Public Notice Details

Planning Application Details

Application No	DA2500091

Property Details

Property Location	"Somerton" 923 Lovely Banks Road Colebrook (CT134018/1)

Application Information

Application Type	Level 2 Activity (EMPCA)
Development Category	Compost Facility and Associated Works
Advertising Commencement Date	Tuesday 2nd September 2025
Advertising Closing Period If the Council Offices are closed during normal office hours within the above period, the period for making representations is extended.	Tuesday 30th September 2025

Enquiries regarding this Application can be made via to Southern Midlands Council on (03) 6254 5050 or by emailing planningenquires@southernmidlands.tas.gov.au. Please quote the development application number when making your enquiry.

Representations on this application may be made to the General Manager in writing either by

Post: PO Box 21, Oatlands Tas 7120
Email: mail@southernmidlands.tas.gov.au
Fax: 03 6254 5014

All representations must include the authors full name, contact number and postal address and be received by the advertising closing date.

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APPLICATION FOR PLANNING PERMIT

DEVELOPMENT / USE

Use this form to apply for a permit in accordance with section 57 and 58 of the *Land Use Planning and Approvals Act 1993*

Proposed use/development:
(Provide details of proposed works and use).

Proposed composting facility and associated works

Location of Development:
(If the development includes more than one site, or is over another property include address of both Properties).

'Somerton'
Lovely Banks Road
Melton Mowbray TAS 7030

Certificate of Title/s Volume Number/Lot Number:

CT- 134018/1

Land Owners Name:

Rodney Clifford Jones

Full Name/s or Full Business/Company Name

Applicant's Name:

Gray Planning obo. Mr Seaton Waterfield

Full Name/s or Full Business/ Company Name (ABN if registered business or company name)

Contact details:

Postal address for correspondence: 224 Warwick Street
West Hobart TAS 7000

Telephone or Mobile: 0439 342 696

Email address: admin@grayplanning.com.au

(Please note it is your responsibility to provide your correct email address and to check your email for communications from the Council.)

Details Tax Invoice for application fees to be in the name of: (if different from applicant)

Seaton Waterfield

Full Name/s or Full Business or Company Name and ABN if registered business or company name

Print email address Unit 2, 19 Willowbend Road Kingston TAS 7050

ABN N/A

What is the estimated value of all the new work proposed

$ 35,000

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For Commercial Planning Permit Applications Only

Signage:

Is any signage proposed?	Yes	No
	☐	☑

If yes, attach details: size, location and art work

Business Details:

Existing hours of operation

Hours	am	to	pm
Weekdays	N/A		
Sat			
Sun			

Proposed hours of new operation

Hours	am	to	pm
Weekdays	7:00		5:00
Sat			
Sun			

Number of existing employees:	N/A	Number of proposed new employees:	2

Traffic Movements:

Number of commercial vehicles serving the site at present	see lodged TIA	Approximate number of commercial vehicles servicing the site in the future	see TIA

Number of Car Parking Spaces:

How many car spaces are currently provided	None	How many new car spaces are proposed	2

Is the development to be staged: Please tick ✓answer

Yes	☐	No	☑

Please attach any additional information that may be required by Part 6.1 *Application Requirements* of the Tasmanian Planning Scheme – Southern Midlands. see all lodged docs

Signed Declaration D Gray

I/we as owner of the land or person with consent of the owner hereby declare that:

1. I/we have read the Certificate of Title and Schedule of Easements for the land and I/we are satisfied that this application is not prevented by any restrictions, easements or covenants.
2. I/we provide permission by or on behalf of the applicant for Council officers to enter the site to assess the application.
3. The information given in this application is true and accurate. I/we understand that the information and materials provided with this application may be made available to the public. I/we understand that the Council may make such copies of the information and materials as, in its opinion, are necessary to facilitate a thorough consideration of the application.
4. I/we have secured the necessary permission from the copyright owner to communicate and reproduce the plans submitted with the application for assessment. I/we indemnify the Southern Midlands Council for any claim or action taken against it regarding a breach of copyright in respect of any of the information or material provided.
5. I/we declare that, in accordance with Section 52(1) of the Land Use Planning and Approvals Act 1993, that I have notified the owner of the intention to make this application. Where the subject property is owned or controlled by Council or the Crown, their consent is attached and the application form signed by the Minister of the Crown responsible and/or the General Manager of the Council.

Applicant Signature (If not the Title Owner)	Applicant Name (*please print*)	Date
D Gray	Gray Planning (Danielle Gray) obo S. Waterfield	7.7.25
Land Owner(s) Signature	**Land Owners *Name (please print)***	**Date**
notified as per s. 52(1)	See letter	

Address all correspondence to: The General Manager, PO Box 21, Oatlands, Tasmania 7120
Oatlands Office: 71 High Street, Oatlands 7120 Phone (03) 62545000
Kempton Office: 85 Main Street, Kempton 7030 Phone (03) 62545050
Email Address: mail@southernmidlands.tas.gov.au Web: www.southernmidlands.tas.gov.au
ABN 68 653 459 589

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Land Owner(s) Signature	Land Owners *Name (please print)*	Date
see attached S52 notification letter		

PRIVACY STATEMENT

The Southern Midlands Council abides by the Personal Information Protection Act 2004 and views the protection of your privacy as an integral part of its commitment towards complete accountability and integrity in all its activities and programs.

Collection of Personal Information: The personal information being collected from you for the purposes of the Personal Information Protection Act, 2004 and will be used solely by Council in accordance with its Privacy Policy. Council is collecting this information from you in order to process your application.

Disclosure of Personal Information: Council will take all necessary measures to prevent unauthorised access to or disclosure of your personal information. External organisations to whom this personal information will be disclosed as required under the Building Act 2000. This information will not be disclosed to any other external agencies unless required or authorised by law.

Correction of Personal Information: If you wish to alter any personal information you have supplied to Council please telephone the Southern Midlands Council on (03) 62545050. Please contact the Council's Privacy Officer on (03) 6254 5000 if you have any other enquires concerning Council's privacy procedures.

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Information & Checklist Sheet
DEVELOPMENT / USE

Use this check list for submitting your application for a planning permit –Please do not attach the check list with your application

Submitting your application ✓

1. All plans and information required per Part 6.1 Application Requirements of the Tasmanian Planning Scheme i.e.: site plan showing all existing buildings, proposed buildings, elevation plans etc. see submitted ☑
2. Copy of the current Certificate of Title, Schedule of Easements and Title Plan (Available from Service Tasmania Offices) retrieved 7.7.25 ☑
3. Any reports, certificates or written statements to accompany the Application (if applicable) required by the relevant zone or code. see attached reports ☑
4. Prescribed fees payable to Council TBC ☐

Information

If you provide an email address in this form then the Southern Midlands Council ("the Council") will treat the provision of the email address as consent to the Council, pursuant to Section 6 of the Electronic Transactions Act 2000, to using that email address for the purposes of assessing the Application under the Land Use Planning and Approvals Act 1993 ("the Act").

If you provide an email address, the Council will not provide hard copy documentation unless specifically requested.

It is your responsibility to provide the Council with the correct email address and to check your email for communications from the Council.

If you do not wish for the Council to use your email address as the method of contact and for the giving of information, please tick ✓ the box ☐

Heritage Tasmania

If the Property is listed on the Tasmanian Heritage Register then the Application will be referred to Heritage Tasmania unless an Exemption Certificate has been provided with this Application. (Phone 1300 850 332 (local call cost) or email enquires@heritage.tas.gov.au)

TasWater

Depending on the works proposed Council may be required to refer the Application to TasWater for assessment (Phone 136992)

IMPORTANT: There is no connection between Planning approval and Building & Plumbing approvals.

Owners are to ensure that the work is either Low-Risk Building Work, Notifiable Building Work or Permit work in accordance with the Directors Determination – Categories of Building & Demolition Work v 1.4 dated 12 March 2021 prior to any building works being carried out on the land.

https://www.cbos.tas.gov.au/__data/assets/pdf_file/0014/405014/Directors-determination-categories-of-building-and-demolition-work-2021.pdf

Gray Planning

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Danielle Gray, Principal Consultant

Gray Planning

224 Warwick Street

West Hobart TAS 7000

7 July 2025

The General Manager

Southern Midlands Council

PO Box 21

Oatlands TAS 7120

Dear Sir,

RE: proposed Composting Facility (Compost King) at 'Somerton', Lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1)

I wish to advise you that Gray Planning has been engaged by Mr Seaton Waterfield (Compost King) to submit a planning application for a composting facility and associated works to Southern Midlands Council.

The proposal seeks to undertake composting of waste organic materials at the site as well as undertake minor site works to facilitate the composting operations including installation of shipping containers and an ablutions block as shown on the submitted plans.

This application replaces the previous planning application DA 2020/60 Proposed Organic Composting Facility Property described as CT134018/1 Lovely Banks Road, Melton Mowbray.

The proposed composting operations as outlined and described in the submitted documentation have now been approved by the EPA. Given that process took nearly 4 years and the Planning Scheme has now changed over to the Tasmanian Planning Scheme in the Southern Midlands municipality, the decision has been made to lodge a new application for planning approval afresh under the Tasmanian Planning Scheme and *Southern Midlands Local Provisions Schedule*.

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Documents submitted as part of this new planning application include:

- Completed planning application form dated 7 July 2025;
- Town Planning compliance report prepared by Gray Planning (Version 4.0) dated 7 July 2025;
- Title documents comprising title plan, title text and property report for the subject site CT-134018/1, retrieved 7 July 2025;
- Land owner notification S.52(1) letter dated 7 July 2025 and prepared by Gray Planning on behalf of the developer Mr Seaton Waterfield;
- Land owned notification declaration to Council dated 7 July 2025;
- Measured plans and dimensioned images of the proposed buildings (shipping containers) and toilet block (pre fabricated) dated July 2025;
- Agricultural report dated July 2021 prepared by Rod Hancl;
- Traffic Impact Assessment dated November 2022 prepared by Terry Eaton;
- Community consultation report dated 13 August 2021 prepared by William (Bill) Cromer;
- Natural Values Assessment dated 4 August 2022 prepared by Enviro Dynamics;
- Geotechnical report dated February 2024 prepared by William (Bill) Cromer;
- Hydrogeological report dated February 2024 prepared by William (Bill) Cromer;
- Odour Impact Assessment prepared by Assured Environmental (AE) dated 17 December 2024, Version R2.
- Odour Management Plan dated 18 December 2024 prepared by William (Bill) Cromer
- Environmental Impact Assessment, Revision 7, dated February 2025 and prepared by William (Bill) Cromer; and
- EPA signed approval of R7 EIS provided by Bill Cromer (see above report) dated 14 April 2025.

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I make reference to Council's RFI for the previously submitted planning application DA 2020/60 and provide comments against each requested item:

1. Assessment Level / Quantity

Application has been made for a Level 1 Activity under the *Environment Management and Pollution Control Act 1994* (EMPCA) and the *Land Use Planning and Approvals Act 1993* (LUPAA) on the basis that the composted material will be used on agricultural land under the same ownership as the land on which the compost is produced (Schedule 2, 3(d) of EMPCA), reproduced below:

> *(d) Resource recovery: the conduct of works for –*
> *(i) the production of compost or mushroom substrate, being works with a production capacity of 100 tonnes per year or more, other than –*
> *(A) backyard composting for domestic use; and*
> *(B) on-farm composting for use on agricultural land having the same owner as the land on which the compost is produced; and*
> *(C) works in respect of silage for use on agricultural land;*

The application indicates that the quantity of material will be far more than the 100 tonnes per year threshold specified in Schedule 2 (d)(i), with the proposed amount over 30 000 tonnes per year.

Council is concerned that the proposal may be beyond the reasonable scope of the exemption granted by Schedule 2, 3(d) of EMPCA given the amount

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and type of waste (including fish waste) to be composted. Council officers do not have the expertise or expertise to assess an application for composting at the quantity proposed.

If the proposal is pursued at this level Council will refer the Development Application to the EPA under Section 25 of EMPCA, for their assistance and consideration.

It is further noted that the Environmental Protection Authority (EPA) have the ability to 'call in' a Level 1 Development Application for assessment where it is identified that there is a risk of environmental harm occurring under Section 24 of EMPCA.

Further information is required if the proposal is to be considered for a Level 1 assessment by Council:

a) Reduction of the overall quantity of waste to be composted; and/or

b) Additional detailed information provided to demonstrate that the quantity of compost to be produced can and will be used on land under the same ownership.

   It is suggested that this would need to be a detailed analysis prepared by a suitably qualified person (eg environmental scientist and or agronomist) detailing:
   - Locations and area of land available for compost application;
   - Details of application method, rates and overall quantities;
   - Compost storage details; and
   - Management of compost application to avoid run off or other environmental issues.

Planning Comment

The proponent (Mr Seaton Waterfield of Compost King) and his consultant Mr William (Bill) Cromer have worked through the composting process and the materials and quantities to be processed with the EPA since 2020.

EPA approval has now been given as per their letter dated 14 April 2025.

Please see attached plans, reports and documents that formed part of the EPA consultation and approval and all of which have been submitted as part of this new planning application.

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2. Environmental Impact Assessment

The current application documents do not provide sufficient detail or demonstrate input from suitably qualified experts for the nature of the proposal.

Please provide an Environmental Impact Assessment prepared by a suitably qualified person considering at least the following matters:

- Detailed site plan drawn to an appropriate scale;
- Odour modelling and management;
- Management of runoff and leachate, including consideration of watercourses, groundwater and surrounding land uses;
- Conservation values (particularly vegetation as the access passes through an area mapped within the Biodiversity Code of the Planning Scheme);
- Noise generation and hours of operation;
- Solid waste management;
- Hazardous materials use and storage (such as fuels);
- Visual considerations;
- Traffic and access;
- Fire risk;
- Weed Management;
- Details of staff facilities onsite;
- Site cleanup and rehabilitation; and
- Monitoring program.

Planning Comment

EPA approval has now been given as per their letter dated 14 April 2025.

Please see attached plans, reports and documents that formed part of the EPA consultation and approval and all of which have been submitted as part of this new planning application.

These submitted documents include odour management and assessment reports, a revised Version 7 Environmental Impact Statement (EIS), Traffic Impact Assessment, plans of proposed buildings and works and a natural values assessment (despite the subject site no longer containing any vegetation overlay).

It should be noted that while there are overlays affecting the subject site that trigger consideration under the C7.0 Natural Assets Code, none of these are located in the vicinity of the proposed use and works that are to be located in the far north western corner of the subject site. The Natural Assets Code is therefore not relevant in the assessment of the proposal.

Likewise, there are no overlays affecting the subject site that trigger consideration of visual impact or scenic value.

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The subject site is affected by the Bushfire Prone Areas overlay and further information can be provided if necessary.

3. Planning Scheme Assessment

Please provide a planning assessment with information and details addressing the following relevant parts of the Southern Midlands Interim Planning Scheme 2015:

a) Rural Resource Zone – 26.3.3 Discretionary Uses;
b) E5 Road and Railway Assets Code;
c) E6 Parking and Access Code;
d) E7 Stormwater Management Code;
e) E9 Attenuation Code
f) E10 Biodiversity Code; and
g) E11 Waterway and Coastal Protection Code.

Planning Comment

Please see the accompanying town planning compliance report prepared by Gray Planning (Version 4.0) dated 7 July 2025.

Comments have been provided against the Discretionary use standards under the applicable Agriculture zone while each Code has been commented upon in this report. More information, clarification or expanded detail can be provided if required by Council.

Should you wish to discuss or have any questions, please get in touch.

Yours faithfully

Danielle Gray B.Env.Des. MTP. MPIA

Principal Consultant, Gray Planning

Obo Mr Seaton Waterfield

Gray Planning

Solutions for Town Planning & Heritage

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Danielle Gray, Principal Consultant

Gray Planning

224 Warwick Street

West Hobart TAS 7000

7 July 2025

The General Manager

Southern Midlands Council

PO Box 21

Oatlands TAS 7120

Dear Sir,

RE: proposed Composting Facility (Compost King) at 'Somerton', Lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1)

I wish to advise you that Gray Planning has been engaged by Mr Seaton Waterfield (Compost King) to submit a planning application for a composting facility and associated works to Southern Midlands Council.

The proposal seeks to undertake composting of waste organic materials at the site as well as undertake minor site works to facilitate the composting operations including installation of shipping containers and an ablutions block as shown on the submitted plans.

Under Section 52(1) of the Land Use Planning and Approvals Act 1993, *the applicant must include in the application for the permit a declaration that the applicant has notified the owner of the intention to make the application.*

On this basis, Gray Planning has prepared a letter dated 7 July 2025 advising the owner Mr Rodney Clifford Jones of the affected land that a planning application for a composting facility at the property 'Somerton' at Lot 1 Lovely Banks Road at Melton Mowbray (CT-134018/1) will be shortly submitted to Southern Midlands Council for an application for planning approval under the Tasmanian Planning Scheme.

Should you wish to discuss or have any questions, please get in touch.

03 6288 8449
0439 342 696

danielle@grayplanning.com.au
224 Warwick St, West Hobart, Tas, 7000

grayplanning.com.au
ABN 99148920244

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Yours faithfully

Danielle Gray B.Env.Des. MTP. MPIA

Principal Consultant, Gray Planning

Obo Mr Seaton Waterfield

Gray Planning

Solutions for Town Planning & Heritage

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Danielle Gray, Principal Consultant

Gray Planning

224 Warwick Street

West Hobart TAS 7000

1 August 2025

Mr Rodney Clifford Jones

4209 Midland Highway

Melton Mowbray TAS 7040

Dear Mr Jones,

RE: proposed Composting Facility (Compost King) at 'Somerton', Lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1)

I wish to advise you that Gray Planning has been engaged by Mr Seaton Waterfield (Compost King) to submit a planning application for a composting facility and associated works to Southern Midlands Council.

The proposal seeks to undertake composting of waste organic materials at the site as well as undertake minor site works to facilitate the composting operations including installation of shipping containers and an ablutions block as shown on the submitted plans.

Under Section 52(1) of the Land Use Planning and Approvals Act 1993, *the applicant must include in the application for the permit a declaration that the applicant has notified the owner of the intention to make the application.*

On this basis, Gray Planning seeks to advise you as the owner of the affected land that a planning application for a composting facility at the property 'Somerton' at Lot 1 Lovely Banks Road at Melton Mowbray (CT-134018/1) has been submitted to Southern Midlands Council for an application for planning approval under the Tasmanian Planning Scheme.

Should you wish to discuss or have any questions, please get in touch.

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[illegible]

Yours faithfully

Danielle Gray B.Env.Des. MTP. MPIA

Principal Consultant, Gray Planning

Obo Mr Seaton Waterfield

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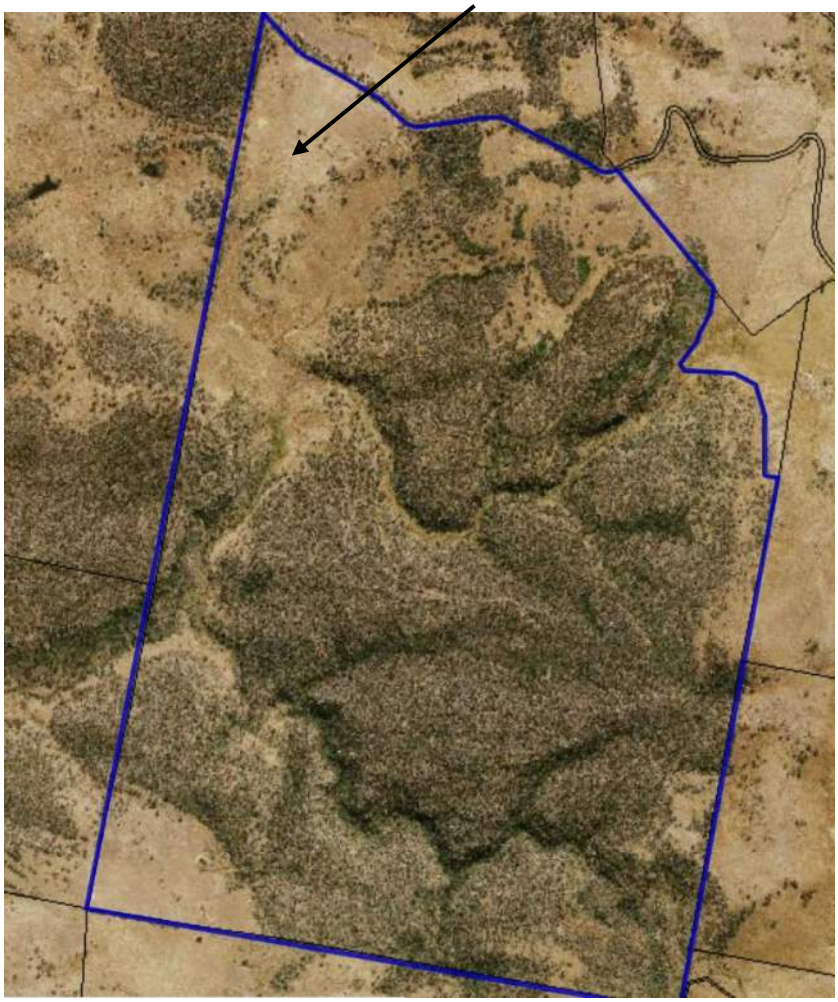

Town Planning compliance review and advice
Proposed Composting Facility
For Mr S Waterfield, Compost Kings

Lot 1, Lovely Banks Road, Melton Mowbray (CT-134018/1)
Southern Midlands Local Provisions Schedule and
Tasmanian Planning Scheme

1 August 2025

Version 5.

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Gray Planning
224 Warwick Street
West Hobart TAS 7000

1 August 2025

Mr Seaton Waterfield
Compost Kings
c/- billcromer@bigpond.com; and
s.waterfield1984@hotmail.com

Dear Seaton,

Thank you for considering Gray Planning to assist you with town planning enquiries you have in relation to a proposed development at the property 'Somerton' located at lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1).

I refer to recent discussions with yourself and your consultant Bill Cromer in relation to the development which requires professional planning advice and assistance to provide you with written town planning advice.

Gray Planning has been engaged to undertake the following work:

1.0 Preliminary planning advice:
Council discussion with relevant officer (D Cundall):
Undertaken 19 May 2021 at 9am with Council officers David Cundall and Louisa Brown

Site inspection and images and on site meeting:
Undertaken 19 June 2021

Review of proposal plans and available documents and title for the subject property, review of relevant zoning and Code development and use standards and the provision of written town planning advice as to the planning issues to address applicable Planning Scheme standards:
Please find attached following review and town planning compliance report dated 7 July 2025

Meeting (zoom or teleconference etc) with yourself and client to go over written planning advice
Ongoing but most recently undertaken September, October and December 2024

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**Gray Planning can provide a full copy of the Certificate of Title (including title text, title plan and schedule of easements) for the subject property at an additional cost of $72 not including GST for the title review and included above (a copy of these documents will be also provided to the client for their own records)*

Please see in following updated town planning compliance report dated 7 July 2025 (Version 4.0)

Please find attached an updated preliminary town planning review report (Version 4.0) outlining the likely compliance or otherwise of the proposed use and development under the applicable zone and Codes under the *Southern Midlands LPS and State Planning Provisions of the Tasmanian Planning Scheme*.

It is intended that the information contained therein will assist you in making decisions about preparations to develop the property and accordingly lodge a planning application to Southern Midlands Council.

I also note that the EPA have noted: *The EPA previously advised that the EIS for Compost Kings Tasmania, Proposed Composting Facility, Lovely Banks Road, Melton Mowbray Revision 7 dated February 2025 contains sufficient information to satisfy the requirements of section 74(3) of EMPCA for the purposes of public and agency consultation, which was referred as previous permit application DA 2020/60*.

Should you have any questions about the content of the report, please do not hesitate to contact me on 0439 342 696 and I will be happy to assist you.

Yours faithfully

Danielle Gray B.Env.Des. MTP. MPIA

Principal Consultant, Gray Planning

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1 Introduction

1.1 Purpose

The purpose of this report is to provide a preliminary planning review confirming compliance against the applicable use and development standards in the Planning Scheme (Southern Midlands LPS and State Planning Provisions as part of the Tasmanian Planning Scheme) for a proposed development of a composting facility at the property 'Somerton' located at lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1).

1.2 Copyright

The report is subject to copyright the owner of which is Danielle Gray Planning, trading as Gray Planning. All unauthorised copying or reproduction of this report or any part of it is forbidden by law and is subject to civil and criminal penalties as asset out in the *Copyright Act 1968*. All requests for permission to reproduce this report or its contents must be directed to Danielle Gray.

Last updated: 1 August 2025

Report Author: Danielle Gray

Version 5.0

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2 Scope of town planning assistance

2.1 Request for town planning advice

Gray Planning was approached by the client in February 2021 to provide town planning and guidance with respect to the development for a composting facility at lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1).

Gray Planning was engaged to undertake the following as part of an overall scope of works which also included a meeting with Council and involvement in a community consultation meeting:

Review of proposal plans and available documents and title for the subject property, review of relevant zoning and Code development and use standards and the provision of written town planning advice as to the planning issues to address applicable Planning Scheme standards:

The following town planning review and report provide responses to address the above.

It should be noted that the original town planning review reports dated May 2021 (Version 1.0) and 27 September 2022 (Version 2.0) have been superseded by this Version 4.0 town planning report which has been updated to make reference to recent updated environmental assessments including the most recent *Odour Impact Assessment* prepared by Assured Environmental dated 17 December 2024, amended plans from Bill Cromer and also updated to reflect the changeover to the Southern Midlands Local Provisions schedule (LPS) and State Planning Provisions as part of the Tasmanian Planning Scheme that the Southern Midlands municipal area operates under.

These plans and documents were recently approved by the EPA in a letter dated 14 April 2025. This approval letter and all approved documents have been included as part of the new planning application submitted to Council under the Tasmanian Planning Scheme.

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3 The subject site

3.1 Existing Site Development at the subject site Lot 1 Lovely Banks Road, Melton Mowbray (CT-134018/1

The subject site is 'Somerton' located at lot 1 Lovely Banks Road, Melton Mowbray (title reference CT-134018/1) and has frontage onto Lovely Banks Road to the northern 'frontage' boundary of the site which is determined to be the 'primary' frontage.

The subject site is vacant in terms of development and is understood to be used for primary production purposes in the form of pasture for grazing (sheep).

A site inspection was undertaken for this advice on 19 June 2021, with the advice provided within this report providing a summary of applicable planning use and development standards under the *Southern Midlands LPS* and *State Planning Provisions of the Tasmanian Planning Scheme*.

When viewed on aerial photography and inspected, the subject site has undulating gradients to the south while gradients and topography are more level in the northern part of the site, close to the Lovely Banks Road frontage.

The site is a mixed of historically cleared pasture in the north where the development will occur and also native vegetation in the form of Eucalyptus and grasslands to the south within the subject site.

The subject site itself is 898 hectares in total area, however only a very small north western part of the subject site close to Lovely Banks Road will be used for the proposed use and development of a composting facility. This northern part of the site to be used for the proposed composting facility will be fenced off and measures approximately 23 hectares in area.

The subject site is free of any development in the form of buildings or structures and is used as pasture primarily for the grazing of sheep.

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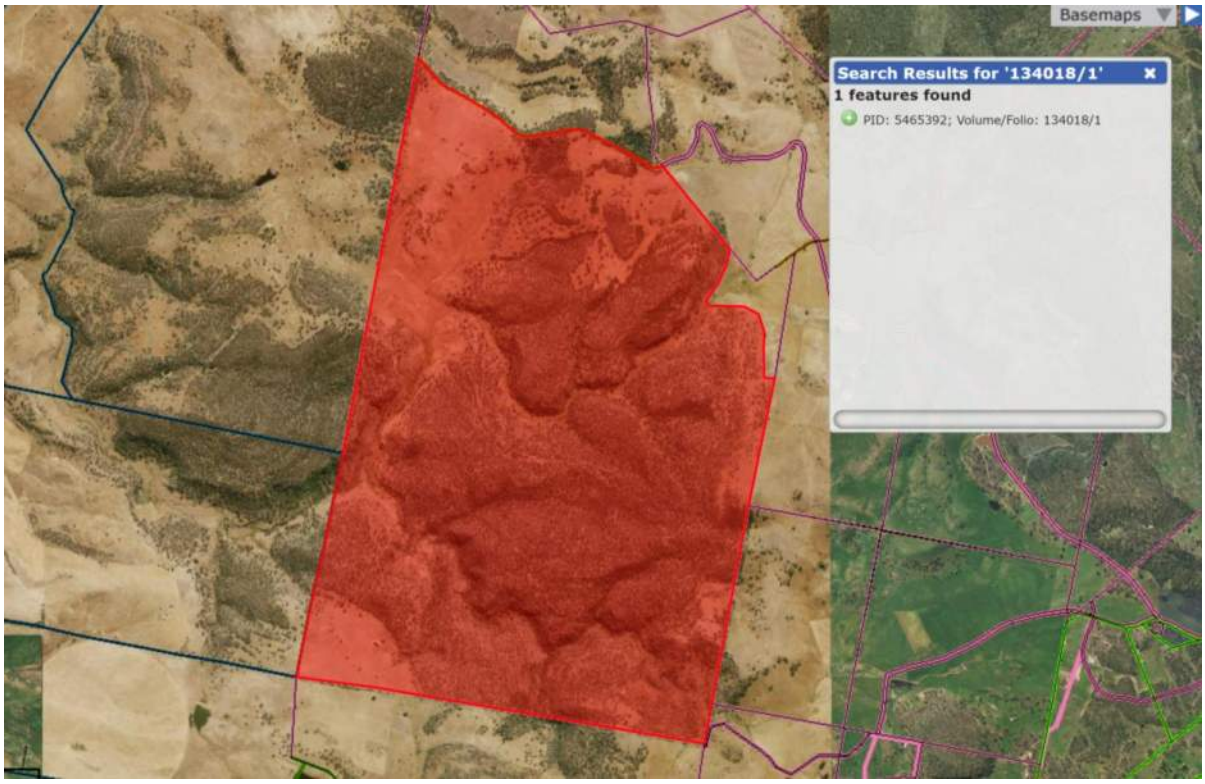

Figure.1. The subject site shown outlined with surrounding rural land which appears to be used primarily for grazing purposes (sheep). Source: TheLIST, sourced July 2025. No nominated scale.

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<u>Figure.2.</u> The subject site shown outlined with surrounding rural land which appears to be used primarily for grazing purposes (sheep). Source: TheLIST, sourced July 2025. No nominated scale.

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4 Title documents for the subject site

4.1 Title for the subject site Lot 1 Lovely Banks Road

The subject title reference is CT-134018/1 with the property measuring 898 hectares in total site area.

A check of the title for the property revealed there is no applicable Schedule of Easements attached to the subject title. This would imply that the property has no covenants, easements, Part 5 Agreements or building areas.

The title property report from TheList provides the following property information (which notes it is rated as pastoral/grazing purposes only):

PREMIUM PROPERTY Information Report

PROPERTY DETAILS - LOVELY BANKS RD MELTON MOWBRAY

Property Name:	SOMERTON
Land Use:	Primary Production - GRAZING/PASTORAL-OPEN,RUN,BUSH (valuation purposes only)
Improvements:	FARM IMPTS
Improvement Sizes (Top 3 by Size):	**Improvement:** OTHER IMPROVEMENTS **Area:**
Number of Bedrooms:	
Construction Year of Main Building:	
Roof Material:	
Wall Material:	
Land Area:	898.0 hectares
Title References:	134018/1
Municipality:	SOUTHERN MIDLANDS View Municipality Information Report
Title owner:	134018/1 : RODNEY CLIFFORD JONES
Interested parties:	RODNEY CLIFFORD JONES
Postal address: (Interested Parties)	4208 MIDLAND HWY MELTON MOWBRAY TAS 7030

OWNERSHIP HISTORY - LOVELY BANKS RD MELTON MOWBRAY

TYPE	NAME	ADDRESS	FROM	TO
Ownership	RODNEY CLIFFORD JONES	REDSIDE 4208 MIDLAND HWY MELTON MOWBRAY TAS 7030	02/11/1993	
Ownership	ALEC WILLIAM JONES	SOMERTON LOVELY BANKS ROAD MELTON MOWBRAY TAS 7030	01/07/1982	02/11/1993

Figure.3. Rating and property information of subject site. Source: TheLIST, sourced July 2025.

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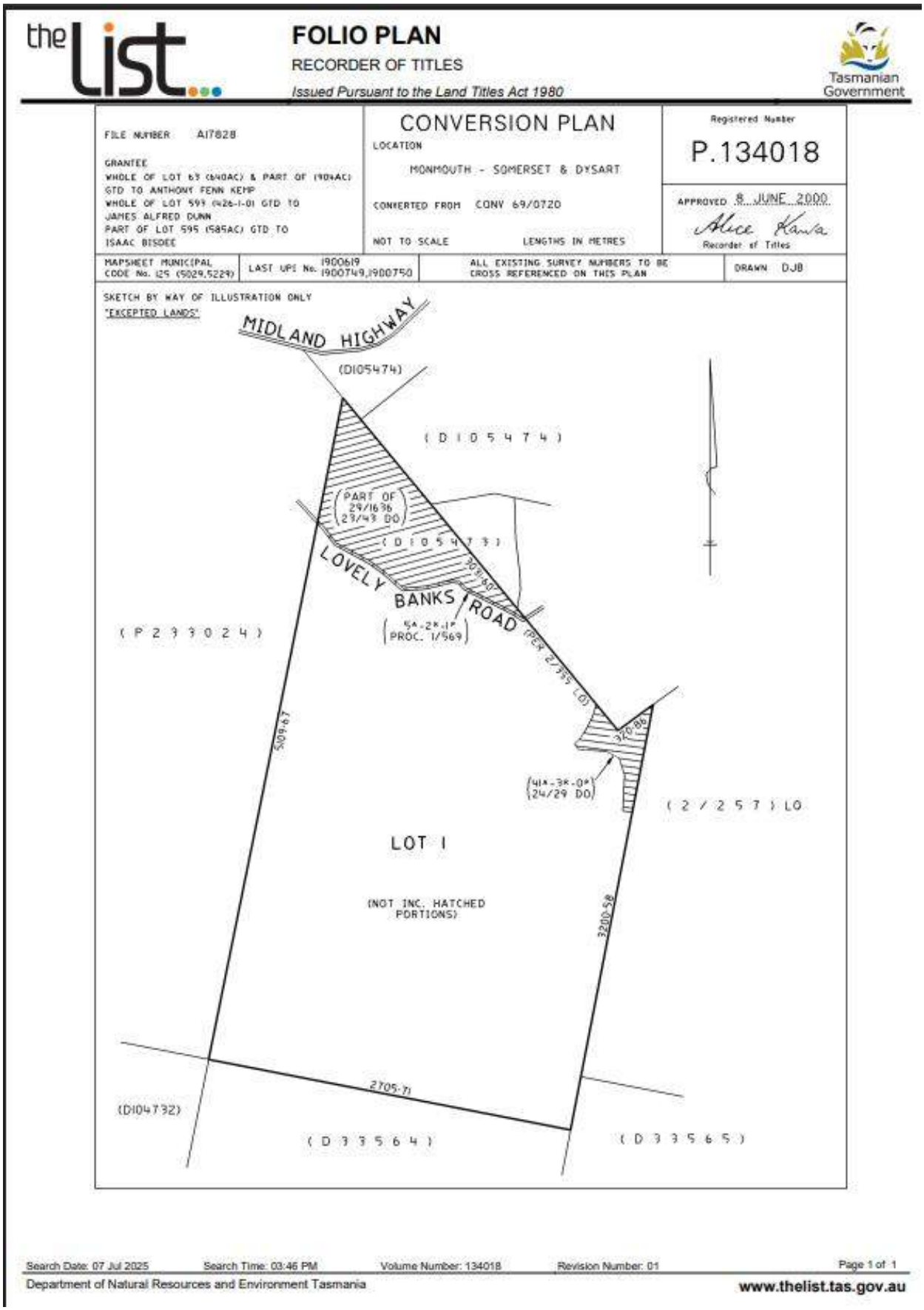

<u>Figure.4.</u> Title plan for the subject site. There is no applicable Schedule of Easements.
Source: TheLIST, sourced July 2025.

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5 Outline of the proposed use and development of a composting facility at the subject site

5.1 Plans and location of the proposed composting facility

The following is an outline of the proposed use and development of a composting facility at the subject site.

The information on following pages has been taken from the most recent Assured Environmental assessment (as per EPA approval 14 April 2025) of the development that outlines the proposed composting operations, process and materials to be composted.

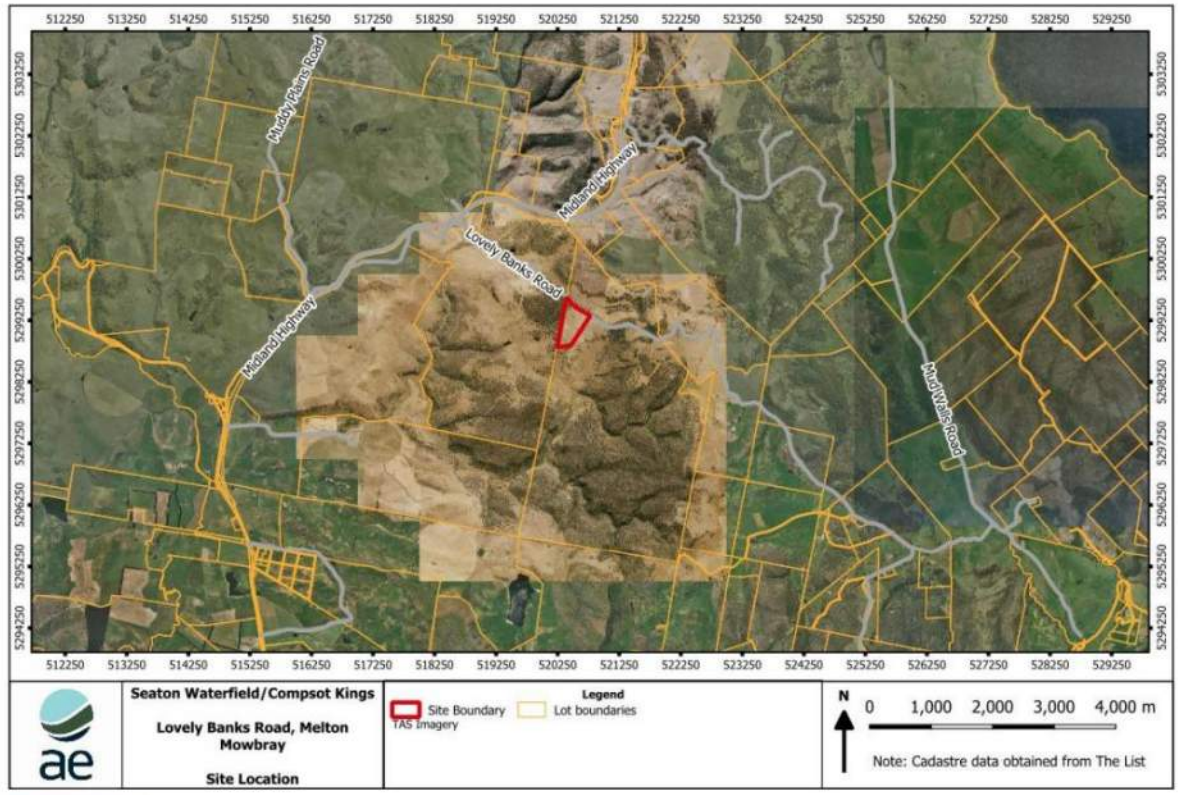

Figure 1: Site Location

The above map is where the proposed use and development will occur within the Somerton property at Lot 1 Lovely Banks Road.

(Source: *Odour Impact Assessment* prepared by Assured Environmental dated 17 December 2024, page 10)

03 6288 8449
0439 342 696
danielle@grayplanning.com.au
224 Warwick St, West Hobart, Tas, 7000
grayplanning.com.au
ABN 99148920244

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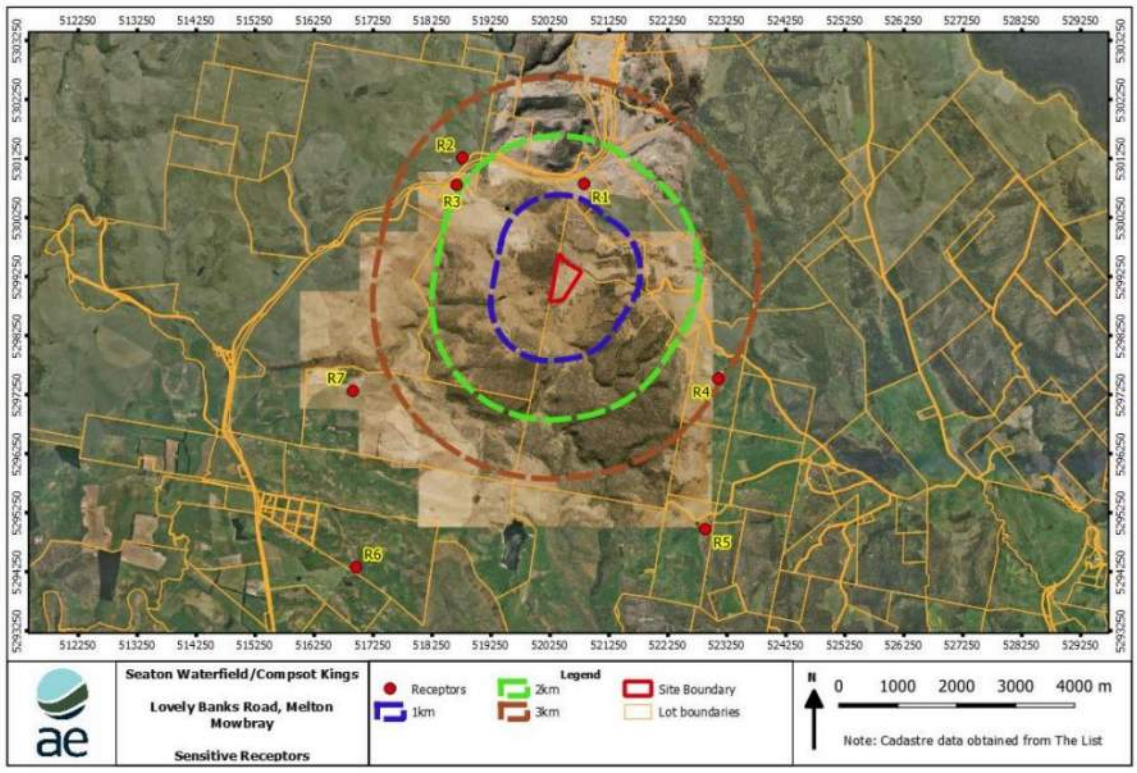

Figure 3: Receptors

The above map is where the proposed use and development will occur within the Somerton property at Lot 1 Lovely Banks Road.

(Source: *Odour Impact Assessment* prepared by Assured Environmental dated 17 December 2024, page 12)

03 6288 8449
0439 342 696
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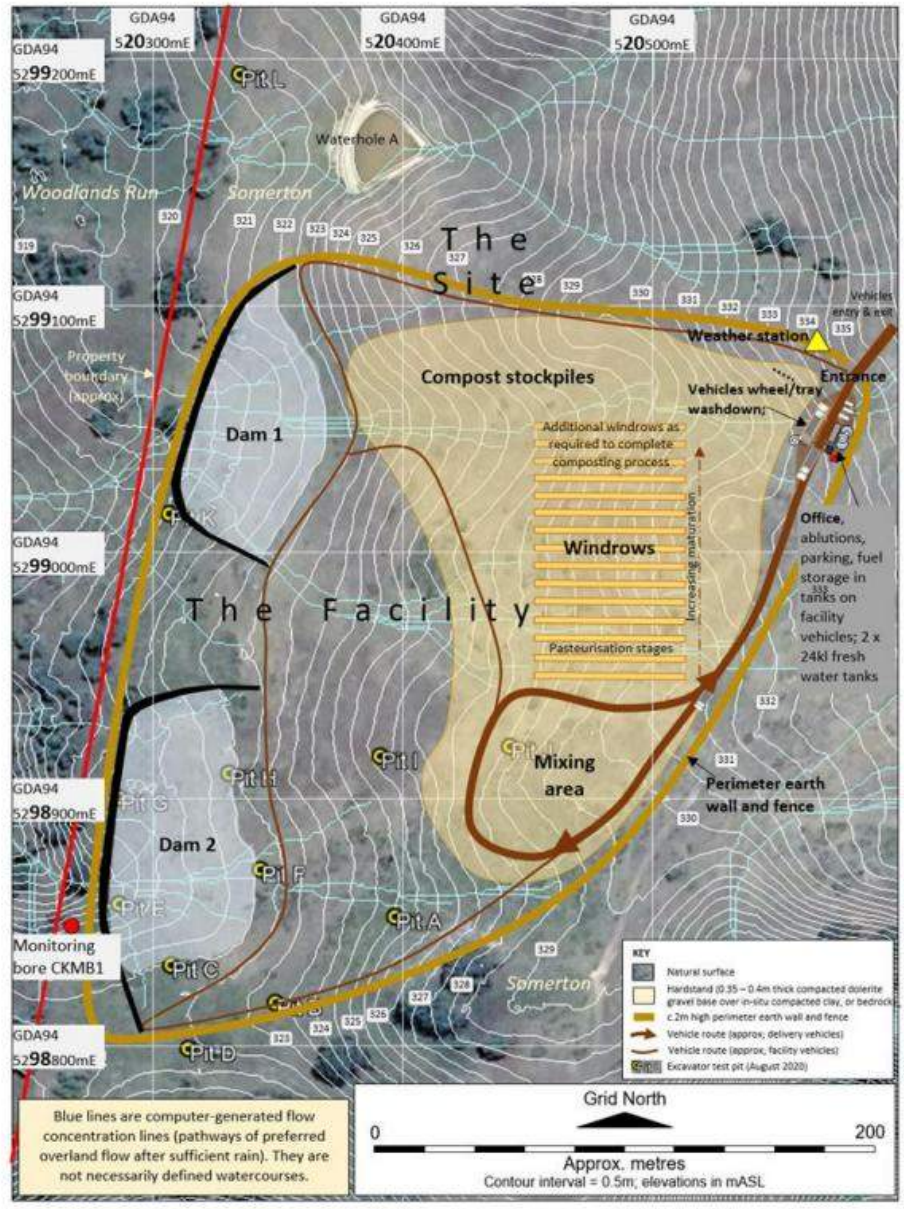

Figure 5: Facility Layout Schematic

The above is a map showing the location of proposed works and development proposed as part of the composting facility.

(Source: *Odour Impact Assessment* prepared by Assured Environmental dated 17 December 2024, page 17)

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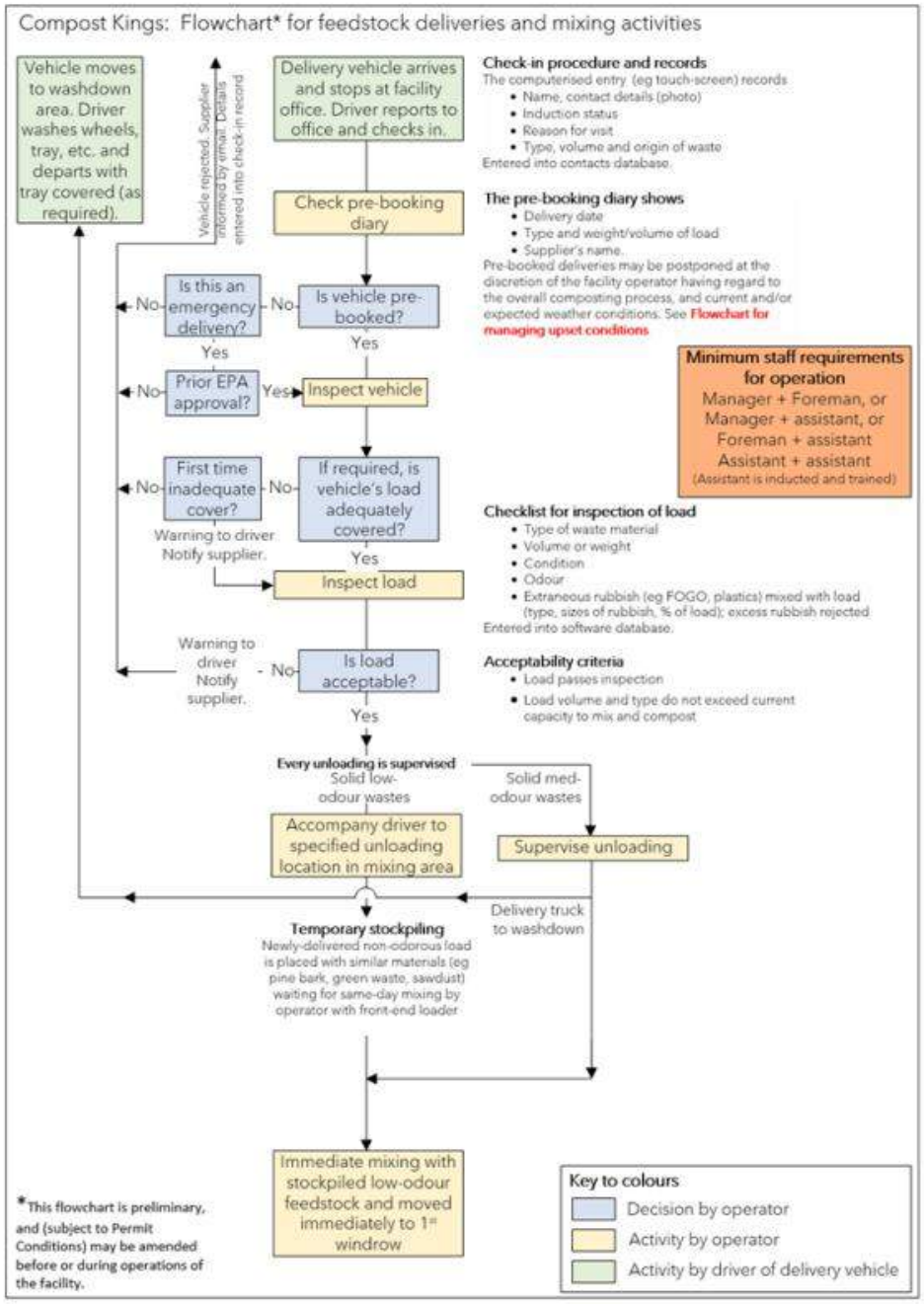

Figure 6: Waste Acceptance and Mixing Activities Flow Chart

The above is a flowchart of the of the proposed composting facility operations.

