOLD MINING AREAS) LIMITED** of that land described as **Lot 101 on Deposited Plan 40372**, Certificate of Title Volume 2625 Folio 387, recognises the value of sound land management practices and the value of protecting areas within the land described on this plan.

The registered proprietor of the land agrees that an irrevocable instrument known as a Conservation Covenant be entered into in respect of that area of land contained within; Certificate of Title Volume 2625 Folio 387, for the purpose of setting aside land for the protection and management of vegetation under Section 30B of the *Soil and Land Conservation Act 1945*. Accordingly:

We: **NORTHERN STAR (HAMPTON GOLD MINING AREAS) LIMITED**  
(Proprietor of the Land)

Of: **Level 4, 500 Hay Street**  
**SUBIACO WA 6008**  
(Normal Postal Address)  
ABN 79 009 473 054

Covenant to retain and protect 800.8196 hectares of native vegetation in perpetuity, as shown on this plan as an area cross hatched orange contained within Certificate of Title Volume 2625 Folio 387 in accordance with the following conditions:

- The area of land described above is to be adequately fenced to exclude all classes of livestock and be managed in such a way as to retain and promote the growth of native vegetation.
- Subject to sections 30B and 30C of the *Soil and Land Conservation Act 1945*, this Conservation Covenant is to have effect in perpetuity.
- A Conservation Covenant registered on Certificate of Title by Memorial binds each person successively becoming an owner or occupier of the land.
- Subject to any necessary approvals from relevant authorities, and in accordance with any written law, clearing is permitted within the areas described above for boundary fence lines and firebreaks and adherence to the fire management plan.
- As per Condition 2 of *Environment Protection and Biodiversity Conservation Act 1999* approval EPBC 2021/9026.

**REGISTERED PROPRIETOR:**

Signed on behalf of NORTHERN STAR (HAMPTON GOLD MINING AREAS) LIMITED on 18/8/2023

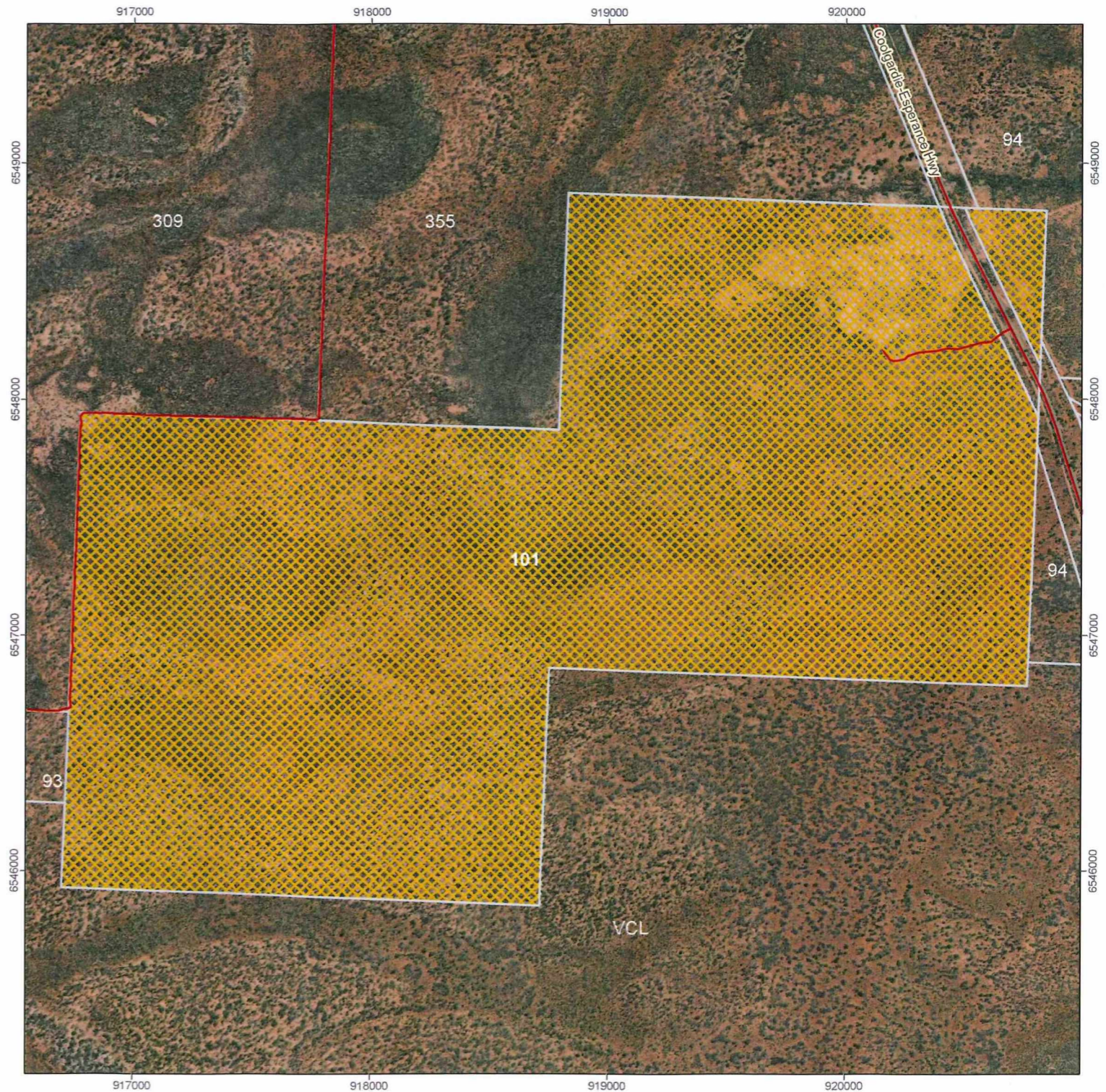
Signature of Director

Signature of Director/Company Secretary

STUART TONKIN  
Name of Director

HILARY MACDONALD  
Name of Director/Company Secretary

**Dr Melanie Strawbridge**   
COMMISSIONER OF SOIL AND LAND CONSERVATION  
DATE: 4/9/2023



Road	NOTE: 1. All measurements and areas are only approximate and subject to on-site assessment by a Land Conservation Officer from the Department of Primary Industries and Regional Development (DPIRD). 2. Landgate cadastral parcels as at August 2023 3. Imagery - Digital Globe April 2018-February 2019 4. Projection - Transverse Mercator Datum - Geocentric Datum of Australia 1994 Grid - Map Grid of Australia 1994 Zone 51
Cadastral parcel boundary	
Area to be retained and protected as native vegetation 800.8196 ha	
Drawn by: P. Goulding	Date: 20/06/2023
Checked by:	Date:



WESTERN



AUSTRALIA

TITLE NUMBER

Volume Folio

2625 387

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 101 ON DEPOSITED PLAN 40372

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

NORTHERN STAR (HAMPTON GOLD MINING AREAS) LIMITED OF LEVEL 4 500 HAY STREET SUBIACO WA 6008  
(AN O024589 ) REGISTERED 7/11/2018

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. P707653 MEMORIAL. SOIL AND LAND CONSERVATION ACT 1945. REGISTERED 13/9/2023.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP40372  
PREVIOUS TITLE: 2190-964  
PROPERTY STREET ADDRESS: LOT 101 COOLGARDIE-ESPERANCE HWY, LONDONDERRY.  
LOCAL GOVERNMENT AUTHORITY: SHIRE OF COOLGARDIE

**Appendix 3 EPBC 2021 - 9026 Construction Environmental Management Plan**



**NORTHERN STAR**  
RESOURCES LIMITED

# **Carouse Dam TSF Cell 4 Project Construction Environmental Management Plan**

EPBC Act Referral: 2021/9026

15 July 2022

**Version No. 2**

<b>Proponent Details</b>		
Company Name	Northern Star (Carosue Dam) Pty Ltd	
ACN/ABN	14 116 649 122	
Address	Level 1/388 Hay St, Subiaco WA 6008	
Postal Address	PO Box 2008 Subiaco WA. 6904 Australia	
Key Contact Representative	Name	Rob Mills
	Position	Environmental Superintendent
	Phone Number	(08) 6229 9519
	Email	cdoenviro@nsrltd.com

## Document Control

This Construction Environmental Management Plan will be reviewed over the life of the project to ensure new knowledge on Malleefowl populations in and around the project area are incorporated into the plan to ensure the effectiveness of the implemented management measures.

Version	Details of review or changes	Prepared by	Date	Document Reference
Draft	Draft prepared	Larissa Byrne	18 April 2022	Draft
1.0	Draft prepared	Larissa Byrne	02 June 2022	Draft
2.0	Final amended	Larissa Byrne	15 July 2022	Final

## Declaration of Accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth). The offence is punishable on conviction by imprisonment or a fine, or both.

I am authorised to bind the approval holder to this declaration, and I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed: \_\_\_\_\_

Full Name: John Albrecht

Position: Site Senior Executive

Organisation: Northern Star (Carosue Dam) Pty Ltd

Date: 15 July 2022

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## 1.0 Introduction

### 1.1 Background

Northern Star (Carosue Dam) Pty Ltd (Northern Star) proposes to expand the Tailings Storage Facility (TSF) at its Carosue Dam Operations with the construction of TSF Cell 4 and associated infrastructure (the Project).

Targeted surveys surrounding the Project have identified the area supports suitable habitat for Malleefowl. The Project will require the clearing of 217.3 ha of native vegetation of which 152.6 ha is suitable habitat for Malleefowl. Non active mounds (those unlikely to support active Malleefowl populations) have been identified within the Project footprint and will be impacted by project activities.

This Construction Environmental Management Plan (CEMP) has been prepared to support the assessment of the Project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and accompanies the Preliminary Documentation. It outlines the key risks posed to Matters of National Environmental Significance that have the potential to be impacted by the Project, namely the Malleefowl (*Leipoa ocellata*) (Malleefowl), and how these risks will be managed. It also describes the performance criteria and corrective actions, as well as roles and responsibilities.

### 1.2 Purpose

The purpose of this CEMP is to:

- provide a framework for the implementation, monitoring and management actions required, to ensure that potential impacts to Malleefowl and their habitat attributable to the expansion of the Carosue Dam TSF are minimised.
- minimise risks to Malleefowl during the construction of TSF Cell 4.

### 1.3 Key construction activities with potential impacts to the Malleefowl & Primary Management Strategies

The Project involves the construction of a new TSF Cell adjacent to and abutting the existing facility as shown in Figure 1. The following key aspects of the Project have been identified as having the potential to impact Malleefowl:

- Native vegetation clearing;
- Vehicle/equipment movement;

These key construction activities for the Project and their associated primary management strategies have been discussed in Table 1.

All works will be undertaken in accordance with statutory approvals, this CEMP, and relevant site-specific procedures. Employees and contractors are provided with environmental education sessions (inductions, toolbox meetings) prior to commencing work on site and are required to adhere to site procedures.

**Table 1: Key construction activities with potential impacts to Malleefowl**

Source / Activity	Potential Impact	Primary Strategies for Management	Relevant Document / procedure
<b>Native Vegetation Clearing</b>			
<p><b>Key Activity</b> - A total of 217.3 ha of Native Vegetation will be cleared for construction activities. 152.6 ha is considered suitable habitat for Malleefowl. A total of 7 mounds within the development envelope will require removal.</p>	<p>Potential loss of suitable habitat for Malleefowl.</p>	<p>Surveys are undertaken to determine baseline habitat information and record mounds.</p> <p>Clearing undertaken in line with statutory approvals.</p> <p>Northern Star Clearing Activity Permit approved by Environment department.</p>	<p>Clearing Management Safe Work Procedure and Clearing Activity Permit.</p>
	<p>Loss of Malleefowl breeding mounds</p>	<p>All Malleefowl, active and inactive mounds will be recorded in a "Malleefowl Register" which will include date, observer, status of mound/Malleefowl and a GPS/location description.</p> <p>Clearing activities will preferentially occur outside of breeding season. Clearing may however, only occur during breeding season if mounds have been confirmed to be non-active by a suitably qualified environmental specialist.</p> <p>All known active mounds will be avoided and flagged with appropriately sized buffers (50m).</p> <p>Clearing will only commence after positive confirmation that there are no active mounds.</p>	<p>Construction Environmental Management Plan (CEMP)</p>
	<p>Fauna unable to escape during clearing</p>	<p>Clearing boundary is marked using GPS and cleared first to prevent over-clearing. Vegetation is then cleared in a systematic pattern allowing fauna to move into adjacent undisturbed vegetation to the north and west of the disturbance footprint (Section 8).</p> <p>Fauna spotter present during clearing. Works cease should fauna require relocation during clearing.</p>	<p>Clearing Management Safe Work Procedure and Clearing Activity Permit.</p>



	Open areas may result in increased predation on Malleefowl.	Sightings of feral animals will be reported to Environment Department and managed in accordance with site procedures.	Weed and Feral Animal Control Procedure.
	Dust impacting surrounding vegetation.	Water carts with dribble bars will be used to manage dust in line with normal Carosue Dam site procedures.	Construction Environmental Management Plan (CEMP)
<b>Vehicle/equipment movement</b>			
<b>Key Activity</b> - Increased equipment and vehicle movements for clearing and construction activities.	Increased vehicle strikes causing injury/death to fauna including Malleefowl.	<p>The following speed limits will apply:</p> <ul style="list-style-type: none"> <li>• Dozer limited to 10km/hr during clearing activities.</li> <li>• 60km/hr for vehicles travelling on haul road</li> </ul> <p>Suitably qualified fauna spotter to walk ahead of dozer during clearing.</p>	<p>Haul Road Management Safe Work Procedure</p> <p>Weed and Feral Animal Control Procedure.</p>
	Minimise pollution from light and noise.	<p>Compliance with industry requirements for noise and light emissions.</p> <p>Light emissions limited to project area.</p>	Construction Environmental Management Plan (CEMP)
	Minimise entrapment leading to injury or death of terrestrial fauna, including the Malleefowl at the catchment dam.	<p>All operators to report sightings of Malleefowl (live or dead) during construction.</p> <p>Daily visual inspection will be undertaken to check for trapped fauna.</p>	Incident Reporting
	Increased occurrence of weeds, reducing quality of adjacent habitat.	Weed hygiene procedure implemented and Weed Hygiene certificate approved	Weed and Feral Animal Control Procedure.
	Increased risk of fire resulting in death/injury and displacement of Malleefowl and/or destruction of Malleefowl habitat and mounds	<p>Emergency Response Team is trained in fire response.</p> <p>Maintain fire breaks and implementation of Northern Star fire management procedures</p>	Construction Environmental Management Plan (CEMP)

## 2.0 Project Description

### 2.1 Carosue Dam TSF Expansion Cell 4

Northern Star operates the Carosue Dam Gold Mine, located 110km north-east of Kalgoorlie. Carosue Dam includes four open pits, Karari, Whirling Dervish, Monty's, and Twin Peaks. Karari and Whirling Dervish have been developed into underground mining operations while Luvironza pit, a fifth pit, was used for in-pit tails deposition and completed in 2014.

The Carosue Dam mine site consists of a carbon in leach processing plant, paddock style tailings storage facilities, waste rock dumps, a paste plant, workshops, core farms, turkeys nest dams, laydown areas, roadways, stores, borefields, administration facilities and a dual power station. Other infrastructure includes an aerodrome, solar farm, and accommodation village (Figure 1).

To support ongoing mining operations at Carosue Dam, Northern Star Resources propose to expand the existing Tailings Storage Facility (TSF) by constructing a new TSF cell (Cell 4), and associated infrastructure which involves clearing a total of 217.3ha of Native Vegetation within a development envelope of approximately 229ha. The location of the proposed development envelope for the expansion of the TSF is provided in Figure 2.

The proposed expansion of the TSF was declared a controlled action under section 95A(2) of the EPBC Act requiring further information to assess the relevant impacts of the proposed action.

