

TASMANIAN PLANNING COMMISSION

DECISION

Planning scheme	Tasmanian Planning Scheme – Flinders
Planning authority	Flinders Council
Applicant	Douglas and Collins Lawyers for Markarna Grazing Company Pty Ltd
Date of decision	13 April 2026

Background

On 11 March 2026, Douglas and Collins, on behalf of Markarna Grazing Company Pty Ltd, submitted a request to the Commission under section 40B(1) of *Land Use Planning and Approvals Act 1993* (the Act). The request relates to an application to amend the Flinders Local Provisions Schedule and seeks a review of the Flinders planning authority's (the planning authority) decision to refuse the request to amend the LPS.

The applicant's letter to the Commission, which outlined the reasons for the requested review, noted the proposed combined draft amendment and permit was supported by a comprehensive suite of documents. The request was also accompanied by a copy of the planning authority's notice of decision.

The following documents were provided by the applicant's representative to assist the Commission in its review of the decision to not certify the amendment:

- Notice of determination dated 27 February 2026
- Copy of the Council Agenda dated 25 February 2026
- Copy of attachments to Council Agenda dated 25 February 2026
- Unconfirmed Minutes Flinders Council Meeting dated 25 February 2026
- Extract from Flinders Council Minutes dated 16 March 2021
- Letter from the Commission to Flinders planning authority dated 3 November 2025
- Email from Mick Purves Strategic Planner Flinders and attachments, and
- Flinders Island Structure Plan – Draft for Public Consultation dated July 2016.

The planning authority subsequently confirmed that the documents provided by the applicant were the relevant documents.

The Commission also reviewed the recording of the planning authority's consideration of the draft amendment at its meeting on 25 February 2026.

Requirements of the Act

Under section 40B(1) of the Act, the Commission must consider whether it is satisfied that the planning authority took into account, in making its decision the matters referred to in section 38(1), when refusing the request for the amendment.

Section 38(1) provides -

A planning authority, before deciding whether to prepare a draft amendment of an LPS in relation to a municipal area in accordance with a request under section 37(1), must be satisfied that such a draft amendment of an LPS will meet the LPS criteria.

The LPS criteria under section 34(2) of the Act are:

- (a) contains all the provisions that the SPPs specify must be contained in an LPS; and
- (b) is in accordance with section 32; and
- (c) furthers the objectives set out in Schedule 1; and
- (d) is consistent with each State policy; and
- (da) satisfies the relevant criteria in relation to the TPPs; and
- (e) as far as practicable, is consistent with the regional land use strategy, if any, for the regional area in which is situated the land to which the relevant planning instrument relates; and
- (f) has regard to the strategic plan, prepared under section 66 of the *Local Government Act 1993*, that applies in relation to the land to which the relevant planning instrument relates; and
- (g) as far as practicable, is consistent with and co-ordinated with any LPSs that apply to municipal areas that are adjacent to the municipal area to which the relevant planning instrument relates; and
- (h) has regard to the safety requirements set out in the standards prescribed under *the Gas Safety Act 2019*.

In the council minutes dated 25 February 2026 it was stated: 'As noted in the Assessment Report, AM2025-02 is generally consistent with the majority of the Northern Tasmania Regional Land Use Strategy (regional strategy), however there are specific provisions that allow for local strategy to determine a range of matters on the Furneaux Islands, including competing demands to:

- maintain the natural appearance of the landscape of areas surrounding Marshall Bay (including the subject lands) for their landscape, biodiversity and geodiversity functions, and
- support the rural and agriculture sectors on Flinders Island.

A recommendation was provided for the planning authority to determine whether to certify the combined amendment and permit which stated:

That the planning authority adopts the *draft Flinders Structure Plan 2016* as local strategy to inform assessment of AM2025-02 under the *Northern Tasmanian Regional Land Use Strategy* and:

- A. Refuses the application by Van Diemen Consulting on behalf of the owner, to initiate AM2025-02 to the Flinders Local Provisions

Schedule under section 40D(b) of the *Land Use Planning and Approvals Act 1993* to rezone Certificates of Title 120064/1, 215120/1 & 230282/1 (PID 3513143), part of the 'Markarna Park' property at 368 Five Mile Jim Road, Memana, from Landscape Conservation Zone to Rural Zone under Section 37(1) of the *Land Use Planning and Approvals Act 1993* (Act), as:

- i. the request was not considered to be practicably consistent with the draft Flinders Structure Plan;
- ii. the request was not considered to comply with the requirements of the *Northern Tasmanian Regional Land Use Strategy*; and
- iii. the respective merits of the requested rezoning were not accepted; and
- iv. DA2023-038 is refused.

or

- B. Supports the application by Van Diemen Consulting on behalf of the owner, to initiate AM2025-02 to the Flinders Local Provisions Schedule under section 40D(b) of the *Land Use Planning and Approvals Act 1993* to rezone Certificates of Title 120064/1, 215120/1 & 230282/1 (PID 3513143), part of the 'Markarna Park' property at 368 Five Mile Jim Road, Memana, from Landscape Conservation Zone to Rural Zone under Section 37(1) of the *Land Use Planning and Approvals Act 1993* (Act); and

1. Pursuant to Section 40F of the *Land Use Planning and Approvals Act 1993*, certifies that AM2025-02 meets the LPS criteria; and
2. Instructs that adjoining property owners and occupiers be notified of draft amendment AM2025-02; and
3. Under s6, delegate to the General Manager the authority to:
 - a. authorise final revisions to the documentation for AM2025-02;
 - b. submit notice of the decision to initiate and certify AM2025-02 to the Tasmanian Planning Commission;
 - c. complete the statutory notification of AM2025-02;
 - d. provide responses to information requests or directions issued by the Commission in their processing of AM2025-02; and
4. Pursuant to Section 57 and 40Y of the *Land Use Planning and Approvals Act 1993* and the *Tasmanian Planning Scheme – Flinders*, approve the planning application DA2023-038 for the proposed lime sand pit and associated works and infrastructure, subject to the conditions including *Permit Part B Permit Conditions - Environmental No. 11576, EPA Tas, 5*

August 2025, and as otherwise determined by the General Manager.

Page 54 of the council agenda dated 25 February 2026 stated:

‘....Both the Assessment Report and the Statutory Requirements section of this Agenda Item identify that the central question for AM2025-02 is whether the requested rural zone is consistent with the strategic directions and intents for the wider Marshall Bay landscape identified through the Structure Plan, which is the only available strategy consulted with the Flinders community.

Absent strong submissions by the proponent to address the strategic philosophy for the zoning of the Marshall Bay area within the Structure Plan, it is difficult to identify why a departure to the zoning regime for the Marshall Bay area that was accepted and ultimately approved by the Commission, should be adopted by the Council.

The lack of a clear outcome on the conflict between management of the natural and landscape values established under the Structure Plan with the need to develop and diversify the local agriculture sector suggests that a precautionary approach may be suitable.’

The Commission notes that the regional strategy does acknowledge specific challenges exist in relation to the Furneaux Group of islands and that local strategies may be adopted to address those challenges.

It is apparent from the documentation submitted to the planning authority in the planning advisers report, that considerable reliance was placed on the document referred to as the Draft Flinders Structure Plan 2016.

Draft Flinders Structure Plan 2016

The Commission notes that references to the subject site occur throughout the draft Flinders structure plan 2016 (Structure Plan) below:

Page 20 - ‘Open Space linkages with large vegetation patches on Crown land, on Local Authority land adjacent to the Lady Barron Waste Transfer station and on Vinegar Hill are also important. Further north threatened species are mapped at very high density on several individual allotments at Long Point Centre Hill and Killiecrankie. Threatened ecological communities occur in large patches at NE River; east of Palana Road near West End Road intersection; at Leeka and West End; along Boat Harbour Creek; adjacent to Killiecrankie, Limestone and Marshall Bays; north of the Dock; on Quoin Hill and at NE River.’

Page 36 - ‘There are locations where loss of vegetation is unacceptable, for example, Marshall Bay where intensification of development is not warranted and where grazing is encouraged to reduce and ultimately cease as a use. The land adjacent to the length of Marshall Bay is potentially subject to extreme erosion and the Tasmanian land classification (Classification 6-7) confirms its unsuitability for grazing. An allotment near the Long Point Road and Palana Road intersection, Centre Hill and two Quoin allotments have the highest density of listed threatened species on the island.’

Page 37 - 'The residential enclave at West End has potential for further holiday home development with some constraints in relation to visibility across Marshall Bay from Emita and clearance of vegetation. No further subdivision on the vegetated slopes above West End Road addresses the issue of land slip and fire hazard management, and will also reduce the potential visual impacts. Below the road, adjacent to the coast, there is some potential for further development of housing that minimises visual impacts from Marshall Bay/Emita. A minimum lot size of 10ha is proposed in this coastal location. Land division should ensure that frontage to the coast is approximately 150-200 metres to retain the amenity of the beach front area in keeping with current character.'

It appears from the record of the planning authority deliberations, that the planning authority at its meeting on 25 February 2026 resolved to adopt the Structure Plan and consider its application to the request to certify the combined draft amendment and permit.

Commission consideration

1. The Commission notes that in the planning adviser report and in the report before the planning authority, reliance was placed on the application of the Structure Plan.
2. It was submitted that the applicability and reliance on the Structure Plan was said to derive from the regional strategy, with the Structure Plan being adopted by the planning authority.
3. The Commission notes that while it is not a matter for the Commission to decide, it is questionable whether the Structure Plan has any status that is derived for the regional strategy.
4. The Commission also notes, that the fact that the Commission previously considered the Structure Plan in its assessment of the draft Flinders LPS, does not preclude its further consideration in application to a request for a subsequent amendment to the draft LPS.
5. In any event, even if the Structure Plan does derive some status from the regional strategy, that is not solely determinative of the matter. In considering the application of the LPS criteria to a requested amendment, the test for the application of the regional strategy is that a proposed amendment is 'in so far as practicable consistent with the regional strategy'. The planning authority could determine that the positive application of the other LPS criteria results in it not being practicable for the amendment to be consistent with the regional strategy.
6. Whether or not the existence and application of the Structure Plan have any relevance to the consideration of any of, or application to, other LPS criteria that the planning authority must consider, is a matter for the planning authority.
7. While it is not a factor in the Commission's decision, the Commission further observes that it appears that the Structure Plan was formally adopted for the purpose of consideration of the requested amendment. The Commission is uncertain as to whether the Structure Plan is being adopted effectively on a 'case by case' basis or has ongoing application to the planning authority's decision making. In fairness to any applicant for an amendment, the existence and status of any strategic or structure plan and its ongoing application in

planning authority decision making must be a public document able to be ascertained by an applicant, so that any matters relevant to the amendment request, can be addressed in an application.

Consideration of section 40(B)

8. Section 40B(1) of the Act states:

- (1) A person, within 14 days of receiving a notice under section 38(3) that the planning authority has decided not to prepare a draft amendment of an LPS in accordance with the person's request, may request the Commission to determine whether the Commission is satisfied that the planning authority took into account, in making its decision, the matters referred to in section 38(1).

9. The role of the Commission under section 40B(1) is limited. It does not require that the Commission reviews the planning merit of the planning authority's decision. Rather, it requires that the Commission is satisfied that the planning authority took into account the LPS criteria.

Commission consideration

10. At the meeting on 25 February 2026 the planning authority had before it a planning adviser report that provided advice on application of the LPS criteria to the draft amendment. The report provided options. It indicated that the amendment could meet the LPS criteria and indicated that it could be refused principally placing reliance on the Structure Plan.
11. The Commission review of the discussions at the planning authority meeting, recorded on video indicated that the planning authority did not consider the proposal in the context of the advised LPS criteria. The planning authority essentially considered two matters:
 - that the area of land for which the draft amendment to rural zoning was sought, was too large an area of land
 - observations were also about the benefit of access to the sand resource to the economy of the island
12. The Commission has reviewed all the information and finds that while the planning adviser report before the planning authority did provide advice on the application of the LPS criteria, the deliberations of the planning authority indicate that the full suite of the LPS criteria and their relevance and application to the draft amendment were not considered. One of the options presented by the planning adviser report indicated that the draft amendment could meet the LPS criteria. However, the merits of that option by reference to the LPS criteria was not considered.

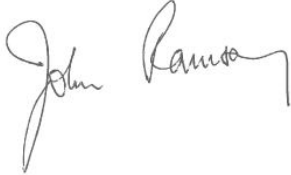
Decision

13. After reviewing the documents provided by the applicant, which were confirmed by the planning authority to be all the relevant documents, and viewing the video recording of the meeting, I am satisfied the planning authority was provided with enough information to determine whether the requested

amendment met the LPS criteria. I also consider it clear that the planning authority did not take the LPS criteria into account in making its decision.

Direction

In accordance with section 40B(4)(a) of the Act, the Commission directs the planning authority to reconsider whether to prepare a draft amendment in relation to a request made on behalf of Markarna Grazing Company Pty Ltd, considered by the planning authority on 25 February 2026.

A handwritten signature in black ink, appearing to read 'John Ramsay', with a stylized, cursive script.

John Ramsay
Executive Commissioner

PLANNING SCHEME AMENDMENT REPORT

MARKARNA GRAZING COMPANY PTY LTD

PALANA ROAD, FLINDERS ISLAND

6 JANUARY 2026



Van Diemen Consulting Pty Ltd

PO Box 171 Brighton Tasmania

T: 0438 588 695 E: rwbarnes73@gmail.com

This document has been prepared in accordance with the scope of services agreed upon between Van Diemen Consulting (VDC) and the Client.

To the best of VDC's knowledge, the report presented herein represents the Client's intentions at the time of completing the document. However, the passage of time, manifestation of latent conditions or impacts of future events may result in changes to matters that are otherwise described in this document. In preparing this document VDC has relied upon data, surveys, analysis, designs, plans and other information provided by the client, and other individuals and organisations referenced herein. Except as otherwise stated in this document, VDC has not verified the accuracy or completeness of such data, surveys, analysis, designs, plans and other information.

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This document does not purport to provide legal advice. Readers should engage professional legal advisers for this purpose.

EXECUTIVE SUMMARY

Pursuant to s37 and s40T(1) of the *Land Use Planning and Assessment Act 1993* (LUPAA) Markarna Grazing Company Pty Ltd requests an Amendment to the Local Provision Schedule concurrent with the assessment of a development application for a permit to conduct an activity that is otherwise prohibited in the current zone.

The Amendment requested is to rezone land (Certificates of Titles CT 120064/1, CT 215120/1, CT 230282/1 – private freehold (PID 3513143)) at Lughrata from Landscape Conservation to Rural. No deletions, amendments, or additions to Code mapped overlays are proposed.

The purpose for the requested zone Amendment is to facilitate broader use of the Site to include the establishment and use of a small-scale Extractive Industry use class – being the extraction of lime sands for use in the island’s critically important agricultural sector.

A Mining Lease is in force; Provision 2.1.8 of the State Coastal Policy provides that the extraction of construction materials in the coastal zone will be allowed provided access to areas is allowed under the provisions of the *Mining Act 1929* (superseded by the *Mineral Resources Development Act 1995*).

Agricultural potential and the value the land can generate in livestock and produce is reliant on sustainable soil nutrition and maintenance of productivity. Agriculture is also a critical employment and income generation activity on Flinders Island, so its longevity is of paramount importance to the social and economic well-being of the island.

Off-island supplies of lime are costly due to high freight charges which in the medium to long-term undermines the economic viability of agriculture on the island. That is, if lime is expensive then it is likely that inadequate levels would be used by agricultural operators (due to cost) that then has a long-term negative impact to the overall soil health and potential of agricultural lands to produce food.

The Amendment does not alter the existing management arrangements of natural hazards established by the LPS process, being the occurrence of mapped overlays for relevant codes such as landslip hazard and coastal erosion hazard.

The zoning of the Land to Rural does not alter the applicability of the Natural Assets Code.

This report describes and considers the merits of the Amendment against the relevant statutory requirements such as the *Land Use Planning and Approvals Act 1993*.

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ACRONYMS

AHD	Australian Height Datum
DA	Development Application
DPIPWE (now DNRE)	Department of Primary Industries, Parks, Water and Environment
DNRE	Department of Natural Resources and Environment
EAR	Environmental Assessment Report of the EPA
EIS	Environmental Impact Statement
EMPCA	<i>Environmental Management and Pollution Control Act 1994</i>
ENV	Effective Neutralising Value (used in relation to the ability of a substance to neutralise acidity)
EPA	Environment Protection Authority
FC	Flinders Council
LCZ	Landscape Conservation Zone
LUPAA	<i>Land Use Planning and Approvals Act 1993 (Tas)</i>
QCP	Quarry Code of Practice, May 2017
RLUSNT	Regional Land Use Strategy of Northern Tasmania, 23 June 2021
RMPS	Resource Management and Planning System

GLOSSARY

(the) Amendment	the rezoning of parts of Certificates of Titles CT 120064/1, CT 215120/1, CT 230282/1 – private freehold (PID 3513143) to Zone 20 (Figure 4). See also Attachment 6 .
(the) Activity	all use and development associated with the lime sand extraction pit (DA2023-038) including the screening of extracted sands and ancillary infrastructure such as the storage shed (including crib room), sediment ponds and drains, road and access tracks, hardstand, and wastewater (septic) infrastructure.
Decision	<i>Flinders Local Provisions Schedule approval [2022] TASPComm 16 (21 April 2022)</i>
development	development includes – (a) the construction, exterior alteration or exterior decoration of a building; and (b) the demolition or removal of a building or works; and (c) the construction or carrying out of works; and (d) the subdivision or consolidation of land, including buildings or airspace; and (e) the placing or relocation of a building or works on land; and (f) the construction or putting up for display of signs or hoardings – but does not include any development of a class or description, including a class or description mentioned in paragraphs (a) to (f) , prescribed by the regulations for the purposes of this definition;
Guideline	<i>Section 8A Guideline No.1 Local Provisions Schedule Zone and Code Application, June 2018</i>
(the) Land	Mining Lease 2117P/M (in force); the area within which the Activity is proposed to occur
Landowner	Markarna Grazing Company Pty Ltd 129 Wellington Parade South, East Melbourne VIC 3002
Landscape Conservation (zone)	means Zone 22.0 <i>Landscape Conservation</i> in the Scheme
Planning Scheme or Scheme	Tasmanian Planning Scheme - Flinders

Rural (zone)	means Zone 20.0 <i>Rural</i> in the Scheme
Site	means the land included within the Amendment (Figure 1 and Attachment 6)
Threatened fauna	Species of fauna listed on the – • Tasmanian <i>Threatened Species Protection Act 1995</i>, or the • Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>.
Threatened flora	Species of flora listed on the – • Tasmanian <i>Threatened Species Protection Act 1995</i>, or the • Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>.
Threatened ecological community or communities	Ecological communities listed under s 181 of the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
Threatened native vegetation community or communities	Native vegetation communities listed under Schedule 3A of the Tasmanian <i>Nature Conservation Act 2002</i> .
works	includes any change to the natural or existing condition or topography of land including the removal, destruction or lopping of trees and the removal of vegetation or topsoil, but does not include forest practices, as defined in the <i>Forest Practices Act 1985</i> , carried out in State forests.

PART A – INTRODUCTION

A.1 AMENDMENT

Pursuant to s37 and s40T(1) of the *Land Use Planning and Assessment Act 1993* (LUPAA) Markarna Grazing Company Pty Ltd requests an Amendment to the Local Provision Schedule concurrent with the assessment of a development application for a permit to conduct an activity that is otherwise prohibited in the current zone (i.e. Landscape Conservation).

The requested Amendment is to rezone land (part of each of Certificates of Titles 120064/1, 215120/1, and 230282/1) at Lughrata from Landscape Conservation to Rural. The Landscape Conservation zone is proposed to be retained along the foreshore part of the three CTs where there is no mining lease in force.

The draft Amendment is provided in **Attachment 6**.

The purpose of the Amendment is to facilitate the establishment and use of a small-scale Extractive Industry use class – being the extraction of lime sands for use in the island’s critically important agricultural sector. The Amendment will establish a permitted pathway for future extraction of lime sands within the mining lease (to be applied for progressively using the statutory mechanisms in force at the time as the lime sand resource is required) while retaining the Landscape Conservation zone on the sensitive coastal foreshore of Marshall Bay.

No deletions, amendments, or additions to Code mapped overlays are proposed nor requested (see **Figures 5A and 5B** for existing LPS mapped overlays).

The retention of Code overlays and the level 2 activity assessment provisions of EMPCA (notably the s74 of EMPCA which requires an environmental impact assessment to be undertaken) provides a broader layer of environmental impact assessment than is solely afforded by the Scheme.

A.2 DETAILS OF APPLICANT AND LANDOWNER

Name of Applicant	Markarna Grazing Company Pty Ltd
Registered address of Applicant	129 Wellington Parade South, East Melbourne VIC 3002
Postal address of Applicant	129 Wellington Parade South, East Melbourne VIC 3002
ACN	063 634 444
Contact person’s details	Mr George Adams (Director) Phone: (03) 9333 2400, Fax: (03) 9333 1258 cynthia.adams@adamsgroup.com.au

Consultant engaged to prepare the DA	Dr Richard Barnes, Van Diemen Consulting Pty Ltd 0438 588 695, rwbarnes73@gmail.com
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Authorisation for the Applicant to act for the Landowner are provided in **Attachment 1**.

A.3 PLANNING INSTRUMENT

Tasmanian Planning Scheme – Flinders Island Local Provisions Schedule

A.4 APPLICABLE CERTIFICATES OF TITLE AND AMENDMENT AREA

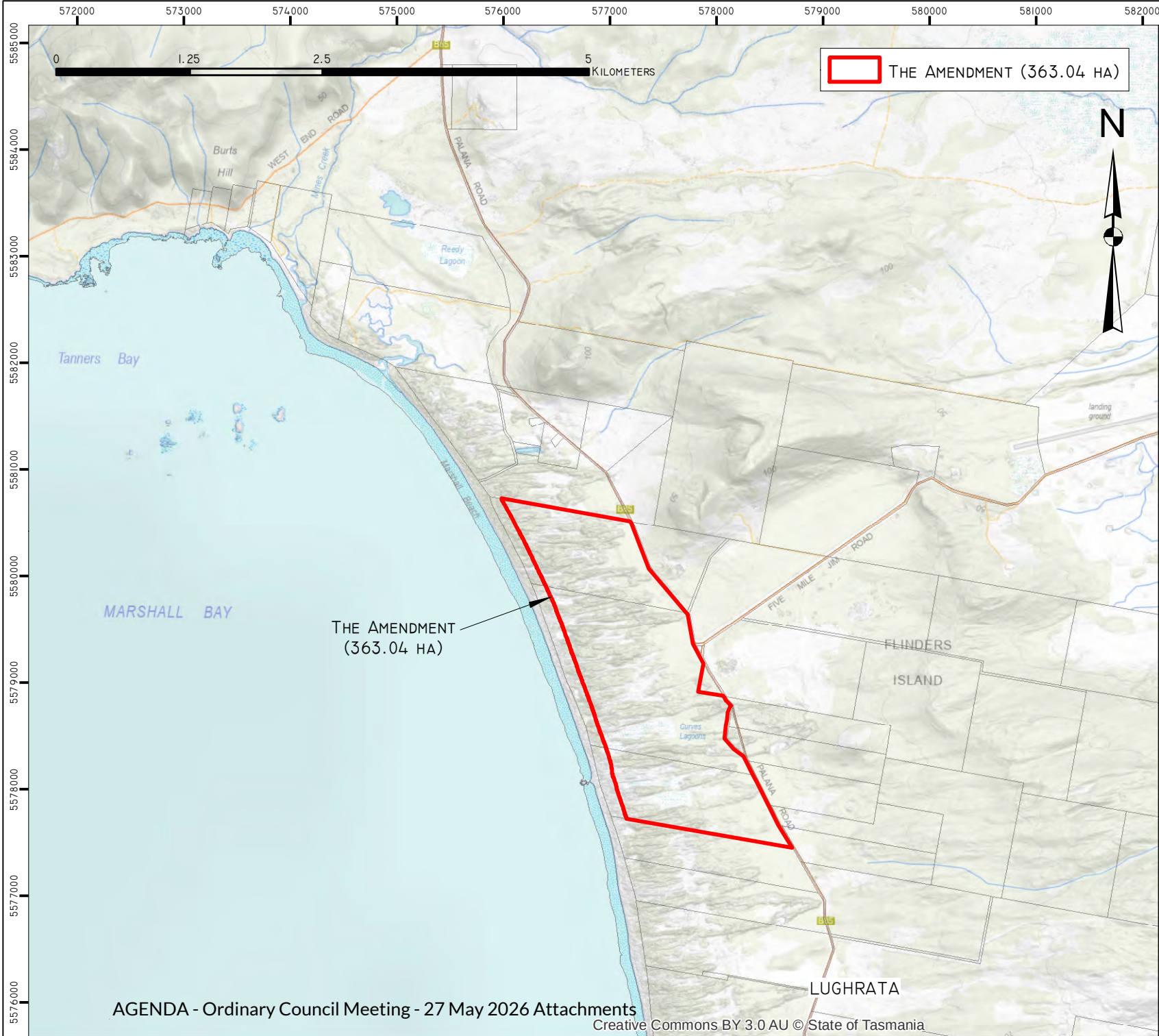
Certificates of Title included in the amendment (Attachments 2 and 5)	Part of each 120064/1, CT 215120/1, and CT 230282/1 (see Figures 1 and 2)
PID	3513143
Physical Address	'MARKANA PARK' - 368 FIVE MILE JIM RD MEMANA TAS 7255
Access	Access is from Palana Road (sealed road section) over Crown Land under licence
Area of amendment	Approximately 363.04 Ha

A.5 EXISTING ZONE

The current zone is Landscape Conservation as shown in **Figure 3**.

A.6 REQUESTED ZONING

The requested zone is Rural as shown in **Figure 4** and **Attachment 6**. The foreshore area of each of the three relevant CTs will remain Landscape Conservation.



Annexure: 16.2.2

MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE I: LOCATION OF MARKARNA PARK PLANNING SCHEME AMENDMENT AREA

TASMAP:

LGA: FLINDERS

BASE DATA BY TASMAP. © STATE OF TASMANIA
BASE IMAGE BY TASMAP. © STATE OF TASMANIA



an Diemen CONSULTING

PO Box 1 NEW TOWN TAS 7008



DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
MARKARNA GRAZING
COMPANY PTY LTD

576000

577000

578000

579000

Annexure: 16.2.2

MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE 2: LOCATION
OF MARKARNA
PARK LAND TITLES

TASMAP:
TANNER
EMITA

LGA:
FLINDERS

BASE DATA BY TASMAP. © STATE OF TASMANIA
BASE IMAGE BY TASMAP. © STATE OF TASMANIA

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DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
MARKARNA GRAZING
COMPANY PTY LTD



44 of 1160
DATE: 1 JAN 2026



THE AMENDMENT
(363.04 HA)

LAND TITLES
CONTAINING
"THE SITE" ARE:
CT120064/I,
CT215120/I,
CT230282/I AND
PART OF RESERVE ROAD
ON CID 1182404

-  SAND RESOURCE (APPROX)
-  THE AMENDMENT
-  LAND TITLES (THE LIST)

0 250 500 1,000
METERS

AGENDA - Ordinary Council Meeting - 27 May 2026 Attachments

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576000

577000

578000

579000

Annexure: 16.2.2

MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE 3: EXISTING ZONING
TASMANIAN PLANNING SCHEME
LPS ZONES

TASMAP:
TANNER
EMITA

LGA:
FLINDERS

BASE DATA BY TASMAP. © STATE OF TASMANIA
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DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
MARKARNA GRAZING
COMPANY PTY LTD

45 of 1160
DATE: 1 JAN 2026



THE AMENDMENT
(363.04 HA)

THE AMENDMENT



LPS ZONES



ENVIRONMENTAL MANAGEMENT



LANDSCAPE CONSERVATION



RURAL

0 250 500 1,000
METERS

576000

577000

578000

579000

Annexure: 16.2.2

MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE 4: PROPOSED ZONING TASMANIAN PLANNING SCHEME LPS ZONES

TASMAP:
TANNER
EMITA

LGA:
FLINDERS

BASE DATA BY TASMAP. © STATE OF TASMANIA
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DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
MARKARNA GRAZING
COMPANY PTY LTD

46 of 1160
DATE: 1 JAN 2026



THE AMENDMENT
(363.04 HA)

THE AMENDMENT



PROPOSED LPS ZONES



ENVIRONMENTAL MANAGEMENT



LANDSCAPE CONSERVATION



RURAL

0 250 500 1,000 METERS

AGENDA - Ordinary Council Meeting - 27 May 2026 Attachments

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576000

577000

578000

579000

Annexure: 16.2.2

MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE 5A: CODE OVERLAYS
TASMANIAN PLANNING SCHEME
(EXC. NATURAL ASSETS CODE)

TASMAP:
TANNER
EMITA

LGA:
FLINDERS

NOTE:
ENTIRE LAND AREA ON MAP IS:
BUSHFIRE-PRONE AREAS CODE

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- COASTAL INUNDATION HAZARD CODE**
 COASTAL INUNDATION INVESTIGATION AREA
- SCENIC PROTECTION CODE**
 SCENIC PROTECTION AREA
- LANDSLIP HAZARD CODE**
 LOW LANDSLIP HAZARD BAND
 MEDIUM LANDSLIP HAZARD BAND
- COASTAL EROSION HAZARD CODE**
 HIGH COASTAL EROSION HAZARD BAND
 MEDIUM COASTAL EROSION HAZARD BAND
- THE AMENDMENT**

THE AMENDMENT
(363.04 HA)



0 250 500 1,000 METERS

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576000

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Annexure: 16.2.2

MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE 5B: CODE OVERLAYS
TASMANIAN PLANNING SCHEME
(NATURAL ASSETS CODE)

TASMAP:
TANNER
EMITA

LGA:
FLINDERS

NOTE:
ENTIRE LAND AREA ON MAP IS:
BUSHFIRE-PRONE AREAS CODE

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DATUM: GDA94
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MARKARNA GRAZING
COMPANY PTY LTD



48 of 1160
DATE: 1 JAN 2026

NATURAL ASSETS CODE

-  FUTURE COASTAL REFUGIA AREA
-  PRIORITY VEGETATION AREA
-  WATERWAY AND COASTAL PROTECTION AREA

THE AMENDMENT



THE AMENDMENT
(363.04 HA)



0 250 500 1,000
METERS

AGENDA - Ordinary Council Meeting - 27 May 2026 Attachments

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A.7 RATIONALE FOR THE AMENDMENT REQUEST

The basis for the s40T application is to rezone land (being part of each of Certificates of Title CT 120064/1, CT 215120/1, CT 230282/1) from the Landscape Conservation to Rural zone, with existing LPS mapped Code overlays to remain unaffected.