(Source: *Odour Impact Assessment* prepared by Assured Environmental dated 17 December 2024, page 18)

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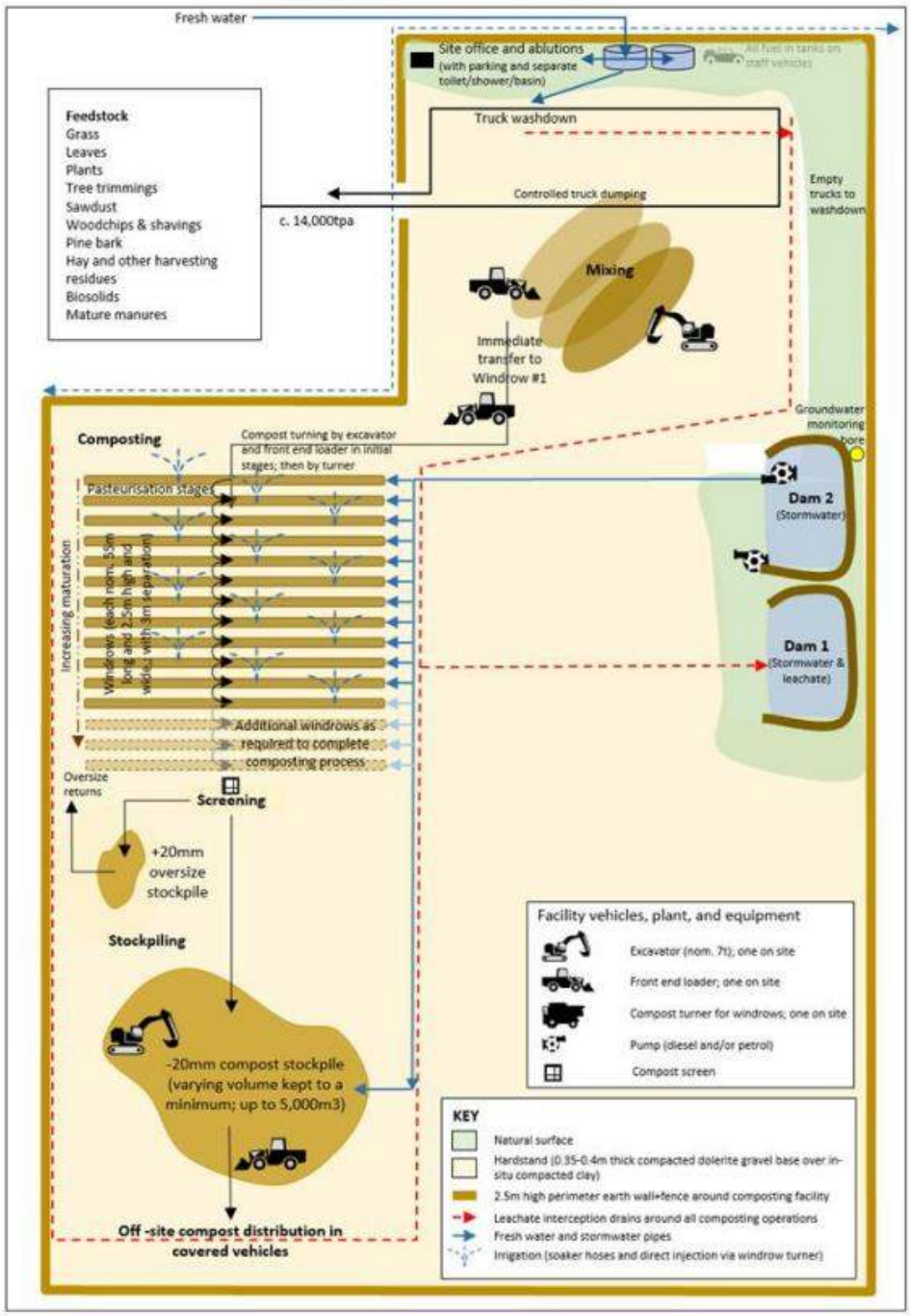

Figure 7: Process Diagram (Overview)

The above is an outline of the proposed composting activity.

(Source: *Odour Impact Assessment* prepared by Assured Environmental dated 17 December 2024, page 19)

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5.2 Outline of the proposed composting process

Proposed Composting Process

The Odour Assessment report prepared by Assured Environmental, Revision R3 (dated 17.12.2024, page 16 onwards) outlines the following activities:

Based on visual inspection, loads may not meet waste acceptance (Figure 6) criteria:
- *loads required to be covered but arriving uncovered will be rejected,*
- *loads containing FOGO will be rejected, and*
- *anything other than minimal other contamination (e.g., easily removable foreign matter like plastics) will be rejected.*
- *from the facility office and load checking area, all loads are directed to the waste mixing area.*

Communications with the operators of McRobies Gully Waste Management Centre in Hobart on 14 March 2024 confirmed that they do not accept FOGO contaminated waste even though domestic FOGO is placed in the greenwaste collection bins. The FOGO is diverted to Barwick's facility.

Mixing
The composting process begins with mixing of the raw material in the nominal proportions listed in Table 4. The mixing will be conducted using a 7t excavator and front-end loader on the mixing pad. Given the proportion of each type of waste as shown in Table 4, it is expected that the characteristic of the odour will be relatively consistent during the first few weeks. The initial mixing pad is expected to be the most odorous activity.

Composting
Once mixing is completed the front-end loader will transport the matured mixture to the main composting area to begin the nominally 12-week composting cycle. The method of windrow construction during the initial stages will be undertaken using a windrow turner, excavator and front-end loader.

Composting windrows will be aligned in parallel rows up-and-down the slope, each separated by several metres to allow access for plant and equipment. Rows are of increasing compostage from the first (fresh from the mixing area, undergoing pasteurisation) to last (matured, and ready for screening and stockpiling).
Sufficient rows will be created in the windrow area for three rows to ensure the final rows have completed maturation under upset weather conditions. As the windrows continue to mature, odorous emissions are expected to reduce and the character change to one that is less offensive and best described as earthy.
The windrow process is shown in Figure 8.

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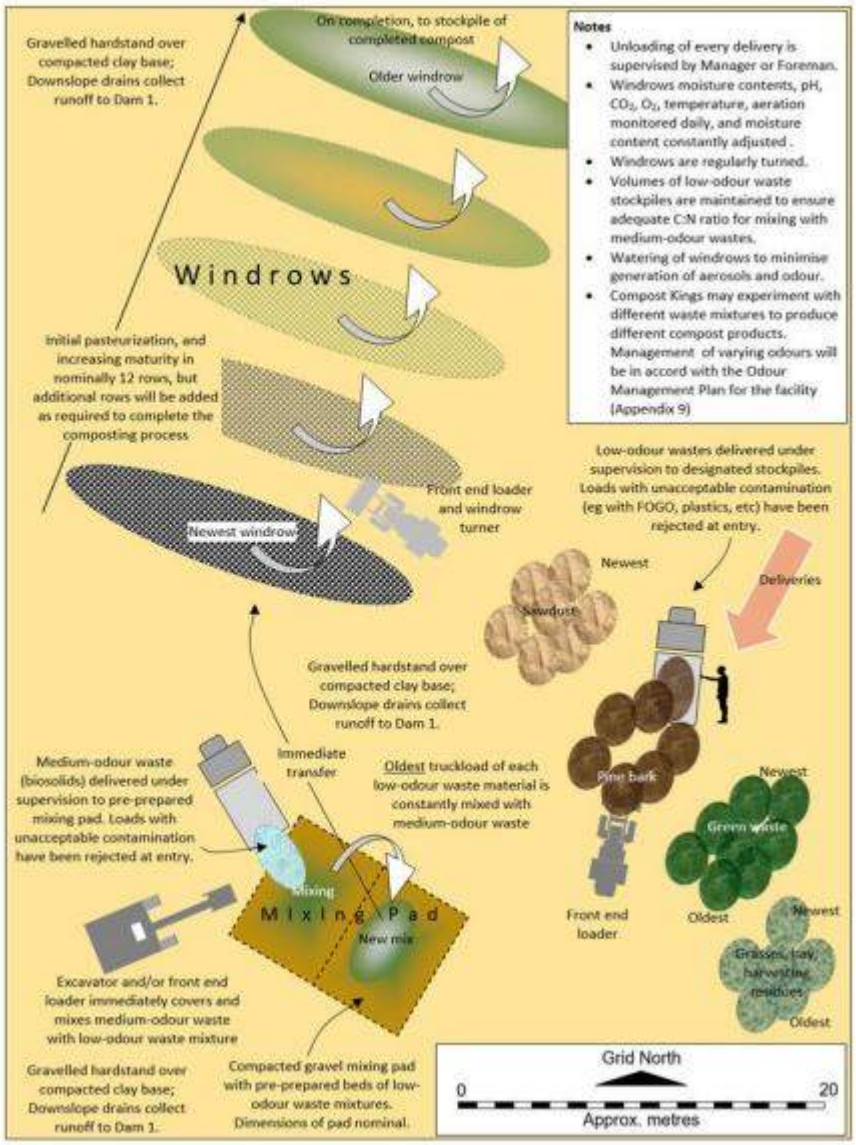

Figure 8: Composting Mixing and Windrow Process

Screening

After significant maturation, composted material is screened to generate saleable products (- 20 mm compost). Screening occurs continuously during operating hours. Oversized material (+20 mm) is returned to be added to the material commencing the composting process.

Screening stockpiles are typically non-offensive and represent the change in odour character that is known to occur during the composting process, with mature compost typically having a comparatively inoffensive but unique odour.

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Stockpiling

Stockpiling of the final product will not comprise more than 5,000 m3 at any one time; with the size of the stockpile kept to a minimum. The product will be moved from the composting windrows to the stockpile by excavator and front-end loader during operational hours.

Off-Site Vehicles

The saleable compost is removed in poly covered trucks of varying sizes. The largest truck expected to be used for removing product compost from the facility is 40 m3 . It is expected that up to two product trucks will pick up compost a day. 3.4.6 Stormwater & Leachate Collection There are two dams proposed for the facility. Dam 1 will collect stormwater and leachate to prevent release. The leachate is expected to be no more than 20% of the Dam 1 contents. Dam 2 will be stormwater collection only.

Truck Washout

Figure 9 shows the truck washout operations. The wash out liquid will be piped to Dam 1. 3.5 Odorous Sources Odour sources at the facility have been identified as either transient or continuous. These sources are listed in Table 5

Table 5: Continuous and Transient Odour Sources

Continuous Odour Sources	Transient Sources
Windrows	Raw waste unloading
Raw material stockpiles	Windows formation and turning
Mixing area	Truck movements (raw material delivery and product pickup).
Dam I	Truck Washout
Screening and product stockpile	

Assured Environmental have undertaken odour monitoring at numerous composting facilities throughout Australia. Based on the operations of the facility, the odour emission rates have been calculated for normal and worst-case conditions. The database used for this assessment are presented in Appendix C.

The emission rates include conservatism for varying feedstock. Overall, the SOER proposed by EPA are considered to be conservative for the proposed operation. The emission rates used in this assessment are listed in Table 6.

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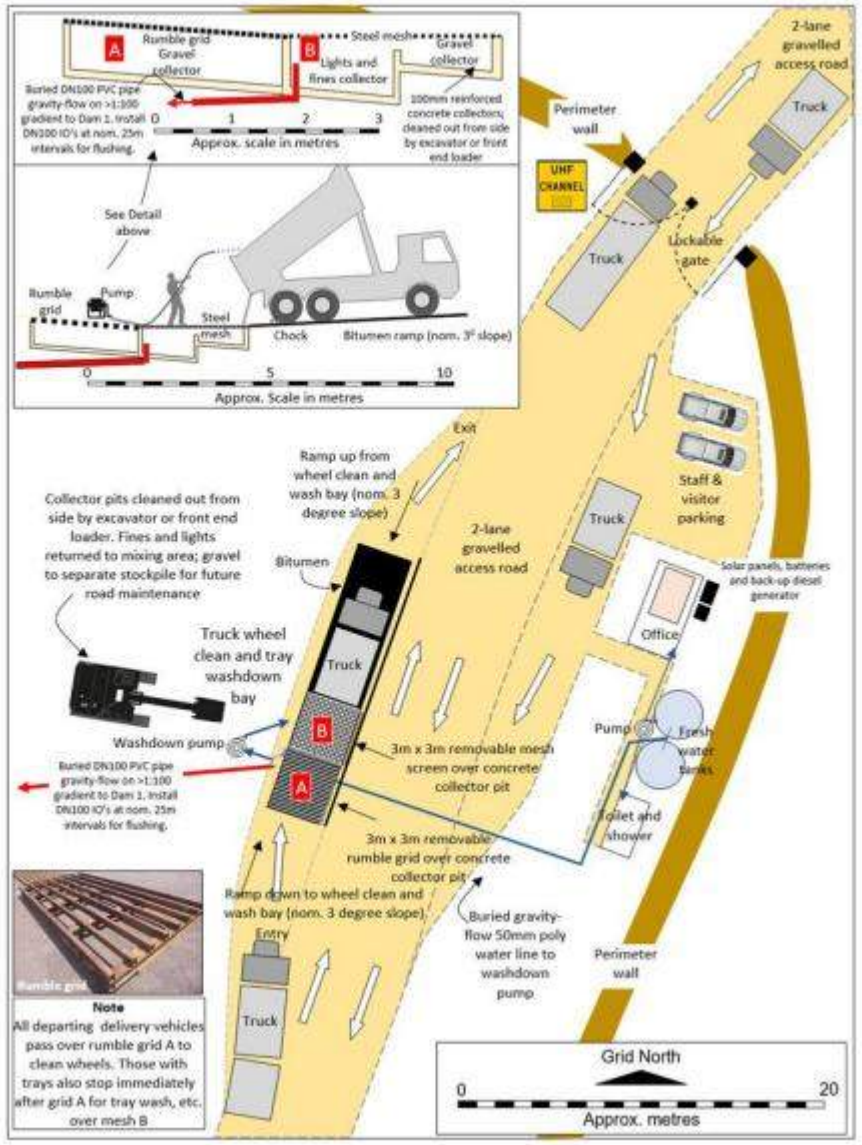

Figure 9: Truck Wash Out Operations

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Table 6: Odour Emission Rates

Source	Area (m^2)	Normal		Worst-case		Modelled Operating Hours
		SOER (ou/m^2/sec)	OER (ou/s)	SOER (ou/m^2/sec)	OER (ou/s)	
Raw material deliveries (based on biosolids) [e]	5	-	-	6.7	33	1x return truck movement per hour during 07:00-17:00. Only worst-case conditions modelled.
Truck washout	5	3.6	18	6.7	33	07:00-17:00
Saw Dust stockpile	79	0.1	8	0.2	12	All hours
Pine bark stockpile	79	0.4	32	1.0	75	All hours
Green waste stockpile	139	0.4	56	1.0	133	All hours
Hay stockpile	139	1.0	163	2.2	354	All hours
Mixing Pad (including immediate transfer)	414	5.2	2150	6.7	2770	07:00-17:00
Windrow - Week 1	414	3.3	1365	5.7	2357	All hours
Windrow - Week 2	414	3.0	1241	5.7	2357	Constant with turning activities 1200-1600 hours
Windrow - Week 3	414	2.5	1034	5.0	2068	
Windrow - Week 4 to 6	414	1.9	765	5.0	2068	All hours
Windrow - Week 5	414	1.9	765	2.9	1191	All hours
Windrow - Week 6	414	1.4	587	2.9	1191	All hours
Windrow-Week 7 to 12[c]	414	1.4	575	2.9	1199	All hours
Freshly Turned	414	3.5	1447	5.8	2398	Applied to windrow week 2 for 4 hours pd
Screening	50	1.4	70	1.6	80	07:00-17:00
Product Stockpile	3441	1.4	4817	1.6	5506	All hours
Stormwater and leachate dam (Dam 1)	328	1.9	1231	2.6	1706	All hours. Assumes 20% leachate
Product Truck (40 m^3) [d] [e]	16	1.4	22	1.6	25	1x return truck movement per hour during 07:00-17:00.
Total (OU/m^2/sec)			**18,661**		**35,148**	

a) *Emission rate based on biosolids material and truck size per truck. Deliveries will occur between 07:00-17:00 hours only. This represents the worst-case emission rate for any raw material and is applied to both normal and worst-case operations. The modelling of trucks is based on vehicle pass-bys, which will be for a select a return truck movement on the section of road which passes receptors. The emissions are based on speed.*

b) *Received odorous raw materials (will be covered immediately with saw dust and mixed immediately.*

c) *By week 7 of the composting process, the windrows have stabilised, and the odour character changes to become more earthy.*

d) *Based on return trip of a 40 m^3 truck with a surface area of 16 m^2 travelling the length of the internal haul road (578 m) at 10 km/hour speed limit.*

e) *Three separate road sections (to represent the worst-case impacts for receptors R1, R2 and R3) modelled based on return trip of an 8 m^3 truck with a surface area of 5 m^2.*

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The application also seeks approval for the following buildings and works:

- 1200mm timber post and wire stock proof fence to contain the composting site within the subject site (see submitted plans with dimensions).

- Four (4) shipping containers (see submitted plans with dimensions) to be located in the SE corner of the fenced off composting site within the subject site. Three of the shipping containers will be configured together with a corrugated dome roof to be drained to a water tank. (see submitted plans with dimensions)

- A 4m x 3.7m toilet block building (pre-fab) to be located directly adjacent to grouped shipping containers with domed roof (see submitted plans with dimensions).

- Access driveway within the subject site to be sealed with FCR (see submitted plans with dimensions).

The anticipated (maximum) number of workers at the site will be 2.

The hours of operation will be 7am until 5pm five days per week (Monday to Friday).

The proposal does not seek approval for any signage.

The access into the subject site is already existing and is recommended to be upgraded to meet Fig 6.61 – Rural Property Access adjusted for twoway use with the access road tapering back to the proposed access road width over 16 metres, as per the submitted Traffic Impact Assessment.

The general public will not access the site for any sales with compost being taken away from the site by the owner/operator for sales.

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6 Applicable LPS zone

The subject site Lot 1 Lovely Banks Road is zoned Agriculture under the *Southern Midlands LPS* (the 'Planning Scheme').

Figure.5. Subject site shown arrowed and located within the (brown) Agriculture zoned area of Melton Mowbray which is the primary zoning in the area. The beige zoned area to the far east (right) in the above is land zoned Rural under the LPS. Source: TheLIST July 2025. No nominated scale.

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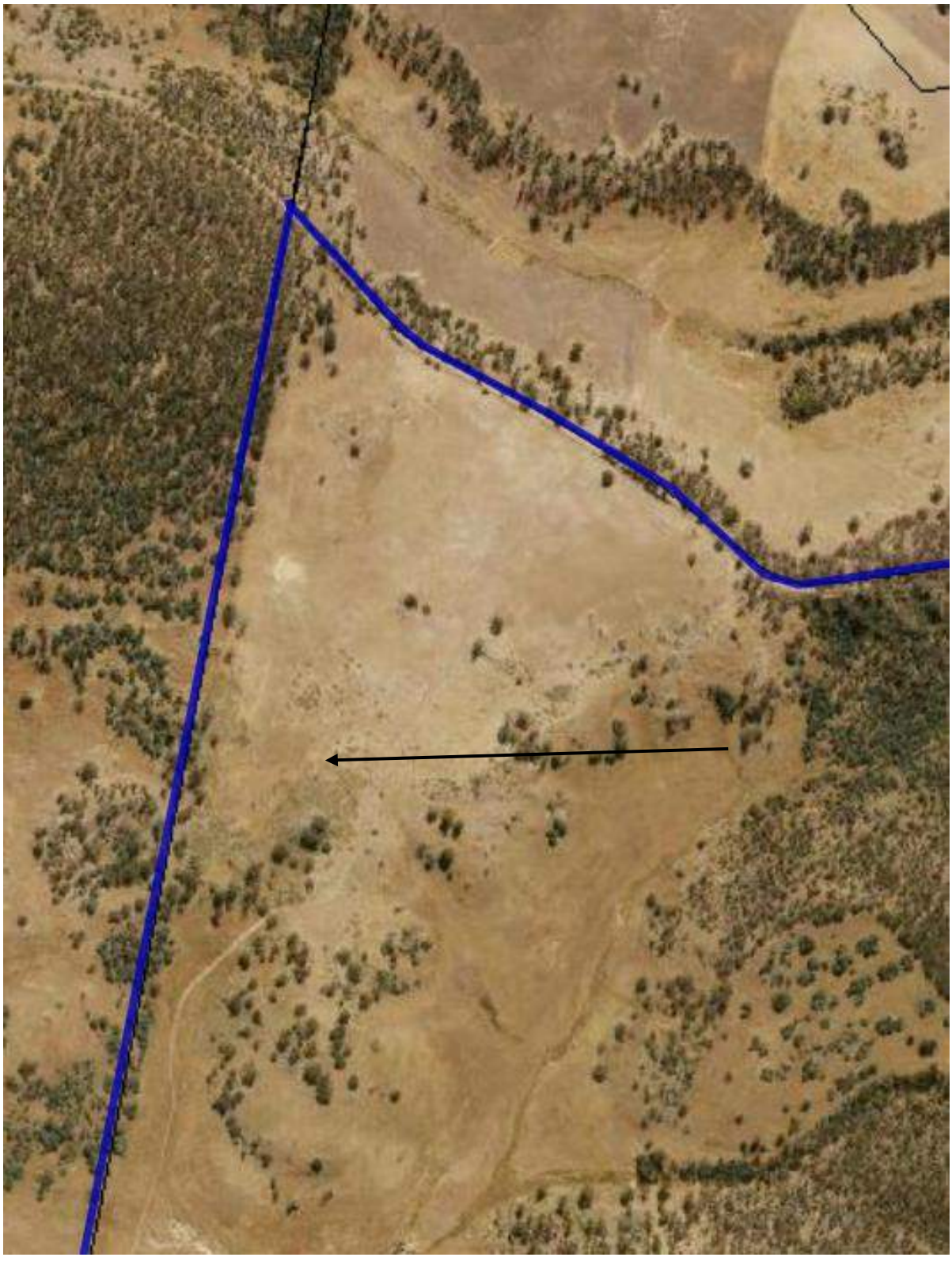

<u>Figure.6.</u> The north western portion of the subject site (arrowed) where works and composting will occur. Source: TheLIST July 2025. No nominated scale.

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7 Applicable Planning Scheme Zone Use and Development Standards

7.1 Classification of the proposed use

Classification of Use

The proposed use involves composting of biosolids, hay and greenwaste material on the subject site with composting to take around 12 weeks and is to be located in windrows on the northern part of the subject site.

The proposed use of composting is not considered to be Resource Development which includes the following uses under the State Planning Provisions: *use of land for propagating, cultivating or harvesting plants or for keeping and breeding of livestock or fishstock. If the land is so used, the use may include the handling, packing or storing of produce for dispatch to processors. Examples include agricultural use, aquaculture, controlled environment agriculture, crop production, horse stud, intensive animal husbandry, plantation forestry, forest operations, turf growing and marine farming shore facility.*

The use is however considered to fall within the Resource Processing use which includes the following uses under the State Planning Provisions: *use of land for treating, processing or packing plant or animal resources. Examples include an abattoir, animal saleyard, cheese factory, fish processing, milk processing, winery, brewery, cidery, distillery, and sawmilling.*

The composting facility involves the processing of biosolids, hay and greenwaste and using natural processes to turn these into compost.

On this basis, it is considered the proposed composting use falls under the Resource Processing use which is defined in the Planning Scheme as land use for the treating processing or packing of plant or animal resources.

Under 21.2 Use Table for the Agriculture zone of the State Planning Provisions, Resource Processing (composting) is classed as a Discretionary use.

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7.2 Use standards applicable to the proposed development

Use standards for the Rural Resource zone

The following use standards can be found in Part 21.0 of the State Planning Provisions which are attached to the Southern Midlands Local Provisions Schedule (LPS).

Clause 21.3.1.A1 Discretionary use

This clause applies to all proposed discretionary uses in the Agriculture zone.

There is no A1 Acceptable Solution.

The P1 Performance Criteria outline the following requirements for proposed discretionary uses:

P1

A use listed as Discretionary, excluding Residential or Resource Development, must be required to locate on the site, for operational or security reasons or the need to contain or minimise impacts arising from the operation such as noise, dust, hours of operation or traffic movements, having regard to:

(a) access to a specific naturally occurring resource on the site or on land in the vicinity of the site;

(b) access to infrastructure only available on the site or on land in the vicinity of the site;

(c) access to a product or material related to an agricultural use;

(d) service or support for an agricultural use on the site or on land in the vicinity of the site;
(e) the diversification or value adding of an agricultural use on the site or in the vicinity of the site; and

(f) provision of essential Emergency Services or Utilities.

It is considered a composting facility at the subject site would not impact upon or fetter agricultural use on neighbouring or surrounding property. In fact, it is considered that agricultural use is complimentary for the proposed composting facility.

The proposed composting use is considered appropriate only in a remote rural area to ensure there are no land use conflicts with sensitive use.

On that basis, the proposed use satisfactorily meets the P1 Performance Criteria.

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Clause 21.3.1.A2 Discretionary use

This clause applies to all proposed discretionary uses in the Agriculture zone.

There is no A2 Acceptable Solution.

The P2 Performance Criteria outline the following requirements for proposed discretionary uses:

P2

A use listed as Discretionary, excluding Residential, must minimise the conversion of agricultural land to non-agricultural use, having regard to:

(a) the area of land being converted to non agricultural use;

(b) whether the use precludes the land from being returned to an agricultural use;

(c) whether the use confines or restrains existing or potential agricultural use on the site or adjoining sites.

It is considered a composting facility at the subject site would not impact upon or fetter agricultural use on neighbouring or surrounding property. In fact, it is considered that agricultural use is complimentary for the proposed composting facility.

The use of the site for composting would not preclude the land from being returned to an agricultural use, in fact it is considered any future agricultural use would benefit from the land being used for composting.

The proposed use will not confine or retrain any potential agricultural use wither on the site or adjoining sites (they are all used for sheep grazing currently, which will have no impact from the proposal).

On that basis, the proposed use satisfactorily meets the P2 Performance Criteria.

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Clause 21.3.1.A3 Discretionary use

This clause applies to all proposed discretionary uses in the Agriculture zone.

There is no A3 Acceptable Solution.

The P3 Performance Criteria outline the following requirements for proposed discretionary uses:

P3

A use listed as Discretionary, excluding Residential, located on prime agricultural land must:
(a) be for Extractive Industry, Resource Development or Utilities, provided that:

(i) the area of land converted to the use is minimised;

(ii) adverse impacts on the surrounding agricultural use are minimised; and

(iii) the site is reasonably required for operational efficiency; or

(b) be for a use that demonstrates a significant benefit to the region, having regard to the social, environmental and economic costs and benefits of the proposed use.

The proposal cannot comply with P3(a) but complies with P3(b).

It is considered a composting facility at the subject site would not impact upon or fetter agricultural use on neighbouring or surrounding property. In fact, it is considered that agricultural use is complimentary for the proposed composting facility.

The development has been specifically designed to reduce environmental impact and emissions. The proposed composting facility is best located within an area generally free of sensitive use and development to avoid land use conflict.

The proposed use is considered to be a very important regional operation that will convert waste to a useable product to benefit the surrounding agricultural industry which is the primary use in the surrounding area in Southern Midlands.

On that basis, the proposed use satisfactorily meets the P3 Performance Criteria.

Clause 21.3.1.A4 Discretionary use

This clause applies to discretionary residential uses in the Agriculture zone.

This clause is not applicable to the proposed use as the use being sought is Resource Processing.

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7.3 Development standards applicable to the proposed development

Development standards for the Agriculture zone

The following development standards can be found in Part 21.0 of the Planning Scheme.

Development standards will be applied to all buildings and structures. These include proposed fences and buildings.

Dimensioned development plans have been included as part of the application for lodgement o Council for a planning application under the Tasmanian Planning Scheme.

The application has spent the last 3 years being assessed by the EPA to ensure the proposed composting process is acceptable in terms of operations and likely emissions, with an approval issued 14 April 2025 by the EPA – this letter has been included in submitted documentation.

Clause 21.4.1.A1 Building Height:

The A1 Acceptable Solution sets a maximum permitted height of 12m for all non-residential buildings.

The buildings proposed as part of the development all comply with this with dimensioned plans of all buildings being provided including a floor plan and elevations as well as the location of these buildings within the subject site with dimensions to title boundaries.

Clause 21.4.2.A1 All Boundaries Setbacks:

A1 Acceptable Solution: Not less than 5m or if the setback of an existing building is less than 5m, not less than the existing building.

The proposed buildings exceed more than 240m to any title boundary with the closest being the western side boundary which will be more than 245m to any proposed building.

Clause 21.4.2.A2 Setbacks for sensitive uses

A2 Acceptable Solution:

This clause applies to the setbacks for a sensitive use. None is proposed as part of the application and therefore this clause is not applicable.

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Clause 21.4.3.A1 Access for new dwellings

A2 Acceptable Solution:

This clause applies to the access requirements for residential use. None is proposed as part of the application and therefore this clause is not applicable.

Clause 21.5. Subdivision

This clause relates to subdivision standards for proposed subdivisions (division of existing titles to create new titles). As none is proposed or required as part of the proposal, this clause is not relevant to the assessment of the proposal.

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8 Planning Scheme overlays that apply to the subject site

The subject site was checked for Planning Scheme overlays under the Southern Midlands LPS.

The site is not affected by any General overlays under the LPS.

The subject site has multiple overlays with one located in the nominated part of the 'Somerton' property that is proposed to be used for the composting facility. It should be noted that none of the blue overlays are located in the far north western portion of the site where the composting facility is proposed to be located.

These overlays are shown as blue and brown hatched overlays contained in the below mapping image:

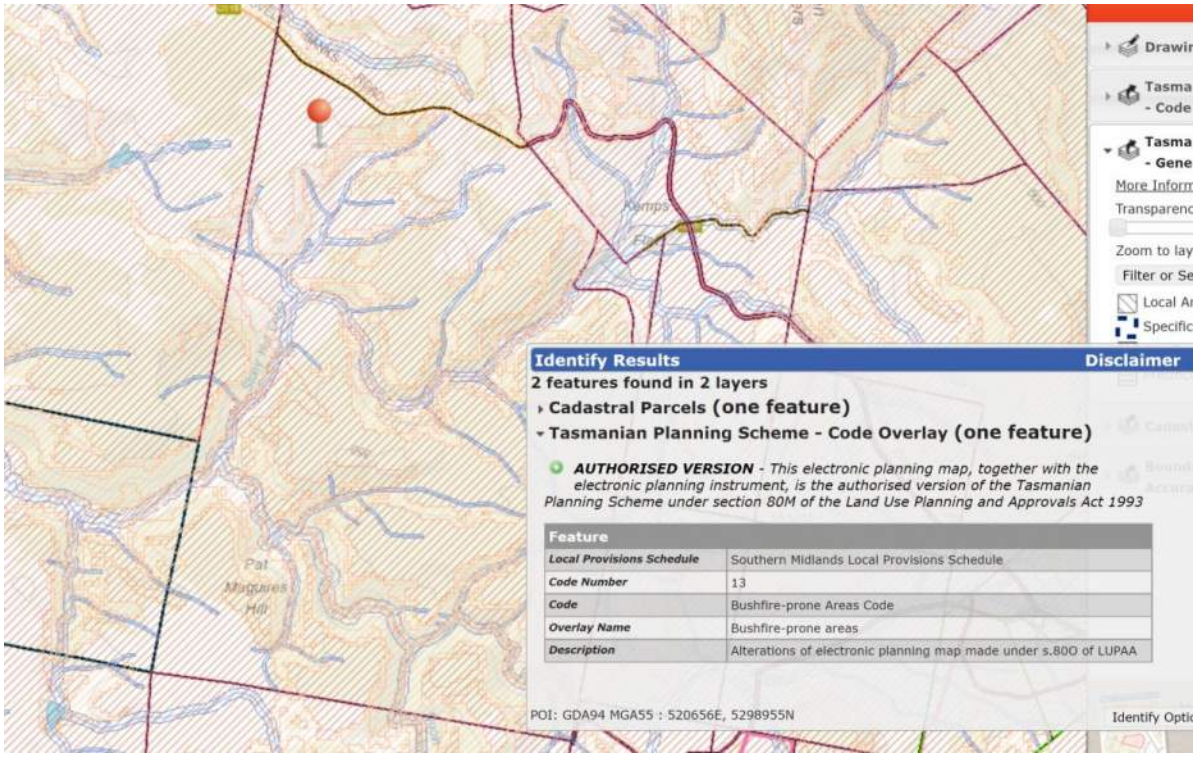

Figure.4. Map of the subject site area to be used for the composting facility – the development area has 1 overlay. Source: TheLIST, sourced July 2025.

Brown overlay: Bushfire Prone Area.

The implications of these are discussed in detail in the next section of this report on State Planning Provisions Codes.

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9 Planning Scheme Codes likely to apply to the proposed development of a composting facility at the subject site

Comment has been provided under each Planning Scheme Code:

C1.0 Signage Code

This Code applies to new signage and therefore would not be applicable to the proposed development if no signs are proposed.

No signage is proposed as part of the application.

C2.0 Parking and Sustainable Transport Code

This Code is relevant as it provides standards for the provision of car parking for new use and development.

Table C2.1 requires 2 spaces to be provided per 3 employees for Resource Processing uses. A total of 2 employees are proposed for the operations.

Two spaces can easily be provided on the subject site and would be located adjacent to the proposed shipping container and domed structure.

C3.0 Road and Railway Assets Code

This Code may apply as the proposed development.

The proposal does not involve subdivision, residential use or access onto a class 1 Highway.

The proposal includes construction of a new access road from the existing gateway. The lodged TIA (Traffic Impact Assessment) recommends that this access at the gateway be upgraded to meet Fig 6.61 – Rural Property Access adjusted for two-way use with the access road tapering back to the proposed access road width over 16 metres. This upgrade should ensure a satisfactory and efficient access layout.

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C4.0 Electricity Transmission Infrastructure Protection Code

This Code is not relevant as it applies to development and new works in an Electricity Transmission Corridor, a Communications Station Buffer Area or a Substation Facility Buffer Area.

C5.0 Telecommunications Code

This Code is not relevant as it is for development involving telecommunications.

C6.0 Local Historic Heritage Code

This Code does not apply as the subject site is not within a Heritage Precinct and is not an individually listed Heritage Place.

C7.0 Natural Assets Code

This Code does not apply as the subject site where the development will occur within 'Somerton' is not mapped within an overlay including Waterway and Coastal Protection Area or Coastal Refugia Area. Additionally, the subject site does not contain any native vegetation and in any case, there are no vegetation overlays for this Code applicable in the Agriculture zone.

C8.0 Scenic Protection Code

This Code does not apply as the subject site is not mapped as being within a scenic protection area or tourist road corridor.

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C9.0 Attenuation Code

The application is not assessed under this Code as Level 2 Activities are exempt from assessment under the Attenuation Code. Instead, the application is referred to the EPA fort assessment with respect to environmental nuisance and impact on sensitive uses.

For reference the following Attenuation Areas are provided under Table C9.1 of this Code:

Activity		Attenuation Distance	
		Level 1 Activity	Level 2 Activity
Composting works Excluding backyard composting for domestic use, on-farm composting for use on agricultural land having the same owner as the land on which the compost is produced, and works in respect of silage for use on agricultural land.	Vegetation only - emissions such as odour and noise.	250m	500m
	Human or animal wastes - emissions such as odour and noise.	500m	1,000m
Concrete batching plants The conduct of works for the production of concrete by the mixing of cement, sand, rock, aggregate or other similar materials, excluding the manufacture of concrete products - emissions such as noise and dust.		200m	–

The EPA gave their approval to the proposal on 14 April 2025 with that approval letter and all approved documents and reports submitted as part of this planning application to be assessed against the Tasmanian Planning Scheme.

C10.0 Coastal Erosion Hazard Code

The subject site is inland and not in a mapped coastal area and therefore this Code is not applicable.

C11.0 Coastal Inundation Hazard Code

The subject site is inland and not in a mapped coastal area and therefore this Code is not applicable.

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C12.0 Flood Prone Areas Code

The subject site is inland with no major watercourses in the vicinity and is not in a mapped area and therefore this Code is not applicable.

C13.0 Bushfire Prone Areas Code

The subject site is bushfire prone as it has a Bushfire Prone Area overlay. The use proposed is not classed as a vulnerable one which comprises uses such as residential care etc.

The Code may apply where a hazardous use is proposed. A hazardous use is defined as following:

(a) hazardous chemicals of a manifest quantity are stored on a site; or

(b) explosives are stored on a site and where classified as an explosives location or large explosives location as specified in the Explosives Act 2012.

The proposal will require confirmation from an accredited bushfire practitioner or Tasfire that the composting facility and associated materials are not considered to be 'hazardous' (which is unlikely). These can be provided upon request by Southern Midlands Council as part of the planning process.

C14.0 Potentially Contaminated Land Code

This Code will only apply if the subject site has had any one of the following activities undertaken on it at any point (none is known to have occurred):

Table C14.2 Potentially Contaminating Activities

Potentially Contaminating Activity	Potentially Contaminating Activity
Acid / alkali plant and formulation	Mineral processing
Ammunition manufacture and usage (e.g. shooting ranges)	Mine sites involving waste rock or tailings deposits
Asbestos production, handling or disposal	Oil or gas production or refining
Asphalt/bitumen manufacturing	Paint manufacture and formulation
Battery manufacturing or recycling	Pesticide manufacture and formulation
Boat/ship building, marinas, slip ways and associated boat yards	Petroleum product or oil storage
Boiler or kiln usage	Pharmaceutical manufacture and formulation

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Chemical manufacture and formulation (e.g. fertilisers, paints, pesticides, photography, plastics, solvents)	Power stations
Commercial engine and machinery repair sites	Printing
Drum conditioning works	Radio-active material usage (e.g. hospitals)
Dry cleaning establishments	Railway yards
Electrical transformers	Scrap yards and recycling facilities
Ethanol production plants	Sewage treatment plants
Explosives industries	Sheep and cattle dips
Fertiliser manufacturing plants	Sites of fires involving hazardous materials, including firefighting foam use
Fill material imported onto a site from a potentially contaminated source	Sites of incidents involving release of hazardous materials
Foundry operations	Spray painting industries
Gas works	Spray storage and mixing sites (e.g. for orchards)
Herbicide manufacture	Tanning and associated trades
Industrial activities involving hazardous chemicals in significant quantities	Textile operations
Iron and steel works	Tyre manufacturing and retreading works
Landfill sites, including on-site waste disposal and refuse pits	Wood preservation and storage or cutting of treated timber
Metal smelting, refining or finishing	Wool scouring
Metal treatments (e.g. electroplating) and abrasive blasting	

C15.0 Landslip Hazard Code

This Code does not apply as the subject site is not mapped with any overlay as having any landslip hazard.

C16.0 Safeguarding of Airports Code

This Code is not applicable as the subject site is not mapped with an overlay.

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10Summary

- There are no title impediments for the proposed use and development such as building areas, covenants or Part 5 Agreements.
-
- The proposed use is a Discretionary use in the Agriculture zone and is considered to meet all applicable Performance Criteria in Use Standards for the zone.

- The site presents few, if any, impediments for the proposed use and development.

- The proposal includes several minor pre fabricated buildings including a toilet block and four shipping containers. Plans of these buildings plus a plan showing their dimensions to title boundaries is included as part of submitted documentation.

- The applicable zone use and development standards under the State Planning Provisions are considered unproblematic for the proposed use and associated development.

- The subject site is remote, and it is for this purpose that it has been intentionally chosen in order to avoid any land use conflict.

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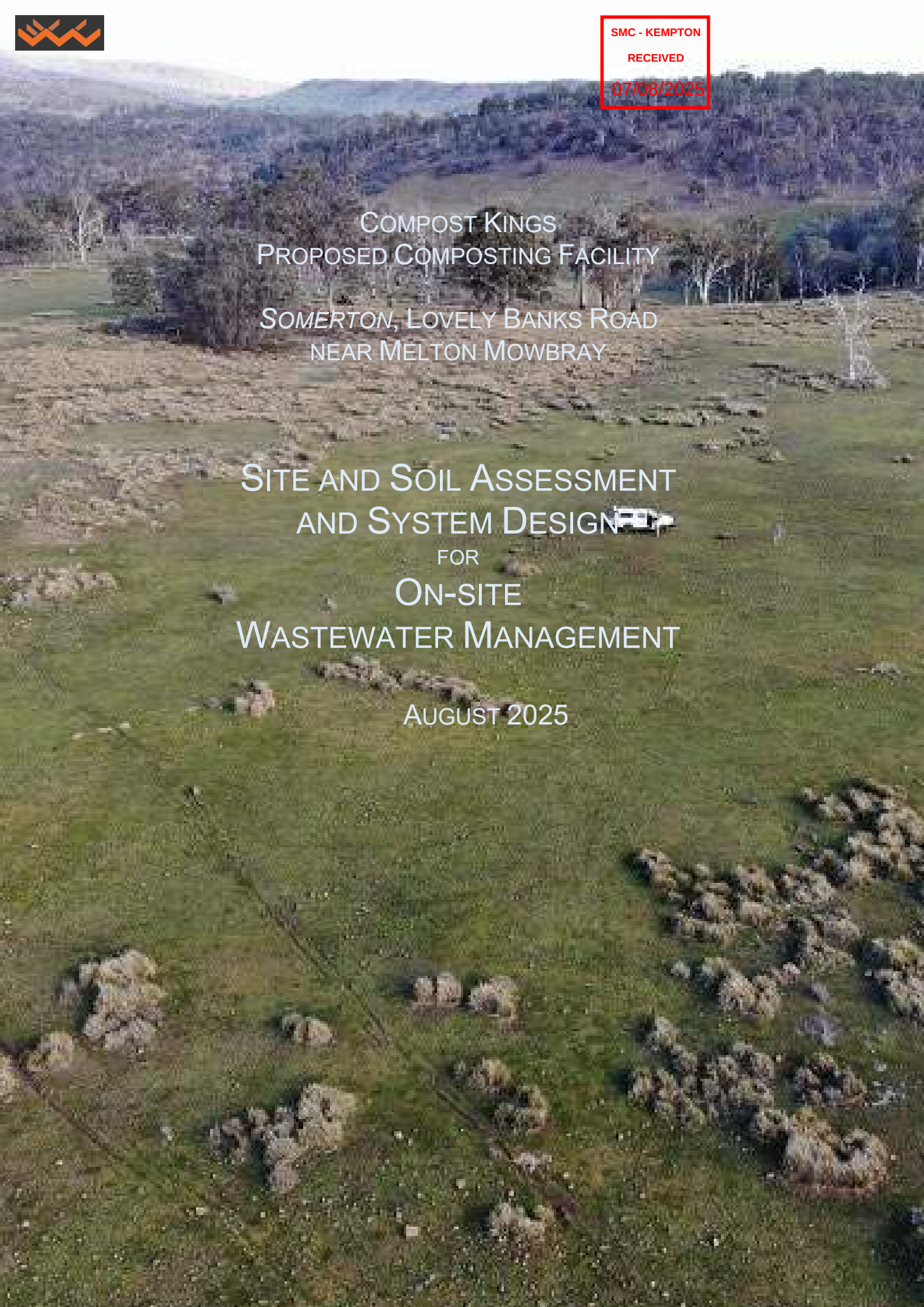

COMPOST KINGS
PROPOSED COMPOSTING FACILITY

SOMERTON, LOVELY BANKS ROAD
NEAR MELTON MOWBRAY

SITE AND SOIL ASSESSMENT AND SYSTEM DESIGN
FOR
ON-SITE WASTEWATER MANAGEMENT

AUGUST 2025

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Cover

View south over the southeastern part of the proposed composting facility
Drone photo: Bill Cromer, 26 July 2020.

Refer to this report as

Cromer, W. C. (2025). *Site and Soil Assessment and System Design for On-site Wastewater Management, proposed composting facility,* Somerton, *Lovely Banks Road near Melton Mowbray.* Unpublished report for Compost Kings by William C. Cromer Pty. Ltd., 6 August 2025

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Limitations of this geotechnical report

Site investigations for geotechnical reports usually but not always involve digging test holes and taking samples, at locations thought appropriate based on site conditions and general experience. The reports only apply to the tested part(s) of the site, and if not specifically stated otherwise, results should not be extrapolated to untested areas.

The main aim of the investigations is to reasonably determine the nature of and variability in subsurface conditions at the time of inspection. The number and location of test sites, and the number and types of tests done and samples collected, will vary from site to site. Subsurface conditions may change laterally and vertically between test sites, so discrepancies may occur between what is described in the reports, and what is exposed by subsequent excavations. No responsibility is therefore accepted for (a) any differences between what is reported, and actual site and soil conditions for parts of an investigation site not assessed at the time of inspection, and (b) subsequent activities on site by others, and/or climate variability (eg rainfall), which may alter subsurface conditions at the sites from those assessed at the time of inspection.

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IMPORTANT NOTES FOR CLIENT

Guidance documents

Where required or appropriate, this document is in accordance with, or obtains guidance from, the following:

- Australian/New Zealand Standard AS/NZS1547:2012 *On-site domestic wastewater management;* "AS/NZS1547" in this report
- The Tasmanian Director of Building Control's *Guidelines for On-site Wastewater Management* Systems (Nov 2017); the "Guidelines" in this report
- The Tasmanian Director of Building Control's *Determination – Accreditation and Maintenance of Plumbing Installations* (Dec 2016), and
- The software program Trench^{R}3[1] for site assessment and system sizing for domestic wastewater management

Scope and intent of this report

This document constitutes a site and soil assessment (SSER) and wastewater design for a small toilet block to serve three staff at the proposed Compost Kings composting facility.

Applying for a Plumbing Permit (PP)

This document is intended to support, not replace, an application (if required) to local Council for a Plumbing Permit.

The designer and system certification

William C Cromer Pty Ltd is the Designer for the design(s) suggested in this report, and must certify the system before it can be used. A **Form 35** is included in this document.

The designer may make site inspections to assess whether:

- the installed system conforms with the approved design, and
- the system, as installed, conforms with AS/NZS1547

It is the responsibility of the client or the client's agent to contact the designer before construction starts on the wastewater disposal system, to establish the stages of construction required to be inspected by the designer.

[1] Cromer, W. C. (1999). Trench^{TM}3.0: A computer application for site assessment and system sizing, in Patterson, R. A. (Ed.) *On-site '99 – Proceedings of the On-Site '99 Conference: Making on-site wastewater systems work*. Univ. of New England, Armidale, 13-15 Jul 1999, pp 85-88.

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SUMMARY STATEMENT

The composting facility proposed by Compost Kings Tasmania on *Somerton* off Lovely Banks Road near Melton Mowbray will employ up to four people.

The facility will have tank water and no electricity.

The daily wastewater volume is conservatively set at 100L/day.

Soils in the land application area (LAA) selected for wastewater disposal are Category 2 topsoils up to about 0.5m thick over Category 6 subsoils.

It is proposed to gravity-discharge primary-treated effluent to a nonconventional (raised) bed in a land application area (LAA).

The adopted design loading rate is 3L/day.

The required minimum wetted area in the LAA is 5m^2, but conservatively, 9m^2 has been adopted.

The LAA is sized in accordance with AS/NZS1547, and it complies with Table 3 of the Tasmanian Director of Building Control *Director's Guidelines for On-site Wastewater Management Systems v2.0.*

This LAA constitutes Acceptable Solutions for separation requirements A1, A3, A4 and A5, and Performance Criteria P2, P6 and P7, in Section 3 of the *Director's Guidelines.* A reserve area is also available.

A Form 35 is included in this report.

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BACKGROUND

Purpose of this report

Compost Kings proposes a new composting facility[2] on about 6.5ha of agricultural land on *Somerton*, on Lovely Banks Road near Melton Mowbray (Maps 1.1 and 1.2 in Attachment 1).

This site and soil evaluation report (SSER), and wastewater design based on the SSER for the facility, was instigated by the proponent Mr. Seaton Waterfield.

The new system will cater for up to four employees (including manager and foreman).

This report is intended to support an application to Huon Valley Council for a Plumbing Permit for the wastewater system.

PART A

SITE AND SOIL EVALUATION

Location, size, zoning, topography, vegetation and drainage

Somerton and the Compost Kings site[3] is zoned *Agriculture* in the Southern Midlands Local Provisions Schedule of the Tasmanian Planning Scheme. The land tenure is *Private Freehold*.

The facility covers about 6.5ha within a larger site set aside and fenced off from the rest of *Somerton*.

The area set aside for wastewater management is to be located in the southwestern corner of the site, just outside the facility boundary (Map 1.3 in Attachment 1).

The site and facility are cleared to grassland, with scattered eucalypts in the southeastern corner.

There are no natural drainage lines on the property.

Water and power supply

Rainwater tank water supply; no electricity available.

Assumed daily wastewater

The source of wastewater at the facility is classed as an office or factory activity, so that the assumed daily wastewater use per employee is 20L/day (Table 4 in the Director's Guidelines[4]).

[2] Full details of the proposed facility are contained in Cromer, W. C. (2025).Environmental Impact Statement: Proposed Composting Facility, Lovely Banks Road, Melton Mowbray. Report for Compost Kings Tasmania by William C Cromer Pty. Ltd. 12 February 2025. Revision 7.