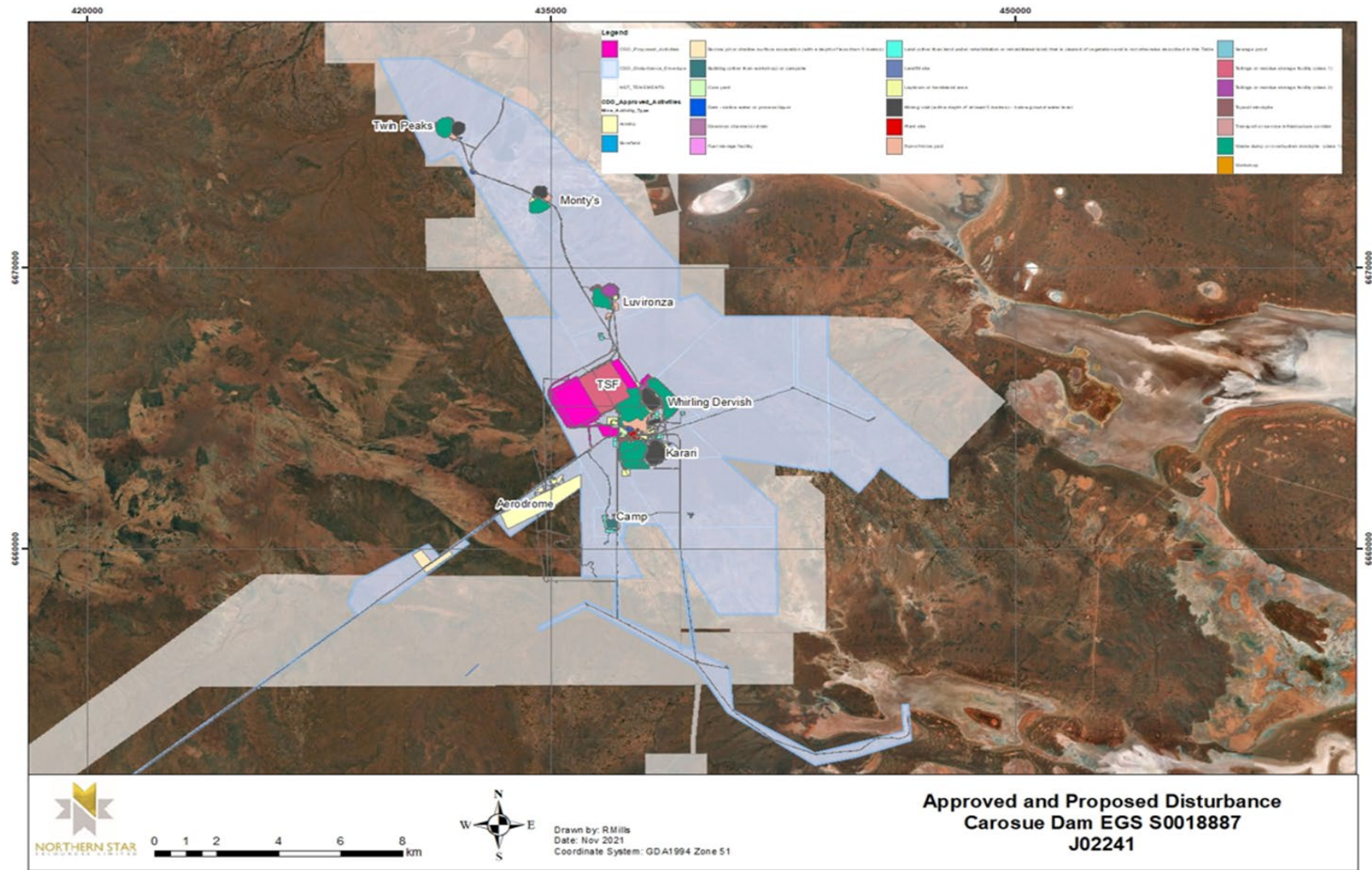


Figure 1: Location of the Project in relation to the Carosue Dam Operations

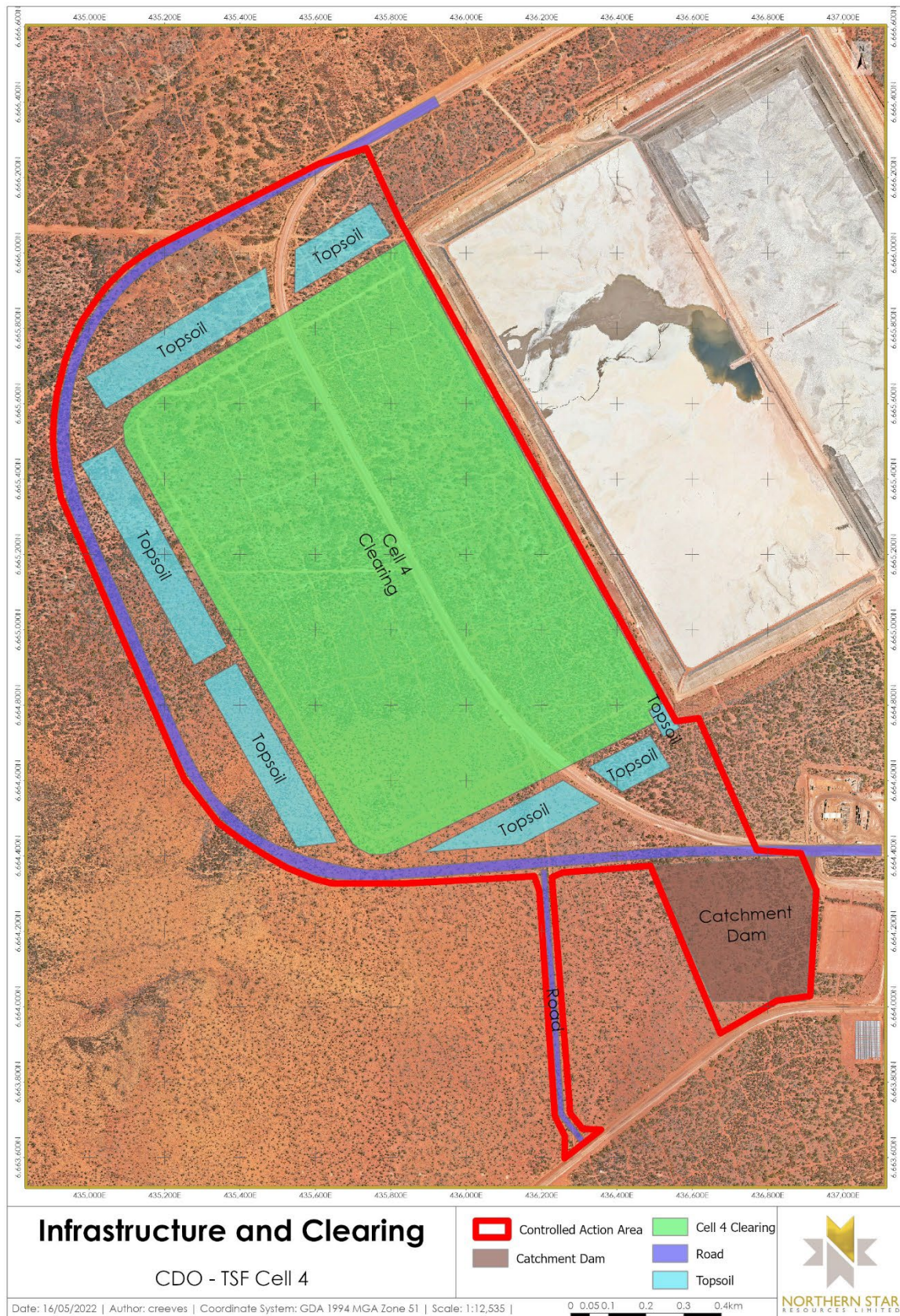


Figure 2: Layout of TSF Cell 4

## 2.3 Schedule for Construction Activities

Clearing for the construction of TSF Cell 4 and associated infrastructure will be prioritised to be undertaken outside of Malleefowl breeding season, between April and August, inclusive. This is to ensure mounds are not active during clearing activities and individuals can move into adjacent suitable habitat. However, if there are any unavoidable delays and if current tailings storage capacity is not adequate, clearing may be conducted with controls in place to ensure no impact to any Malleefowl.

Clearing is currently scheduled to occur no later than August 2022 to allow construction to commence in September 2022. Construction of Cell 4 is expected to take seven months (plus an additional 2 months to install miscellaneous items such as pipework, power, fencing, etc), with deposition of tailings material scheduled for January 2024. Operation of the facility will continue for the current life of mine (7+ years).

Table 2 provides a summary and timing of all phases of the proposed action including construction, operations and decommissioning/rehabilitation, outlining the activities associated with each phase. The anticipated timing and duration of each component as well as potential impacts during each phase.

**Table 2: Schedule of all phases of the proposed action**

Phase	Activity Description	Start Date	Completion Date	Duration
Construction	Clearing of impact area	August 2022	August 2022	1 month
	Construction of embankments	September 2022	April 2023	7 months
	Compaction & construction of roads	September 2022	October 2022	2 months
	Redirection of surface water flows through construction of drainage channels	September 2022	October 2022	2 months
Operations	Commence deposition of tailings into Cell 4	January 2024	January 2031	7 years
	Maintenance of infrastructure	January 2024	January 2031	7 years
	Twice daily inspections of pipelines during operation	January 2024	January 2031	7 years
	Road maintenance including dust suppression and surface grading	August 2022	January 2031	9 years
Decommissioning & Rehabilitation	Cease deposition and allow consolidation and drying of tailings material	January 2031	July 2031	6 months
	Reshape and batter slopes to <18°;	August 2031	January 2032	6 months
	Cap top surface with competent rock;	January 2032	March 2032	3 months
	Respread topsoil;	March 2032	April 2032	2 months
	Rip on the contour	April 2032	April 2032	1 month
	Seed with local native species	April 2032	April 2032	1 month
	Rehabilitation monitoring	September 2032	September 2042	10 years

## 2.4 Climate

The Goldfields region is arid to semi-arid with average annual rainfall decreasing from about 250mm in the south-west to 200mm in the north-east. The area experiences hot summers and mild winters with cold nights. Rainfall varies widely between years and droughts are common. Remnants of tropical cyclones occasionally bring heavy summer rain and can cause flooding to the area. The area transitions between desert summer and winter dominated rainfall and desert: non-seasonal bioclimatic (Alex Holm and Associates 2022). As Malleefowl have been recorded within the area of the surrounding Carosue Dam Gold Mine, it suggests that the climate supports Malleefowl occurrence.

## 2.5 Soils

The Carosue Dam is located within the Murchison IBRA region, in the East Murchison subregion. The East Murchison area is characterised as having internal drainage with soils that are typically shallow earthy loam overlaying red-brown hardpan, shallow stony loams on hills and red sand on sand plains (Alexander Holm & Associates 2022).

## 2.6 Regional Flora

The region lies within the Eremaean botanical province near the southern boundary of the Austin botanical district (Beard, 1990). The Eremaean Botanical Province is typified by plants from the families Fabaceae (*Acacia* spp., *Senna* spp.), Scrophulariaceae (*Eremophila* spp.), Chenopodiaceae (Samphires, Bluebushes, Saltbushes), Asteraceae (Daisies) and Poaceae (grasses). The Austin Botanical District is essentially the Mulga (*Acacia aneura*) region of Western Australia. *Acacia aneura* is a dominant or a significant component in most plant communities in this District. The region is often rich in ephemerals, which reduce to scrub on hills. The Austin Botanical District is also characterised by hummock grasslands, saltbush shrublands and *Tecticornia* shrublands (Alexander Holm & Associates 2022).

Lake Rebecca forms a major vegetation divide with characteristic *Acacia aneura* (mulga) low woodlands associated with red loams over siliceous hard pan to the north and low woodlands of mixed mulga and *Casuarina pauper* (black oak) and *Eucalyptus* species on alkaline and calcareous soils to the south. Spinifex hummock grassland with eucalypt overstorey on sand plain is common. Halophytic vegetation occurs throughout the region on palaeodrainage systems, breakaways and on some stony and alluvial plains. Highly saline soils support *Atriplex* (saltbush), *Maireana* (bluebush) and *Tecticornia* (samphire) shrublands, while less saline soils support mulga with saltbush or bluebush understoreies.

## 2.7 Local Flora

Vegetation of the Carosue Dam Gold Mine consists of low open *Eucalyptus* woodland over *Acacia* and other mixed shrubs to *Casuarina* and *Acacia* woodland. Toward Lake Rebecca the vegetation becomes more halophytic and the overstorey disappears, leaving low halophytic shrubs with occasional sandy banks and drainage zones which support a wide range of species. Numerous flora surveys have been conducted in and around Carosue Dam.

A total of 534 flora taxa have been recorded across the Carosue Dam Project, including the occurrence of five species of conservation significance. These species represent 52 families, and 187 genera. The most common families represented throughout the project include Chenopodiaceae (78 taxa), Fabaceae (59 taxa), Asteraceae (49 taxa), Poaceae (48 taxa), Myrtaceae (43 taxa) and Scrophulariaceae (40 taxa).

Flora surveys across the Carosue Dam Project have highlighted that species composition and vegetation communities are typical of the area and not considered to be unusually diverse.

## 2.8 Malleefowl (*Leipoa ocellata*)

Malleefowl (*Leipoa ocellata*) are a stocky ground-dwelling bird, that rarely flies, belonging to the family Megapodiidae that build distinctive nests comprised of larger mounds built from soil and leaf litter to incubate their eggs. Breeding season usually begins in September when

egg laying begins and ends in late January. During this time the male bird remains at the mound constantly re-working it. Breeding pairs are monogamous, will pair for life and will breed in the same area using existing mounds. Chicks typically begin hatching in November, with most chicks emerging from mounds by January, however it has been noted that in some seasons hatching may continue until March (Benshemesh, 2007). Malleefowl (eggs and chicks) are threatened by predation, habitat clearing, isolation due to habitat fragmentation and increased wildfires.

## **2.9 Distribution and Habitat**

Historically, Malleefowl have been found in semi-arid mallee shrublands and woodlands across southern Australia, however although the species is still found across its range, its remaining populations are highly fragmented due to extensive land clearing (Department of Parks and Wildlife, 2016). Malleefowl habitat is generally found in shrublands and low woodlands dominated by mallee. In Western Australia habitat generally consists of Acacia dominated shrublands and occasionally woodlands dominated by eucalypts. Habitat areas require a sandy substrate and abundance of leaf litter for the construction of mounds. Studies have found density of birds is greater in areas of higher rainfall, on more fertile soils and where shrub diversity is greatest. Habitats characterised by numerous food plants (especially leguminous shrubs and herbs), a dense canopy cover and open ground layer are generally associated with high breeding densities. Malleefowl also prefer long unburnt country (Benshemesh, 2007). Thick vegetative corridors are beneficial to Malleefowl that predominantly disperse on foot.

The surrounding area of the Carosue Dam has been surveyed and is considered to contain suitable habitat to support Malleefowl. A total of 152.6ha of suitable habitat for Malleefowl will be removed, however, the 4,276ha surrounding Carosue Dam operations, which includes the disturbance envelope, is covered by a unified land unit map, 368ha is considered to be habitat suitable for forage and cover and 2,143ha is considered to be critical habitat used for breeding and forage (Alexander Holm and Associates 2022).

At the broader land system scale, most nesting mounds are within Deadman land system characterised by level to gently undulating plains with casuarina-acacia shrublands which include the Malleefowl-favoured acacia shrublands of land units 4a and 4b Nesting mounds occur on footslopes of Lawrence and Leopold land systems characterised by low hills with eucalypt or acacia woodlands with halophytic under-shrubs which include basalt hill footslopes of land unit 2b. Nesting mounds also occur in favoured locations within the extensive Kirgella land system characterised by sandplain supporting spinifex and acacia/eucalypt shrublands which is dominated by spinifex sandplain of land unit 4d (Alexander Holm and Associates 2022).

Deadman, Kirgella, Lawrence and Leonora land systems occupy approximately 18,000ha within 10km of the disturbance envelope and provide potential habitat for Malleefowl. Kirgella land system, which extends up to 40km to the west and is contiguous with the disturbance envelope, occupies two thirds of the potential habitat (Alexander Holm and Associates 2022).

## **2.10 Conservation Status**

The Malleefowl is one of three mound – building birds species in Australia and is recognized as a threatened species under State and Commonwealth legislation. The Malleefowl is listed as Vulnerable fauna under the EPBC Act. The species is also listed as Vulnerable under the *Biodiversity Conservation Act 2016 (WA)*.

### 3.0 Objective

The objective of the CEMP is to ensure impacts to Malleefowl and its habitat, from the expansion of the Carosue Dam Tailings Storage Facility Project are minimised. The key objectives and performance criteria have been detailed in Section 8 in Table 8.

### 4.0 Environmental Roles and Responsibilities

Table 3 identifies the roles and responsibilities relating to the implementation of this CEMP.

**Table 3: Environmental roles and responsibilities**

Role	Responsibility
Site General Manager	<ul style="list-style-type: none"> <li>• Implementation and maintenance of the plan.</li> <li>• Undertake the assessment and review of the effectiveness of this management as required.</li> </ul>
Site Environmental Advisors	<ul style="list-style-type: none"> <li>• Maintain site records of surveys and any other relevant environmental data and implement monitoring programs.</li> <li>• Deliver fauna education and induction awareness training to field personnel.</li> <li>• Ensure pre-clearing surveys are conducted to ensure no malleefowl are breeding in the disturbance area.</li> <li>• Ensure a 'spotter' is present during clearing activities.</li> <li>• Liaise with stakeholders regarding feral animal control and fire management.</li> <li>• Record any incidents associated with construction activities and provide direction for remedial actions.</li> </ul>
Project Managers/Supervisors	<ul style="list-style-type: none"> <li>• Ensure the plan is being adhered to by all staff and contractors</li> <li>• Participate in compliance audits and inspections.</li> </ul>
All Northern Star employees and Sub-contractors/temporary workers	<ul style="list-style-type: none"> <li>• Adhere to the requirements in this management plan.</li> <li>• Report all incidents that involve impacts to fauna including Malleefowl.</li> </ul>

### 5.0 Reporting

The reporting requirements for the CEMP are outlined in Section 8 Table 8.

### 6.0 Environmental Training

Environmental training will be provided to all relevant staff including temporary contractors prior to the commencement of clearing to ensure they understand the requirements of the plan. Training will be aimed at minimising impacts on the species and site environmental controls, understanding the roles and responsibilities of all personal in adhering to the requirements of the Management Plan and ensuring objectives are being achieved.

Training will be provided but not limited to the following formats:

- Site inductions
- Pre-start meetings



Records of staff and contractors completing site inductions will be maintained as per site training protocols.

## 7.0 Emergency Contacts and Procedures

During construction activities, if an emergency arises where objectives are not going to be met, or direct impacts to the Malleefowl/fauna or mound are likely then the Environmental team will be notified and corrective actions will be implemented.

## 7.0 Environmental Risks

A risk assessment for the construction activities identifies the key risks and potential impacts of the proposed activity on Malleefowl. This process allows identified risks to be evaluated and outlines mitigation measures and effectiveness of these measures. The Risk Assessment has been completed in accordance with the Australian/New Zealand standard 4360:1999 Risk Management. The risk assessment considers the likelihood of an impact event and the relative consequence of that event. The risk assessment is detailed in Table 7.

**Table 4: Qualitative measures used for the determination of an event likelihood rating**

Likelihood	Description
<b>A</b> Almost Certain	Common or Frequent occurrence (e.g. once per day)
<b>B</b> Likely	Is known to occur or "it's happened" (e.g. >once per month, but <once per day)
<b>C</b> Possible	Could occur or "I've heard of it happening" (e.g. >once per year, but <once per month)
<b>D</b> Unlikely	Not Likely to occur (e.g. <once per year)
<b>E</b> Rare	Rare / practically impossible (e.g. very unlikely to ever occur)

**Table 5: Qualitative measures used for the determination of an event consequence**

Consequence	Description
<b>1</b> Very Low	None or insignificant impact to MNES (Malleefowl) with no effect on ecosystem function.
<b>2</b> Minor	Moderate to minor impact to MNES (Malleefowl) resulting in a minor, recoverable impact.
<b>3</b> Moderate	Minor and short-term impact to MNES expected, resulting in a moderate, recoverable impact.
<b>4</b> Major	Long-term impact to MNES expected, resulting in a major, recoverable impact.
<b>5</b> Catastrophic	Irreversible impact to MNES expected.