Information is provided in **Attachment 4**, which includes a report by Dr Lee Peterson of Nicholbrook Horticultural Consulting. Dr Peterson's report was prepared to provide an expert assessment of the requirement for lime sand application by agricultural enterprises on Flinders Island, in particular Markarna Grazing Company Pty Ltd.

THE NEED FOR LIME SAND

Dr Peterson summarises the issues associated with acidic soils and their effect on agricultural production in the extracted portion of his report provided below -

Requirement for soil neutralising compounds

Many soils in Tasmania, especially in coastal regions are acidic. Soil acidification is a natural process caused primarily due to the buildup of hydrogen ions, a natural result of organic matter decay, heavy rainfall leaching alkaline minerals, and geological factors. Soil acidification is accelerated by agriculture through the use of nitrogen fertilizers (which release hydrogen ions during nitrification) and removing nutrients with crops. Essentially, acids build up or alkaline "base" elements (like calcium, magnesium) get washed away or harvested, leaving more acidic conditions.

Soil acidity is a potentially serious land degradation issue. When soil becomes too acidic it can:

- decrease the availability of essential nutrients
- increase the impact of toxic elements
- decrease plant production and water use
- affect essential soil biological functions like nitrogen fixation
- make soil more vulnerable to soil structure decline and erosion.

Without treatment, soil acidification can impact agricultural productivity and sustainable farming systems. Acidification can also extend into subsoil layers, posing serious problems for plant root development and requires remedial action.

In addition to general acidity issues, the low pH of soils can cause secondary issues with aluminium toxicity to plants. Aluminium is highly abundant in soils, pH is the most important factor affecting aluminium solubility and toxicity and, for this reason, it is:

- the easiest and most-used measurement for making lime decisions; and
- often used as a proxy to estimate aluminium levels.

When soil pH is above 6.0, aluminium is in a solid state and not in the soil solution – and therefore not toxic to roots. When soil pH drops below about 5.0, aluminium becomes more soluble and dangerous to roots. Aluminium in the soil solution rises exponentially when pH is less than 4.5. Applying lime to acidic soils and lifting pH (towards neutral or alkaline conditions) precipitates soluble aluminium from the soil solution into a biologically inactive (solid) form.

The following extract from Dr Peterson’s report (Attachment 4, pg. 11) illustrates the loss of agricultural activity/production with a lack of lime application to correct soil pH and to then maintain it at productive levels for production. The initial application is often large, and must be followed up with maintenance levels of spreading to keep soil pH at productive levels to carry stock grazing.

Utilising the Western Australian developed iLime app which allows for selection of lime source, soil type characteristics, rainfall and pasture type to determine the productivity improvement of lime application. This demonstrates the effect of lime application of lime to initially low pH soil and the future requirements to maintain more acceptable pH levels. This also demonstrates the decrease in productivity without any lime applications. (Figure 1)

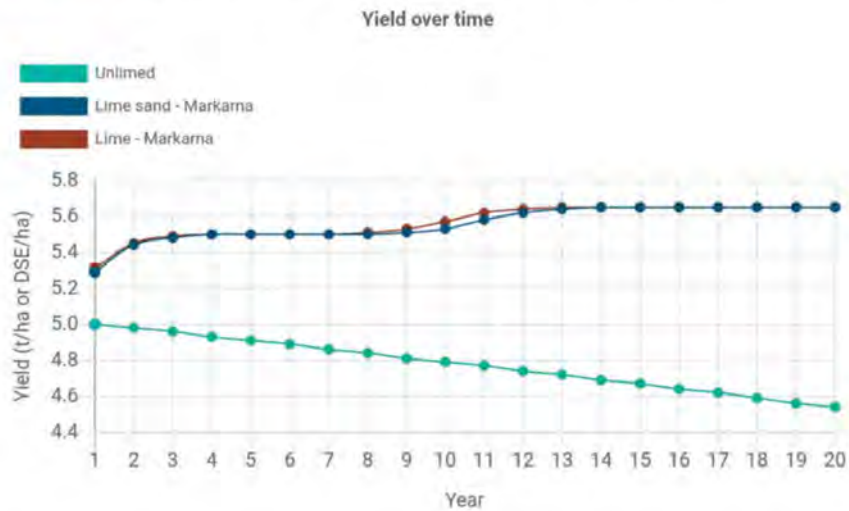


Figure 1: iLime calculation of applying 8 t/ha to newly developed area followed by maintenance applications every 3 years of 4.6 t/ha of lime sand or 4.3 t/ha agricultural lime to maintain long term productivity

Based on the soil test data and aluminium levels, Table 3 indicates the required lime sand application rates for each farm and the total amount of lime sand required for treatment of 33% of pasture area per annum (1 in every 3 year application) plus assuming the new areas are developed over the next 5 years.

The cost of product (lime) is variable in Tasmania, with high costs associated with freight to Flinders Island.

Dr Peterson’s report (**Attachment 4**, pg 7) notes that Nutrien Whitemark provided a quotation for supply of Beams Bros. lime landed on farm on Flinders Island at \$600 per tonne. This is significantly higher than on mainland Tasmania where it ranges from \$45 to \$100 per tonne. This is due to the additional road and sea freight and additional handling costs as this can only be delivered in 1 tonne bulk bags. A 100% natural calcium carbonate product, Calciprill, is available which decreases the total volume needed by 20% for equivalent neutralising value of Beams lime, however it is only available in 600kg bags at a cost of \$1200 per tonne delivered on farm on Flinders Island.

The agricultural activity of Markarna is the largest operation on Flinders Island, and agriculture is the largest private economic sector on Flinders Island. Any diminishment in the output and investment by Markarna will have a marked negative effect on the Flinders Island economy and broader community.

The following text and tables are taken from Peterson (2026; **Attachment 4**) and reproduced here as they are critically important to understanding the basis for the Amendment to farm costs and viability on Flinders Island.

Based on the soil test data and aluminium levels, Table 3 (from Peterson 2026; **Attachment 4**) indicates the required lime sand application rates for each farm and the total amount of lime sand required for treatment of 33% of pasture area per annum (1 in every 3 year application) plus assuming the new areas are developed over the next 5 years.

Table 3: Lime sand application requirements 33% of pasture application annually	Pasture Average Application Rate (t/ha)	New Area Application Rate (t/ha)	Total Annual Application (tonne)
Oatdale	5		282
Wingaroo	5	8	2078
Markarna	5	8	6577
Carnsdale	3		797
Grandview	2.5		365
Yeltanna	5		655
Centre Hill	2.5		481
Overall			11300

Based on the lime requirements of Table 3 and typical excavator, truck and labour rates, an assessment of the gross margin of lime sand extraction from the companies own mining lease is shown in Table 4 (from Peterson 2026). This is the price of lime sand delivered on farm which equates to \$13.33/t. Typical mainland lime supply is in the order of \$45-100/t. The current pricing of lime sand supplied from other leases for the raw material is \$9-10/t plus the extraction costs. The overall cost of lime sand supplied to farms without their own mining lease is a very cost effective price compared to mainland Tasmania farms.

Table 4: Gross margin of utilising lime sand				Total	Per Hectare
Pasture Area	6800 Ha				
Lime sand requirement	11300 t	1300 kg/m3	8692 m3		

Excavator	30 m3/hr	140 \$/hr	290 hrs	\$ 40,564	\$ 5.97
Truck	10 m3/hr	80 \$/hr	869 hrs	\$ 69,538	\$ 10.23
Labour	1159 hrs	35 \$/hr		\$ 40,564	\$ 5.97
Gross Margin				\$ 150,667	\$ 22.16

By comparison, the gross margin of agricultural lime supplied by Beams Brothers with a neutralising value of 85% which allows for some saving in volume requirements compared to the 75% neutralising value of lime sand is shown in Table 5 (from Peterson 2026; **Attachment 4**). The significant price of lime landed on farm on Flinders Island far outweighs the neutralising value variance making this source of lime uneconomic. Such a cost would result in an overall negative gross margin for beef production.

Table 5: Gross margin of importing lime			Total	Per Hectare
Pasture Area	6800 Ha			
Lime import requirement	85% NV	9971 t		
Price landed on farm	600 \$/t		\$ 5,982,353	\$ 879.76
Gross Margin			\$ 5,982,353	\$ 879.76

A high analysis product such as Calciprill reduces the volume of lime required further but is even less economic due to the high landed price.

Table 6: Gross margin of importing Calcipril			Total	Per Hectare
Pasture Area	6800 Ha			
Lime import requirement	100% NV	8475 t		
Price landed on farm	1200 \$/t		\$10,170,000	\$ 1,495.59
Gross Margin			\$10,170,000	\$ 1,495.59

The Marshall Bay land parcels owned by Markarna Grazing Company Pty Ltd ('Markarna') were specifically purchased to provide ongoing lime sands for the agricultural lands on the property and associated properties, and to also provide some for sale to other agricultural enterprises on the island. The existing but now disused

pit (which is the starting location for the new pit) was once used by many islanders to access lime sand due to its ease of access to obtain and extract high ENV lime sand for agricultural land application. Sands will also be used to supply concrete production activities because most sand for such a purpose is currently brought to the island.

Some lime sands produced from the pit, in excess of Markarna's own needs, may be sold to other Island graziers. The two nearby pits have a combined license to produce 10 000 tonnes per year. Markarna requires around 16 000 tonnes per annum (subject to the climatic conditions and overall production requirements of the farm) for its operations. Importing lime sand onto the island is very expensive (\$160 per tonne), making it not financially viable.

The financial impact if Markarna cannot replace the supply of lime sands from the "new" pit when its existing site is exhausted is that the profitability of its operations will suffer as its pastures progressively deteriorate and the carrying capacity of those pastures progressively declines. Because of the negative financial effect this will cause, Markarna would also find it increasingly more difficult to justify the investment of more capital into the property.

Further information is provided in **Attachment 4** in relation to Markarna's own lime sands needs, and the broader need for a lime sand resource on Flinders Island, including but not limited to the following: available supply of lime sands on Flinders Island; potential need and demand for lime sands on Flinders Island; and the current and projected usage of lime sands on the Markarna Park holdings.

OBJECTIVE OF AMENDMENT

The intended outcome of the Amendment is to establish a zone (**Figure 2**) to ensure the extraction of lime sands and associated infrastructure is a permitted use to support the agricultural sector on Flinders Island. An Extractive Industry is Prohibited in the LCZ.

The rezoning seeks to recognise the legitimate land use of lime sand extraction that underpins agriculture and other activities on the island, to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity. It is submitted that 'maintenance' is not solely 'protection', rather protection is a component of maintenance.

The lime sand deposits at Marshall Bay are well known, highly significant to the agricultural productivity of Flinders Island, and proven in their ENV on agricultural lands (see also **Attachment 4**).

The Amendment seeks to secure the economic and social well-being of the local population because it unlocks an on-island natural resource to avoid off-island dependence for inputs, which otherwise add cost to enterprises and an off-island flow of funds. *Sustainable development* can be achieved by managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –

(a) *sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations*; and [access to lime sands and other earth-based resources are necessary to meet the needs of roads, construction materials, agricultural inputs, etc.]

(b) *safeguarding the life-supporting capacity of air, water, soil and ecosystems*; and [these are managed by the application of various Acts, such as the *Mineral Resources Development Act 1995*, *Forest Practices Act 1985*, *Environmental Management and Pollution Control Act 1994*, etc.]

(c) *avoiding, remedying or mitigating any adverse effects of activities on the environment.* [this is achieved through the application of the Natural Assets Code, Scenic Protection Code, as well as legislation such as the *Mineral Resources Development Act 1995*, *Forest Practices Act 1985*, *Environmental Management and Pollution Control Act 1994*, etc].

ALTERNATIVE OPTIONS

Options to establish a permissible pathway for an Extractive Industry in the LCZ are limited but may include the use of a site-specific qualification (SSQ), particular purpose zone (PPZ), or specific-area plan (SAP) as allowed by s32(3) of LUPAA.

These options were not proposed by the Amendment because there is already a zone (Rural) within the SPP's that can accommodate the proposed use (and its associated development), while noting the tight constraints imposed by s32(4) on the actual use of any other planning instrument within the LPS –

- '(4) An LPS may only include a provision referred to in subsection (3) in relation to an area of land if –
- (a) a use or development to which the provision relates is of significant social, economic or environmental benefit to the State, a region or a municipal area; or
 - (b) the area of land has particular environmental, economic, social or spatial qualities that require provisions, that are unique to the area of land, to apply to the land in substitution for, or in addition to, or modification of, the provisions of the SPPs.'

Furthermore, in the hearings that led to the Decision [for the Flinders LPS], the Planning Authority proposed a site-specific qualification (SSQ) to provide for Extractive Industry as a Permitted use within the mining lease **only** for the Mining Lease in force on 2270 Palana Road, Lughrata folios of the Register 160313/1 and 154620/2. The Decision rejected this proposition and instead directed that the Rural zone apply to the property in its entirety (i.e. the Mining Lease and the remainder of the two CT's which were intersected by the Mining Lease). The thought process for the Decision was seemingly based on the presence (or not) of a Mining Lease which does not provide an exemption to the enactment of LUPAA because s11 does not apply.

As noted by the Decision, 'The Commission is of the view that landscape values cannot simply be managed through the Priority Vegetation Area and Scenic Protection Area overlays, as neither the Natural Assets nor Scenic Protection Area codes control use.' (paragraph 152, Flinders Local Provisions Schedule approval [2022]TASPComm 16 (21 April 2022)).

It is therefore counterintuitive for example, to adopt, or even to suggest the adoption of, a SSQ for an Extractive Industry use in the LCZ, especially given the use is not existing (it is a proposed new use and development) and the way an Extractive Industry use was treated by the TPC in the LPS assessment process. That is, an Extractive Industry use is not compatible with the zone purpose statement for the LCZ.

For these reasons a SSQ approach to the creation of a permissibility pathway was rejected in the drafting of the s40T application. Equally, neither a PPZ nor SAP were pursued, especially in the context of s32(4), because the Rural zone already exists and is available.

Codes that regulate Development already exist on most of the CTs within the Amendment (**Figures 5A and 5B**), including the Scenic Protection Code, and the Natural Assets Code. While Use is not regulated by, for example, the Scenic Protection and Natural Assets Codes, it is exceptionally rare for a development

application to not include some form of *development*¹, which may simply be in the form of *works* (i.e. ‘....includes any change to the natural or existing condition or topography of land including the removal, destruction or lopping of trees and the removal of vegetation or topsoil’). Therefore, unless an exemption exists, tree removal or lopping for example is encompassed in the definition of *works* and therefore represents development, and the Scenic Protection and Natural Assets Codes consequently apply. On this basis it can be stated that the Scenic Protection and Natural Assets Codes are broad regulatory tools which are easily triggered in their operability, and powerful in their application to regulate native vegetation clearance and conversion and associated impacts to both natural assets and scenic values. It is for these reasons that no alterations are proposed to the existing LPS mapped scenic protection and priority vegetation overlays by the amendment.

¹ Development includes –

- (a) the construction, exterior alteration or exterior decoration of a building; and
- (b) the demolition or removal of a building or works; and
- (c) the construction or carrying out of works; and
- (d) the subdivision or consolidation of land, including buildings or airspace; and
- (e) the placing or relocation of a building or works on land; and
- (f) the construction or putting up for display of signs or hoardings –

but does not include any development of a class or description, including a class or description mentioned in paragraphs (a) to (f) , prescribed by the regulations for the purposes of this definition;

PART B – DESCRIPTION OF SITE AND SURROUNDS

B.1 TOPOGRAPHY AND LANDFORM

The Site is comprised of relatively flat land with intermittent east-west linear dune series with minor depression between dunes. The Site is part of the very large area of low relief land associated with Marshall Bay, with steeper hills formed mainly by granite to the east, and with Mt Tanner (granite) being prominent to the north-west.

The deflection basins within the Site are dominated by coastal grasslands (**Plate 2**) with any minor dune formation in the basins, even those of only 1-2 m high, being dominated by scrub or ex-pasture vegetation. The inland dunes (predominantly comprised of calcareous sands) on the Site are very distinctive as they are covered by *Acacia* scrub and *Leptospermum* scrub/forest.

A series of foredunes occur north-south along the coastal fringe of Marshall Bay like many other coastal beach formations and are dominated by typical sand dune vegetation (e.g. coastal grasses, herbs and succulent species). These foredunes are excluded from the Site and consequently remain within the Landscape Conservation zone.

B.2 SOILS AND GEOLOGY

VDC engaged the Forest Practices Authority (FPA) to investigate the geomorphology, and soils present in the Site owned by the Markarna Grazing Company between Palana Road and Marshall Beach near the settlement of Lughrata on Flinders Island. The field work and report were completed by Dr Adrian Slee (Slee 2024; **Attachment 5**).

The geological profile is a mosaic of lacustrine/littoral gravels and sands compacted/cemented in situ by the overlying dune sequences. The base geology is highly fossiliferous (marine shells), compacted and easily distinguished from all forms of dune derived sands (**Plate 1B**).

Slee (2024) observed no karst landforms in the Site apart from very minor surface solution sculpture (karren) landforms have been identified during his survey. Given the extensive nature and relief of the limestone on the hills east of the mining lease subsurface water flow through karst aquifers is likely but significant karst landforms are unlikely to be present. In the absence of evidence for significant karst formulation of mitigation measures were unnecessary for the proposed development by DA2023-038, and in terms of the amendment, there is little to no risk or impact to karst values by the rezoning.

The general and approximate location of the dunes that are the lime sand resource in the Mining Lease are shown in **Figure 2**. The sands to be extracted are of littoral origin and are highly calcareous in nature. The sands are white to yellow-white and unconsolidated generally with scrub dominated vegetation typical of alkaline sands. **Plate 1A** illustrates the previously worked area of the existing but now disused pit. All overlying lime sand was extracted from the base geology at the now disused pit; there are no podsols present between the base sediments and overlying Quaternary derived sands.

Acidic soils are unlikely to be present over extensive areas and may be totally absent. While organic topsoils, buried paleosols and lake/swamp sediments are present in the pit location for example, none of these soils contain adequate organic material to significantly reduce the pH within the dune sands due to the abundance of acid neutralising carbonates. This is applicable across the Site where lime sands occur over limestone

bedrock. The likelihood of occurrence of coastal acid sulphate soils is accordingly low to extremely low (TheLIST).

Landslip hazard bands (applied through the Landslide Planning Map in the LPS which shows the distribution and relative susceptibility of landslides in Tasmania and underpins the state’s planning and building regulations) in the Site are minor and are only associated with very small sections of the steepest of inland dunes. The Amendment does not propose to alter the landslip hazard area overlay. Functionally, the Mining Lease provides an exemption to the Landslip Hazard Code² for an Extractive Industry but otherwise applies for other land use classes subject to the exemptions prescribed at Clause 15.4.1.

Plate 1. Base geological formation and dune system at the disused sand pit

A – basement geology is a compacted/cemented mosaic of gravel, sand, and mud

B – a vegetated dune dominated by white to yellow-white lime dominated sands overlays the base geological formation

A



B



B.3 LAND USE

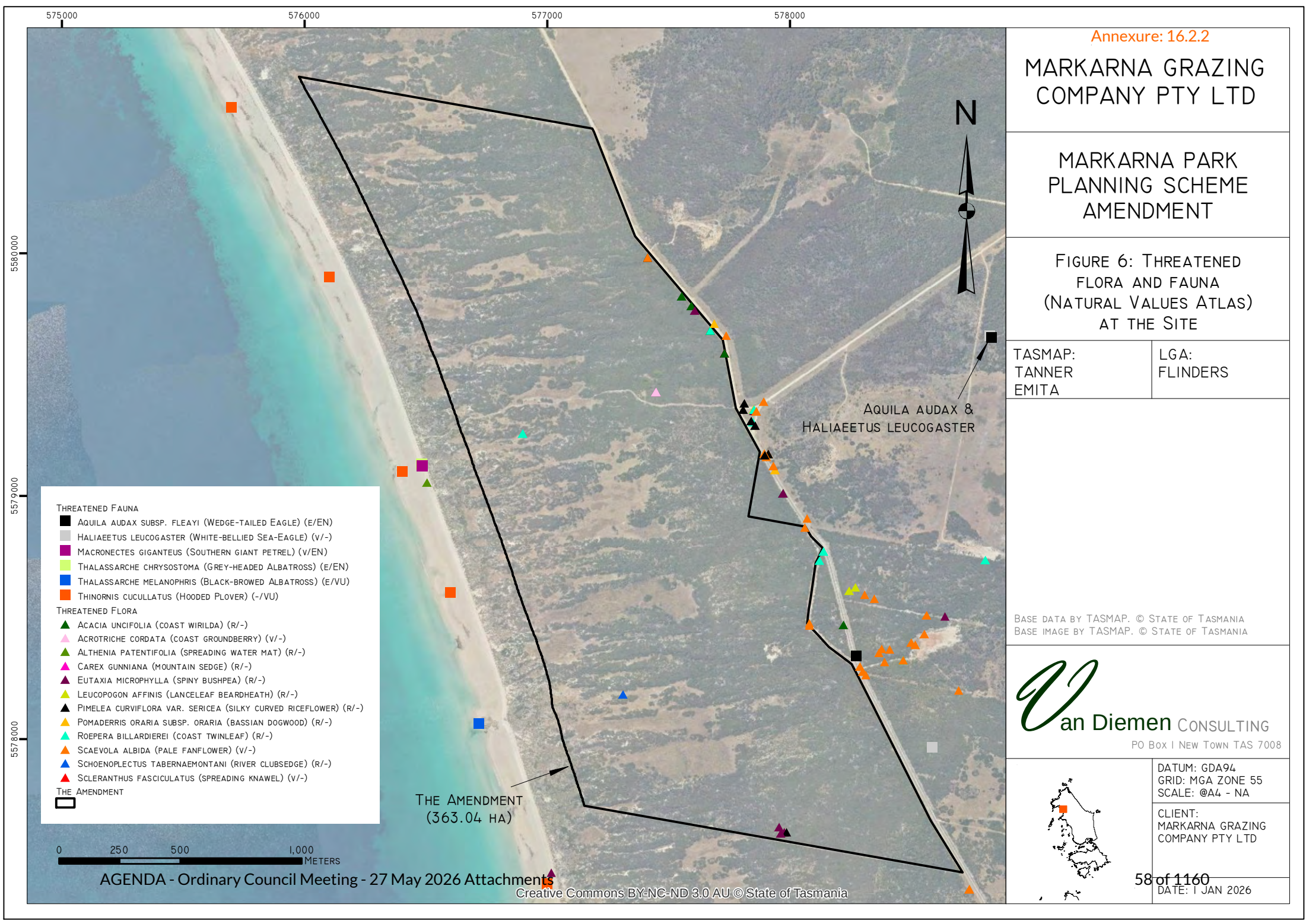
The current land use of the Site is native vegetation and some stock (cattle) grazing. Historically the Site has been used for livestock grazing. Some areas are dominated by agricultural grass and herb species with only minor recruitment of native species such as grasses, herbs and occasional emergent shrubs (mainly species of *Acacia* and *Leptospermum*).

The Land Capability is not recorded by NRE however the sandy alkaline sands are likely to qualify as Land Class 5 to 6 or possibly 7 as there is no irrigation water available for the Site.

² C15.4.1

The following use or development is exempt from this code:

(b) use or development of land for Extractive Industry if on a mining lease that is in force under the *Mineral Resources Development Act 1995*, excluding a hazardous use;



MARKARNA GRAZING
COMPANY PTY LTD

MARKARNA PARK
PLANNING SCHEME
AMENDMENT

FIGURE 6: THREATENED
FLORA AND FAUNA
(NATURAL VALUES ATLAS)
AT THE SITE

TASMAP:
TANNER
EMITA

LGA:
FLINDERS

AQUILA AUDAX &
HALIAEETUS LEUCOGASTER

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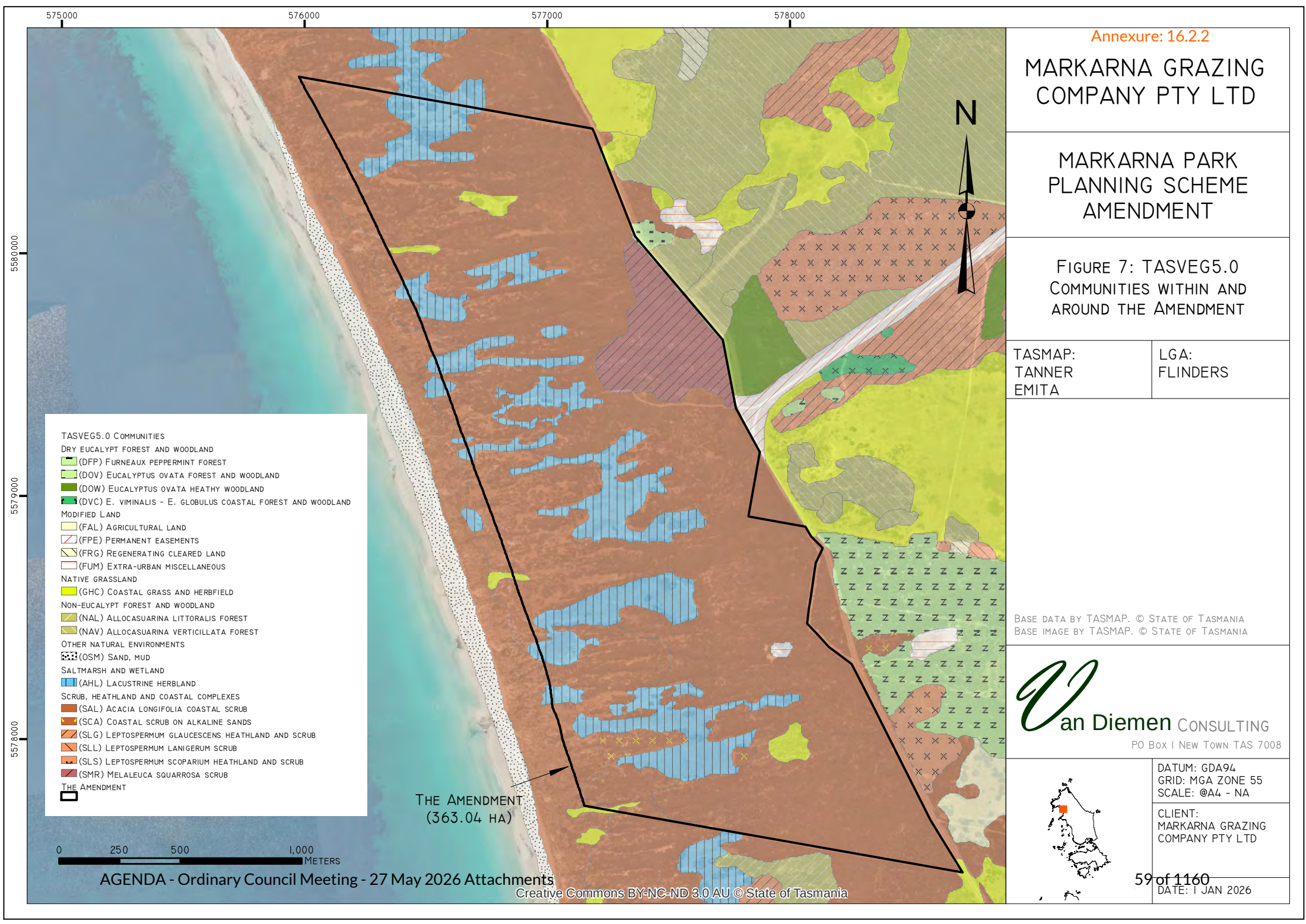