[3] In this document, the terms "site" and "facility" have separate meanings:

- "site" means the 23ha area bordering Lovely Banks Road and containing the facility.
- "facility" means the 6.5ha earth-walled and fenced area wholly contained within the site, and which encloses all the composting activities.

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This amounts 80L/day in total, but 100L/day has been adopted as a conservative measure.

Interpretation of site geology and soils

Published geology of the property

The published geology[5] at and near the proposed composting facility includes Triassic sandstone, siltstone and mudstone, but the dominant rock type beneath the facility is shown as fine – medium grained laminated sandstone

My interpretation of the geology

Subhorizontal subcrops and outcrops of medium-grained, light yellowish grey sandstone are scattered sporadically over the site and the proposed facility.

Soils

Ten excavator test pits (A – K) were dug over the facility in August 2020[6]. Pits A and B were closest to the proposed wastewater disposal area (the Land application Area, LAA), and are summarised in Table 1.

The soil profile comprises a dark-coloured sandy topsoil (SP; A1 and A2 horizons; Layer 1 in Table 1) over a lighter-coloured high plasticity sandy clay subsoil (CH, CL; B horizon; Layer 2), over a light-coloured extremely weathered sandstone (CL; Layer 3), siltstone or mudstone.

Fill

No fill is present.

Soil selected for wastewater disposal

The A1 and A2 topsoil horizons in pits A and B, and by inference over the proposed LAA, are judged to be Category 2. The underlying B horizon silty clay is interpreted as Categories 6.

Proposed wastewater management system

Method

It is proposed to install a dual-purpose septic tank (with outlet filter) at the toilet block (Map 1.3 in Attachment 1), and gravity-feed to a nonconventional (raised) bed nominally 50m downslope.

[4]Tasmanian Director of Building Control *Director's Guidelines for On-site Wastewater Management Systems v2.0.*
[5] Forsyth, S. M, Abtmaier, B. F. and Leaman, D. E. (1976). 1:50,000 geological map series. *Oatlands*. Department of Mines Tasmania, and Leaman, D. E. (1975). 1:50,000 geological map series. *Brighton*. Department of Mines Tasmania.
[6] Cromer (2025) cited above.

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Table 1. Summary of test pits A and B. See Map 3.1 in Attachment 3 for locations.

Client	COMPOST KINGS	**Test pit**	**A**	**B**
Location	*Somerton*	**Depth dug (m)**	1.0	1.1
	Lovely Banks Road	**Easting (GDA94)**	520397	520348
Date dug	20-Aug-20	**Northing (GDA94)**	5298854	5298819
		Water seepage (following rain)	Trace @ 0.5m	Trace @ 0.25m

No.	Layer	Details	USCS	Interp.	Figures are depths	
1	SAND	Trace silt; grey grading to brown, grey, locally light grey towards base; fine-medium grained; occasional light yellow to orange sandstone clasts to 0.1m; sharp base; M-W; L-MD	SP	Topsoil (A1 and A2 horizons)	0 to 0.5	0 to 0.25
2	SANDY CLAY	Patchy yellowish orange, locally grey-blue; mod-high plasticity; sand increases to gradational base; M<PL; VSt	CH, loc CL towards base	Subsoil (B horizon)	0.5 to 0.7 D@0.7m	0.25 to 0.8; D@0.7
3	Clayey SAND	Yellowish brown; light grey; usually with conspicuous subvertical polygonal fractures c. 0.3-0.5m across with light yellowish grey sandy clay or clayey sand infill; D-M; D-VD	CL grading to SC	CB horizon (EW Triassic sandstone bedrock)	0.7 to 1.0	
4	SILTY CLAY	Includes clayey silt; grey, yellowish orange; mod plasticity; M<<PL; VST-H	CL	CB horizon (EW Triassic siltstone or mudstone bedrock)		0.8 to 1.1
5	SAND STONE	Yellowish brown; light grey; subhorizontal; mostly massive or sparsely fractured; mod-high strength; D		Triassic-age bedrock	CR @ 1.0 on bedrock	
6	SILT STONE	Olive brown; subhorizontal; fractured; mod-high strength; D				CR @ 1.1 on bedrock
7	MUD STONE	Grey, dark grey; subhorizontal; fractured; mod strength; D				

Notes and abbreviations

USCS = Unified Soil Classification System
Grey cells indicate USCS not applicable, and/or a missing layer or layers in a test pit
Easting and Northing coordinates from Google Earth and hand-held GPS. Datum is GDA94.

Waste water category Based on Table E1 of AS/NZS1547:2012 *On-site domestic wastewater management*

Samples D@1.0m = disturbed sample for disperison testing at indicated depth

Excavability Equipment = 7 tonne excavator; 1.25m mud bucket; Operator: Seaton Waterfield
ripper = single toothed ripper used; EAR = end as required; NR = no refusal; CR = close to refusal; R = refusal.

Weathering For rock only. F = fresh; SW = slightly weathered; MW = moderately weathered; HW = highly weathered; EW = extremely weathered (ie soil properties; material can be remolded in the hand, with or without water)

Moisture D = dry; M = moist (M<=>PL = moisture less than, equal to or greater than Plastic Limit); W = wet.

Consistency Fb = Friable (crumbles to powder when scraped with thumbnail)
S = Soft (Easily penetrated by fist; 25 – 50kPa)
F = Firm (Easily penetrated by thumb; 50 – 100kPa)
St = Stiff (Indented with thumb; penetrated with difficulty; 100 – 200kPa)
VSt = Very stiff (Easily indented with thumbnail; 200 – 400kPa)
H = Hard (Indented by thumbnail with difficulty; >400kPa)

Relative density VL = Very loose (ravelling)
L = Loose (easy shovelling)
MD = Medium dense (hard shovelling)
D = Dense (picking)
VD = Very dense (hard picking)

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Design Loading Rate (DLR)

Conservatively adopted as 20mm/day (ie 20/m^2/day) based on Table M1 of AS/NZS1547:2012

Minimum wetted area required for wastewater disposal

The wetted area required is the daily wastewater volume divided by the DLR. This is 100L/day divided by 20L/m^2/day = 5m^2, in accordance with Section L4 of AS/NZS1547:2012.

Groundwater

No groundwater was encountered in test pits.

A groundwater monitoring bore has been installed by Compost Kings approximately 100m downslope from the LAA.

Slope stability

Published slope instability

There are no records of slope instability on the Mineral Resources Tasmania landslide database, and the site and facility are not shown to be in any landslide hazard band.

Observed slope instability

No signs of slope instability were observed on the property, and none is expected given the low westerly slope of the land.

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PART B

SYSTEM DESIGN AND REGULATORY COMPLIANCE

Regulatory requirements for wastewater management

Wastewater management on this property must comply with AS/NZS1547:2012 *Onsite Domestic Wastewater Management,* and with Section 3 and Table 3 of the Tasmanian Director of Building Control *Director's Guidelines for On-site Wastewater Management Systems v2.0.*

Area required for On-site wastewater management

The land application area (LAA) for wastewater disposal in Attachment 3 is sized in accordance with AS/NZS1547, and it complies with Table 3 in the *Director's Guidelines.*

Horizontal and vertical separation distances for wastewater disposal areas

Section 3 of the *Director's Guidelines* sets out Acceptable Solutions (A) and Performance Criteria (P) for horizontal and vertical separation distances for disposal systems in LAAs. These are summarised in Table 2 for the wastewater management system for the proposed house. The location of the LAA constitutes Acceptable Solutions for separation requirements A1 – A6, and Performance Criterion P7, in Section 3.

Table 2. System compliance of LAA with Section 3 of the Director's *Guidelines*

Separation distances to a disposal area:	Compliance of this site	Reasons for compliance	References, or relevant section of this report
Horizontal distance from a building	Complies with A1(i)	>6m from upslope buildings. No downslope habitable buildings	Attachment 3
Horizontal distance from downslope surface water	Complies with P2(a) and (b)	Primary treatment; nonconventional bed; downstream water is facility dam used for stormwater collection for irrigation of compost windrows	Cromer (2025; cited above); Attachment 3
Horizontal distance from a property boundary (measured at right angles to contours)	Complies with A3(b)(i) and (ii)	More than 1.5m from level boundary, and more than 2m per degree of average gradient from downslope boundary	Attachment 3
Horizontal distance from a downslope bore, well or similar water supply	Complies with A4	More than 50m from downslope groundwater monitoring bore.	See the Groundwater Information Access Portal (http://dpipwe.tas.gov.au/water/groundwater/groundwater-information-access-portal)
Vertical distance from groundwater	Complies with A5(b)	No water table expected in surface 1.5m	This report.
Vertical distance from a limiting layer	Complies with P6	Limiting layer is c. 0.5 – 1m or so beneath wastewater distribution module; complies with AS/NZS1547 App. R	Table 1 in Part A of report
Location of the system relative to buildings	Complies with P7	No environmental nuisance (odour, noise, aerosols) will be created for properly operating and maintained system	

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Summary of system design

An acceptable (and recommended) disposal option for wastewater management for the property is summarised below, with layout and design details in Attachment 3.

Method	Primary treatment in a dual-purpose septic tank with outlet filter, and gravity discharge to a nonconventional (raised) bed
Components	
	Septic tank
	Discharge line
	Nonconventional (raised) bed

In-ground details for LAA

Wetted area	Min. 5m^2 assuming a wastewater volume of 100L/day.
Back-up Area	Available.
Design	See Attachment 3.
Cut-off drain(s)/berm	Required. See Attachment 3.
Setback(s)	See Table 1

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PART C
GENERAL NOTES

Applying for a Plumbing Permit (PP)

This document is intended to support, not replace, an application to local Council for a Plumbing Permit.

This report sizes one or more Land Application Areas (LAAs) within which wastewater must be disposed, but the proposed location of the LAA may be nominal. There may be flexibility in its location provided setback distances are satisfied, and the final location would be specified when applying for a Plumbing Permit.

Detailed design notes for some wastewater systems, and related wastewater information, are available on my website.

Appointment of designer and inspection arrangements

If required, William C Cromer Pty Ltd accepts the role of Designer for the design(s) suggested in this report. A **Form 35** is included with this document.

Depending on local government policy, the designer is required to make as many site inspections as is necessary to be able to certify to the client and the local Council that:

- the installed system conforms with the approved design, and
- the system, as installed, conforms with the currently-adopted version of AS/NZS1547.

Usually, certification is required before the dwelling can be occupied and the wastewater disposal system used.

It is the responsibility of the client or the client's agent to contact the designer before construction starts on the wastewater disposal system, in order to establish the stages of construction required to be inspected by the designer.

System, design, performance and maintenance

Depending on the type of wastewater disposal system installed, owners may be required by Council to satisfy all or some of the following, which would usually form a set of conditions of approval for a plumbing permit.

1. The system shall comply with the currently-adopted version of AS/NZS1547.

2. All tank and system openings shall be accessible at finished surface level for inspection and servicing, and adequately sealed to prevent stormwater infiltration.

3. Where pumps are fitted, and power is required for system operation, a hard-wired audible and visible (indicator light) alarm shall be installed to warn of pump failure, blower failure and power failure.

4. Where an existing disposal system is being added to or altered and the existing septic tank is going to be used, a filter will need to be retro-fitted to the existing septic tank. Owners will need to advise their plumber to ensure that this matter is taken into consideration when purchasing a new septic tank or where the filter is to be retro-fitted.

5. The minimum wetted area requirement for wastewater disposal must be installed and maintained in the approved locations as per the design by the Designer and lodged with the application for a Special Plumbing Permit.

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6. All wastewater disposal (including irrigation) areas shall be completed, approved and formally signed off by the Designer as complying with AS/NZS1547 prior to commissioning of the system. Certification, in a format approved by Council; shall include a site plan to scale showing the wastewater disposal locations and areas property boundaries, infrastructure, GPS grid coordinates.

7. All pipes, pipe sleeves, identification tapes, and outlets on an irrigation system shall be coloured lilac (P23), in accordance with AS2700.

8. If one or more wastewater irrigation systems are proposed, they shall be constructed and installed in accordance with approved plans accompanying the Special Plumbing Permit, and the following:

Spray Irrigation Systems:

- The sprinklers used for distributing the wastewater must of a type that minimise formation of small droplets and aerosols. Impact and pencil type sprays shall not be used.
- A flush valve is to be installed on each irrigation area so that the lines can be flushed. The discharge from the flush valve must discharge either onto the irrigation area or piped back to a suitable chamber of the treatment system, having regard to whether the wastewater is chlorinated or not, so that the efficacy of the treatment plant is not compromised by the introduction of the flush water.
- Flush valves are to be installed in valve boxes to enable inspection and service.

Drip and sub-surface Irrigation Systems:

- Only pressure compensated drip line shall be used.
- Vacuum breaker valves are to be provided at the high point(s) of all irrigation fields. Such valves are to be installed in valve boxes to enable inspection and service.
- A flush valve is to be installed on the low point of each irrigation field with piping discharging the flush water to a suitable chamber of the treatment system, having regard to whether the wastewater is chlorinated or not, so that the efficacy of the treatment plant is not compromised by the introduction of the flush water. Flush valves are to be installed in valve boxes to enable inspection and service.

9. Unless specifically advised by the Designer as unnecessary or inappropriate, an effective surface water diversion drain or mound shall be provided and maintained on the high side of wastewater disposal (including irrigation) areas. Note that all concentrated stormwater must be retained on the property.

10. Weed matting, plastic or other materials that impede water penetration into the soil shall not be used between the irrigation system and the soil surface.

11. All wastewater irrigation areas shall be maintained in good order at all times. Such maintenance includes but may not be restricted to weeding, mowing, and replacement of mulch or plants.

12. Council shall be provided with an amended plan if the location of the irrigation area is altered or changed from the "as installed" plan. The owner shall ensure that any altered wastewater disposal (including irrigation) areas meet minimum setback distances from boundaries and buildings and any other conditions contained within this permit.

13. The wastewater treatment system shall be regularly maintained in accordance with the conditions of accreditation issued under the Tasmanian Plumbing Code.

14. Any septic tank associated with the disposal system shall be desludged at least once every five years.

15. Where required, the owner shall enter into and maintain an on-going service maintenance agreement with a person with appropriate qualifications and experience to

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maintain the wastewater disposal system in accordance with the Plumbing Regulations 2004 and the Tasmanian Plumbing Code. A copy of the signed agreement shall be submitted to Council before commissioning of the system.

16. Where required, effluent quality for land application shall meet the criteria specified in the installed system's certificate of accreditation or, if not specified, as follows (from AS/NZS1547:

5-day Biological Oxygen Demand (BOD5)	20mg/L
Suspended Solids (SS)	30mg/L
Thermotolerant coliforms	10 per 100mL
Free chlorine residual	0.5mg/L

17. Only when these tests indicate compliance will the unit be regarded as being commissioned. A NATA approved laboratory should conduct such tests. Testing shall be conducted as follows:

a) Commissioning phase: Mandatory testing after three months from the final installation inspection (to coincide with the normal on-going scheduled maintenance visits) but fortnightly in the event of failure to comply
b) On going operational phase: Mandatory testing for a free chlorine residue is required every three months. Remedial works should be undertaken when the minimum fire chlorine residual is not met. Random surveillance for BOD5, SS and thermotolerant coliforms shall be done at no less than once each 4 years. An authorised person may require sampling for BOD5, SS and thermotolerant coliforms or to undertake other chemical analyses to help identify operational problems.

18. Where required, monitoring details for individual on-site waste water management systems are to be recorded on a standardised form and lodged with the Council each quarter.

19. A final inspection of all installations may be conducted by a Council Environmental Health Officer following receipt of the written certification from the system designer. Plumbers and owners should be made aware that a minimum number of working days' notice is required for such inspections and the building will need to be open for inspection as required.

W. C. Cromer
Principal

This report is and must remain accompanied by the following Attachments

Attachment 1. Maps (4 pages)
Attachment 2. Test pit photos (pages)
Attachment 3. Wastewater system layout and design (3 pages)
Attachment 4. Loading Certificate and Risk Assessment (4 pages)
Attachment 5. Form 35 for this project (3 pages)
Attachment 6. Documents required when applying for a plumbing permit for an on-site wastewater management system (2 pages)

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Attachment 1

(4 pages including this page)

Maps

Map 1.1	Location, cadastre, topography
Map 1.2	Aerial imagery, cadastre, topography
Map 1.3	Location of the wastewater management system

Sources
Maps 1.1 and 1.2:
www.thelist.tas.gov.au

Map 1.3:
Google Earth

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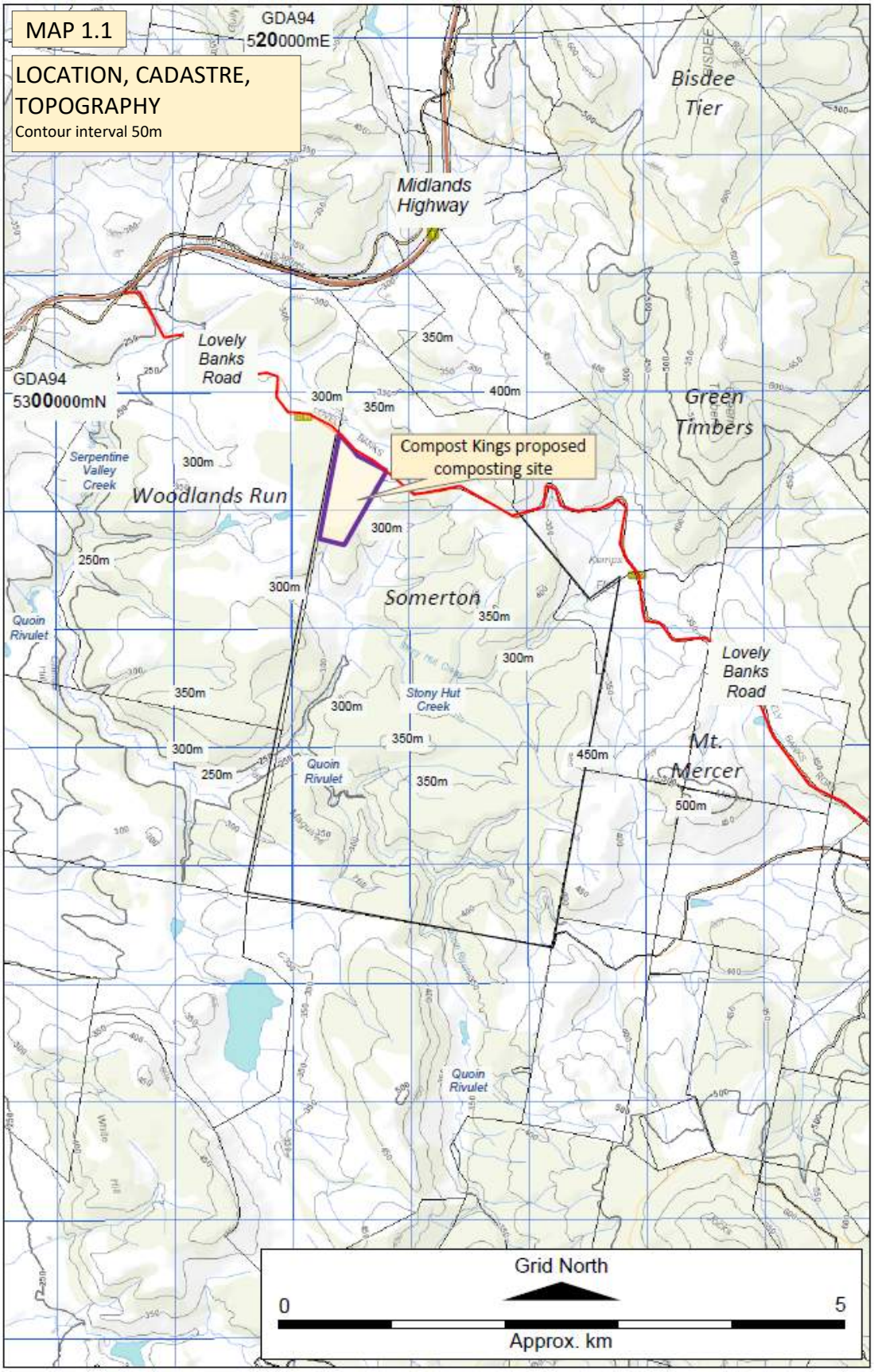

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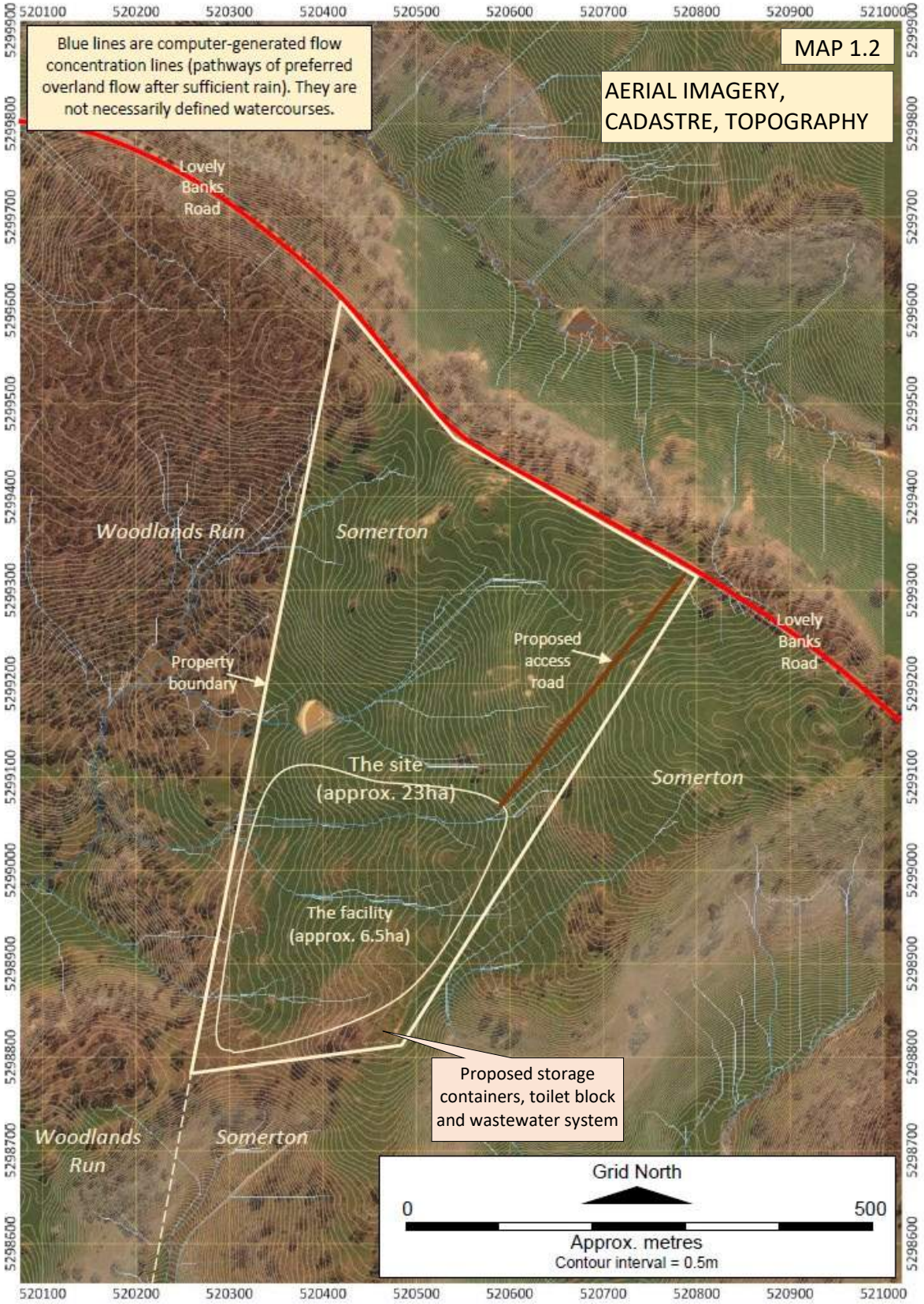

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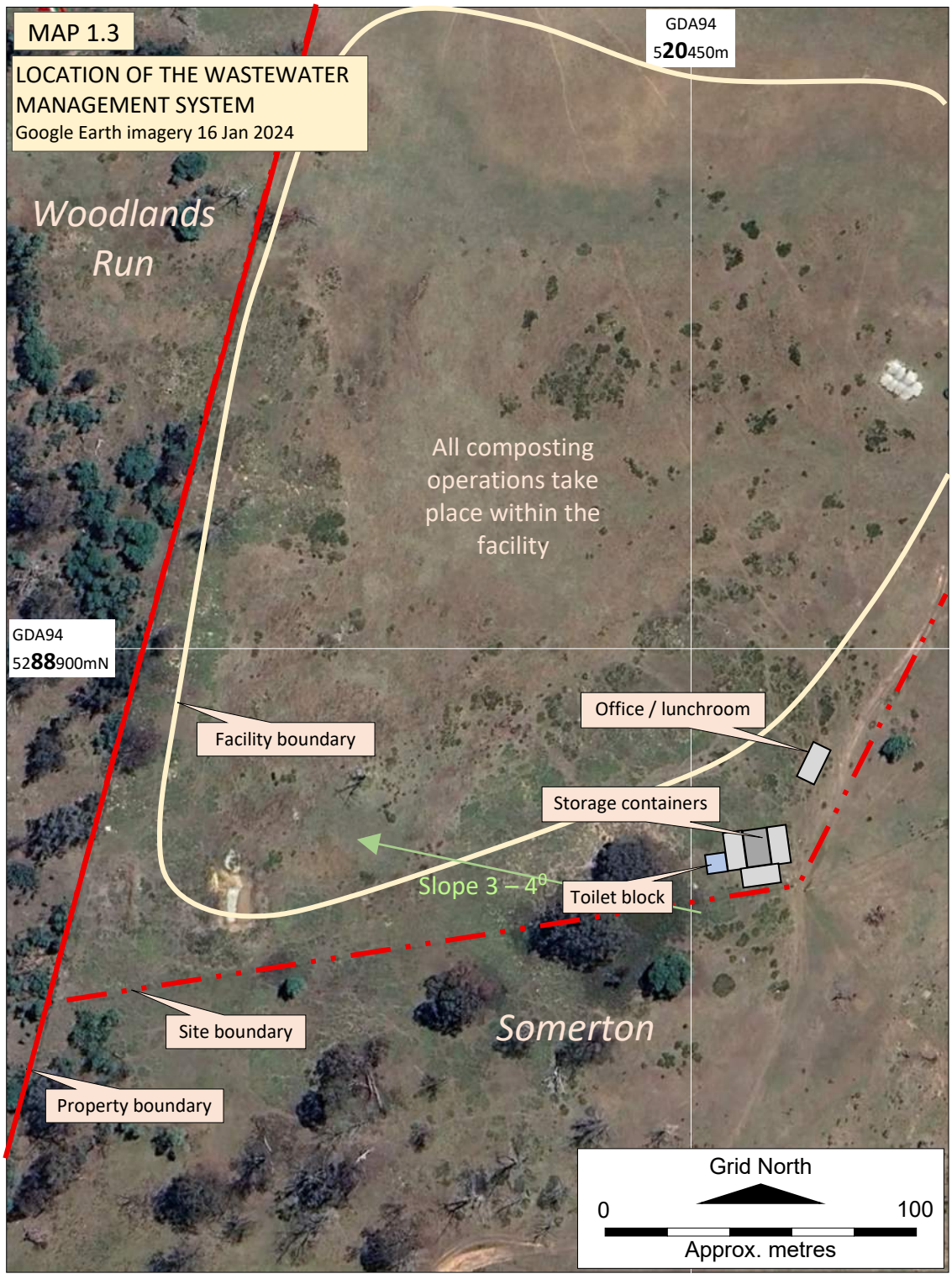

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Attachment 2

Test pit photographs

(3 pages including this page)
20 August 2020

The scale in these photos is graduated in black- and red-numbered segments each one metre long. The large numbers are decimetres.

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Attachment 3

Wastewater system layout and design

(3 pages including this page)

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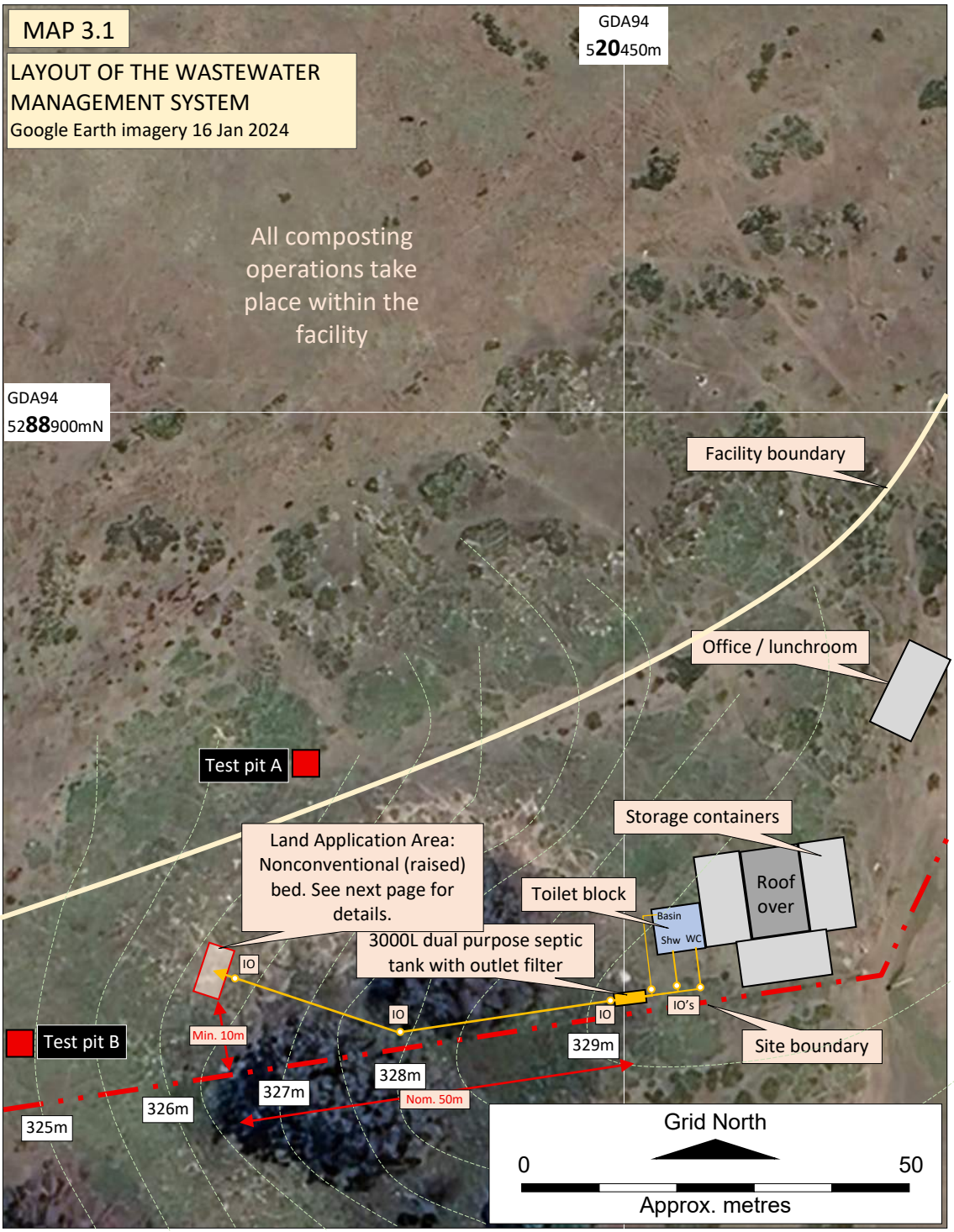

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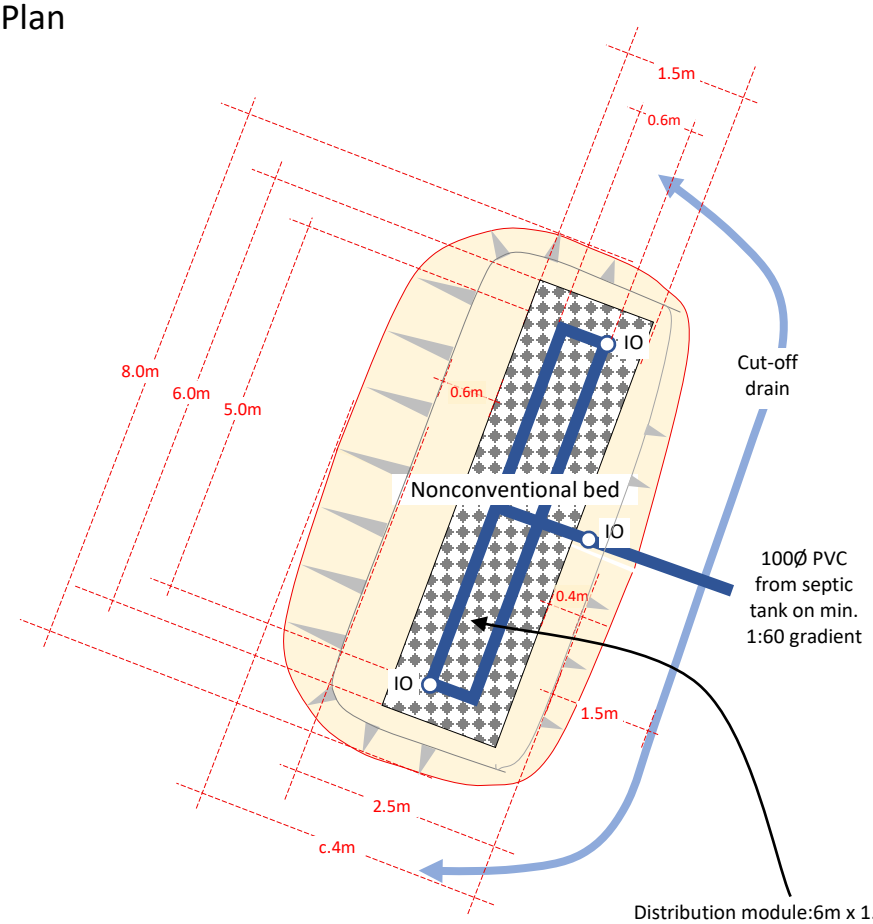
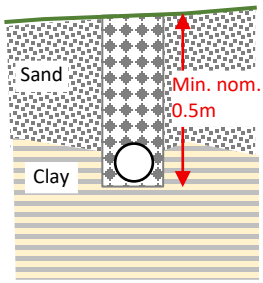
Nonconventional (raised) bed

Plan



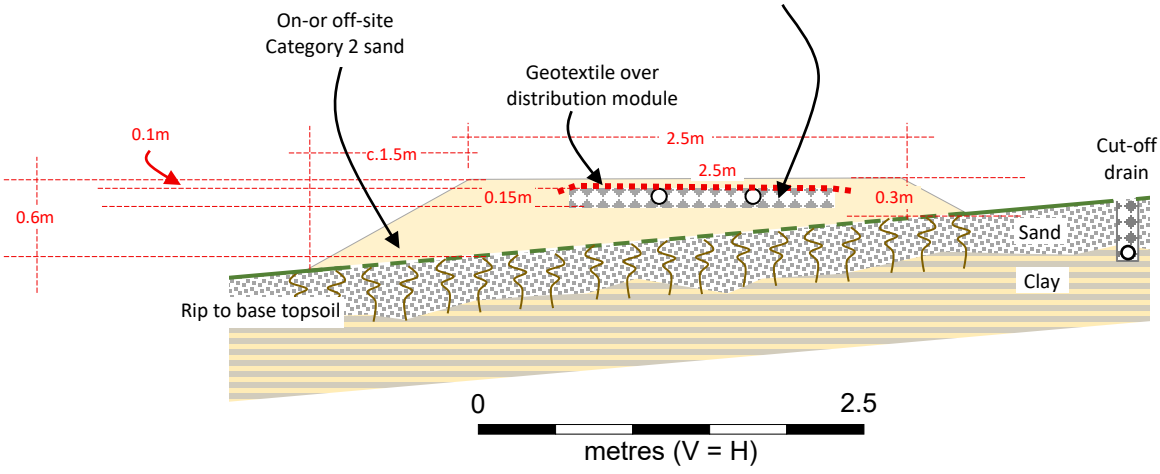
Distribution module:6m x 1.5m x 0.15m of durable, clean 10-15mm screened aggregate, containing horizontal rectangle of 100Ø PVC pipework perforated at 4 an d8 o'clock with 4mm diam holes spaced each 0.8m; covered with geotextile and 100mm on-site topsoil.

Cut-off drain section



Excavate drain nom. 0.5m so that base extends into clay subsoil. Width nominal (say, 0.2m). Lay 65mm or similar ag pipe on base; cover to surface with durable clean screened aggregate (eg 10mm). Keep drain clear of rubbish, leaves, etc.

Section



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Attachment 4

(4 pages)

Loading Certificate and Risk Assessment

The owner should retain and read any certificate of accreditation, operating manual or related documents for components of the selected wastewater treatment system, to ensure optimal, nuisance-free operation of the system with minimal environmental health impacts.

This loading certificate is provided in accordance with Clause 7.4.2(d) of AS/NZS 1547.

4.1 System capacity (medium-long term)

Toilet block for up to 4 employees: 100L/day

4.2 Design criteria summary:

Effluent quality	Primary from septic tank
Soil category	Category 2. Max medium-long term Design Loading Rate no more than 20mm/day.
Land application system	Nonconventional (raised) bed

4.3 Primary disposal area (land application area; LAA)

Distribution module: 6m x 1.5m = 9m^2. See Attachment 3.

4.4 Secondary disposal area (Reserve land application area)

Available adjacent to proposed LAA.

4.5 Water efficient fittings etc

Design assumes standard use of water efficient fixtures and fittings, eg composting and/or 3L/6L flush toilets, 9L/min (max) showerheads, aerator fittings on taps.

(see https://www.energy.gov.au/households/water-efficiency)

4.6 Phosphorus free detergents, etc

Phosphorus free detergents and soaps are recommended.

4.7 Variation from design flows etc.

The system should successfully manage additional occasional short term (eg no longer than daily) peak loadings provided that this does not exceed more than 50% of the design system capacity in any 3-month period.

4.8 Consequences of changing wastewater characteristics.

Users of the system should avoid disposing of wastes which would be additional to those normally disposed in a household sewerage system; in particular, increases in organic loadings such as from the use of sink-waste disposal units are to be avoided.

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Users of the system should avoid using disinfectants or bactericides in anything more than small amounts and at recommended rates of dilution, and should not dispose of solvents and other chemicals or pharmaceuticals such as antibiotics or antimicrobials which may kill bacteria and other microorganisms required for effective wastewater treatment.

4.9 Consequences of overloading the system.

Long term daily wastewater generation exceeding system capacity may result in biological and hydraulic overloading of the nonconventional bed, surfacing of effluent, environmental health nuisances, pollution of surface water and groundwater etc.

4.10 Consequences of underloading the system.

Long periods of zero use may result in poor functioning of the system when normal use recommences.

4.11 Consequences of lack of operation, maintenance and monitoring attention.

The components of the wastewater system are

1. the septic tank
2. the 100Ø PVC delivery line to the LAA
3. the nonconventional (raised) bed

Consequences of failure to observe the regular maintenance requirements may include any of the following:

- Spread of infectious diseases
- Nuisance and unpleasant odours
- Pollution of waterways, streams, beaches and shellfish beds
- Contamination of bores, wells and groundwater
- Excessive and unsightly weed growth
- Alteration of local ecology

4.12 Maintenance of a system log book

It is recommended that a log book be kept of system maintenance (eg pump out of septic tank), problems or modifications.

4.13 Other relevant considerations

Fence off the land application area so people (including children), animals and vehicles do not have access.

Do not allow vehicles within the LAA.

Make no modifications to the design of this system without authorisation.

4.14 Risk management of the proposed wastewater management system

Tables 4.1 and 4.2 summarise a risk management approach for the wastewater management system at this site, in general accordance with Clause A3.2 of AS/NZS1547.

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- Table 4.1 Terminology used in risk management in this report
- Table 4.2 Issues relating to the use and sustainable management of the wastewater system at this site

Table 4.1. Terminology used in risk management in this report

Likelihood	Consequences to property and or indicated stakeholders			
	Major	Medium	Minor	Insignificant
Almost certain	VH	VH	H	L
Likely	VH	H	M	L
Possible	H	M	L	VL
Unlikely	M	L	L	VL
Rare	L	L	VL	VL
Barely credible	VL	VL	VL	VL

Notes

1. In this report, an **issue** is defined as a physical, chemical or environmental aspect of a particular site (as listed in Trench[R]3) which should usually (but not necessarily always) be considered in the design of a wastewater system at the site.
2. **Likelihood** describes the possibility – if untreated – of the issue causing a hazard over the projected operational life of the on-site wastewater management system
3. A **hazard** is a physical, chemical or biological agent with the potential to cause harm.
4. **Consequence** describes the level of impact or harm caused by a hazard, and in this report is defined as:

Insignificant = harm easily remedied by landowner or licenced plumber; all wastewater retained on land application area

Minor = harm requires licenced plumber to remedy; all wastewater retained on land application area

Medium = harm requires licenced plumber to remedy; some or all wastewater discharges via surface or shallow seepage off the land application area but all is retained on the property

Major = harm requires licenced plumber to remedy; some or all wastewater discharges via surface or shallow seepage off the land application area and property to one or more neighbours and/or receiving waters. Regulator may or may not serve notice to landowner.

5. **Risk** = Likelihood combined with Consequence. VL = Very Low; L = Low; M = Moderate; H = High; VH = Very High. Levels are colour-coded.
6. **Stakeholders** (Section A3.2.1 of AS/NZS1547:2012)

This risk assessment applies to the stakeholders indicated below:

Internal stakeholders

client (property owner)
property occupier (if not owner)
site investigator
system designer
system installer
equipment supplier
servicing agent

External stakeholders

regulator
neighbouring property owners

7. The definitions of issue, likelihood, consequence and risk shown here are proposed by William C Cromer Pty Ltd, but do not have the approval of any regulatory authority. In the interests of improving risk assessments for on-site wastewater management, constructive comment and feedback are invited and welcomed from wastewater practitioners and

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Table 4.2. Issues relating to the use and sustainable management of the wastewater system at this site.
Source: The Director of Building Control Accreditation and Maintenance of Plumbing Installations (December 2016)

					Before treatment					After treatment		
Issue #	System component	Size, etc	Confidence level of value used	Potential hazard(s) related to use	Likelihood of this issue causing a hazard	Consequences to property and stakeholders if issue causes a hazard	Level of risk to property and stakeholders if issue creates a hazard	Recommended risk treatment (and explanatory notes)	Likelihood of this issue becoming a hazard	Consequences to property and stakeholders if issue causes a hazard	Level of risk to property and stakeholders if issue becomes a hazard
1	Septic tank	3000L dual purpose, with outlet filter	High	Malfunction of any component	Possible	Medium	Moderate	Operate system in acordance with manufacturer's instructions. Inspect outlet filter monthly and clean inspect tank annually or more frequently and pump out if necerssary	Possible	Minor	Low
2	Distribution pipework leading downslope to land application area	100Ø	High	Clogging of pipework	Possible	Medium	Moderate	Heavy-footed animals (horses, cows, etc), and/or vehicles must not be located and have no access over the buried pipework. Inspect annually via los and if necessary flush out pipework.	Possible	Minor	Low
3	Pipework in distribution module at LAA	Min. wetted area 9m2	High	Clogging of pipework	Possible	Medium	Moderate	Heavy-footed animals (horses, cows, etc), and/or vehicles must not be located and have no access over the LAA. Inspect annually via los and if necessary flush out pipework.	Possible	Minor	Low

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Attachment 5

(3 pages)

Form 35 for this project

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

To: Mr. S Waterfield *Owner name*

s.waterfield1984@hotmail.com *Suburb/postcode*

Form **35**

Designer details:

Name:	Bill Cromer	Category:	
Business name:	William C Cromer Pty Ltd	Phone No:	0408 122 127
Business address:	74A Channel Highway		
	Taroona	Fax No:	
Licence No:	CC6184Q	Email address:	billcromer@bigpond.com

Details of the proposed work:

Owner/Applicant	Compost Kings Tasmania	Designer's project reference No.	
Address:	10 Kingfisher Street		
	Kingston	7050	

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:

On-site wastewater management system for proposed composting facility on *Somerton*, Lovely Banks Road, near Melton Mowbray. See location maps in Cromer (2025) referenced on page 2 of this Form.

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer or Civil Designer
	☐ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☒ Plumbing design	~~Plumber-Certifier; Architect~~, Building Designer ~~or Engineer~~
	☐ Other (specify)	

Deemed-to-Satisfy: X☐ Performance Solution: ☐ *(X the appropriate box)*

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Other details:

See Cromer (2025) report below

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers: See Cromer (2025) report below	Prepared by:	Date:
Schedules: See Cromer (2025) report below	Prepared by:	Date:
Specifications: See Cromer (2025) report below	Prepared by:	Date:
Computations: See Cromer (2025) report below	Prepared by:	Date:
Performance solution proposals: See Cromer (2025) report below	Prepared by:	Date:
Test reports: See Cromer (2025) report below	Prepared by:	Date:

Standards, codes or guidelines relied on in design process:

AS/NZS1547:2012 On-site domestic wastewater management

Cromer, W. C. (1999). Trench™3.0: A computer application for site assessment and system sizing, in Patterson, R. A. (Ed.) *On-site '99 – Proceedings of the On-Site '99 Conference: Making on-site wastewater systems work.* Univ. of New England, Armidale, 13-15 Jul 1999, pp 85-88

The Tasmanian Director of Building Control's *Guidance for On-site Wastewater Management* Systems (Nov 2017)

The Tasmanian Director of Building Control's *Determination – Accreditation and Maintenance of Plumbing Installations* (Dec 2016)

Any other relevant documentation:

Cromer, W. C. (2025). *Site and Soil Assessment and System Design for On-site Wastewater Management, proposed composting facility,* Somerton, *Lovely Banks Road near Melton Mowbray.* Unpublished report for Compost Kings by William C. Cromer Pty. Ltd., 6 August 2025

Attribution as designer:

I William C Cromer.....
am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	William C Cromer		6/8/2025
Licence No:	CC6184Q		

Director of Building Control - date approved: 2 August 2017 — *Building Act 2016* - Approved Form No 35

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Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [X] The works will not increase the demand for water supplied by TasWater
- [X] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [X] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [X] The works will not damage or interfere with TasWater's works
- [X] The works will not adversely affect TasWater's operations
- [X] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [X] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [X] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I .....William C Cromer..... being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008*, that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.
Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	William C Cromer		6/8/2025

Director of Building Control - date approved: 2 August 2017 — *Building Act 2016* - Approved Form No 35

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Attachment 6

(2 pages)

Documents required in relation to a plumbing permit for an on-site wastewater management system

Source: Director of Building Control Director's Specified List (Part 3), September 2017 v1.2

The documents listed below are required to accompany an application for a plumbing permit for the installation of an on-site wastewater management system.

1.Complete drawings of the installation, drawn to a scale of not less than 1:200 or as agreed to by the Permit Authority, showing the following:

(a) the title boundaries of the land;

(b) the position of any existing or proposed buildings on the land and their use;

(c) the position of any roads or driveways on the land;

(d) the location of any water courses;

(e) the contours on the land;

(f) the position of the Wastewater treatment unit; Wastewater land application area (absorption trenches, mound, irrigation area); Pump chamber, distribution box or other manual or automatic valve; Soil evaluation test holes.

(g) the location and size of any drains and vents;

(h) the location of any cut-off drains diverting surface water or sub-soil drains for ground water;

(i) the location of the outlets from the building;

(j) A cross section drawing demonstrating that there is sufficient gravity fall from the plumbing fixtures to the wastewater treatment unit and land application area.

(k) Operation and maintenance guidelines for the OWMS

(l) Installation instructions for the wastewater treatment unit and land application area

2. Written details of the proposed fixture unit load on the system or parts of the system.

3. A site-and-soil evaluation report completed in accordance with AS/NZS 1547:2012 clause 5.2

4. A Design report which is consistent with the Director of Building Control Onsite Wastewater Management Guidelines and includes the following;

(a) A design based on the site and soil evaluation report

(b) Design calculations for the wastewater land application system and wastewater treatment unit

(c) Specification for the wastewater treatment unit, if a unique on-site wastewater management system a design report from a suitably qualified designer demonstrating compliance with the performance requirements of the Volume 3 of the NCC.

(d) A loading certificate setting out the design criteria and the limitations associated with use of the system incorporating the following:

- System capacity (number of persons and daily flow)
- Summary of design criteria
- The location of and use of the reserve area
- Use of water efficient fittings, fixtures, or appliances

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- Allowable variation from design flows (peak loading events)
- Consequences of changes in loading (due to varying wastewater characteristics)
- Consequences of overloading the system
- Consequences of underloading the system
- Consequences of lack of operation, maintenance, and monitoring attention
- Any other relevant considerations related to use of the system; and

(e) The results of the risk management process undertaken in accordance with AS/NZS 1547 Clause A3.2. if required by the Director of Building Control Onsite Wastewater Management Guidelines.

5. A written specification and construction details of the land application system to be used, including details of the following:

(a) the type of system;

(b) the trade name, if any;

(c) the manufacturer's name and address;

(d) the design capacity of the system; and

(e) a section (drawing detail) through the land application system, of not less than 1:20, specifying its construction.

(f) Pump chamber capacity, pump and supply pipe specifications (where appropriate)

(g) Distribution boxes, automatic sequencing valves, dosing syphons or other pulse dosing devices.

6. Copy of Certificate of Accreditation issued under the Building Act by the Director of Building Control for the on-site wastewater management system (if applicable).