**Table 6: Risk Rating Matrix**

LIKELIHOOD	CONSEQUENCES				
	Very Low 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
<b>A</b> Almost Certain	<b>H</b> (11)	<b>H</b> (16)	<b>E</b> (20)	<b>E</b> (23)	<b>E</b> (25)
<b>B</b> Likely	<b>M</b> (7)	<b>H</b> (12)	<b>H</b> (17)	<b>E</b> (21)	<b>E</b> (24)
<b>C</b> Possible	<b>L</b> (4)	<b>M</b> (8)	<b>H</b> (13)	<b>E</b> (18)	<b>E</b> (22)
<b>D</b> Unlikely	<b>L</b> (2)	<b>L</b> (5)	<b>M</b> (9)	<b>H</b> (14)	<b>E</b> (19)
<b>E</b> Rare	<b>L</b> (1)	<b>L</b> (3)	<b>M</b> (6)	<b>M</b> (10)	<b>H</b> (15)

**Matrix Legend:**

- E:** Extreme risk      Immediate action required, further reduction needed. If not possible, Country Manager or COO approval required
- H:** High risk        Senior management attention needed
- M:** Moderate risk    Management responsibility must be specified
- L:** Low risk         Manage by routine procedure

**Table 7: Identification and Management of risks associated with the proposed action**

	Risk Pathway/Impact	Initial Risk			Actions to be implemented/Mitigation Measures	Residual Risk			Justification for Residual Risk ranking	EMP or Procedure incorporating risk treatment
		Likelihood	Consequence	Risk		Likelihood	Consequence	Residual Risk		
<b>Direct Impact</b>	Impacts on habitat use due to fragmentation	C	3	H13	The infrastructure to be constructed within the proposed impact area has been designed to directly abut existing TSF infrastructure, without gaps or creating satellite facilities, therefore fragmentation of habitat is unlikely. Malleefowl habitat and surrounding native vegetation is extensive and generally continuous throughout the region, therefore any potential impacts due to fragmentation is rated as low.	D	2	L5	The impact site is not located in a satellite location where it could potentially break a linkage between favourable habitat plots. It is located directly adjacent to existing infrastructure to minimise fragmentation of habitat.	CDO-ENV-023-SWP Clearing Management
	Reduction in habitat size due to clearing	C	3	H13	Disturbance will be limited to only what is necessary for safe construction and operation of the TSF and associated infrastructure. The facility has been designed to adjoin to abut the existing TSF facility which allows NSR to utilise the existing western wall of the paddock TSF and associated existing cleared areas (11.8ha) within the proposed development envelope, reducing disturbance footprints as far as practically possible. An internal Clearing Activity Permit will be issued by site Environmental personnel and signed off by operators and supervisors involved in the clearing. Disturbed areas will be rehabilitated progressively where possible and upon closure in line with the approved Mine Closure Plan. Implementation of NSR internal Clearing Management Safe Work Procedure. Total footprints of new TSF and miscellaneous infrastructure have been minimised wherever practical to reduce overall disturbance and minimise impacts to Malleefowl habitat. The reduction of habitat size from the proposal is rated as Low.	D	2	L5	Within the immediate 4,276ha surrounding Carosue Dam operations, which includes the disturbance envelope and is covered by a unified land unit map (Alexander Holm & Associates 2019), 368ha is considered to be habitat 'suitable' for forage and cover and 2,143 ha is considered to be 'critical' habitat used for breeding and forage. This habitat extends well beyond this confined area and highlights the limited impact footprint of this proposal.  The proposed location of the TSF directly adjacent to the existing facility ensures that disturbance is minimised as far as practically possible.	CDO-ENV-023-SWP Clearing Management
	Reduction in population numbers due to removal of breeding mounds	D	3	M9	The most recent targeted survey conducted in December 2021 determined that there were no active mounds during the 2021 breeding season. It is unlikely there will be a reduction in Malleefowl population due to the removal of breeding mounds. The risk has been rated as Low. Pre-clearance surveys will be undertaken to identify the presence of Malleefowl and mounds in proposed clearing areas. Clearing activities will preferentially occur outside of breeding season. Clearing may however, only occur during breeding season if mounds have been confirmed to be non-active by a suitably qualified environmental specialist. All known active mounds will be avoided and flagged with appropriately sized buffers (50m). Active mounds will be monitored for a suitable period of time to ensure no impacts are sustained by individuals or their young. Clearing will only commence after positive confirmation that the mound is no longer active. Annual monitoring of the Malleefowl population in accordance with the National Malleefowl Monitoring Manual and in consultation with the DBCA and other best practice organisations.	D	2	L5	Malleefowl demonstrate resilience to disturbance in many examples, including at Carosue Dam where nesting mounds have been previously located <10m away from roadways and other infrastructure (outside of the proposed impact site). Proposed buffer zones of 50m are deemed sufficient by DMIRS in the recently approved Purpose Permit (CPS8000/2) amendment to minimise impacts to breeding mounds.	Clearing Permit CPS8000/2  CDO-ENV-051-Pla - Biodiversity Management
	Fauna injury or mortality due to vehicle strike	C	3	H13	Northern Star will continue to implement the following mitigation measures to prevent injury/mortality of Malleefowl at the site: Reduction in vehicle speed limits within the area. Clearing procedure outlines strategy required to allow potential fauna within the impact area to move into adjacent habitat areas;	D	3	M9	No Malleefowl have been hit by vehicles around the current TSF Haul Road or TSF area during Saracen or Northern Star's ownership of the project, therefore providing evidence that the likelihood of fauna strike is extremely low. Reduced	CDO-OHS-SA-003-PLA Carosue Dam Traffic Management Plan  CDO-ENV-051-Pla - Biodiversity Management

	Risk Pathway/Impact	Likelihood	Consequence	Risk	Actions to be implemented/Mitigation Measures	Likelihood	Consequence	Residual Risk	Justification for Residual Risk ranking	EMP or Procedure incorporating risk treatment
					Additional Warning signs will be erected on transport corridors and around the construction site informing of Malleefowl potentially in the area. Implementation of the Haul Road Management Safe Work Procedure to reduce the incidence of vehicle strikes. All operators to report sightings of Malleefowl (live or dead) including mounds. All personnel will complete an environmental induction prior to commencing work to ensure procedures and management measures are understood.				speed limits during the construction phase of the project will further decrease this risk.	
	Displacement of adult birds due to habitat clearing	C	2	M8	Clearing will be conducted in accordance with the CEMP, which outlines procedures to allow birds and other fauna to move into adjacent areas of habitat. A total of 2500 ha of suitable Malleefowl habitat surrounds the impact area to support displaced birds. Within the immediate area an additional 4,276ha surrounding the impact site is over 2,500ha of suitable habitat to support displaced birds. Suitable habitat also extends far beyond this.	D	2	L5	Malleefowl are currently not reliant on the mounds within the development footprint which has been confirmed by the various Malleefowl surveys over the area- all mounds are inactive.	Construction Environmental Management Plan (CEMP) CDO-ENV-051-Pla - Biodiversity Management
	Potential entrapment leading to injury or death of terrestrial fauna, including the Malleefowl at the catchment dam.	C	3	H13	All operators to report sightings of Malleefowl (live or dead) during construction. Daily visual inspection will be undertaken to check for trapped fauna.	D	3	M9	The earthen dam will be constructed to capture any potential surface water flows. Standing water is not expected to be present within the dam and any surface water collected will be pumped out.	Construction Environmental Management Plan (CEMP)
	Increase risk from feral species through predation or competition with Malleefowl	C	3	H13	Northern Star will continue to implement the following mitigation measures to prevent predation on Malleefowl at the site: Predator control program implemented. Monitoring of feral animal activity. Staff training of feral animal and waste Management Avoid attraction of feral animals by implementing domestic waste management procedures. Waste and water sources fenced not available to feral animals. Putrescible rubbish (including food scraps) and other materials are disposed of into sealed 1 tonne bulka bags prior to burial to prevent feral animals and vermin from accessing the waste, allowing them to breed and increase in numbers. Carosue Dam have existing procedures for feral animal control on site and work closely with neighbouring pastoralists to undertake feral animal control in the surrounding area. It is unlikely there will be an increased risk in predation from the controlled action on Malleefowl. The risk is rated as Low.	D	3	M9	Evidence through sightings, scats and tracks suggest feral animal numbers in the area are low. Recent annual Malleefowl Monitoring to the east of the mine area showed no evidence of cats, little evidence of dogs and some evidence of rabbits. Baiting is carried out by neighbouring pastoralists frequently throughout each year.	CDO-ENV-024-SWP Weed and Feral Animal Control CDO-ENV-051-Pla - Biodiversity Management
<b>Indirect Impacts</b>	Noise from construction, vehicles, and general mine operations impacting Malleefowl movements in the area	C	2	M8	The proposed TSF Cell 4 and associated infrastructure is located within an active mining and processing area. The total footprints of new TSF and miscellaneous infrastructure have been minimised wherever practical to reduce overall disturbance and minimise impacts to Malleefowl. All mounds within the proposed development footprint are not active, therefore risks of mine operations impacting individuals of the species is negligible. It is unlikely that the addition of the controlled action is going to result in Noise/Light impacts to the Malleefowl. The following mitigation measures will be implemented: Project travel between dusk and dawn will be limited to essential travel only.	D	2	L5	Studies have demonstrated Malleefowl are extremely resilient to activity and disturbance near their habitat. An active Malleefowl population is present directly east of the mine area (outside of any potential impact area). There are many examples at Carosue Dam where Malleefowl have nested directly adjacent to roads and other mining infrastructure.	Construction Environmental Management Plan (CEMP)

	Risk Pathway/Impact	Likelihood	Consequence	Risk	Actions to be implemented/Mitigation Measures	Likelihood	Consequence	Residual Risk	Justification for Residual Risk ranking	EMP or Procedure incorporating risk treatment
					Lights will be strategically placed and designed to shine towards plant operations and minimise light exposure to the surrounding environment. Equipment design will specify compliance with Australian Standard noise limits					
	Increased occurrence of weeds, reducing quality of adjacent habitat suitable for Malleefowl.	D	1	L2	A Weed Management Procedure has been implemented on site which includes recording and mapping infestations in a database.  All vehicles entering site must be cleaned prior to arrival and checked before they commence work. A Weed Hygiene Certificate is issued to confirm they are free of vegetative and soil material. It is unlikely that the occurrence of weeds will impact adjacent Malleefowl habitat. The risk has been rated as Low.	E	1	L1	The majority of the proposed disturbance will not be susceptible to weed infestations as the haul road will be compacted and trafficked consistently and the entire TSF footprint is not conducive to vegetation growth due to the hypersaline nature of the tailings. Topsoil stockpiles will be monitored in line with the remainder of Carosue Dam and weeds managed as required.	CDO-ENV-024-SWP Weed and Feral Animal Control
	Dust impacting surrounding vegetation suitable for Malleefowl.	D	2	L5	Dust generation from clearing activities and vehicle movement will be mitigated using water suppression via water cart as required during clearing and construction.  The construction/clearing activities will only occur for a period of 9 months. It is unlikely that dust generated from the short-term project will impact surrounding vegetation suitable for Malleefowl. Therefore, the risk has been rated as Low.  Dusting events are mitigated through clearing procedures, for example clearing must not be undertaken during high wind events.	E	2	L3	Dust suppression once applied is extremely effective due to the hypersaline nature of the water at Carosue Dam. The dust suppression forms a crust over the areas watered, therefore minimising dust generation to an acceptable standard.	CDO-ENV-035-SWP Haul Road Management
	Altered surface water flow impacting vegetation suitable for Malleefowl (e.g. water starvation or flooding)	D	2	L5	Intensive surface water studies have been conducted and appropriate water management infrastructure has been designed to ensure altered surface water flows do not negatively impact on vegetation suitable for Malleefowl. Therefore, it is unlikely that altered water resources will impact on vegetation suitable for Malleefowl. The risk is rated as Low.	E	2	L3	Surface water risks have been assessed and appropriate controls put in place through the design phase to ensure no issues occur during and after construction.	CDO-REP-TSF4 Expansion Surface and Groundwater Report
	Hypersaline water from dust suppression affecting vegetation suitable for Malleefowl.	D	2	L5	Water carts are fitted with dribble bars rather than spray bars to ensure dust suppression is only applied to immediate area in need of suppression, therefore minimising risk of hypersaline water affecting surrounding vegetation.  Sumps are dug in runoff v-drains to capture incidental hypersaline runoff from road watering activities. It is unlikely that hypersaline water will impact suitable Malleefowl habitat. The risk is rated Low.	E	2	L3	Frequent inspections are completed of roadside sumps to ensure they do not need to be dug out and for evidence of salt movement.  This is regulated via Tenement Conditions under the Mining Act 1978.	CDO-ENV-035-SWP Haul Road Management
	An increased risk of fire due to construction equipment and activities impacting fauna and Malleefowl habitat.	C	4	E18	Various fire management practices and controls are implemented at the Carosue Dam minesite which contribute to the overall protection of the site and surrounding areas, these include: <ul style="list-style-type: none"> <li>• Maintain fire breaks and implementation of NSR fire management procedures</li> <li>• Firefighting and suppression equipment located at site and on construction equipment/vehicles</li> <li>• All equipment and vehicles restricted to designated cleared access tracks/roads.</li> <li>• Staff training and awareness in the prevention and management of fires.</li> <li>• Consultation with relevant agencies (FESA, DBCA) in relation to prescribed burns and fire management.</li> </ul>	D	3	M9	Bushfires are becoming more prevalent across the arid region.	Construction Environmental Management Plan (CEMP)

## **8.0 Environmental Management**

Environmental management measures have been outlined in Table 8. These objectives and management measures are applicable during the clearing and construction phase of the project.

**Table 8: Environmental Management Objectives, Controls and Reporting**

Objectives	Performance Criteria	Management Measures	Reporting
<p>Minimise the potential of vehicle strike causing injury or death to terrestrial fauna, including the Malleefowl.</p>	<p>No deaths of fauna/Malleefowl attributable to vehicle strike.</p>	<p>Malleefowl road traffic warning signs are erected on project specific transport corridors and around the construction site informing of Malleefowl in the area. Restricted vehicle speeds will be applied on clearing equipment. Suitably qualified fauna spotter to walk ahead of dozer during clearing.</p>	<p>Incidents and near misses are reported through INX InControl and will be included in the Annual Compliance Report to DCCEEW.</p>
<p>Minimise entrapment leading to injury or death of terrestrial fauna, including the Malleefowl.</p>	<p>No Malleefowl (adult or chick) death due to entrapment in water holding facilities.</p>	<p>All operators to report sightings of Malleefowl (live or dead) during construction. impacts to Malleefowl. Daily visual inspection will be undertaken to check for trapped fauna.</p>	<p>Visual Inspection            Incident Reporting</p>
<p>Minimise requirements for clearing which results in habitat loss and fragmentation.</p>	<p>No unauthorised clearing and/or clearing outside approved clearing areas.            No unauthorised clearing of active Malleefowl mounds.</p>	<p>Clearing activities will be kept to a minimum, with all native vegetation clearing to be undertaken in accordance with Clearing Permit CPS8000/2 and EPBC Approval 2021/9026.</p> <p>Pre-clearance surveys will be undertaken prior to clearing to identify and record the presence of Malleefowl and mounds in proposed clearing areas.</p> <p>A fauna spotter will be present during clearing and will stop work if Malleefowl are spotted in, or adjacent to, the disturbance area,</p> <p>Clearing activities will preferentially occur outside of breeding season. Clearing may however, only occur during breeding season if mounds have been confirmed to be non-active by a suitably qualified environmental specialist.</p> <p>All known active mounds will be avoided and flagged with appropriately sized buffers (50m).</p> <p>Active mounds will be monitored for a suitable period of time to ensure no impacts are sustained by individuals or their young. Clearing will only commence</p>	<p>An annual Clearing Permit Report is submitted to DMIRS as required under CPS8000/2.</p> <p>Information will also be included in the Annual Compliance Report to DCCEEW.</p>

Objectives	Performance Criteria	Management Measures	Reporting
		after positive confirmation that the mound is no longer active. Staff training and awareness including an induction and Toolbox sessions.	
Minimise pollution from light and noise.	Compliance with industry requirements for noise and light emissions. Light emissions limited to project area.	Project travel between dusk and dawn will be limited to essential travel only.  Lights will be strategically placed and designed to shine towards plant operations and minimise light exposure to the surrounding environment.  Equipment design will specify compliance with Australian Standard noise limits.	
Minimise increases to predator abundance.	No increase in predator abundance No fauna/Malleefowl deaths due to predation.	Predator control program implemented if required  Waste and water sources fenced not available to feral animals.  Avoid attraction of both feral and native species to the project footprint by: <ul style="list-style-type: none"> <li>• Implementing domestic waste management procedures</li> <li>• Feral animal control for the Project and coordination with regional programs in accordance with Northern Star Weed and Feral Animal Control Procedure.</li> </ul> Staff training on waste and water management, including information on feral species.	
No increase in fire frequency or intensity.	No fires attributed to construction/mining and associated activities.	Maintain fire breaks and implementation of Northern Star fire management procedures  Firefighting and suppression equipment located at site and on construction equipment/vehicles  All equipment and vehicles restricted to designated cleared access tracks/roads  Staff training and awareness in the prevention and management of fires.	Incidents are reported through INX InControl.



Objectives	Performance Criteria	Management Measures	Reporting
		Consultation with relevant agencies (FESA, DBCA) in relation to prescribed burns and fire management.	
Minimise potential impacts to terrestrial fauna, including the Malleefowl by training staff to increase awareness on the identification, monitoring and management of Malleefowl.	All relevant staff and contractors to be trained through inductions/pre-start meetings on Malleefowl/fauna Management.	Staff training and awareness will be rolled out prior to construction to provide information on the Malleefowl (e.g. how to identify adults, chicks and mounds, conservation status, the importance of minimising impacts on the species and adherence to the CEMP to ensure impacts are minimised).	Records kept of training programs and participants.

## References

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*Alexander Holm & Associates (2021b) Impacts on Malleefowl of land clearing associated with the expansion of Carosue Dam TSF. Prepared for Northern Star Resources. August, 2021.*

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Department of Parks and Wildlife. (2016). Fauna profiles: Malleefowl *Leipoa ocellata*. Retrieved from: <http://www.dpaw.wa.gov.au/>

National Malleefowl Monitoring Manual: Edition: v2020\_1 - (Revised June 2020)

## **Appendix 4 Approved Offset Management Plan**



EPBC ref: 2021/9026

Mr John Albrecht  
General Manager  
Northern Star (Carouse Dam) Pty Ltd  
Northern Star Resources Limited  
388 Hay St, Subiaco WA 6008

**Approval of Offset Management Plan for Northern Star Resources – Carouse Dam TSF Cell 4, WA**

Dear Mr Albrecht

I refer to an email from Mr Cliff Bennison of Northern Star Resources Limited to the Department of Climate Change, Energy, the Environment and Water, dated 17 May 2023, and subsequent emails, seeking approval of the *Carosue Dam TSF Cell 4 Exempt East Location 55 (EEL55) Offset Management Plan V4; 7 August 2023* in accordance with condition 3 of the above project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Officers of the department have advised me on the offset management plan and the requirements of the conditions of the approval for this project. On this basis, and as a delegate of the Minister for the Environment and Water (the Minister), I have decided to approve the *Carosue Dam TSF Cell 4 Exempt East Location 55 (EEL55) Offset Management Plan V4; 7 August 2023*. This plan must now be implemented.

As you are aware, the department has an active monitoring program which includes monitoring inspections, desk top document reviews and audits. Please ensure that you maintain accurate records of all activities associated with, or relevant to, the conditions of approval so that they can be made available to the department on request.

Should you require any further information please contact Eric Tierney by email at [PostApproval@dcceew.gov.au](mailto:PostApproval@dcceew.gov.au).

Yours sincerely

A handwritten signature in black ink, appearing to read 'Rachel Short'.