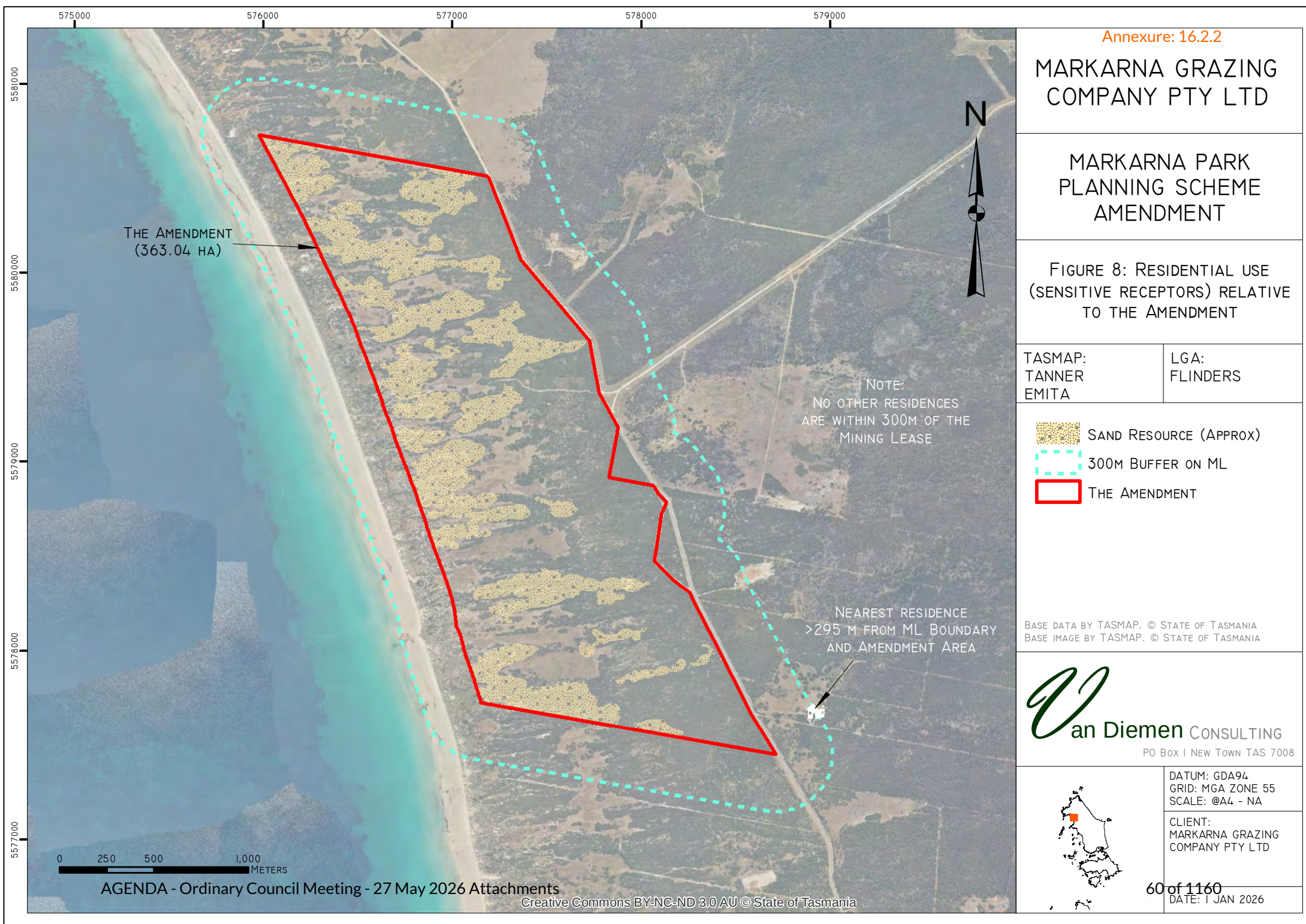
DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
MARKARNA GRAZING
COMPANY PTY LTD

- THREATENED FAUNA
- AQUILA AUDAX SUBSP. FLEAYI (WEDGE-TAILED EAGLE) (E/EN)
 - HALIAEETUS LEUCOGASTER (WHITE-BELLIED SEA-EAGLE) (V/-)
 - MACRONECTES GIGANTEUS (SOUTHERN GIANT PETREL) (V/EN)
 - THALASSARCHE CHRYSOSTOMA (GREY-HEADED ALBATROSS) (E/EN)
 - THALASSARCHE MELANOPHRIS (BLACK-BROWED ALBATROSS) (E/VU)
 - THINORNIS CUCULLATUS (HOODED PLOVER) (-/VU)
- THREATENED FLORA
- ▲ ACACIA UNCIFOLIA (COAST WIRILDA) (R/-)
 - ▲ ACROTRICHE CORDATA (COAST GROUND BERRY) (V/-)
 - ▲ ALTHENIA PATENTIFOLIA (SPREADING WATER MAT) (R/-)
 - ▲ CAREX GUNNIANA (MOUNTAIN SEDGE) (R/-)
 - ▲ EUTAXIA MICROPHYLLA (SPINY BUSHPEA) (R/-)
 - ▲ LEUCOPOGON AFFINIS (LANCELEAF BEARDHEATH) (R/-)
 - ▲ PIMELEA CURVIFLORA VAR. SERICEA (SILKY CURVED RICEFLOWER) (R/-)
 - ▲ POMADERRIS ORARIA SUBSP. ORARIA (BASSIAN DOGWOOD) (R/-)
 - ▲ ROEPERA BILLARDIEREI (COAST TWINLEAF) (R/-)
 - ▲ SCAEVOLA ALBIDA (PALE FANFLOWER) (V/-)
 - ▲ SCHOENOPLECTUS TABERNAEMONTANI (RIVER CLUBSEDE) (R/-)
 - ▲ SCLERANTHUS FASCICULATUS (SPREADING KNAWEL) (V/-)
- THE AMENDMENT
-

THE AMENDMENT
(363.04 HA)





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MARKARNA GRAZING COMPANY PTY LTD

MARKARNA PARK PLANNING SCHEME AMENDMENT

FIGURE 8: RESIDENTIAL USE (SENSITIVE RECEPTORS) RELATIVE TO THE AMENDMENT

TASMAP:
TANNER
EMITA

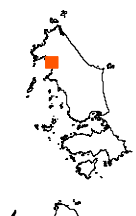
LGA:
FLINDERS

- SAND RESOURCE (APPROX)
- 300M BUFFER ON ML
- THE AMENDMENT

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The lime sands proposed to be extracted are well drained and there is no formal drainage to the nearby wetlands. There are low lying depressions of sandy soils that occur southwards and northwards of the Site. These depressions are dominated by coastal vegetation, dominated by scrub or ex-pasture vegetation. The surrounding area consists of two occasionally used small sand pits, scrubland and limited grazing.

There are no defined watercourses, or swamps within the Site.

The nearest sensitive receptor to the Site is approximately 295 m to the east (**Figure 8**), with no other sensitive uses within 300m of the Site.

Plate 2. Coastal grasslands between linear dunes



B.4 NATURAL ASSETS

VEGETATION

Figure 7 provides the TASVEG mapping for the Site and surrounds which formed the basis of the priority vegetation overlay included in the LPS.

The recorded vegetation communities/TASVEG mapping units in the Site are listed in **Table 1**.

The vegetation in the Site is typical of coastal dune sequences derived from or dominated by lime sands on Flinders Island. Other parts of Tasmania also support comparable vegetation, including King Island (e.g., Yellow Rock Beach, Porky Beach and many areas of west coast in the ‘Old Dune’ sequences), and the far north-west (e.g. Cape Grim, Marrawah, Cape Woolnorth). These vegetation types are well-reserved and not Threatened ecological community or communities or Threatened native vegetation community or communities.

Remnant agricultural land occurs sporadically across the Site and is generally very localised on the edge of coastal grassland vegetation – no areas of this non-native vegetation mapping unit have been mapped in the Site by TASVEG (**Figure 6**).

The active dunes at the beach (outside the Site) are dominated by grasses, mainly the introduced marram grass (*Ammophila arenaria*), with succulent herbs and shrubs typical of an exposed beach environment. As distance is traversed inland the effect of the salt spray and wind exposure lessen to enable scrub to replace grassland on the dunes, with grassland generally restricted to the deflation basins.

Table 1. TASVEG mapping unit categories recorded in the Site

TASVEG Code	TASVEG community or mapping unit name	Threatened native vegetation community (NC Act)	Threatened ecological community or communities (EPBC Act)
SCA	Coastal scrub on alkaline sands	No	No
FAL	Agricultural land	No	No
SAL	<i>Acacia longifolia</i> coastal scrub	No	No
GHC	Coastal grassland and herbfield	No	No

There are no Threatened native vegetation community/communities mapped in the Site (**Figure 7**).

Several ‘lagoons’ are mapped by TASVEG in the Site as TASVEG as lacustrine herbland (TASVEG code - AHL) however the vegetation present does not represent this community. These areas are a coastal grassland and herbfield community (TASVEG Code – GCH) and not ‘wetlands’ in the sense of TASVEG mapping units and the application of the ‘wetland’ concept as a Threatened native vegetation community. Unlike Arbothnots Lagoon further to the south of the Site, which is easily visited on route to Castle Rock, there is no standing water or associated ‘aquatic species and vegetation of a wetland’ in the Site.

The priority vegetation overlay which includes Scheme protection measures for **Threatened native vegetation community/communities** operates in the Site, and there is no change (addition, deletion or amendment) to the mapped overlay by the amendment.

Comments are provided below for each native vegetation type and mapping unit recorded in the Site.

Coastal scrub on alkaline sands (TASVEG code - SCA)

The dominant species are *Leptospermum laevigatum* and *Myoporum insulare*. In the Site this mapping unit is represented by a relatively species poor scrub community dominated by *Leptospermum laevigatum* with sub-dominant to occasional *Allocasuarina verticillata*, *Acacia longifolia* subsp. *sophorae* and sparse numbers (and canopy coverage) of *Myoporum insulare*.

The ground layer species diversity is low to very with most of the ground covered by leaf litter, mosses and lichens and/or exposed lime sands. Common herbs include *Tetragonia implexicoma*, *Parietaria cardiostegia*, *Threlkeldia diffusa*, *Ajuga australis*, *Podolepis jaceoides*, *Dichondra repens*, *Senecio biserratus*, *Wahlenbergia gracilentia*, and *Urtica incisa*. A few rush and sedge species occur in the ground layer where there are canopy openings and include *Juncus pallidus*, *J. pauciflora*, and *Lepidosperma concavum*.

The following images depict the various forms of this scrub type in the Site.





Coastal grassland and herbfield (TASVEG code – GCH)

This community is dominated by *Austrofestuca littoralis*, *Austrostipa stipoides*, *Poa poiformis* and *P. labillardierei*. Common non-dominant grasses include *Distichlis distichophylla* and the sedge *Ficinia nodosa*. Herbs include *Acaena nova-hollandiae*, *Carpobrotus rossii*, *Centaurium erythraea*, *Pelargonium australe*, *Ranunculus lappaceus*, *Samolus repens*, *Apium prostratum*, *Dichondra repens*, *Tetragonia tetragonioides*, *Rhagodia candolleana* and *Selliera radicans*.

The *Lowland Native Grasslands of Tasmania* ecological community, and EPBC listed community (i.e. a Threatened ecological community), is considered here given the presence of a TASVEG potential analogue - Coastal grassland and herbfield (TASVEG – Code GCH).

In this case, the GCH in the Survey Area –

- (1) has less than 50% *Poa labillardierei* coverage of the native perennial tussock grasses (it is 0 to 20%) present in the GCH patches, and/or
- (2) Patch size is less than 1 hectare, and/or
- (3) Weeds (perennial) make up 20% or more than the total ground cover of the patch.
 - which excludes it from *the Lowland Native Grasslands of Tasmania* ecological community listed on the EPBC Act³.

The following images depict the various forms of this vegetation type in the Site.

³ Department of the Environment, Water, Heritage and the Arts (2010). *Lowland Native Grasslands of Tasmania* — a nationally threatened ecological community. Environment Protection and Biodiversity Conservation Act 1999 Policy Statement 3.18. Australian Government, Canberra.



Acacia longifolia coastal scrub (TASVEG code - SAL)

Acacia longifolia subsp. *sophorae* coastal scrub occurs on sand dunes in a narrow but variable coastal zone; typically, there is a strong zonation from the high-water mark inland across the dunes. This mapping unit is shrubland with a dense closed canopy. *Leucopogon parviflorus*, *Banksia marginata*, *Allocasuarina verticillata*, *Myoporum insulare* and *Rhagodia candolleana* are occasionally prominent elements in this community, though *Acacia longifolia* subsp. *sophorae* is always dominant.

The ground layer species diversity is low to very with most of the ground being bare sand/soil, or with a covering of leaf litter, mosses and lichens and/or exposed lime sands.

Common herbs include *Tetragonia implexicoma*, *Parietaria cardiostegia*, *Ajuga australis*, *Podolepis jaceoides*, *Dichondra repens*, *Senecio biserratus*, and *Wahlenbergia gracilentia*. A few rush and sedge species occur in the ground layer where there are canopy openings and include *Juncus pallidus*, *J. pauciflora*, and *Lepidosperma concavum*.

The following images depict the various forms of this scrub type in the Site.



THREATENED AND CONSERVATION SIGNIFICANT FLORA SPECIES

Eleven flora species ('Threatened flora') are known to occur near and/or in the Site (TSP Act and EPBC Act listing):

- *Acacia uncifolia*, coast wirilda (r/-)
- *Asperula minima*, mossy woodruff (r/-)
- *Eutaxia microphylla*, spiny bushpea (r/-)
- *Schenkia australis*, spike centaury (r/-)
- *Pimelea curviflora* var. *gracilis*, curved riceflower (r/-)
- *Leucopogon affinis*, lanceleaf beardheath (r/-)
- *Pomaderris oraria* subsp. *oraria*, bassian dogwood (r/-)
- *Pomaderris paniculosa* subsp. *paralia*, shining dogwood (r/-)
- *Acrotriche cordata*, coast groundberry (v/-)
- *Roepera billardiarei*, coast twinleaf (r/-)
- *Scaevola albida*, pale fanflower (v/-)

Species locations are shown in **Figure 6**.

No species listed on the *Environment Protection and Biodiversity Conservation Act 1999* are known to occur or have been observed/recorded in the Site.

Despite the number of Threatened Flora known from the Site, their occurrence is limited spatially and often to very specific habitats such as in open areas of scrub where windthrow has created a canopy gap (e.g. *Schenkia australis*, *Asperula minima*, *Eutaxia microphylla*), or on skeletal areas of limestone bedrock (e.g., *Acacia uncifolia*, *Acrotriche cordata*). Canopy closure in scrub often leads to many plants of several species to die as light becomes too restricted for growth and survival. This is evident throughout some areas where there are dead *Eutaxia microphylla* and *Pimelea curviflora* var. *gracilis*.

The priority vegetation overlay which includes Scheme protection measures for Threatened Flora Species operates in the Site, and there is no change (addition, deletion or amendment) to the mapped overlay.

THREATENED AND CONSERVATION SIGNIFICANT FAUNA SPECIES

There are several Threatened fauna species known from Flinders Island, and some which may occur on Flinders Island (e. g. chaostola skipper) where there is potential habitat.

Table 2 provides a list of Threatened fauna species that were identified in a Natural Values Atlas (NRE maintained database of natural values in Tasmania including threatened flora and fauna species) search of the Site. Comments are provided in **Table 2** of the possible or likely occurrence in the Site, and whether the species' occurrence is significant.

Significant habitat as applied through the Natural Assets Code (i.e. 'significant habitat for threatened fauna species') is absent from the Site for all fauna species discussed in **Table 2**.

Table 2. Threatened and conservation significant fauna species that do or may occur in the Site

Common name <i>Species name</i>	Habitat present in Site? If yes, comments about likelihood of presence.
Birds	
blue-winged parrot <i>Neophema chrysostoma</i>	No. No eucalypt forest or woodland present.
forty-spotted pardalote <i>Pardalotus quadragintus</i>	No. No white gum eucalypt forest or woodland present. Not a known colony.
swift parrot <i>Lathamus discolor</i>	No. Not a known nesting site, no nesting suitable eucalypt forest or woodland is present.
wedge-tailed eagle <i>Aquila audax</i> subsp. <i>fleayi</i>	Yes. Foraging habitat is present in the Site.

white-bellied sea-eagle <i>Haliaeetus leucogaster</i>	Yes. Foraging habitat is present in the Site.
Mammals	
New Holland Mouse <i>Pseudomys novaehollandiae</i>	Unlikely. Some vegetation present at the western edge of the Site contains floristic components that may represent possible foraging habitat; vegetated dunes but the Site is outside the species' core range so significant habitat is absent.
Amphibians	
Green and gold frog <i>Litoria raniformis</i>	No suitable habitat (i.e. freshwater wetlands, coastal freshwater lagoons and swamps, freshwater dams) in the Site. The Site is within the potential range but habitat (breeding and overwintering) is absent.
Striped Marsh Frog <i>Lymnodynastes peroni</i>	No suitable habitat (i.e. freshwater wetlands, coastal freshwater lagoons and swamps, freshwater dams) in the Site. The Site is within the potential range but habitat is absent.
Fish	
Australian grayling <i>Prototroctes maraena</i>	No. A migratory freshwater and marine species. The Site is within the potential range, but habitat (waterways, creeks and/or streams) is absent.
Eastern Dwarf Galaxias <i>Galaxiella pusilla</i>	No. On Flinders Island the species is known from wet heathlands, swamps, backwaters of streams and rivers, and drains. The Site is within the potential range, but habitat is absent.
Invertebrates	
chaostola skipper <i>Antipodia chaostola</i>	Possible but unlikely. <i>Gahnia</i> species are present in the Site (<i>Gahnia radula</i> , <i>G. grandis</i>) but patches are very small (<20 square metres) and are sporadic. This invertebrate species is not known from Flinders Island.
Reptiles	
Tussock skink <i>Pseudemoia pagenstecheri</i>	Possible but unlikely. Grassland with <i>Poa</i> tussock is present, especially in the deflation basins which are dominated by Coastal grassland and herbfield (TASVEG – GCH).

Marshall Bay has a typical beach profile of an active beach system, foredunes, and less mobile back dunes. As noted by Slee (pp. 12-13 of **Attachment 5**), at the west are the modern foredune and back dunes behind Marshall Beach while inland are a series of elongated west-to-east trending parallel dunes that rise to 24 m above sea level. The coastal foredunes climb onto the older dunes but can be broadly demarcated by their

hummocky forms and presence of sand blow-outs that contrast to the more elongated uniform stabilised ridges of the older dunes.

The Site does not include the beach, or foredunes but does include the back dunes in part, and older dune sequences (i.e. they are not part of the Amendment and would remain in the Landscape Conservation zone). The beach associated birds are limited to the active dunes and foredunes as depicted in **Plate 3**.

Table 3 provides a list of the avifauna which are known to occur at the nearby Marshall Bay beach associated habitats (e.g., dune, beach and back dune environments associated with modern/recent dunes).

Table 3. Summary table of Site relevant avifauna and associated statutory conservation listings

Scientific Name	Common Name	EPBC Act-listed	TSP Act-listed
Australian fairy tern	<i>Sternula nereis nereis</i>	Vulnerable	vulnerable
Eastern hooded plover	<i>Thinornis cucullatus cucullatus</i>	Vulnerable	-
Little tern	<i>Sternula albifrons</i>	Migratory	-

Plate 3. Marshall Bay beach and dune avifauna habitat outside the Site



B.5 AVAILABILITY OF INFRASTRUCTURE AND SERVICES*WATER AND SEWER*

The Site has no reticulated water or sewer connections. It's noted in the development application that neither reticulated service is required.

POWER

The Site has access to powerlines and poles along its eastern edge.

STORMWATER DRAINAGE

There is no public reticulation stormwater system to the Site which is comparable to most rural areas on Flinders Island.

ROAD ACCESS

Access to the Site is from Palana Road (sealed road section). Traffic would enter and exit onto the sealed section of Palana Road using the now disused reserved road section. This reserved road section is licensed by the Crown to provide access to the Land.

PART C – STATUTORY PLANNING INSTRUMENTS

C.1 LAND USE PLANNING AND APPROVALS ACT (THE ACT)

The Resource Management and Planning System of Tasmania (RMPS) provides for the planning and environmental policy framework within which the planning merit of the Amendment can be assessed.

The key tenet of the RMPS is the concept of **sustainable development** which is statutory defined as;

‘managing the use, development and protection of natural resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while:

- a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations;*
- b) safeguarding the life supporting capacity of air, water, soil and ecosystems; and*
- c) avoiding, remedying or mitigating any adverse impacts of activities on the environment.’*

The Act sets out the requirements for a planning scheme amendment. These are;

- (a) must seek to further the objectives set out in Schedule 1; and*
- (b) must be prepared in accordance with State Policies, and*
- (c) it may make provision which relates to the use, development, protection or conservation of any land; and*
- (d) must have regard to the safety requirements set out in standards prescribed under the Gas Pipelines Act 2000; (There is no gas pipeline involved) and*
- (e) must, as far as practicable, avoid the potential for land use conflicts with use and development permissible under the planning scheme applying to the adjacent area; and*
- (f) must have regard to the impact the use and development permissible under the Amendment will have on the use and development of the region as an entity in environmental, economic and social terms.*

SCHEDULE 1

Schedule 1 of the Act establishes the following objectives, which must be furthered by the amendment;

- a) To promote the sustainable development and natural and physical resources and the maintenance of ecological processes and genetic diversity.*

Extensive environmental studies found the Amendment will not have an adverse impact on this objective.

- b) To provide for the fair, orderly and sustainable use and development of air, land and water.*

Adequate infrastructure to and on the Site exists so there is no requirement to extend or further supplement publicly owned/managed infrastructure assets or services.

c) To encourage public involvement in resource management and planning.

The community and government departments will be able to formally comment on the Amendment in accordance with the provisions of the Act.

d) To facilitate economic development in accordance with the objectives set out in paragraphs(a), (b) and (c) and

The Amendment will facilitate the extraction of lime sands to assist with the improvement and maintenance of the soil structure of rural land that in turn will provide economic benefits from vigorous and sustainable agricultural activity on Flinders Island.

e) To promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

The Amendment requires consultation, review and where necessary approval by the local planning authority, State government departments, and the community.

PART 2 OBJECTIVES OF THE PLANNING PROCESS ESTABLISHED BY THIS ACT

The objectives of the planning process established by this Act are, in support of the objectives set out in Part 1 of this Schedule –

- (a) to require sound strategic planning and co-ordinated action by State and local government; and*
- (b) to establish a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land; and*
- (c) to ensure that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land; and*
- (d) to require land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels; and*
- (e) to provide for the consolidation of approvals for land use or development and related matters, and to co-ordinate planning approvals with related approvals; and*
- (f) to promote the health and wellbeing of all Tasmanians and visitors to Tasmania by ensuring a pleasant, efficient and safe environment for working, living and recreation; and*
- (g) to conserve those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value; and*
- (h) to protect public infrastructure and other assets and enable the orderly provision and co-ordination of public utilities and other facilities for the benefit of the community; and*
- (i) to provide a planning framework which fully considers land capability.*

The proposed Amendment gives effect to Part 2 objectives in that approval or otherwise is made within the framework established by the Act, no buildings or specified values are identified, and further development and use must be in accord with the planning scheme.

C.2 STATE POLICIES

The State Policies are;

- Tasmanian State Coastal Policy 1996
- Protection of Agricultural Land 2009
- State Policy on Water Quality Management 1997
- National Environmental Protection Measures (NEPM)

TASMANIAN STATE COASTAL POLICY 1996

The Land is within one kilometre of the coast thus the State Coastal policy applies.

The Coastal Policy contains three principles relating to;

- the protection of *natural and cultural values*:
- *sustainable use and development and*
- *integrated management and protection of the coastal zone is a shared responsibility.*

The Policy also lists a series of expected outcomes that ensure any development or use in the coastal zone is environmentally sustainable. It also recognises that the coast has economic, landscape and social values that should be developed or enhanced.

The relevant *Protection of Natural and Cultural Values of the Coastal Zone* outcomes are provided below with comments in relation to each and the proposed use and development –

1.1. NATURAL RESOURCES AND ECOSYSTEMS	
1.1.1. The coastal zone will be managed to ensure sustainability of major ecosystems and natural processes.	The Amendment considers the management of the area of land within the coastal zone to ensure the sustainability of major ecosystems and natural processes. There will be no adverse impact on major ecosystems.
1.1.2. The coastal zone will be managed to protect ecological, geomorphological and geological coastal features and aquatic environments of conservation value.	The sustainability of major ecosystems and natural processes was considered in the assessment of DA2020-038 by the Environment Protection Authority concluded there was to be no adverse impacts. More broadly, the Site doesn't support recorded features (geomorphological and geological coastal features and aquatic environments) of conservation value.
1.1.3. The coastal zone will be managed to conserve the diversity of all native flora and fauna and their habitats, including seagrass and seaweed beds, spawning and breeding areas. Appropriate conservation measures will be adopted for the protection of migratory species and the protection and recovery of rare, vulnerable and endangered species in accordance with this Policy and other relevant Acts and policies.	The protection of migratory species and the protection and recovery of rare, vulnerable and endangered species will be via measures identified and prescribed through the Environmental Impact Assessment Principles at s74 of EMPCA for the assessment of Level 1 and 2 activities.

1.1.4. Exotic weeds within the coastal zone will be managed and controlled, where possible, and the use of native flora encouraged. 1.1.10. The design and siting of buildings, engineering works and other infrastructure, including access routes in the coastal zone, will be subject to planning controls to ensure compatibility with natural landscapes.	The Scheme provides for the assessment of priority vegetation, which includes threatened species, and other Acts also apply regardless of the Scheme and any assessment undertaken through EMPCA or LUPAA – e.g., the EPBC Act protects and regulates impacts to MNES which includes migratory species. The Site does not occur in the marine environment so seagrass beds and spawning and breeding areas for marine aquatic species is not relevant. Buildings and other infrastructure will remain the subject of planning controls in the TPS – Flinders which includes the scenic protection code.
1.2. CULTURAL AND HISTORIC RESOURCES	
1.2.1. Areas within which Aboriginal sites and relics are identified will be legally protected and conserved where appropriate. 1.2.2. All Aboriginal sites and relics in the coastal zone are protected and will be identified and managed in consultation with Tasmanian Aboriginal people in accordance with relevant State and Commonwealth legislation.	An Aboriginal Heritage Assessment has been conducted. The report has been accepted by Aboriginal Heritage Tasmania. The findings of that report are confidential but would be made available to the regulatory authorities for assessment purposes.
1.4. COASTAL HAZARDS	
1.4.1. Areas subject to significant risk from natural coastal processes and hazards such as flooding, storms, erosion, landslip, littoral drift, dune mobility and sea level rise will be identified and managed to minimise the need for engineering or remediation works to protect land, property and human life. 1.4.2. Development on actively mobile landforms such as frontal dunes will not be permitted except for works consistent with Outcome 1.4.1.	The Scheme contains Codes which consider natural coastal processes and hazards such as flooding, storms, erosion, landslip, littoral drift, dune mobility and sea level rise. The Amendment does not propose to add, delete, or amend any of the overlays that trigger the operability of Codes that regulate natural hazards including landslip hazard, and coastal inundation hazard, and coastal erosion hazard.

The relevant *Sustainable Development of Coastal Areas and Resources* outcomes are provided below with comments in relation to each and the proposed use and development –

2.1. COASTAL USES AND DEVELOPMENT

2.1.1. The coastal zone shall be used and developed in a sustainable manner subject to the objectives, principles and outcomes of this Policy. It is acknowledged that there are conservation reserves and other areas within the coastal zone which will not be available for development. 2.1.2. Development proposals will be subject to environmental impact assessment as and where required by State legislation including the <i>Environmental Management and Pollution Control Act 1994</i>. 2.1.3. Siting, design, construction and maintenance of buildings, engineering works and other infrastructure, including access routes within the coastal zone will be sensitive to the natural and aesthetic qualities of the coastal environment. 2.1.4. Competing demands for use and development in the coastal zone will be resolved by relevant statutory bodies and processes, in particular the Land Use Planning Review Panel, the Resource Management and Planning Appeal Tribunal and the Marine Farming Planning Review Panel. Planning schemes, marine farming development plans and other statutory plans will provide guidance for resource allocation and development in accordance with this Policy. 2.1.5. The precautionary principle will be applied to development which may pose serious or irreversible environmental damage to ensure that environmental degradation can be avoided, remedied or mitigated. Development proposals shall include strategies to avoid or mitigate potential adverse environmental effects. 2.1.8. Extraction of construction materials, mineral, oil, and natural gas deposits in the coastal zone will be allowed provided access to areas is allowed under the provisions of the <i>Mining Act 1929</i>. 2.1.10. Extraction will be subject to the Quarry Code of Practice and environmental assessment as required by State legislation including the <i>Environmental Management and Pollution Control Act 1994</i>. Adequate rehabilitation shall be carried out. 2.1.11. Extraction of sand will be provided for by zoning of appropriate areas in planning schemes. 2.1.16. Water quality in the coastal zone and in ground water aquifers will accord with the requirements and guidelines established by the <i>Environmental Management and Pollution Control Act 1994</i> or the	The extraction of lime sands to support agricultural use on Flinders Island is critical to keeping input costs low to the farming sector to keep it competitive locally. The Amendment is the means to enable an application for the extractive use to be made (i.e., made permissible); it is currently a prohibited use and development in the Landscape Conservation zone. Being a level 2 activity, the Board of the Environment Protection Authority assessed the proposal and concluded that the proposal is capable of being managed in an environmentally acceptable manner such that it is unlikely that the RMPS and EMPCS objectives would be compromised, provided that the Permit Conditions - Environmental No. 11576 appended to the EAR are imposed and duly complied with. The design, colour, location, and layout of buildings associated with the extractive use are sensitive to the natural and aesthetic qualities of the coastal environment. Measures applicable through the Scenic Protection Code (which covers the Site and will not change because of the amendment) would continue to operate as they do now as the Code is equally applicable in the Landscape Conservation and Rural zones. A Mining Lease is in force; Provision 2.1.8 provides that the extraction of construction materials in the coastal zone will be allowed provided access to areas is allowed under the provisions of the <i>Mining Act 1929</i> (superseded by the <i>Mineral Resources Development Act 1995</i>). In granting the Mining Lease, the Minister considered <i>inter alia</i> the risk of mobile dunes in the coastal area as acceptable. Extraction will be subject to the Quarry Code of Practice and environmental assessment as required by State legislation including the <i>Environmental Management and Pollution Control Act 1994</i>.
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Environment Protection (Sea Dumping) Act 1987 (as appropriate) and any other relevant State and Commonwealth Policies and statutes.	
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The Amendment is specifically consistent with policy principles and outcomes;

- specifically clause, 2.1.11'. states that the extraction of sand will be provided for by the zoning of appropriate areas in planning schemes.' and
 - does not cause nor contribute to ribbon development along the coast;
 - provides for adequate rehabilitation to be carried out through the Mining Lease under the *Mineral Resources Development Act 1995* and the draft permit conditions imposed by the Board of the Environment Protection Authority (EPA) if a permit is issued;
 - is a use and development that was assessed and will be regulated under the Quarry Code of Practice and environmental assessment as required by State legislation including the *Environmental Management and Pollution Control Act 1994*. Adequate rehabilitation shall be carried out as required by the Mining Lease (granted under the MRDA, and by the draft permit conditions proposed to be imposed by the EPA Board); and
 - does not impact on any significant natural or cultural values and the potential impact to amenity value can be appropriately managed and regulated by controls administered through planning permit conditions and the Mining Lease.