7. Any other document or certificate required by the relevant permit authority or environmental health officer

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Louisa Brown

From: Bushfire Practitioner <bfp@fire.tas.gov.au>
Sent: Thursday, 23 September 2021 1:44 PM
To: billcromer@bigpond.com; 'Danielle Gray'
Cc: 'Seaton Waterfield'
Subject: RE: Compost Kings proposed composting facility near Melton Mowbray

07

Hi Bill / Danielle,

Further to our discussion earlier, I've had a look at the information provided.

The Bushfire-Prone Areas Code will only apply to this project if the proposal is a 'hazardous use' as defined in clause E1.3.1 of the Southern Midlands Interim Planning Scheme 2015. The use is defined through reference to the use, handling, generation or storing of hazardous chemicals in volumes that exceed the manifest quantities of the *Work Health and Safety Regulations 2012.*

I don't think any of the proposed inputs are hazardous chemicals in the context of the *Work Health and Safety Regulations 2012.* If there are flammable liquids being stored onsite (fuels etc), they potentially could tip this over into being a hazardous use, but only if the volumes exceeded the manifest quantities specified in Schedule 11 of the *Work Health and Safety Regulations 2012.*

I'm not sure if there are any other fire-related requirements contained in the EPA's guidelines for the project? Sometimes they include a requirement for a 'plan for fire management', which is broader than what the Code requires.

Regards,

Tom O'Connor
Senior Planning & Assessment Officer
Bushfire Risk Unit

Tasmania Fire Service

Service | Professionalism | Integrity | Consideration

Cnr Argyle and Melville Streets | GPO Box 308 Hobart Tasmania 7001
Phone (03) 6166 5575 | Mobile 0438 101 367
tom.oconnor@fire.tas.gov.au | **www.fire.tas.gov.au**

From: billcromer@bigpond.com <billcromer@bigpond.com>
Sent: Wednesday, 22 September 2021 11:58 AM
To: Bushfire Practitioner <bfp@fire.tas.gov.au>
Cc: 'Seaton Waterfield' <s.waterfield1984@hotmail.com>; 'Danielle Gray' <danielle@grayplanning.com.au>
Subject: Compost Kings proposed composting facility near Melton Mowbray

Attention Tom O'Connor

Hi Tom
(Danielle Gray gave me your name and contact details)

I am putting together an EIS for Compost Kings' proposed 10,000 tpa composting facility on Lovely Banks Road near Melton Mowbray.
Danielle is looking after planning issues for us. She tells me we will need to address E1.0 Bushfire Code, and has suggested I contact you for advice/input.

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Would you please be kind enough to call me on 0408 122 127 for a chat?

In the meantime, I've attached some background info.

Kind regards

Bill
PS: Please confirm receipt of this email.

Bill Cromer
William C Cromer Pty Ltd
ABN 48009531613
Consulting engineering, groundwater and environmental geologists
M 61 408 122 127
billcromer@bigpond.com
www.williamccromer.com

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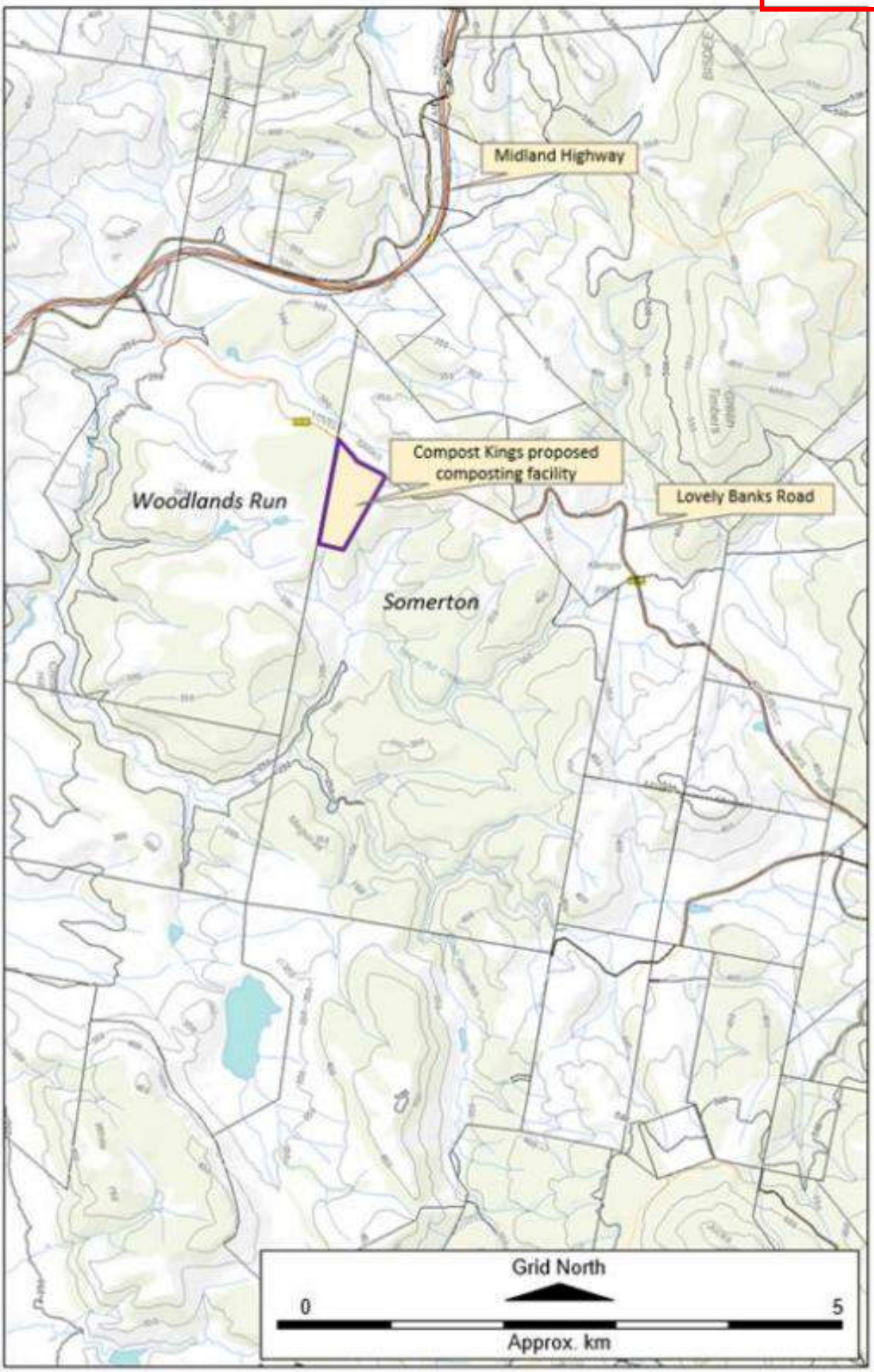
The composting facility would cover about 2.5ha of land on *Somerton*, at a site about 500m south of Lovely Banks Road, and next to the *Somerton – Woodlands Run* property boundary.



Proposed site location

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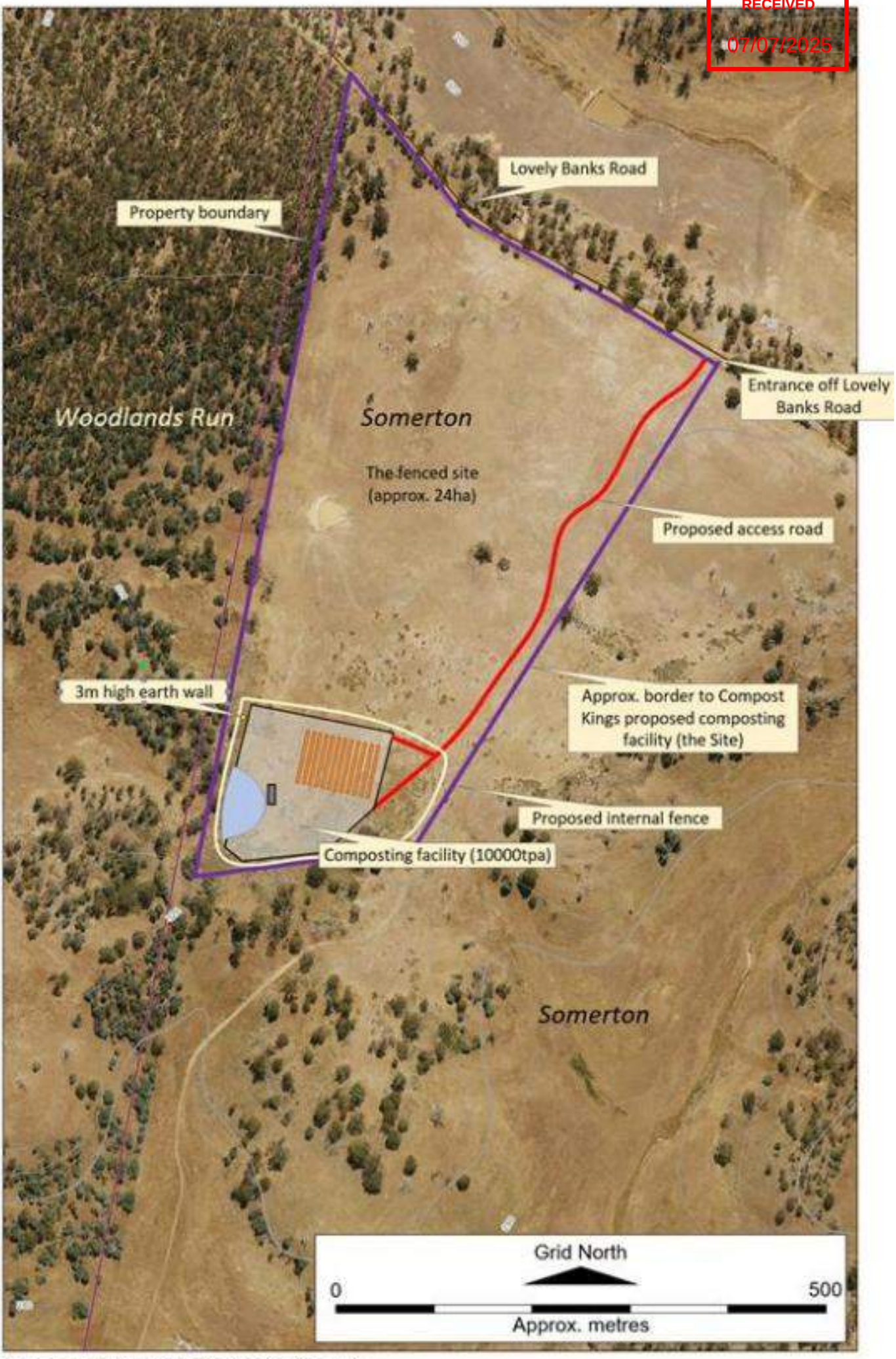

Proposed site layout (preliminary)

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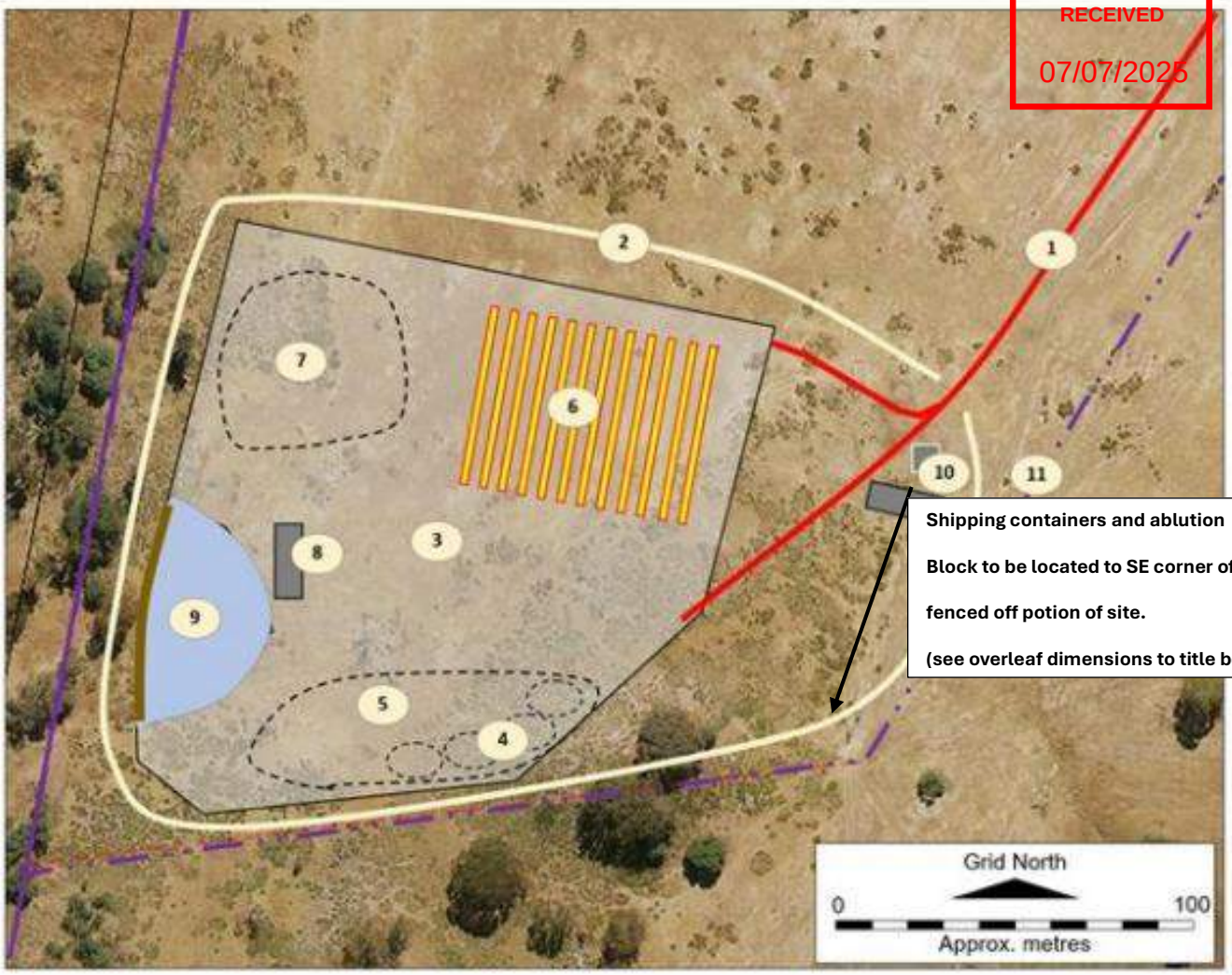
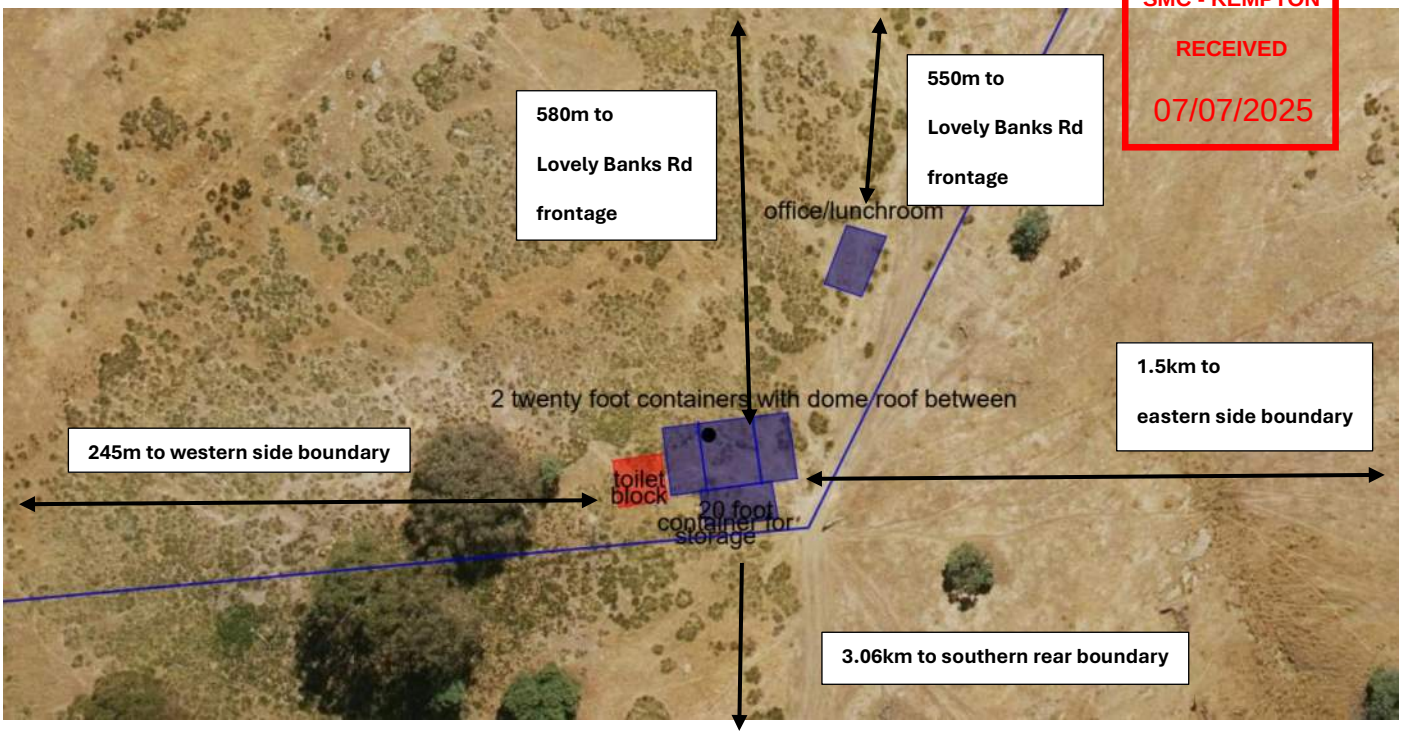


1. Access road; gravel; 4m wide
2. Perimeter earth wall: nominally 3m high x 5m wide at base; 10m gap between windrows for truck, turner access.
3. Gravelled hardstand (approx. 2ha)
4. Delivered raw materials (fish morts, sawdust, green waste, pine bark; liquid fish wastes (in tanks))
5. Mixing area
6. Windrows: 12, each 55m long x 2.5m high and wide; 3m apart: area = nom. 63m x 55m. No cover or fans.
7. Stockpiled compost area (could hold up to 5,000m3 or so at times)
8. Truck washdown area
9. Leachate and stormwater dam
10. Site office and toilet (*Portaloo*)
11. Internal fence
12. Property boundary

Detail of proposed facility layout (preliminary)



Proposed location of 4 shipping containers with dimensions to title boundaries of CT-134018/1

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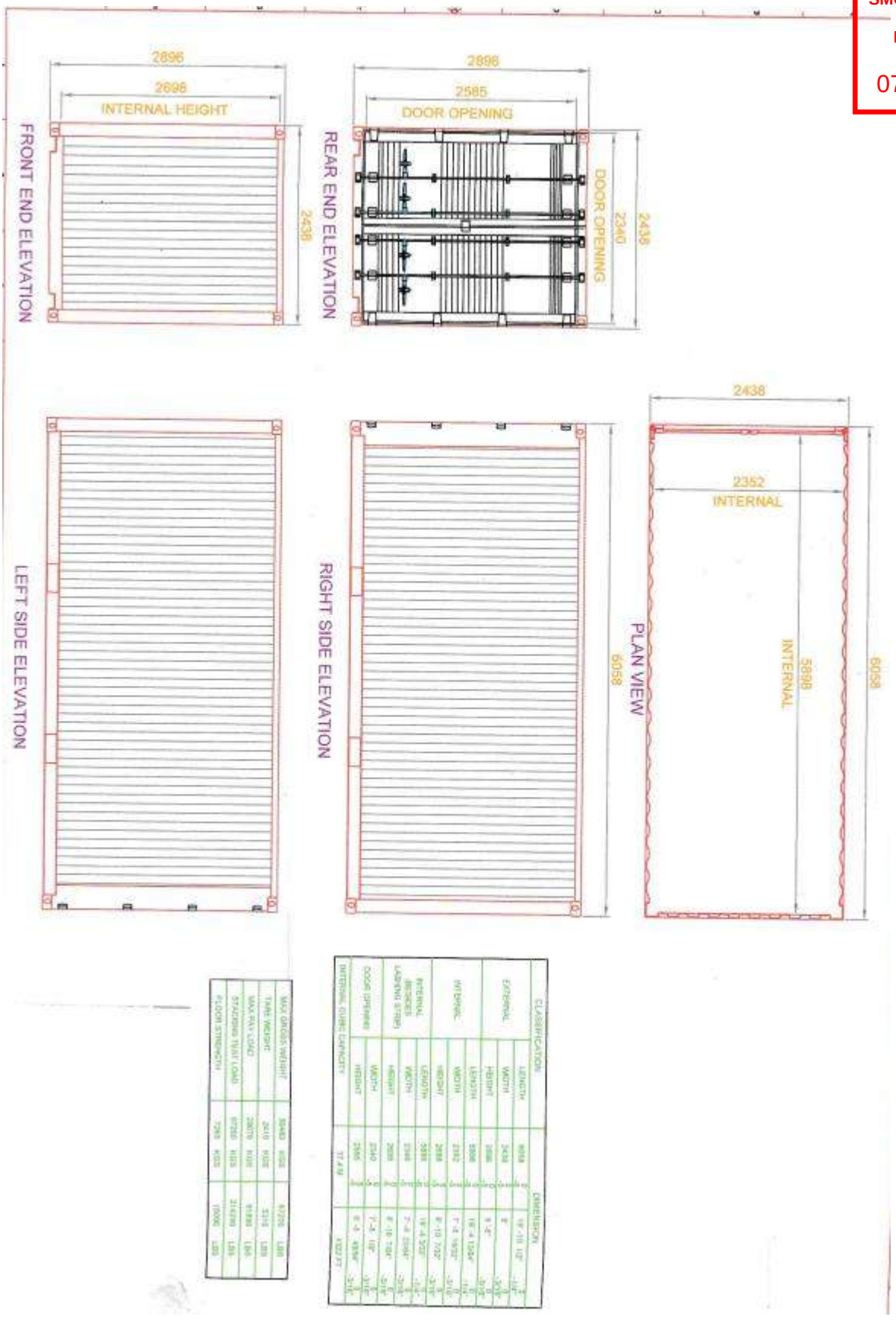

Proposed shipping container plans with dimensions (four are proposed as per plan above)

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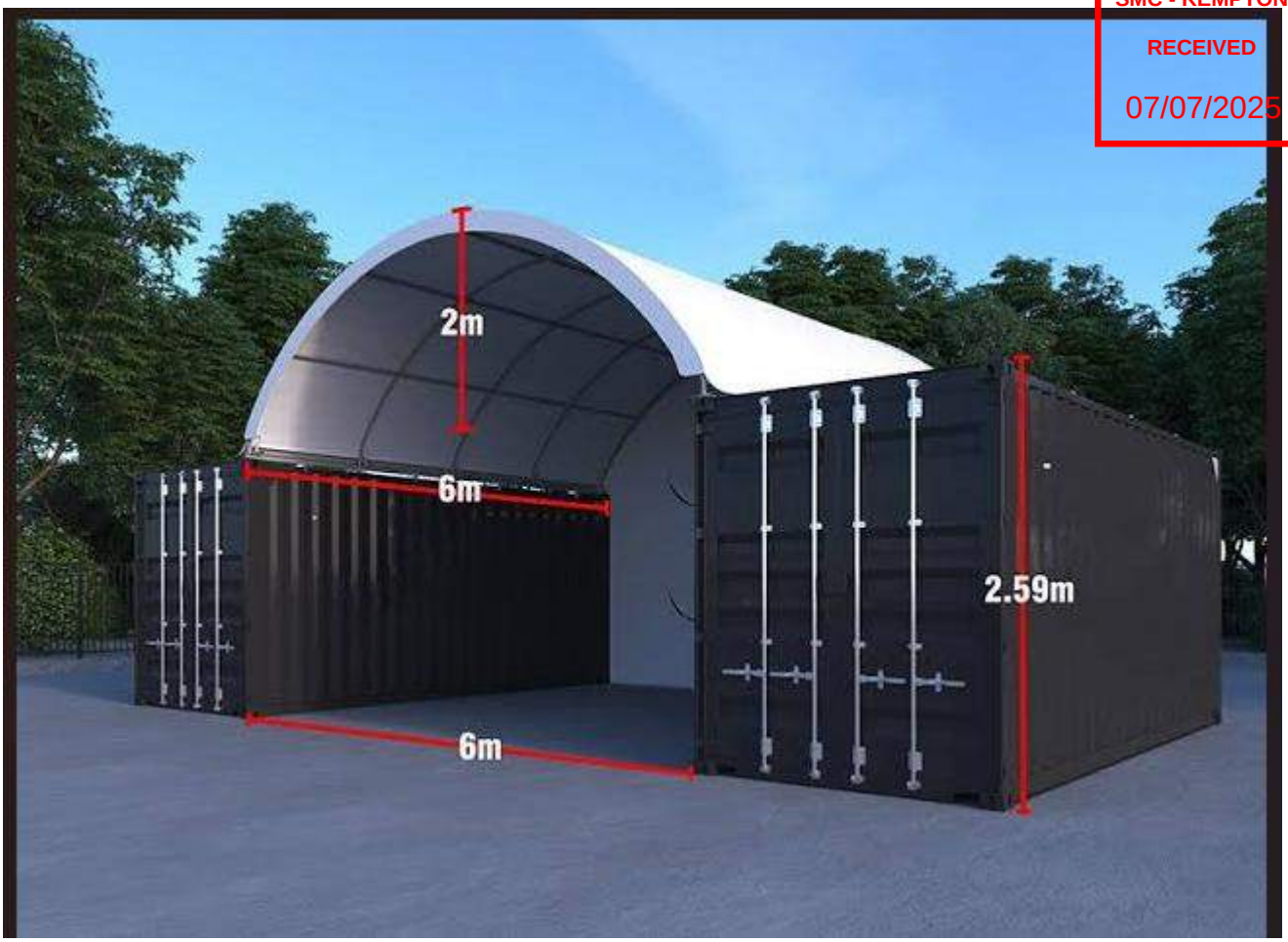

Proposed shipping container plan configured together (3 containers) with domed roof with dimensions

Fourth shipping container is to be used as a sheltered lunchroom

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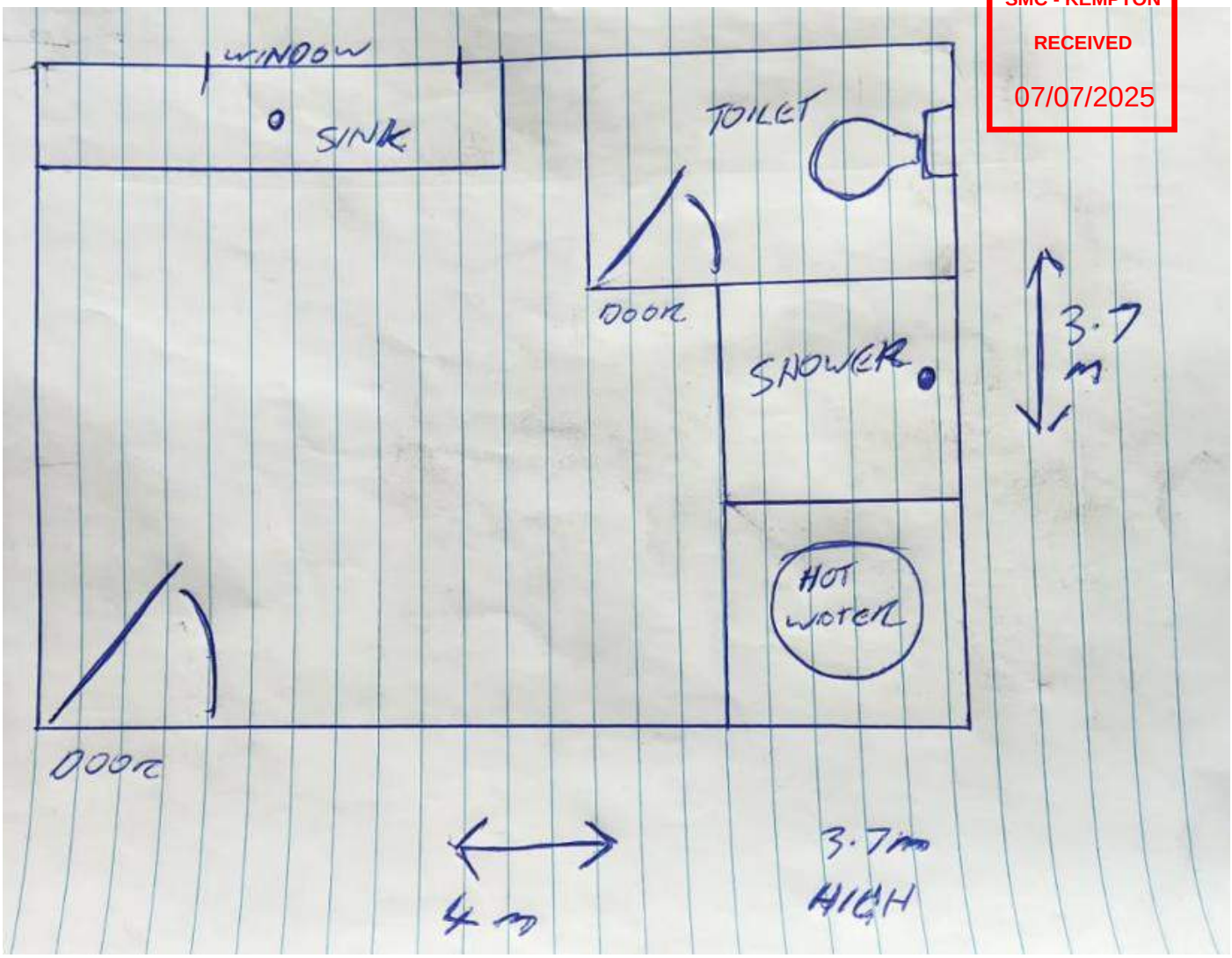
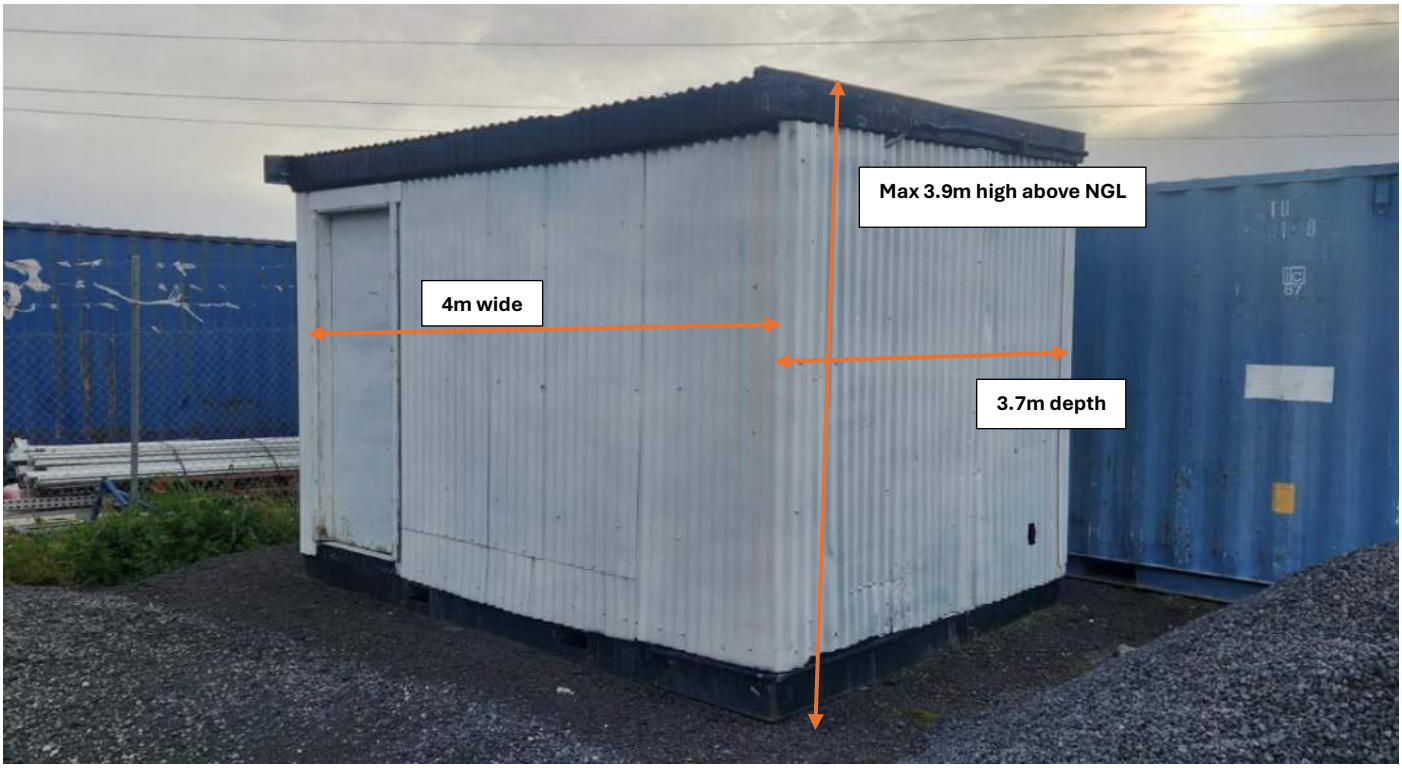


4m wide, 3.7m depth, 3.7m high (3.9m above NGL once mounted on slab)



Proposed toilet block portable pre-constructed building with dimensions

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Interior images of proposed toilet block portable pre-constructed building (prior to final fit out)

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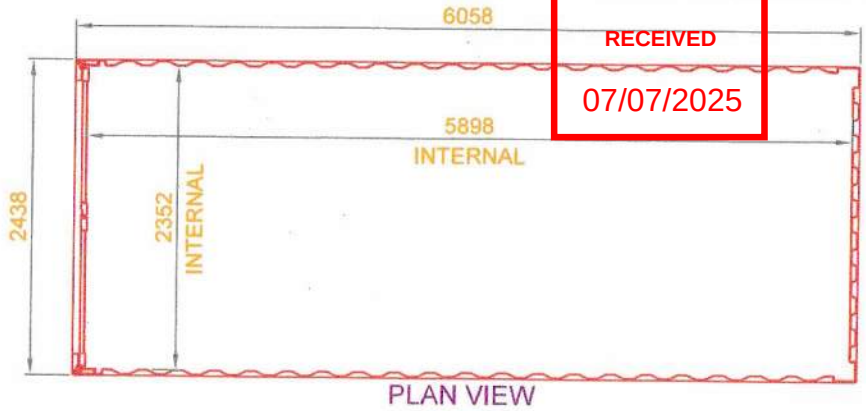
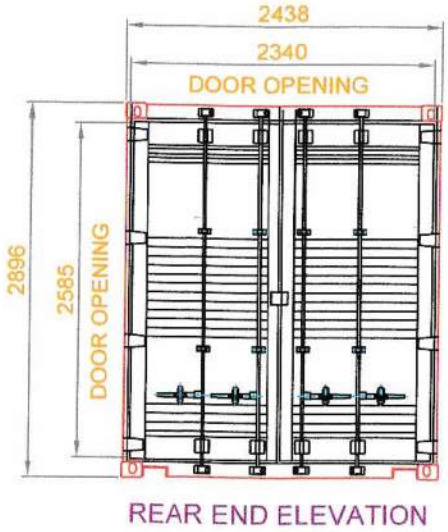
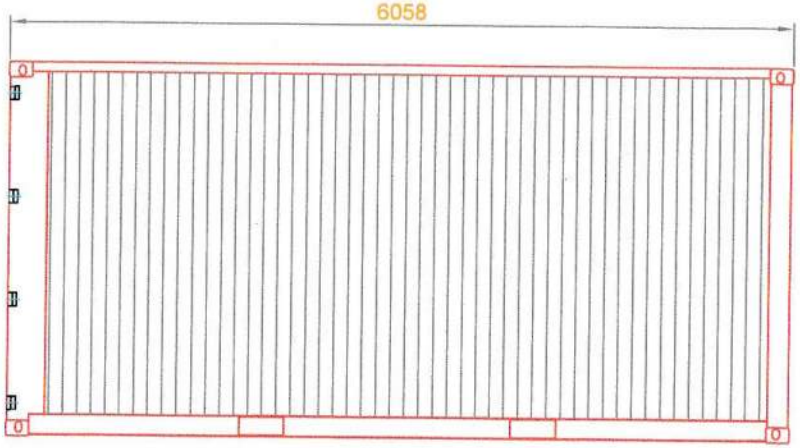


PLAN VIEW

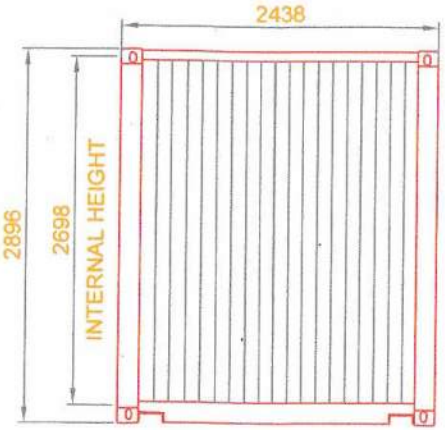


REAR END ELEVATION

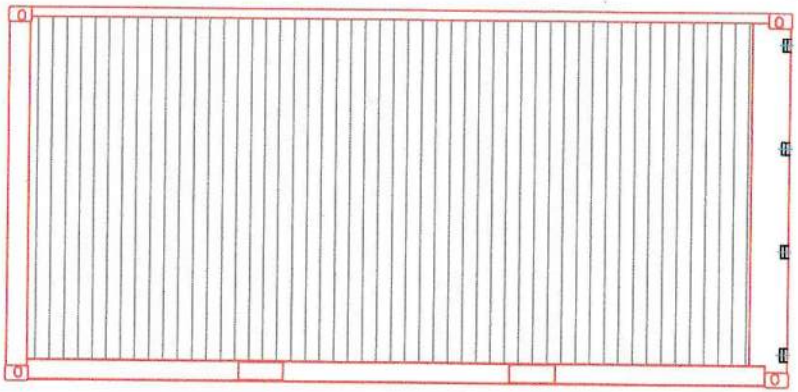


RIGHT SIDE ELEVATION

CLASSIFICATION		DIMENSION	
EXTERNAL	LENGTH	6058 0 -5	19'-10 1/2" 0 -1/4"
	WIDTH	2438 0 -5	8' 0 -3/16"
	HEIGHT	2896 0 -5	9'-6" 0 -3/16"
INTERNAL	LENGTH	5898 0 -5	19'-4 13/64" 0 -1/4"
	WIDTH	2352 0 -5	7'-8 19/32" 0 -3/16"
	HEIGHT	2698 0 -5	8'-10 7/32" 0 -3/16"
INTERNAL (BESIDES LASHING STRIP)	LENGTH	5895 0 -5	19'-4 3/32" 0 -1/4"
	WIDTH	2346 0 -5	7'-8 23/64" 0 -3/16"
	HEIGHT	2695 0 -5	8'-10 7/64" 0 -3/16"
DOOR OPENING	WIDTH	2340 0 -5	7'-8 1/8" 0 -3/16"
	HEIGHT	2585 0 -5	8'-5 49/64" 0 -3/16"
INTERNAL CUBIC CAPACITY		37.4 M	1322 FT

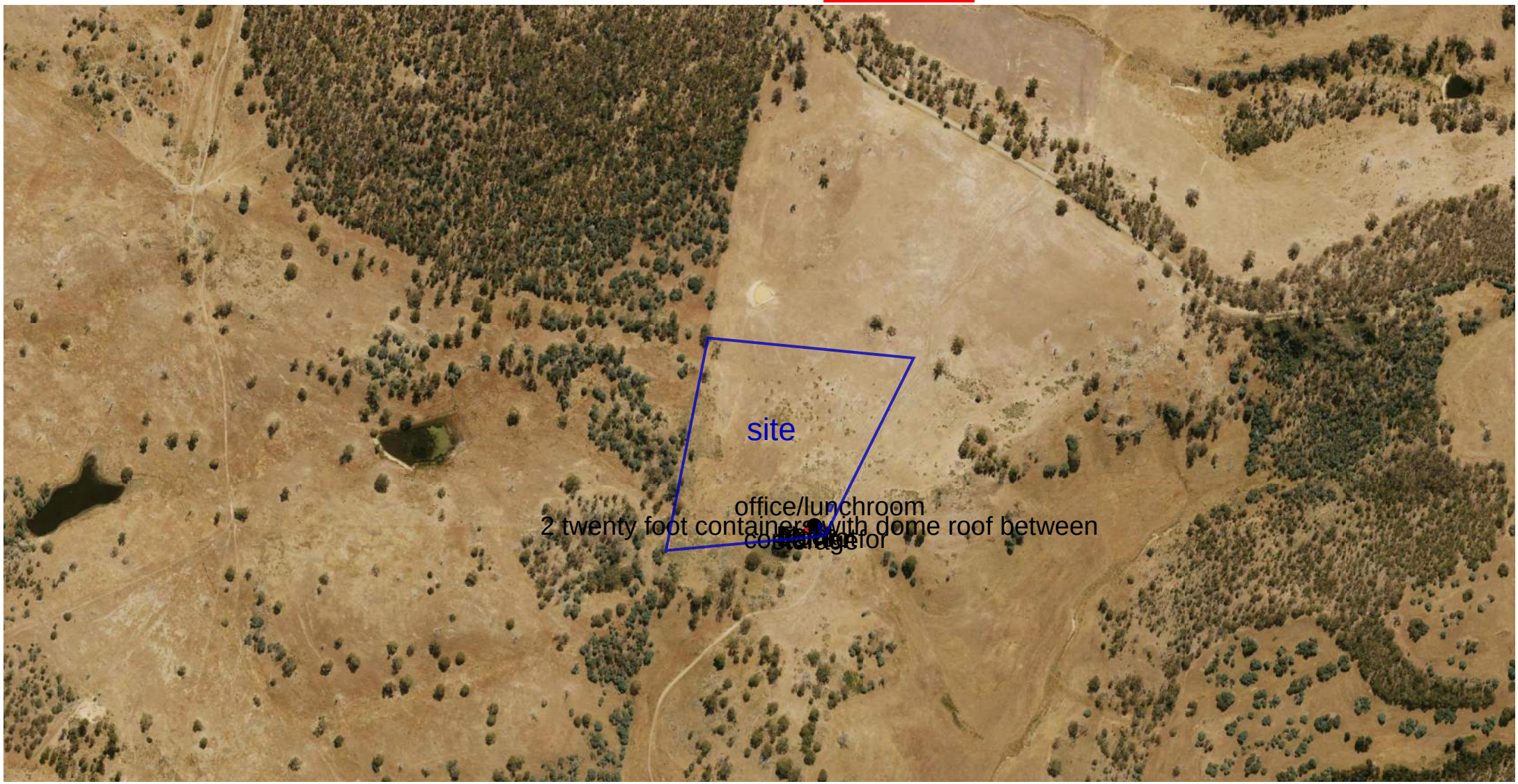


FRONT END ELEVATION



LEFT SIDE ELEVATION

MAX GROSS WEIGHT	30480	KGS	67200	LBS
TARE WEIGHT	2410	KGS	5310	LBS
MAX PAY LOAD	28070	KGS	61890	LBS
STACKING TEST LOAD	97200	KGS	214290	LBS
FLOOR STRENGTH	7260	KGS	16000	LBS



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RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

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SEARCH OF TORRENS TITLE

VOLUME	FOLIO
134018	1
EDITION	DATE OF ISSUE
5	17-Oct-2014

SEARCH DATE : 07-Jul-2025
SEARCH TIME : 03.46 PM

DESCRIPTION OF LAND

Parish of DYSART, Land District of MONMOUTH
Parish of SOMERTON, Land District of MONMOUTH
Lot 1 on Plan 134018
Being the land described in Assent 69/0720
Derivation : Whole of Lot 63, 640 acres and Part of 904 acres,
Granted to Anthony Fenn Kemp. Whole of Lot 593, 426a-1r-0p,
Granted to James Alfred Dunn and Part of Lot 595, 585 acres,
Granted to Isaac Bisdee
Derived from A17828

SCHEDULE 1

RODNEY CLIFFORD JONES

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
C248710 MORTGAGE to Perpetual Trustees Tasmania Limited
Registered 20-Oct-2000 at 12.04 PM
C412138 MORTGAGE to Perpetual Trustees Tasmania Limited
Registered 21-Nov-2002 at 12.02 PM
C944264 MORTGAGE to Tasmanian Perpetual Trustees Limited
Registered 27-Nov-2009 at noon
D142004 MORTGAGE to Commonwealth Bank of Australia
Registered 17-Oct-2014 at noon
E75871 TRANSFER of MORTGAGES C248710 and C412138 to MyState Bank Limited Registered 11-Jan-2017 at noon
E75870 TRANSFER of MORTGAGE C944264 to MyState Bank Limited
Registered 13-Jan-2017 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

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FILE NUMBER A17828

GRANTEE
WHOLE OF LOT 63 (640AC) & PART OF (904AC) GTD TO ANTHONY FENN KEMP
WHOLE OF LOT 593 (426-1-0) GTD TO JAMES ALFRED DUNN
PART OF LOT 595 (585AC) GTD TO ISAAC BISDEE

CONVERSION PLAN

LOCATION

MONMOUTH - SOMERSET & DYSART

CONVERTED FROM CONV 69/0720

NOT TO SCALE LENGTHS IN METRES

Registered Number
P.134018

APPROVED 8 JUNE 2000
Alice Kawa
Recorder of Titles

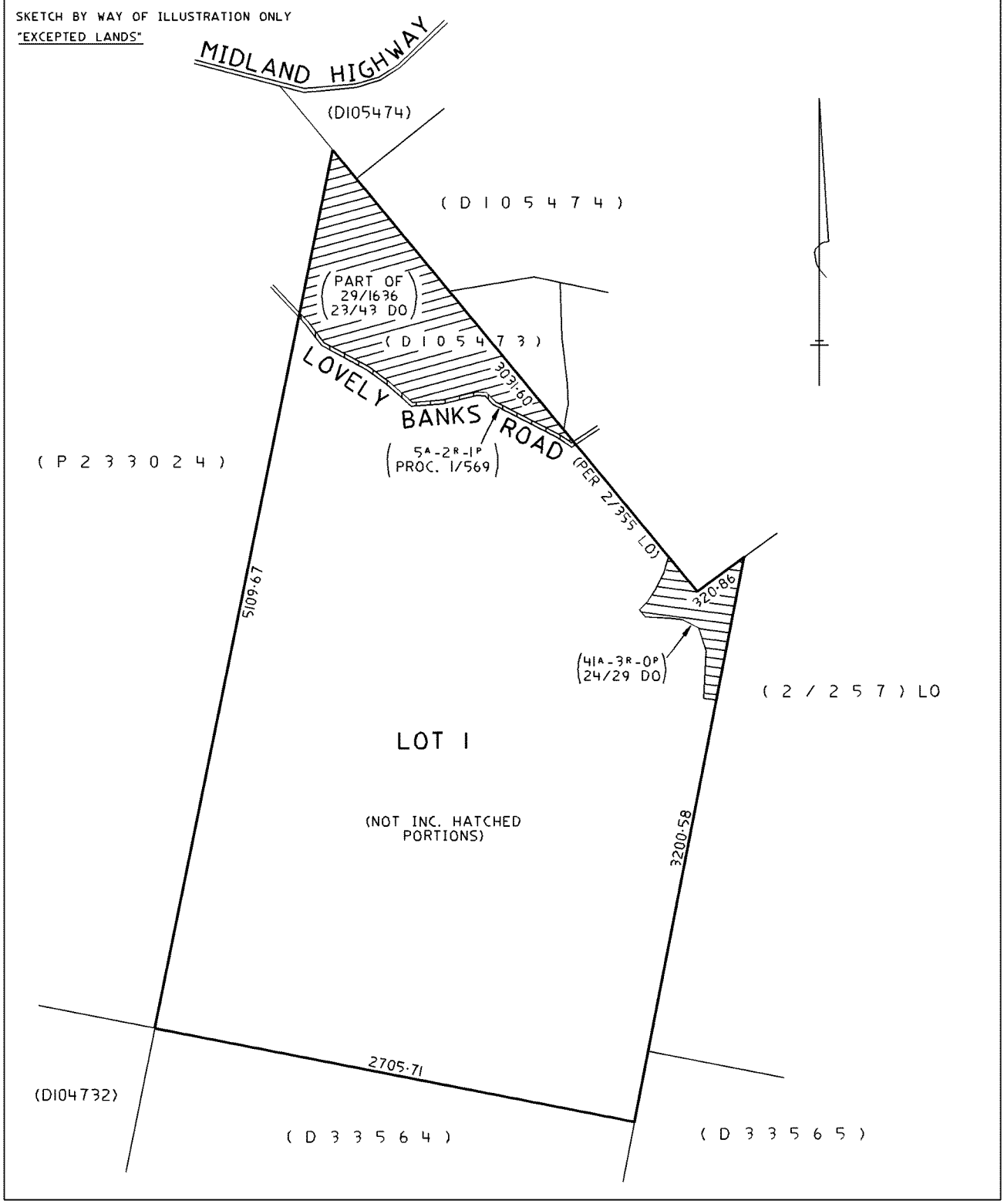
MAPSHEET MUNICIPAL CODE No. 125 (5029,5229)

LAST UPI No. 1900619 1900749,1900750

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

DRAWN DJB

SKETCH BY WAY OF ILLUSTRATION ONLY
"EXCEPTED LANDS"



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Agricultural Report

Farm Production and Compost

Justin Jones
'Melton Mowbray'
Tasmania

July 2021

Rod Hancl, B.Ag.Sc. (Hon.)
Nutrien Ag Solutions
49 Glenstone Rd, Bridgewater, Tasmania, 7030.