Rachel Short  
Branch Head  
Environment Assessments (Vic, Tas) and Post Approvals Branch  
Nature Positive Regulation Division

06 March 2024



**NORTHERN STAR**  
RESOURCES LIMITED

**Carosue Dam TSF Cell 4  
Exempt East Location 55 (EEL55)  
Offset Management Plan**

EPBC 2021/9026

7 August 2023

**Version No. 4**

<b>Proponent Details</b>		
Company Name	Northern Star (Carosue Dam) Pty Ltd	
ACN/ABN	14 116 649 122	
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## Document Control

Version	Date	Details of review or changes	Authorisation
1.0	14 July 2022	Submission to DCCEEW	John Albrecht
2.0	2 August 2022	Minor changes post consultation with DCCEEW	John Albrecht
3.0	17 May 2023	Updated to address conditions of EPBC 2021/9026	John Albrecht
4.0	7 August 2023	Updated to address comments from DCCEEW review	John Albrecht

## Declaration of Accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both.

I am authorised to bind the approval holder to this declaration, and I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed: \_\_\_\_\_



Full Name: John Albrecht

Position: Site Senior Executive

Organisation: Northern Star (Carosue Dam) Pty Ltd

Date: 7 August 2023

## Executive Summary

Northern Star (Carosue Dam) Pty Ltd has approval to develop a new cell (Cell 4) at its Tailings Storage Facility (TSF) at Carosue Dam Operations. Approval to construct Cell 4 was granted under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 22 November 2022 (EPBC 2021/9026).

Construction of Cell 4 was predicted to impact 152.6 ha of Malleefowl (*Leipoa ocellata*) habitat and Conditions 2 of EPBC 2021/9026 requires the approval holder to control and legally secure the EEL55 offset to compensate for significant residual impacts to Malleefowl. Land parcel “EEL55”, located approximately 140 km south-west of Cell 4, is an 800 ha parcel of freehold land owned by Northern Star and known to contain Malleefowl habitat.

This Offset Management Plan (OMP) has been prepared to meet the requirements of Condition 3 of EPBC 2021/9026, which states:

*‘To compensate for significant residual **impacts to Malleefowl** the approval holder must submit, within 6 months of **commencement of action**, an Offset Management Plan to the **Department** for the **Minister’s** approval. The Offset Management Plan must, to the satisfaction of the **Minister**, meet the requirements specified in Attachment D. The approval holder must implement the approved Offset Management Plan for the life of the approval.’*

This Offset Management Plan (OMP) has been prepared to meet the requirements of Condition 3 of EPBC 2021/9026. The objectives of this OMP are to:

- Protect Malleefowl habitat in EEL55 from future development by securing the site for long term conservation management.
- Improve Malleefowl habitat quality within the site through implementation of management measures.

The management approach outlined in this OMP has incorporated recovery actions identified in the National Malleefowl Recovery Plan (Benshemesh, 2007). The primary strategies to achieve these objectives are:

- Securing a conservation covenant over EEL55
- Environmental management to improve Malleefowl habitat quality at the site, including:
  - Exclusion of grazing
  - Feral predator control
  - Bushfire prevention
  - Weed control

Monitoring will be undertaken to assess performance of these measures and an adaptive management approach will be used to implement contingency actions until completion criteria are achieved. The implementation of these measures will establish the offset site as a conservation area with high quality Malleefowl habitat.



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## 1.0 Introduction

### 1.1 Background

Northern Star (Carosue Dam) Pty Ltd has approval to develop a new cell (Cell 4) at its Tailings Storage Facility (TSF) at Carosue Dam Operations. Approval to construct Cell 4 was granted under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 22 November 2022 (EPBC 2021/9026).

Construction of Cell 4 was predicted to impact 152.6 ha of Malleefowl (*Leipoa ocellata*) habitat and Conditions 2 of EPBC 2021/9026 requires Northern Star to control and legally secure the EEL55 offset to compensate for significant residual impacts to Malleefowl. Land parcel “EEL55”, located approximately 140 km south-west of Carosue Dam Operations, is an 800 ha parcel of Freehold land owned by Northern Star and known to contain Malleefowl habitat.

Condition 3 of EPBC 2021/9026 requires the approval holder to submit an Offset Management Plan (OMP) to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for the Minister's approval. Condition 3 states:

*‘To compensate for significant residual **impacts to Malleefowl** the approval holder must submit, within 6 months of **commencement of action**, an Offset Management Plan to the **Department** for the **Minister’s** approval. The Offset Management Plan must, to the satisfaction of the **Minister**, meet the requirements specified in Attachment D. The approval holder must implement the approved Offset Management Plan for the life of the approval.’*

### 1.2 Purpose and Scope

This Offset Management Plan (OMP) has been prepared to meet the requirements of Northern Star's Offset Proposal and provides the details on land management actions, completion criteria, monitoring and reporting.

The purpose of this Offset Management Plan is to:

- Provide a framework for the implementation, monitoring and management actions required, to ensure the offset site is secure and protected from potential impacts associated with mining, agriculture, predation and other environmental risks that have the potential to degrade the environmental values at the site.
- Provide and maintain protection of 800 ha of land including 755.2 ha of Malleefowl habitat to improve conservation outcomes for Malleefowl within EEL55.

**This OMP has been prepared to meet the requirements of Condition 3 of EPBC 2021/9026. A summary of relevant sections in the OMP is provided in Table 1: EPBC 2021/9026 Offset Management Plan requirements**

The OMP was prepared in accordance with the Environmental Management Plan Guidelines (Commonwealth of Australia, 2014) by suitably qualified environmental experts: Kiera Mews (Principal Environmental Advisor), Karina Tedesco (Environment Manager) and Cliff Bennison (Senior Environmental Advisor). These personnel have over 50 years' combined experience in environmental management.

### **1.3 Objective**

The objectives of the OMP are to:

- Protect the offset site from future development by securing the site for long term conservation management.
- Improve Malleefowl habitat quality within the site through implementation of management measures.

**Table 1: EPBC 2021/9026 Offset Management Plan requirements**

Item	EPBC 2021/9026 Offset Management Plan requirements	Section	Page No.	Commitment
	<b>EPBC Approval Condition</b>			
2	To compensate for residual significant impacts to Malleefowl, the approval holder must:	Sections 6.1, 7.0 & 8.4	31, 34, 38, 42	
	a. control the EEL55 offset site within 6 months of the date of this approval decision,			Northern Star have control of the EEL55 offset site.
	b. legally secure the EEL55 offset site within 6 months of the date of Offset Management Plan being accepted by the Department,			Northern Star commit to legally securing the EEL55 offset site within 6 months of the date of OMP acceptance by the Department.
	c. within 10 business days of legally securing the EEL55 offset site, provide the Department with: <ul style="list-style-type: none"> <li>i. written evidence demonstrating that the EEL55 offset site has been</li> <li>ii. legally secured, and</li> <li>iii. shapefiles and offset attributes of the EEL55 offset site,</li> </ul>			Northern Star will provide written evidence to the Department, including shapefiles and offset attributes, demonstrating that the EEL55 offset site has been legally secured, within 10 business days of securing offset site.
	d. once the EEL55 offset site has been legally secured, report annually on the presence of Malleefowl at the EEL55 offset site for the life of the approval, and			Northern Star will report annually on the presence of Malleefowl at EEL55 for the life of the approval.
	e. provide the Department with evidence demonstrating the presence of Malleefowl at the EEL55 offset site within 5 years of this approval.			Northern Star will provide the Department evidence of Malleefowl at the EEL55 offset site within 5 years of this approval.



Item	EPBC 2021/9026 Offset Management Plan requirements	Section	Page No.	Commitment
3	To compensate for significant residual impacts to Malleefowl the approval holder must submit, within 6 months of commencement of the Action, an Offset Management Plan to the Department for the Minister's approval. The Offset Management Plan must, to the satisfaction of the Minister, meet the requirements specified in Attachment D [see below]. The approval holder must implement the approved Offset Management Plan for the life of the approval.	Section 6	29	Northern Star commit to submit an Offset Management Plan (this document) to the Department for approval.  The approved Offset Management Plan will be implemented for the life of the approval.
6	<p>If the approval holder is unable to demonstrate the presence of Malleefowl at the EEL55 offset site within 7 years of this approval, the approval holder must:</p> <ul style="list-style-type: none"> <li>a. submit an alternative offset site proposal, which meets the requirements of the Environmental Offsets Policy, to the Department,</li> <li>b. submit an Offset Management Plan for the alternative offset site in accordance with the requirement specified in Attachment D.</li> <li>c. not recommence undertaking the Action unless the Offset Management Plan for the alternative offset site is approved in writing by the Minister,</li> <li>d. legally secure the alternative offset site, and</li> <li>e. within 6 months of the Offset Management Plan for the alternative offset site being approved by the Minister, provide the Department with:                             <ul style="list-style-type: none"> <li>i. written evidence to the demonstrating that the alternative offset site has been legally secured, and</li> <li>ii. shapefiles and offset attributes of the alternative offset site.</li> </ul> </li> </ul>	Section 7 & Section 8 .3	38, 41	<p>Northern Star commit to finding and legally securing an alternative suitable offset site if unable to demonstrate the presence of Malleefowl at EEL55 within 7 years of this approval.</p> <p>If required, an alternative Offset Site Proposal and associated Offset Management Plan will be submitted to the Department for approval in accordance with Condition 6a-b.</p> <p>The action will not be recommenced until the alternative offset site is approved by the Minister in accordance with Condition 6c.</p>

Item	EPBC 2021/9026 Offset Management Plan requirements	Section	Page No.	Commitment
	<p>Note: The approval holder should commence seeking an alternative offset site if the presence of Malleefowl at the EEL55 offset site has not been demonstrated 5 years after this approval decision and initiate discussions with the Department about what measures it should take to avoid any interruption to implementation of the approved Action. The alternative offset site proposal and Offset Management Plan for the alternative offset site may be submitted to the Department well before 7 years after this approval decision.</p>			
<p><b>7 - 8</b></p>	<p><b>Revised Action Management Plans</b></p> <p>7. If the approval holder wishes to carry out any activity otherwise than in accordance with the Action management plans referred to in these conditions, the approval holder must submit to the Department for the Minister's written approval a revised version of that plan. The approval holder must not commence the varied activity until the Minister has approved the revised plan in writing. If the Minister approves such a revised plan, that version of the plan must be implemented in place of the version previously approved.</p> <p>8. If the Minister believes that it is necessary or convenient for the better protection of Malleefowl to do so, the Minister may request that the approval holder make specified revisions to a plan referred to in these conditions and submit the revised plan for the Minister's written approval. The approval holder must comply with any such request.</p>	<p>Section 8.2 &amp; 8.3</p>	<p>41</p>	<p>Northern Star will submit a revised Management Plan to the Department for approval where activities within the plan have changed. Northern Star will not commence the varied activity until the revised plan has been approved in accordance with Condition 7.</p> <p>Northern Star will submit a revised plan if requested by the Minister in accordance with Condition 8.</p>
<p><b>9-13</b></p>	<p><b>Submission and Publication of Plans</b></p>	<p>Section 8.5</p>	<p>42</p>	<p>Northern Star commit to the submission and publication of all plans required by</p>



Item	EPBC 2021/9026 Offset Management Plan requirements	Section	Page No.	Commitment
	<p>9. The approval holder must submit all plans required by these conditions electronically to the Department.</p> <p>10. Unless otherwise agreed to in writing by the Minister, the approval holder must publish each plan on the website within 15 business days of the date:</p> <ul style="list-style-type: none"> <li>a. of this approval, if the version of the plan to be implemented is specified in these conditions; or</li> <li>b. the plan is approved by the Minister in writing, if the plan requires the approval of the Minister; or</li> <li>c. the plan is submitted to the Department in accordance with a requirement of these conditions, if the plan does not require the approval of the Minister</li> </ul> <p>11. The approval holder must keep all published plans required by these conditions on the website until the expiry date of this approval.</p> <p>12. The approval holder is required to exclude or redact sensitive ecological data from plans published on the website or otherwise provided to a member of the public.</p> <p>13. If sensitive ecological data is excluded or redacted from a plan in accordance with condition 12, the approval holder must notify the Department in writing what exclusions and redactions have been made in the version published on the website.</p>			<p>these conditions in accordance with Conditions 9-13.</p>
<b>Information Requested in EPBC 2021/9026 Attachment D</b>				
a)	be prepared in accordance with the Environmental Management Plan Guidelines	Section 1.0	1	



Item	EPBC 2021/9026 Offset Management Plan requirements	Section	Page No.	Commitment
b)	be prepared by a suitably qualified expert	Section 1.1	1	
c)	include a summary of the residual impacts to Malleefowl that the Offset Management Plan proposes to compensate for, including: <ul style="list-style-type: none"> <li>i. the size of the area, in hectares,</li> <li>ii. the habitat quality of the area, and</li> <li>iii. the total number of suitable nest mounds identified during any pre-clearance survey</li> </ul>	Section 3.0	11	
d)	reference the EPBC Act approval conditions to which the Offset Management Plan refers	Section 1.1 <b>Table 1: EPBC 2021/9026 Offset Management Plan requirements</b>	1, 3	
e)	include maps, prepared in accordance with the Maps Guide, of the proposed offset site(s)	Figure 4	13 15 16 21	

Item	EPBC 2021/9026 Offset Management Plan requirements	Section	Page No.	Commitment
f)	include details of the offset site(s), including: i. the size of the area, in hectares, ii. site survey results, iii. the habitat quality of the site(s), and, iv. the environmental values of the site(s), including the total number of nesting mounds within the site(s)	Section 4.0	14	
g)	detail measurable ecological outcomes and include commitments to achieve those outcomes	Section 6.0	37	
h)	detail management actions, and the timing of those actions, that will be implemented to achieve the ecological outcomes	Section 6.0	37	
i)	include a program to monitor the implementation of the plan, including the progress of the plan towards achieving ecological outcomes	Section 7.0	36	
j)	detail a schedule to review and report on the implementation of the plan, including a progress assessment towards the attainment of ecological outcomes	Section 8.0	46	
k)	include a risk assessment which evaluates the risk of the plan not achieving the ecological outcomes	Section 5.0 Table 12	34	
l)	propose corrective actions, with measurable performance indicators and trigger values to ensure that ecological outcomes are attained and maintained once attained.	Section 5.0 Table 12	34	

## 2.0 Project Description

Expansion of the TSF is required to ensure continued operation of the Carosue Dam Project, located approximately 120km north-east of Kalgoorlie in the Pinjin region of the Eastern Goldfields. To continue processing operations into the future, Northern Star has developed a 10 year TSF permitting design, which includes the construction of an additional cell adjacent to the existing TSF.

The project occurs on existing mining tenure (M28/269 & M31/295) and will involve 217.3 ha of vegetation clearing within a 229.1 ha development envelope, of which 52.5ha is considered suitable (used for foraging and cover) and 100.1 ha critical (used for breeding and foraging) Malleefowl habitat. Within the development envelope, 11.8 ha has been previously cleared.

Table 2 provides a summary of the indicative implementation schedule for construction, operation, and decommissioning/rehabilitation of the TSF.

**Table 2: Implementation schedule for the TSF**

Phase	Activity Description	Start Date	Completion Date	Duration
Construction	Clearing of impact area	November 2022	December 2022	1 month
	Construction of embankments	November 2022	July 2023	8 months
	Compaction & construction of roads	November 2022	July 2023	9 months
	Redirection of surface water flows through construction of drainage channels	November 2022	September 2023	11 months
Operations	Commence deposition of tailings into Cell 4	January 2024	January 2031	7 years
	Maintenance of infrastructure	January 2024	January 2031	7 years
	Twice daily inspections of pipelines during operation	January 2024	January 2031	7 years
	Road maintenance including dust suppression and surface grading	August 2022	January 2031	9 years
Decommissioning & Rehabilitation	Cease deposition and allow consolidation and drying of tailings material	January 2031	July 2031	6 months
	Reshape and batter slopes to <18°;	August 2031	January 2032	6 months
	Cap top surface with competent rock;	January 2032	March 2032	3 months
	Respread topsoil;	March 2032	April 2032	2 months
	Rip on the contour	April 2032	April 2032	1 month
	Seed with local native species	April 2032	April 2032	1 month
	Rehabilitation monitoring	September 2032	September 2042	10 years

### 3.0 Impacts of Controlled Action

The controlling provisions for EPBC 2021/9026 comprise Listed threatened species and ecological communities (section 18 and 18A of the EPBC Act). Specifically, the project has potential to result in significant residual impacts to Malleefowl (*Leipoa ocellata*), which is listed as Vulnerable under the EPBC Act.

Significant residual impacts to Malleefowl include:

- clearing up to 152.6 ha of suitable Malleefowl habitat, comprising 100.1 ha of critical habitat suitable for breeding and foraging, and 52.5 ha of supporting habitat suitable for foraging and shelter.
- Removal of up to seven inactive nest mounds, including four recently inactive mounds and three abandoned mounds.

### 3.1 Habitat Quality

In accordance with the EPBC offsets assessment guide (How to use the Offsets assessment guide) three components, i) site condition, ii) site context and iii) stocking rate, were rated to provide an assessment of habitat within the disturbance envelope (Table 3).

The basis for habitat assessment was a targeted Malleefowl survey conducted by Alexander Holm & Associates in 2021 (Alex Holm and Associates, 2022a), and vegetation surveys conducted over the impact area and surrounds reported in Alexander Holm & Associates (2012, 2019). These surveys provide spatially-described information within land units each occupying a similar topographic position with similar vegetation and soil type.

Within the 229.1 ha disturbance envelope, 11.8 ha has been previously cleared for a haul road, minor access roads and boundary fencing, leaving 217.3 ha of habitat for assessment. Of this, alluvial plains with chenopods (land unit 5a) occupy 29%; acacia shrubland (land unit 4a) 26%; spinifex sandplain (land unit 4d) 21%; basalt foot slopes (land unit 2b) 20%; sandy rises with spinifex (land unit 1d) 3% and laterite rises (land unit 2a) 1%.

When indices for habitat condition, context and Malleefowl stocking rate are combined, sandy rises with spinifex (land unit 1d) score the highest for Malleefowl habitat followed by acacia shrublands (land unit 4a), spinifex sandplain (land unit 4d), and basalt footslopes (land unit 2b) which all rate highly. Alluvial plains (land unit 5a) and lateritic rises (land unit 2a) are of limited value.

After combining area-adjusted ratings for each land unit and expressing this as a ratio of the maximum possible score of 10, the total habitat score for the disturbance envelope is 5.41. The habitat quality assessment for the disturbance envelope is summarised in Table 3.

### 3.2 Malleefowl Mounds

The action will result in removal of seven inactive mounds. Most of these are located within the 100.1ha of acacia shrublands and basalt footslopes, which are critical habitat suitable for breeding and foraging by Malleefowl. While two nesting mounds were found in spinifex sandplain and sandy rises with spinifex, these mounds were restricted to small, favoured locations without spinifex, where acacias occur and are not prone to fire.

Elsewhere, there were no nesting mounds where spinifex is the dominant ground cover and fire is common. Consequently, these spinifex-dominated systems covering 52.5 ha are considered primarily habitat for foraging and cover.

Alluvial plains and lateritic rises, covering 64.8 ha which make up the balance of the disturbance envelope, are of limited value as Malleefowl habitat (Alexander Holm & Associates 2022a).