STATE POLICY ON WATER QUALITY MANAGEMENT 1997

The policy is designed to achieve the sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of RMPS.

The Policy sets out a series of objectives that include the enhancing and protection of water quality and managing pollutants at the source in order the water quality is not reduced.

Of particular relevance are clauses 31.1 and 31.5;

Clause 31.1 of the policy states that – 'Planning schemes should require that development proposals with the potential to give rise to off-site polluted stormwater runoff which could cause environmental nuisance or material or serious environmental harm should include, or be required to develop as a condition of approval, stormwater management strategies including appropriate safeguards to reduce the transport of pollutants off-site.'

Clause 31.5 states, 'Planning schemes must require that land use and development is consistent with the physical capability of the land so that the potential for erosion and subsequent water quality degradation is minimised.'

A geomorphological study of the Site was conducted by Dr Adrian Slee (see **Attachment 5**) who found the top layer of lime sand has high permeability, which influences infiltration rates and storm water runoff. There are no defined water courses, and no formal drainage exists into the nearby wetlands.

The policy is relevant to the planning and design of stormwater, sewage and grey water disposal systems to ensure that any discharge complies with the policy requirements. Accordingly appropriate provisions need to be part of any development permit.

The rezoning proposed by the Amendment has no effect on the continued operability of the Policy at the Site.

STATE POLICY ON PROTECTION OF AGRICULTURAL LAND 2009 (PAL)

The policy aims to conserve and protect agricultural land so that it remains available for the sustainable development of agriculture, recognising the importance of Prime Agricultural Land. Specific objectives are to enable the sustainable development of agriculture by minimising: (a) conflict with or interference from other land uses; and (b) non-agricultural use or development on agricultural land that precludes the return of that land to agricultural use.

The Site is not Prime Agricultural land⁴ as defined in the PAL. Given the soil types present, the land is marginal (Class 5-7) for agricultural use.

The Site is zoned Landscape Conservation. The proposed Amendment rezones the Site to Rural.

The rezoning is consistent with Principle 1 of the PAL:

‘Agricultural land is a valuable resource and its use for the sustainable development of agriculture should not be unreasonably confined or restrained by non-agricultural use or development.’

The Amendment allows land to be used in a manner that enhances and supports Agricultural use on other lands.

It's noted the planning scheme identifies the purpose for the Rural zone as,

To provide for a range of use or development in a rural location:

- (a) where agricultural use is limited or marginal due to topographical, environmental or other site or regional characteristics;
- (b) that requires a rural location for operational reasons;
- (c) is compatible with agricultural use if occurring on agricultural land; and
- (d) minimises adverse impacts on surrounding uses.

To minimise conversion of agricultural land for non-agricultural use.

⁴ “Agricultural land” means all land that is in agricultural use or has the potential for agricultural use, that has not been zoned or developed for another use or would not be unduly restricted for agricultural use by its size, shape and proximity to adjoining non-agricultural uses.

The Land is now zoned Landscape Conservation (**Figure 3**), and the Amendment would conform to the requirements of the Rural zone.

NATIONAL ENVIRONMENTAL PROTECTION MEASURE (NEPM)

In accordance with s.12A of the *State Policies and Projects Act 1993*, a national environmental protection measure is taken to be a State Policy. There is no discretion to differentiate a State Policy made under s.12A compared to s.11.

Thus, the following items need to be considered,

- Ambient Air quality June 2002
- Diesel Vehicle emission 2001
- Assessment of site contamination 1999
- Used Packaging Materials 1999
- Movement of Controlled Waste between States and Territories 1998
- National Pollutant Inventory June 2000

Consideration of the relevant EPNs is the assessment of site contamination, diesel vehicle emissions and air quality.

REGIONAL LAND USE STRATEGY OF NORTHERN TASMANIA 2021 (RLUSNT)

The Strategy which encompasses Flinders Island guides future land use, development and infrastructure provision. **Table 4** provides comments about the Amendment relative to the Strategic Directions of the RLUSNT.

The following from the NTRLUS provides definitive guidance that applies to extractive industry;

- ED-A11 Identify natural economic resource areas and protect from further fragmentation and inappropriate land use; and
- ED-A12 Identify and protect extractive and mineral resources for potential future extraction (including providing appropriate transport corridors and buffers) and protect these, ensuring that planning preserves the opportunity for discovery and development of new resources in appropriate areas.

Table 4. Comments in relation to the Strategic Directions of the RULSNT

GOAL	RELEVANT STRATEGIC DIRECTION	COMMENTS IN RELATION TO AMENDMENT
C.4.1 Goal 1: Economic Development To facilitate economic development and productivity through integrated land use and infrastructure planning.		
Strategic Direction G1.1 Capitalise on the region's sources of competitiveness by identifying future opportunities for sustainable competitive advantage.	a) Facilitate innovation and capitalise on the co-location of industry in strengthened 'clusters' of economic and employment activity. b) Add value, diversify the economy and generate jobs. c) Develop the preconditions for business competitiveness through merits-based planning and development assessment processes that: - Flexibly consider the location of economic development having regard for the changing economic environment; and - Focus on community-specific outcomes and environmental impacts, rather than a standards-based approach. d) Facilitate the needs of small business, including working from home and other flexible/non-traditional locations.	The Amendment seeks to enable an extractive industry to be permissible in the Site, which would then be assessed on its merits via a development application. The extractive industry is to extract lime sands to directly benefit the agricultural land productivity of Flinders Island through a substantial on-island supply capable of being used to increase and maintain productivity of soils to grow agricultural produce. The Amendment would facilitate value to be added to the island economy (e.g., by offering on-island jobs, a resource for sale on the island), to provide opportunities to diversify agriculture (including different and/or novel agricultural activities) and to overall generate and/or facilitate continued employment on the island. Some jobs generated may be in downstream processing of agricultural products (not directly caused by the Amendment) from lands that receive the lime sands from the Site.
Strategic Direction G1.2 Adopt an integrated and coordinated approach to government infrastructure, transport and land use planning.	a) Coordinate provision of transport, energy, communications and other infrastructure services with appropriately zoned and located land for development.	The Amendment relates to land accessed from Palana Road – a major arterial road that connects the north and south of the island. The use of the main arterial road on the western side of the island provides efficient travel options to all parts of the island

		for the delivery and use of lime sands on agricultural lands in production, or capable of being brought into production. The Amendment does not change the requirement of new or additional government funded or managed infrastructure.
Strategic Direction G1.3 Develop a thorough understanding of key industry needs, including future demand and location requirements.	a) Support agricultural and related primary industries by: • Recognising the complex jurisdictions and the role of Natural Resource Management (NRM) organisations; • Applying the State Policy on the Protection of Agricultural Land (PAL) Policy (2009) consistently across the region; • Supporting the forest practices system and ongoing structural reforms; • Promoting appropriate aquaculture development; • Identifying and mapping key mineral assets, protecting key resources; and • Supporting appropriate mining and mineral development, and protecting that resource from encroachment by sensitive land uses. b) Support tourism, culture and arts by: • Recognising the ‘drivers’ of tourism, including natural values, heritage, food and wine, and local character; and • Providing for development of tourism products including accommodation.	The PAL policy has been considered, and the Amendment is consistent with it. The outcome of the rezoning provides an opportunity to directly support the further development and sustained maintenance of agricultural lands and their productivity to generate local jobs and wealth. The lime sands at Marshall Bay are a key mineral asset, as noted by the MRT mapping of Strategic Resources, for Flinders Island. The resource needs to be protected from sensitive uses, and can be accessed, utilised and managed in an environmentally appropriate manner. Extractive Industry is listed as a permitted use in the Rural zone with no specified use limitations. Notwithstanding this, the Rural zone does open other Use classes to the permitted and discretionary pathways. Extractive Industry is probably the highest level of use that the Site can sustain due to its locality, soil types and vegetation. Consideration of the other listed uses in the Rural zone as occurring on the Land (especially of Permitted Uses) is improbable given the financial limitations and isolated locality of the Site (being on an island, and in a remote location on that island). Aquaculture is not proposed. Forest practices are not proposed.
C.4.2 Goal 2: Liveability To promote liveability measures for social and community development and the betterment of healthy, strong and vibrant urban and rural settlements.		

Strategic Direction G2.1 Identify Urban Growth Areas to advance a sustainable urban settlement pattern.	Not directly applicable to the PSA.	
Strategic Direction G2.2 Plan for socio-demographic changes.	Not directly applicable to the PSA.	
Strategic Direction G2.3 Promote local character values.	Not directly applicable to the PSA.	
Strategic Direction G2.4 Enhance social inclusion.	c) Provide for a mix of integrated and complementary land use.	The Amendment will provide a land use that is complementary to agricultural use and supports social inclusion by creating employment for those people who want to live on the island.
C.4.3 Goal 3: Sustainability To promote greater sustainability in new development and develop stronger community resilience to social and environmental change.		
Strategic Direction G3.1 Promote and protect the Region's unique environmental assets and values.	a) Protect sensitive landforms and ecosystems, including coastal landforms and karst (limestone area shaped by erosion). b) Manage the relationship between development and impacts of natural hazards (for example salinity, land instability, acid sulfate soils, bushfire and flood potential, contamination). c) Protect the future capacity of the natural resource base including productive soils, minerals, hard rock and significant forest assets. d) Protect and manage available agricultural land for sustainable productive use and values.	The Amendment considers the management of the area of land within the coastal zone to ensure the sustainability of major ecosystems and natural processes. Slee (Attachment 5) found no evidence of a karst landform in the Site, nor any other coastal geomorphological or geological feature of such significance that its preservation must occur. The Amendment does not alter the existing management arrangements of natural hazards established by the LPS

	h) Preserve and protect areas of natural environmental significance, particularly: • Areas of biodiversity and important flora and fauna communities and threatened species; • Land and coastal areas sensitive to climate change, tidal and storm surges, rising sea levels and other natural hazards (including acid sulfate soils, bushfire and flooding); and • Regionally significant open space, scenic landscape amenity areas and outdoor recreation reserves	process, being the occurrence of mapped overlays for relevant codes such as landslip hazard and coastal erosion hazard. The zoning of the Land to Rural does not alter the applicability of the Natural Assets Code. The lime sands at Marshall Bay are a key mineral asset, as noted by the MRT mapping of Strategic Resources, for Flinders Island. It is a local natural resource that should be available as an input to agricultural use of land on Flinders Island. The extraction of lime sands to support agricultural use on Flinders Island is critical to keeping input costs low to the farming sector to keep it competitive locally and to other markets, such as Victoria. The extraction of the lime sands provides an end-to-end model of business infrastructure provision. It therefore provides lower costs than freighted equivalents, and the greater reliability of supply given it is on island, so its availability is not transport reliant.
Strategic Direction G3.2 Establish planning policies to support sustainable development, address the impacts of climate change, improve energy efficiency and reduce environmental emissions and pollutants.	a) Support good building design, reuse and recycling by: • Identifying known or foreseeable impacts of climate change, such as rising sea levels, flood risk and land instability, and adopting a precautionary approach to the location of new development.	The LPS already provides for the assessment of known or foreseeable impacts of climate change, such as rising sea levels, flood risk and land instability through a development application. The Amendment does not alter the existing management arrangements of natural hazards established by the LPS process, being the occurrence of mapped overlays for relevant codes such as landslip hazard and coastal erosion hazard.
C.4.4 Goal 4: Governance To provide cooperative and transparent leadership and regionally supportive local governance structures to advance integrated strategic land use objectives/ outcomes, including the goals, strategies and policies of the RLUS.		

Strategic Direction G4.1 Advance regional leadership.	This will be achieved by the following strategies - a) Adopt and implement best practice governance structures to provide strategic and innovative leadership within communities. b) Empower and engage communities to develop community 'visions', build community confidence and support acceptance of change.	The assessment of the PSA should be via the best practice governance structures implemented by the RLUS.
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C.3 ENVIRONMENTAL MANAGEMENT AND POLLUTION CONTROL ACT 1994 (EMPCA)

Because DA2023-038 involves a level 2 activity the Planning Authority was required to refer the proposal to the Board of the Environment Protection Authority (EPA) for assessment.

A comprehensive Environmental Impact Statement (EIS) was prepared for DA2023-038. The EIS provides further details of the environmental matters associated with the proposed use and development and it is this which formed the basis for the decision of the EPA. The EPA concluded that the proposal for an extractive industry on the Land is capable of being managed in an environmentally acceptable manner and meets the requirements of the Resource Management and Planning System (RMPS).

C.4 FLINDERS COUNCIL STRATEGIC PLAN 2021 TO 2031

A Strategic Plan is to be in respect of at least a 10-year period and guides the decision making of Council, resource allocations, and work plans of Council staff and is a means of communicating how Council will work to contribute to community ambitions, meet its governance obligations, provide leadership and set priorities.

Council identifies in the Strategic Plan that when setting our strategic priorities and decision making, Council will be guided by the following principles:

1. *Community Engagement* – encourage and value community contribution.
2. *Island Heritage and Character* – retain and enhance our heritage, cultural traditions and community spirit.
3. *Environment, Waste and Sustainable Land Use Practices* – value our unique natural environment and encourage sustainable industries, lifestyle and practices.
4. *Service Quality* – provide service excellence, efficiently and effectively, and within our means.
5. *Transparency* – make professional and transparent decisions, communicated and implemented in the interest of the Community.
6. *Governance and Financial Responsibility* – comply with government regulations and Council's guiding plans: Strategic Plan, Long-Term Financial Management Plan and Long-Term Asset Management Plan.
7. *Sustainability* – strive for sustainability in the social / community, economic / business, and built / natural environments.
8. *Continuous improvement* – Ensure ongoing, documented, continuous improvement processes.

The importation of required earth-based resources to support the island's biggest employer and economic driver seems counter-intuitive to the sustainability of the island and the broader objectives of the Strategic Plan.

Table 5. Comments in relation to the proposed Amendment and the Strategic Plan 2021-20231

Focus Area 1: Liveability		
WHAT COUNCIL WANTS TO ACHIEVE TOGETHER:	HOW COUNCIL PLANS TO DO IT:	AMENDMENT RELEVANT ITEMS FOR IMPLEMENTATION OF VISION
<i>1.1 A viable population that enables the necessary services and activities required for the Community to prosper.</i> <i>1.2 A harmonious and healthy community actively engaged in employment, recreation, volunteering, arts and culture.</i> <i>1.3 Development and land use planning guidelines that promote balance between our built and natural environments.</i> <i>1.4 Our natural environment protected and enhanced through land management activities.</i> <i>1.5 Reliable and sustainable water security that strengthens community resilience, public health, and environmental balance.</i>	1.1.1 Encourage and support an increased supply of housing for long-term residential rental and purchase. 1.1.2 Promote the islands' authentic lifestyle, business and entrepreneurial opportunities to attract 'working age' population and families. 1.1.3 Collaborate with stakeholders to enable a variety of training and employment opportunities, including local skills and knowledge sharing. 1.1.4 Support provision of services to attract families as residents e.g childcare services. 1.2.1 Provide recreational facilities and assist community groups to encourage an active and healthy lifestyle. 1.2.2 Maintain and develop partnerships with Arts and Cultural organisations and support activities, projects and events that provide opportunities for community involvement and creative expression. 1.3.1 Promote and support sustainable activities to conserve the islands' natural and agricultural environments.	Items 1.1.1, 1.1.2, and 1.1.3 Agricultural activity generates employment and therefore can attract workers and their families to the island to invest in housing stock. Economic activity generates entrepreneurial opportunities and possibly training opportunities for service providers and recipients. Item 1.3.1 Agricultural potential and the value the land can generate in livestock and produce is reliant on sustainable soil nutrition and maintenance of productivity. Agriculture is also a critical employment and income generation activity on Flinders Island, so its longevity is of paramount importance to the social and economic well-being of the island. Off-island supplies of lime are costly due to high freight charges which in the medium to long-term undermines the economic viability of agriculture on the island. That is, if lime is expensive then it is likely that inadequate levels would be used by agricultural operators (due to cost) that then has a long-term negative impact to the overall soil health and potential of agricultural lands to produce food.

	1.3.1 Develop a current Flinders Structure Plan for the Municipality. 1.4.1 Develop and implement strategies to reduce the risks of flood inundation. 1.5.1 Promote sustainable water use through education and awareness campaigns. 1.5.2 Collaborate with stakeholders to strengthen water security and prepare for climate change impacts.	
Focus Area 2: Infrastructure and Services		
WHAT COUNCIL WANTS TO ACHIEVE TOGETHER:	HOW COUNCIL PLANS TO DO IT:	AMENDMENT RELEVANT ITEMS FOR IMPLEMENTATION OF VISION
<i>2.1 Quality public infrastructure, roads and footpaths.</i> <i>2.2 Safe and reliable air and sea access to the islands.</i> <i>2.3 Council assets/land maintained and utilised effectively.</i> <i>2.4 Compliant, integrated waste management program that is cost-effective.</i> <i>2.5 Compliant treatment and disposal of wastewater</i>	2.1.1 Maintain a network of safe roads and pedestrian pathways that recognises the changing needs of the Community. 2.1.2 Create townships that are attractive and welcoming through improvements to community infrastructure. 2.2.1 Review and update the Flinders Airport Masterplan. 2.2.2 Engage with key stakeholders to support and improve commercial and community sea access. 2.1.3 Develop and implement a Council Land Strategy to ensure land is utilised effectively. 2.3.2 Finalise and implement the Asset Management Plan, maintenance schedules and disposal procedures to meet audit and governance requirements.	These operational and financial management matters are not directly relevant to the Amendment.

<i>2.6 A modern and equitable freight system that supports affordability and access for island communities.</i>	2.4.1 Review and implement Council's Waste Management Strategy in line with relevant legislation, codes of practice and policy. 2.5.1 Collaborate with TasWater to provide an integrated septic and sewerage system for Flinders Island. 2.6.1 Advocate for an updated freight equalisation scheme that includes both air and sea freight across all industries. 2.6.2 Lobby for the inclusion of a CPI index to ensure Freight Equalisation remains responsive to rising costs.	
Focus Area 3: Economy and Business		
WHAT COUNCIL WANTS TO ACHIEVE TOGETHER:	HOW COUNCIL PLANS TO DO IT:	AMENDMENT RELEVANT ITEMS FOR IMPLEMENTATION OF VISION
<i>3.1 Ongoing opportunities across all business sectors to future-proof the critical needs of the islands.</i> <i>3.2 Sustainable and alternative energy opportunities embraced.</i> <i>3.3 A visitor economy that embraces regenerative tourism principles.</i>	3.1.1 Support and encourage innovation in business and industry through partnerships, infrastructure provision and support services. 3.1.2 Encourage diversity in agricultural endeavours to future-proof food security for the islands. 3.1.3 Advocate federal and state governments for improved availability of critical services and industries on the islands to benefit the Community and economy. 3.2.1 Engage with relevant partners to explore renewable energy options, including opportunities to turn waste streams into energy. 3.3.1 Encourage and support positive impact and regenerative visitor experiences that create conditions for people and places to thrive.	Item 3.1.2 The Amendment facilitates the additional supply of lime sands, both to the landowner for their large farming activity and to the broader community for lime sand access. Agriculture underpins the island economy, and its diversification and intensification would benefit from further lime sand access and security of inter-generational supply.

Focus Area 4: Good Governance		
WHAT COUNCIL WANTS TO ACHIEVE TOGETHER:	HOW COUNCIL PLANS TO DO IT:	
4.1 <i>An organisation that provides good governance, effective leadership and high-quality services, within our means.</i> 4.2 <i>Skilled, committed, and professional employees in a supportive environment.</i>	4.1.1 Council meets its statutory obligations to manage risk, achieve financial sustainability and model good governance. 4.1.2 Improve communication channels between Council and Community to foster greater community participation and outcomes. 4.1.3 Provide effective and timely incident and emergency management planning and response. 4.1.4 Collaborate with King Island Council, other councils, and stakeholders to improve efficiencies and advocacy. 4.2.1 Maintain a framework for staff performance management, training, and safety.	These operational and financial management matters are not directly relevant to the Amendment.

C.5 STRUCTURE PLAN (2016 DRAFT)*STATUS OF THE STRUCTURE PLAN*

It's noted the Act makes no reference (nor requirement) that any matters in a Council structure plan (or plans) are to be used as a direction for amendments (specifically, these plans are not identified at s34 of the Act as a relevant consideration in the LPS criteria). There is no requirement that a structure plan be amended because of a zone amendment. On this basis, we do not see any relevance of the Structure Plan to the Amendment.

The above noted, to avoid as far as possible an appeal, the following is submitted.

The **draft Flinders Structure Plan 2016** states –

'The Structure Plan seeks to provide the basis and direction to satisfy this test. It is likely that most local area provisions will rely on s32(4)(b).

Thus [sic] the Structure Plan has the key purpose of highlighting local land use priorities with the concurrent aim of supporting a sustainable future for the Flinders Municipality.'

AMENDMENT AND THE STRUCTURE PLAN

The Amendment seeks to install a permissible pathway for an Extractive Industry Use on selected lots to extract lime sands for use in agriculture on the island.

The Structure Plan (pg.) notes for agriculture –

'Agriculture, in the form of the pastoral related activity is vital to the municipal economy. In 2010, ABS reported a gross value of agricultural production on Flinders Island totalling \$14 million. In 2008 there were 58 agricultural holdings running 119,159 head of sheep for meat and wool and 75 holdings running 20,032 head of meat cattle. There was also 1,119 hectares of pasture for cereal or hay. Since then, there has been a significant increase in the number of cattle and a reduction in sheep.⁵; and

'It is therefore important for the planning scheme to facilitate opportunities for diversification of the rural economy. Flinders Island already produces garlic, olive oil, honey, chillies and wine as well as agricultural products for the local market. Expansion of 'niche market' products and adding value to those products by some form of processing is a critical element of the Council's strategy to diversify the economy and is considered to be a fundamental strategic pillar of the new planning scheme.'

The s40T application is clearly consistent with the existing *draft Flinders Structure Plan* because it is logical to say that the same considerations (s34 criteria) ought to apply to the s40T application as they did to the DRAFT LPS assessment. That is, the *draft Flinders Structure Plan* was actively used by the TPC to justify its Decision to rezone those lands that support a Mining Lease to a zone where Extractive Industry was permissible as detailed below –

1. retain the Landscape Conservation Zone for the area now covered by Mining Lease 2117P/M because it was not in force at the time of the Decision; and to

⁵ AK Consultants 2010 Agricultural Profile Flinders Municipality

2. alter the Draft LPS to revise the zoning of the following properties to Rural:

- 2270 Palana Road, Lughrata folios of the Register 160313/1 and 154620/2;
- Palana Road, Lughrata folios of the Register 141842/1 and 141842/2;
- That part of 634 Palana Road, Whitemark folio of the Register 182299/2 that previously contained in folio of the Register 245509/1; and
- Harleys Road, Whitemark folio of the Register 176057/2.’.

All these properties are in Marshall Bay to which the statement in the *draft Flinders Structure Plan 2016* has been applied in the Decision (emphasis added) –

‘There are locations where loss of vegetation is unacceptable, for example, Marshall Bay where intensification of development is not warranted and where grazing is encouraged to reduce and ultimately cease as a use. The land adjacent to the length of Marshall Bay is potentially subject to extreme erosion and the Tasmanian land classification (Classification 6-7) confirms its unsuitability for grazing. An allotment near the Long Point Road and Palana Road intersection, Centre Hill and two Quoin allotments have the highest density of listed threatened species on the island.’

It is submitted ‘Marshall Bay’ is a very large area and includes numerous zones, including the LC and Rural zones. The application of zones to each lot within the Marshall Bay area in the Decision was driven by the *presence* of a Mining Lease (in force) on those lots at the time the Decision was made. For example, the zoning of land at Marshall Bay [2270 Palana Road, Lughrata folios of the Register 160313/1 and 154620/2; Palana Road, Lughrata folios of the Register 141842/1 and 141842/2;] to Rural in the Decision is in stark contrast to the retention of the LCZ on nearby land which lacked a Mining Lease coverage.

Now that Mining Lease 2117P/M is in force for parts of the lots in the amendment, and supported by a s40T application, the rezoning of the land to Rural is consistent with the reasons for the Decision. That is, the Structure Plan is the strategy used by the Decision to justify the zoning of Rural for lots with a Mining Lease; the same process applies here, as the land proposed to be rezoned is now covered by a Mining Lease. For these reasons, the Amendment does not seek to amend or modify the Structure Plan because it does not need to be.

C.6 APPLICATION OF SECTION 8A GUIDELINE NO.1

The purpose of the document ‘Section 8A Guideline No.1 Local Provisions Schedule Zone and Code Application’ issued by the Tasmanian Planning Commission (the ‘Guideline’) is to provide an easy reference guide for the application of all zones and codes for the –

- (1) preparation of draft Local Provisions Schedules (LPSs); and
- (2) amendments to LPSs.

Clauses 5.0 and 6.0 of Guideline provides detailed Local Provisions Schedule (LPS) application instructions for the State Planning Provisions (SPPs) zones and codes.

Clause 3.4 is directive in the use of the Guideline –

‘The primary objective in applying a zone should be to achieve the zone purpose to the greatest extent possible. Reference may also be made to the ‘allowable minimum lot size’ in the Acceptable Solution, unless there is a Performance Criterion that specifies an absolute minimum, in the subdivision standards for the zone to understand the density that is allowable.’

The Guideline itself is relevant to the PSA because it proposes to rezone land; Landscape Conservation to Rural because an Extractive Industry Use Class is **Prohibited** in the LCZ.

Of importance is the Guideline states that the **primary objective in applying a zone** should be to achieve the zone purpose to the greatest extent possible. Hence, it is unlikely that the retention of a zone to which a Use Class is prohibited could simply be addressed by the application of a SSQ within that zone – the zone purpose would be inconsistent with the use Class of the activity which the SSQ sought to ‘make permissible’. This is especially so for a use that is not existing (i.e. there are no existing use rights), nor does it have a permit issued prior to the LPS being declared.

Table 6 provides a full list of the zones in the TPS and commentary on whether an *Extractive Industry* use is, may be, or is compatible with the zone purpose, which is largely driven by its Use Table status (i.e., Prohibited, Discretionary, Permitted) for each zone.

Noting that the Guideline directs the primary objective in applying a zone is to achieve the zone purpose to the greatest extent possible (noting that the zone purpose is not necessarily limited to either **use** or **development**), it could be said that an Extractive Industry has been specifically excluded as a **use** from the LCZ because it does not achieve the zone purpose (even to a moderate extent). This proposition is consistent with the Decision in how the Rural zone was applied to lots which supported a Mining Lease at the time of the Decision and those that did not.

RURAL ZONE

The purpose of the Rural Zone is:

To provide for a range of use or development in a rural location:

20.1.1

- (a) where agricultural use is limited or marginal due to topographical, environmental or other site or regional characteristics;
- (b) that requires a rural location for operational reasons;
- (c) is compatible with agricultural use if occurring on agricultural land; and
- (d) minimises adverse impacts on surrounding uses.

20.1.2 To minimise conversion of agricultural land for non-agricultural use.

20.1.3 To ensure that use or development is of a scale and intensity that is appropriate for a rural location and does not compromise the function of surrounding settlements.

Table 6. Assessment of Zone suitability for an Extractive Industry as proposed.