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1. Prelude

The Compost Kings are proposing a composting facility on the 2.5 ha of land at the Somerton property (*i.e. Lovely Banks road, Melton Mowbray*) under the Southern Midlands council planning scheme. The plan is to produce up to 10, 000 tons of compost at the site (i.e. approximately 17, 000 cubic metres). The benefits of the composting proposal are that it would both value add to the organic waste that would otherwise be destined for landfill and the high quality product could then be utilized to improve the soil health and subsequently farm productivity of marginal farming land. Cotching (2009) states that the "Organic Matter is vital component of a healthy soil as it contributes to soil physical, `chemical and biological fertility". And Chivers (1996) identifies that "both coarse and fine organic matter are essential".

2. Summary of Agricultural Report

The following report demonstrates that incorporating a good quality compost, such as that proposed by the Compost King, could be utilised as a strategic management tool (*i.e. if cost efficient*) to improve the soil structure and fertility, and potentially lift farm productivity outcomes.

3. Introduction

Agronomically it is extremely hard to quantify an ideal soil, but there is plenty that a farmer and agronomist can do to improve the soils to increase farm productivity outcomes. The largest fraction of the soil is its mineral component (*i.e. sand, silt, and clay*). The second major component of a soil is its organic matter. This component of the soil is delicate and can be easily destroyed by cultivation. The role of the of the organic matter in the soil is that it encompasses the nutrient storage and availability, soil buffering, soil structure and water holding capacity.

The soils of the Jones Family agricultural enterprise can be described to vary from light sandy soils (i.e. CEC < 5 meq/100g), to sand-loam soils (i.e. CEC of 5 to 10 meq/100g) to Clay-loam soils (i.e. up to CEC of 15 meq/100g). The organic matter in these farm soils range from

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2.1 % to 6.3% (Appendix 1, Appendix 2, and Appendix 3). Generally, it could be sated that a soil of good fertility will have organic matter levels greater than 4%.

4. Farm Compost Demonstration

The soils of Pivot #1 can be classified as light sandy soils that have a low CEC levels and low in organic matter levels (Appendix 1). Light sandy soils can be stated to be free draining, weakly structured, the nutrients tend to leach, and the soil is susceptible to erosion. Irrigation is generally necessary to provide good yields in high value crops.

A compost demonstration was conducted on the soils of Pivot #1 (*i.e. compost spread at 3 T/ha*) and then this paddock was sown down to lucerne in October 2019. There is no definitive *(i.e. statistical*) conclusion in the Organic Matter levels in the soil data set (*i.e. six soil samples between 2015 and 2021*) but the most recent soil sample data (*i.e. Pivot #1 – House*) identifies that organic matter levels are now like those in the 2016 soil data, which is good farming outcome as cultivated sandy soils can rapidly decline in organic matter content (Appendix #1). But it should also be noted that when implementing farm management practices to build up the organic matter levels that the process may take several seasons.

The soils of Pivot #2 can be classified as light sandy soils that have low CEC levels and are low in organic matter (Appendix 2). A compost demonstration was conducted on the southern half of the soils of Pivot #2 (*i.e. compost spread at 3 T/ha*) and then this paddock was sown down to a barley cereal crop. Images early in this cereal growth stage, in late 2019, identify a visual difference in the crop where the compost had been spread and incorporated into the soil (Picture #1 and Picture #2).

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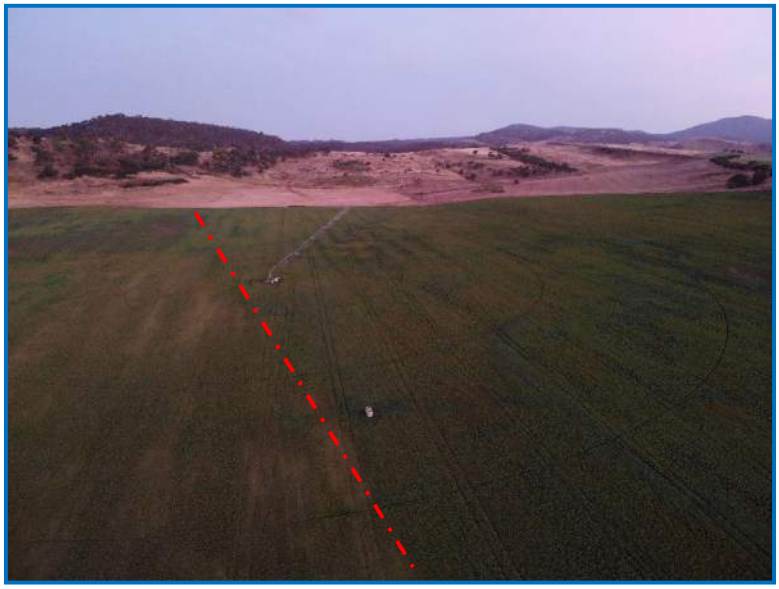
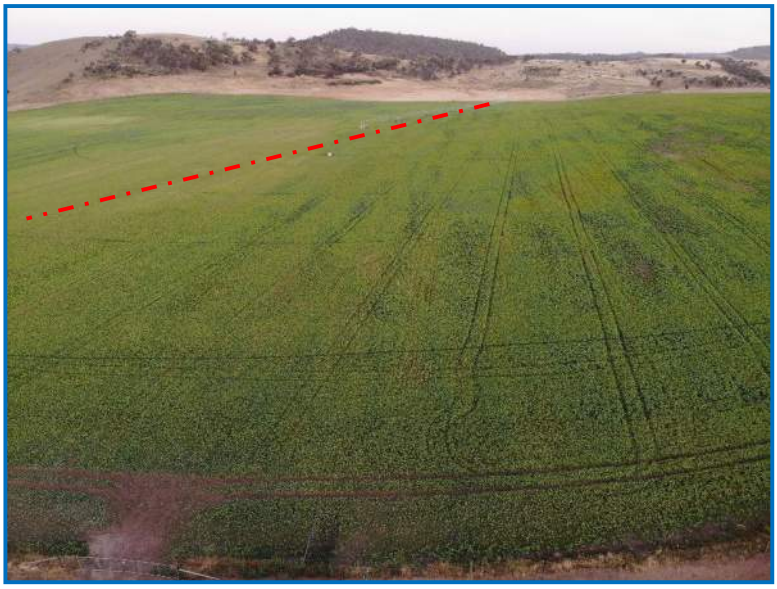
Picture #1 (*top*) and Picture # 2 (*bottom*).

The right-hand side of the red dotted line (i.e. *both images*) identifies the area of the Pivot #2 soils that represents a compost demonstration. The compost was applied at 3 T/ha and soil incorporated. The barley cereal crop appears visually greener where the compost has been applied.





5. Conclusion

Farm management practices can help maintain or increase the soils organic matter levels. These include, for example, reduced or minimum tillage, retention of crop residues, the use of green manure or cover crops, reduced over grazing and the minimisation of bare earth fallows. A high standard good quality compost, that is cost effective, could provide many benefits on light sandy to sandy-loam soils by increasing farm productivity outcomes in cropping yields and animal productivity gains.

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6. Reference and Bibliography

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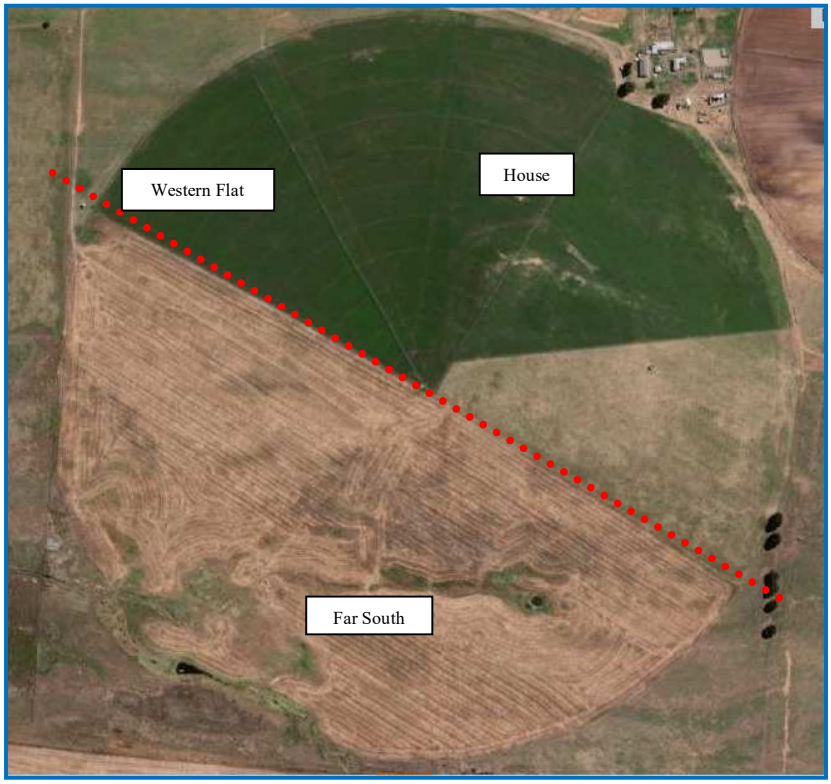
7. Appendices

Appendix 1. Pivot #1 soil data set.

a.) **ESRI Imagery map** (*theList web site*) identifying **"Pivot #1"** on the Follies property. The family dwelling (Justin Jones) and farm sheds can be identified in top right-hand top corner of the picture.

b.) Table of selected basic data from 6 soil analysis between 2015 to 2021 identifying sandy soil type. (*Note: this paddock has been assigned various names by different soil samplers*). The 'North Pivot*' and the 'Pivot North' soil analysis identifies soil sampling for the complete pivot area (*i.e. prior to any compost applications*). The pivot picture is split by a red dotted line. The top side of red dotted line identifies the House soil analysis after a compost demonstration (*i.e. this is a compost application at 3-ton / ha*). The bottom side of the red dotted line is Far South soil analysis (*i.e. has no compost applications*). The Western Flat Paddock is the House Paddock (*i.e. prior to any compost applications*).



	Guidelines	5.2 - 7.4	12.0 - 40.0			3.0 - 8.0	20 - 70	0.5 - 1.2	7.0 - 20.0	6.0 - 15.0	1.0 - 4.5
Pivot #1	Date	pH CaCl)	CEC	*Soil type*	OC %	OM %	P (Olsen)	K	S	Ca	Mg
North Pivot *	27/07/2015	5.4	4.1	*sand*	1.2	2.1	30 **	0.15	9	3.1	0.6
Pivot North	9/09/2016	5	4.23	*sand*	1.6	2.8	24	0.22	11	3.21	0.63
North Pivot (west Flat)	30/01/2019	4.9	3.64	*sand*	1.3	2.2	23	0.07	8	2.75	0.49
Pivot #1 Far South	17/06/2020	5.6	5.07	*sandy-loam*	1.2	2.1	14	0.3	5	3.58	0.89
Pivot #1 Far South	12/04/2021	5.2	4.27	*sand*	1.4	2.4	19	0.23	4	3.07	0.72
Pivot #1 (House)	12/04/2021	5.6	5.78	*sandy-loam*	1.6	2.7	25	0.3	7	4.48	0.71

Note: Majority of soil analysis is throught the Phosyn lab (QLD) and hence utilise their soil guidelines.

Note: *Denotes IPL Lab **Denotes Phosphorus Colwell. Organic Matter (OC) % = Organic Carbon (OC) % mutiplied by 1.72

Note: ppm = mg/kg (i.e. P & S). Note: meq/100g = cmol(+)/kg (i.e. K, Ca & Mg)

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Appendix 2. Pivot #2 soil data set.

a.) **ESRI Imagery map** (*theList web site*) identifying **"Pivot #2"** on the Follies property. The family dwelling (Justin Jones) and farm sheds can be identified in mid left-hand side of the picture.

b.) Table of selected basic data from 6 soil analysis between 2015 to 2021 identifying generally a sandy soil type. (*Note: this paddock has been assigned various names by different soil samplers*). The Pivot #2 Northside, Pivot South, The Pivot West and Pivot East soil analysis identifies soil sampling for the pivot soils prior to any compost applications. The northern side of the Pivot would have a slightly heavier soil type.

	Guidelines	5.2 - 7.4	12.0 - 40.0			3.0 - 8.0	20 - 70	0.5 - 1.2	7.0 - 20.0	6.0 - 15.0	1.0 - 4.5
Pivot #2	Date	pH CaCl)	CEC	*Soil type*	OC %	OM %	P (Olsen)	K	S	Ca	Mg
Pivot #2 Northside (Tip Pdk)	27/07/2015	4.8	6.9	*sandy-loam*	1.9	3.3	71 **	0.51	5	4.4	1.7
Pivot South	9/09/2016	5.5	4.32	*sand*	1.4	2.4	17	0.12	11	3.3	0.72
New Pivot West	20/01/2017	4.5	3.23	*sand*	1.5	2.5	25	0.14	5	2.18	0.72
New Pivot East	20/01/2017	4.5	2.74	*sand*	1.3	2.2	22	0.14	4	1.88	0.57
PIVOT NO 2	2/10/2019	4.9	6.67	*sandy-loam*	2.1	3.6	28	0.37	23	4.76	1.32
PIVOT SOUTH	2/10/2019	5.2	5.24	*sandy-loam*	1.6	2.7	17	0.3	9	3.8	0.9

Note: Majority of soil analysis is throught the Phosyn lab (QLD) and hence utilise their soil guidelines.

Note: * Denotes IPL Lab ** Denotes Phosphorus Colwell. Organic Matter (OC) % = Organic Carbon (OC) % mutiplied by 1.72

Note: ppm = mg/kg (i.e. P & S). Note: meq/100g = cmol(+)/kg (i.e. K, Ca & Mg)

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Appendix 3. Extra farm soil data set

Table of selected basic data from 69soil analysis between 2015 to 2021 across other parts of the farming enterprise (i.e. Charlton Farm and Hutton Park properties). These soils results identify some good clay-loam soil types high organic matter levels and soil nutrition levels. The sandy soils would benefit from the addition of compost to lift soil organic matter and nutrition levels.

	Guidelines	5.2 - 7.4	12.0 - 40.0			3.0 - 8.0	20 - 70	0.5 - 1.2	7.0 - 20.0	6.0 - 15.0	1.0 - 4.5
Paddock(s)	Date	pH CaCl)	CEC	*Soil type*	OC %	OM %	P (Olsen)	K	S	Ca	Mg
Boar *	27/07/2015	4.8	4.8	*sand*	2	3.4	33 **	0.26	4	2.9	1.3
Pete's	5/06/2018	4.4	4.04	*sand*	2.1	3.6	26	0.48	11	2.57	0.92
Pitt	5/06/2018	5.1	11.01	*clay-loam*	3.1	5.4	13	0.49	13	7	3.22
Pitt	12/04/2021	5.5	12.8	*clay-loam*	3.3	5.6	16	0.48	6	8.89	3.1
Airstrip	5/06/2018	5.1	12.37	*clay-loam*	3.7	6.3	6	0.79	15	7.31	3.55
Langola	5/06/2018	5.8	15.03	*clay-loam*	3.3	5.7	21	0.46	7	10.73	3.43
Langola	19/03/2021	5.6	11.19	*clay-loam*	2.7	4.6	12	0.38	9	7.92	2.59
ARTHURS	19/03/2021	5.4	5.54	*sandy-loam*	1.9	3.2	19	0.21	5	4.44	0.65

Note: Majority of soil analysis is throught the Phosyn lab (QLD) and hence utilise their soil guidelines.

Note: * Denotes IPL Lab ** Denotes Phosphorus Colwell. Organic Matter (OC) % = Organic Carbon (OC) % mutiplied by 1.72

Note: ppm = mg/kg (i.e. P & S). Note: meq/100g = cmol(+)/kg (i.e. K, Ca & Mg)

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Traffic Assessment

Proposed Composting Facility

at Somerton, Lovely Banks Road, Melton Mowbray

SUBMITTED BY:

TERRY EATON
Traffic Engineer
29 Carey's Road
Bridgenorth TAS 7277
Email terry.eaton@bigpond.com

NOVEMBER 2022

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1. Introduction

A proposal is being advanced to develop a composting facility on the Somerton Property with access via Lovely Banks Road, Melton Mowbray.

In accord with Code E5.0 of the Southern Midlands Interim Planning Scheme, a traffic assessment report to the satisfaction of the Council's Infrastructure Department (the Road Authority) is required as part of the development application documentation.

This report, prepared by Terry Eaton, an experienced traffic engineer, is provided for that purpose.

Preparation of the report has included discussion with the applicant and a site visit.

2. The Site

The site, which could be considered remote, is an area of some 24 hectares as part of the Somerton rural holding with access to Lovely Banks Road some 3 kilometres east of the junction with the Midland Highway.

The area of Somerton in proximity to the site is considered as dry land pasture generally in use for sheep and cattle grazing.

The land profile for the site is an upgrade to a ridge some 300 metres south of Lovely Banks Road and then a downgrade further south.

Access to the site is via an existing gateway (some 4.6 metres wide). Sight distance at this gate is some 160 metres to the east and 224 metres to the west.

3. The Proposal

The proposal is to install a composting facility on the site some 550 metres south of Lovely Banks Road with access via a new roadway from the existing gateway near the eastern edge of the site. The land profile suggests no significant topography issues for the construction of the access road.

The facility to be operational on weekdays between the hours of 8am and 4pm as a private facility with no public access. The proposal to produce some 10,000 tonnes of compost per annum.

The transport plan is for all heavy vehicle movements to be to / from the west.

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4. Lovely Banks Road

Lovely Banks Road is a local rural access road connecting between the Midland Highway and Richmond Road, a distance of some 10 kilometres.

Indications are that traffic use is low, estimated at less than 30 vehicles per day with some use by trucks and semi-trailers to cart farm supplies including stock cartage.

In the vicinity of the driveway to the proposed composting site the road is constructed with a well-maintained gravel surface some 6.6 metres wide with indications that the central 4.8 metres is the normal trafficked width (indicative of generally single lane use due to the low traffic volume).

To the east of the proposed driveway the road is curvilinear, i.e. large radius curve from the gateway with short straight and continuous curve to a further straight over a length of some 200 metres. West of the proposed driveway the road is relatively straight for some 200 metres.

The road profile is a downgrade of some 4% from east of the proposed driveway to a shallow vertical curve some 100 metres west of the proposed driveway with an upgrade of some 4% to a crest some 50 metres further west to a downgrade at some 5% to 6%.

The general description of Lovely Banks Road is that from the crest east of the site to the Midland Highway the road is of a high standard for the use except for a short narrow section plus a one lane bridge some 100 metres east of the Midland Highway.

East from the crest near the site the road standard reduces to a narrow, undulating profile and winding alignment.

The length from the site to the Midland Highway is assessed as low speed use, i.e. some 55 to 60 km/h, however for the section some 200 metres either side of the site gateway the indicative travel speed is some 60 to 65 km/h.

The junction with the Midland Highway is in the process of being improved as part of the Midland Highway upgrade at this location. This upgrade will cater for heavy vehicle turns at the junction, a separate turn lane to be installed at the highway for right turns to Lovely Banks Road (storage length some 110 metres).

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5. Traffic Data

- **Lovely Banks Road**

A limited traffic count at the site indicates traffic use in this vicinity at up to some 20 to 30 vehicles per day with some 40% as heavy vehicles.

- **Composting Traffic Generation - Weekdays**

- Staff / Visitors, light vehicles	allow 40 two-way movements per week
- Rigid trucks	10 two-way movements per week
- Semi-trailers	20 two-way movements per week

Total 70 per week
i.e. average 14 two-way vehicle movements per day

Note, the present business plan is for the composted material to be used by the surrounding rural holding.

6. Assessment

Assessment in accord with Section E5.0 Southern Midlands Road and Railway Assets Code:

E5.5.1 P2 Lovely Banks Road is a low use rural access road with the section of road required to service the proposed composting plant, that is between the Midland Highway and the site, considered to be satisfactory for the required traffic use.

The Midland Highway junction is being upgraded to a high standard and is considered satisfactory for the proposed traffic use.

a) Increase in traffic
The proposal will add some 14 vehicles per weekday to the existing traffic on Lovely Banks Road, suggesting an increase of up to some 50% on the present use. However, the total use up to some 45 vehicles per day is well below a reasonable level of service for the present road condition of some 200 vehicles per day. Note, 200 vehicles per day is the minimum value at which some Council's seal gravel surfaces.

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b) The traffic will comprise on average some 8 two-way light vehicles with 3 loaded heavy vehicles and 3 returning empty heavy vehicles per weekday. The road standard is considered satisfactory for this use. However, it is suggested some local road and sign upgrades could be considered for the curve and one-lane bridge just east of the Midland Highway.

c) The proposal includes construction of a new access road from the existing gateway. It is suggested that this access at the gateway be upgraded to meet Fig 6.61 – Rural Property Access adjusted for two-way use with the access road tapering back to the proposed access road width over 16 metres. This upgrade should ensure a satisfactory and efficient access layout.

d) As outlined in this report, Lovely Banks Road is a low use rural access road with the present construction standard considered satisfactory to serve the proposed composting facility traffic demand.

e) The gravel road default speed limit of 80 km/h is applicable. However, this assessment suggests actual travel speed well below this value with a speed of up to 65 km/h considered realistic. As outlined in this report, the evaluated traffic use on the road is well below the capacity of the present road provisions.

f) The site is in a remote rural location with access to what could be considered a minor rural access road, no alternative access is seen as providing a more desirable alternative.

g) The proposed composting facility relies on external inputs with the use seen as providing an important element as part of a waste management strategy with the output of significant value for the upgrading of the local agricultural land.

h) This report is provided as the Traffic Impact Assessment.

i) Advancing this project will require consideration of this report by the Southern Midlands Council as the Road Authority.

E5.5.2 Not applicable

E5.6 Not applicable

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E5.6.2 The proposal is to use an existing gateway access, that is no new access will be required (refer to E5.5.1 P2 c) of this report).

E5.6.4 The available sight distance at the existing gateway is some 165 metres to the east and 224 metres to the west. These values are well in excess of the safe intersection sight distance requirement for a 65 km/h speed limit of some 130 metres.

7. Conclusion

A traffic assessment for a proposed composting facility with access to Lovely Banks Road has found compliance with the E5.0 Code in the Southern Midlands Council Interim Planning Scheme provided consideration is given to the suggested upgrades as outlined in this report.

Terry Eaton

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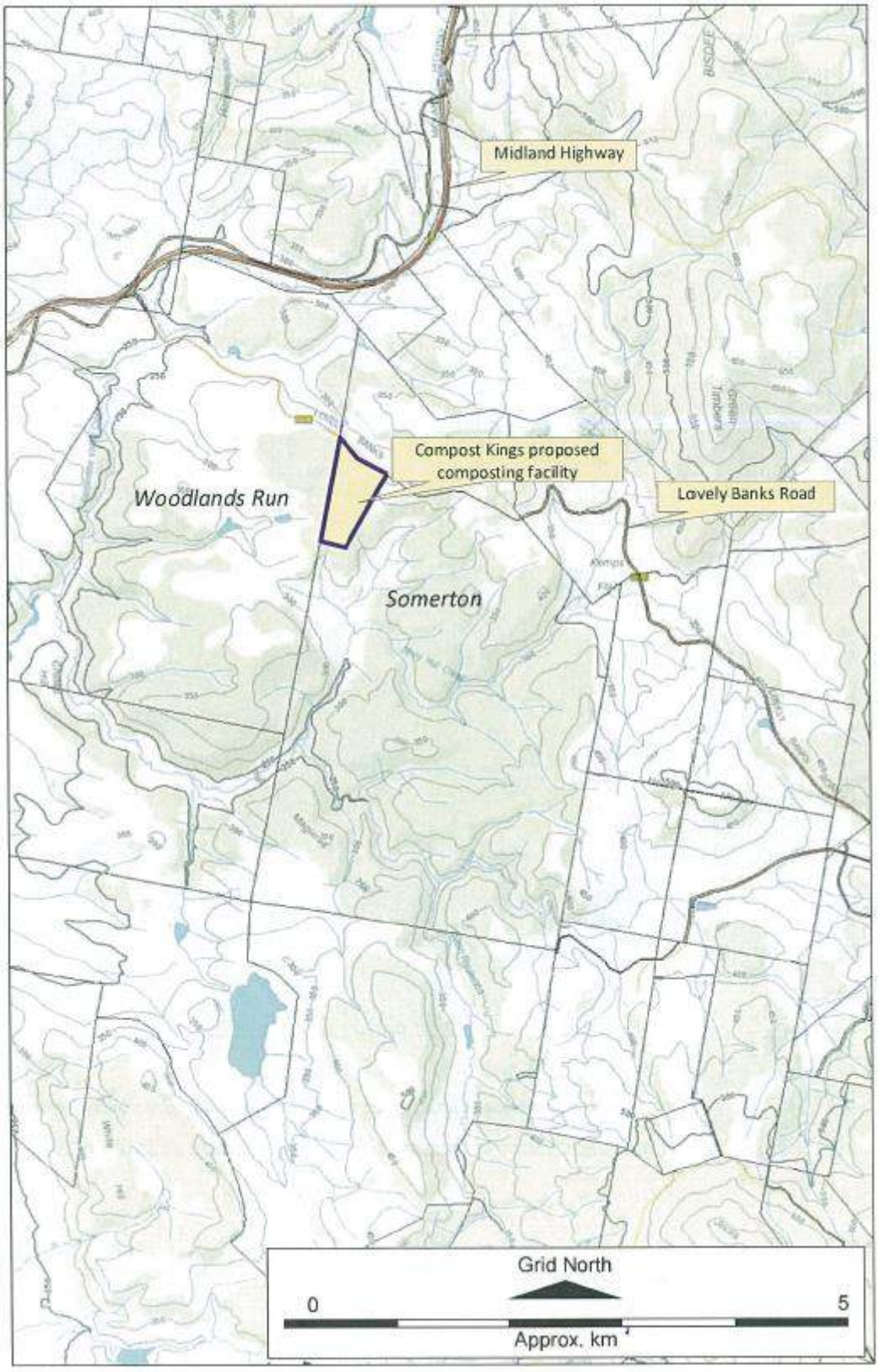
ATTACHMENTS

Location Plan



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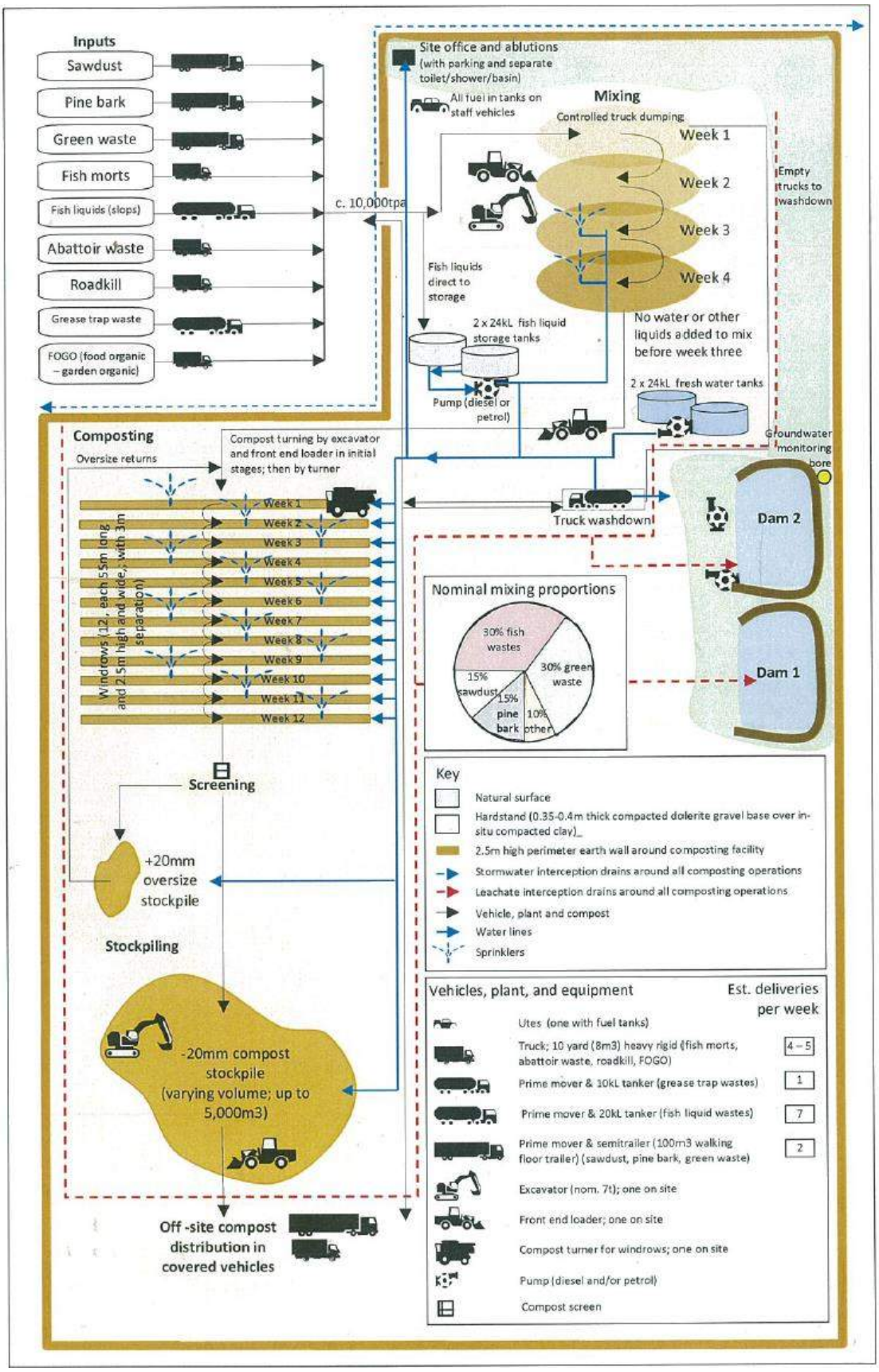
Process Chart



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Rural Property Access

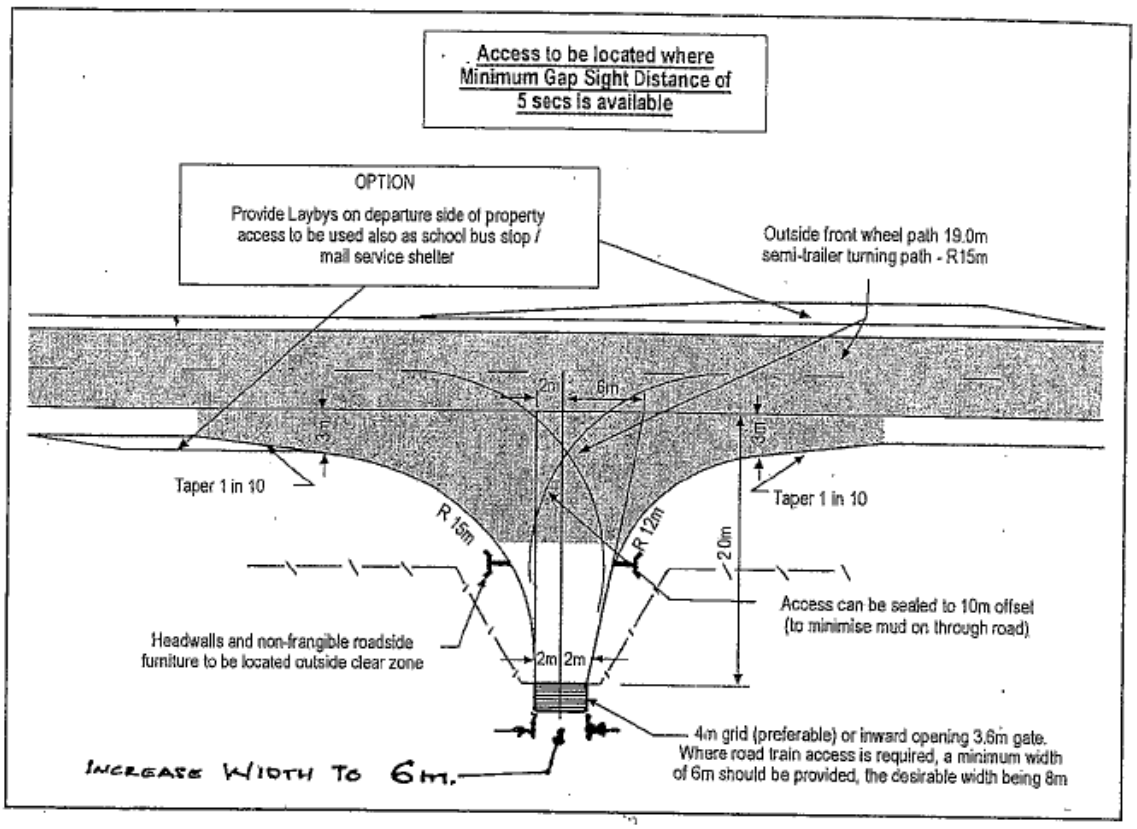

Figure 6.61 — Rural Property Access – Layout for Semi-Trailers

Note: Two-way carriageway - design AADT ≥ 2 000 OR Dual carriageway
'Left in - Left Out' access minimum requirements for semi-trailer access

ADJUST DIMENSIONS FOR 2WAY USE
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Photos

Site Access

View to West

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View to East

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William C Cromer Pty Ltd
ABN 48 009 531 613
Environmental, engineering and groundwater geologist

13 August 2021

Mr. S. Waterfield
Compost Kings Tasmania
s.waterfield1984@hotmail.com

Dear Seaton

Proposed composting facility, Lovely Banks Road, *Somerton*

COMMUNITY CONSULTATION

The following pages:

(a) record attendees (Plate 1) at the first community consultative meeting on 19 June at the proposed composting facility on *Somerton*, and include a map of their properties (Figure 1),

(b) include the letter of invitation and information brochure sent to prospective attendees before the meeting, and

(c) presents the approved summary of the meeting sent to attendees and others.

Plate 1. Attendees at Compost Kings' initial Community Consultation Meeting held at the proposed location of the composting facility on *Somerton* on 19 June 2021 were (L to R): Adam Jones (*Redside*), Sarah Copping (*Charlton Park*), Ella Minehan (Compost Kings), Danielle Gray (Convenor; Gray Planning), Jill Copping (*Charlton Park),* Justin Jones (*Somerton*), Seaton Waterfield (Compost Kings), Wayne Carnes (*Green Timbers*) and Mick Holmberg (Compost Kings). Absent: Andrew McShane (*Lovely Banks; Woodlands Run*).
Photo: Bill Cromer.

Sincerely

Bill Cromer
Principal

Hobart, Tasmania, Australia
M +61 408 122 127 E billcromer@bigpond.com W www.williamccromer.com

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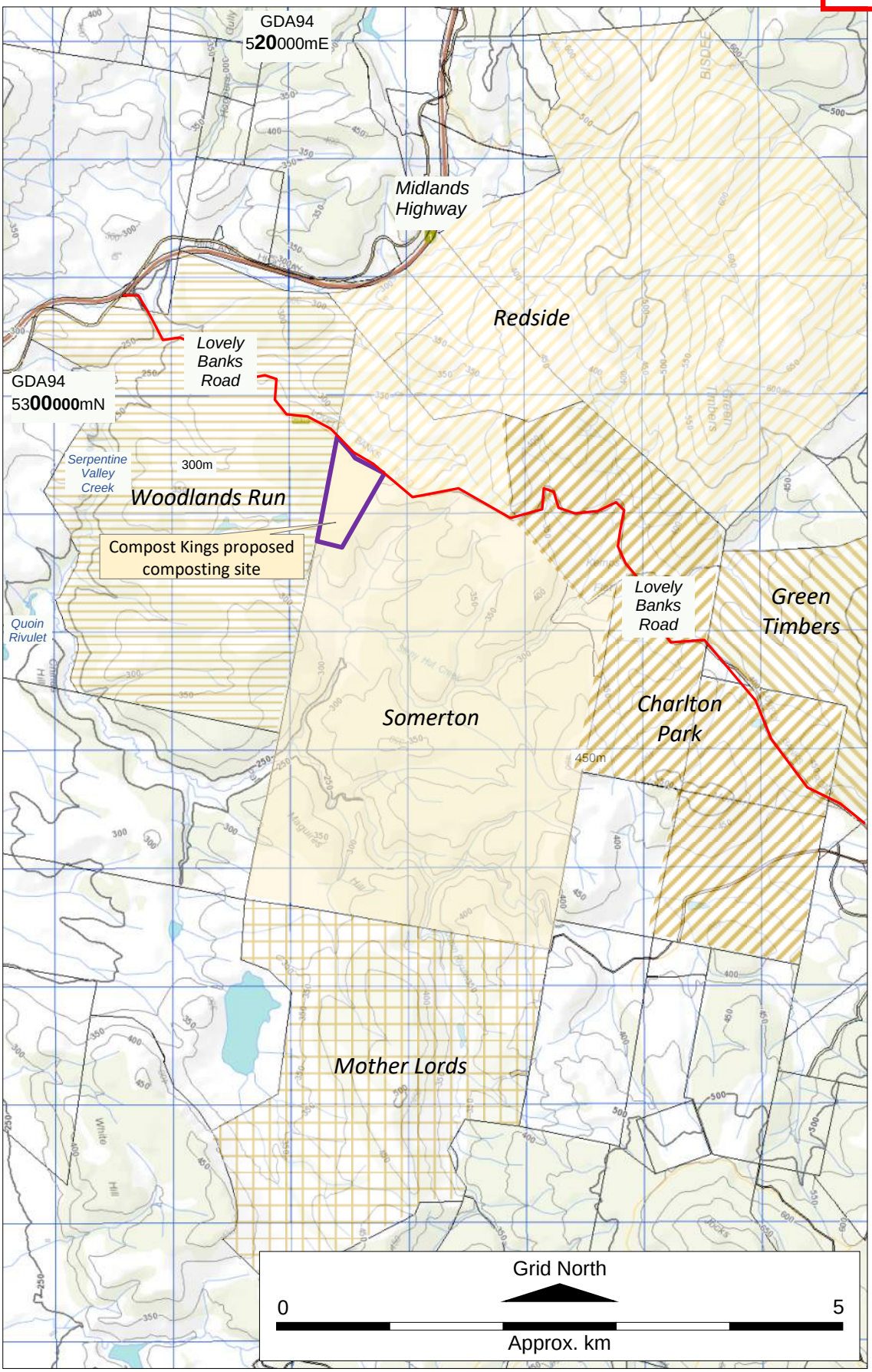

Figure 1. Properties whose owners were invited to Compost Kings' initial Community Consultation Meeting on Somerton on 19 June 2021.

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Attachment 1

(8 pages including this page)

Letter of invitation (next page) to initial Community Consultation Meeting held on 19 June 2021, and the Information Brochure (following 6 pages) which accompanied it.

The letter (in this instance addressed to Ms J. Copping at *Charlton Park*) and Information Brochure were also sent to Mr. Andrew McShane (*Lovely Banks*), Mr. Anthony Bailey (*Mother Lord*), and Mr. Wayne Carnes (*Green Timbers*).

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COMPOST KINGS
Unit 2/1a Willowbend Road
KINGSTON Tas 7050

Mobile: 0452 383 485
Email: s.waterfield1984@hotmail.com

4 June 2021

Ms. J. Copping
Charlton Park
Lovely Banks Road
MELTON MOWBRAY 7030

Dear Jill

PROPOSED COMPOSTING FACILITY TO BE LOCATED AT *SOMERTON*,
LOVELY BANKS ROAD
COMMUNITY CONSULTATION INVITATION

My name is Seaton Waterfield and I am writing to you as the owner of Compost Kings (a recently-formed Tasmanian composting firm).

I have experience in large-scale composting operations, and I am seeking your input and support for my proposal to develop a composting facility in your area. In this I am encouraged by the endorsement received from Justin Jones, who carried out a trial application of my compost on *Somerton* with very encouraging results.

Accompanying this letter is a separate document describing the proposal in more detail.

Compost Kings has applied to Southern Midlands Council (SMC) for a Planning Permit to produce up to 10,000 tonnes per year of compost on land at *Somerton*. Council referred my application to the Tasmanian Environmental Protection Authority (EPA) who assessed the proposal as a "Stage 2B" activity.

This requires me to produce and submit an Environmental Impact Statement (EIS) to the EPA. The EIS will describe the proposed operations in detail, identify any potential environmental issues, and where necessary, set out procedures to manage them. Subject to EPA approval, the EIS would form the basis of a Planning Permit of Approval issued by SMC.

I have asked Bill Cromer, an experienced engineering, groundwater, and environmental geologist, to prepare the EIS for me. I have also engaged other experts to report on various aspects of the proposal, as required by the Planning Scheme and EPA.

An important part of the EIS is consulting with members of the local community who might be directly or indirectly affected by the proposed composting operations, or who might have an interest in, the project. Accordingly, this letter is an invitation to you to participate in the consultation process and provide feedback so that any concerns can be managed and addressed. The invitation has also been sent to others in the district.

As part of the consultation, we plan to have a community consultation meeting on Saturday 19 June 2021, at 10am, at the proposed site of the composting facility on *Somerton* (Lovely Banks Road).

At the meeting we would aim to clearly describe the proposal, what we see as the main environmental issues, and how we think they might best be addressed. We would encourage your views and comments as part of your attendance at this meeting, should you be interested in attending. Also, your support would assist considerably in the assessment process with Council and EPA authorities. Accordingly, at the meeting, we will be asking attendees whether they would be prepared to sign a letter of endorsement of the proposal.

If you are interested in attending on 19 June please reply to me by phone or email (contact details above) no later than 14 June.

In the meantime, if you have any questions about the proposal, the process, or the compost product, I would be happy to talk to you and answer any questions you may have. My contact details have been provided at the top of this letter to you.

I look forward to meeting you and also working through any issues or questions you may have.

Kind regards

(signature)

Seaton Waterfield

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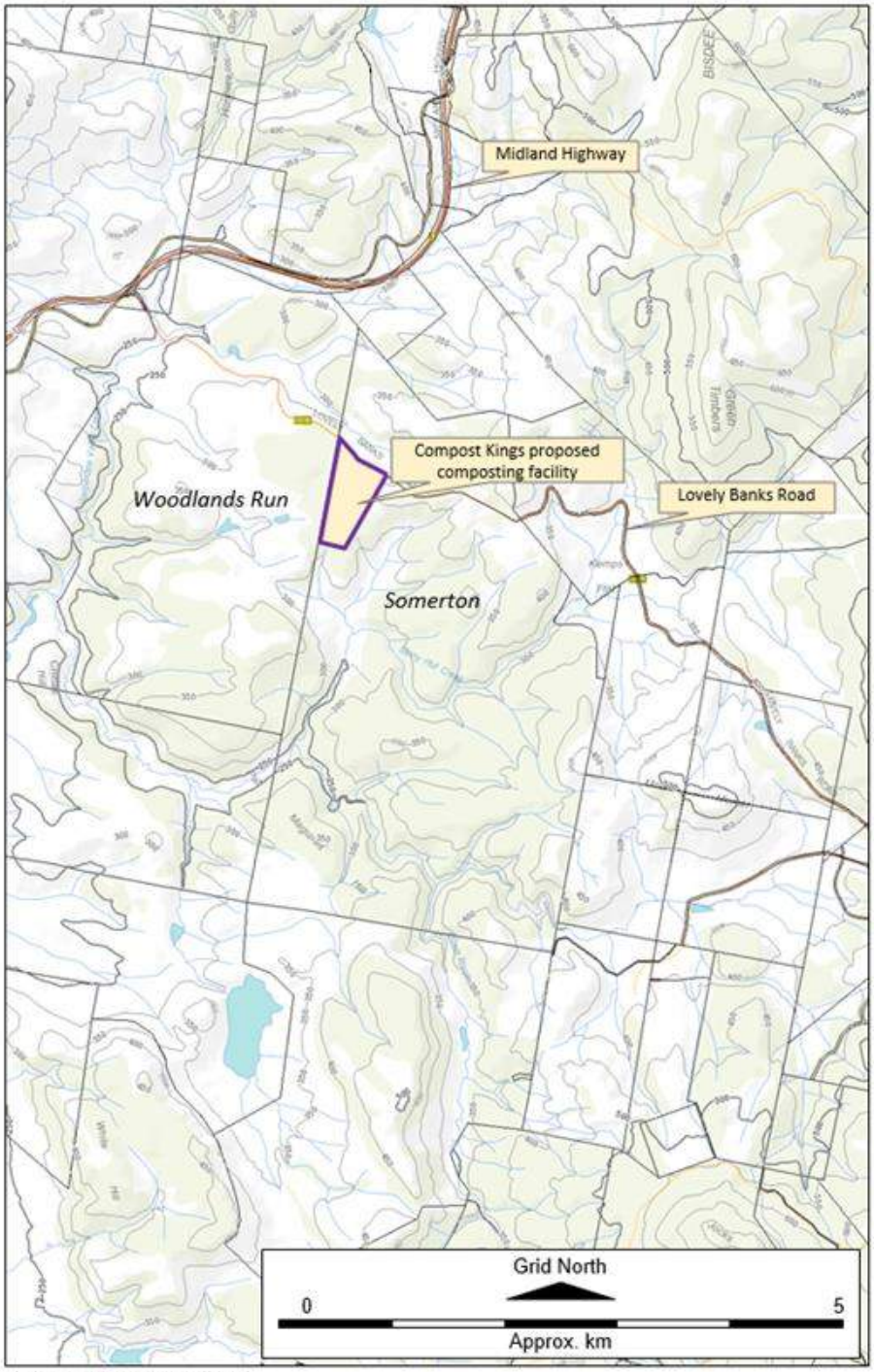
June 2021

COMPOST KINGS
Proposed composting facility on *Somerton*

Information brochure

The composting facility would cover about 2.5ha of land on *Somerton*, at a site about 500m south of Lovely Banks Road, and next to the *Somerton – Woodlands Run* property boundary.



Proposed site location

Hobart, Tasmania, Australia
M +61 408 122 127 E billcromer@bigpond.com W www.williamccromer.com

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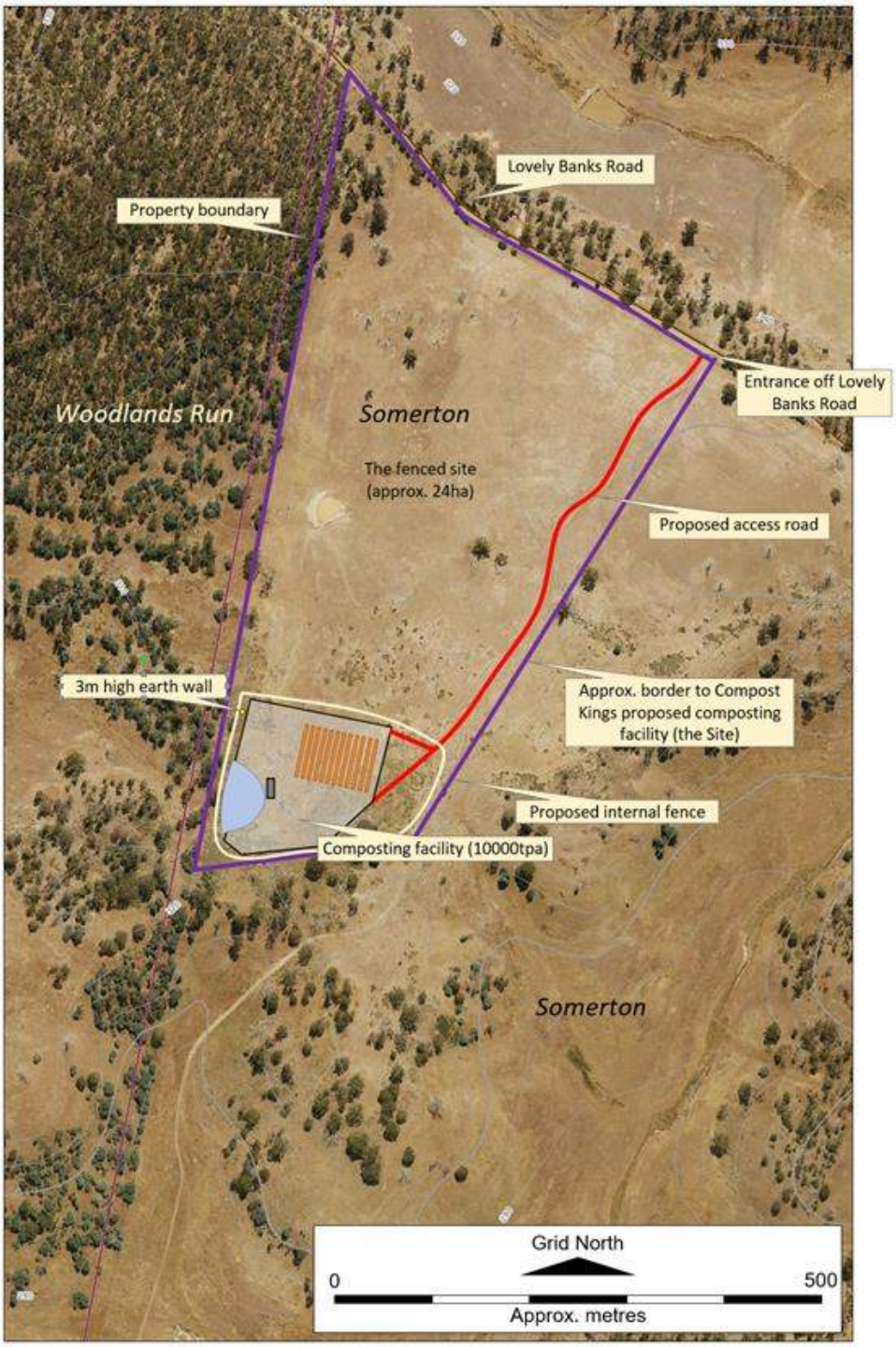
The facility would be surrounded by a 3m high earth wall, and about 24ha of surrounding land (including an internal gravel access road) would be fenced off.