**Table 3: Habitat assessment of impact site**

Assessment component	Factors	Proportional score (out of 10)	Summary
Site condition	Vegetation condition Site attributes	1.67	Disturbed by recent mining and historic pastoral grazing. Roads, vehicle tracks fragment the area. Spinifex sandplain and sandy rises with spinifex are mostly in excellent condition and the remainder mostly in fair condition. Litter abundance is optimal in acacia-dominated units and minimal elsewhere. Sandy loam soils suitable for mound construction are prevalent in all land units except alluvial plains. No evidence of predators noted.
Site context	Movement patterns of the species Proximity of the site in relation to other suitable areas of habitat	2.05	Connectivity with surrounding landscapes is compromised by mining infrastructure and pastoral fencing. Site is part of a regionally significant contiguous suitable habitat; records on site for Malleefowl within last 6-10 years; site is within known distribution of species.
Malleefowl stocking rate	Occurrence of nesting mounds.	1.69	No active Malleefowl nesting mounds. Previously active mounds found within acacia shrublands, basalt footslopes, and in localised sites within spinifex units. Lateritic rises unsuitable
Overall site rating		5.41	

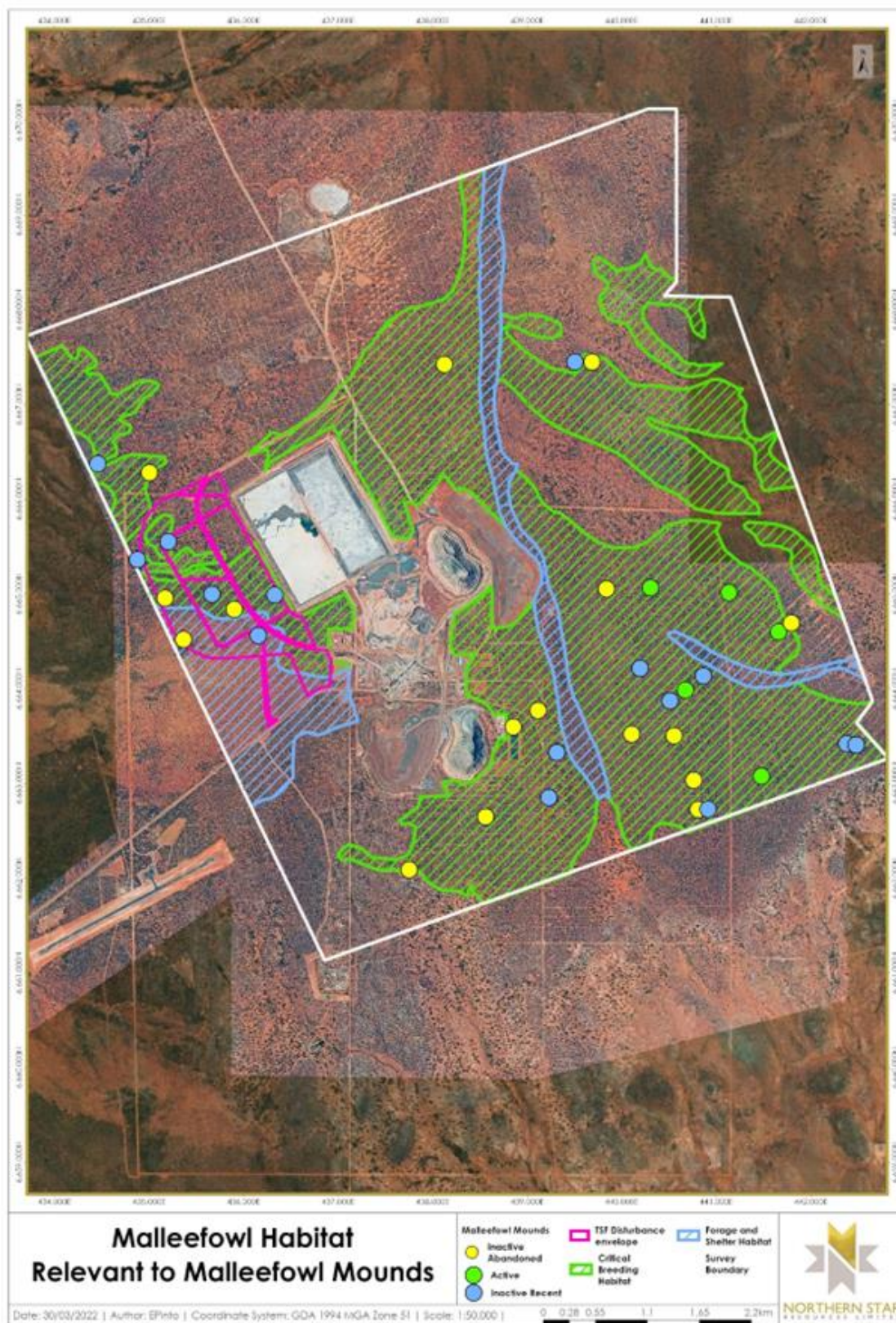


Figure 1: Malleefowl habitat at impact site

## 4.0 Offset Site Values

### 4.1 Property Details and Land Use

Land parcel "EEL55" has been identified as a suitable offset and is located approximately 140 km south-west of the Project in the City of Kalgoorlie Boulder (Figure 2). The site is 800 ha of Freehold land owned by Northern Star and holds a special land category 'Exempt East Location' (EEL) allowing mining and/or exploration activities to occur on the land under agreement, exempt from the provisions of the *Mining Act 1978* and *Mining Regulations 1981*.

EEL55 is surrounded by mining and exploration tenure, and pastoral leases (Figure 3). A pastoral licence agreement overlies the offset site. There has previously been no formal protection and/or management over EEL55 for the purposes of conservation, to prevent pastoral, mining and/or exploration activities.

The proposed offset site is located within a continuous patch of vegetation and abuts the Department Biodiversity, Conservation and Attractions (DBCA) managed Yallari Timber Reserve, providing a connection to regional Malleefowl habitat. The Scahill Timber Reserve is approximately 8 km southwest from EEL55 as shown in Figure 3.

### 4.2 Climate

The Goldfields region is arid to semi-arid with average annual rainfall decreasing from about 250 mm in the south-west to 200 mm in the north-east. The area experiences hot summers and mild winters with cold nights. Rainfall varies widely between years and droughts are common. Remnants of tropical cyclones occasionally bring heavy summer rain and can cause flooding to the area. The area transitions between desert summer and winter dominated rainfall and desert: non-seasonal bioclimatic (Alex Holm and Associates 2022b).

Malleefowl have been recorded within EEL55 and surrounding areas, suggesting the climate supports Malleefowl occurrence.

### 4.3 Bioregional Context

The proposed offset site is located within the Murchison bioregion at the western edge of the Eastern Goldfields subregion (Phoenix Environmental Services 2022).

The Eastern Goldfields subregion is characterised by:

- subdued relief comprised of undulating plains interrupted by low hills and ridges in the west and a horst in the east
- playa lakes associated with the remnants of an ancient major drainage line
- calcareous earths that cover much of the plains and greenstone areas
- vegetation dominated by Mallees, Acacia thickets, shrubland heaths, Eucalyptus woodlands and dwarf samphire shrublands
- land use dominated by Unallocated Crown Land, Crown Reserves and grazing.

The proposed offset site is located within a continuous patch of vegetation and abuts the DBCA managed Yallari Timber Reserve.



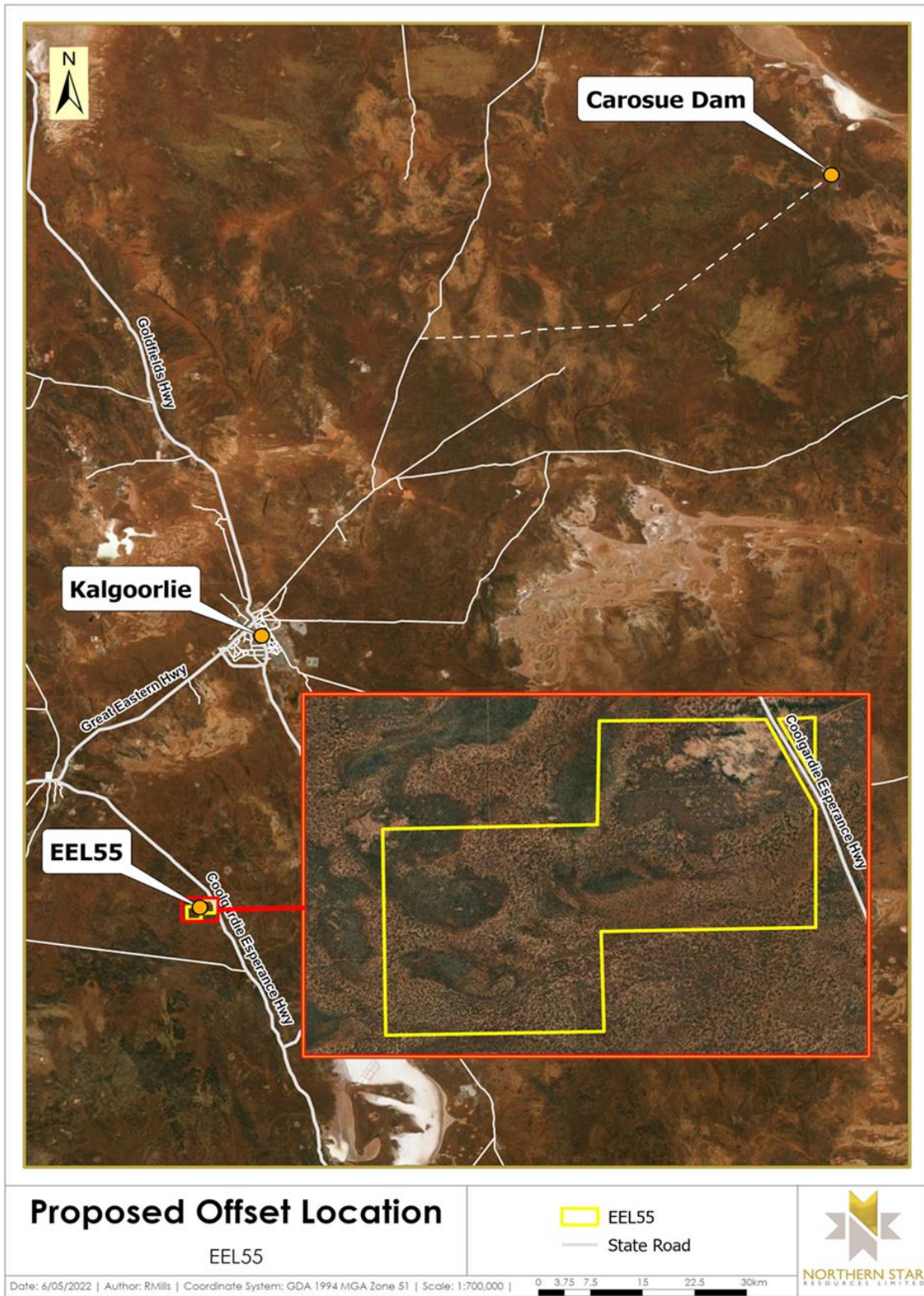


Figure 2: Exempt East Location 55

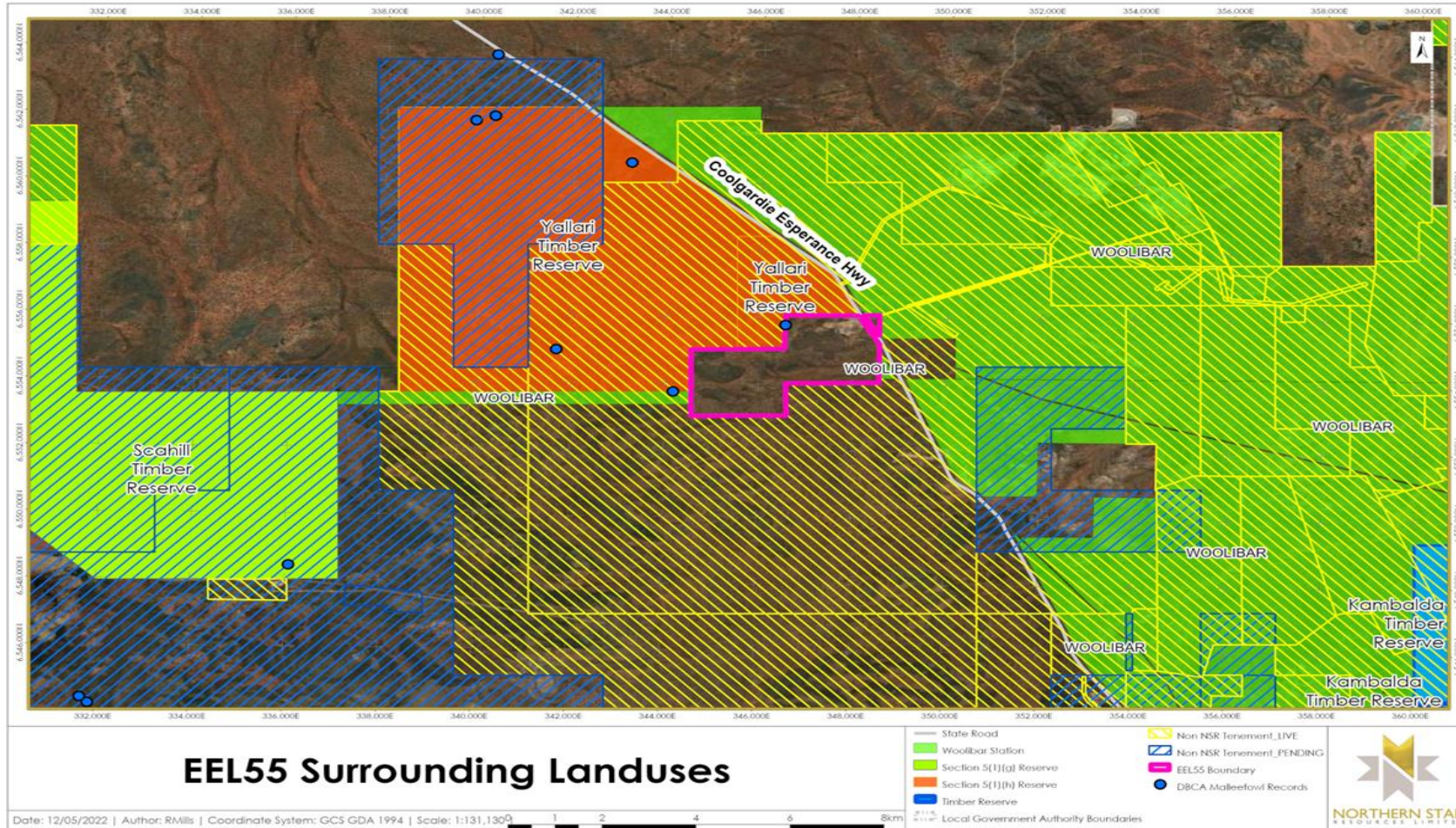


Figure 3: Surrounding Land Use to offset site

## 4.4 Land Systems and Surface Geology

The Department of Primary Industries and Regional Development (DPIRD) undertakes land system mapping for Western Australia using a nesting soil-landscape mapping hierarchy. While the primary purpose of the mapping is to inform pastoral and agricultural land capability, it is also useful for informing biological assessments. Under this hierarchy, land systems are defined as areas with recurring patterns of landforms, soils, vegetation and drainage. EEL55 intersects two land systems, of which Mx41 is the most extensive and colluvium 38491 and Depot Granodiorite H dominated surface geology (Phoenix Environmental Services 2022).

Land Systems and Surface Geology within the EEL55 include:

Land systems

- Mx41: Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments
- Mx42: Broad flat to undulating valleys with isolated granitic, and

Surface geology:

- colluvium 38491: Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite
- Depot Granodiorite H: Hornblende granodiorite and tonalite with scattered microcline phenocrysts; mafic granite

## 4.5 Habitat Assessment

Phoenix Environmental Services (2022) completed a fauna habitat assessment across EEL55 to determine the quality of Malleefowl habitat within EEL55. Habitat type Eucalyptus woodland (405.5 ha, 50.7%) dominated the site followed by Acacia shrubland (309 ha, 38.6%), then Melaleuca shrubland (40.7 ha, 0.3%). A total of 1 ha was cleared land and 44.4 ha (5.5%) was attributed to a granite extrusion. Habitat structure was considered suitable across the site, with Acacia shrubland and Melaleuca shrubland providing highest suitability for Malleefowl (Phoenix Environmental Services, 2022 and Alexander Holm & Associates, 2022b).


EEL55 and the surrounding Yallari Timber Reserve are important to the regional Malleefowl population. Following an initial survey by Phoenix Environmental Services (2022), EEL55 was considered likely to contain Malleefowl populations based on the presence of suitable habitat and historic records within and/or immediately adjacent to the sites. As a result, an additional targeted survey was conducted over EEL55 by Alexander Holm and Associates (2022b), during which both active and inactive Malleefowl mounds and evidence of recent Malleefowl activity were identified, demonstrating the suitability of EEL55 as an offset site.



Based on these surveys, the resulting assessment of habitat quality for Malleefowl within EEL55 is detailed in Table 4. Malleefowl habitat suitability has been mapped in Figure 4.


## 4.6 Vegetation Condition

Vegetation condition for EEL55 was considered pristine, showing no signs of anthropogenic disturbance or damage. There was observed old drums and PVC piping left on the site from historical unauthorised access, however, was not seen to be impacting vegetation (Phoenix Environmental Services 2022).