ZONE NUMBER AND NAME	POSSIBLE ZONE FOR EXTRACTIVE INDUSTRY	COMMENTS
8.0 General Residential Zone	No	Residential use focused zone.
9.0 Inner Residential Zone	No	Residential use focused zone.
10.0 Low Density Residential Zone	No	Residential use focused zone.
11.0 Rural Living Zone	No	Residential use focused zone.
12.0 Village Zone	No	Residential use focused zone.
13.0 Urban Mixed Use Zone	No	Business and commercial oriented use zone.
14.0 Local Business Zone	No	Business and commercial oriented use zone.
15.0 General Business Zone	No	Business and commercial oriented use zone.
16.0 Central Business Zone	No	Business and commercial oriented use zone.
17.0 Commercial Zone	No	Business and commercial oriented use zone.
18.0 Light Industrial Zone	No	Industrial activity-oriented use zone.
19.0 General Industrial Zone	No	Heavy industrial activity-oriented use zone.
20.0 Rural Zone	Yes	
21.0 Agriculture Zone	Yes	The purpose of the zone is to protect agricultural use to a greater extent that is allowed in the Agricultural zone
22.0 Landscape Conservation Zone	No	Natural value and landscape protection-oriented zone.
23.0 Environmental Management Zone	No	While the land is private freehold (to which the zone can apply based on the Guideline), not public, this zone is not suitable because it refers to a statutory management plan.

24.0 Major Tourism Zone	No	
25.0 Port and Marine Zone	No	
26.0 Utilities Zone	No	
27.0 Community Purpose Zone	No	
28.0 Recreation Zone	No	
29.0 Open Space Zone	No	
30.0 Future Urban Zone	No	

USE TABLE (CLAUSE 20.2)

Extractive Industry is listed as a permitted use in the Rural zone with no specified use limitations. Extractive Industry is probably the highest level of use that the Site can sustain due to its locality, soil types and vegetation.

Consideration of the other listed uses as occurring on the Land (especially of Permitted Uses) is improbable given the financial limitations and isolated locality of the Site (being on an island, and in a remote location on that island).

Use Class	Qualification
No Permit Required	
Natural and Cultural Values Management	
Passive Recreation	
Resource Development	
Utilities	If for minor utilities.
Permitted	
Business and Professional Services	If for: (a) a veterinary centre; or (b) an agribusiness consultant or agricultural consultant.

Domestic Animal Breeding, Boarding or Training	
Educational and Occasional Care	If associated with Resource Development or Resource Processing.
Emergency Services	
Extractive Industry	
Food Services	If associated with Resource Development or Resource Processing.
General Retail and Hire	If associated with Resource Development or Resource Processing.
Manufacturing and Processing	If for the processing of materials from Extractive Industry.
Pleasure Boat Facility	If for a boat ramp.
Research and Development	If associated with Resource Development or Resource Processing.
Residential	If for: (a) a home-based business in an existing dwelling; or (b) alterations or extensions to an existing dwelling.
Resource Processing	
Storage	If for: (a) a contractors yard; (b) freezing and cooling storage; (c) grain storage; (d) a liquid, solid or gas fuel depot; or (e) a woodyard.
Utilities	If not listed as No Permit Required.
Visitor Accommodation	If for guests accommodated within an existing building.
Discretionary	
Bulky Goods Sales	If for: (a) a supplier for Extractive Industry, Resource Development or Resource Processing; (b) a garden and landscaping materials supplier;

	(c) a timber yard; or (d) rural supplies.
Business and Professional Services	If not listed as Permitted.
Community Meeting and Entertainment	
Crematoria and Cemeteries	
Custodial Facility	
Educational and Occasional Care	If not listed as Permitted.
Food Services	If not listed as Permitted.
General Retail and Hire	If not listed as Permitted.
Manufacturing and Processing	If not listed as Permitted.
Motor Racing Facility	
Pleasure Boat Facility	If not listed as Permitted.
Recycling and Waste Disposal	
Research and Development	If not listed as Permitted.
Residential	If for a single dwelling and not restricted by an existing agreement under section 71 of the Act.
Service Industry	If associated with Extractive Industry, Resource Development or Resource Processing.
Sports and Recreation	
Storage	If not listed as Permitted.
Tourist Operation	
Transport Depot and Distribution	
Visitor Accommodation	If not listed as Permitted.
Prohibited	
All other uses	

PART D - CONCLUSION

The intended outcome of the PSA is to establish a zone on on the Site (i.e., the Mining Lease that is in force) that makes the extraction of lime sands and associated infrastructure a **permissible** use to support the agricultural sector on Flinders Island. An Extractive Industry is **Prohibited** in the LCZ.

The approval of the PSA would substantially contribute to securing the economic and social well-being of the local Flinders Island population, because it unlocks an on-island important natural resource that will avoid off-island dependence for inputs, which otherwise add cost to enterprises and an off-island flow of funds. The cost of bringing lime sand onto the island is not a viable and sustainable proposition for the agricultural industry.

Sustainable development as defined in the Act can be achieved (by managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –

- (a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and [access to lime sands and other earth-based resources are necessary to meet the needs of roads, construction materials, agricultural inputs, etc.]
- (b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and these are managed by the application of various Acts, such as the *Mineral Resources Development Act 1995*, *Forest Practices Act 1985*, *Environmental Management and Pollution Control Act 1994*, etc.]
- (c) avoiding, remedying or mitigating any adverse effects of activities on the environment. through the application of various Acts such as the *Mineral Resources Development Act 1995*, and, *Environmental Management and Pollution Control Act 1994*, and the planning scheme provisions.

The Amendment should be approved as the RMPS objectives have been achieved and it complies with the LPC criteria.

PART E - ATTACHMENTS

ATTACHMENT 1 OWNERS CONSENT AND AUTHORISATION TO ACT

Form No. 1

Owners' consent

Requests for amendments of a planning scheme or Local Provisions Schedule and applications for combined permits require owners' consent. This form must be completed if the person making the request is not the owner, or the sole owner.

The person making the request must clearly demonstrate that all owners have consented.

Please read the notes below to assist with filling in this form.

1. Request made by:

Name(s):

MARKARNA GRAZING COMPANY PTY LTD

Email address

cynthia.adams@adamsgroup.com.au

Contact number:

(03) 9333 2400

2. Site address:

Address:

'Markarna Park'
368 FIVE MILE JIM RD MEMANA TAS 7255

Property identifier (folio of the Register for all lots, PIDs, or affected lot numbers on a strata plan):

PID 3513143
(the whole of CT215120/1, CT230282/1, and CT120064/1)

3. Consent of registered land owner(s):

Every owner, joint or part owner of the land to which the application relates must sign this form (or a separate letter signed by each owner is to be attached).

Consent to this request for a draft amendment/and combined permit application is given by:

Registered owner :

MARKARNA GRAZING COMPANY PTY LTD

Property identifier (folio of the Register for all lots, PIDs, or affected lot numbers on a strata plan):

PID 3513143 (the whole of CT215120/1, CT230282/1, and CT120064/1)

Position
(if applicable):

DIRECTOR.

Signature:

~~S. Lamm.~~

Date:

19.6.2023.

Registered owner
(please print):

Property identifier (folio of the Register for all lots, PIDs, or affected lot numbers on a strata plan):

Position
(if applicable):

DIRECTOR.

Signature:



Date:

19.6.2023

Registered owner
(please print):

Property identifier (folio of the Register for all lots, PIDs, or affected lot numbers on a strata plan):

Position
(if applicable):

Signature:

Date:

NOTES:**a. When is owners' consent required?**

Owners' consent is required for:

- amendments to an interim planning scheme or to a Local Provisions Schedule¹; or
- combined permits and amendments².

Owners' consent must be provided before the planning authority determines to initiate, certify or prepare the amendment.

b. Who can sign as owner?

Where an owner is a natural person they must generally sign the owner's consent form personally.

Where an owner is not a natural person then the signatory must be a person with legal authority to sign, for example company director or company secretary.

If the person is acting on behalf of the owner under a legal authority, then they must identify their position, for example trustee or under a power of attorney. Documentary evidence of that authority must also be given, such as a full copy of the relevant Trust Deed, Power of Attorney, Grant of Probate; Grant of Letters of Administration; Delegation etc.

Please attach additional pages or separate written authority as required.

c. Strata title lots

Permission must be provided for any affected lot owner and for common property for land under a strata title under the *Strata Titles Act 1998*. For common property, permission can be provided in one of the following ways:

- i. a letter affixed with the body corporate's common seal, witnessed by at least two members of the body corporate (unless there is only one member, in which case the seal must be witnessed by that member) and which cites the date on which the body corporate or its committee of management met and resolved to give its consent to the application; or,
- ii. the consent of each owner of each lot on the strata plan.

d. Companies

If the land is owned by a company the form is to be signed by a person with authority in accordance with the *Corporations Act 2001 (Cwth)*.

e. Associations

If the land is owned by an incorporated association the form is to be signed by a person with authority in accordance with the rules of the association.

f. Council or the Crown

If the land is owned by a council or the Crown then form is to be signed by a person authorised by the relevant council or, for Crown land, by the Minister responsible for the Crown land, or a duly authorised delegate.

The name and positions of those signing must be provided.

Effective Date: September 2021

¹ under section 33(1) of the former provisions of the *Land Use Planning and Approvals Act 1993* or section 37 of the current provisions.

² under section 43A of the former provisions or section 40T of the current provisions of the Act



4 Davies St (PO Box 40)
Whitemark, Flinders Island, Tas, 7255
www.flinders.tas.gov.au

P (03) 6359 5001
F (03) 6359 2211

ABN: 75 754 974 669

AUTHORISATION TO ACT AS AGENT

Property Address	'Markarna Park', 368 FIVE MILE JIM RD MEMANA TAS 7255
Title Reference	CT215120/1, CT230282/1, and CT120064/1
Proposed Development	Extractive Industry - extract lime sand (incl screening), max 10,000 cu m/annum, storage shed (incl crib room), septic system and ancillary infrastructure

I/We GEORGE ADAMS

Hereby grant authorisation for Van Diemen Consulting Pty Ltd

To act on my/our behalf regarding planning, building, and plumbing applications for the proposed work at the above-mentioned property.

Owner

Name: (Print)

GEORGE ADAMS

Signed:

[Signature]

Date:

19.6.2023.

ATTACHMENT 2 CERTIFICATE OF TITLES

OWNER		PLAN OF TITLE LOCATION FLINDERS./LUGHRATA		REGISTERED NUMBER P 120064
FOLIO REFERENCE C.T. 2914/ 55				APPROVED 16 AUG 1995 <i>Michael Simon</i> Recorder of Titles
GRANTEE		FIRST SURVEY PLAN No.	SCALE 1: 900 LENGTHS IN METRES	
COMPILED BY L T O				
MAPSHEET MUNICIPAL CODE No.	LAST UPI No.	LAST PLAN No.	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN	

BALANCE PLAN

SEARCH OF TORRENS TITLE

VOLUME 120064	FOLIO 1
EDITION 4	DATE OF ISSUE 14-May-2015

SEARCH DATE : 10-Apr-2023

SEARCH TIME : 04.46 PM

DESCRIPTION OF LAND

Parish of LUGHRATA, Land District of FLINDERS
Lot 1 on Plan 120064
Derivation : Whole of Lot 25441 Gtd to T McKenzie
Prior CT 2914/55

SCHEDULE 1

C829114 TRANSFER to MARKARNA GRAZING COMPANY PTY LTD
Registered 27-Nov-2007 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
E10087 MORTGAGE to Australia and New Zealand Banking Group
Limited Registered 14-May-2015 at 12.05 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

K.P. 312

2580

64

ANNEXURE TO CERTIFICATE OF TITLE VOL.

FOL.

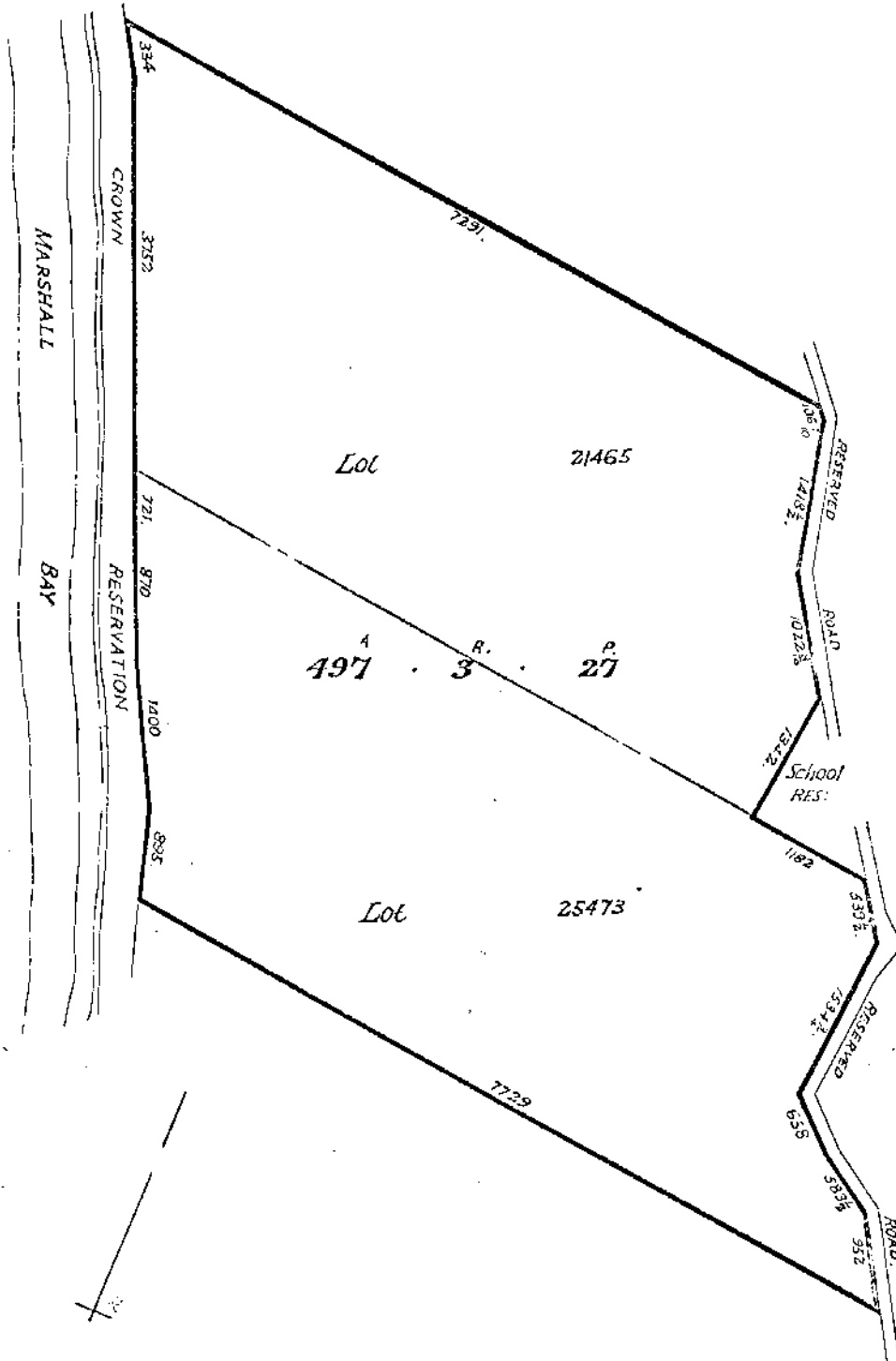
REGISTERED NUMBER

215120

Murthinsons
Recorder of Titles



Lot 1 of this plan consists of all the land comprised in the above-mentioned cancelled folio of the Register.



SEARCH OF TORRENS TITLE

VOLUME 215120	FOLIO 1
EDITION 4	DATE OF ISSUE 14-May-2015

SEARCH DATE : 10-Apr-2023

SEARCH TIME : 04.47 PM

DESCRIPTION OF LAND

Parish of LUGHRATA, Land District of FLINDERS

Lot 1 on Plan 215120

Derivation : Whole of Lots 21465 and 25473 Gtd. to C.J.
Robinson & J.H. Thompson respectively.

Prior CT 2580/64

SCHEDULE 1C829114 TRANSFER to MARKARNA GRAZING COMPANY PTY LTD
Registered 27-Nov-2007 at noonSCHEDULE 2Reservations and conditions in the Crown Grant if any
E10087 MORTGAGE to Australia and New Zealand Banking Group
Limited Registered 14-May-2015 at 12.05 PMUNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

REF. NO.

ANNEXURE TO CERTIFICATE OF TITLE

VOL.

FOL.

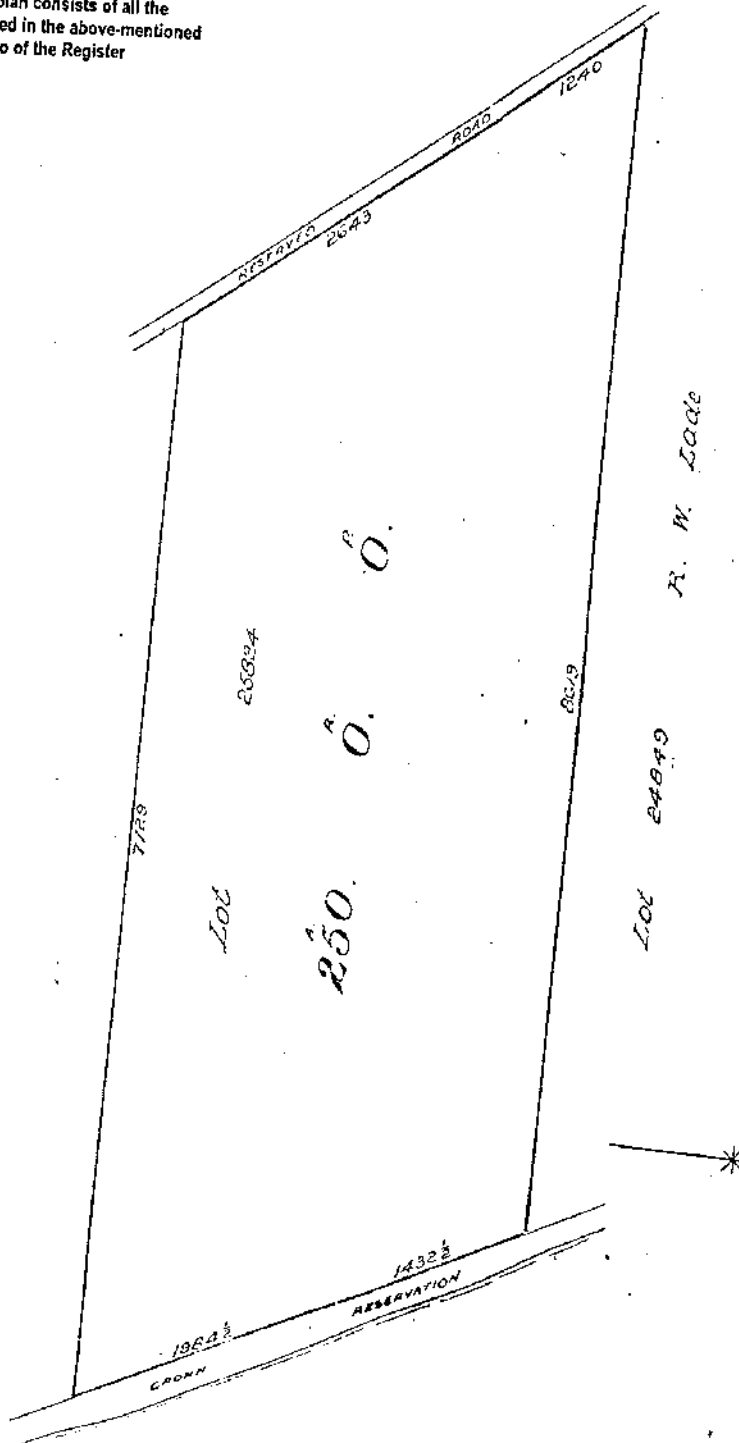
REGISTERED NUMBER

230282

Recorder of Titles



Lot 1 of this plan consists of all the land comprised in the above-mentioned cancelled folio of the Register



NO. 1

SEARCH OF TORRENS TITLE

VOLUME 230282	FOLIO 1
EDITION 4	DATE OF ISSUE 14-May-2015

SEARCH DATE : 10-Apr-2023

SEARCH TIME : 04.47 PM

DESCRIPTION OF LAND

Parish of LUGHRATA, Land District of FLINDERS

Lot 1 on Plan 230282

Derivation : Whole of Lot 25824 Gtd. to J.R. Robinson.

Prior CT 2992/93

SCHEDULE 1

C829114 TRANSFER to MARKARNA GRAZING COMPANY PTY LTD

Registered 27-Nov-2007 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

E10087 MORTGAGE to Australia and New Zealand Banking Group

Limited Registered 14-May-2015 at 12.05 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

ATTACHMENT 3 SIGNIFICANCE OF LIME SANDS TO AGRICULTURE ON FLINDERS ISLAND

RFI ITEM 4**Why is lime sand used for agricultural production?**

Soil acidification is a naturally occurring process which is influenced by soil type, organic matter, fertiliser usage, rainfall, and farming practices. Most of Tasmania's soils are naturally acidic, which compounds the problem of acidification.

Lime sands (material rich in calcium carbonate – CaCO_3) reduce acidity by neutralising the acid reaction in soils. The carbonate component of lime consumes hydrogen ions present in the soil solution and in doing so raises soil pH. The higher the Effective Neutralising Value (ENV) the more reactive the lime product is within the soil and the greater its ability for unit volume to neutralise acidity.

'Liming' is the only cost-effective way to manage low soil pH. It prevents loss of production and profitability in farming systems and reverses acidification. Lime is usually applied on the surface several months before sowing pasture or crops to allow time for the lime to react in the soil. Incorporation of the lime into the soil is recommended for the quickest results, as lime does not move readily down through the soil profile.

Commonly used liming materials include for example –

1. Agricultural lime - Crushed and sieved natural limestone is mainly calcium carbonate. It is safe, cheap and effective.
2. Lime sand - Lime sand is mined from natural deposits and is mainly calcium carbonate. It is safe and cheap but can on occasion be coarser and slower reacting than agricultural lime.
3. Dolomite - A mixture of calcium and magnesium carbonates. It is particularly valuable where magnesium is low.
4. By-product lime - This is a by-product from the production of soda ash. It contains mostly calcium carbonate, but with some calcium oxide and hydroxide.

Over time soil pH decreases, with the rate of pH decline being quicker in light textured soils that have low organic matter. The processes which reduce pH levels in agricultural soils are primarily –

1. Organic matter accumulation which causes organic acids;
2. Removal of plant and animal material containing large amounts of cations (calcium, magnesium and potassium);
3. Leaching of cations due to high rainfall;
4. Leaching of nitrate and nitrogen from the root zone; and/or
5. The application of soil-acidifying fertilisers.

The acidification of agricultural land is potentially a serious land degradation issue and without addressing the issue, agricultural productivity and sustainability will be negatively affected. The key issues which are caused by soil acidification are:

- A decrease in the availability of nutrients to plants;
- Increasing the toxicity of aluminium and manganese;
- Decreasing soil biological functions;

- Reduce the ability for legumes to fix nitrogen; and
- Make the soil more vulnerable to soil structure decline and erosion.

The importance of agricultural production to Flinders island

Agriculture is a critical employment and income generation activity on Flinders Island, so its longevity is of paramount importance to the social and economic well-being of the island. The size of the agriculture sector on Flinders Island is however not easily ascertained.

Island wide agricultural sector

Approximately half (46,600 ha) of the island is under agricultural production, with dryland pasture supporting beef cattle grazing being the dominant enterprise⁶.

In 2010, AK Consultants produced a report for the Flinders Island Council which stated in 2008 there were 58 holdings running 119,159 head of sheep and 75 holdings running 20,032 head of cattle. The gross value of agricultural production on Flinders Island at that time was reported to be \$14m.

In terms of measuring the *Dry Sheep Equivalent* (“DSE”) of Flinders Island at that time and using an average figure of 10 DSE per head of cattle, the above figures suggest the Island’s agricultural industry at the time was carrying 320,000 DSE. The industry has grown since then.

Currently, a large cattle property is for sale on Flinders Island which claims to have a carrying capacity of 75,000 DSE and lays claim to covering over 10% of the arable area on Flinders Island. This property has seen a high level of investment in infrastructure and fertiliser over the years, and its DSE per hectare would be above many other smaller producers on the Island. Therefore, suggesting a 750,000 DSE for the whole Island would be an overstated estimate.

Most likely, the stocking capacity of the agricultural industry on Flinders Island today would be around 500,000. However, anecdotal evidence would suggest that smaller producers aren’t able to stock their properties to optimal levels, and it seems unlikely that the agricultural industry on Flinders Island would ever see pastures stocked to 500,000 DSE.

It’s accepted that in an average season, prime pastures on Flinders Island (like those operated by Markarna) can sustain a DSE of 14-15 – say 15 per hectare. In the absence of any scientific data, a diminishment in pasture growth where no Lime Sand or Superphosphate is applied could be said to be 4-5% per year cumulatively.

From a DSE of 15 per Hectare on an ideally fertilised pasture, the DSE would fall to 14.25 after a year, to 13.5 after two years, to 12.9 after three years and to 12.2 at the end of four years.

RMCG (2022) note of the soils on Flinders Island –

‘The island’s soils are highly variable, ranging from acidic sandy loam over Podzols and poor draining sodic Kurozols, to sandy, alkaline Calcarozols and shallow Rudzols with limited organic matter. This variability and its impact on pasture and subsequent meat production and profitability, present a range of soil management challenges to maintaining their economic and environmental sustainability. One key consideration is the challenge and cost of bringing farming inputs and technologies to the island. The inputs and management

⁶ RMCG (2022). Flinders LPS Rural Enterprise Concept Report. 5 January 2022.

options are market driven. This results in a greater emphasis to achieve economies of scale to be able to justify the inputs.’

As noted by RMCG ‘challenge and cost of bringing farming inputs and technologies to the island’, off-island supplies of lime are costly due to high freight charges which in the medium to long-term undermines the economic viability of agriculture on the island. That is, if lime is expensive then it is very likely that inadequate levels would be used by agricultural operators (due to cost) which then has a long-term negative impact to the overall soil health and potential of agricultural lands to produce food. A lessening of soil fertility and optimal growth characteristics will reduce productivity.

The FLPS Supporting Report⁷ notes that under the current Flinders Planning Scheme, the Rural Zone applies to 75,338 hectares or 94.1% of all freehold and Crown lease land within the local government area. There is no distinction between high productivity agricultural land and other rural land within the current Flinders Planning Scheme.

The FLPS Supporting Report also states (citing references in that document) that (my emphasis) –

‘Within the Flinders Municipality there is no prime agricultural land. 79% of land on Flinders Island is class 5. There are small pockets of class 4 land representing 4% of the total of Flinders Island. Class 6 or 7 land represents 16%. **The land capability and nominal irrigation potential reinforces broad acre grazing enterprises as the highest agricultural use on Flinders Island.** This is supported by the value of agricultural commodities for the Flinders Municipality in the year ended 2016: slaughtered livestock represented 89% of the \$22,371,148 total agricultural product. The remainder was wool and hay for animal production.’

Despite ‘low quality’ land, the island has enjoyed significant island activity, and hence agriculture must be the focus of any regional strategy. The significance of Agriculture to the island economy has been clearly recognised in the Flinders Island Structure Plan.

The FLPS Supporting Report⁸

‘Consistent with the NTRLUS expectation that “..the Furneaux Group are more reliant on local strategies for Rural Residential Areas and the protection of agricultural land that respond to the complexities of remote area economics and the need to retain or increase population and visitation”, the proposal on Flinders Island is to convert some non-prime agricultural land from the current Rural Zone to one of four main SPP zones.’

This statement is critical to why agricultural land and associated activities (that may occur on non-agricultural or low agricultural lands) need to be further and better maintained in the relevant zones. Remote area economics are transport driven, which is often a high proportion of cost – it is simply logical to deliver a local zone that facilitates access to agriculture dependent inputs (e.g., lime sands, rock for farm road and track infrastructure) that should be accessed on-island in favour of costly off-island inputs.

Markarna Grazing Company Pty Ltd

The Marshall Bay land parcels owned by Markarna Grazing Company Pty Ltd (‘Markarna’) were specifically purchased to provide ongoing lime sands for the agricultural lands on the property and associated properties, and to also provide some for sale to other agricultural enterprises on the island. The existing but now disused

⁷ Flinders Local Provisions Schedule Supporting Report, November 2020 and Revised April 2021

⁸ p.53

pit (which is the starting location for the new pit) was once used by many islanders to access lime sand due to its ease of access to obtain and extract high ENV lime sand for agricultural land application. Sands will also be used to supply concrete production activities because most sand for such a purpose is brought to the island.

The agricultural activity of Markarna is the largest operation on Flinders Island, and agriculture is the largest private economic sector on Flinders Island. Any diminishment in the output and investment by Markarna will have a marked negative effect on the Flinders Island economy and broader community.

As set out for reasons mentioned above, the approval and subsequent operation of the lime pit sought by Markarna will not result in any material increase in capital investment, employment or income on Flinders Island.

Some product produced from the lime pit (product in excess of Markarna's own needs) may be sold to other Island graziers. Depending upon how much product they're currently selling, this may have no impact on the two other lime pit operators, or it could possibly cause them to reduce their prices. Even so, the price of Lime Sand at the pit gate from an on-island source is only 20% of the overall cost to have Lime Sand spread on paddocks so the benefit to producers in seeing a reduction in the pit gate price from an on-island source is minimal.

The costs of 'liming' options to graziers on Flinders Island are provided in the report by Dr Lee Peterson – forms part of **Attachment 4**.

The financial impact if Markarna cannot replace the supply of Lime Sand from the "new" pit when its existing site is exhausted is that the profitability of its operations will suffer as its pastures progressively deteriorate and the carrying capacity of those pastures progressively declines. Because of the negative financial effect this will cause, Markarna would also find it increasingly more difficult to justify the investment of more capital into the property.

The financial implications are provided in the report by Dr Lee Peterson – forms part of **Attachment 4**.