Proposed site layout (preliminary)

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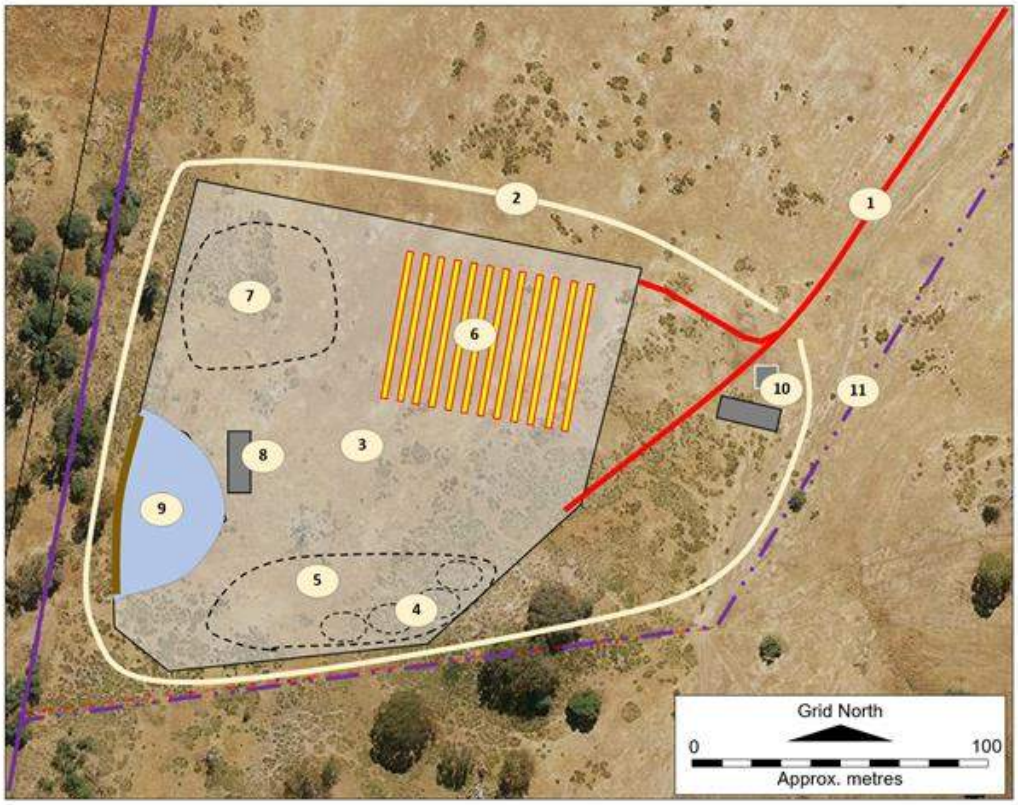

1. Access road; gravel; 4m wide
2. Perimeter earth wall: nominally 3m high x 5m wide at base; 10m gap between windrows for truck, turner access.
3. Gravelled hardstand (approx. 2ha)
4. Delivered raw materials (fish morts, sawdust, green waste, pine bark; liquid fish wastes (in tanks))
5. Mixing area
6. Windrows: 12, each 55m long x 2.5m high and wide; 3m apart: area = nom. 63m x 55m. No cover or fans.
7. Stockpiled compost area (could hold up to 5,000m3 or so at times)
8. Truck washdown area
9. Leachate and stormwater dam
10. Site office and toilet (*Portaloo*)
11. Internal fence
12. Property boundary

Detail of proposed facility layout (preliminary)

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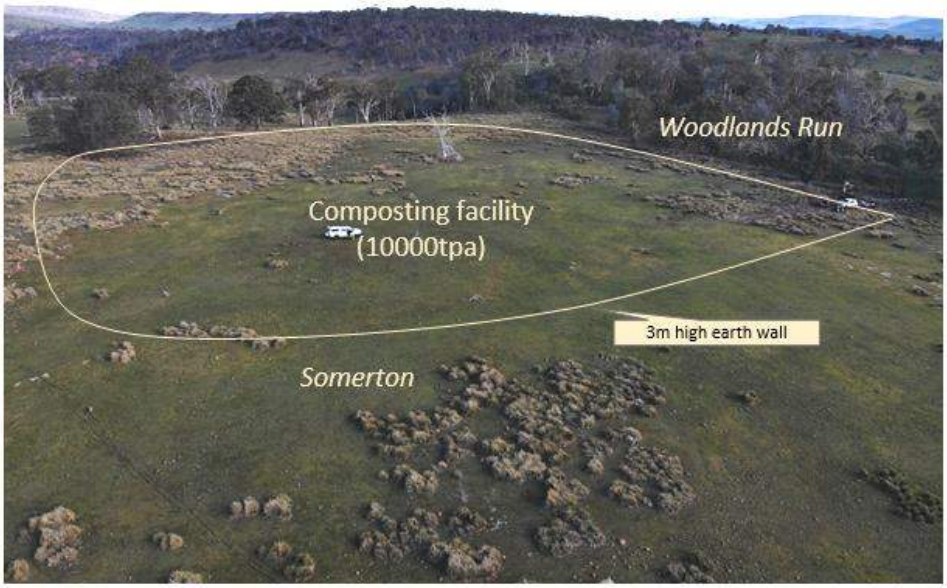

Aerial view looking southwest over the proposed location of the composting facility (approx.)

The bulk of the raw materials for composting would include sawdust, green waste, fish wastes (solid and liquid), and pine bark. Other waste products will also probably be accepted.

The raw material would be sourced mostly from southern Tasmania.

To produce up to 10,000 tonnes of compost a year (equal to about 17,000 cubic metres), requires a similar amount of raw materials.

The raw materials would be delivered to the site by trucks of various sizes, including semitrailers, and the compost would leave the site the same way.

The facility would be operated by two – three people. It would not be open to the public. It would operate from 8am – 4pm five days a week, but not on weekends and public holidays.

Raw materials arriving at the site would be blended in appropriate proportions before being composted in windrows for up to about 12 weeks, and then stockpiled for later transport off-site.

Proposed activities at the site are shown schematically on the accompanying process flow chart.

Benefits of the proposal

The over-riding benefit is that wastes which would otherwise go to landfill will be converted to a value-added product to improve farm productivity in Tasmania.

It is expected that much of the final compost would be applied to neighbouring farmland.

In addition to employing several people on site, extra employment would be created for truck drivers, and possibly farm hands.

The facility could be used for educational and training purposes.

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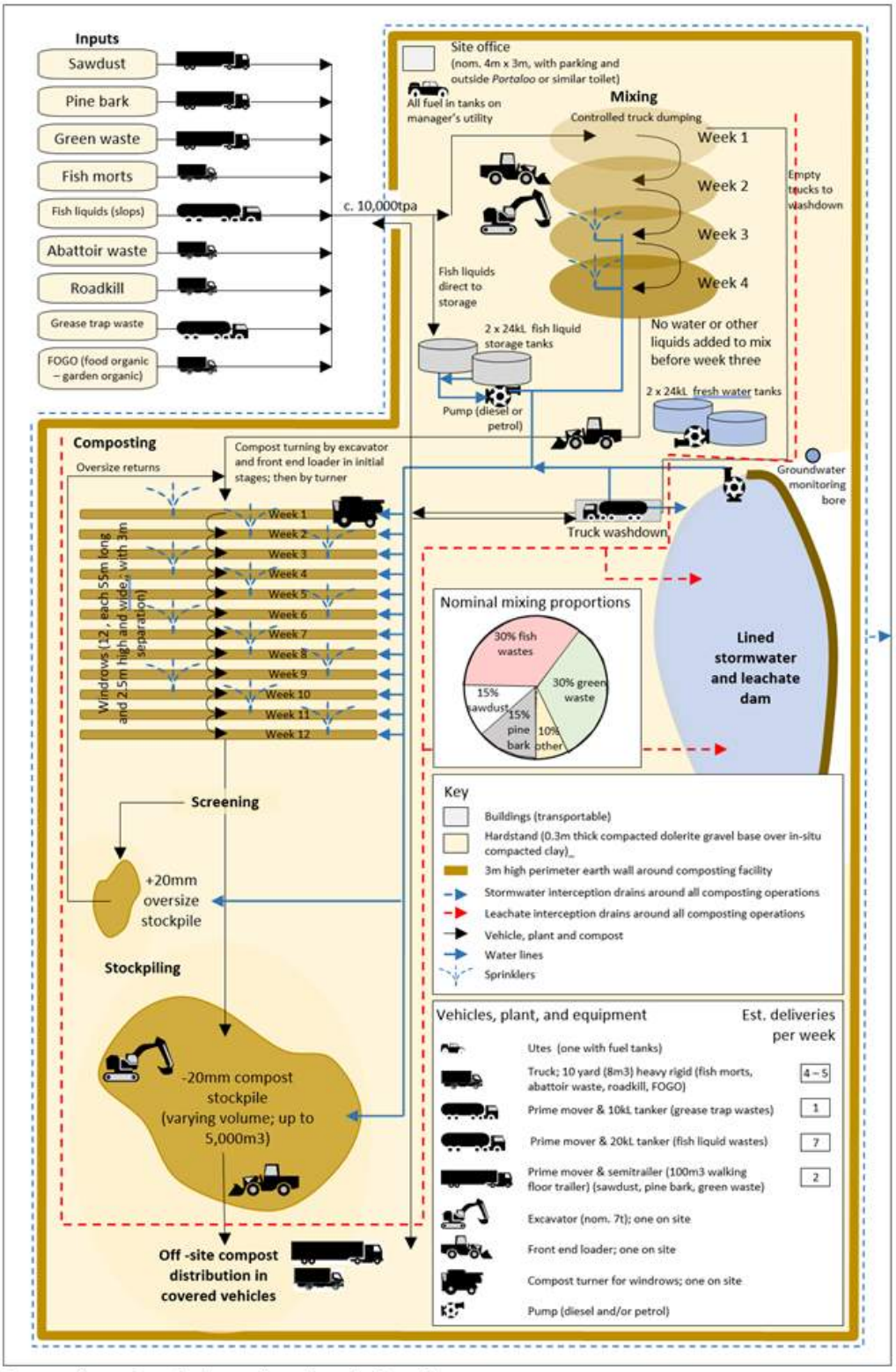

Process flow chart (schematic and preliminary)

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Some environmental issues

Some of the environmental issues we and the Tasmanian Environmental Protection Authority (EPA) have identified are:

- odour from raw materials – particularly from fish wastes – as they are composted (the final product has little or no odour)
- leachate produced during composting, and its potential effect on groundwater and surface water
- increased traffic (trucks on gravelled and narrow Lovely Banks Road, mostly travelling to and from the site to the Midland Highway)
- dust from stockpiles etc
- noise from operations (eg trucks, front end loader, excavator, compost turner, pumps)
- native animals (including birds) and vermin attracted by odour

The environmental team

Compost Kings has engaged the services of experts to advise on environmental matters.

Planning
Through its Planning Scheme, Southern Midlands Council will require a range of issues to be addressed. Danielle Gray of *Gray Planning* is an experienced planner who will essentially audit the composting proposal against development standards, zones, and codes.

Odour assessment
Assured Environmental based in Brisbane are experienced consultants in air emission and odour assessments throughout Australia, including Tasmania. Senior Consultant Michelle Clifton has visited the Lovely Banks site, and prepared an odour assessment report. Michelle's report demonstrates that odour from the facility will be at acceptable levels at the nearest houses more than 2km away.

Groundwater assessment
Experienced groundwater geologist Bill Cromer has been engaged to assess whether leachate generated at the composting facility will affect groundwater. There is no chance of this happening at the nearest known water bore, about 2km away to the west. At the proposed composting site, a recently drilled exploratory bore encountered small amounts of poor-quality groundwater at depths below about 12m. This bore will be used to monitor any effects from the composting process.

Biodiversity and natural values assessment
Andrew North of highly-respected Hobart-based consultants *North Barker* has long experience in assessing ecological and natural values throughout Tasmania. He has been engaged to review these aspects in relation to the composting site and proposed activities.

Traffic assessment
Perhaps 20 – 30 vehicles currently use Lovely Banks Road each day. Almost half are heavy vehicles. The proposed composting facility is estimated to add another 14 or so vehicle movements daily. About half will be heavy vehicles.

Experienced traffic engineer Terry Eaton has reported that the facility will comply with the Road and Railway Assets Code in the Southern Midlands Council planning scheme.

Seaton Waterfield
Mobile: 0452 383 485
s.waterfield1984@hotmail.com

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Attachment 2
(8 pages including this page)
Summary of first Community Consultative Meeting of 19 June 2021

The following pages were sent to attendees of the meeting on 29 June 2021 in draft form, requesting comments and amendments. There were none. They were resent unamended as Final on 1 August 2021.

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COMPOST KINGS

Unit 2/1a Willowbend Road
KINGSTON Tas 7050

Mobile: 0452 383 485
Email: s.waterfield1984@hotmail.com

29 June 2021 (as Draft)
(Reissued unamended as Final, 1 August 2021)

PROPOSED COMPOSTING FACILITY AT *SOMERTON*
SUMMARY OF FIRST COMMUNITY CONSULTATION MEETING

Date and time
The meeting was held on *Somerton* at the location proposed for the composting facility, between about 10am and noon on Saturday 19 June 2021.

Invitees
Seaton Waterfield (proponent) either contacted each of the following landowners, or hand-delivered an invitation letter and information brochure to them individually.

Name	Property	Contact mobile #	Email
Justin Jones	*Somerton*	0429 951 430	redside4208@bigpond.com
Andrew McShane	*Woodlands Run*		
Anthony Bailey	*Mother Lords*		
Jill Copping	*Charlton Park*	0427 660 091	jilly@skymesh.com.au
Wayne Carnes	*Green Timbers*	0407 872 198	tassieconcretetanks@outlook.com
Rodney Jones	*Redside*		

Attendees
The following attended

Name	Property	Contact mobile #	Email
Justin Jones	*Somerton*	0429 951 430	redside4208@bigpond.com
Jill Copping	*Charlton Park*	0427 660 091	jilly@skymesh.com.au
Sarah Copping	*Charlton Park*	0429 373 474	sarah.copping23@gmail.com
Wayne Carnes	*Green Timbers*	0407 872 198	tassieconcretetanks@outlook.com
Adam Jones		0427 591 125	redsidemerino@bigpond.com
Mick Holmberg (Compost Kings)		0419 149 996	mick.holmberg@outlook.com
Ella Minehan (Compost Kings)		0452 559 485	ella.minehan95@hotmail.com
Seaton Waterfield (proponent)		0452 383 485	s.waterfield1984@hotmail.com
Danielle Gray (Gray Planning)		0439 342 696	danielle@grayplanning.com.au
Bill Cromer (William Cromer Pty Ltd)		0408 122 127	billcromer@bigpond.com

Meeting
The meeting was held in the open. It was informal. Attendees asked questions and raised issues throughout.

Bill first thanked all for attending.

He said that his professional association with Seaton was about 10 years old, and that Seaton had asked him to assist in doing the paperwork for the composting proposal.

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Bill then went through the steps that had been taken to get the proposal to the current stage (the following were not discussed in detail at the meeting, but the list is provided here as background information for attendees)

2020 June

- Seaton's initial Development Application (DA) to Southern Midlands Council (SMC) for a planning permit to operate the facility

2020 August

- Bill completed geotechnical site investigations

2020 October

- A final DA was prepared by Compost Kings

2020 November

- SMC forwarded the DA to the Tasmanian Environmental Protection Authority (EPA) for comment (would EPA need to get involved?)
- Site meeting with EPA and SMC
- EPA advised that the scale and nature of the DA amounted to a "Stage 2b" activity, which would require the preparation of an Environmental Impact Statement (EIS).

2020 December

- SMC provided a list of planning issues which would need to be addressed
- EPA prepared a site-specific set of EIS guidelines for Compost Kings. EPA considered the most important issues to address were odour and the potential for groundwater contamination from leachate from the composting process.
- A groundwater monitoring bore was drilled

2021 January

- Groundwater from the bore, and surface water from two dams, was sampled and laboratory tested
- Field soil permeability testing was done

2021 February

- Laboratory soil permeability testing was done

2021 March

- A traffic report was prepared by traffic engineer Terry Eaton.
- Michelle Clifton from *Assured Environmental* (AE) based in Brisbane visited the site and other composting facilities with Bill, and both met with EPA

2021 April

- The AE air quality report was prepared

2021 May

- EIS preparation by Bill, including preparation of a draft hydrogeological report and water balance for the facility
- Danielle Gray of Gray Planning prepared a preliminary town planning review to outline the requirements to address the Planning Scheme
- Meeting held with Seaton, Bill Cromer and Danielle Gray with Southern Midlands Planning department staff Louisa Brown and David Cundall to advise of proposed community consultation and give an update on progress and studies undertaken

2021 June

- A natural values summary report was completed by consultants *North Barker*
- A second groundwater and surface water sampling event was done

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Seaton then addressed the meeting, explaining his experience with composting (for example, at Interlaken), and his intention to provide high quality compost intended to enhance agricultural productivity on land in the district. He was critical of processes at other composting facilities. He said a major problem at these sites was the delivery (and necessary acceptance) of sometimes large amounts of raw materials (including fish wastes) which exceeded the capacities of the facilities to properly treat the material. He said that his operation would avoid this issue by not having formal contracts with suppliers. He would then not be obliged to accept wastes if the facility could not cope at the time.

Seaton emphasised his intention to work closely and sympathetically with neighbouring property owners during operations.

Danielle then went through the SMC planning process, and the Zones and Codes in the interim planning scheme. She explained the implications of the Attenuation Code, noting that the facility would have a 1,000m attenuation distance around it, and that any DA for a sensitive use within the attenuation area would need to show that it would not be adversely affected by the facility. Bill handed out a map showing the attenuation area (attached to this summary)

General discussion followed, and towards the end of the meeting, attendees were generally talking to each other, and to Bill, Seaton and Danielle, in small groups or one-on-one.

The main issues

Traffic

Wayne asked whether trucks would travel mostly east from the Midlands Highway, or west to the facility along Lovely Banks Road from Mud Walls Road. He said that the road was narrow, and heavy traffic should be discouraged. In the following discussion, ways to minimise truck movements were canvassed: from informal direction from Compost Kings, to formal instructions to truck operators, to possible permit conditions. Seaton said Compost Kings was in full agreement with the concerns, and would address them.

Odour

Jill commented that she had had experience on the mainland where at times she could detect odour from an industrial facility 100km upwind.

Seaton explained that solid fish wastes (a major source of odour) would be covered immediately on arrival with sawdust, etc to minimise odour. Liquid fish wastes would be immediately stored in covered tanks.

Some attendees had interpreted the phrase “sensitive receivers” to mean Compost Kings would install odour detectors at attendees’ houses if required. Bill said he wasn’t sure whether such devices existed (they do[1]). Seaton said if they were at a reasonable cost Compost Kings would consider installing the detectors.

Support requested for Compost Kings proposal

Bill explained that it would be a major step forward in the regulatory process for Compost Kings to receive written endorsement of its proposal from neighbouring landowners. A draft Letter of Endorsement was handed out to all attendees for their consideration, feedback and (if acceptable) signatures.

[1]See https://www.researchgate.net/publication/7205794_Continuous_monitoring_of_odors_from_a_composting_plant_using_electronic_noses The Abstract says in part: “The odour impact of a composting plant situated in an urbanized area was evaluated by continuously monitoring the ambient air close to the plant during a period of about 4 days using two electronic noses. One electronic nose was installed in a nearby house, and the other one inside the perimeter of the composting plant in order to compare the response of both instruments…… The results of the study show the possibility of using an electronic nose for environmental odours monitoring, which enables the classification of the quality of the air and to quantify the olfactory nuisance from an industrial source in terms of duration and odour concentration.”
See also: http://www.odotech.com/en/landingpage/how-does-electronic-nose-work/

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Towards the end of the meeting, the contact details of all attendees were collected. It was agreed that Bill would provide a summary of the meeting to all (this document) and that Compost Kings would continue to liaise via emails/meetings to keep everyone informed of progress.

Attachments to this summary

Attenuation area map (1 page)
Extracts from AE Odour Assessment Report (2 pages)

Bill Cromer for :
Seaton Waterfield
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COMPOST KINGS
Proposed composting facility on *Somerton*

ATTENUATION AREA

The E9.0 *Attenuation Code* in the Southern Midlands Council Interim Planning Scheme 2015 indicates that an attenuation separation distance of 1000m would apply from all boundaries of the composting site, creating an Attenuation Area. See the map below. Within the Attenuation Area, an application for a sensitive use by a neighbour may need to demonstrate that the proposed sensitive use would not be adversely affected by the composting facility.

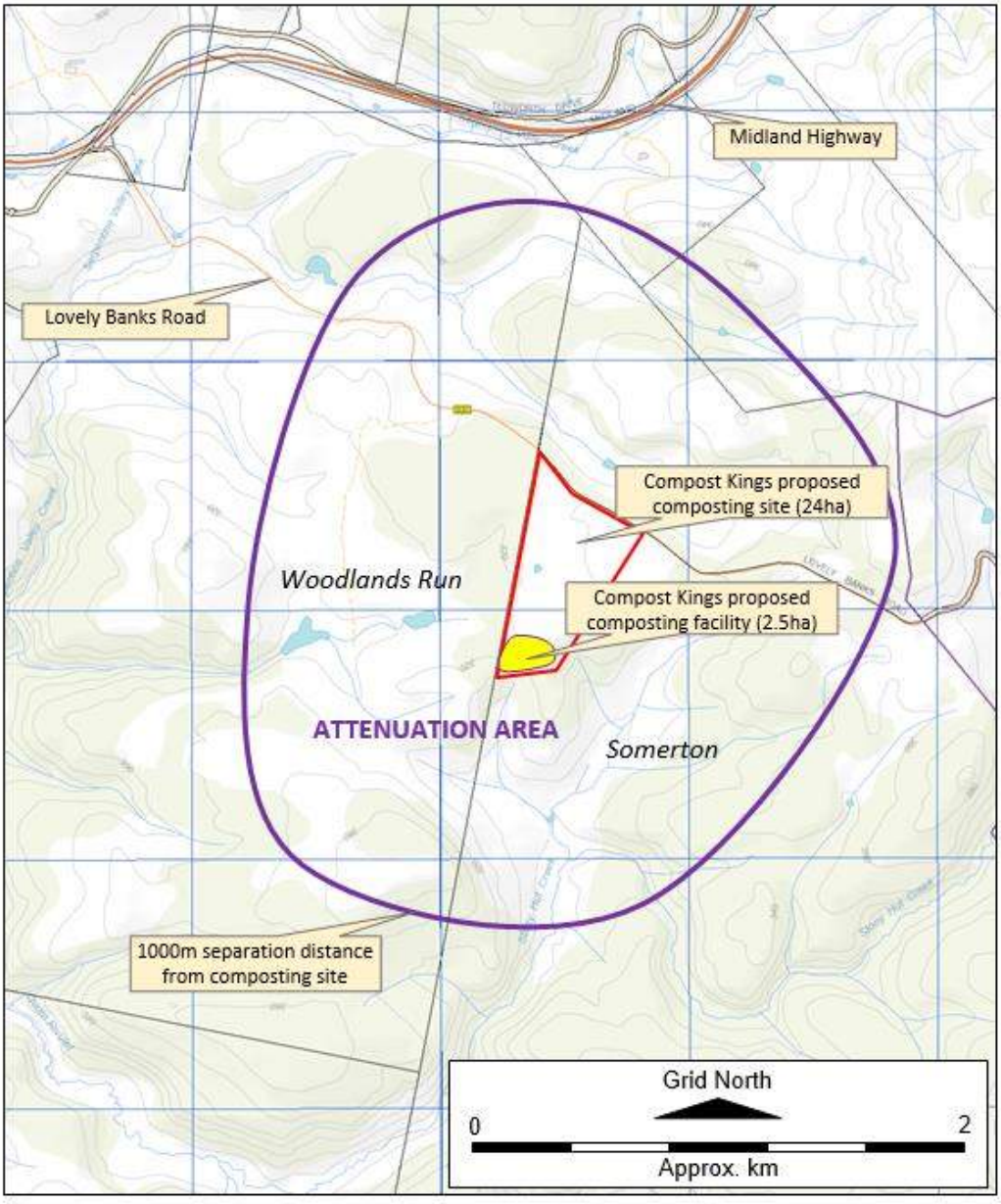

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Table 3 of the AE Odour Assessment Report dated 1 April 2021

Table 3: Receptors

ID	Location (UTM Zone 55) X	Location (UTM Zone 55) Y	Elevation (m)	Land Use	Address
R1	520823	5300822	304	Dwelling	4208 Midland Highway
R2	518753	5301263	283	Dwelling	1231 Lovely Banks Rd
R3	518660	5300800	258	Dwelling	1231 Lovely Banks Rd
R4	520823	5300822	304	Dwelling	539 Lovely Banks Rd
R5	522875	5294967	384	Dwelling	221 Beards Rd
R6	516954	5294317	244	Dwelling	3012 Midland Highway
R7	516903	5297314	202	Dwelling	3454 Midland Highway

All the receptors identified are residential dwellings. There are no health care facilities, educational facilities, or other sensitive receptors identified nearby.

Figure 3 of the AE Odour Assessment Report dated 1 April 2021, showing the locations of the closest sensitive receptors (R1 to R7) in relation to distances from the proposed composting site

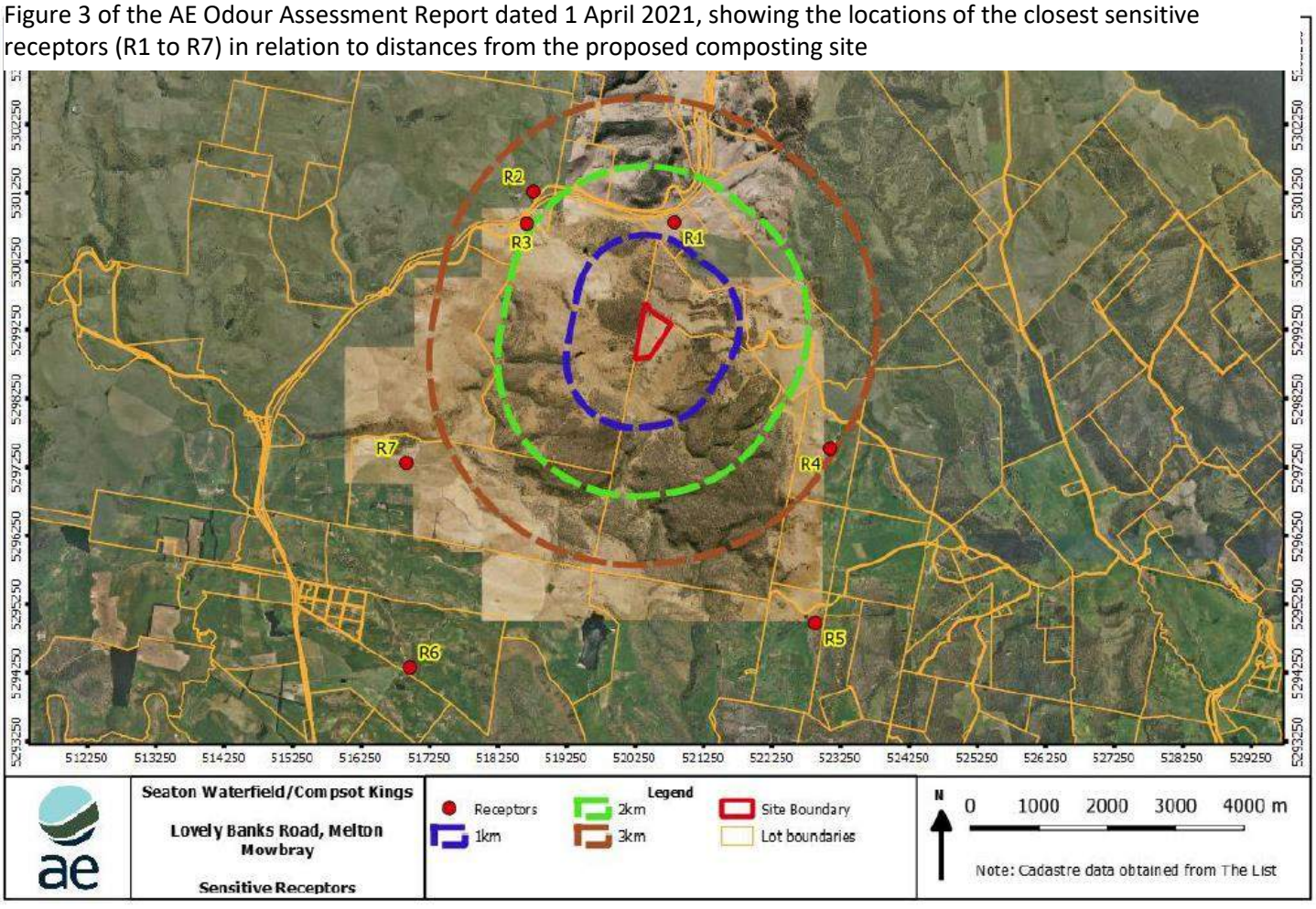

Figure 3: Sensitive Receptors and Attenuation Distances

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The map below is part of Figure 10 of the AE Odour Assessment Report dated 1 April 2021 showing worst-cast odour contours. The white numbers are Odour Units (OUs). The cut-off for acceptability at sensitive sites (eg houses(is 2 OU.

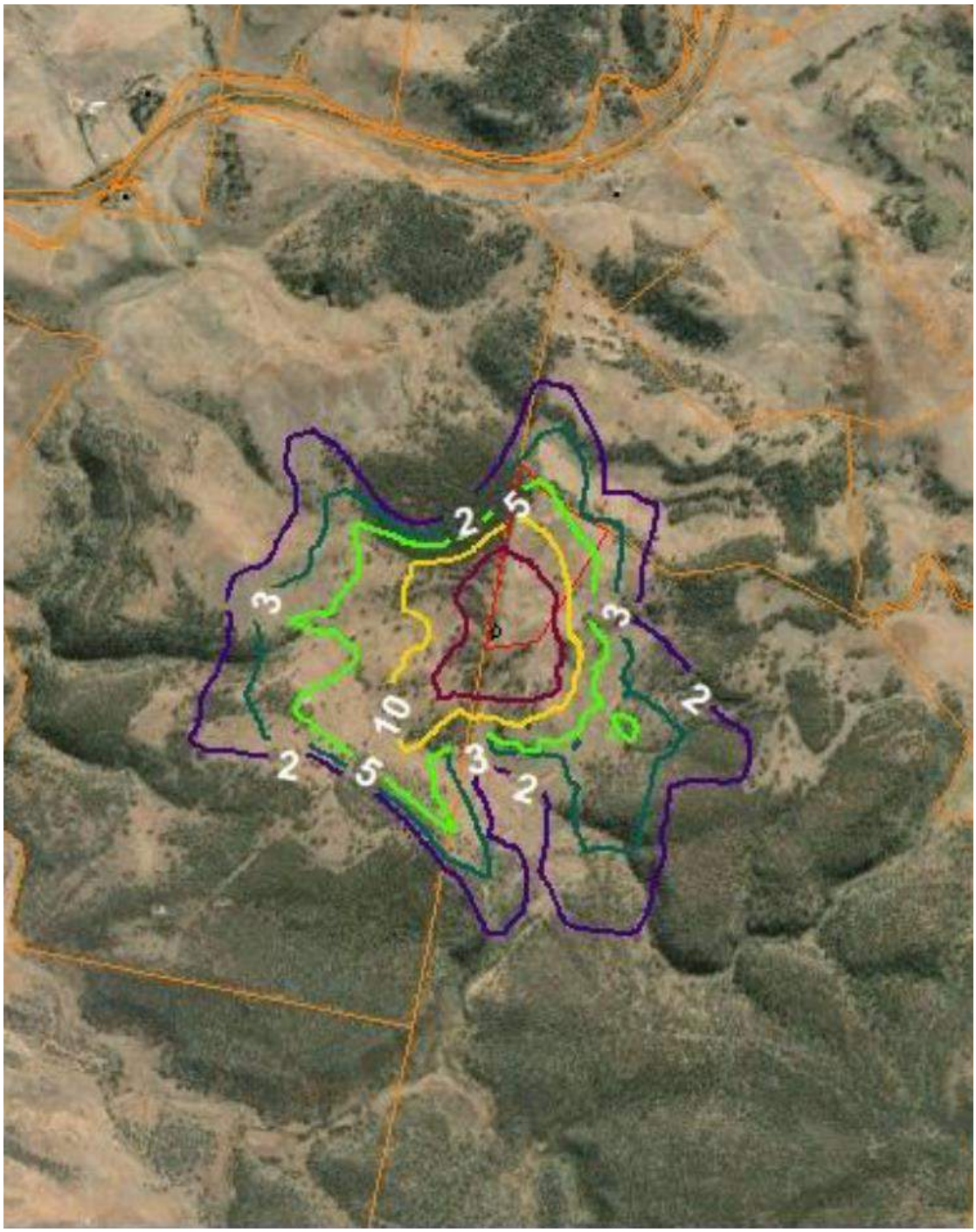

Figure 10: Predicted 1-hour 99.5th percentile odour ground level contours from cumulative activities

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northbarker
ECOSYSTEM SERVICES

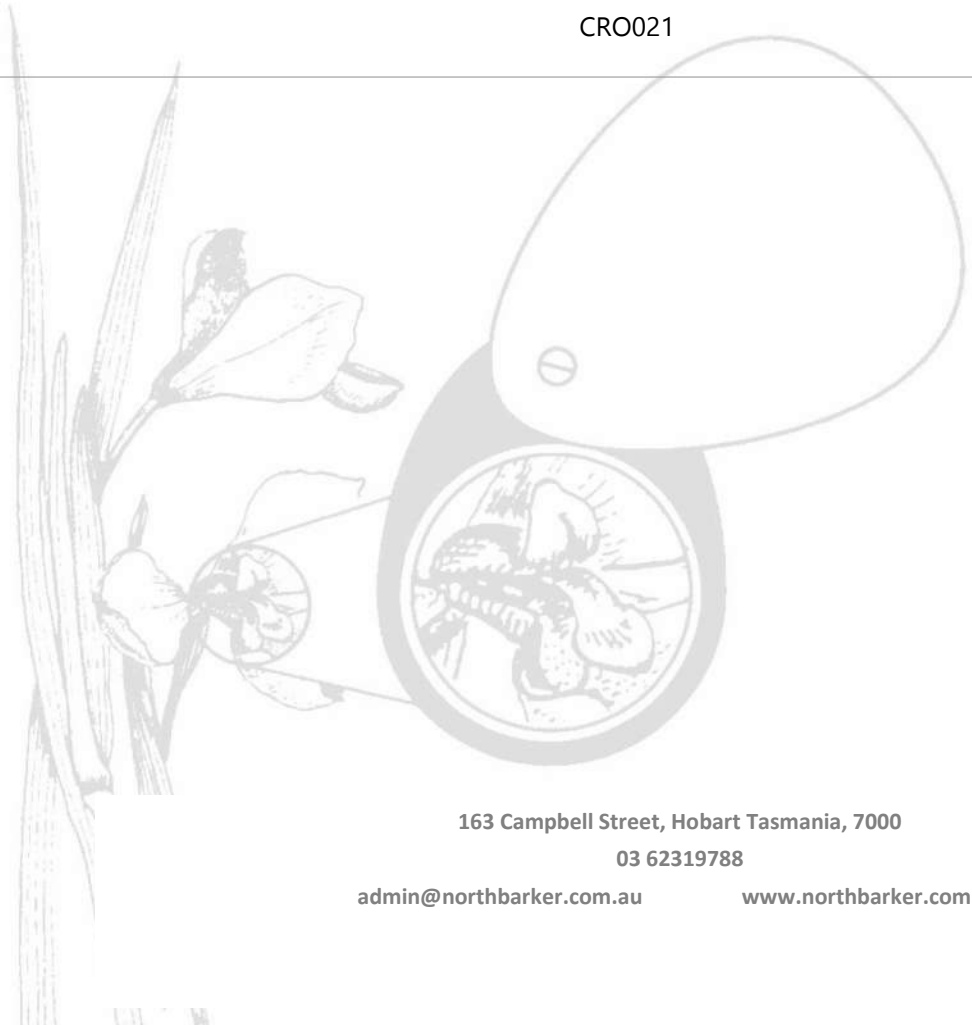
Seaton Waterfield/Compost Kings Composting facility
Lovely Banks Road, Melton Mowbray

Natural Values Assessment

04/08/2022

For Bill Cromer OBO Seaton Waterfield

CRO021



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Contributors

Project	Compost facility
Location	Lovely Banks Road, Melton Mowbray, southern Tasmania
Proponent	Seaton Waterfield/Compost Kings
NBES job code	CRO021
NBES project manager	Richard White, rwhite@northbarker.com.au
Field surveys	Richard White, Cameron Geeves and Fiona Walsh
Survey Dates	16th June and 4th November 2021
Reporting	Richard White
Mapping	Richard White

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Summary and recommendations

A composting facility (approximately 6.70 ha including the access road) is proposed for development at Lovely Banks Road in Tasmania's Southern Midlands council. The area is comprised primarily of degraded grassland with a notable native component, including two threatened plant species. The main findings of two natural values surveys (winter and spring), and the impacts of the development on those values, with recommendations, are as follows:

Vegetation

Three native TASVEG units were recorded at the 22.66 ha site:

- DAS - *Eucalyptus amygdalina* forest and woodland on sandstone (1.29 ha)
- GCL - Lowland grassland complex (19.28 ha)
- GSL - Lowland grassy sedgeland (1.87 ha)

Broadly, the grassland communities are degraded, anthropogenically derived communities with a notable component of introduced species. The project will impact **5.53 ha** of GCL and **1.04 ha** of GSL. Neither of these communities are threatened, and this impact is not considered significant.

RECOMMENDATION

- The works area should be marked in construction plans and on the ground, and all works, vehicles and materials should be confined to the works area.

Threatened flora

Two threatened flora species were recorded during the initial survey and subsequent extension survey:

- ***Leucopogon virgatus* var. *brevifolius*** (TSPA rare): Two plants of the 317 recorded occur in the facility area but additional plants occur just outside the facility area.
- ***Scleranthus fasciculatus*** (TSPA vulnerable): Four of 78 plants recorded occur in the facility area but additional plants occur just outside the facility area.

Although these impacts are not significant, the occurrence of the *L. virgatus var. brevifolius* is important given the paucity of records in the area. Recommendations to reduce impact to threatened flora given their proximity to the facility area are as follows:

RECOMMENDATIONS

- Eight *Leucopogon virgatus var. brevifolius* and four *Scleranthus fasciculatus* at the site occur under two trees near and just outside the southern boundary of the proposed facility (see figure 3 below). Ensure there is no disturbance or development, including subsurface digging, within 15 m of the two trees. This 15 m zone should be delineated as an exclusion zone on plans and on the ground to ensure no inadvertent impact to these trees. This will protect both threatened plant species in this area.
- Fourteen *Scleranthus fasciculatus* are near the western boundary of the proposed facility. There should be no disturbance or development within 5 m of these plants and this area should be demarked as an exclusion zone on plans and on the ground to ensure no inadvertent impact to these plants.
- The design of the earthen bank around the facility should include a measure to manage drainage given the proximity of threatened flora to the bank. There should be no run-off from this bank to the surrounding areas such that the occurrences of threatened flora beyond the project footprint will be negatively impacted.

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Threatened fauna and threatened fauna habitat

The proposed facility contains foraging habitat for Tasmanian devil, eastern quoll, Tasmanian masked owl and Tasmanian wedge-tailed eagle. This habitat occurs widely in the broader area. The loss of this 6.70 ha of degraded grassland is not expected to have a significant impact on any species of threatened fauna. A single tree that may support hollows suitable for masked owl occurs very near the north western edge of the facility area. The facility is also likely to increase scavenging by native fauna at the facility. The following are recommended to manage impact associated with these risks:

RECOMMENDATIONS

- To ensure no impact to masked owl, avoid any impact within 15 m of the potential hollow-bearing tree to the north-west of the facility boundary. Before construction or if impact within 15 m is unavoidable, this tree should be inspected by a suitably qualified arborist to ensure it is not in use by a masked owl. If the tree is found to be in use, further measures that restrict development may be required to avoid impact to this species.
- Animals may cross Lovely Banks Road, especially at night, to access the facility. Traffic calming signage should be implemented on the road on the western and eastern extents of the site that aim to 1) reduce speed of drivers in the area and 2) raise awareness of potential native fauna on the road.
- Coverage of organic waste can reduce fly propagation and pest animal issues. If possible, organic waste that is likely to attract scavengers (especially food waste) should be covered to the extent practicable as soon as practicable.

Weeds

Without mitigation, the proposal runs the risk and spreading and/or worsening the spread of weeds on site.

RECOMMENDATIONS

- Best practice construction hygiene should be applied to prevent the spread of weed propagules in contaminated soil. This should involve cleaning all machinery before leaving the works area, as well as not bringing dirty machinery into the site. To this end, a register of washdowns should be kept and there should be regular inspections to ensure compliance.
- It should also be ensured that all spoil/soil brought onto site is free of weeds and weed propagules. Accordingly, all spoil/soil should be guaranteed by the supplier to be non-contaminated in this regard. This should be written into contracts.

Legislation

Environment Protection and Biodiversity Conservation Act 1999: By following the recommendations it is not likely that any species or natural value protected under this act that has the potential to occur on this site will be significantly impacted.

Threatened Species Protection Act 1995: A permit to take will required for impact to the threatened flora species *Leucopogon virgatus* var. *brevifolius (*rare) and *Scleranthus fasciculatus* (vulnerable).

Tasmanian Planning Scheme – Southern Midlands: In terms of natural values, there are no apparent planning impediments.

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1 Introduction

1.1 Background

A compost facility is proposed at Lovely Banks Road in southern Tasmania (Figure 1). In the Project Specific Guidelines supplied by the Tasmanian Environment Protection Agency (EPA),[1] mandatory requirements from the Southern Midlands Council are detailed. Although these do not require an assessment of natural values, and that the EPA specify there is no requirement for a natural values survey, the proponent was advised to assess the potential for the project impact to natural values. Accordingly, in June 2021, North Barker Ecosystem Services (NBES) undertook a natural values survey of the 22.66 ha site where the facility is located. The findings of that survey resulted in an additional extension survey in November 2021. The findings of these surveys, with recommendations and a comment on relevant legislation, are presented in this Natural Values Report (NVA).

Notably, since the initial publishing of this report on 24/12/2021, the design of the facility has changed and the area increased to 6.70 ha (including the area for the access road to the facility).

1.2 The site, the facility and survey areas

The site is on the Somerton property ~5.5 km north-east of Melton Mowbray on the Somerton property on Lovely Banks Road in Tasmania's southern midlands (Figure 1). The site is in the Southern Midlands Council area and is in the Tasmania South East Bioregion[2].

Topography is relatively gentle. The land slopes from ~350 m ASL in the north to ~310 m ASL in the south. The geology is predominantly Triassic sediments (sandstone, siltstone and mudstone). There is a small dam on the site but no permanent creeks or obvious drainage lines.

Initially, a 22.66 ha area of the Somerton property was surveyed (the site), with a focus on the access road and the southern area planned for the compost facility (~4.3 ha, the facility). Since the initial survey of the site, the facility area was increased to 6.7 ha. Given the site was surveyed in entirety, and the increased area extended into rough pasture, the need for additional surveying because of this increase is not warranted. Based on the findings of the initial survey of the site, a buffer area of 250 m around the site was surveyed for threatened flora (i.e. an extension survey area for *Leucopogon virgatus* var. *brevifolius*).

2 Methods

The 22.66 ha site was surveyed by one ecologist on the 16th of June 2021. Based on these findings, an additional survey of the site, and a 250 m buffer around the site, was recommended. The timing of this survey was planned to coincide with the spring flowering season and was conducted by two ecologists on the 4th of November 2021 with the following aims:

- A spring survey for threatened flora species in the facility area (Figure 1).
- A presence/absence survey in the facility area for tussock skink using the DPIPWE approved method (Plate 1, Appendix A).
- An extension survey for *Leucopogon virgatus* var. *brevifolius* in areas of potential habitat within 250 m of the 22.66 site area (Figure 1). (Two plants were recorded in the facility area during the June 2021 survey; an outcome of this was a recommendation for an extension survey.)

[1] Environment Protection Authority Tasmania (2020)
[2] IBRA 7 (2012)

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- A natural values survey in the facility area in accordance with the *Guidelines for Natural Values Survey – Terrestrial Development Proposals* [3]. This used a meandering area search technique[4].

Native vegetation was mapped in accordance with units defined in TASVEG 4.0[5]. Vascular plants were recorded in accordance with the current census of Tasmanian plants[6]. All data were recorded with a handheld GPS.

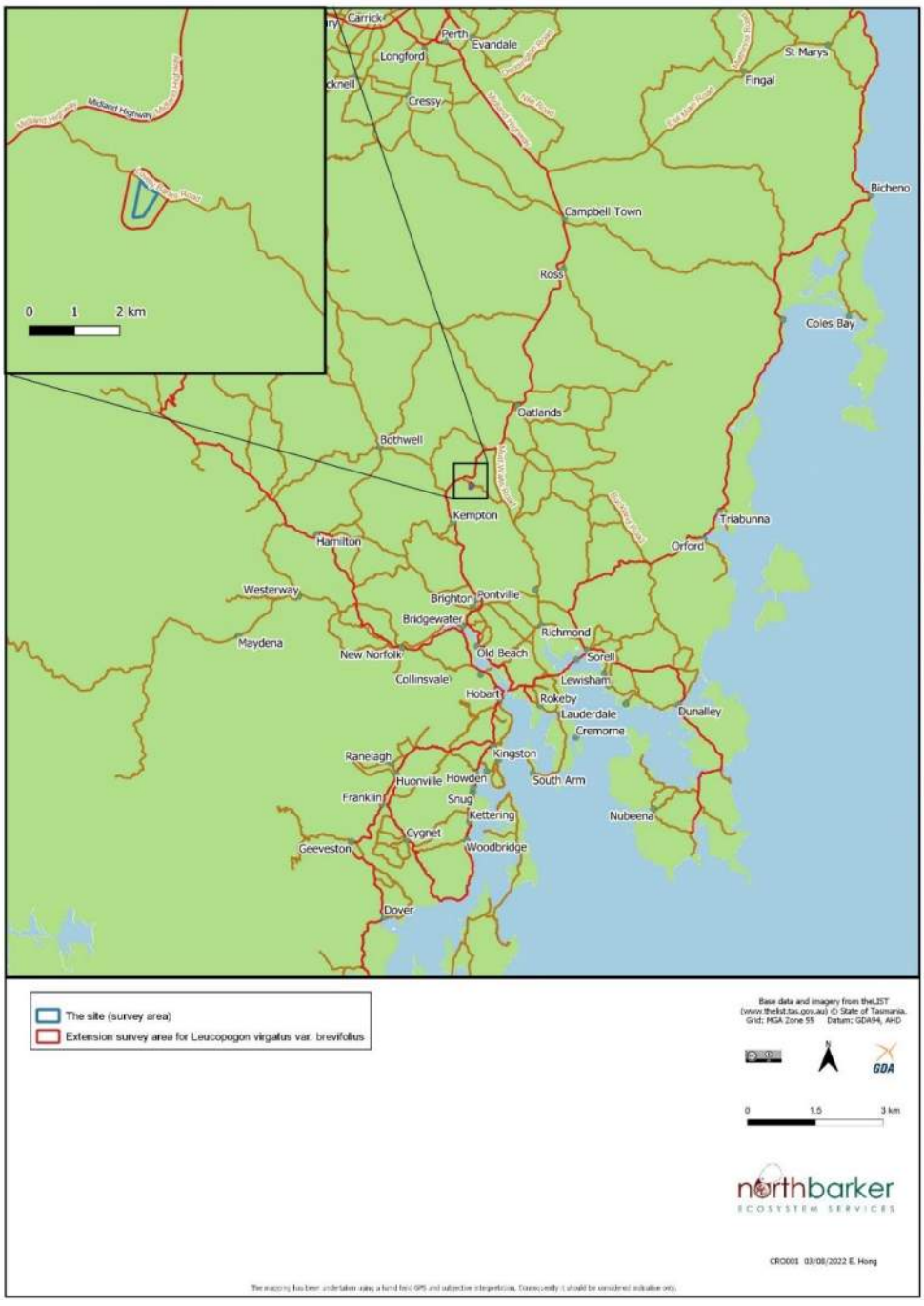

Figure 1: The site of the facility in southern Tasmania (plus extension survey area).

[3] DPIPWE 2015
[4] Goff *et al.* 1982
[5] Kitchener and Harris 2013
[6] de Salas and Baker 2021

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Plate 1: Tussock skink survey method - double layer of roof tin placed in the field for > 1 month (weights were used to keep the tin in place)

2.1 Limitations

The field surveys were undertaken in winter and in spring. Some seasonal species may have been overlooked or seasonally absent. To compensate for these limitations, data from the present survey are supplemented with data from the Tasmanian *Natural Values Atlas* (NVA)[7]. These data include records of all threatened species known to occur, or with the potential to occur, up to 5 km from the site.

3 Results - Biological values

3.1 Vegetation

The following native TASVEG units were recorded in the 22.66 ha site area:

1. DAS - *Eucalyptus amygdalina* forest and woodland on sandstone (1.29 ha)
2. GCL - Lowland grassland complex (19.28 ha)
3. GSL - Lowland grassy sedgeland (1.87 ha)

[7] DPIPWE 2021a, nvr_1_15-Jun-2021

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The DAS on site accords to the threatened vegetation community *Eucalyptus amygdalina* forest and woodland on sandstone, which is listed as threatened under the Tasmanian *Nature Conservation Act 2002* (NCA).

A small recently cleared area (0.22 ha) present in the south of the site was mapped as extra urban miscellaneous (FUM).