**Table 4: Habitat Summary within EEL55**

Habitat type	Description	Extent in EEL55 (ha and %)	Contains suitable Malleefowl habitat	Representative photograph
Eucalyptus woodland	<p>Tall, open <i>Eucalyptus</i> woodland tall, isolated <i>Acacia</i> shrubs over variably present shrubs of <i>Eremophila</i>, <i>Melaleuca</i>, <i>Senna</i>, <i>Maireana sedifolia</i> and <i>Phebalium</i> sp..</p> <p>Contains suitable Malleefowl habitat.</p>	405.5 (50.7)	Yes	

Habitat type	Description	Extent in EEL55 (ha and %)	Contains suitable Malleefowl habitat	Representative photograph
Acacia shrubland	<p>Tall Acacia shrubland over variable mid open shrubland of <i>Dodonaea</i> sp., <i>Phebalium</i> and <i>Sclerolaena</i> sp., over low <i>Rhagodia</i>, <i>Senna</i>, and <i>Maireana</i> shrubs.</p> <p>Contains suitable Malleefowl habitat.</p>	309.0 (38.6)	Yes	
Granite extrusion forbland	<p>Large open granite extrusion with isolated Acacia and <i>Hakea</i> shrubs over forbland of <i>Helipterum roseum</i>, <i>Maireana</i> and <i>Sclerolaena</i> sp..</p> <p>Does not contain suitable Malleefowl habitat.</p>	44.4 (5.5)	No	

Habitat type	Description	Extent in EEL55 (ha and %)	Contains suitable Malleefowl habitat	Representative photograph
<i>Melaleuca</i> shrubland	<p><i>Melaleuca</i> shrubland over low scattered <i>Maireana sedifolia</i>, <i>Grevillea</i> and <i>Atriplex</i> sp. (saltbush), <i>Phebalium</i> and greybush.</p> <p>Contains suitable Malleefowl habitat.</p>	40.7 (5.1)	Yes	
Cleared	<p>Roads, agricultural infrastructure such as watering holes etc.</p> <p>Does not contain suitable Malleefowl habitat.</p>	1.0 (0.1)	No	NA
Total		800.6		

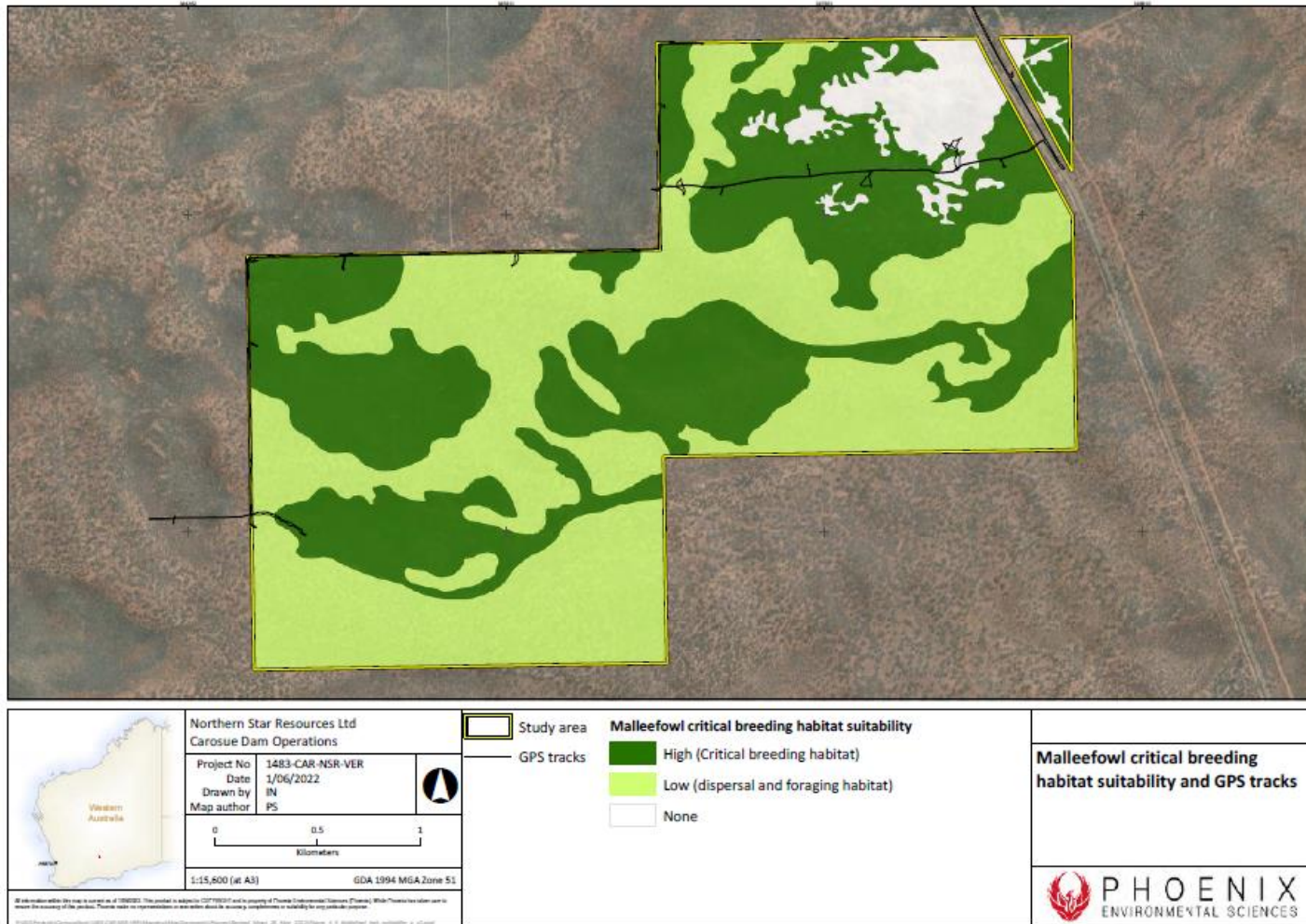


Figure 4 Malleefowl habitat suitability

## 4.7 Malleefowl (*Leipoa ocellata*)

Malleefowl (*Leipoa ocellata*) are a stocky ground-dwelling bird, that rarely flies, belonging to the family Megapodiidae that build distinctive nests comprised of larger mounds built from soil and leaf litter to incubate their eggs. Breeding season usually begins in September when egg laying begins and ends in late January. During this time, the male bird remains at the mound constantly re-working it. Breeding pairs are monogamous, will pair for life and will breed in the same area using existing mounds. Chicks typically begin hatching in November, with most chicks emerging from mounds by January, however it has been noted that in some seasons hatching may continue until March (Benshemesh, 2007). Malleefowl (eggs and chicks) are threatened by predation, habitat clearing, isolation due to habitat fragmentation and increased wildfires.

## 4.8 Distribution and Habitat

Historically, Malleefowl have been found in semi-arid mallee shrublands and woodlands across southern Australia, however although the species is still found across its range, its remaining populations are highly fragmented due to extensive land clearing (Department of Parks and Wildlife, 2016). Malleefowl habitat is generally found in shrublands and low woodlands dominated by mallee. In Western Australia, habitat generally consists of Acacia dominated shrublands and occasionally woodlands dominated by eucalypts. Habitat areas require a sandy substrate and abundance of leaf litter for the construction of mounds. Studies have found density of birds is greater in areas of higher rainfall, on more fertile soils and where shrub diversity is greatest. Habitats characterised by numerous food plants (especially leguminous shrubs and herbs), a dense canopy cover and open ground layer are generally associated with high breeding densities. Malleefowl also prefer long unburnt country (Benshemesh, 2007). Thick vegetative corridors are beneficial to Malleefowl that predominantly disperse on foot.

At the broader land system scale, most nesting mounds are within Deadman land system characterised by level to gently undulating plains with casuarina-acacia shrublands which include the Malleefowl-favoured acacia shrublands of land units 4a and 4b. Nesting mounds occur on footslopes of Lawrence and Leopold land systems characterised by low hills with eucalypt or acacia woodlands with halophytic under-shrubs which include basalt hill footslopes of land unit 2b. Nesting mounds also occur in favoured locations within the extensive Kirgella land system characterised by sandplain supporting spinifex and acacia/eucalypt shrublands which is dominated by spinifex sandplain of land unit 4d (Alexander Holm and Associates 2022).

Deadman, Kirgella, Lawrence and Leonora land systems occupy approximately 18,000 ha within 10 km of the disturbance envelope and provide potential habitat for Malleefowl. Kirgella land system, which extends up to 40 km to the west and is contiguous with the disturbance envelope, occupies two thirds of the potential habitat (Alexander Holm and Associates 2022).

## 4.9 Conservation Status

The Malleefowl is one of three mound – building birds species in Australia and is recognized as a threatened species under State and Commonwealth legislation. The Malleefowl is listed as Vulnerable fauna under the EPBC Act. The species is also listed as Vulnerable under the *Biodiversity Conservation Act 2016 (WA)*.

## 4.10 Introduced Fauna

Predation by feral animals (fox, cats, and dingos) is a key factor contributing to the decline of Malleefowl species due to mortality (Bode et al., 2011 and Benshemesh J, 2007). Feral animals



are known to take Malleefowl at all stages of the bird's life cycle, reducing recruitment of Malleefowl into populations (Benshemesh J, 2007). Table 5 outlines evidence of predators observed at EEL55 during surveys.

**Table 5: Observed feral predator activity**

Species	Record of Evidence	Comments
Cat ( <i>Felis catus</i> )	Scats/tracks	Recorded on the track (NS030). (Phoenix Environmental Services, 2022). Alexander Holm and Associates (2022b) confirmed presence of Cat.
Dog/Dingo	Tracks	Fresh tracks of wild dog/dingo were noted at several locations throughout the assessment by Alexander Holm and Associates (2022b).

#### 4.11 Malleefowl Mounds and Malleefowl Activity on EEL55



Phoenix Environmental Services (2022) has undertaken a fauna habitat assessment across EEL55 to determine the quality of Malleefowl habitat within the proposed offset which included a desktop review identifying 120 Malleefowl records within a 40 km radius of the site. During the habitat assessment one degraded Malleefowl mound was recorded on the northwest boundary track of EEL55 situated within Acacia Shrubland (Table 6).

Further survey work undertaken by Alexander Holm and Associates (2022b) identified twelve nesting mounds of which two were active, one inactive recent, two inactive abandoned and seven long unused. Fresh tracks of one adult and one juvenile Malleefowl were found either within or nearby 'acacia shrubland' (Table 7).

**Table 6: Single Malleefowl Mound observed by Phoenix Environmental Services (2022)**

Site	Latitude	Longitude	Mound Status
NS026	-31.1220	121.3908	<p>Long unused: Evidence of an extended period of inactivity such as dense shrubs or trees growing from hollow or mound very degraded/poorly formed. Highly unlikely to become Active in the future.</p> 

**Table 7: Malleefowl Mounds surveyed by Alec Holm and Associates (2022).**

Details	Photo	Details	Photo
<p><b>EEL55_01</b></p> <p>Outer rim: 3.85m                      Inner rim; 2.45m                      Depth: 0.26m                      Long unused</p>		<p><b>EEL55_03</b></p> <p>Outer rim: 3.7m                      Inner rim; 2.1m                      Depth: 0.13m                      Long unused</p>	
<p><b>EEL55_02</b></p> <p>Outer rim: 3.12m                      Inner rim; 1.70m                      Depth: 0.12m                      Long unused</p>		<p><b>EEL55_04</b></p> <p>Outer rim: 2.80m                      Inner rim; 1.50m                      Depth: 0.12m                      Long unused</p>	

**EEL55\_05**

Outer rim: 4.00m  
Inner rim; 2.67m  
Depth: 0.30m  
Long unused



**EEL55\_07**

Outer rim: 4.20m  
Inner rim; 2.35m  
Depth: 0.26m  
Inactive abandoned



**EEL55\_06**

Outer rim: 4.45m  
Inner rim; 2.45m  
Depth: 0.41m  
Active



**EEL55\_08**

Outer rim: 3.70m  
Inner rim; 2.65m  
Depth: 0.30m  
Long unused



**EEL55\_09**

Outer rim: 4.35m

Inner rim; 1.80m

Depth: 0.41m

Active



**EEL55\_011**

Outer rim: 5.30m

Inner rim; 3.45m

Depth: 0.31m

Long unused



**EEL55\_010**

Outer rim: 4.55m

Inner rim; 2.00m

Depth: 0.33m

Inactive recent



**EEL55\_012**

Outer rim: 5.00m

Inner rim; 2.75m

Depth: 0.18m

Long unused



## 4.12 Habitat Quality Assessment Score

A habitat quality score for EEL55 was calculated using the three components laid out in the EPBC Act Offsets Assessment Guide (DSEWPC, 2012): Malleefowl stocking rate, Site condition and Site context.

These were combined in a framework that differentiates, describes and weights these components to derive a Habitat quality score out of a maximum value of ten. Scores for these components were calculated for each habitat type within each individual site. The framework gave a greater weighting to species presence, with Site context and Site condition each making up 30% of the total score and Malleefowl stocking rate making up the final 40%. The total score for each habitat type was then weighted based on the proportion of that habitat type within the offset site. These scores were then summed, resulting in an overall habitat score out of ten, which aligns with the EPBC Act Offset Assessment Guide (DSEWPC, 2012).

A summary of the habitat quality score for EEL55 is provided below in Table 8.

**Table 8: Habitat quality assessment for offset site EEL55**

Factor	Score	Condition/details	Habitat type					
			Eucalyptus woodland	Acacia shrubland	Granite extrusion	Melaleuca shrubland	Cleared	
Site condition								
Vegetation condition	5	Pristine	4.7	4.8	5.0	5.0	0.0	
	4	Excellent						
	3	Very good						
	2	Good						
	1	Degraded						
	0	Completely degraded						
Score out of 3			2.8	2.9	3.0	3.0	0.0	
Habitat structure - Diversity of habitat species present - Habitat features (Based on Malleefowl habitat assessment)	3	High suitability (score of 6-8/8)	2.0	3.0	0.0	3.0	0.0	
	2	Medium suitability (score of 5/8)						
	1	Low suitability (score of 4/8)						
	0	Not suitable (score of 0-3/8)						
Score out of 3			2.0	3.0	0.0	3.0	0.0	
Feral Predator Activity	3	Not detected in targeted survey	0.0	1.0	2.0	3.0	3.0	
	2	Low (one record within habitat)						
	1	Medium (Multiple records of single species or single records of more than one species)						
	0	High (Multiple records of more than one species)						
Score out of 3			0.0	1.0	2.0	3.0	3.0	
		Overall score out of 3 (weighted so Vegetation condition = 40% of total and Habitat structure = 60% of total)	3	1.7	2.5	1.3	3.0	0.8
Site context								
Movement patterns of Malleefowl	3	Site is part of a regionally large contiguous suitable habitat; records on the site for Malleefowl within last 5 years; site is within known distribution of Malleefowl and has connectivity with protected areas.	3.0	3.0	1.0	2.5	1.0	

Factor	Score	Condition/details	Habitat type				
			Eucalyptus woodland	Acacia shrubland	Granite extrusion	Melaleuca shrubland	Cleared
Proximity of the site in relation to other suitable areas of habitat Overall population or extent of Malleefowl	2.5	Site is part of a regionally significant contiguous suitable habitat; records on site or immediately adjacent (within 3 km) for Malleefowl within last 6-10 years; site is within known distribution of Malleefowl.					
	2	Site is part of a contiguous suitable habitat; Malleefowl records on site or adjacent (within 5 km) to site within last 6- 10 years; site is within known distribution of Malleefowl.					
	1.5	Site is part of a contiguous suitable habitat; Malleefowl records on or adjacent (within 10 km) to site within last 6-10 years; site is located within known distribution of Malleefowl.					
	1	Site is unsuitable or isolated from suitable habitat. Malleefowl records on site or in region (within 10 km) within last 10 years and Malleefowl are capable of migrating to site. Site is located within known distribution of Malleefowl.					
	0.5	Site is unsuitable or isolated from suitable habitat. Records on site or in region (within 10 km) within last 10 years and species are capable of migrating to site. Site is not located within known distribution of species.					
	0	Site is unsuitable or isolated from suitable habitat. No Malleefowl records on site or in region (within 10 km) within last 10 years and Malleefowl unlikely to migrate to site.					
Score out of 3			3.0	3.0	1.0	2.5	1.0
Malleefowl stocking rate							
Known presence	4	Malleefowl recorded on site annually for three consecutive years, includes evidence of active mounds and other signs of recent/current presence such as direct sightings of birds, fresh tracks and scats.	3.0	3.0	0.0	2.0	0.0
	3	Malleefowl recorded on site, includes evidence of active mounds and other signs of recent/current presence such as direct sightings of birds, fresh tracks and scats.					
	2	Malleefowl previously recorded on site, no recent activity in mounds, sightings or tracks and scats.					
	1	No records of Malleefowl on site, within known range of Malleefowl, suitable habitat present.					
	0	Site outside current known range of Malleefowl or habitat is unsuitable.					
Score out of 4			3.0	3.0	0.0	2.0	0.0
Scores							
		Score out of 10 (before scaling)	7.7	8.5	2.3	7.5	1.8
		Habitat area (ha)	405.5	309.0	44.4	40.7	1.0
		Habitat area proportion	0.5	0.4	0.1	0.1	0.0



Factor	Score	Condition/details	Habitat type				
			Eucalyptus woodland	Acacia shrubland	Granite extrusion	Melaleuca shrubland	Cleared
		Scaled score (score scaled to proportion of tenement)	3.9	3.3	0.1	0.4	0.0
Final Habitat quality score out of 10			7.7				

## 5.0 Risk Assessment

A risk assessment for the key risks potentially impacting Malleefowl habitat and Malleefowl species at the offset site has been completed. This process allows identified risks to be evaluated and outlines mitigation measures and effectiveness of these measures. The Risk Assessment has been completed in accordance with the Australian/New Zealand standard 4360:1999 Risk Management. The risk assessment considers the likelihood of an impact event (Table 9) and the relative consequence of that event (Table 10) using the risk matrix provided in Table 11. The risk assessment is detailed in Table 12.

**Table 9: Qualitative measures to determine an event likelihood rating**

Likelihood	Description
<b>A</b> Almost Certain	The event is expected to occur in most circumstances, once per week.
<b>B</b> Likely	The event will probably occur in most circumstances, once per month.
<b>C</b> Possible	The event could possibly occur at some time, once per year.
<b>D</b> Unlikely	The event could possibly occur at some time but is unlikely, once every 5-10 years.
<b>E</b> Rare	The event may occur in exceptional circumstances >10 years.

**Table 10: Qualitative measures to determine an event consequence**

Consequence	Description
<b>1</b> Very Low	None or insignificant impact to MNES (Malleefowl) with no effect on ecosystem function.
<b>2</b> Minor	Moderate to minor impact to MNES (Malleefowl) resulting in a minor, recoverable impact.
<b>3</b> Moderate	Minor and short-term impact to MNES expected, resulting in a moderate, recoverable impact.
<b>4</b> Major	Long-term impact to MNES expected, resulting in a major, recoverable impact.
<b>5</b> Catastrophic	Irreversible impact to MNES expected.