In summary, the approval sought by Markarna to establish the "new" lime pit, is highly unlikely to provide a *boost* to the Flinders Island economy in the immediate term and is possibly unlikely to do so in the medium/longer term either. Rather, the approval sought by Markarna will allow it to continue its existing operations at current levels (and hopefully increase them incrementally over time).

ATTACHMENT 4 RFI RESPONSE ITEMS 4 AND 13

Background – Agriculture on Flinders Island

The size of the agriculture sector on Flinders Island is not easily ascertained.

In 2010, AK Consultants produced a report for the Flinders Island Council which stated in 2008 there were 58 holdings running 119,159 head of sheep and 75 holdings running 20,032 head of cattle. The gross value of agricultural production on Flinders Island at that time was reported to be \$14m.

In terms of measuring the Dry Sheep Equivalent (“DSE”) of Flinders Island at that time and using an average figure of 10 DSE per head of cattle, the above figures suggest the Island’s agricultural industry at the time was carrying 320,000 DSE. The industry has grown since then.

Currently, a large cattle property is for sale on Flinders Island which claims to have a carrying capacity of 75,000 DSE and lays claim to covering over 10% of the arable area on Flinders Island. Markarna has seen a high level of investment in infrastructure and fertiliser over the years, and its DSE per hectare would be above many other smaller producers on the Island. Therefore, suggesting a 750,000 DSE for the whole Island would be an overstated estimate.

Most likely, the stocking capacity of the agricultural industry on Flinders Island today would be around 500,000. However, anecdotal evidence would suggest that smaller producers aren’t in a position to stock their properties to optimal levels, and it seems unlikely that the agricultural industry on Flinders Island would ever see pastures stocked to 500,000 DSE.

Background – Lime Sand

When it can be done so economically, the application of Lime Sand can be beneficial to pasture growth when soil sampling reveals pH levels are below 5. Applications of up to 2-3 tonnes per Hectare could be deemed appropriate for degraded paddocks.

Currently on Flinders Island there are two commercial operators supplying Lime Sand to local farmers. Between them, it’s estimated they can lawfully (constrained by permits) supply up to 15,000 tonnes p.a. of product. Their pits potentially have a long life, but one less so than the other. Product is sold from their gates at about \$7 per tonne. No details of how much Lime Sand is sold from these two sites is publicly available.

With transport-to-farm costs and spreading costs, it’s estimated the total cost to buy, transport and spread a tonne of Lime Sand is about \$35 per tonne.

As Lime Sand cannot be shipped to Flinders Island for less than about \$100 per tonne landed at the port of Lady Barron, sourcing Lime Sand “off island” is not economic.

Proposed Lime Sand pit

Currently, Markarna Grazing Company Pty Ltd (“Markarna”) mines Lime Sand from another deposit on its farm. This site will soon be exhausted and thus the company has sought to establish a new lime pit on land it owns on Marshall Bay.

Historically, the proposed lime pit site had been (illegally) mined by locals for many years until the current owner restricted access to the site.

The location of this proposed lime pit is virtually beside another lime pit currently operating; it includes the same landforms and is equally part of the Marshall Bay ‘scenic and natural value’ area that was the focus of the LPS assessment. The lime sand pit has been located to minimise scenic and natural value impacts while

providing for a medium-term supply of lime sand material. As the area proposed for initial extraction is exhausted, another area of lime sand (another lime sand dune system) would be identified and carefully planned to be extracted to avoid and mitigate impacts to the environment and so on. The PSA essentially seeks to rezone land such that a naturally occurring resource vital to the island's agricultural sector is available now and well into the future – the rate at which it would be extracted would safeguard the life-supporting capacity of air, water, soil and ecosystems as well as provide for their social, economic and cultural well-being and for their health and safety (including food safety).

Construction of an access road and opening of the lime pit would be completed by Markarna employees. The capital outlays required by Markarna all seem to be the costs involved in *actually getting* a Permit for the activity.

Once approved, operational costs for the lime pit will simply be absorbed within overall farm costs (as they are at the moment). There won't be any additional employment generated because activity at the "new" lime pit will simply replace existing activity which occurs at the current lime pit (which is imminently close to being fully exhausted of material).

Rehabilitation, again, would be completed by Markarna employees.

Degradation of Pasture with no Lime Sand or Superphosphate applied

It's accepted that in an average season, prime pastures on Flinders Island (like those operated by Markarna) can sustain a DSE of 14-15 – say 15 per hectare.

In the absence of any scientific data, a diminishment in pasture growth where no Lime Sand or superphosphate is applied could be said to be 4-5% per year cumulatively.

From a DSE of 15 per hectare on an ideally fertilised pasture, the DSE would fall to 14.25 after a year, to 13.5 after two years, to 12.9 after three years and to 12.2 at the end of four years.

Environmental matters

An Environmental Impact Statement (EIS) was prepared for the proposed activity which found that the impact to the environment is negligible, and manageable through careful planning and rehabilitation programs – which are already imposed by the in-force Mining Lease over the area and would likely be supported by the permit conditions prescribed by the Environment Protection Authority. This finding of the EIS is not surprising given the existence of two other smaller lime sand pits in the Marshall Bay area which operate there without unreasonable ill-effects to the scenic and natural values of the area.

The EIS, with input from experts, found that the lime pit is consistent with all State Policies and that on balance the impact to the environment, including threatened flora and fauna species, is acceptable and reasonable. Cultural values (including aboriginal heritage) were also considered in detail through on-site studies and liaison with the aboriginal community and Aboriginal Heritage Tasmania. On environmental grounds alone (i.e. the very low intensity of the known and likely future impact), the activity meets the definition of *sustainable development*⁹ within Schedule 1 of LUPAA regardless of the quantum of its economic benefits.

⁹ *sustainable development* means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –

An EAR prepared and approved by the EPA Board based on information provided in the permit application and additional information provided in the EIS. The area defined as the Development Area at page 8 and Figure A-4 of the EIS has been adopted as the Activity Area within this EAR, with the inclusion of the drains, sediment basins and septic system absorption pad excluded by the EIS definition (refer Figure 3 of the EAR).

The EPA conducted its assessment of the proposed Activity and concluded the following in its Environmental Assessment Report –

1. the RMPS and EMPCS objectives have been duly and properly pursued in the assessment of the proposal; and
2. the assessment of the proposal has been undertaken in accordance with the Environmental Impact Assessment Principles, except for those excluded under Section 25A(4); and
3. the proposal is capable of being managed in an environmentally acceptable manner such that it is unlikely that the RMPS and EMPCS objectives would be compromised, provided that the Permit Conditions - Environmental No. 11576 appended to the EAR are imposed and duly complied with.

Economic Impact on Flinders Island

As set out for reasons mentioned above, the approval and subsequent operation of the lime pit sought by Markarna will not result in any material increase in capital investment, employment or income on Flinders Island.

Some lime sand product (in excess of Markarna’s own needs) may be sold to other Island graziers. Depending upon how much product the other pit operators are currently selling, this may have no impact to them, or it could possibly cause them to reduce their prices. Even so, the *actual price* of Lime Sand at the quarry gate is only 20% of the overall cost to have Lime Sand spread on paddocks so the benefit to producers in seeing a reduction in the quarry gate price is minimal.

The financial impact if Markarna is not able to replace the supply of Lime Sand from the “new” lime pit when its existing site is finished is that the profitability of its operations will suffer as its pastures progressively deteriorate and the carrying capacity of those pastures progressively declines.

Because of the negative financial effect this will cause, Markarna would also find it increasingly more difficult to justify the investment of more capital into the property, and reduced employment for the activity.

In summary, the approval sought by Markarna to establish the “new” lime pit, is highly unlikely to provide a boost to the Flinders Island economy in the immediate term and is possibly unlikely to do so in the medium/longer term either.

Rather, the approval sought by Markarna will allow it to continue its existing operations at current levels (and hopefully increase them incrementally over time). Markarna is the largest agricultural operation on Flinders Island, and agriculture is the largest private economic sector on Flinders Island. Therefore, a refusal of the application would cause economic harm to Markarna and therefore to the island given there would be less investment and less employment from the farming activity.

(a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and

(b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and

(c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

Any diminishment in the output and investment by Markarna will have a marked negative effect on the Flinders Island economy.

LIME SAND REQUIREMENT – FLINDERS ISLAND

JANUARY 2026



66 Richmond Vally Road, Richmond, Tasmania 7025

Email: lee@nicholbrook.com.au Mobile: 0418 141 762

Author: Dr Lee Peterson

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Introduction

This report, by Dr Lee Peterson, Principal Consultant, Nicholbrook Pty Ltd, has been prepared to provide an expert assessment of the requirement for lime sand application by agricultural enterprises on Flinders Island, in particular Markarna Grazing Company Pty Ltd.

This report reviews the agricultural use and requirements for lime, soil analysis, lime alternatives and the financial implications on Flinders Island.

Qualifications and Experience

Dr Lee Peterson is an agricultural science graduate from the University of Tasmania with over 35 years of experience in primary industry production, research and consulting. Dr Peterson has worked with a variety of farming enterprises throughout Tasmania, mainland states and overseas. An outline of experience and qualifications is attached in Appendix A.

Scope of Assessment

This report has been prepared to assess the following request from council:

13. Independent advice from a qualified and experienced agronomist or other such professional regarding the need for the lime sand resource on Flinders Island, including but not limited to the following:
 - a. available supply of lime sands on Flinders Island;
 - b. potential need and demand for lime sands on Flinders Island;
 - c. current and projected usage of lime sands on the Markarna Park holdings; and
 - d. any other matters the agronomist considers relevant to support the proposal.

Requirement for soil neutralising compounds

Many soils in Tasmania, especially in coastal regions are acidic. Soil acidification is a natural process caused primarily due to the buildup of hydrogen ions, a natural result of organic matter decay, heavy rainfall leaching alkaline minerals, and geological factors. Soil acidification is accelerated by agriculture through the use of nitrogen fertilizers (which release hydrogen ions during nitrification) and removing nutrients with crops. Essentially, acids build up or alkaline "base" elements (like calcium, magnesium) get washed away or harvested, leaving more acidic conditions.

Soil acidity is a potentially serious land degradation issue. When soil becomes too acidic it can:

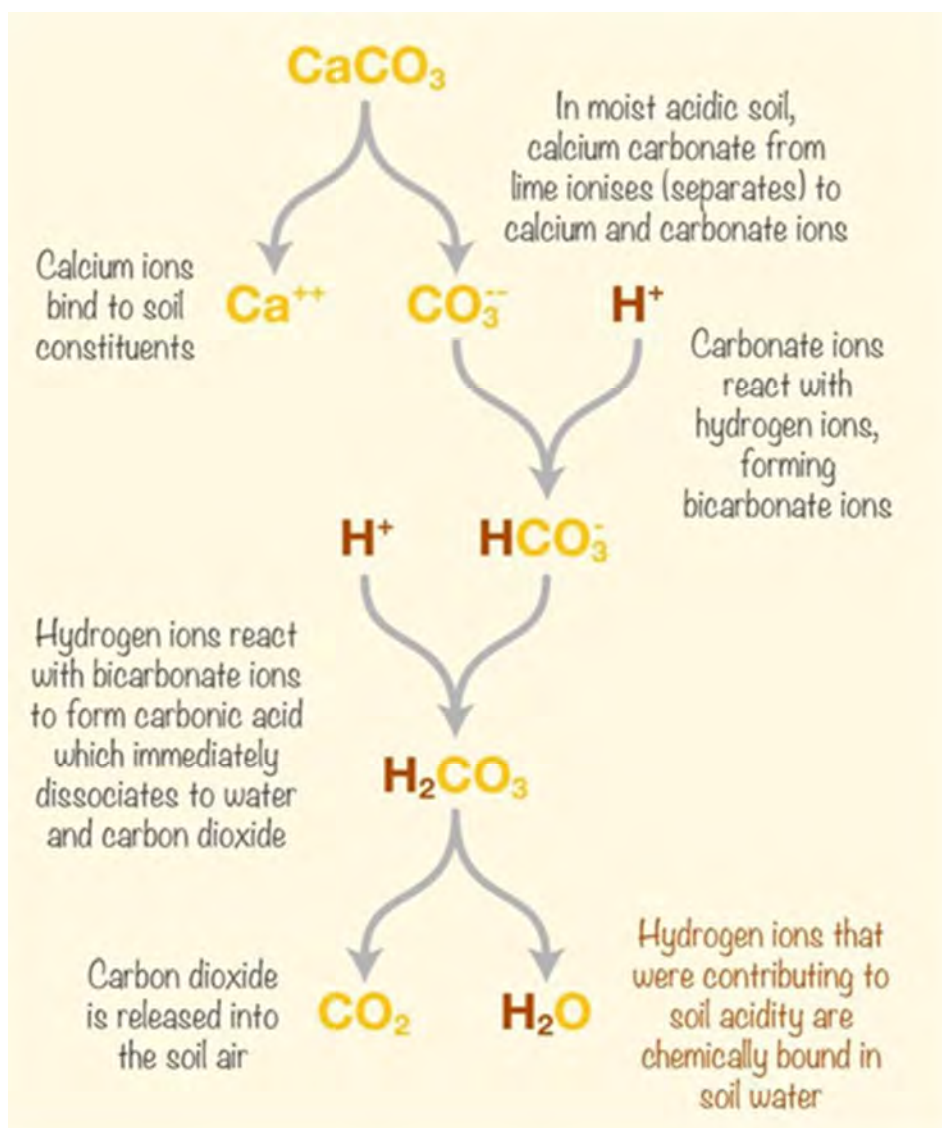
- decrease the availability of essential nutrients
- increase the impact of toxic elements
- decrease plant production and water use
- affect essential soil biological functions like nitrogen fixation
- make soil more vulnerable to soil structure decline and erosion.

Without treatment, soil acidification can impact agricultural productivity and sustainable farming systems. Acidification can also extend into subsoil layers, posing serious problems for plant root development and requires remedial action.

Agricultural lime is any inorganic product that is used to increase the pH of soil (i.e. increase the alkalinity). In Australia, the main sources are lime sand, limestone and dolomitic lime. Application of one of these products is usually the most economical method of ameliorating soil acidity depending on availability. When agricultural lime is applied, carbonate from calcium carbonate (or from magnesium carbonate) neutralises elements (mainly hydrogen ions, H^+) in the soil.

The soil chemistry can be simplified into a few steps:

1. In wet acidic soil, calcium carbonate ionises (separates) to calcium and carbonate ions (CO_3^{2-}).
2. The carbonate ions (CO_3^{2-}) react with hydrogen ions (H^+) in the soil solution, forming bicarbonate ions (H_2CO_3)
3. The bicarbonate ions react with hydrogen ions in the soil solution and form carbon dioxide and water.
4. The end result is that the soil has more calcium ions on the exchange surfaces of the soil, carbon dioxide is released into the soil air and hydrogen ions that were contributing to acidity are bound in soil water.



Importance of lime in relation to soil aluminium

Aluminium is highly abundant in soils, pH is the most important factor affecting aluminium solubility and toxicity and, for this reason, it is:

- the easiest and most-used measurement for making lime decisions; and
- often used as a proxy to estimate aluminium levels.

When soil pH is above 6.0, aluminium is in a solid state and not in the soil solution – and therefore not toxic to roots. When soil pH drops below about 5.0, aluminium becomes more soluble and dangerous to roots. Aluminium in the soil solution rises exponentially when pH is less than 4.5. Applying lime to acidic soils and lifting pH precipitates soluble aluminium from the soil solution into a biologically inactive (solid) form.

Aluminium is not essential for the growth of plants or animals. Aluminium toxicity has not been detected in grazing animals but plant growth, particularly growth of seedlings, can be greatly harmed by high levels of exchangeable soil aluminium. Aluminium is a major constituent of most soils but only when it moves into soluble or exchangeable form can it affect plants. Exchangeable aluminium values may be

high in soils with pH below 5.5 but may occur at pH values as high as 6.0 in heavy textured soils. The critical soil pH, at which aluminium becomes exchangeable in toxic concentration, depends on many factors, including the predominant clay minerals, organic matter level, concentrations of other cations, anions and total salts as well as the species or cultivar of the plant being considered. Species differ widely in their tolerance of excess aluminium. Lucerne and phalaris are highly sensitive. Subterranean clover, white clover and perennial ryegrass are moderately tolerant, while cocksfoot is tolerant.

The signs of aluminium toxicity may resemble those of phosphorus deficiency (overall stunting; small, abnormally dark green leaves; purpling of stems, leaves and leaf veins; and yellowing and death of leaf tips). Aluminium-injured roots are characteristically stubby and spatulate, while the root tips are thickened and may be brown. The root system as a whole has many stubby lateral roots but lacks fine branching. Aluminium damaged roots are inefficient in absorbing water and nutrients. Their appearance can be easily confused with that of malformed roots growing in compacted soil.

Whilst pH is the initial driver and potential indicator of aluminium toxicity the better indicator is the aluminum saturation percentage. Base saturation (BS) measures the percentage of a soil's Cation Exchange Capacity (CEC) occupied by basic cations and the percentage that is occupied by aluminium. When BS aluminium exceeds 5% plant growth will be restricted.

Review of availability of soil neutralising resources (lime) on Flinders Island

Soil Neutralising Value

The carbonate content of lime determines the capacity of the lime to neutralise acidity. Neutralising value is expressed as a percentage relative to pure calcium carbonate, which is given a value of 100%. With higher neutralising value, a lower rate can be used to achieve the same pH change.

The size of the lime particles determines how quickly the lime can neutralise acid. Lime with a higher proportion of finer particles has a larger surface area to react with the acid in soil. Research shows that finer limes (a high proportion of particles less than 0.5 millimetres) increase pH faster, which is necessary for rapid amelioration of acidic soil.

Current sources of lime

Mainland Tasmania

Commercial lime suppliers operate throughout rural mainland Tasmania and there is widely spread limestone resource available. One of the largest commercial suppliers of agricultural lime is Beams Brothers, they also supply dolomite which is calcium magnesium carbonate, this is used when correction of magnesium deficiencies is also required but generally restricted to more intensive cropping and horticultural applications, eg apples, cherries.

This source of lime is limestone rock that is quarried and crushed, lime sands are uncommon on mainland Tasmania and when they do occur they are of lower neutralising value. Lime sands are more common in coastal areas of Western Australia and South Australia.

Beams Bros. lime generally has a high neutralising value, typically greater than 80%, depending on batch origin.

Nutrien Whitemark provided a quotation for supply of Beams Bros. lime landed on farm on Flinders Island at \$600 per tonne. This is significantly higher than on mainland Tasmania where it ranges from \$45 to \$100 per tonne. This is due to the additional road and sea freight and additional handling costs as this can only be delivered in 1 tonne bulk bags.

A 100% natural calcium carbonate product, Calciprill, is available which decreases the total volume needed by 20% for equivalent neutralising value of Beams lime, however it is only available in 600kg bags at a cost of \$1200 per tonne delivered on farm on Flinders Island.

Flinders Island

Areas of limestone occur on Flinders Island and are well documented by Everard (1950) but are of extremely porous and susceptible to erosion except where protected by granite. Sites suitable for quarrying of the limestone appear very limited, either due to scale of resource, neutralising value or accessibility and in many cases combination of these factors.

For agricultural use the limestone would have to be crushed and graded to a small particle size to have an acceptable neutralising value. This would require significant investment in equipment and infrastructure, appropriate environmental management practices as well as being centrally placed for efficient transportation to farms. While practical and economic due to scale on mainland Tasmania, such an operation is expensive to operate on Flinders Island.

The only other commercial scale resource of a neutralising resource on Flinders Island are lime sands. These are a naturally occurring mix of sand and calcium carbonate formed from naturally crushed marine shells blown inland over millennia. These lime sands have formed dune systems close to the coast and are most prominent in the Marshall Bay area. The advantage of utilising lime sands is that they can be extracted using regular earthmoving equipment and do not require any further processing or treatment before direct application to land. They are easily screened to remove large particles or plant matter (e.g. roots) and can be blended with other soil ameliorants if required, such as boron resulting in a complete soil product.

There are currently three mining leases in place for extraction of lime sands in Marshall Bay which includes the lease held by Markarna Grazing Company Pty Ltd.

Lime Sand Requirement – Flinders Island

Lease	Owner	Expiry	Titles	Area (ha)	Status	TPS Zone	Comments
2056P/M	Nicholls, JT	28/2/2025	141842/2 141842/1	82	Pending renewal	Rural	Existing area near depletion
2056P/M	Davrol Rural Management Pty Ltd	30/4/2024	160313/1 154620/2	44	Pending renewal	Rural	Currently under offer of sale but new owner is agreeable for the extraction to continue
2117P/M	Markarna Grazing Company Pty Ltd	31/5/2028	230282/1 215120/1 120064/1	365	Granted	Landscape conservation	Extraction a prohibited activity under current zoning

*Nicholls lime sand pit*



Davrol lime sand pit

The extent of lime sands in the Marshall Bay area is considerable. The Initial lime sand resource area identified for development by Markarna Grazing Company is 17.7 ha, 4.8% of the total mining lease area. This development area of 17.7 ha has been assessed in the order of 30 years supply of Markarna Grazing Company requirements. There are further deposits present within the mining lease area that can provide future supplies of lime sands, or to be exploited sooner if larger volumes are required by agricultural activities on the island.

Analysis of the lime sands by Phosyn Analytical Pty Ltd indicates these lime sands have a neutralising value of between 75 and 77%. However, the effective neutralising value is potentially greater due to the small particle size of the lime sands. This neutralising value is very similar to lime sand resources utilised in South Australia and Western Australia.

Markarna Grazing Company Lime Requirements

The Markarna Grazing Company owns and operates 7 farms (map Appendix A) the total areas, area of developed pasture and potential new areas of development are shown in Table 1.

Table 1: Markarna Farms	Total Area	Pasture Area	Estimated New Area
Oatdale	221	171	
Wingaroo	1727	896	300
Markarna	6798	3501	400
Carnsdale	879	805	
Grandview	546	442	
Yeltanna	483	397	
Centre Hill	709	583	
Overall	11363	6795	700

Recent soil test data from pasture areas is summarized in Table 2 which also indicates the typical number of paddocks tested annually. This data demonstrates the wide range of soil pH values and the Base Saturation levels of aluminium of the soils managed by Markarna Grazing Company.

Table 2: Farm	Number of tests per farm	pH high	pH low	BS Al (%) low	BS Al (%) High
Wingaroo/Oatdale	27	7.1	4.8	0.7	10
Markarna Park	85	7.8	5	0.9	9.9
Carnsdale	18	7.4	5.6	1.6	4.9
Grandview	14	6.5	5.3	1	1.9
Yeltanna	10	7.1	5.2	3.2	8.2
Centre hill	7	6.3	5.3	1.2	1.8

Whilst there are some paddocks with high pH they are very few compared to the number of low pH paddocks. Many of the paddocks have very low pH and these also correspond with high BS aluminium levels deeming them significant risk of aluminium toxicity to plants and reduced growth and therefore lower stocking rates. This is very prevalent on the Markarna Park, Wingaroo and Oatdale and Yeltanna farms which require higher liming rates for amelioration. In general, the Grandview and Centre Hill farms require only maintenance applications of lime.

The Markarna Park paddocks with a low pH are likely to be reflective of many paddocks on the island, especially in the Northern region.

The requirement for and the application rates of lime for a paddock are determined from the soil test data of pH and aluminium levels.

The most commonly used general formula for lime requirement is calculated as:

$$\text{Lime requirement (t/ha)} = (\text{Target pH} - \text{Current pH}) \times \text{Soil Texture Factor}$$

The higher the soil clay content the higher the Soil Texture Factor. In the case of a sandy loam the factor is 3 and a loam/clay loam is 3.

This formula is based on using lime with a neutralising value of greater than 80%

It should also be noted that the majority of soils are sandy loams with moderate to high permeability and therefore prone to leaching of alkaline minerals hence even once pH levels have been ameliorated there is an ongoing requirement of continual base applications of lime to maintain acceptable pH level as these will continue to decrease over time.

Utilising the Western Australian developed iLime app which allows for selection of lime source, soil type characteristics, rainfall and pasture type to determine the productivity improvement of lime application. This demonstrates the effect of lime application of lime to initially low pH soil and the future requirements to maintain more acceptable pH levels. This also demonstrates the decrease in productivity without any lime applications. (Figure 1)

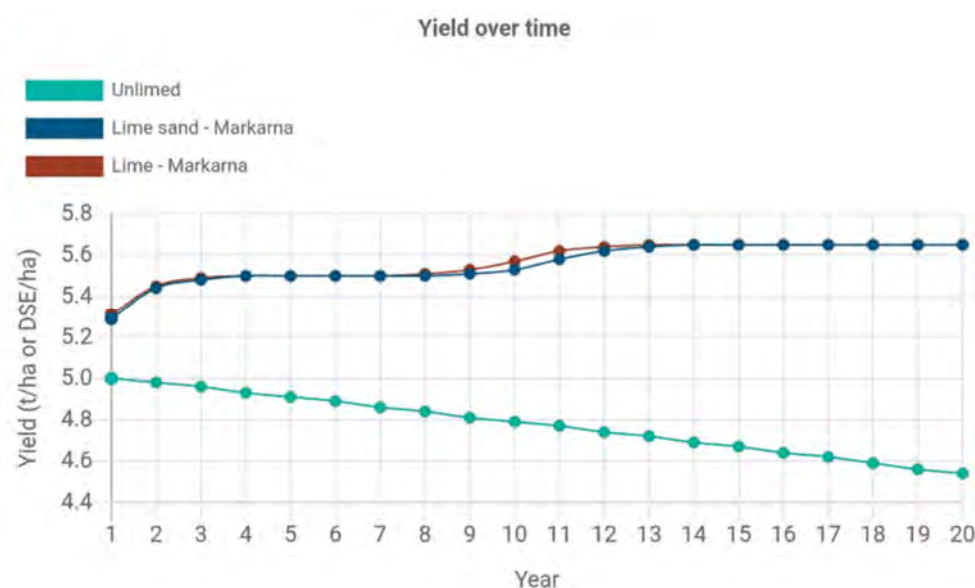


Figure 1: iLime calculation of applying 8 t/ha to newly developed area followed by maintenance applications every 3 years of 4.6 t/ha of lime sand or 4.3 t/ha agricultural lime to maintain long term productivity

Based on the soil test data and aluminium levels, Table 3 indicates the required lime sand application rates for each farm and the total amount of lime sand required for treatment of 33% of pasture area per annum (1 in every 3 year application) plus assuming the new areas are developed over the next 5 years.

Table 3: Lime sand application requirements 33% of pasture application annually	Pasture Average Application Rate (t/ha)	New Area Application Rate (t/ha)	Total Annual Application (tonne)
Oatdale	5		282
Wingaroo	5	8	2078
Markarna	5	8	6577
Carnsdale	3		797
Grandview	2.5		365
Yeltanna	5		655
Centre Hill	2.5		481
Overall			11300

This equates to approximately 8,000 cubic metres of lime sand annual extraction. Annual soil testing to monitor the pH response and effect on aluminium levels will further determine teach annual liming program. In addition, the impact of variation in seasonal conditions may require higher rates such that the request for 10,000 cubic metre lease allows for sufficient lime sand to always be available and where applicable excess can be provided to other farms.

Financial Impact of Lime Availability

Markarna Grazing has invested significantly in dedicated spreading equipment for the application of lime sands from the existing pit (on farm but almost depleted) to ensure accurate application rates.

Comparative gross margins for lime supplied on farm for different sources have been calculated assuming that the spreading costs are comparative between the products. There is potentially more on farm handling with supply of product in bulk bags versus bulk in truck, but there is also offsets in total volume handled due to variation in neutralising value of the lime product. These factors are considered to have less impact compared to cost supplied on farm.

Gross Margin of lime supplied on farm

Based on the lime requirements of Table 3 and typical excavator, truck and labour rates, an assessment of the gross margin of lime sand extraction from the companies own mining lease is shown in Table 4. This is the price of lime sand delivered on farm which equates to \$13.33/t. Typical mainland lime supply is in the order of \$45-100/t. The current pricing of lime sand supplied from other leases for the raw material is \$9-10/t plus the extraction costs. The overall cost of lime sand supplied to farms without their own mining lease is a very cost effective price compared to mainland Tasmania farms.

Table 4: Gross margin of utilising lime sand				Total	Per Hectare
Pasture Area	6800 Ha				
Lime sand requirement	11300 t	1300 kg/m3	8692 m3		
Excavator	30 m3/hr	140 \$/hr	290 hrs	\$ 40,564	\$ 5.97
Truck	10 m3/hr	80 \$/hr	869 hrs	\$ 69,538	\$ 10.23
Labour	1159 hrs	35 \$/hr		\$ 40,564	\$ 5.97
Gross Margin				\$ 150,667	\$ 22.16

By comparison, the gross margin of agricultural lime supplied by Beams Brothers with a neutralising value of 85% which allows for some saving in volume requirements compared to the 75% neutralising value of lime sand is shown in Table 5.

The significant price of lime landed on farm on Flinders Island far outweighs the neutralising value variance making this source of lime uneconomic. Such a cost would result in an overall negative gross margin for beef production.

Table 5: Gross margin of importing lime				Total	Per Hectare
Pasture Area	6800 Ha				
Lime import requirement	85% NV	9971 t			
Price landed on farm	600 \$/t			\$ 5,982,353	\$ 879.76
Gross Margin				\$ 5,982,353	\$ 879.76

A high analysis product such as Calciprill reduces the volume of lime required further but is even less economic due to the high landed price.