3.1.1 DAS - Eucalyptus amygdalina forest and woodland on sandstone (1.29 ha)

A small area of DAS occurs in the north-western corner of the site (Plate 2, Figure 2). *E. amygdalina* is dominant throughout the DAS, with *E. viminalis* occasional. Canopy trees are 60-90 cm DBH and appear relatively healthy. As with other areas of native vegetation at the site, this community has been exposed to a long history of disturbance, primarily browsing/grazing by livestock. There is no understorey layer, but the ground/subshrub layer still contains mostly native species. The native grass layer is mostly comprised of *Poa rodwayi* and *Microlaena stipoides*, and species of *Austrostipa* and *Rytidosperma* are also common. *Lissanthe strigosa* is the most common understorey sub shrub. Introduced species are regular and include: *Acetosella vulgaris*, *Dactylis glomerata* and *Stellaria media*.

This community is listed as threatened under the Tasmanian *Nature Conservation Act 2002*.

Plate 2: DAS in the north west of the site

3.1.2 GCL - Lowland grassland complex (19.28 ha)

This community occurs throughout most of the site (Figure 2). The community is anthropogenically derived through an established history of clearing and livestock farming. It is highly degraded and very closely cropped (from grazing pressure) across much of the site and was therefore difficult to assess in terms of species present (Plate 3). Species diversity is apparently relatively low; *Microlaena stipoides*, and species of *Austrostipa* and *Rytidosperma* are regular in many areas. Introduced grasses and herbs form a notable component of the community with clover (*Trifolium subterraneum)* and Capeweed (*Arctotheca calendula*) particularly common. Browntop bent grass

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(*Agrostis capillaris*), sheep sorrel (*Acetosella vulgaris*) and buckshorn plantain (*Plantago coronopus*) also contribute significantly. Scattered trees occur in a few places, including *Eucalyptus ovata* and *E. pauciflora*.

The GCL in the southern and western parts of the site are in better condition with more obvious coverage of native species, especially *Themeda triandra* and *Poa labillardierei* (Plate 4). The diversity of native herbs and subshrubs is relatively poor with *Acaena novae-zelandiae* one of the more regularly encountered natives.

Although challenging to assess, it is expected that native grass cover exceeds 25 % in most areas: this is the minimum native component percentage for classification as GCL; less than this, and the community would be classified as agricultural land (FAG). So, despite the significant component of introduced species, GCL is the most suitable vegetation community to assign the vegetation across much of the site. However, it must be acknowledged that the quality of this habitat is generally poor and that localised areas (parallel to the existing access road for example) will have less than the 25 % native species coverage.

Plate 3: Degraded GCL but with a native component in the north of the site

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Plate 4: Better quality GCL in the west of the site (this small patch is dominated by *Themeda triandra*.)

3.1.3 GSL - Lowland grassy sedgeland (1.87 ha)

This community occurs in the southern part of the site (Figure 2, Plate 5). As with the GCL, it is anthropogenically derived through an established history of disturbance. Although species diversity is low and the dominance of *Lomandra longifoli*a forms a monoculture in places, the diversity is greater, or at least more obvious, than in the GCL where heavy browsing has cropped much of the ground cover. The threatened *Scleranthus fascicularis* (TSPA vulnerable) and *Leucopogon virgatus* var. *brevifolius* (TSPA rare) occur in this community. Other species include *Chrysocephalum apiculatum, Lissanthe strigosa, Gonocarpus tetragynus, Pimelea humilis* and *Viola hederacea.*

Plate 5: GSL in the south of the site

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3.2 Threatened flora

Sixty-five species of vascular plant were recorded at the site. A notable portion of these (24 species or 35 %) are introduced species. A complete species list from the field survey is presented in Appendix B.

Two species listed as threatened under the TSPA occur in the facility area:

- ***Leucopogon virgatus* var. *brevifolius*** (TSPA rare, Figure 2, Plates 6 and 7): A total of 317 were recorded during the surveys (2 in the facility area, 8 just outside the facility area and within the site, and 307 in the extension survey area). Notably, the extension survey was recommended due to the paucity of records in the area: the main cluster of records is ~60 km to the north and the nearest record is an observation 20 km to the north from 2007.
- ***Scleranthus fasciculatus*** (TSPA vulnerable, Figure 2, Plate 8): A total of 78 plants were recorded during the surveys (4 in the facility area, 19 just outside the facility area and within the site, and 55 in the extension survey area).

Previous surveys within 5 km of the site identified an additional 5 species listed under the TSPA and EPBCA[8]. These are listed in Appendix C together with a description of their preferred habitat and an assessment of the likelihood of their occurrence in the proposed facility; none of these have a reasonable chance of occurring in the proposed facility.

Plate 6. *Leucopogon virgatus* var. *brevifolius* in the proposed facility

Plate 7: *Leucopogon virgatus* var. brevifolius in the proposed facility

[8] DPIPWE 2021a, nvr_1_15-Jun-2021

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Plate 8: *Scleranthus fasciculatus* in the proposed facility

3.3 Threatened fauna and threatened fauna habitat

During our field survey, no species of listed threatened fauna were observed. Habitat for the following threatened fauna species was recorded; additional species recorded within 5 km of the proposed facility are considered in Appendix D:

3.3.1 **Tasmanian masked owl** (*Tyto novaehollandiae*, TSPA endangered, EPBCA vulnerable):

There are no records within 500 m and 3 within 5 km. A single tree occurs in the west of the site (but ~2 m of the facility area) that is sufficiently large to contain hollows that may be suitable for this species (Figure 2, Plate 9). It is quite possible that this species forages over the site from time to time.

3.3.2 **Swift parrot** (*Lathamus discolor*, TSPA endangered, EPBCA critically endangered):

There are no records within 5 km. Six *Eucalyptus ovata* were recorded at the site (outside the proposed facility area). These are foraging habitat for this species. Four of these are in a small cluster. These are relatively isolated trees surrounded by rough pasture. They are moderately healthy showing some signs of dieback. A single hollow that may be suitable for breeding is visible in one tree.

Although it is possible this species occurs, given the relatively isolated occurrence of a few trees, it is not likely that this species occurs with any regularity at the site.

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3.3.3 **Tasmanian wedge-tailed eagle** (*Aquila audax fleayi*, TSPA endangered, EPBCA endangered):

No records within 500 m and 9 within 5 km. No nesting habitat at the site but may forage over the area from time to time. There are no nest records within 1 km and the nearest nest is 3.2 km to the east of the proposed facility.

Potentially suitable breeding habitat is mapped primarily to the east and south of the site as per the Forest Practices Authority's eagle habitat model (see Appendix E)[9]. Based on the assessment of some of this habitat during the extension survey and on inspection of aerial images of the area, it is our assessment that the model has overestimated the suitability of the breeding habitat within 1 km. It is our assessment that the chances of eagles breeding within 1 km line-of-sight of the proposed facility is low and we suggest that further surveying is not necessary.

3.3.4 **Tasmanian devil** (*Sarcophilus harrisii*, TSPA endangered, EPBCA endangered):

There is one record within 500 m and 41 within 5 km. No scats, tracks or other signs of this species were recorded. However, it is quite possible that this species forages at the site. No suitable breeding habitat was observed: the habitat is structurally simple, and the substrate is not friable for much of the site including the area of the proposed facility.

3.3.5 **Eastern quoll** (*Dasyurus viverrinus*, EPBCA endangered):

There are no records within 500 m and 5 within 5 km. No scats, tracks or other signs of this species were recorded. However, it is quite possible that this species forages at the site. The breeding habitat requirements are relatively broad for this species and although it is possible that the species breeds at the site, the habitat is suboptimal and more suitable habitat is expected in the surrounding area.

3.3.6 **Tussock skink** (*Pseudemoia pagenstecheri*, TSPA vulnerable):

There are no records within 5 km. A targeted survey was undertaken for this species. Only two skinks were observed during the targeted survey (during the active search rather than under the tin sheets) but these were not able to be caught and were not identified. Regardless, on closer inspection and further consideration of the habitat, additional surveying is not considered necessary: there is low component of tussock grasses in the facility area (<10 %) and tussock skink is unlikely to occur in anthropogenically-derived habitat (the site has been converted from woodland) as this species typically occurs in areas that were grassland originally (pers. comm. Ray Brereton).

[9] Forest Practices Authority (2014)

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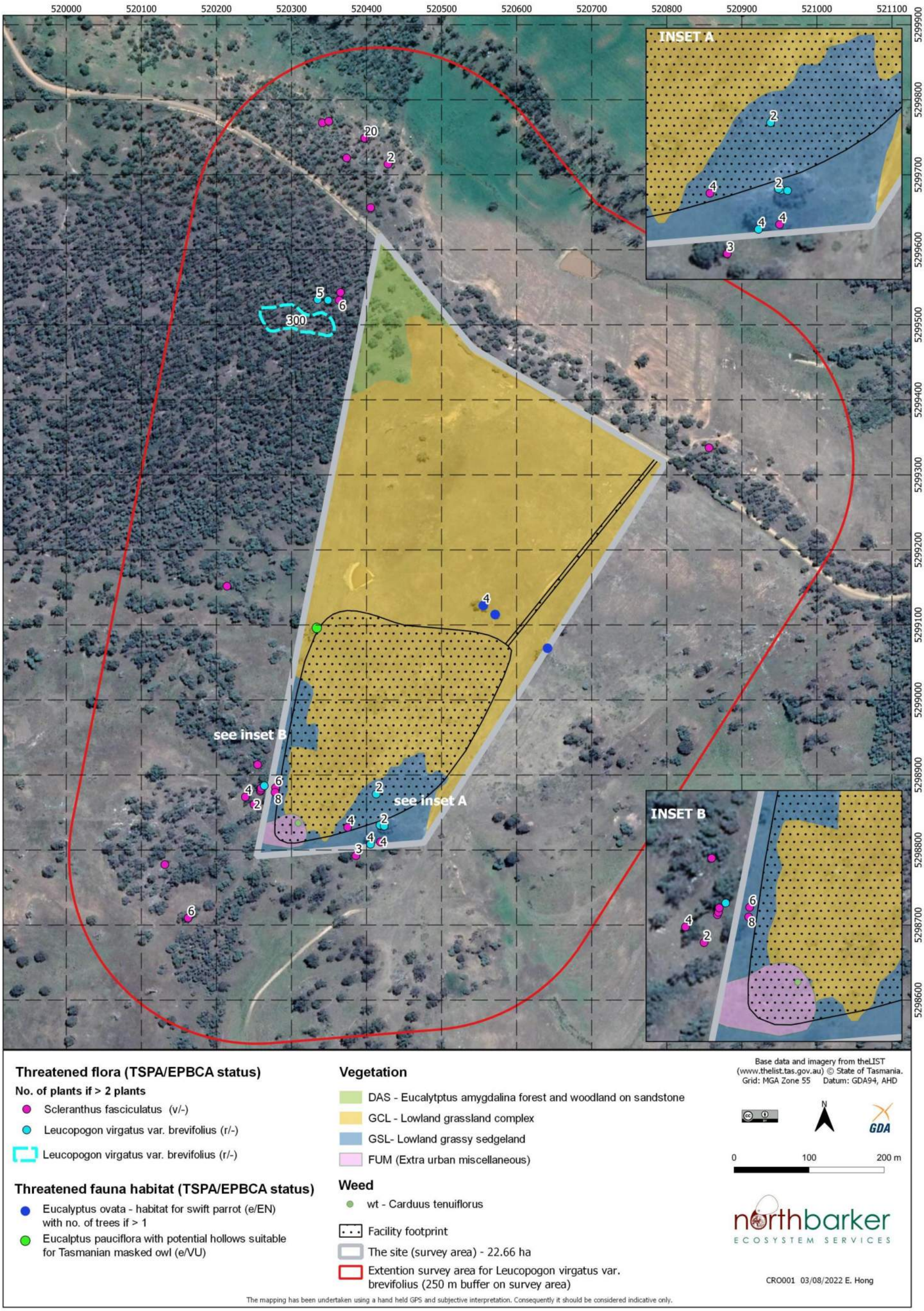

Figure 2: Map of the natural values at the site

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Plate 6: Tree suitable for Tasmanian masked owl immediately adjacent to the proposed facility

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4 Weeds

Introduced species are common at the site with twenty-four species recorded during the surveys. No species declared under the Tasmanian *Weed Management Act 1999* were recorded during the survey but several species of widespread and highly invasive weed such as Capeweed (*Arctotheca calendula*) and milk thistle (*Silybum marianum*) occur and are abundant in some areas.

Plate 7: Capeweed (*Arctotheca calendula* - yellow flower in the image) dominating this area of grassland just outside the proposed facility area.

5 Assessment of Impact and Mitigation

5.1 Vegetation

There will be no impact to the threatened vegetation in the proposed facility area on the site. The proposed facility will impact 6.57 ha native vegetation in the following TASVEG 4.0 vegetation communities:

- (GCL) Lowland grassland complex: 5.53 ha
- (GSL) Lowland grassy sedgeland: 1.04ha

These are anthropogenically derived grassland communities that are relatively low in diversity. The loss of this amount of these habitats is not significant.

Impact in these areas is expected to be total, and clearance is difficult to mitigate. However, the risk of unnecessary and indirect impacts on vegetation outside the footprint of the development can be minimised.

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RECOMMENDATION

- The works area should be marked in construction plans and on the ground, and all works, vehicles and materials should be confined to the works area.

5.2 Threatened flora

Two species listed as threatened under the TSPA occur in the proposed facility area and will be impacted by the proposal. Additionally, several plants outside but near the facility with the nearest 5 m from the facility boundary.

Leucopogon virgatus* var. *brevifolius (TSPA rare): Two plants of the 317 recorded in the surveys occur in the proposed facility. This occurrence is important given the paucity of records in the area: the main cluster of records is ~60 km to the north and the nearest record is an observation 20 km to the north from 2007.

The loss of two plants is not substantial in terms of the number of plants found, but effort should be made to reduce the chances of any inadvertent impact to plants outside but near the facility impact area (see recommendations below).

Scleranthus fasciculatus (TSPA vulnerable): Four of 78 plants recorded during the surveys occur in the proposed facility. Although the loss of four plants is not significant given the broader occurrence of the species in the area, it is not negligible, and effort should be made to reduce the chances of any inadvertent impact to plants outside but near the facility impact area (see recommendations below).

Under the TSPA a permit to take will be required to impact these species. No impact to species listed under the EPBCA is expected.

RECOMMENDATIONS

Given the concentration of threatened flora in the southern and eastern part of the site but just outside the facility footprint, and the proximity of the facility boundary to these plants, efforts must be made to manage the development in this area to avoid inadvertent impact to these threatened plants.

- Eight *Leucopogon virgatus var. brevifolius* and four *Scleranthus fasciculatus* at the site occur under two trees near and just outside the southern boundary of the proposed facility (see figure 3 below). Ensure there is no disturbance or development, including subsurface digging, within 15 m of the two trees. This 15 m zone should be delineated as an exclusion zone on plans and on the ground to ensure no inadvertent impact to these trees. This will protect both threatened plant species in this area.
- Fourteen *Scleranthus fasciculatus* are near the western boundary of the proposed facility. There should be no disturbance or development within 5 m of these plants and this area should be demarked as an exclusion zone on plans and on the ground to ensure no inadvertent impact to these plants.
- The design of the earthen bank around the facility should include a measure to manage drainage given the proximity of threatened flora to the bank. There should be no run-off from this bank to the surrounding areas such that the occurrences of threatened flora beyond the project footprint will be negatively impacted.

The identification of the threatened species for the exclusion zones must be undertaken by a suitably qualified ecologist.

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Figure 3: Threatened flora in and to the south of the south of the proposed facility; note the distribution of a number of plants is near the boundary of the proposed facility.

5.3 Threatened fauna and threatened fauna habitat

Although, none of the trees that have hollow-bearing potential will be directly impacted, the single large tree that has the potential to support hollows for masked owl is very near the north-western boundary of the facility and may be critically impacted (see recommendation below).

Overall, the facility footprint is relatively small (6.70 ha) and does not contain habitat that can be considered optimal or important for any species of threatened fauna. None of the *Eucalyptus ovata* that are potential foraging habitat for swift parrot will be impacted.

The project will impact habitat that may be utilised for foraging for a range of species including Tasmanian devil, eastern quoll, Tasmanian masked owl and Tasmanian wedge-tailed eagle, but this habitat occurs widely in the broader area. The loss of this 6.7 ha of degraded grassland is not expected to have a significant impact on any species of threatened fauna.

RECOMMENDATION

To ensure no impact to masked owl, avoid any impact within 15 m of the potential hollow-bearing tree to the north-west of the facility boundary. Before construction or if impact within 15 m is unavoidable, this tree should be inspected by a suitably qualified arborist to ensure it is not in use by a masked owl. If the tree is found to be in use, further measures that restrict development may be required to avoid impact to this species.

5.4 Scavenging

It is well understood that fauna and invertebrate species are attracted to facilities that process organic waste to exploit food sources. This may be to forage directly on the organic waste at the

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site, or to prey on species attracted to the site; for example, waste on the site may attract rodents who in turn are preyed on by carnivores.

In terms of scavenging, the most obvious species likely associated with the site are rats, forest ravens and potentially Tasmanian devils and the facility may increase the prevalence of these fauna at the site. The facility may also attract predators such as Tasmanian masked owl and Tasmanian wedge-tailed eagle due to the increase in prey fauna at the site. The scale of such an increase is however not expected to result in any significant risk to any native or threatened species or result in a significant 'knock on' effect that may negatively impact other native species. Regardless, relatively simple efforts can help reduce and manage risk to these species.

RECOMMENDATIONS

- Animals may cross Lovely Banks Road, especially at night, to access the facility. Traffic calming signage should be implemented on the road on the western and eastern extents of the site that aim to 1) reduce speed of drivers in the area and 2) raise awareness of potential native fauna on the road.
- Coverage of organic waste can reduce fly propagation and pest animal issues[10]. If possible, organic waste that is likely to attract scavengers (especially food waste) should be covered to the extent practicable as soon as practicable.

5.5 Weeds

Without mitigation, the proposal runs the risk and spreading and/or worsening the spread of weeds on site.

RECOMMENDATIONS

- Best practice construction hygiene should be applied to prevent the spread of weed propagules in contaminated soil. This should involve cleaning all machinery before leaving the works area, as well as not bringing dirty machinery into the site. To this end, a register of washdowns should be kept and there should be regular inspections to ensure compliance.
- It should also be ensured that all spoil/soil brought onto site is free of weeds and weed propagules. Accordingly, all spoil/soil should be guaranteed by the supplier to be non-contaminated in this regard. This should be written into contracts.

6 Legislative Requirements

6.1 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The EPBCA is structured for self-assessment; the proponent must determine whether or not the project is considered a 'controlled action' which if confirmed would require approval from the Commonwealth Minister.

Referral under the EPBC Act will be necessary if, as the Act states:

'An action has, will have, or is likely to have a significant impact on an endangered or vulnerable species if it does, will, or is likely to (amongst other things):

[10] DPIPWE 2004

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modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.'

Although significant impact tests against impact criteria are required to better quantify the significance of potential impact to a species under this act, if recommendations are followed we do not think it is likely that any species or value that has the potential to occur on this site will be significantly impacted.

6.2 Tasmanian *Threatened Species Protection Act 1995*

The proponent will require a 'permit to take' for impact to the two plant species listed under this act that are in the proposed facility: *Leucopogon virgatus* var. *brevifolius* (TSPA rare) and the *Scleranthus fasciculatus* (TSPA vulnerable).

6.3 Tasmanian *Weed Management Act 1999*

No weeds species listed under this act occur in the proposed facility.

6.4 Tasmanian Planning Scheme - Southern Midlands

The project is in the Agricultural Zone. There are no Code overlays intersecting with the facility area. In terms of natural values, there are no apparent planning impediments.

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7 Conclusion and summary of recommendations

A composting facility (approximately 6.70 ha including the access road) is proposed for development at Lovely Banks Road in Tasmania's Southern Midlands council. The area is comprised primarily of degraded grassland with a notable native component, including two threatened plant species. The main findings of two natural values surveys (winter and spring), and the impacts of the development on those values, with recommendations, are as follows:

Vegetation

Three native TASVEG units were recorded at the 22.66 ha site:

- DAS - *Eucalyptus amygdalina* forest and woodland on sandstone (1.29 ha)
- GCL - Lowland grassland complex (19.28 ha)
- GSL - Lowland grassy sedgeland (1.87 ha)

Broadly, the grassland communities are degraded, anthropogenically derived communities with a notable component of introduced species. The project will impact **5.53 ha** of GCL and **1.04 ha** of GSL. Neither of these communities are threatened, and this impact is not considered significant.

RECOMMENDATION

- The works area should be marked in construction plans and on the ground, and all works, vehicles and materials should be confined to the works area.

Threatened flora

Two threatened flora species were recorded during the initial survey and subsequent extension survey:

- ***Leucopogon virgatus* var. *brevifolius*** (TSPA rare): Two plants of the 317 recorded occur in the facility area but additional plants occur just outside the facility area.
- ***Scleranthus fasciculatus*** (TSPA vulnerable): Four of 78 plants recorded occur in the facility area but additional plants occur just outside the facility area.

Although these impacts are not significant, the occurrence of the *L. virgatus var. brevifolius* is important given the paucity of records in the area. Recommendations to reduce impact to threatened flora given their proximity to the facility area are as follows:

RECOMMENDATIONS

- Eight *Leucopogon virgatus var. brevifolius* and four *Scleranthus fasciculatus* at the site occur under two trees near and just outside the southern boundary of the proposed facility (see figure 3 below). Ensure there is no disturbance or development, including subsurface digging, within 15 m of the two trees. This 15 m zone should be delineated as an exclusion zone on plans and on the ground to ensure no inadvertent impact to these trees. This will protect both threatened plant species in this area.
- Fourteen *Scleranthus fasciculatus* are near the western boundary of the proposed facility. There should be no disturbance or development within 5 m of these plants and this area should be demarked as an exclusion zone on plans and on the ground to ensure no inadvertent impact to these plants.
- The design of the earthen bank around the facility should include a measure to manage drainage given the proximity of threatened flora to the bank. There should be no run-off from this bank to the surrounding areas such that the occurrences of threatened flora beyond the project footprint will be negatively impacted.

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Threatened fauna and threatened fauna habitat

The proposed facility contains foraging habitat for Tasmanian devil, eastern quoll, Tasmanian masked owl and Tasmanian wedge-tailed eagle. This habitat occurs widely in the broader area. The loss of this 6.70 ha of degraded grassland is not expected to have a significant impact on any species of threatened fauna. A single tree that may support hollows suitable for masked owl occurs very near the north western edge of the facility area. The facility is also likely to increase scavenging by native fauna at the facility. The following are recommended to manage impact associated with these risks:

RECOMMENDATIONS

- To ensure no impact to masked owl, avoid any impact within 15 m of the potential hollow-bearing tree to the north-west of the facility boundary. Before construction or if impact within 15 m is unavoidable, this tree should be inspected by a suitably qualified arborist to ensure it is not in use by a masked owl. If the tree is found to be in use, further measures that restrict development may be required to avoid impact to this species.
- Animals may cross Lovely Banks Road, especially at night, to access the facility. Traffic calming signage should be implemented on the road on the western and eastern extents of the site that aim to 1) reduce speed of drivers in the area and 2) raise awareness of potential native fauna on the road.
- Coverage of organic waste can reduce fly propagation and pest animal issues. If possible, organic waste that is likely to attract scavengers (especially food waste) should be covered to the extent practicable as soon as practicable.

Weeds

Without mitigation, the proposal runs the risk and spreading and/or worsening the spread of weeds on site.

RECOMMENDATIONS

- Best practice construction hygiene should be applied to prevent the spread of weed propagules in contaminated soil. This should involve cleaning all machinery before leaving the works area, as well as not bringing dirty machinery into the site. To this end, a register of washdowns should be kept and there should be regular inspections to ensure compliance.
- It should also be ensured that all spoil/soil brought onto site is free of weeds and weed propagules. Accordingly, all spoil/soil should be guaranteed by the supplier to be non-contaminated in this regard. This should be written into contracts.

Legislation

Environment Protection and Biodiversity Conservation Act 1999: By following the recommendations it is not likely that any species or natural value protected under this act that has the potential to occur on this site will be significantly impacted.

Threatened Species Protection Act 1995: A permit to take will required for impact to the threatened flora species *Leucopogon virgatus* var. *brevifolius (*rare) and *Scleranthus fasciculatus* (vulnerable).

Tasmanian Planning Scheme – Southern Midlands: In terms of natural values, there are no apparent planning impediments.

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Appendix A: Threatened Species Advice Form

Threatened Species Advice Form

Threatened species officer name: Jo Potter-Craven **Date:** 21 September 2021

Development proposal name: Tussock Skink Survey Methods – Northern Midlands Irrigation Scheme and Lovely Banks Road composting facility

The Threatened Species Recovery Hub (NESP) recently released a factsheet about monitoring reptiles, where they compared active searching with artificial refuges and found that a combination of both methods yielded the highest number of species detected. Corrugated iron was found to yield higher counts of skinks than tiles. This advice is based on the factsheet (see here) and the articles referenced within it.

Recommendation: Surveys for tussock skink should combine the inspection of artificial refuges (made of stacked corrugated iron and in place for a minimum of 1 month) with timed active searching of habitat in sunny weather during times of the day and year when skinks are basking.

Suggested sampling regime of a 1 ha area: (replicate this regime for larger areas)

- Artificial refuges: 2 x stacks of corrugated iron (double-layered) placed about 100 m apart in suitable habitat. They may need to be weighed down to stop them from blowing away. They must be left in place for a minimum of 1 month prior to inspection.
- Active search: 20 minutes of active searching of habitat i.e. within tussocks, under rocks, logs, etc (replace habitat as found). Active searches must be performed on clear, sunny days during the hours when the skinks are likely to be basking (10-3pm) during their most active months (late spring to early autumn).

Animal Ethics Committee (AEC) approval: We understand that ethics approval is not required for these surveys. Relevant extracts from the Biosecurity Tasmania website (see here) are included below along with a flow chart (see here) which explains the AEC process.

> *"Section 3 of the Animal Welfare Act 1993 (the Act) defines animal research as a procedure, test, experiment, inquiry or study on an animal which is undertaken to develop, demonstrate or acquire knowledge, or techniques, in an area of science or teaching; and is likely to have a significant adverse effect on the welfare of the animal.*
>
> *Where clarification is required of whether an activity is animal research or not a determination can be made by an inspector authorised under the Animal Welfare Act 1993 (see Determinations by an inspector below).*
>
> *No activity is precluded by the Act from being submitted for AEC approval and monitoring as an animal research project in order to comply with institutional internal policies or funding and publishing requirements. This includes activities that have been determined not to be animal research or fall outside the definition or are exempt under section 27 of the Act from licensing."*

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Appendix B: Vascular Plant Species list

Status codes:

ORIGIN	NATIONAL SCHEDULE	STATE SCHEDULE
i - introduced	EPBC Act 1999	TSP Act 1995
d - declared weed WM Act	CR - critically endangered	e - endangered
en - endemic to Tasmania	EN - endangered	v - vulnerable
t - within Australia, occurs only in Tas.		VU - vulnerable r - rare

Sites:

1	GCL - E520585, N5299019	4/11/2021	Fiona	Walsh
2	GSL - E520434, N5298871	4/11/2021	Fiona	Walsh
3	GCL (winter) - E520624, N5299399	16/06/2021	Richard	White
4	GSL (winter) - E520496, N5298882	16/06/2021	Richard	White
5	DAS - E520420, N5299498	16/06/2021	Richard	White

Site	Name	Common name	Status
	DICOTYLEDONAE		
	ASTERACEAE		
1 3 4	*Arctotheca calendula*	capeweed	i
2	*Chrysocephalum apiculatum*	common everlasting	
2 3 4	*Cirsium vulgare*	spear thistle	i
1 2 5	*Hypochaeris radicata*	rough catsear	i
2 4	*Silybum marianum*	variegated thistle	i
4	*Solenogyne gunnii*	hairy flat-herb	
1	*Taraxacum officinale*	common dandelion	i
	BORAGINACEAE		
2	*Myosotis sp*	forget me not	i
	BRASSICACEAE		
1	*Capsella bursa-pastoris*	shepherds purse	i
	CAMPANULACEAE		
2	*Wahlenbergia sp.*	bluebell	
	CARYOPHYLLACEAE		
2 4	*Scleranthus biflorus*	twinflower knawel	
2	*Scleranthus fasciculatus*	spreading knawel	v
4 5	*Stellaria media*	garden chickweed	i
1 2	*Stellaria sp.*	chickweed	i
	CHENOPODIACEAE		
5	*Einadia nutans subsp. nutans*	climbing saltbush	
	CONVOLVULACEAE		
4	*Dichondra repens*	kidneyweed	
	CRASSULACEAE		
1 2	*Crassula decumbens var. decumbens*	spreading stonecrop	
	DROSERACEAE		
2	*Drosera sp.*	sundew	
	ERICACEAE		
2 4	*Leucopogon virgatus var. brevifolius*	shortleaf beardheath	r
2 5	*Lissanthe strigosa subsp. subulata*	peachberry heath	
2 4	*Styphelia humifusa*	native cranberry	
	FABACEAE		
4	*Acacia dealbata subsp. dealbata*	silver wattle	
3 4	*Trifolium sp.*	clover	i

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1 2	*Trifolium subterraneum*	subterranean clover	i
	GERANIACEAE		
1	*Erodium sp.*	storksbill	
2	*Geranium potentilloides potentilloides*	mountain cranesbill	
	HALORAGACEAE		
2 4	*Gonocarpus tetragynus*	common raspwort	
	MYRTACEAE		
5	*Eucalyptus amygdalina*	black peppermint	en
3	*Eucalyptus ovata var. ovata*	black gum	
4	*Eucalyptus pauciflora subsp. pauciflora*	cabbage gum	
5	*Eucalyptus viminalis subsp. viminalis*	white gum	
	OXALIDACEAE		
2 4	*Oxalis sp.*	woodsorrel	
	PITTOSPORACEAE		
2	*Bursaria spinosa subsp. spinosa*	prickly box	
	PLANTAGINACEAE		
1 3	*Plantago coronopus*	buckshorn plantain	i
	POLYGONACEAE		
1 2 3 4 5	*Acetosella vulgaris*	sheep sorrel	i
	ROSACEAE		
2 3	*Acaena novae-zelandiae*	common buzzy	
	THYMELAEACEAE		
2 4	*Pimelea humilis*	dwarf riceflower	
	URTICACEAE		
3	*Urtica incisa*	scrub nettle	
2	*Urtica urens*	stinging nettle	i
	VIOLACEAE		
2	*Viola hederacea*	ivyleaf violet	
	MONOCOTYLEDONAE		
	ASPARAGACEAE		
1 2 3 4 5	*Lomandra longifolia*	sagg	
	ASPHODELACEAE		
2	*Bulbine sp*	bulbine-lily	
	JUNCACEAE		
3	*Juncus pallidus*	pale rush	
1	*Juncus sarophorus*	broom rush	
	ORCHIDACEAE		
2	*Calochilus sp.*	beard orchid	
2	*Thelymitra sp.*	sun-orchid	
	POACEAE		
4 5	*Agrostis capillaris*	brown top bent grass	i
3	*Agrostis sp.*	blown grass	
5	*Aira caryophyllea*	silvery hairgrass	i
2 4	*Aira sp.*	hair grass	i
2	*Anthoxanthum odoratum*	sweet vernalgrass	i
1 2 3 5	*Austrostipa sp.*	speargrass	
4 5	*Cynosurus echinatus*	rough dogstail	i
2 5	*Dactylis glomerata*	cocksfoot	i
3 4	*Holcus lanatus*	yorkshire fog	i
2	*Hordeum distichon*	two-row barley	i
3 4 5	*Microlaena stipoides*	weeping grass	

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1 2	*Poa annua*	winter grass
1 2 4	*Poa labillardierei*	silver tussockgrass
4 5	*Poa rodwayi*	velvet tussockgrass
5	*Poa sp.*	poa
1 3 4 5	*Rytidosperma sp.*	wallabygrass
2 4	*Themeda triandra*	kangaroo grass
	PTERIDOPHYTA	
	DENNSTAEDTIACEAE	
2 4	*Pteridium esculentum subsp. esculentum*	bracken fern

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Appendix C: Threatened flora recorded within 5 km of the site

Species	Status TSPA / EPBCA	Records in 500m / 5km	Habitat[11]	Potential to occur in the proposed facility	Commentary
RECORDED IN THE PROPOSED FACILITY DURING SURVEYS					
Ranunculus pumilio var. *pumilio* ferny buttercup	rare/ -	0/1	*Ranunculus pumilio* var. *pumilio* occurs mostly in wet places (e.g. broad floodplains of permanent creeks, "wet pastures") from sea level to altitudes of 800-900 m above sea level.	NONE	No suitable habitat in the proposed facility
Scleranthus fasciculatus spreading knawel	vulnerable/ -	0/22	*Scleranthus fasciculatus* is only recorded from a few locations in the Midlands and south-east. The vegetation at most of the sites is *Poa* grassland/grassy woodland. *Scleranthus fasciculatus* appears to need gaps between the tussock spaces for its survival and both fire and stock grazing maintain the openness it requires. Often found in areas protected from	PRESENT	78 plants were recorded during the surveys, 23 in the proposed facility.

[11]Informed in part from notesheets on the Threatened Species Link – see DPIPWE (2021b) in references

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Species	Status TSPA / EPBCA	Records in 500m / 5km	Habitat[11]	Potential to occur in the proposed facility	Commentary
			grazing such as fallen trees and branches.		
Vittadinia cuneata var. *cuneata* fuzzy new-holland-daisy	rare/ -	0/1	*Vittadinia cuneata* var. *cuneata* occurs in native grassland and grassy woodland on fertile soils, typically overlying basalt. It is confined to the Derwent Valley, Central Midlands and central East Coast on areas of lowest rainfall in Tasmania.	VERY LOW	The substrate in the proposed facility is suboptimal for this species. The survey was conducted during the flowering time for this species, and it is unlikely to have been overlooked in the relatively limited proposed facility.
Vittadinia gracilis woolly new-holland-daisy	rare/ -	0/22	*Vittadinia gracilis* occurs in dry grassy habitats, often in relatively degraded grasslands and grassy woodlands. It has been found to occur in low- rainfall areas, on a range of substrates.	LOW	The proposed facility is suitable for this species but the extensive cover of *Lomandra longifolia* limits the available habitat. The survey was conducted during the flowering time for this species, and it is unlikely to have been overlooked in the relatively limited proposed facility.
Vittadinia muelleri narrowleaf new-holland-daisy	rare/ -	0/1	*Vittadinia muelleri* occurs in dry native grasslands and grassy woodlands particularly in open areas with lighter grass cover and patches of bare ground such as rock plates. It freely colonises	LOW	The proposed facility is suitable for this species but the extensive cover of *Lomandra longifolia* limits the available habitat. The survey was conducted during the flowering time for this species, and it is

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Species	Status TSPA / EPBCA	Records in 500m / 5km	Habitat[11]	Potential to occur in the proposed facility	Commentary
			disturbed sites such as roadside cuttings. It is widely dispersed through the Midlands and South East.		unlikely to have been overlooked in the relatively limited proposed facility.
Xanthoparmelia amphixantha lichen	endangered/ -	0/3	*Xanthoparmelia amphixantha* occurs in the Southern Midlands on stony shallow basalt soils in native grassland.	NONE	No suitable basalt soil habitat in the proposed facility.

Appendix D: Threatened fauna recorded within 5 km of the site

Species	Status TSPA / EPBCA	Records in 500m / 5km	Habitat[12]	Potential to occur in the proposed facility	Commentary
BIRDS					
Aquila audax subsp. fleayi Tasmanian wedge-tailed eagle	Endangered / ENDANGERED	0/9	Pairs of the wedge-tailed eagle defend a large territory, nesting in patches of mature forests with sheltered aspects throughout Tasmania (including large offshore islands). The total adult population has been estimated as less than 1000 birds. While individual responses vary, disturbance occurring even many hundreds of metres away can cause breeding birds to temporarily leave eggs or chicks at risk, or even to desert their nest site for years. Disturbances involving visible people or helicopters can be particularly serious.	Foraging: MODERATE Nesting: NONE in proposed facility and LOW within 1 km.	No nesting habitat in the proposed facility but may forage over the area from time to time. There are no nest records within 1 km and the nearest nest is 3.2 km to the east of the proposed facility. Potentially suitable breeding habitat is mapped primarily to the east and south of the proposed facility as per the Forest Practices Authority's eagle habitat model (see Appendix E)[13]. Based on the assessment of some of this habitat during the extension survey and on inspection of aerial images of the area, it is our assessment that the model has overestimated the suitability of the breeding habitat within 1 km. Accordingly, the chances of eagles breeding within 1 km of the proposed facility is low and we

[12] Threatened Species Section (2020) and Bryant and Jackson (1999) were used to inform these in part

[13] Forest Practices Authority (2014 a)

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					suggest that further surveying is not necessary.
Tyto novaehollandiae subsp. castanops Tasmanian masked owl	Endangered / VULNERABLE	0/3	The Tasmanian masked owl subspecies hunts at night for small mammals and birds in a range of habitats which contain some mature forest, usually below 600 m altitude - these include native forests and woodlands as well as agricultural areas with a mosaic of native vegetation and pasture. Birds occupy a permanent territory and rely on hollows in old-growth trees for nesting and often for roosting.	Foraging: MODERATE Nesting: NONE	A single tree occurs in the west of the site (but outside the proposed facility) that is sufficiently large to contain hollows that may be suitable for this species (Figure 2, Plate 9). It is quite possible that this species forages over the proposed facility from time to time.
Hirundapus caudacutus White-throated needletail	- / VULNERABLE	0 / 9	This is a migratory species, breeding in central and north-eastern Asia in Siberia, Mongolia, northern-eastern China and northern Japan. It migrates south through eastern China, Korea and Japan spending its non-breeding season in eastern and south-eastern Australia including Tasmania. Is almost exclusively aerial, occurring over most types of habitat with a preference to wooded areas, open forests, heathland and rainforests.	Nesting: NONE Foraging: MODERATE	It is possible that this species will fly over the proposed facility from time to time.
MAMMALS					

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Dasyurus maculatus subsp. *maculatus* spotted tailed quoll	Rare / VULNERABLE	0/7	This naturally rare forest-dweller most commonly inhabits rainforest, wet forest and blackwood swamp forest. It forages and hunts on farmland and pasture, travelling up to 20 km at night, and shelters in logs, rocks or thick vegetation. Important habitat includes large patches of forest containing adequate denning sites and high densities of mammalian prey. Spotted-tailed quolls are solitary with home ranges that vary typically between 100 ha and 5,000 ha with females tending to have smaller ranges and male ranges overlapping several female ranges[14].	Foraging: VERY LOW Denning: VERY LOW	The lack of suitable wet forest/woodland habitat in the proposed facility significantly reduces the chance of this species utilising the site; it is highly unlikely to occur and less likely to breed in the proposed facility.
Dasyurus viverrinus eastern quoll	-/ ENDANGERED	0/5	The eastern quoll is widespread in Tasmania and was previously widespread in mainland south-eastern Australia but has been effectively extinct there since 1963 (some reintroductions have occurred). Not currently listed as threatened species within Tasmania under the TSPA.	Foraging: MODERATE Denning: LOW	No scats, tracks or other signs of this species were recorded. However, it is quite possible that this species forages in the proposed facility. The breeding habitat requirements are relatively broad for this species and although it is possible that the species breeds in the proposed facility, the habitat is suboptimal and more suitable habitat is expected in the surrounding area.

[14] Long & Nelson 2010 cited in the spotted-tailed quoll (Tasmanian population) Species Profile and Threats Database http://www.environment.gov.au,

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			Records from the NVA indicate that the eastern quoll occurs in most parts of Tasmania but is recorded infrequently in the wetter western third of the state. The species' distribution is associated with areas of low rainfall and cold winter minimum temperatures. It is found in a range of vegetation types including open grassland (including farmland), tussock grassland, grassy woodland, dry eucalypt forest, coastal scrub and alpine heathland, but is typically absent from large tracts of wet eucalypt forest and rainforest.		
Sarcophilus harrisii Tasmanian devil	Endangered / ENDANGERED	1/41	The Tasmanian devil lives in a wide range of habitats across Tasmania, especially in landscapes with a mosaic of pasture and woodland. Populations have declined substantially since the first observations of the infectious cancer Devil Facial Tumour Disease (DFTD). DFTD has now spread across much of Tasmania. The reduced population is also likely to be more sensitive to additional threats such as death by roadkill, competition with cats and foxes, and loss or disturbance of areas	Foraging: MODERATE Denning: VERY LOW	No scats, tracks or other signs of this species were recorded. However, it is quite possible that this species forages in the proposed facility. No suitable breeding habitat was observed: the habitat is structurally simple, and the substrate is not friable for much of the proposed facility.

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			surrounding traditional dens where young are raised. The protection of breeding opportunities is particularly important for the species due to the mortalities from demographic pressures. There are very few records from bases of trees or hollow logs and most are recorded from underground burrows or caves.		
Perameles gunnii Eastern barred bandicoot	- / VULNERABLE	/ 2	This species originally occurred in native grasslands and grassy woodlands in Tasmania's Midlands. However, it is now rare in the Midlands where most of its habitat has been cleared. Since European settlement the eastern barred bandicoot has spread into (originally heavily forested) agricultural areas in the state's southeast, northeast and northwest. It favours a mosaic of open grassy areas for foraging and thick vegetation cover for shelter and nesting. Removal of plant cover in agricultural areas is seen as one of the main threats to the species.	VERY LOW	The most recent record within 5 km is from 1975 and this species is now rare in this part of Tasmania. It is unlikely that tis species occurs in the proposed facility.
OTHER					
Litoria raniformis Green and gold frog	vulnerable / VULNERABLE	0/1	In Tasmania, the species occurs in lowland areas in the south-east (where it is very rare) and north,	NONE	No Suitable habitat in the proposed facility

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			breeding in permanent freshwater or slightly brackish habitats, generally with emergent vegetation. It has declined significantly (over 20 %) in range and abundance over the last 20 years, having disappeared from the Midlands, Derwent Valley, much of the Hobart region and parts of the north-west coast (although historical records are also less common in that region)		
Oreixenica ptunarra ptunarra brown butterfly	vulnerable / ENDANGERED	0/4	Found within *Poa* tussock grassland, woodland and grassy shrubland, this species is found in small populations above 400 m in the Central Plateau, the Steppes, eastern highlands, southern midlands and north-west plains. *Poa* grass is considered crucial for this species as the food plant for its caterpillar stage.	NONE	Although there is an occasional Poa tussock at the site, tussock grassland does not occur and there is no chance of this species occurring.

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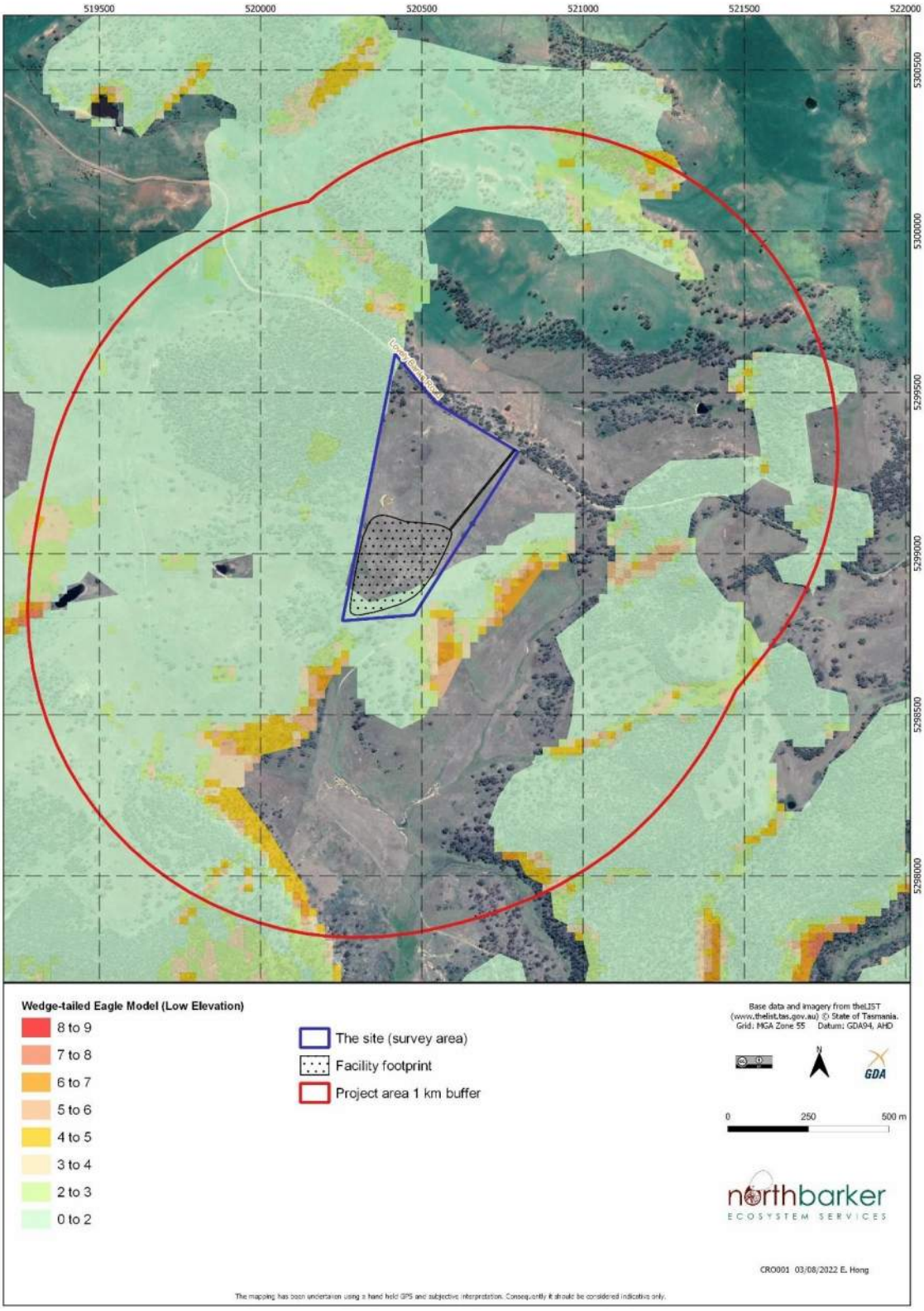
Appendix E: Wedge-tailed eagle breeding habitat model



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Appendix F: Design from the proponent

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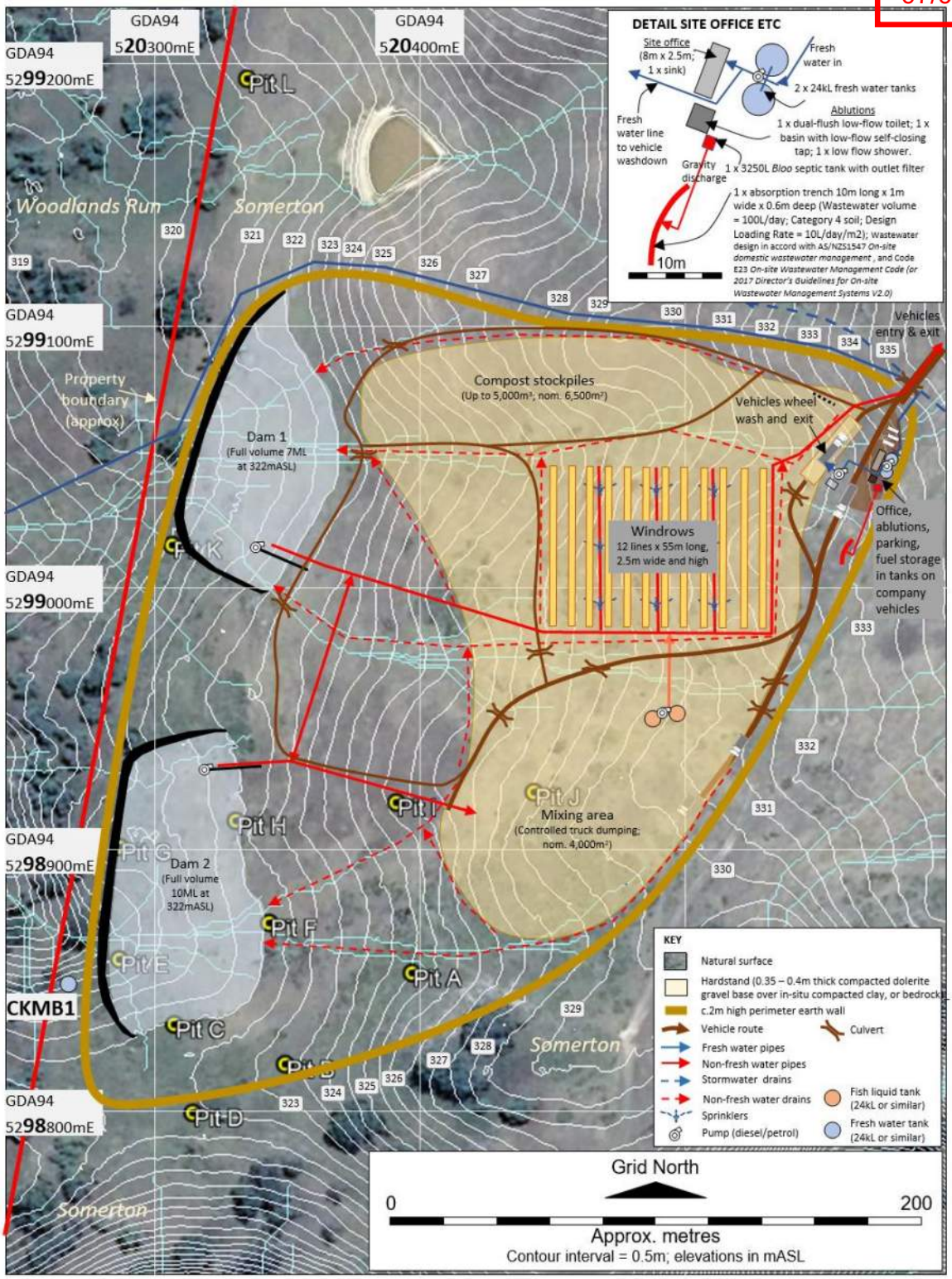

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COMPOST KINGS TASMANIA

PROPOSED COMPOSTING FACILITY
LOVELY BANKS ROAD, MELTON MOWBRAY

GEOTECHNICAL REPORT

February 2024

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Cover photo

View south at the proposed composting facility on *Somerton* off Lovely Banks Road, at the hardstand testing site. Low permeability sandy clay subsoil (B horizon) and/or low permeability clayey sand (CB horizon) are exposed after removal of 0.4m of sandy topsoil. The white material in the photo is solidified crushed spent concrete ("pit wash") compacted in a 100mm moistened layer and covered with up to 0.35m of compacted doleritic road base. It is being tested to assess its mechanical and permeability properties as a sub-base liner for the hardstand area. The test was inconclusive, and it was decided to not use the material.
Photo: Bill Cromer, 12 January 2021

Refer to this report as

Cromer, W. C. (2024). *Geotechnical report, proposed composting facility, Lovely Banks Road, Melton Mowbray.* Unpublished report for Compost Kings Tasmania by William C. Cromer Pty. Ltd., 28 February 2024.