**Table 11: Risk Rating Matrix**

		CONSEQUENCES				
		Very Low 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
LIKELIHOOD						
<b>A</b>	Almost Certain	<b>H (11)</b>	<b>H (16)</b>	<b>E (20)</b>	<b>E (23)</b>	<b>E (25)</b>
<b>B</b>	Likely	<b>M (7)</b>	<b>H (12)</b>	<b>H (17)</b>	<b>E (21)</b>	<b>E (24)</b>
<b>C</b>	Possible	<b>L (4)</b>	<b>M (8)</b>	<b>H (13)</b>	<b>E (18)</b>	<b>E (22)</b>
<b>D</b>	Unlikely	<b>L (2)</b>	<b>L (5)</b>	<b>M (9)</b>	<b>H (14)</b>	<b>E (19)</b>
<b>E</b>	Rare	<b>L (1)</b>	<b>L (3)</b>	<b>M (6)</b>	<b>M (10)</b>	<b>H (15)</b>

## Matrix Legend:

- E:** Extreme risk                      Immediate action required; further reduction needed. If not possible, Country Manager or COO approval required
- H:** High risk                              Senior management attention needed
- M:** Moderate risk                      Management responsibility must be specified
- L:** Low risk                                Manage by routine procedure

**Table 12: Risk Assessment and management**

Objective	Risk	Risk Factors	Likelihood	Consequence	Risk	Management Measures	Likelihood	Consequence	Residual Risk	Trigger	Corrective Actions
Protect Malleefowl habitat at the offset site	Loss of habitat from future land use e.g. exploration, mining, pastoralism.	<ul style="list-style-type: none"> <li>The Goldfields is a highly prospective area for exploration and mining</li> <li>Much of the Goldfields is overlaid with Exploration, Miscellaneous and Mining tenure.</li> <li>Site has mineral resources that may become economical in future, subjecting land to exploration and mining activity</li> <li>Land subject to pastoral licence agreements</li> <li>Potential sale of property with unknown future land use</li> </ul>	B	4	E21	<ul style="list-style-type: none"> <li>Placing land under a conservation covenant will protect the land from future mining or exploration activities that would contribute to significant habitat loss and degradation.</li> <li>Excise EEL55 from Pastoral Licence Agreement.</li> </ul>	E	1	L1	Conservation covenant not secured within 6 months post approval of the OMP.	<ul style="list-style-type: none"> <li>Identify basis for not securing conservation covenant and either secure covenant for the site or an alternative mechanism, to protect the site from future land use impacts.</li> </ul>
Improve Malleefowl habitat quality	Degradation of habitat from grazing.	<ul style="list-style-type: none"> <li>Land has previously been, and is currently subject to, a pastoral licence agreement allowing stock grazing on the land contributing to degradation in habitat quality.</li> <li>Without an offset, pastoral activity can occur.</li> </ul>	C	4	E18	<ul style="list-style-type: none"> <li>Fence installed to exclude stock animals.</li> <li>Excise EEL55 from Pastoral Licence Agreement.</li> </ul>	E	1	L1	Annual inspections show fence is damaged and integrity is compromised.	<ul style="list-style-type: none"> <li>Repairs undertaken to maintain fence integrity</li> </ul>
	Presence of foxes, cats and wild dogs increasing risk of predation	<ul style="list-style-type: none"> <li>Evidence of cats recorded during the site survey.</li> <li>Evidence of wild dogs were recorded during surveys on EEL55 and EEL55 is adjacent to a known vermin cell (Goldfields Nullabor Rangelands Biosecurity Association)</li> </ul>	A	5	E25	<ul style="list-style-type: none"> <li>Implementation of a predator control program in consultation with DBCA and relevant stakeholders (e.g. baiting)</li> </ul>	C	3	H13	Annual predator control monitoring shows predator activity unchanged or increased from baseline.	<ul style="list-style-type: none"> <li>Increase of intensity, extent or type of predator control measures</li> </ul>
	Unplanned fire causing habitat loss and degradation	<ul style="list-style-type: none"> <li>Fire is becoming a more common occurrence throughout the state.</li> <li>Malleefowl populations are extremely susceptible to fire.</li> </ul>	D	4	H14	<ul style="list-style-type: none"> <li>Firebreaks installed and maintained</li> <li>DFES on standby to respond to fire event.</li> <li>In the event of a fire event, weed and predator activity will be monitored and adaptive</li> </ul>	E	4	M10	Catastrophic bushfire impacts offset site.	<ul style="list-style-type: none"> <li>Re-instate firebreaks and ensure fire protection is consistent with industry standards.</li> <li>Weed and predator populations will be monitored</li> </ul>

Objective	Risk	Risk Factors	Likelihood			Management Measures	Consequence			Residual Risk	Trigger	Corrective Actions
			Likelihood	Consequence	Risk		Likelihood	Consequence				
		<ul style="list-style-type: none"> <li>Increased risk of weed encroachment in areas disturbed by fire.</li> <li>Increased predator activity post fire</li> </ul>				management implemented post the event.						and adaptive management implemented post the event.
	Encroachment of weeds into site reducing habitat quality	<ul style="list-style-type: none"> <li>The Coolgardie-Esperance Hwy runs through the northwest corner of the site. This presents a risk of vehicles spreading weeds to the site if travelling through.</li> </ul>	B	1	M7	<ul style="list-style-type: none"> <li>Implementation of weed control program.</li> </ul>	D	1	L2	Annual weed monitoring shows weed coverage increased.	<ul style="list-style-type: none"> <li>Increase of intensity, extent or type of weed control</li> </ul>	
	Degradation from external factors such as climate change	<ul style="list-style-type: none"> <li>Drying conditions resulting in more frequent fires</li> </ul>	D	3	M9	<ul style="list-style-type: none"> <li>Firebreaks installed and maintained</li> <li>DFES on standby to respond to fire event.</li> <li>In the event of a fire event, weed and predator activity will be monitored and adaptive management implemented post the event.</li> </ul>	E	3	L	Catastrophic bushfire impacts offset site.	<ul style="list-style-type: none"> <li>Re-instate firebreaks and ensure fire protection is consistent with industry standards.</li> <li>Weed and predator populations will be monitored and adaptive management implemented post the event.</li> </ul>	
	Failure to achieve competition criteria	<ul style="list-style-type: none"> <li>Insufficient funding to implement plan.</li> </ul>	C	3	H13	<ul style="list-style-type: none"> <li>Offset management costs incorporated into mine operation and closure budget, which has a similar timescale.</li> </ul>	E	3	M6	Budget does not include funding for environmental of management of EEL55.	<ul style="list-style-type: none"> <li>Secure additional funding.</li> </ul>	
		<ul style="list-style-type: none"> <li>Efficacy of management measures is lower than anticipated</li> </ul>	C	3	H13	<ul style="list-style-type: none"> <li>Monitoring programs implemented to assess environmental performance against performance targets and completion criteria.</li> <li>Corrective actions implemented when triggered (in line with this Table).</li> <li>Continue to consult relevant Departments, conservation bodies, expert consultants, and</li> </ul>	E	3	M6	Completion criteria not achieved i.e. Malleefowl habitat quality less than 8.7 <sup>1</sup> after 20 years.	<ul style="list-style-type: none"> <li>Implementation of additional management measures and/or identification of an alternative or additional offset.</li> </ul>	

<sup>1</sup> Methods for scoring Malleefowl habitat quality are outlined in Section 4.12 of this OMP and described further in Phoenix (2022) and Alexander Holms and Associates (2022b).

Objective	Risk	Risk Factors	Likelihood	Consequence	Risk	Management Measures	Likelihood	Consequence	Residual Risk	Trigger	Corrective Actions
						key stakeholders to ensure success of the offset site.					

## 6.0 Management Measures

This OMP will be implemented upon approval by the Minister and will be regularly reviewed to ensure its effectiveness of the implemented management measures. Northern Star will coordinate the ongoing and adaptive management of the offset for the life of the approval.

Preliminary management measures, completion criteria and associated monitoring has been outlined in the implementation schedule below (Table 13). The implementation schedule outlines management measure to be implemented, along with the completion criteria for monitoring performance of management. Thresholds and corrective actions for management are included in the risk assessment and management table.

Research suggests implementation of integrated management strategies can provide improved outcomes managing land for conservation of Malleefowl (Berry et al., no date). Accordingly, this OMP incorporates multiple management measures to mitigate key threats identified in the National Malleefowl Recovery Plan. The aim is to improve habitat quality through improving fire management and reducing pressure from grazing to preserve vegetation cover, increase food resources, retain soil moisture content, and protect the species from extreme temperatures.

Management measures implemented will include:

- Place a conservation covenant over EEL55 (Management Action 1)
- Exclusion of grazing (Management Action 2)
- Predator management (Management Action 3)
- Bushfire prevention and management with the installation of firebreaks (Management Action 4)
- Weed Management (Management Action 5)

These align with the following Actions in the Malleefowl Recovery Plan (Benshemesh, 2007).

- Action 1.1: Retain areas that support Malleefowl and protect them from incremental clearing, and report annually on clearing
- Action 2.1: Remove goats and sheep from reserves, or keep them at low numbers
- Action 2.3: Erect adequate fencing to protect Malleefowl habitat
- Action 3.1: Reduce the occurrence of large fires, and promote patchiness of fires, where Malleefowl conservation is a priority in large reserves
- Action 4.1: Record and centralise details of predator control in or near areas where there are estimates of Malleefowl abundance
- Action 4.3: Reduce fox numbers in large areas of native habitat where Malleefowl densities have declined, and predation is a likely explanation for such declines
- Action 9.1: Analyse and review monitoring data. Recommend improvements and develop site-specific management plans consistent with a national adaptive management design.
- Action 9.4: Facilitate and standardise monitoring and coordinate national monitoring effort
- Action 10.1: Detail the distribution of Malleefowl in remote areas of South Australia and Western Australia by field surveys, and describe the habitats in which Malleefowl are found
- Action 12.1: Describe the habitat requirements and preferences of Malleefowl, with a view to identifying important habitat components that may underlie variations in breeding densities

Table 13 outlines the Implementation Schedule, completion criteria and remedial actions to be taken should monitoring and review indicate completion criteria are not being met or are not on track to being met. It includes threshold triggers to ensure timely responses.



Table 13: Implementation Schedule, Completion Criteria and Monitoring

Objective	Completion Criteria	Management Measure	Performance Indicator	Timing	Monitoring Activity & Purpose	Methods	Parameters	Frequency	Threshold triggers and remedial actions	Evidence to demonstrate compliance
Secure protection of habitat for Malleefowl	Conservation covenant placed over EEL55	Establish conservation covenant over site (Management Action 1)	Conservation covenant documentation obtained	Legally secure the EEL55 offset site within 6 months of the date of Offset Management Plan being accepted by the Department	N/A	N/A	N/A	N/A	N/A	Conservation covenant will be registered on the Certificate of Title
Demonstrate adequacy of the offset	Malleefowl active within EEL55	Malleefowl Survey	Malleefowl presence is demonstrated at EEL55 within 5 years of this approval in accordance with Condition 2e	Within 5 years of the approval	<u>Malleefowl monitoring</u> Collect data on locations of Malleefowl mounds and evidence of activity to inform habitat quality assessments	LiDAR imagery and analysis  Malleefowl mound monitoring in accordance with National Malleefowl Monitoring Manual (National Malleefowl Recovery Team, 2020)	Locations of mounds  Malleefowl activity and mound status	5-yearly  Annually	N/A – Malleefowl presence was identified in February 2023, demonstrating compliance with Condition 2e	Active Malleefowl mounds identified through breeding season surveys and/or records of scats, tracks, feathers and other evidence of Malleefowl activity  Details to be provided within the Annual Compliance Report
Improve Malleefowl habitat quality	Future increase in Malleefowl habitat quality to at least 8.7 <sup>2</sup>	Installation of perimeter fence (Management Action 2)	Fence is installed and maintained to exclude stock	Fence Installation within 12 months of approval of OMP  For the life of the approval	<u>Infrastructure inspections</u> Inspect condition of fencing to confirm fence is suitable for excluding livestock	Visual inspections of fences	Fence condition	Biannually	<b>Threshold Trigger:</b> Fence is damaged and integrity is compromised  Evidence of livestock within site  <b>Remedial Action:</b> Repairs undertaken to maintain fence integrity  Stock to be removed from site if present	Biannual visual inspection to verify fence intact  Compliance checklist completed
		Implementation of a predator control program each year	Reduced evidence of predator activity from established baseline	Predator activity baseline is to be established within 12 months of	<u>Predator activity monitoring</u> Collect data on predator activity to inform habitat quality assessments and track	Record evidence of predators using methodology based on guidance by Hradsky, B. et al., (2021) and in consultation with	Predator activity and species	Annually	<b>Threshold Trigger:</b> Predator activity unchanged or increased from baseline	Survey by suitably qualified personnel, recording evidence of predator activity

<sup>2</sup> Methods for scoring Malleefowl habitat quality are outlined in Section 4.124.12 of this OMP and described further in Phoenix (2022) and Alexander Holms and Associates (2022b).

Objective	Completion Criteria	Management Measure	Performance Indicator	Timing	Monitoring Activity & Purpose	Methods	Parameters	Frequency	Threshold triggers and remedial actions	Evidence to demonstrate compliance
		(Management Action 3)		approval of this OMP  For the life of the approval	trends in predator activity	relevant DBCA & other land managers			Investigate reasons for ineffective predator control  <b>Remedial Action:</b> Increase of intensity, extent or type of predator control measures	
		Firebreaks are established and maintained around EEL55  (Management Action 4)	Firebreaks are in good condition and easily accessible in accordance with <i>Bushfires Act 1954</i>	Installation within 12 months of approval of this OMP  For the life of the approval	<u>Infrastructure inspections</u>  Inspect condition of firebreaks to confirm firebreak is in suitable condition to manage fire risk and inform maintenance program.	Visual inspections of firebreaks  DFES Guide to Constructing and Maintaining Firebreaks	Firebreak condition	Biannually	<b>Threshold Trigger:</b> Firebreaks have been reported to contain vegetation  <b>Remedial Action:</b> Removal of vegetation through mechanical or chemical means	Biannual visual inspection to verify firebreaks are clear  Compliance checklist completed
		Weed Management Establish baseline weed percentage cover across the site  (Management Action 5)	There will be no increase in weed coverage in EEL55 relative to baseline	Weed coverage baseline is to be established within 12 months of approval of this OMP  For the life of the approval	<u>Vegetation and habitat monitoring</u>  Monitor changes to vegetation condition and habitat quality.  Monitor trends in weed occurrence	Vegetation condition and habitat assessments    Visual inspections for weeds	Vegetation condition  Habitat structure – diversity of habitat present and habitat features	Biennially, for first 6 years and triennially thereafter   Annually, and within 6 months of fire	<b>Threshold Trigger:</b> An increase in weed coverage in the EEL55 site relative to baseline  <b>Remedial Action:</b> Further weed control measures to be undertaken including mechanical and chemical removal	Assessment by suitably qualified person  Weeds are managed in accordance with Northern Star's Weed Management Procedure  Site weed register

## 6.1 Management Action 1 - Protection Mechanism

Several mechanisms exist to provide legal protection of land for the purposes of conservation. One method includes an Agreement to Reserve which involves the land being set aside for the protection and management of vegetation under Section 30B of *Soil and Land Conservation Act 1945*. Under this mechanism, Section 30E of the Act allows provision for the Agreement to be varied or discharged. Alternatively, a Conservation Covenant under the *Soil and Land Conservation Act 1945* can be applied to ensure the protection of the Offset site.

Northern Star has confirmation the Soil Commissioner of Western Australia is willing to enter into a conservation covenant under the *Soil and Land Conservation Act 1945* with regards to EEL55 should this be accepted by DCCEEW as a suitable offset site. This mechanism provides protection of the land in perpetuity and is irrevocable. This conservation covenant will protect the land from impacts through clearing and/or degradation of the vegetation and habitat qualities over time, including grazing, mining and exploration disturbances.

This approach is consistent with Action 1.1 and 1.2 of the Malleefowl Recovery Plan, which aim to reduce habitat loss by retaining sites that support Malleefowl and protecting them from incremental clearing and encourage landholders to enter into conservation covenants and similar agreements.

Northern Star has provided a copy of the proposed draft conservation covenant under the *WA Soil and Land Conservation Act 1945* to the department prior to the document being signed and lodged with the WA Government and will submit a copy of the final covenant to the department.

## 6.2 Management Action 2 - Exclusion of grazing

EEL55 is currently subject to a Pastoral Licence Agreement under which Northern Star has since 2015 granted a licence to the neighbouring pastoralist to use areas of land including EEL55 for pastoral activities until 30 June 2030 (Pastoral Licence). Northern Star is confident that it will be able to secure an agreement from the pastoralist to amend the Pastoral Licence to excise EEL55 from the Pastoral Licence, with the result that no rights to pastoral activities will remain on EEL55. Northern Star will secure this amendment to the Licence should EEL55 be accepted as an offset and put under a conservation covenant. If it is not to become an environmental offset location, the rights under the Pastoral Licence will remain and are likely to lead to a reduced quality of habitat generally on EEL55.

Impacts of grazing on Malleefowl habitat are described in the National Malleefowl Recovery Plan (Benshemesh 2007; Commonwealth of Australia 2022). Grazing by livestock has been attributed to reduce breeding densities by 80% – 90% (Frith 1962) and herbivores have also been linked to impacting important food sources such as seeds (Commonwealth of Australia 2022). Feral goats have also been recognised as being abundant in some areas and may even more damaging. These are less common in other areas such as central Australia, but in these areas impacts from introduced herbivores such as cattle, rabbits and camels are recognised as a key threat.

Environmental impacts from grazing include changes to vegetation structure and composition, leaf litter availability, and soil moisture content and soil structure (Eldridge, D. et al., 2015). Although habitat requirements for Malleefowl are poorly understood, these factors are recognised as being important for the breeding success of Malleefowl (Stenhouse, P and Moseby, K. 2022).

In its initial site assessments, Phoenix Environmental Services identified that land with active pastoral activity (grazing and livestock use) had low suitability for Malleefowl habitat due to degraded habitat structures, these areas also had fewer Malleefowl records, increased feral animals and invasive weed species (Phoenix Environmental Services 2022a). The grazing had altered the vegetation structure and composition rendering the sparsely vegetated areas unsuitable, having impacted key habitat attributes critical for Malleefowl survival (foraging and breeding) such as sandy substrate, leaf litter, and canopy. This also increased predation pressure due to increased open areas (Phoenix Environmental Services 2022a). In addition, studies have indicated the altered vegetation structure and composition from pastoral activity reduced the abundance and diversity of food resources (seeds, flowers, and fruits) of understory shrubs and herbs, an important attribute for ongoing presence of Malleefowl (Benshemesh 2007; Wheeler 2018; Parsons 2008). The reduced abundance of food resources increased time spent foraging resulting in prolonged exposure to predators (Greenslade 1992 and Wheeler 2018). Evidence stated above is potentially a contributing factor to why there are fewer Malleefowl records at sites with active pastoral activity. This is consistent with other studies that indicated pastoral activity had profound eco-system changes and degradation, including altered vegetation structure and composition resulting in an increased predation risk (Hobbs 2001; Lunt et al. 2007; Benshemesh 2007; Saunder et al. 2003; Spooner & Lunt 2004).

Malleefowl have been shown to utilise disturbed habitat provided the habitat structure remains suitable (Wheeler 2018). Malleefowl presence was strongly related to habitat characteristics with high shrub and leaf litter with an abundance of native food shrubs Parsons (2008). Other studies strongly suggests that these habitat characteristics are negatively impacted by livestock grazing (Hobbs 2001; Pettit & Froend 2001; Saunder et al. 2003; Spooner & Lunt 2004), and thus livestock presence may result in a reduction in the quality of Malleefowl habitat and thus a decline in Malleefowl presence. Lewis et al 2012 indicated the removal of grazing had positive vegetation outcomes required for maintaining critical Malleefowl habitat.

Installation of boundary fencing at the offset site will therefore benefit Malleefowl by excluding livestock and preventing degradation of habitat quality attributable to pastoral grazing. With the exclusion of livestock, it is also possible that vegetation structure and/or condition in areas previously impacted by livestock could also improve, as previously grazed vegetation recovers.

This approach is consistent with Action 2.3 of the Malleefowl Recovery Plan, which is to 'erect adequate fencing to protect Malleefowl habitat' and reduce grazing pressure.