Table 6: Gross margin of importing Calciprill				Total	Per Hectare
Pasture Area	6800 Ha				
Lime import requirement	100% NV	8475 t			
Price landed on farm	1200 \$/t			\$10,170,000	\$ 1,495.59
Gross Margin				\$10,170,000	\$ 1,495.59

Liming impact on stocking rate

The elevation of pH generally to acceptable levels will increase the dry matter production and the maintenance of these pH levels is important to manage aluminium toxicity and pasture productivity.

Table 7 outlines the current average dry matter production and stocking rates and the potential increase in stocking rate with pH correction of many of the acidic paddocks.

Table 7: Impact of applying lime				Per Hectare
Pasture Area	6800 Ha			
Current herd	7,000	84000 DSE		12 DSE/ha
Current average feed demand				4.5 t/ha
Potential feed production with corrected pH				6.0 t/ha
Potential stocking rate	9,315			16 DSE/ha



Markarna Park healthy pasture production and stocking rate

This impact is significant to Markarna Grazing and is also applicable to many other farms in the district and represents the development potential for the beef industry

on Flinders Island. This has been highlighted previously with a number of studies and benchmarking workshops undertaken by the island's producers.

Southern Farming Systems healthy soils group has highlighted the importance of maintaining soil pH whilst the Flinders Island Productivity Group and benchmarking groups run by Aggregate Consulting have reviewed management practices and the economics of current production highlighting the importance of improving and maintaining dry matter production to improve stocking rates for what is the islands biggest economic activity and employment source.

Flinders Island lime sand requirement

In and around the Markarna farms there are similar soil types in the norther region of Flinders Island that would similarly require lime for pH correction and ongoing maintenance. The additional pasture area is estimated at approximately 7,000 ha.

46,600 ha has been stated as currently utilised for agricultural production in total on Flinders Island, some of which would be small holdings and some of which would be on soil types with more favourable pH, however the requirement for an economic lime source on the island is significant.

Table 8 represents a conservative estimate of the requirement for lime sands across the island.

Table 8: Total Lime Requirement			Tonnes Lime Sand/Annum	
	Pasture Area	Annual t/ha		
Markarna Farms	6,800	1.7	12,000	
North Flinders	7,000	1.7	12,000	
Balance of agricultural land	8,000	1	8,000	
Total	21,800		32,000	

This overall potential requirement is in the order of 23,000 cubic metres of lime sand per annum.

Impact of restricting lime sand extraction

The iLime app demonstrates the gains in dry matter production through application of lime but also demonstrates the gradual decline in dry matter production if no lime is applied (Figure 1). In the sandy loams typical of Flinders Island this decrease is approximately 0.2 t/ha after 10 years of no application. Table 9 indicates the potential increase in stocking rates as a result of lime sand application versus the inevitable decrease in stocking rates that will occur if no economic source of lime is available after 10 years.

Lime Sand Requirement – Flinders Island

Table 9: Impact of lime sand availability on stock numbers	Potential Stock		
	Potential Stock Number Increase with lime sand availability	Number Decrease due to unavailability of lime sand	Net Gain in livestock numbers from lime sand application
Markarna Farms	2,300	-320	2,620
North Flinders	2,400	-320	2,720
Balance of agricultural land	1,400	-370	1,770
Total	6,100	-1,010	7,110

The impact of restricting lime sand availability is very significant whilst its enhanced availability further improves the productivity of Flinders Island which will provide more employment not only on farm but to all agricultural associated enterprises and service providers on the island.

Generally accepted economic output multiplier for beef production is 3, meaning for every \$100 of output generates \$300 in total economic activity and for every 10 jobs in the industry an additional 15 to 20 jobs can be supported in the broader economy. Whilst not all of this gain will be directly on Flinders Island, a significant proportion will be added to the islands economy. (Tasmanian AgriFood ScoreCard 2022-23)

References

Everard G. (1950) The limestone resources and general geomorphology of Flinders Island.

iLime, Department of Primary Industries and Regional Development Western Australia

Tasmanian Agri-Food ScoreCard (2022-2023) AgriGrowth Tasmania, Department of Natural Resources and Environment Tasmania

Declaration

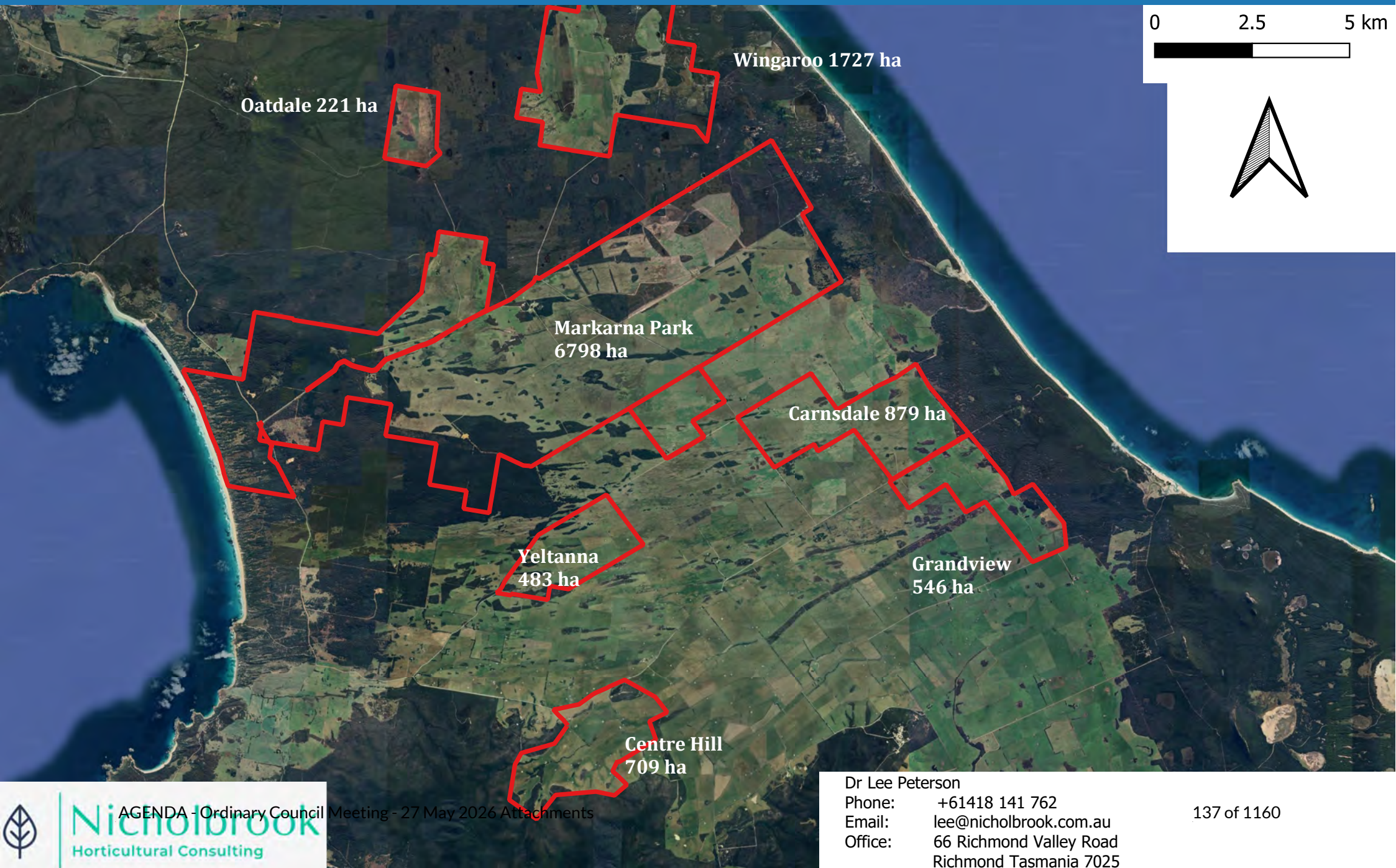
I declare that I have made all the enquiries which I consider desirable or appropriate, and no matters of significance which I regard as relevant have, to my knowledge, been withheld.



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January 2026

Markarna Grazing Pty Ltd - Farms

Annexure: 16.2.2



**Lee Peterson**

Principal Consultant

Qualifications:

B Ag Sc (Hons) University of Tasmania

PhD (Ag Science) Horticultural Research Group University of Tasmania

Professional Associations:

Certified Practicing Agriculturalist (CPAg)

Company Directors Graduate Diploma 2007

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Introduction

Dr Lee Peterson is an agricultural professional with extensive expertise in many aspects of agricultural production gained over a period of 39 years in industry, consulting and research. Lee has considerable experience in the areas of land capability and planning for agriculture, new crop development, horticultural production systems, plant extracts and waste stream management in agricultural.

Professional Experience

2020-present	Director Nicholbrook Horticultural Consulting
2018-2020:	National Technical Manager BerryWorld
2011–2018:	Principal Consultant Macquarie Franklin
2005-2011:	Executive Director – Agribusiness Agricultural Resource Management (AGRM Pty Ltd)
2000- 2004:	Agricultural Resource Management Group
1998- 1999:	Serve-Ag Senior Project Agronomist
1996-1997:	Private agricultural consultancy and contract research provider
1993- 1995:	General Manager of Essential Oils of Tasmania
1989- 1993:	Production Manager of Essential Oils of Tasmania
1985- 1989:	Post-Graduate at the University of Tasmania
1984- 1985:	Agricultural Officer with the Tasmanian Department of Agriculture, Pasture and Field Crops Branch

Project Examples

- Land capability assessments for numerous rural properties to support agricultural development, subdivision of non-agricultural land and expert witness reporting for legal representation when required
- Soil surveys, land capability, enterprise assessment reporting for developments ranging from irrigation schemes through to wind farm developments

Areas of Expertise

- New crop development including essential oils, culinary herbs, medicinals and leafy vegetables
- Design of innovative harvest systems for new crops
- Waste water and effluent reuse
- Agricultural research and development
- Sustainable agricultural system design and implementation
- Environmental monitoring
- Land capability assessment
- Group training
- Agribusiness and financial management
- Socio and economic impact assessment

Nicholbrook Expertise

- Economic studies
- Business and farm management
- Feasibility studies
- State and regional development
- Irrigation and water development
- Land capability and mapping
- Natural resource management
- Training and extension
- Technical agricultural consulting
- Legal representations

- Development of the Farm Water Access Plan framework for Tasmanian Irrigation – individual property requirements assessing soils, land capability and enterprises requirements prior to the granting of water licenses
- Review of Industrial Hemp as a commercial cropping opportunity
- Review of pyrethrum industry strategic plan and industry development officer program
- Economic and socio analysis of the impact of blueberry rust incursion to the Tasmanian blueberry industry
- Production system economic assessment and inputs for TI business case developments – Musselrow, Great Forester, Southern Midlands, Tamar and Greater South East irrigation schemes
- Market, production and feasibility study of medicinal cannabis production for Tasmanian Alkaloids
- Importation of new varieties and coordination and production system development for BerryWorld Australia in Tasmania and Queensland
- Technical advisor to Fresh Cut Salad producers including production system development, variety assessment, market research, crop scheduling, pesticide strategies, IPM program and representation of the industry in respect to technical issues such as biosecurity and IPM
- Agricultural assessment and stakeholder survey for future Hunter Valley irrigation development post power station and mining closures
- Independent advisor and author to the “Environmental Guidelines for Recycled Water Use in Tasmania”.
- Expert reporting for a range of broad acre and horticultural litigation cases
- Assessment of impact of Robbins Island Renewable Energy Park on Agricultural Land Use

Technical advisor to South Pacific Sandalwood, essential oil production and extraction company, Vanuatu – Sandalwood production and research

ATTACHMENT 5 MARKANA LIME SANDS GEOMORPHOLOGY AND SOILS REPORT

Survey of the Geomorphology and Soil characteristics of the Markarna Grazing Company Pty Ltd Property, Marshall Beach, Flinders Island

18 January 2024



This report was compiled by Dr Adrian Slee, Earth Sciences and Cultural Heritage, Forest Practices Authority, 30 Patrick Street, Hobart 7000

Email: adrian.slee@fpa.tas.gov.au

*Geomorphology and soils of the Markana Grazing Company Pty Ltd Property***Citation**

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FPA file reference

D24-20638

Disclaimer for report

The advice contained in this document has been prepared for Markana Grazing Company Pty Ltd and Van Diemen Consulting Pty Ltd only.

Whilst the Forest Practices Authority has used its best endeavours to ensure accuracy, it does not warrant that the material is free of error. Consequently, the advice is provided on the basis that the Forest Practices Authority will not be liable for any error or omission, in contract, tort or otherwise. However, should any error or omission be notified, the Forest Practices Authority will use its best endeavours to correct the advice.

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Glossary

Optically Stimulated Luminescence (OSL) dating: A method of dating sand grains. This method measures the period of time since burial of the sand grains and therefore indicates the age of the host landform (i.e. dune ridge).

Tasmanian Geoconservation Database (TGD): A database that provides a source of information about geodiversity features, systems and processes of conservation significance in the State of Tasmania.

Cover Image (Image 1)

View eastwards from the coastal foredune backing Marshall Beach, looking across isolated outcrops of granite towards the large west-to-east orientated longitudinal dunes forming the main Markana Lime Sands resource

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property

1. Project scope and Aims

Van Diemen Consulting Pty Ltd engaged the Forest Practices Authority (FPA) to investigate the geomorphology and soils present on a 364.1 ha mining lease owned by the Markana Grazing Company between Palana Road and Marshall Beach near the settlement of Lughrata on Flinders Island. The proposal by Markana Grazing Company is to develop and extend an existing old lime sand extraction pit located within the dune fields located between Palana Road and Marshall Beach near the settlement of Lughrata. The priority area is an 800 m long west to east oriented sand dune complex covering approximately 4 ha that forms a lime sand resource immediately west of the current old extraction pit.

The aim of the project was to provide a detailed report on the dune field and other landforms including swamps and potential Tertiary limestone karst features in the vicinity of the proposed extraction pit. Soils were also be investigated in this area. A secondary focus was a general documentation of the dune field and other sites of geomorphic significance in the overall mining lease in the event of expansion of operations in the future.

The report addresses the following issues:

- Documentation of any karst features present and management recommendations.
- Overview of the sand dunes present at the proposed pit site and mine lease in general and dune special values management recommendations.
- Comment on sand blow risks and mediation recommendations.
- Documentation of other geomorphic landforms.
- Soil observations and management.

2. Previous Work

Granite Bedrock

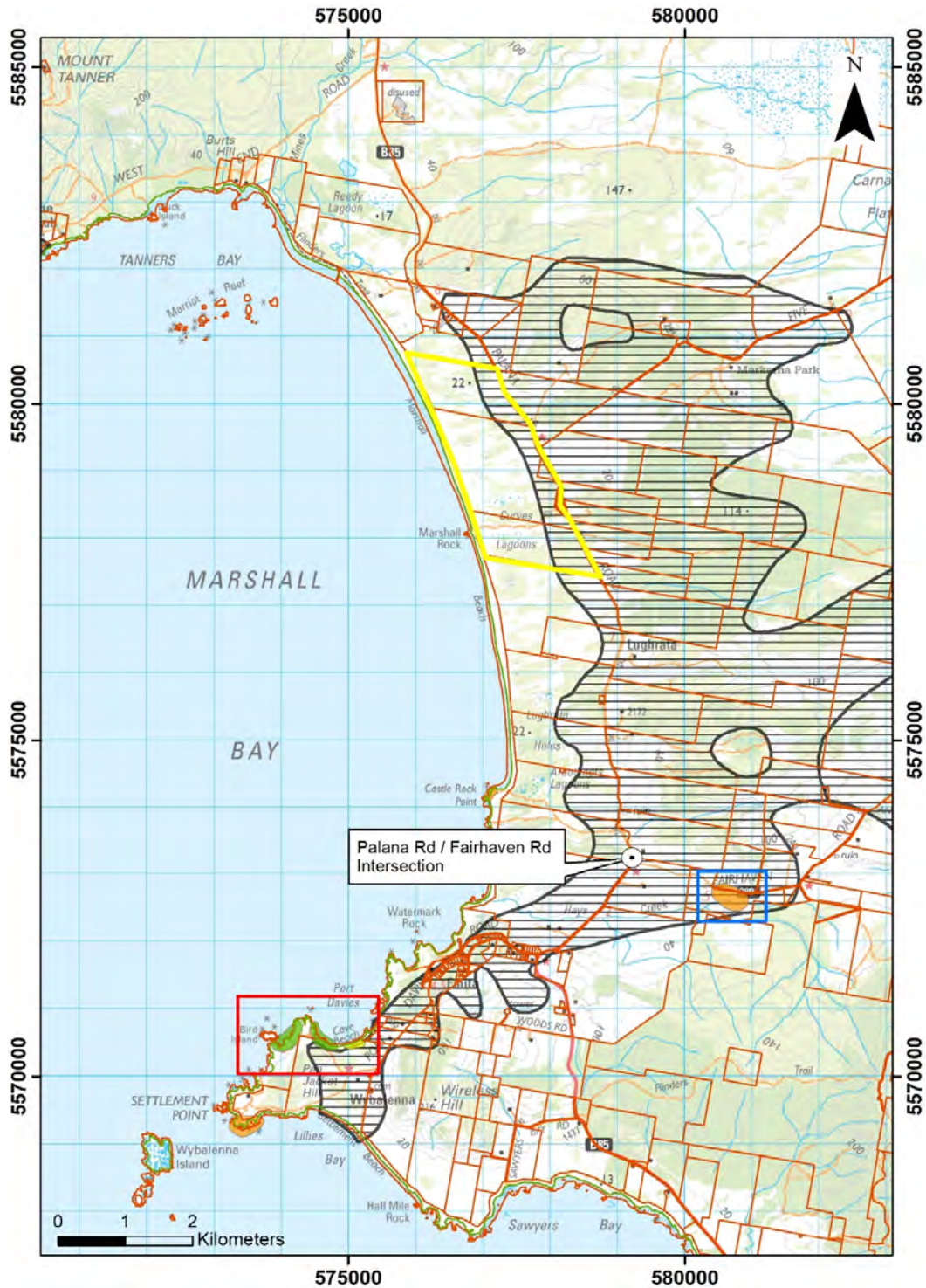
Devonian granite plutons are the dominant bedrock that floors Flinders Island and upon which the Tertiary Limestone and Quaternary deposits lie. White syenogranite/monzogranite (I-type) granite outcrops in the vicinity of Five Mile Road immediately east of the study site. No granite was mapped on the 1:250,000 geological map (available on www.theList.tas.gov.au) within the study area (Mineral Resources Tasmania 2023). However aerial photographs clearly show that Marshall Rock (outcropping on Marshall Beach) is granitic.

*Geomorphology and soils of the Markana Grazing Company Pty Ltd Property***Karst**

Tertiary dune limestone is mapped on the 1:250,000 Tasmanian geological maps. It forms the hills rising east of Palana Road immediately inland of the Markana Lime Sands mining lease. The hills are part of an extensive belt of limestone extending from the vicinity of Five Mile Road in the north, inland to the Memana district and south along the coast to Wybalenna. The area is listed as a category B karst area (Emita-Memana BS17) (Kiernan 1995; see also map 1, below). The karst B classification indicates that karst processes are active in the area. The area has received limited attention from geoscientists and cavers. Limestone has been mapped on the hills to the east of the study site to altitudes approaching 130 m asl. The limestone is likely to be mantling granite and possibly sedimentary rock at depth and may be quite thin i.e., in the order of tens of metres. However, the topographic relief of the limestone here is more than 100 m which is more than enough for significant karst landforms and processes to develop. Kiernan and the author have observed subtle sinkholes in the vicinity of Palana Road/Fairhaven Road intersection (Map 1 and Image 2). Some of these depressions could be dune swales, but the presence of exposed limestone outcrops around others suggest sinkhole development.

A low hill north of Hays Creek has limestone cliff outcrops. The most notable karst landforms occur at Cave Beach where significant limestone exposures in a coastal setting display very rugged limestone weathering pinnacles and solutional forms (karren) associated with several notches and small caves formed at or near the contact between the limestone and the underlying granite (Image 3). The karst landforms in the vicinity of Cave Bay (red box on map 1) and the sinkholes along Fairhaven Road (Blue box on map 1) are listed as Geoconservation sites ID:2254 and ID:2298 in the Tasmanian Geoconservation Database (TGD) accessible on the Tasmanian Natural Values Atlas (NVA.tas.gov.au).

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property



Map 1: Marshall Bay. The striped area is the mapped extent of the Emta – Memana (BS17) karst according to Kiernan 1995; yellow square is the lease area; red and blue squares highlight TGD sites with notable karst development.

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property



Image 2: One of a large number of shallow basins (circled) associated with limestone outcrops (foreground and background) in the vicinity of the Palana Road/Fairhaven Road intersection (Map 1). The lack of dune cover and exposed outcrops suggest shallow soils and that these depressions are solution sinkholes associated with a subsurface karst aquifer.

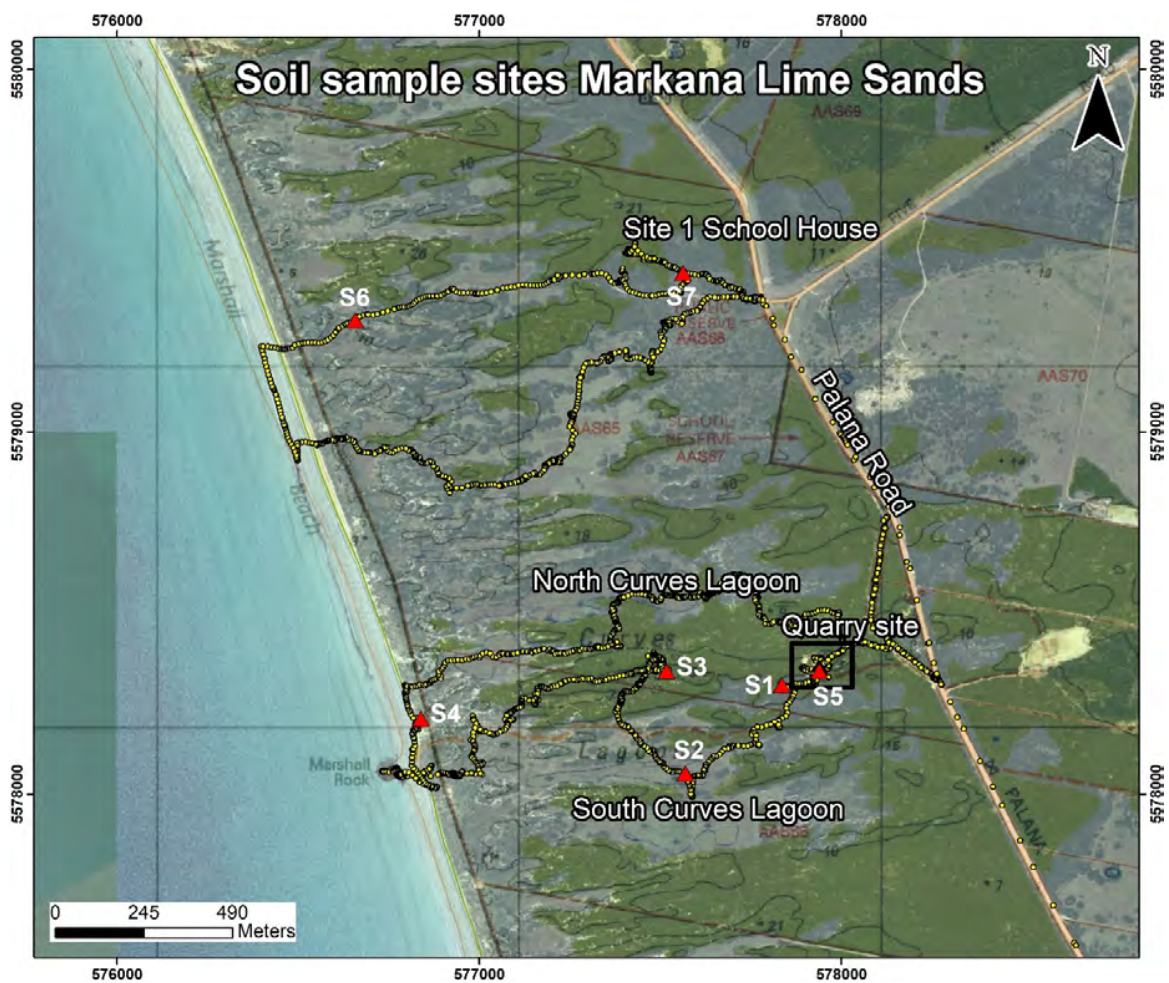


Image 3: The Tertiary Limestone at Cave Bay features significant karst landforms including small caves, notches and solutional (karren) surface weathering forms. The area is a listed TGD site and the limestone outcrops are contiguous with the limestone bedrock in the vicinity of the mine lease.

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property

3. METHODS

Observations of the site were made over two days of fieldwork on the 7th and 8th of November 2023. Waypoints and route tracking were recorded using a Garmin Etrex 22s. The route taken during the field work and the location of the soil samples taken are shown in Map 2. Maps were drawn using ARC-Map 10.8.1. Soil samples were taken using an Eijkelpkamp auger. A sample for Optically Stimulated Luminescence (OSL) dating was taken from the lower dune horizon in the old pit face. This was done by cutting back and benching out the sand dune before a sample was taken using a PVC tube hammered vertically into a dug bench approximately 5 m below the top of the dune.



Map 2: Soil sample sites and survey route (yellow tracks) taken during fieldwork.

4. OBSERVATIONS

BEDROCK GEOLOGY OF THE SITE

Granite

The general geomorphology of the mine lease is presented in Map 3. The Marshall Rock and other granite outcrops located within the sand dunes 150 m to the east of the pit and just within the lease (see Image 1) were visited during the survey. Both are unmapped on geological sheets and feature large, rounded outcrops of white crystalline granite. While the granites are not the focus of proposed operations on the mine lease their presence on the coast and in particularly within the foredunes indicates the likelihood that granite outcrops are present beneath the sand dunes on the property. Granite bedrock rarely forms flat surfaces but rather undulates quite substantially over short distances hence it is impracticable to define the depth of the dunes and further east Tertiary limestones above the granite contact. Exploration could help assess the depth of the lime sands. However, it would be costly over large areas, and possibly yield little additional information.

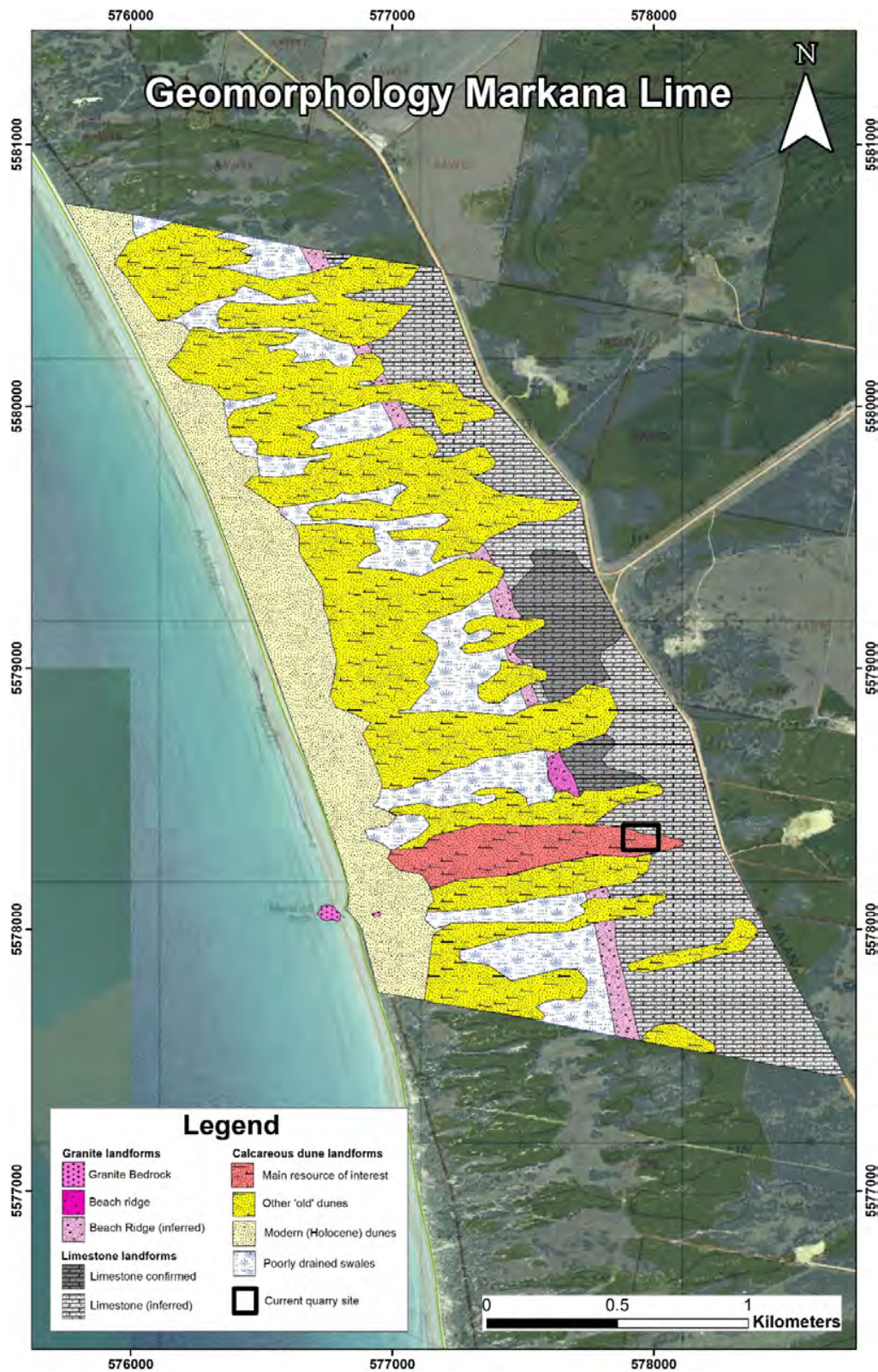
Limestone

A continuous flat bench approximately 15 m above sea level is present in the eastern section of the study area. In places this bench is overlain by dune sands. Significant lag deposits of fossiliferous limestone in the form of boulders and cobbles are found on this bench associated with a distinctive open vegetation community in contrast to the thicker vegetation associated with the younger dune sequences (Image 4). The bench appears to be the western edge of the limestone outcrop and its western margin may have once been a shoreline open to Bass Strait. It now forms a paleo-shoreline. Areas of outcropping limestone are very limited as most of the edges of the limestone plain appear to be buried by Quaternary coastal and dune deposits. Only one small in-situ outcrop of limestone was observed at 577509mE: 5579301mS. This was associated with the blowout of a low 1 m tall sand dune.



Image 4: Flat limestone bench in the east of the property.

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property



Map 3: Geomorphology summary map.

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property

KARST LANDFORMS

WEATHERING LANDFORMS (KARREN)

Very minor but sharp solutional karren weathering forms were located at the larger limestone outcrop (Image 5) and other smaller blocks in the area but no significant solutional karst landforms were observed.



Image 5: Small limestone outcrop

SINKHOLES

Large, elongated depressions are a feature of the property. Some of these are large enough to have warranted definition as enclosed basins on the 1:25,000 topographic map sheets of the area and the largest are defined as lagoons (e.g. Curves Lagoons to the immediate south of the proposed resource). These depressions are elongated. They are not flat floored but have rather undulating forms. Although a small intermittent pond appears to be present in the lowest basin of the northern Curves Lagoon, elsewhere flowing and pooling surface water appears to be very limited; surface water accumulation may be confined to times of intense rainfall. In contrast to enclosed rounded basins associated with limestone bedrock, outcrops interpreted to be probable sinkholes have been described by the author and others near the Palana Road/Fairhaven Road intersection and further south in paddocks north of Trousers Point. The depressions at the study site appear to be all related to either broad west-east oriented interdune swales or (closer to the coast) roughly square

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property

depressions developed behind the active Marshall Beach foredune complex. Depressions of conclusive karstic origin were not identified and are considered unlikely to be present within the study area.

SPRINGS

No obvious streams or springs were located on the property. A possible very small spring rises from beneath Marshall Beach immediately east of Marshall Rock. Here at low tide a small stream flows for approximately 20 m to the ocean, dropping 20–40 cm in altitude. The scale and location of the spring does not imply karstic drainage in the Tertiary limestone several hundred meters inland but rather small-scale subsurface drainage out of the local beach-bordering Holocene dunes. The lack of surface streams is interesting as there are no inlets or obvious streams entering the ocean for the length of Marshall Beach between the outflow of Arbothnots Lagoon to the south and a small inlet to the north at 574850mE: 5582000mN. A series of disappearing stream channels are mapped in the limestone hills southeast and northeast of the study area. The absence of defined stream channels flowing off the limestone in the area does suggest subsurface drainage is occurring in karst.

SUMMARY OF KARST LANDFORMS

An extensive Tertiary dune limestone bench is present in the eastern section of the study area. This bench is overlain in locations by the Quaternary dunes and has open predominantly *Leptospermum laevigatum* dominated forest. The lack of streams (and channels) flowing from the higher limestone hills to the east of the property may indicate that a karst aquifer is present in the area. However, no obvious springs were noted. No sinkholes were observed on the property, and as the largest limestone outcrop observed covered only a few square meters, caves are unlikely to be present in the priority study area. However, the author did not cover the entire mining lease and LiDar coverage is not available for the area so the presence of isolated karst landforms including bedrock bluffs with karren, sinkholes or small caves cannot be entirely ruled out.

OLD BEACH RIDGE

North Curves Lagoon is a large dune swale basin. It is surrounded to the west, south and north by Quaternary and Holocene dune ridges and to the east by the low Tertiary limestone bench. On the eastern margin of the basin at 577625mE: 5578543mN approximately 6–10 m above sea level (asl) white sandy gravels are exposed (Image 6). These are not typical fine sands associated with the beach ridges in the area but are rounded coarse quartz sands that appear to mantle the lower western slopes of the limestone bench. The quartz-rich nature of the sediments suggests two potential sources

1. That granite bedrock is shallowly buried in the vicinity of the eastern end of north Curves Lagoon and the soils at the site are primary granitic soils (known as gruss) formed from weathered granite.
2. That the coarse quartzite sands that contain some shelly carbonate fragments carbonate were deposited on the western edge of the limestone bench in a high energy coastal environment (surf beach).

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property

The latter explanation appears to be more likely as no granite bedrock was observed at the site. It can be assumed that the coastline of Bass Strait was once a high energy environment supplied with coarse sands sourced from offshore granite outcrops such as Marshall Rock or reworked sands from upslope granite sources east of Palana Road. The presence of this beach ridge indicates that the coastline has prograded (advanced) >900 m to the west while becoming a lower energy environment. Given the altitude of the beach it appears likely that it could have formed during the penultimate interglacial high stand, approximately 130,000 years ago when sea levels were 6-8 m higher than today. The presence of granitic soils in this area defines the northern margin of the economic resource in lime-rich dune sands to the south. It is likely that the beach ridge extends beneath the overlying Quaternary carbonate-rich sand dunes, as the dunes appear to have formed over the top of the older granite sands and Tertiary limestones in the east of the property. If this is the case a contact between the carbonate sand resource and the quartz sands may be encountered during mining.



Image 6: Beach ridge composed of quartzite gravel sands (inset) derived from granite bedrock immediately east of North Curves Lagoon.

SAND DUNES

Extensive sand dunes cover most of the mining lease. Except for the granitic sediments east of North Curves Lagoon described on page 8, the sand dunes are composed of fine-grained white quartz and carbonate deposits. Two significant sand dune assemblages are present. In the west are the modern foredune and back dunes behind Marshall Beach. Inland are a series of elongated west-to-east trending parallel dunes that rise up to 24 m above sea level.

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These inland dunes are largely vegetated and stable in comparison to the foredunes that have fewer woody and tree species, instead being dominated by grasses, herbs, wind-pruned shrubs and sedges. The coastal foredunes climb onto the older dunes but can be broadly demarcated by their hummocky forms and presence of sand blow-outs that contrast to the more elongated uniform stabilised ridges of the older dunes.

MAIN DUNE

The 1:25000 topographic map of the main dune (resource) shows a single large dune approximately 180 m wide and 10–25 m high. Two large internal depressions are present west of the current sand pit. The actual landscape is more complex than the contours suggest with at least 8 dune crests identified between North Curves Lagoon and South Curves Lagoon. The dune ridges have narrow rounded tops and steep side slopes, generally >30°. The multi-peaked nature of the dune ridges and the deep wide interdune swales are not well expressed on the 1:25000 topographic map.

The existing pit is located near the narrowest and easternmost part of the dune sequence. Here past pit operations have exposed a cutting through the main dune that has some scientific interest as described in the next section of this report.

EXISTING PIT

The existing pit is located at 577936mE: 5578343mN, 350 m west of Palana Road and is accessible by an overgrown FWD track. The pit exposes a 75 m wide section through the eastern limb of the main dune. Most of the exposure is either overgrown or of limited interest. The floor of the pit appears to be in solid Tertiary limestone bedrock. Some of the floor material could have been brought in by past operations to provide a solid working base. The best exposure through the dune is on the upper southern face of the pit where an approximately 5.5 m deep section is exposed. A modern topsoil and two buried paleosols are exposed in this face while calcified tree roots (rhizoliths) and branches are present within the dune below the lower of the two paleosols. The dune profile was described and photographed (Table 1 and Image 7) and samples were taken from the main horizons.

Table 1. Description of soil profile at the pit site.		
Unit 1	Depth (cm)	Description
1	0 – 20	Grey sandy topsoil with abundant modern root mats
2	20 – 95	Yellow sands with abundant animal burrows
3	95 – 110	Dark grey / brown horizon in sands – paleosol 1
4	110 – 260	Light yellow to white sands
5	260 – 280	Grey / Brown horizon laterally extensive and forming a stratigraphic bench – paleosol 2.
6	280 – 550 (approx.)	White sands, predominantly carbonate; prominent surface carbonate cementation highlighting stratigraphic beds, calcified tree root and possible calcified small tree stump.
7	Pit Floor	Fossiliferous limestone (Tertiary)

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Image 7: Annotated view looking east over the southern wall of the old pit showing dune and paleosol horizons.

PALEOSOLS

The term 'paleosol' refers to a buried soil horizon within a sedimentary profile. Paleosols are darker band of sediment which may or may not contain woody debris, organic matter and charcoal surrounded by lighter and less charcoal-rich sediments. Paleosols can be important indicators of past stability between depositional events. In this case organic topsoils (indicating stability) have been buried by a non-organic deposits (sand dunes). Two prominent paleosols are present in the exposure. The upper paleosol 1 (Image 8) lies between 95 cm and 115 cm depth and forms a prominent but laterally patchy dark brown organic-rich layer in the upper dune profile. The lower paleosol at 260 cm depth is a thinner and lighter compact sand unit that appears to not be as organic rich. However, this paleosol is laterally extensive and forms a prominent grey bench on the mid slope of the cutting. In the case of the dune systems the presence of paleosols indicates a substantial time of dune stability, allowing an organic topsoil to form prior to renewed dune instability resulting in topsoil burial. At the pit site at least three periods of dune stability can be inferred as indicated by the two buried paleosols and the darker modern topsoil associated with thick root mats on the crest of the dune.

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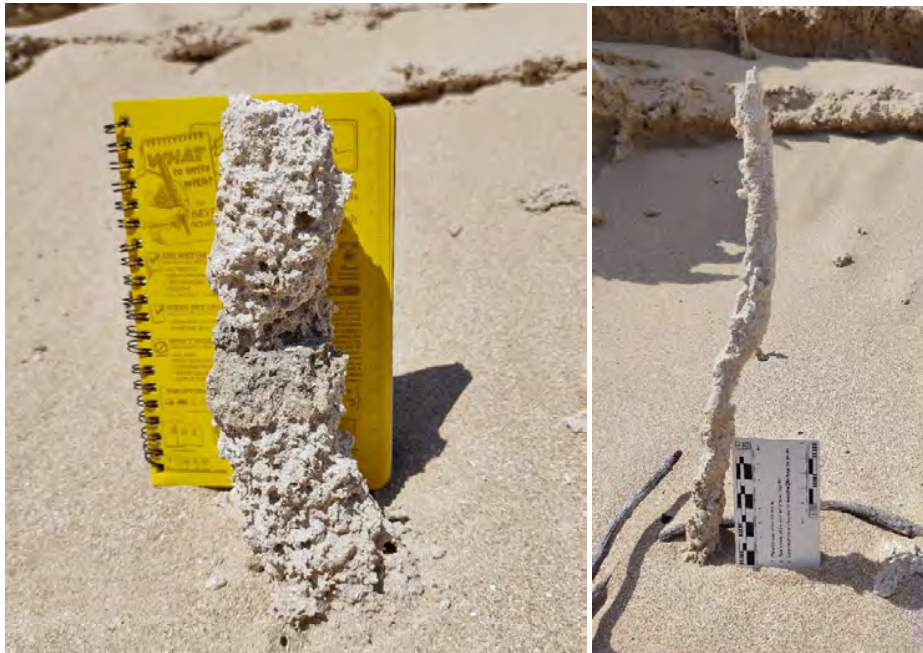
Image 8: Top 1.5 m of the pit face showing prominent brown paleosol at about 1 m depth.

RHIZOLITHS

A feature of the main pit exposure is the rhizoliths located in Unit 6 of the profile (Table 1; Images 9 and 10) formed by dissolution of carbonate by percolating water and its subsequent precipitation around roots.

Rhizoliths observed at the pit include narrow straw-like tree root rhizoliths up to 20 cm long and 1–5 cm across many of which still contain inner woody root material and larger cylindrical-shaped rhizoliths up to 30 cm long and 15 cm thick, which may have formed around tree branches. Small columns are present at other locations in locations suggesting calcification of the stumps of *Melaleuca* and other small trees found at the site.

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Images 9 and 10: Tree root rhizoliths exposed in the lower dune horizon in the pit face. These rhizoliths form from leached calcium carbonate which has precipitated around rough surfaces such as tree roots.



Image 11: Small carbonate benches have formed in the lower dune horizon but unlike the rhizoliths appear to have formed since the pit last operated.

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The cut sand bank also features several distinct carbonate layers (poorly developed calcretes) that indicate slight differences in the carbonate content of the sand dune horizons (Image 11). These layers stand out as hard surfaces in the dune but on cutting back the surface exposure no stratigraphic difference was noted between these layers and those above and below (Image 12). It was concluded that these layers form by surface hardening by carbonate precipitation on the exposed surface since sediment exposure by past pit operations.



Image 12: A cut through the weakly developed calcrete on the cut surface of the pit revealed compact fairly uniform bedded sands.

DATING

A sample for Optically Stimulated Luminescence (OSL) dating was taken from a freshly cut bench in the lowermost dune unit, 1.5 m below the lower paleosol (Images 13 and 14). This sample will be submitted to the OSL laboratory at the University of Wellington (New Zealand) for dating. The date will provide a maximum age for the formation of the lower paleosol and will help establish whether the dunes formed during glacial or interglacial periods.

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Image 13: Taped transect of the face from the top of the dune horizon to the sample site for OSL dating on the cut bench. Image 14: The sample was taken by hammering a sample tube into the cut bench vertically and then removing the sediment for extraction.

MODERN (LATE HOLOCENE DUNES)

Modern dune ridges run parallel to Marshall Beach for the length of the mining lease. They consist of an almost continuous elongated beach foredune backed by a complex of hummocky back dunes separated by roughly bowl-shaped dune swales (depressions). At the western margin of the main resource area these dunes intercept the older west – east longitudinal dunes considered above. The modern dunes are composed of fine loose sands with no evidence of significant calcite crust or rhizolith development; however the carbonate content of the dunes is high. No paleosols were observed in these dunes but thin buried soil horizons may be present. The lack of calcite cementation in the modern dunes suggests a significantly younger age for these deposits as may be expected from their near-coastal setting. Cuttings through the coastal foredune and a low back dune deposit on the main central access track were investigated. The coastal foredune (beach dune) was exposed in a blowout (Images 15 and 16) and displays a uniform profile composed of unconsolidated loose sands. The inland back dune was exposed where the access track cuts through the dune (images 17 and 18). The dune has three horizons: a slightly brown upper 55 cm: a white layer at approximately 55–70 cm and a yellowish layer at >70 cm depth. The profile development indicates a period of dune stability possibly extending back ~1000 years. The brown upper layer is an A1 horizon. The middle white layer is a leached A2 horizon. The deeper yellowish zone is a B horizon. Inappropriate track development and other activities associated with operations on the mining lease could lead to re-activation of these young dunes, which are more exposed to coastal winds than dunes further inland.

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Image 15: Steep modern Marshall Beach foredune looking south from Marshall Rock.

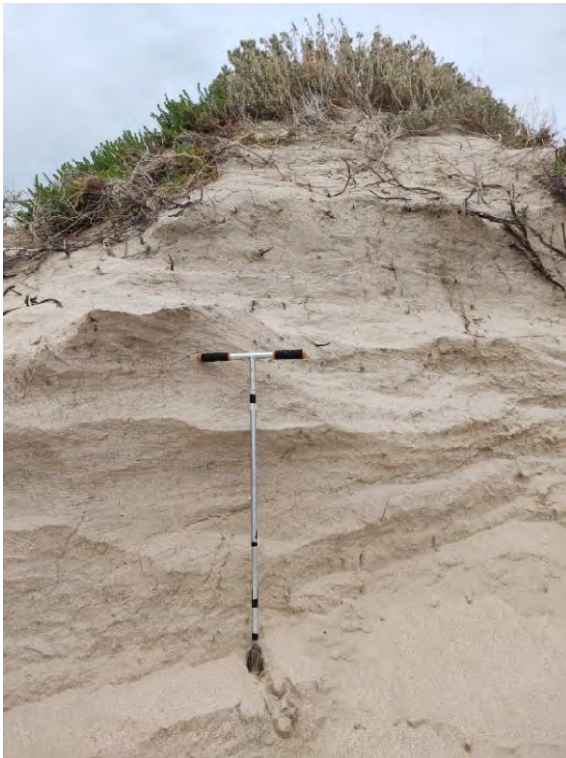


Image 16: Natural windblow exposure through the foredune at soil sample site 6 map 2.

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Image 17: The modern semi-stabilised back dune.



Image 18: The dune has a similar composition to the active foredune however has been stabilised for some time as a soil profile has developed.

*Geomorphology and soils of the Markana Grazing Company Pty Ltd Property***SOIL SURVEY**

Soils were sampled and bagged for transport from several locations in the vicinity of the main resource deposit (Map 2). Soils were sampled at depths of 30 cm, 50 cm and where possible 1 m using either natural cuttings or the Eijkelkamp soil auger. This was to identify any unusual characteristics of the soils and to sample for laboratory assessment of soil acidity (pH). pH was measured after shaking soils and water (1:25 ratio) and allowing the mixture to stand for 2 hours. A Milwaukee MW 100 pH meter was used, calibrated at the time of analysis using standard solutions at pH 4 and pH 7.

Dune swale: Site 1

The centre of a low dune swale southwest of the pit was augered. Soil samples at 30 cm and 50 cm depth were taken from this site. No peat deposits were noted.

South Curved Lagoons Dune swale 2: Site 2

Soils were augered at the lowest point of South Curved Lagoons on a marsupial grazed lawn that appears to hold water at times forming a small pond. The upper 30 cm and 50 cm samples contained yellow white carbonate sands while dark brown swampy organic rich lacustrine sediments were encountered below about 80 cm.

Dune Swale 3: Site 3

The deepest part of the large dune swale that is visible on topographic maps (as an enclosed depression) was sampled at depths of 30, 50 cm and 1 m. The entire profile displayed fine white sands beneath a slightly browner topsoil and no sign of dark organic horizons or peat.

Modern active foredune Site 4:

A grab sample of a cutting in an active foredune exposed in a blowout was sampled at approximately 2.5m depth in a uniform unconsolidated sand with no topsoil.

Main dune exposure: Site 5

Grab samples were taken of the upper dune deposit, Paleosol 1, middle dune deposit, paleosol 2 and the lower dune deposit (Image 7).

Modern (Holocene) back dune Site 6

Three samples were taken from a track cutting through a low dune in the Marshall Beach back dune complex.

Limestone Bench Site 7

Two samples were taken from a thin soil developed on the Tertiary limestone bench.

pH RESULTS

The results of the pH analysis are presented in Table 2. Results for all samples indicated alkaline soil conditions with no indications of highly acidic soil horizons or acid sulphate soils being present in the vicinity of the proposed mining operations. The samples varied in pH between 7.4 and 8.6 with most soils sampled being classified as moderately to strongly alkaline (Blakemore et al. 1987). The topsoil at the large interdune swale (Site 3) returned a

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pH of 7.4 that classifies as slightly alkaline (Acid soils have a pH of below 6.5 with strongly acidic soils having pH of <5.2 (Blakemore et al. 1987)).

Table 2. Results of pH determinations			
Site	Description	Depth	pH
Site 1	Small swale in older dune Southwest of Pit Face	30 cm	8.1
	Small swale in older dune Southwest of Pit Face	50 cm	8.2
Site 2	Lowest point of South Curves Lagoon	30 cm	8.0
	Lowest point of South Curves Lagoon	50 cm	8.0
	Lowest point of South Curves Lagoon – Organic brown muds	100 cm	7.7
Site 3	Lowest point of large elongate dune swale brown topsoil	30 cm	7.4
	Lowest point of large elongate dune swale - gradational	50 cm	7.9
	Lowest point of large elongate dune swale – white sands	100 cm	8.4
Site 4	Holocene Foredune	~250 cm	8.0
Site 5	Course quartz rich sands (rocky base)	30 cm	8.2
	Course quartz rich sands	45 cm	8.3
Site 6	Main Pit profile – Upper sand unit	60 cm	8.5
	Main Pit profile – Paleosol 1	100 cm	8.2
	Main Pit profile – Middle sand unit	120 cm	8.3
	Main Pit profile – Paleosol 2	270 cm	7.8
	Main Pit profile – Lower sand unit (dating sample site)	430 cm	8.1
Site 7	Holocene dune – Upper topsoil	15 cm	8.3
	Holocene dune – Gradational soil (A2)	60 cm	8.3
	Holocene dune – Lower yellow / white sands	95 cm	8.6
Site 8	Shallow limestone soil profile	30 cm	8.1
	Shallow limestone soil profile (rocky base)	50 cm	8.1

The high pH values obtained from the soil samples indicate an alkaline environment where extensive acidic soils are unlikely to be present. The reason for this is that the entire region is buffered by the abundance of dissolved calcium carbonate within the soil profiles and sand dunes and the underlying Tertiary limestone. Low pH conditions are usually associated with deep organic soils or forested areas. While topsoil development is present within the dune fields, they are weakly developed and do not have a significant organic component capable of producing acidic soils, particularly in a carbonate dominated environment. This can be clearly seen by the gradation of pH in the site 3 dune swale samples (Table 2). Here weakly developed topsoil has a pH of 7.4 and pH rises to 7.9 at 50 cm and 8.4 in the white dune sands at >80 cm.

It is notable that although both the site 2 dark organic soil at 100 cm in South Curves Lagoon and the granite-derived soils at site 5 are in locations that should potentially have low pH soils at neither site do pH values drop below pH 7. This is due to the abundance of carbonate in the environment. The lack of deep well-developed topsoils indicate that since the dune formation wet forests or large eucalypt dominated forests may have never been present in this dry landscape. Although the Holocene dune (site 7) clearly shows a period of stability and soil development, the soil is thin and low in organic content. It is notable that at the main pit face (site 5) the two paleosols are also poorly developed and show very limited changes in pH. Previous eucalypt forest cover at these sites is unlikely.

5. SUMMARY AND MANAGEMENT RECOMMENDATIONS

SCIENTIFIC VALUES

The dune field within the study site is a landscape of geoscientific interest which can be and should be managed appropriately to limit the footprint of any extraction activities. The main dune resource identified for extraction under the current development application (not the entire mining lease) is actually a series of up to 8–10 dunes formed between South and North Curves lagoons mapped on the 1:25000 map sheets of the area. Two dune ridges rising to altitudes of around 24 m asl are dominant in the centre of the resource site. The dune ridges have steep profiles and sharp crests indicative of their fairly young age. A central deep elongate depression (mapped as a sinkhole on topographic maps) is a dune swale around 15 m deep. The large dunes and their lower-relief companions (generally 2–4 m high) are oriented west-to-east across the lowland plain. On the eastern margins of the study area they climb onto a bench of Tertiary limestone. The existing pit is near the easternmost end of the two main dunes which at this location have combined into one ridge.

The current face of the old pit provides an interesting profile of dune stratigraphy and is of local scientific interest as it provides evidence of the history of formation of the dunes in this part of Flinders Island and could potentially be used to indicate paleoclimate conditions prevalent on the Island. While this is an interesting exposure, many of the other unimpacted dunes in the region are likely to host similar paleosols and rhizoliths and therefore the features of the pit face are likely to be fairly common within the landscape. The exposure is only visible because of past sand mining operations and has been photographed, sampled and described during this study. Obscuring of the exposure by erosion and tree overturn means that this exposure has a limited lifetime; formal preservation of this site is likely to be impractical.

Resumption of sand mining extending west from the current pit face will destroy and remove the studied deposits but equally it is likely that the mining activities will expose further paleosols and tree root and stump rhizoliths in the sand dune. There is also a remote potential for archaeological deposits to be found within the dune particularly owing to its carbonate-rich nature which is conducive to preserving organic material such as bones (e.g. there is a possibility that large bones associated with megafauna could be exhumed as could ancient human remains or evidence of occupation (fire hearths etc)). Therefore, I suggest that contractors keep an eye out for unusual deposits or large bones during operations. In summary I recommend the following:

Contractors should look out for:

- Thick dark continuous bands within the dunes.
- Buried tree stumps or large calcareous deposits that appear to be parts of a tree.
- Stone deposits within the dunes particularly granite boulders out of place or deposits associated with evidence of fire in the form of charcoal or reddened ash layers or hardened sand.

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- Large accumulations of shells.
- Large bones and accumulations of smaller bones buried >1m under the surface.

In the event notable examples of these deposits are encountered the first task should be to photograph the area and move operations away from the immediate working face until a suitably qualified person (in the context of the item/items discovered) can assess any values.

KARST MANAGEMENT (GENERAL)

While bedrock Tertiary Limestone is present in the east of the mine lease no karst landforms apart from very minor surface solution sculpture (karren) landforms have been identified during this survey. Given the extensive nature and relief of the limestone on the hills east of the mining lease subsurface water flow through karst aquifers is likely but significant karst landforms are unlikely to be present. In the absence of evidence for significant karst formulation of mitigation measures is unnecessary.

SINKHOLES

It is difficult to differentiate shallow sinkhole depressions from dune swales and this is particularly so in the area of the mining lease. However, all the depressions noted were identified as dune swales so I do not believe they should be treated as karst.

Collapse sinkholes form steep sided depressions and are a sign of significant active karst erosion. In the event a steep sided depression forms during operations work should stop at this location and the area should be avoided during operations until expert advice is obtained. Collapse sinkholes can occur in random locations and are potentially hazardous to machinery and the environment as they may continue to expand following the initial collapse and could indicate changes in subsurface karst aquifer conditions.

CAVES

While highly unlikely, if any caves are located within the sand dune or in the mining lease, operations should avoid the area, advice from a suitably qualified person should be obtained before operations resume.

Karst recommendations

- In the event a steep sided depression forms during operations that has signs of collapse these should be recorded and avoided during operations until expert advice is obtained.
- In the event a cave is located on site operations should avoid the area and seek expert advice.

*Geomorphology and soils of the Markana Grazing Company Pty Ltd Property***EROSION RISKS**

Blowouts of the coastal dunes backing the beach are quite common within the mine lease area. However, away from the coast most of the larger dunes appear to be stable. The blowout on the southern edge of the pit face has resulted in minor sand deposition and tree burial south of the highest point of the dune (Image 19). The current location of the pit in the leeward side of the main dune reduces the ability of westerly winds to significantly erode the exposed sands in the pit through deflation, although some loss of sand by wind deflation is likely to have occurred (and may still be occurring). There is a risk that once the operations extend to more of a windward face of the dune, dominant westerly winds may deflate (erode) the dune. This could lead to loss of resource and transport of the sediment. Maintaining a high vegetation cover above the working face and active efforts to revegetate the site away from the working face are key to minimising wind erosion. While easterly winds are common on Flinders Island, they are generally less strong than the westerly winds as evidenced by the strongly deformed vegetation caused by westerlies present at exposed locations on the mining lease (Image 20). Also, easterly winds are generally linked to low pressure systems in the Tasman Sea and rainfall, the wet conditions act to stabilise sand dunes and inhibit wind deflation. Deflation of the sand towards the Marshall Beach Conservation area to west of the proposed pit appears to be unlikely.

Recommendations to minimise wind erosion.

- Avoid, if possible, but otherwise minimise working on faces exposed to westerly winds.
- Maintain vegetation above and to the west of any active face
- Re-establish vegetation on a progressive basis, this could include stockpiling cleared tea tree for covering exposed surface as operations progress.



Image 19: Sand blow deposition burying tree trunks immediately south of the old working face of the sand pit.

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property



Image 20: Vegetation growth strongly impacted by the dominant westerlies.

SOIL MANAGEMENT

Well drained soils in the area of the Markarna lime sands mining lease in the vicinity of the main proposed resource are strongly alkaline Calcarosols. Acidic soils are unlikely to be present over extensive areas and may be totally absent. While organic topsoils, buried paleosols and lake/swamp sediments are present, none of these soils contain adequate organic material to significantly reduce the pH within the dune sands. However, it should be noted that this survey was not comprehensive, and it is possible that the some swampy depressions could host thicker organic horizons having a lower pH. These horizons however will not be directly impacted by sand mining of the high-relief dune ridges.

WETLANDS

The extent of wetlands at both North and South Curves Lagoons are significantly smaller than indicated on the topographic map and the TASVEG mapping. Significant areas of these features are undulating grassy dune fields. No wetlands (swamps) as defined by the Forest Practices Code 2020 (Forest Practices Authority 2020, page 98) were documented in the main resource area.

Geomorphology and soils of the Markana Grazing Company Pty Ltd Property

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ATTACHMENT 6 AMENDMENT

Flinders Local Provisions Schedule

Amendment RZ [.....]

The Flinders Local Provisions Schedule is amended as follows:

To amend the planning scheme map to rezone the land at:

- I. Part of Certificates of Title 120064/1, 215120/1 and 230282/1 (part of 'MARKANA PARK' - 368 FIVE MILE JIM RD MEMANA TAS 7255) from Landscape Conservation Zone to the Rural Zone, as shown in **Annexure 1**.

Annexure 1.