### **6.3 Management Action 3 - Predator Management**

Feral animals are a known threat to biodiversity primarily through predation of, and competition with native fauna species (Department of Environment and Conservation 2013). Predation by feral animals (fox, cats, and dingos) is a key factor contributing to the decline of Malleefowl species due to mortality (Bode et al. 2011 and Benshemesh J 2007). Feral animals are known to take Malleefowl at all stages of the bird's life cycle, reducing recruitment of Malleefowl into populations (Benshemesh J 2007). Research indicates land managers should prioritise conservation efforts targeted at adult survivorship to have the greatest influence on population viability (Bode et al 2011). Broadscale aerial baiting has been successful in enhancing Malleefowl survival by reducing mortality rates from predation (Wheeler et al 2009). However, research indicates success in improving outcomes for Malleefowl is underpinned by incorporating other feral animal control methods like fencing, trapping and monitoring inclusive of frequent broadscale and localised baiting programs (Bode et al 2011; Priddel et al 1997 and Walsh et al 2012).

Wild dogs and feral cats within the Kalgoorlie area are in high numbers and widespread (GNRBA 2021 and Wynne 2011). Survey work undertaken on EEL55 recorded evidence of wild dog/dingo and cat activity. There is a high likelihood of predation risk to any existing Malleefowl population at the site, resulting in a reduction in stocking rates. Therefore, it is proposed that feral animal monitoring will be undertaken over EEL55 to collect feral animal activity evidence such as scats, tracks, sightings, and fauna deaths. Feral animal activity will be analysed in combination with Malleefowl activity to determine the potential predation risks, and to verify the effectiveness of predator control. The Threatened Species Recovery Hub Project: A guide to surveying red foxes and feral cats in Australia (Hradsky, B. et al., 2021) will be used to guide methodology for development of baselines and monitoring of feral predators. Development of this methodology will be done in consultation with DBCA and other land management groups in the region, such as GNRBA (Goldfields Nullarbor Rangelands Biosecurity Association). Details of methodology implemented and results from baselines will be provided in the Annual Compliance Report.

Recent studies (Nou 2021) noted there is scientific uncertainty regarding the effectiveness of baiting programs on Malleefowl but also that there are many factors affecting efficacy of baiting programs, including the type of bait used, and the intensity and extent of the programs. Northern Star will take these findings into consideration when planning predator control and implementing adaptive management measures should our predator control appear ineffective. The Nou (2021) study also noted the importance of implementing a range of management measures to achieve success. This is supported by Berry et al (n.d.) who identified that conservation fencing is required to completely eradicate introduced predators from mainland reserves and found breeding success was notably improved within fenced reserves.

To achieve the best results practicable, this offset will use an integrated approach to feral animal control that includes a variety of control methods locally and at the broader scale, along with the other management measures that aims to reduce threats to Malleefowl and improve conditions for Malleefowl survival i.e. installation of exclusion fencing, bushfire protection and weed control. A site-specific control program for implementation at EEL55 will be developed based on results and information gained during the predator baseline survey.

Relevant stakeholders (e.g. DBCA, Goldfields Nullarbor Rangelands Biosecurity Association, adjacent landowners, and the Malleefowl Recovery Team) will be consulted to identify opportunities for feral animal control programs to contribute towards regional control programs and optimise benefits of predator control at a landscape scale.

Adaptive management will be triggered if monitoring indicates there is an increase in feral animal activity. Additional adaptive management may include: doggers, trapping, broadscale baiting and a biosecurity fence.

This approach is consistent with objective 4 of the Malleefowl Recovery Plan which aims to reduce predation.

## **6.4 Management Action 4 - Bushfire Prevention**

Malleefowl are found in semi-arid shrublands, and low woodlands dominated by mallee and acacias, and these habitats are highly prone to fire, potentially having lasting effects on Malleefowl populations (Benshemesh J 2007 and Parsons et. al. 2011). The habitat structure and condition at the offset site was considered suitable for Malleefowl and in pristine condition and a fire through the area would have the potential to remove all and/or parts of the

vegetation including influencing the recovery of habitat structure and floristic composition post fire (Benshemesh J 2007). After fire, Malleefowl may not be active in the area for more than ten years, with the loss of suitable habitat structure and floristic composition (leaf litter, vegetation cover, soil gravel and food sources) (Benshemesh J 2007).

Furthermore, the impact of a changing climate suggests that resulting drier conditions and more frequent fires will cause further declines in current Malleefowl populations, and to minimise the impacts from climate change, implementing proactive management practices to protect habitat quality will be required. Climate change projections predict Western Australia can expect longer fire seasons, with around 40% more 'very high' fire danger days, increasing the risk of bushfire at EEL55 and in the wider region. Climate Change impacts of increased temperatures, periods of drought and an increased risk of wildfires adds additional pressure to the conservation of habitat for Malleefowl within the Goldfields region (Matthew et al 2020 and Parsons et al 2011).

Therefore, to minimise the impacts from climate change and subsequent increase in risk of bushfires, proactive management practices will be implemented to protect habitat quality at the offset site. This approach is consistent with Action 3.1 of the Malleefowl Recovery Plan which aims to reduce the occurrence of large fires, where Malleefowl conservation is a priority in large reserves. A firebreak with a maximum width of 5m will be installed along the boundary of EEL55 and will be maintained in accordance with the *Bush Fires Act 1954*. Fire management will be implemented in consultation with neighbouring stakeholders and include installation and maintenance of fire breaks around the site boundary. The integration of all management measures, inclusive with fire management, will preserve the habitat quality, structure and composition to protect the species from the impacts associated with climate change (Stenhouse and Moseby, 2022).

## 6.5 Management Action 5 - Weed Management

Introduced flora compete with native plants and, therefore, reducing weeds can lead to an increase in habitat condition. Buffel grass (*Cenchrus ciliaris*) in particular, has been identified as posing a threat to Malleefowl, because it may affect Malleefowl through loss of dietary resources, changes to vegetation structure, and increased occurrence and intensity of fire (Grice et al., 2013; Read et al., 2020).

Weed management will aim to improve habitat condition through improving vegetation structure and minimising the establishment of dietary sources for Malleefowl. Weed management would prioritise the detection and control of weeds known to impact Malleefowl such as Buffel Grass. Control of weeds is likely to include physical and/or chemical removal. While weed management has not been identified in the Malleefowl Recovery Plan as a key requirement for Malleefowl conservation, it typically forms part of multidisciplinary land management for conservation of the species and contributes to overall habitat quality.

## 7.0 Monitoring

This OMP aims to benefit Malleefowl through protecting the offset site via a conservation covenant and improving Malleefowl habitat quality at the offset site. To demonstrate that completion criteria (Table 13) are achieved, habitat quality will need to be monitored.

In accordance with Condition 2d and 2e, once legally secured, Northern Star will monitor and report annually on the presence of Malleefowl at EEL55 and provide evidence to the Department demonstrating the presence of Malleefowl at EEL55 within 5 years of this approval.

Habitat quality assessments will be conducted biennially for the first six years and then triennially thereafter. As outlined in Section 3.5.4, habitat quality is determined through consideration of numerous parameters that include vegetation condition, habitat structure, feral predator activity and Malleefowl activity.

Several monitoring programs will be implemented to collect information on habitat quality parameters. The objectives, methods and frequency of these monitoring programs are outlined in the OMP Implementation Schedule, Completion Criteria and Monitoring (Table 13). Changes to monitoring regimes will be submitted through a revised OMP to the Department for approval.

Exclusion fencing and firebreaks will also be inspected biannually to check the integrity of infrastructure and identify if maintenance is required.

Northern Star (Carosue Dam) Pty Ltd will be responsible for overseeing management and monitoring required as part of this OMP. Monitoring will be conducted by suitably qualified personnel and commence within one year post approval of this OMP. Over time, monitoring will be adapted to account for any trends observed, including accounting for any seasonal or climatic variability, and will be used to determine effectiveness of management measures.

Monitoring has already commenced at EEL 55 and has demonstrated presence of Malleefowl in accordance with Condition 2e and 6 of the approval. As such, an alternative offset site is not required to comply with these Conditions. The associated evidence will be provided in the Annual Compliance Report.

## **8.0 Audit, Review, Adaptive Management, Reporting and Data Management**

### **8.1 Environmental Auditing**

Annual audits will be conducted to assess compliance with this plan. The audits will be undertaken by suitably qualified Northern Star personnel, or external consultants. Audit results will be included in the annual compliance reports for EPBC 2021/9026. An example compliance audit record is provided in Appendix A.

In accordance with Condition 28-31 Northern Star will ensure that an independent audit of compliance with the conditions is conducted for every three-year period following commencement of the Action.

### **8.2 Offset Management Plan Review**

At a minimum, this Offset Management Plan will be reviewed every three years by a suitably qualified environmental expert, for a period of the life of the approval.

This plan will also be reviewed if:

- the results of the audits outlined in section 8.1 show that the completion criteria are not being met or are not tracking towards being met.
- research findings indicate there may be new or better ways to improve outcomes for Malleefowl or their habitat that could be implemented at the site.
- EPBC Act policies or guidance material related to Malleefowl is updated, or if there are otherwise changing circumstances.
- emergency contact details outlined in section 11.0 change.

Where a review of the OMP indicates significant changes are required, the updated OMP will be submitted to DCCEE for review and approval in accordance with Condition 7 and 8.

### **8.3 Adaptive Management**

Adaptive management is important to ensure performance targets and completion criteria are met. It allows for changes in management to be made should audit and review identify performance criteria are not being met or are not on track to being met. Table 12 identifies triggers and corrective actions should this be the case.

Adaptive management measures that stem from new research may also be implemented, where opportunities are identified to improve performance of offset management. These adaptive management measures will be implemented in consultation with DCCEE. This may require the OMP to be updated and re-submitted to DCCEE for assessment and approval in accordance with Condition 7 and 8.

As adaptive management measures are implemented, subsequent audits are expected to identify whether actions are effective or whether further actions are required. Management of the offset site will therefore be a continuous process of monitoring, review and action.

Adaptive management measures implemented will be outlined in the annual compliance report. This may include, for example, where trapping, in addition to baiting, is implemented or if monitoring frequency is increased.



Northern Star will provide an alternative and/or additional offset if the completion criteria are not met after implementing adaptive management measures and in accordance with Condition 6.

## **8.4 Reporting**

In accordance with Condition 2c, Northern Star will provide written evidence to the Department, including shapefiles and offset attributes, demonstrating that the EEL55 offset site has been legally secured, within 10 business days of securing offset site. Once the EEL55 offset site has been legally secured, Northern Star will report annually on the presence of Malleefowl at the EEL55 offset site for the life of the approval and provide evidence demonstrating the presence of Malleefowl at EEL55 within 5 years of this approval in accordance with Condition 2d-e.

### **8.4.1 Annual Compliance Reporting**

The annual compliance report for EPBC 2021/9026 in accordance with Conditions 21-24, will include a compliance audit that assesses performance against the OMP. The OMP compliance audit will outline:

- Management actions implemented within the reporting period, including any adaptive management measures implemented.
- Monitoring conducted during the reporting period (e.g. annual weed, predator and Malleefowl monitoring, biennial/triennial vegetation monitoring and habitat quality assessments) and any changes to monitoring frequency.
- Management triggers actioned during the reporting period and corrective actions implemented or planned.
- Review of progress towards completion criteria in accordance with the implementation schedule, and identification of potential non-compliances.

### **8.4.2 Reporting Non-Compliance**

Northern Star will notify the Department of any incident and/or potential or actual non-compliance with conditions or commitments made in this OMP, in accordance with Conditions 25-27.

## **8.5 Data Management**

Northern Star commits to the submission and publication of all plans required by these conditions in accordance with Conditions 9-13.

Data will be stored and protected by Northern Star for the duration of the approval. This will include maintaining data records to confirm all activities associated with the management actions in this OMP have been undertaken as outlined in the OMP.

Monitoring data may be provided to other stakeholders such as the National Malleefowl Recovery Team, DBCA, Traditional Owners and other Conservation Groups, to facilitate a broader understanding of Malleefowl. Acknowledging that environmental management at a landscape scale can enable a deeper understanding the species, allow for identification of regional population trends, and provides for more effective management over time, leading to better conservation outcomes for the species.

Submission of this OMP to DCCEEW will be accompanied by a digital version of the offset attributes and shapefiles of Malleefowl habitat at EEL55, in accordance with the DAWE (2021) Guide for providing maps and boundary data for EPBC Act projects.

If the specifics of the offset change, updated shapefiles will be published with annual compliance reports for EPBC 2021/9026.

## 9.0 Environmental Roles and Responsibilities

Table 14 identifies the roles and responsibilities relating to the implementation of this OMP.

**Table 14: Environmental roles and responsibilities**

Role	Responsibility
Site General Manager	<ol style="list-style-type: none"> <li>1. Ensure adequate provisioning to meet the requirements of the plan.</li> <li>2. Facilitate implementation of the plan, including associated monitoring, review and reporting.</li> </ol>
Site Environmental Advisors	<ol style="list-style-type: none"> <li>3. Maintain site records of surveys and any other relevant environmental data.</li> <li>4. Coordinate management activities such as fencing, firebreak maintenance and predator control.</li> <li>5. Implement monitoring programs that allow for review of effectiveness of the plan and progress toward completion criteria.</li> <li>6. Complete compliance reporting.</li> </ol>

## 10.0 Environmental Training

Environmental training will be provided to all relevant staff including temporary contractors prior to the commencement of land management within EEL55 to ensure they understand the requirements of the plan. Training will be aimed at minimising impacts on the species whilst land management is being undertaken, ensuring site environmental controls, and key roles and responsibilities of all personal are adhered to.

Training will cover topics such as:

- The requirement to prevent vegetation disturbance.
- Identifying Malleefowl and keeping a distance from them.
- Identifying Malleefowl mounds to avoid disturbance of mounds.
- The importance of good housekeeping at the offset site.
- Other topics as deemed relevant by the Site Environmental Advisors

Records of staff and contractors completing training will be maintained as per site training protocols.

## 11.0 Emergency Contacts and Procedures

During land management activities, the Carosue Dam Operations Environment Department must be notified in emergency events including, but not limited to:

- Bushfire at the site or nearby where authorities have indicated that EEL55 is at risk.
- Where there is, or likely to be, a direct impact to the Malleefowl/ fauna or mound during land management activities.

The Carosue Dam Environment Department can be contacted on:

**Phone:** (08) 6229 9519

**Email:** [cdoenviro@nsrltd.com](mailto:cdoenviro@nsrltd.com)

## 12.0 Glossary

Term	Definition
DBCA	Department of Biodiversity, Conservation and Attractions
Department and/or DCCEEW	Department of Climate Change, Energy, the Environment and Water
DFES	Department of Fire Emergency Services
DPIRD	Department of Primary Industries and Regional Development
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
EEL55	Exempt East Location 55
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
Malleefowl	Malleefowl ( <i>Leipoa ocellata</i> )
MNES	Matters of National Environmental Significance
Northern Star	Northern Star (Carosue Dam) Pty Ltd
Offset Proposal	Refers to document Carosue Dam TSF Cell 4 Project Offset Proposal EPBC Act Referral 2021/9096 15 July 2022.
OMP	Offset Management Plan
TSF	Tailings Storage Facility
The Project	The construction of TSF Cell 4 and associated infrastructure

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**Appendix A – Offset Compliance Assessment Example**

Completion Criteria	Actions	Schedule & Timeframes	Evidence/Comments (Examples)	Date	Compliance (Y/N)	Management Actions Implemented	Monitoring Completed	Management Triggers Actioned	Corrective Actions Implemented
Conservation covenant granted.	<ul style="list-style-type: none"> <li>Conservation covenant applied for and granted</li> </ul>	<ul style="list-style-type: none"> <li>Application made within 6 months of approval of EPBC 2021/9026 (Condition 2a)</li> <li>Conservation covenant granted within 6 months of approval of the OMP (Condition 2b)</li> </ul>	<ul style="list-style-type: none"> <li>Application for Conservation Covenant submitted to the Soil Commissioner on [date].</li> <li>Conservation Covenant accepted on [date] and registered on the Certificate of Title. Documentation received and retained on [file location].</li> </ul>						
Fencing installed and capable of excluding livestock	<ul style="list-style-type: none"> <li>Exclusion fencing installed and maintained</li> </ul>	<ul style="list-style-type: none"> <li>Fencing installed within 1 year of approval of OMP</li> <li>Fencing maintained for life of the approval</li> </ul>	<ul style="list-style-type: none"> <li>Fence inspection conducted on [date] by [personnel].</li> <li>Inspection record and photos retained on [file location]</li> </ul>						
Decrease in predator activity	<ul style="list-style-type: none"> <li>Predator control program</li> <li>Annual predator activity surveys</li> </ul>	<ul style="list-style-type: none"> <li>Review of effectiveness of program conducted annually</li> </ul>	<ul style="list-style-type: none"> <li>Records of predator control included [type] implemented at [location]</li> <li>Annual predator activity survey reports including records of predator activity (sightings, scats, tracks and other evidence)</li> <li>Records of predator activity registered within a spatial database and retained on [file location]</li> </ul>						
Firebreaks established and maintained	<ul style="list-style-type: none"> <li>Firebreak is installed around offset site</li> </ul>	<ul style="list-style-type: none"> <li>Firebreak installation within 1 year of approval of the OMP</li> </ul>	<ul style="list-style-type: none"> <li>Firebreak installed on [date] by [company]</li> <li>Invoice retained on [file location]</li> </ul>						
	<ul style="list-style-type: none"> <li>Firebreak maintained in accordance with industry standards</li> </ul>	<ul style="list-style-type: none"> <li>Biannual maintenance inspections for life of the approval</li> </ul>	<ul style="list-style-type: none"> <li>Firebreak inspection conducted on [date] by [personnel].</li> <li>Inspection record and photos retained on [file location]</li> </ul>						
No degradation to habitat quality due to increased weed cover	<ul style="list-style-type: none"> <li>Weed control program</li> <li>Annual weed monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Annual inspection for life of the approval</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection for weeds conducted during monitoring and/or maintenance inspections on [date] by [personnel]</li> <li>Inspection record and photos retained on [file location]</li> </ul>						

Completion Criteria	Actions	Schedule & Timeframes	Evidence/Comments ( <i>Examples</i> )	Date	Compliance (Y/N)	Management Actions Implemented	Monitoring Completed	Management Triggers Actioned	Corrective Actions Implemented
Malleefowl habitat quality score 8.7	<ul style="list-style-type: none"> <li>• Habitat quality assessments informed by:</li> <li>- Vegetation and habitat monitoring</li> <li>- Malleefowl monitoring</li> <li>- Predator Activity monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat quality assessment and vegetation monitoring biennially for the first six years then triennially thereafter</li> <li>• Predator and weed monitoring annually</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat quality assessment reports</li> <li>• LiDAR analysis reports</li> <li>• Malleefowl mound monitoring inspection records and photos retained on (file location)</li> <li>• Vegetation and habitat inspection records and photos retained on (file location)</li> <li>• Weed inspections records and photos retained on (file location)</li> <li>• Predator activity inspections records and photos retained on (file location)</li> </ul>						