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1 INTRODUCTION

1.1 Background

Compost Kings Tasmania ("Compost Kings") proposes a 10,000tpa composting facility on about 6.5ha of agricultural land on *Somerton*, a property on Lovely Banks Road, near Melton Mowbray (Figures 1 and 2).

The facility will be surrounded by an earth wall, and its interior will be partly covered with a compacted gravel hardstand for truck deliveries, materials mixing, composting in windrows, and compost stockpiling. One of two internal dams will collect leachate/stormwater, and the other will collect stormwater for composting stockpiles and windrows (Figure 3).

This geotechnical report is intended to accompany an Environmental Impact Statement for the Stage 2B activity. It describes the soils and near-surface bedrock geology of the facility, and from that basis suggests appropriate construction methods for hardstand and dams.

"

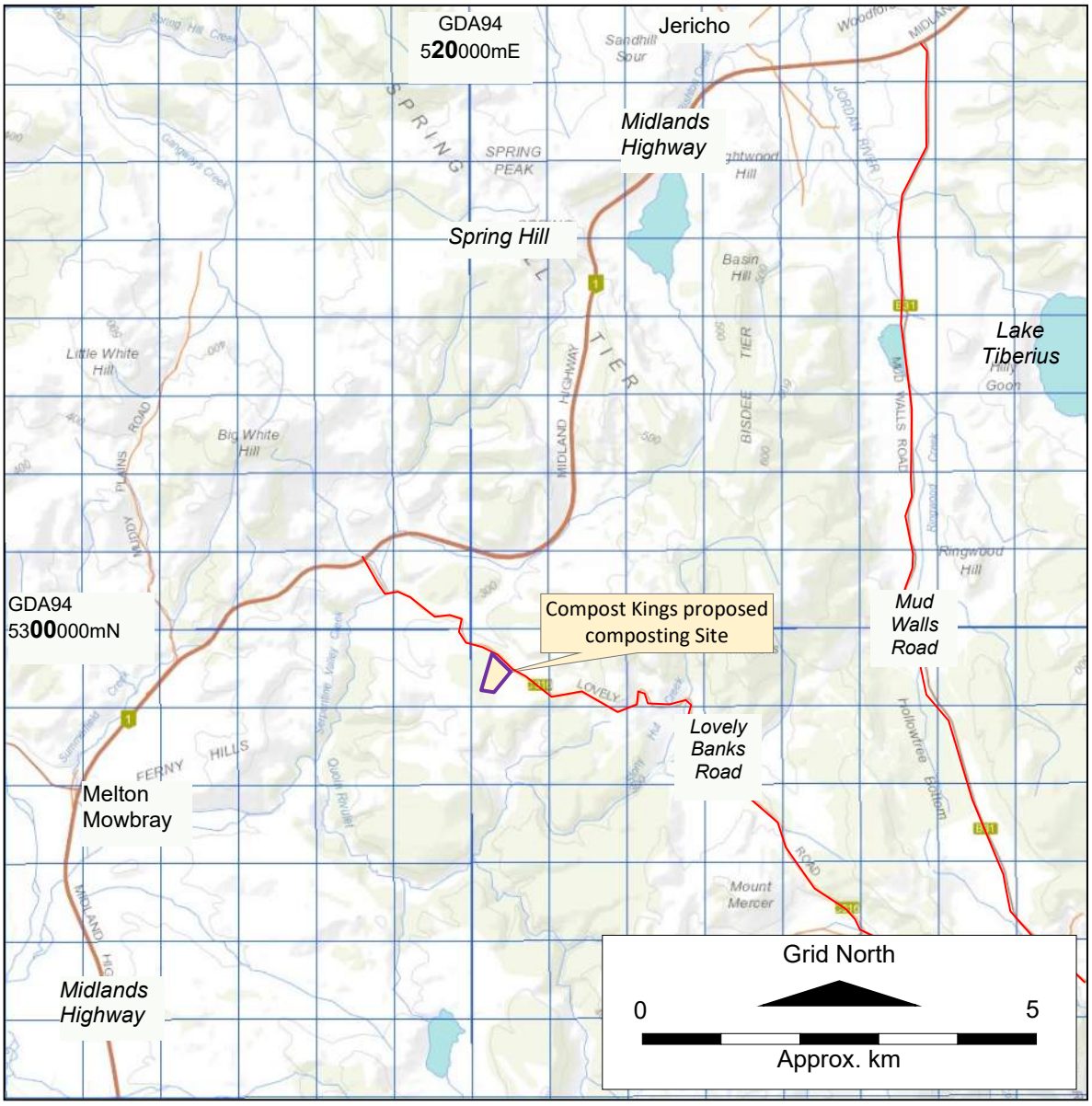

Figure 1. Location of the proposed Compost Kings composting Site on Lovely Banks Road, 2.8km east of its junction with the Midlands Highway.
Source of base map: www.thelist.tas.gov.au

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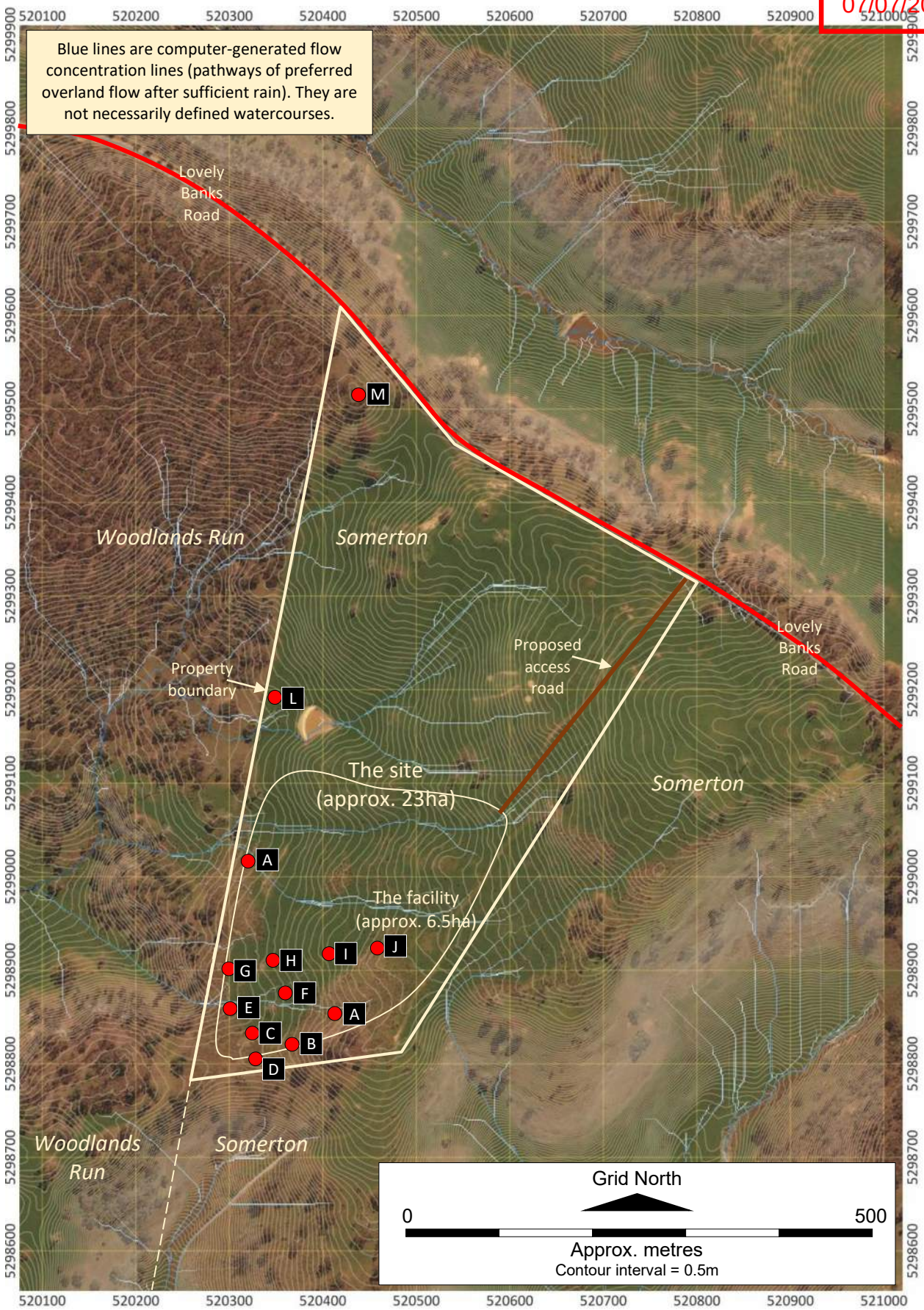

Figure 2. The proposed 6.5ha Compost Kings Facility within the 23ha Site on *Somerton*. Red circles are excavator test pits dug in August 2020 (See Figure 3 for details).
Source of base map: www.thelist.tas.gov.au

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1.2 Scope of geotechnical investigations at the Facility

Geotechnical investigations included desk-top studies, and field and laboratory work.

The desk-top studies comprised on-line searches for relevant geological maps and reports.

The field work was conducted in August 2020 and included:

- site mapping,
- the logging, photography and sampling of 13 excavator test pits,
- in-situ constant head soil permeability testing, and
- field trials of compacted concrete dust (pit wash) as a potential basal hardstand component.

One soil sample was submitted for laboratory compaction and permeability testing, and 10 samples were tested for dispersion.

Locations of test pits are shown in Figure 3. Table 1 summarises the logs of each pit, and Attachment 1 contains photographs of the pits.

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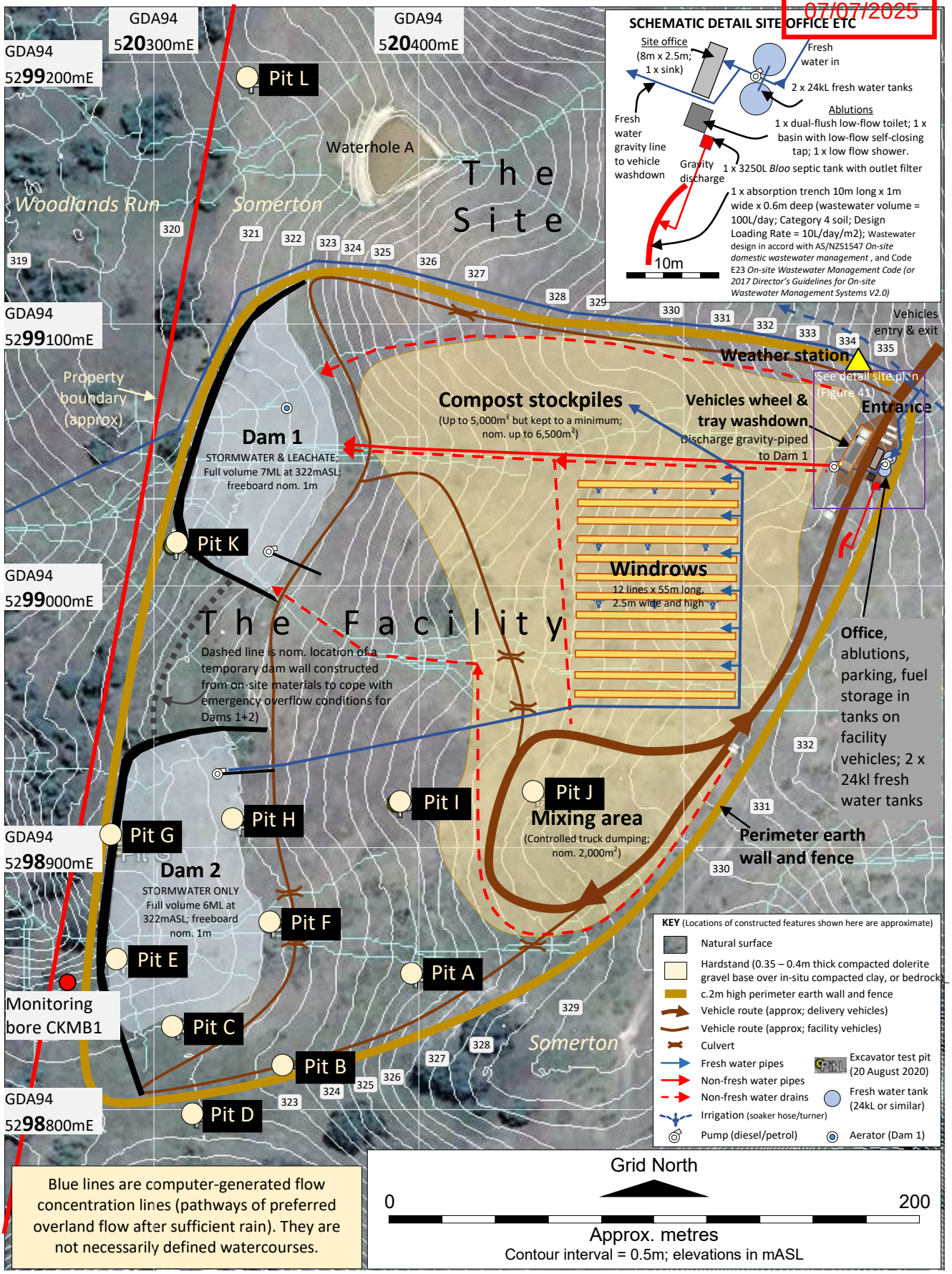

Figure 3. Locations of excavator test pits A – L (Pit M is off-map to the north) dug in August 2020 at and near the proposed composting facility, and of monitoring bore CKMB1 drilled December 2020 to a depth of 54.4m below ground (54.4mbg). See Table 1 for summary details of test pits. At the time of investigation, Pits A – J were located to assess soil and bedrock conditions within a proposed 3ha composting facility, and pits K – M were sited primarily to assess subsurface conditions for a now-abandoned road access. The proposed facility size has been increased to 6.5ha.

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2 RESULTS

2.1 Published bedrock geology

The published geology at and near the proposed composting facility includes Triassic sandstone, siltstone and mudstone, but the dominant rock type at the facility is fine – medium grained laminated sandstone (symbol TRsq in Figure 4). The outcrop patterns of an adjacent mappable sandstone unit (the dotted black lines in Figure 8) are subparallel to contours, indicating the sedimentary rocks in the area are essentially flat-lying.

There are no mapped faults within a kilometre or more of the facility.

2.2 Observed bedrock geology

2.2.1 Outcrops

Subhorizontal subcrops and outcrops of medium-grained, light yellowish grey sandstone mark the surface expression of at least one relatively resistant horizon, and are also scattered sporadically over the facility (Plate 1). The rock is sparsely jointed and slightly weathered (ie it has relatively high strength). It dips roughly parallel to the slope of the land (approximately west), and the hillside feature is interpreted as a cuesta[1]. South of the facility are intermittent low sandstone cliffs.

2.2.2 Test pit exposures

Sandstone, siltstone and mudstone bedrock was variously exposed in test pits (Layers 5, 6, 7 in Table 1).

2.2.3 From drilling groundwater monitoring bore CKMB1

Monitoring bore CKMB1[2] was drilled to 54.4m below ground (mbg) in December 2020 at the southwestern corner of the proposed facility (Figure 3). Beneath a metre of soil, sandstone bedrock occurred in the intervals 1 – 2mbg and 9.5 – 10.5mbg, but the rest of the hole consisted of siltstone and silty mudstone.

2.3 Soils

2.3.1 Soil texture and thickness

Excavator test pitting in August 2020 (Figure 3, Table 1, Plates 2 and 3, and Attachment 1) show mostly a duplex soil profile between the sporadic bedrock subcrops and outcrops. The profile comprises a dark-coloured sandy topsoil (SP; A1 and A2 horizons; Layer 1 in Table 1) over a lighter-coloured high plasticity sandy clay subsoil (CH, CL; B horizon; Layer 2), over a light-coloured extremely weathered sandstone (CL; Layer 3), siltstone or mudstone (CL; Layer 4) bedrock. The 7t excavator with a 1.25m wide mud bucket refused or was close to refusal in all but one test pit at depths in the 0.3 – 1.2m range.

The layer occurrences and thicknesses in the 10 test pits within the facility are:

- Topsoil (Layer 1 A1 and A2 horizons): Present in all 10 test pits; 0.25 – 0.8m thick; average 0.4m;
- Subsoil (Layer 2 B horizon): Present in 6 of 10 test pits; 0.1 – 0.55m thick; average 0.3m;

[1] A *cuesta* (from Spanish *cuesta* "slope") is a hill or ridge with a gentle slope on one side, and a steeper slope on the other, underlain by sedimentary rocks, the dip of which is the same as the gentler slope.

[2] For a detailed log of the monitoring bore, and results of groundwater sampling and analysis, see Cromer, W. C. (2024). *Hydrogeological report, proposed composting facility, Lovely Banks Road, Melton Mowbray.* Unpublished report for Compost Kings Tasmania by William C. Cromer Pty. Ltd., 28 February 2024.

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- EW sandstone (Layer 3 CB horizon): Present in 6 of 10 test pits; 0.15 – 0.3m thick; average 0.3m;
- EW siltstone/mudstone (Layer 4 CB horizon): Present in 2 of 10 test pits; 0.3m thick in both pits

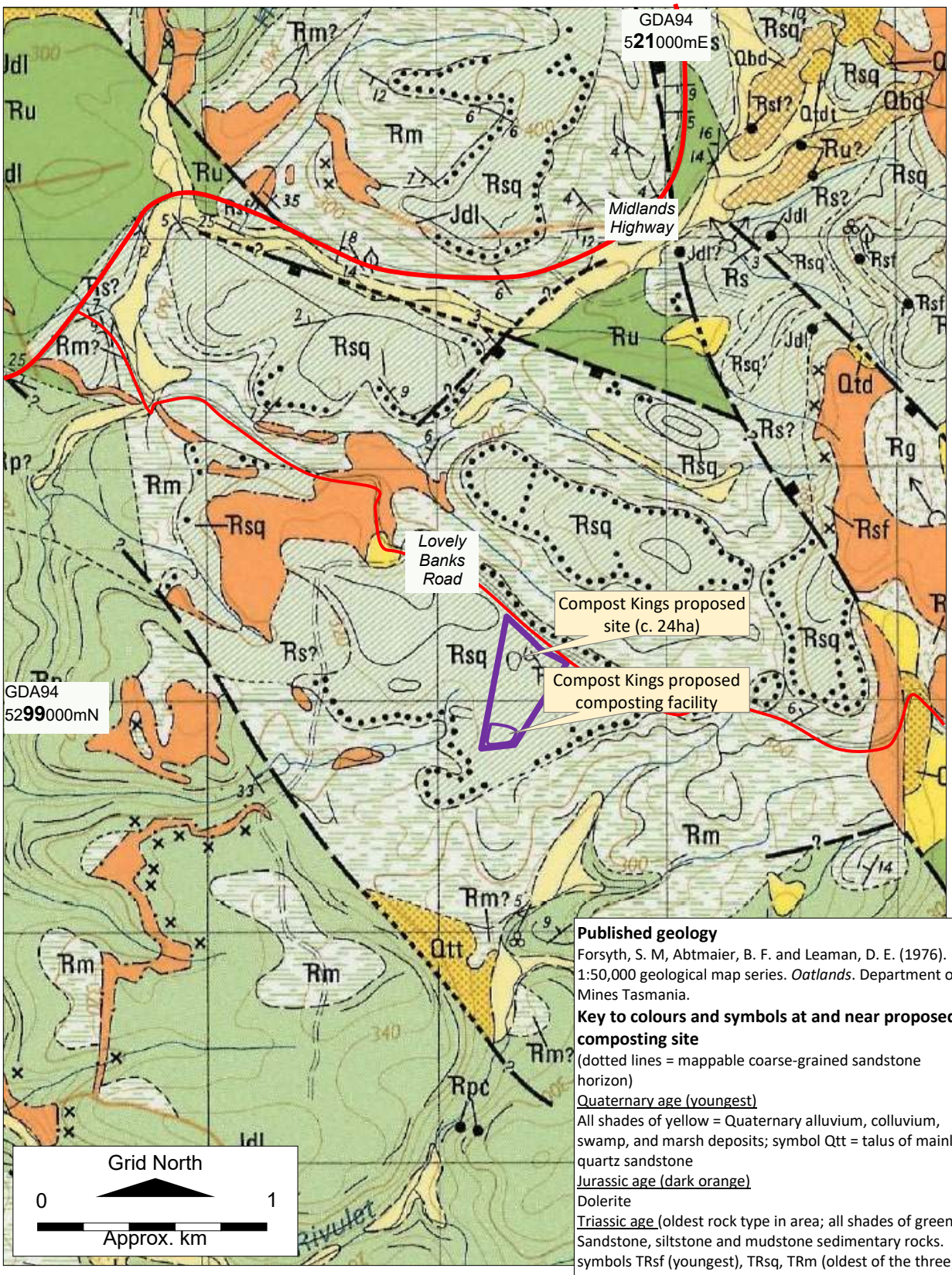

Figure 4. Published geology at and near the proposed composting facility.

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Plate 1. Outcrop of relatively unjointed and massive subhorizontal quartz sandstone at the proposed composting facility. The rock is interpreted as Triassic in age. The horizontal staff is one metre long.

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Table 1. Summary of test pits A – M dug 20 August 2020. For test pit locations refer to Figure 3. Photographs of all profiles are presented in Attachment 1.

Client	COMPOST KINGS	**Test pit**	**A**	**B**	**C**	**D**	**E**
Location	*Somerton*	**Depth dug (m)**	1.0	1.1	1.0	0.85	1.1
	Lovely Banks Road	**Easting (GDA94)**	520397	520348	520305	520312	520284
Date dug	20-Aug-20	**Northing (GDA94)**	5298854	5298819	5298834	5298800	5298859
		Water seepage (following rain)	Trace @ 0.5m	Trace @ 0.25m	Trace @ 0.5m	Trace @ 0.6m	Trace @ 0.5m

No.	Layer	Details	USCS	Interp.	Figures are depths (m) to top and bottom of layer				
1	SAND	Trace silt; grey grading to brown, grey, locally light grey towards base; fine-medium grained; occasional light yellow to orange sandstone clasts to 0.1m; sharp base; M-W; L-MD	SP	Topsoil (A1 and A2 horizons)	0 to 0.5	0 to 0.25	0 to 0.5	0 to 0.6	0 to 0.5
2	SANDY CLAY	Patchy yellowish orange, locally grey-blue; mod-high plasticity; sand increases to gradational base; M<PL; VSt	CH, loc CL towards base	Subsoil (B horizon)	0.5 to 0.7 D@0.7m	0.25 to 0.8; D@0.7	0.5 to 0.8 D@0.6m	0.6 to 0.7 D@0.7m	0.5 to 0.8 D@0.7m
3	Clayey SAND	Yellowish brown; light grey; usually with conspicuous subvertical polygonal fractures c. 0.3-0.5m across with light yellowish grey sandy clay or clayey sand infill; D-M; D-VD	CL grading to SC	CB horizon (EW Triassic sandstone bedrock)	0.7 to 1.0		0.8 to 1.0	0.7 to 0.85	0.8 to 1.1
4	SILTY CLAY	Includes clayey silt; grey, yellowish orange; mod plasticity; M<<PL; VST-H	CL	CB horizon (EW Triassic siltstone or mudstone bedrock)		0.8 to 1.1			
5	SAND STONE	Yellowish brown; light grey; subhorizontal; mostly massive or sparsely fractured; mod-high strength; D		Triassic-age bedrock	CR @ 1.0 on bedrock		CR @ 1.0 on bedrock	CR @ 0.85 on bedrock	
6	SILT STONE	Olive brown; subhorizontal; fractured; mod-high strength; D				CR @ 1.1 on bedrock			CR @ 1.1 on bedrock
7	MUD STONE	Grey, dark grey; subhorizontal; fractured; mod strength; D							

Notes and abbreviations

USCS = Unified Soil Classification System
Grey cells indicate USCS not applicable, and/or a missing layer or layers in a test pit
Easting and Northing coordinates from Google Earth and hand-held GPS. Datum is GDA94.

Waste water category Based on Table E1 of AS/NZS1547:2012 *On-site domestic wastewater management*

Samples D@1.0m = disturbed sample for disperison testing at indicated depth

Excavability Equipment = 7 tonne excavator; 1.25m mud bucket; Operator: Seaton Waterfield
ripper = single toothed ripper used; EAR = end as required; NR = no refusal; CR = close to refusal; R = refusal.

Weathering For rock only. F = fresh; SW = slightly weathered; MW = moderately weathered; HW = highly weathered; EW = extremely weathered (ie soil properties; material can be remolded in the hand, with or without water)

Moisture D = dry; M = moist (M<=>PL = moisture less than, equal to or greater than Plastic Limit); W = wet.

Consistency Fb = Friable (crumbles to powder when scraped with thumbnail)
S = Soft (Easily penetrated by fist; 25 – 50kPa)
F = Firm (Easily penetrated by thumb; 50 – 100kPa)
St = Stiff (Indented with thumb; penetrated with difficulty; 100 – 200kPa)
VSt = Very stiff (Easily indented with thumbnail; 200 – 400kPa)
H = Hard (Indented by thumbnail with difficulty; >400kPa)

Relative density VL = Very loose (ravelling)
L = Loose (easy shovelling)
MD = Medium dense (hard shovelling)
D = Dense (picking)
VD = Very dense (hard picking)

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Table 1 (cont'd)

Client	COMPOST KINGS	**Test pit**	**F**	**G**	**H**	**I**	**J**
Location	*Somerton*	**Depth dug (m)**	1.2	0.8	0.9	0.30	0.4
	Lovely Banks Road	**Easting (GDA94)**	520342	520284	520329	520391	520444
Date dug	20-Aug-20	**Northing (GDA94)**	5298873	5298902	5298912	5298919	5298923
		Water seepage (following rain)	Trace @ 0.4m	None	Trace @ 0.3m	None	Trace @ 0.4m

No.	Layer	Details	USCS	Interp.	Figures are depths (m) to top and bottom of layer				
1	SAND	Trace silt; grey grading to brown, grey, locally light grey towards base; fine-medium grained; occasional light yellow to orange sandstone clasts to 0.1m; sharp base; M-W; L-MD	SP	Topsoil (A1 and A2 horizons)	0 to 0.4	0 to 0.8 (80% ang. boulders)	0 to 0.3	0 to 0.3 (sandy silt)	0 to 0.4
2	SANDY CLAY	Patchy yellowish orange, locally grey-blue; mod-high plasticity; sand increases to gradational base; M<PL; VSt	CH, loc CL towards base	Subsoil (B horizon)			0.3 to 0.6 D@0.5m		
3	Clayey SAND	Yellowish brown; light grey; usually with conspicuous subvertical polygonal fractures c. 0.3-0.5m across with light yellowish grey sandy clay or clayey sand infill; D-M; D-VD	CL grading to SC	CB horizon (EW Triassic sandstone bedrock)	0.4 to 0.9 D@0.65 m		0.6 to 0.9		
4	SILTY CLAY	Includes clayey silt; grey, yellowish orange; mod plasticity; M<<PL; VST-H	CL	CB horizon (EW Triassic siltstone or mudstone bedrock)	0.9 to 1.2				
5	SAND STONE	Yellowish brown; light grey; subhorizontal; mostly massive or sparsely fractured; mod-high strength; D		Triassic-age bedrock		CR @ 0.8 on bedrock	CR @ 1.0 on bedrock		CR @ 0.4 on bedrock
6	SILT STONE	Olive brown; subhorizontal; fractured; mod-high strength; D							
7	MUD STONE	Grey, dark grey; subhorizontal; fractured; mod strength; D			CR @ 1.2 on bedrock			R @ 0.3 on bedrock	

Notes and abbreviations

USCS = Unified Soil Classification System
Grey cells indicate USCS not applicable, and/or a missing layer or layers in a test pit
Easting and Northing coordinates from Google Earth and hand-held GPS. Datum is GDA94.

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Weathering For rock only. F = fresh; SW = slightly weathered; MW = moderately weathered; HW = highly weathered; EW = extremely weathered (ie soil properties; material can be remolded in the hand, with or without water)

Moisture D = dry; M = moist (M<=>PL = moisture less than, equal to or greater than Plastic Limit); W = wet.

Consistency Fb = Friable (crumbles to powder when scraped with thumbnail)
S = Soft (Easily penetrated by fist; 25 – 50kPa)
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VSt = Very stiff (Easily indented with thumbnail; 200 – 400kPa)
H = Hard (Indented by thumbnail with difficulty; >400kPa)

Relative density VL = Very loose (ravelling)
L = Loose (easy shovelling)
MD = Medium dense (hard shovelling)
D = Dense (picking)
VD = Very dense (hard picking)

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Table 1 (cont'd)

				K	L	M
Client	COMPOST KINGS		**Test pit**			
Location	*Somerton*		**Depth dug (m)**	0.7	0.95	1.4
	Lovely Banks Road		**Easting (GDA94)**	520304	520339	520407
Date dug	20-Aug-20		**Northing (GDA94)**	5298018	5299197	5299548
			Water seepage (following rain)	Trace @ 0.25m	Trace @ 0.25m	None

No.	Layer	Details	USCS	Interp.	Figures are depths (m) to top and bottom of layer		
1	SAND	Trace silt; grey grading to brown, grey, locally light grey towards base; fine-medium grained; occasional light yellow to orange sandstone clasts to 0.1m; sharp base; M-W; L-MD	SP	Topsoil (A1 and A2 horizons)	0 to 0.25	0 to 0.25	0 to 0.3
2	SANDY CLAY	Patchy yellowish orange, locally grey-blue; mod-high plasticity; sand increases to gradational base; M<PL; VSt	CH, loc CL towards base	Subsoil (B horizon)	0.25 to 0.5 D@0.5m	0.25 to 0.6; D@0.5	
3	Clayey SAND	Yellowish brown; light grey; usually with conspicuous subvertical polygonal fractures c. 0.3-0.5m across with light yellowish grey sandy clay or clayey sand infill; D-M; D-VD	CL grading to SC	CB horizon (EW Triassic sandstone bedrock)	0.5 to 0.95		
4	SILTY CLAY	Includes clayey silt; grey, yellowish orange; mod plasticity; M<<PL; VST-H	CL	CB horizon (EW Triassic siltstone or mudstone bedrock)		0.6 to 0.954 (mud stone clasts)	0.3 to 1.4 D@0.6m
5	SAND STONE	Yellowish brown; light grey; subhorizontal; mostly massive or sparsely fractured; mod-high strength; D		Triassic-age bedrock	R @ 0.95 on bedrock		
6	SILT STONE	Olive brown; subhorizontal; fractured; mod-high strength; D					EAR @ 1.4 in bedrock
7	MUD STONE	Grey, dark grey; subhorizontal; fractured; mod strength; D				CR @ 0.95 on bedrock	

Notes and abbreviations

USCS = Unified Soil Classification System
Grey cells indicate USCS not applicable, and/or a missing layer or layers in a test pit
Easting and Northing coordinates from Google Earth and hand-held GPS. Datum is GDA94.

Waste water category Based on Table E1 of AS/NZS1547:2012 *On-site domestic wastewater management*

Samples D@1.0m = disturbed sample for disperison testing at indicated depth

Excavability Equipment = 7 tonne excavator; 1.25m mud bucket; Operator: Seaton Waterfield
ripper = single toothed ripper used; EAR = end as required; NR = no refusal; CR = close to refusal; R = refusal.

Weathering For rock only. F = fresh; SW = slightly weathered; MW = moderately weathered; HW = highly weathered; EW = extremely weathered (ie soil properties; material can be remolded in the hand, with or without water)

Moisture D = dry; M = moist (M<=>PL = moisture less than, equal to or greater than Plastic Limit); W = wet.

Consistency Fb = Friable (crumbles to powder when scraped with thumbnail)
S = Soft (Easily penetrated by fist; 25 – 50kPa)
F = Firm (Easily penetrated by thumb; 50 – 100kPa)
St = Stiff (Indented with thumb; penetrated with difficulty; 100 – 200kPa)
VSt = Very stiff (Easily indented with thumbnail; 200 – 400kPa)
H = Hard (Indented by thumbnail with difficulty; >400kPa)

Relative density VL = Very loose (ravelling)
L = Loose (easy shovelling)
MD = Medium dense (hard shovelling)
D = Dense (picking)
VD = Very dense (hard picking)

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Plate 2 (above). Sparsely jointed, subhorizontal mudstone (Layer 6 in Table 1) beneath 0.3m of brown sandy silt (Layer 1) in test pit I. The numbers on the staff are decimetres.

Plate 3 (below). In test pit H, the 7t excavator was close to refusal in weathered sandstone bedrock (Layer 5) beneath a metre of brown sandy topsoil (Layer 1), sandy clay subsoil (Layer 2) and clayey sand (Layer 3). The numbers on the staff are decimetres.

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2.3.2 Soil permeability testing

Field testing

Two adjacent in-situ permeability tests using the *Cromer Constant Head Field Permeameter*[3] were conducted at the hardstand test site (Figure 3) on 12 January 2021 (Plate 4).

The tested interval in both cases was 0.8 – 1.0mbg, a 0.2m zone which was mostly located within the sandy clay (CH, CL) subsoil (B horizon; Layer 2 in Table 1).

Results were:

Test 1: Permeability = 0.23m/day = 2.7 x 10^{-6}m/s
Test 2: Permeability = 0.002m/day = 2.4 x 10^{-8}m/s

The 100-fold difference in permeability over a lateral distance of about a metre is explained by test 1 encountering more microscopic fractures than test 2. Such variability is common in soils.

Plate 4. In-situ permeability testing of the sandy clay subsoil (Layer 2 in Table 1). About 0..3m of Layer 1 topsoil had been previously removed for hardstand testing.

Laboratory testing

A 25kg sample of Layer 2 sandy clay collected on 12 January 2021 from the hardstand test location was submitted to ADG Laboratories in Mornington for falling head permeability testing. The results (Figure 5) show the sample as submitted had an initial dry density of 1.71t/m^3 and a moisture content of 10.4%. On 95% compaction to a density of 1.81t/m3 at a moisture content of 14.2%, the sample returned a falling head permeability of 3.18 x 10^{-10}m/s.

[3] See details (including a demonstration video) on my website.

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ADG LABORATORIES
materials testing laboratories

Unit 8A 121 Mornington Rd Mornington
Ph (03) 62446884 Fax (03) 62451498
ACN 117 593 254

FALLING HEAD PERMEABILITY

job No 0292/21/1H

client **B Cromer** date tested 18-25/1/2021

project **Material Evaluation** cert No 0292/21/1H/AA

location **Compost Kings, Hardstand**

sampled by: **Client** date received 14/1/2021

Sample Identification	Sample Description	coefficient of permeability **m/sec**	initial dry density t/m^3	field moisture content %
H21/050	Maximum Dry Density 1.81 t/m^3 Optimum Moisture Content 14.2%	**3.18×10^{-10}**	1.72	10.4

Note:

1 Hobart tap water used. Mean temperature 15^0 C.

2 Specimen remoulded to a target density of 95% Standard Compaction

Figure 5. Results of a laboratory falling head permeability test on a 25kg sample of sandy clay (Layer 2 in Table 1) from the hardstand test site.

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2.3.3 Tunnel erosion and soil dispersivity

No evidence of tunnel erosion (a sign of dispersive soils[4]) was noted at the facility, but possible localised collapsed tunnel erosion is present on the higher side of the small dam about 250m to the north (Dam A in Figure 3), and there appears to be extensive development in the creek about 500m to the south (in a separate surface water sub-subcatchment).

To assess the potential for tunnel erosion to develop from future activities at the facility, ten soil samples from test pits were tested[5] for dispersion. Results are shown in Figures 6 and 7. Most samples at and near the proposed facility are highly dispersive, and will require management.

Management options are canvassed in DPIW (2009)[6].

[4] Dispersive soils are sodic soils with exchangeable sodium (ESP) greater than 6%. They can cause tunnel erosion. Tunnels may locally collapse, producing a line of open channels and/or potholes. These are widespread in southern Tasmania, and particularly on soils developed on Triassic-age rocks. See the Tasmanian DPIW *Dispersive Soils and their Management*. Tunnels in dispersive soils typically result from human-caused ground disturbance. They affect soil strength, and cause erosion, undermining, sedimentation, and loss of amenity and property values. Once started, they are difficult to manage.

[5] The laboratory work for dispersion was done in the W. C. Cromer Pty. Ltd. laboratory. The laboratory is not NATA-registered for the test. The dispersion test is a slightly modified version of the method described in Section E7 of AS/NZS1547:2012 *On-site domestic wastewater management*. In separate containers, duplicate peds of a soil sample (one air set air dried, the other remoulded) are immersed in water for 24 hours and their performance assessed. The behavior of the peds may be (a) nothing (b) slaking (c) dispersion to produce Emerson Class No. 1 – 8. Estimating the degree of dispersion of a sample to obtain its Emerson Class Number can be subjective. Note also that the test as described does not distinguish between Emerson Class 4, 5 and 6.

[6] DPIW (2009). *Dispersive Soils and their Management: Technical Reference Manual.* Department of Primary Industries and Water, April 2009.

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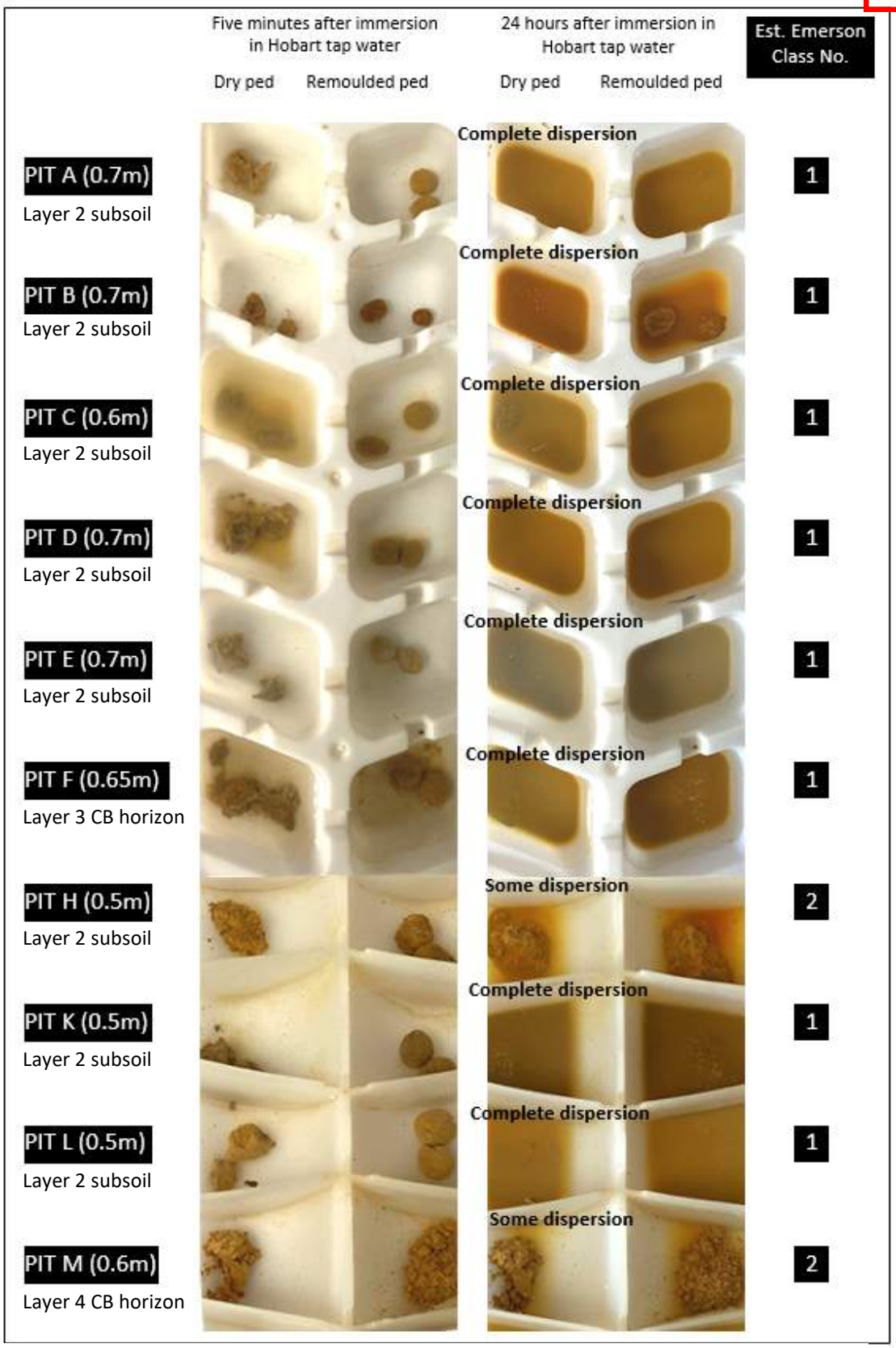

Figure 6. Results of soil dispersion testing of samples collected from test pits. All samples are moderately – highly dispersive, with estimated Emerson Class Numbers of 1 and 2. See Table 1 for descriptions of soil layers, Figure 3 for test pit locations, and Attachment 1 for photographs of soil profiles in pits.

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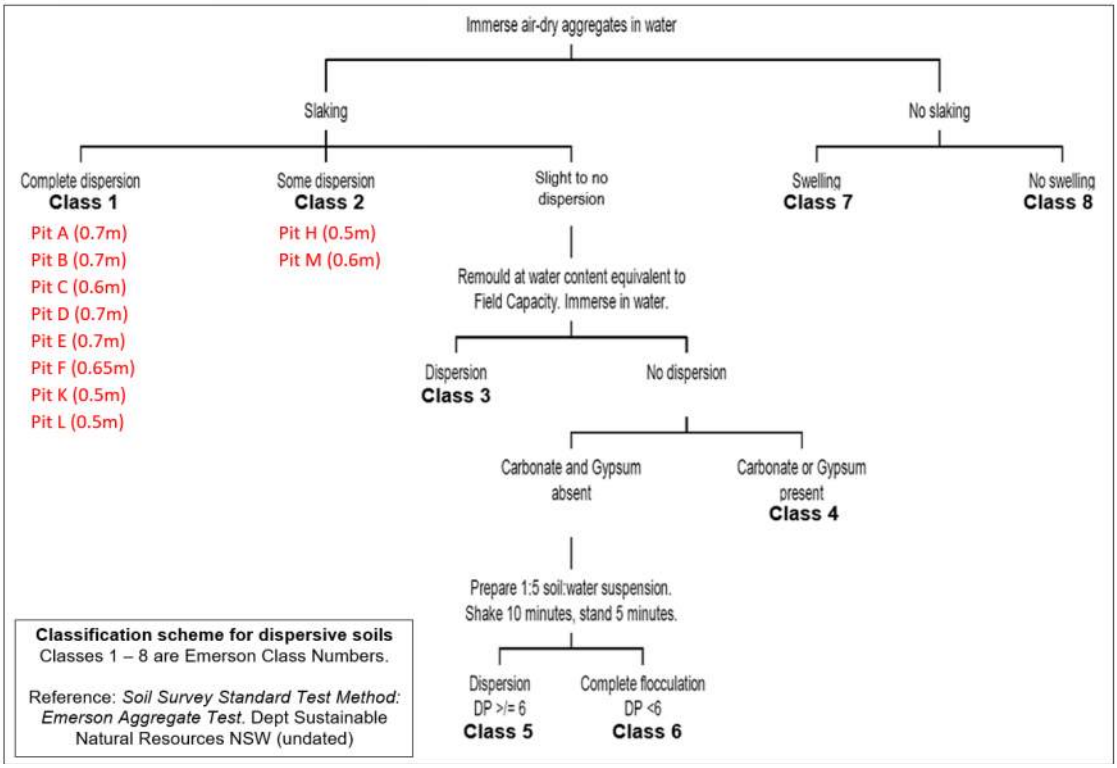

Figure 7. Flow chart for classifying soils tested for dispersion. All samples at the proposed composting facility are moderately – highly dispersive, with estimated Emerson Class Numbers of 1 and 2.
Source: AS1289.3.8.1-1997.

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3 DISCUSSION

3.1 Proposed hardstand design

Based on the geotechnical investigations in this report the proposed method of hardstand construction at the facility (Figure 8) involves stripping topsoil (for re-use in the perimeter wall etc), compaction of subsoil clays (the hardstand subgrade) to nominally 1 x 10^{-10}m/s permeability, and covering with compacted gravel road base. The underlying CB horizon on bedrock, and the bedrock itself, are also judged to be of low permeability.

The area within the facility proposed to be converted to hardstand is shown in Figure 3.

Most of the road base will be obtained from a dolerite quarry on land owned by Justin Jones (*Somerton*) near Spring Hill. Other quarries in the vicinity of the facility may also be used.

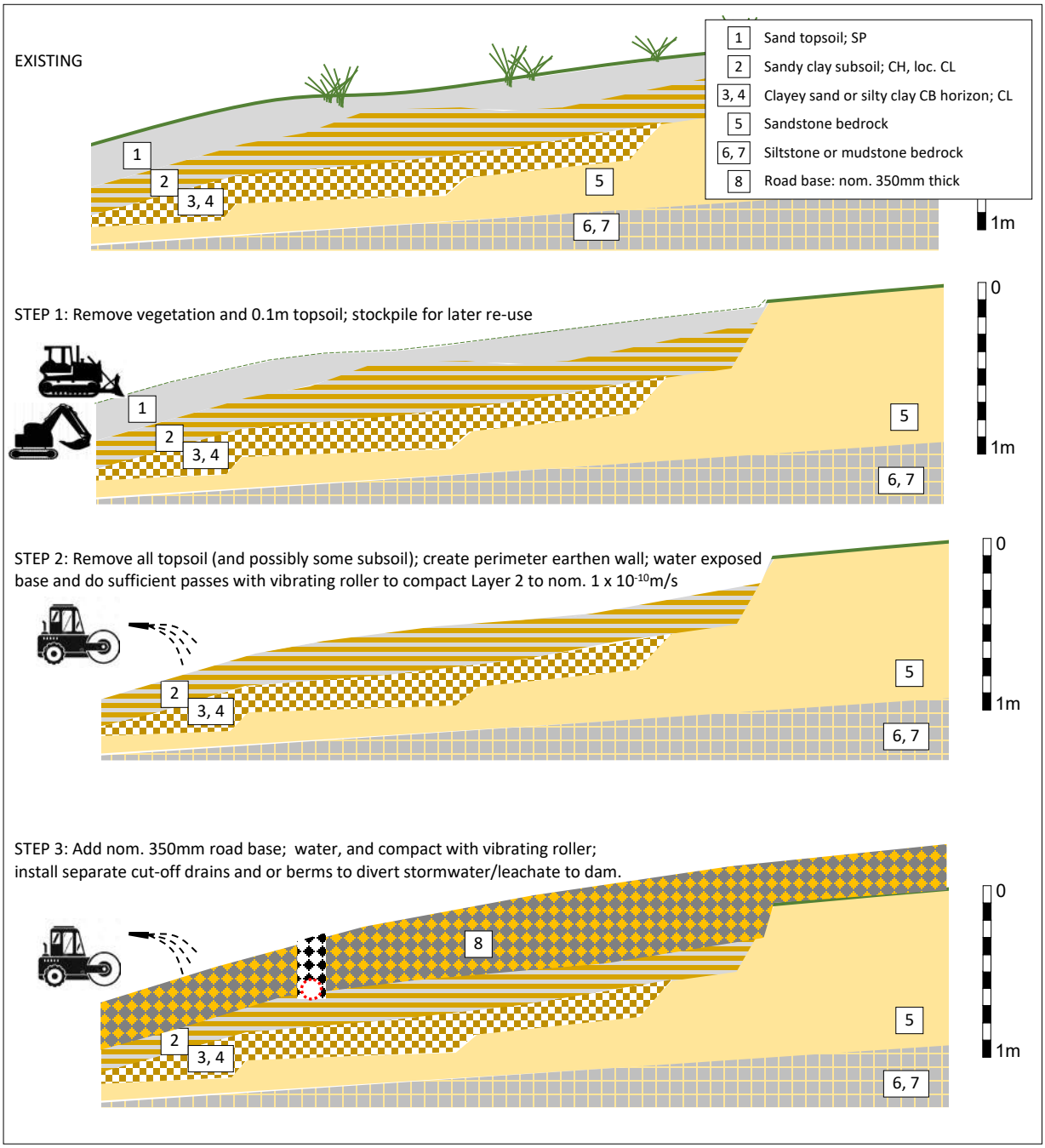

Figure 8. Proposed method of hardstand construction for the facility.

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3.2 Proposed dam construction method

Based on the geotechnical investigations in this report it is proposed that the two stormwater/leachate dams within the facility will be constructed in a manner similar to that depicted in Figure 9.

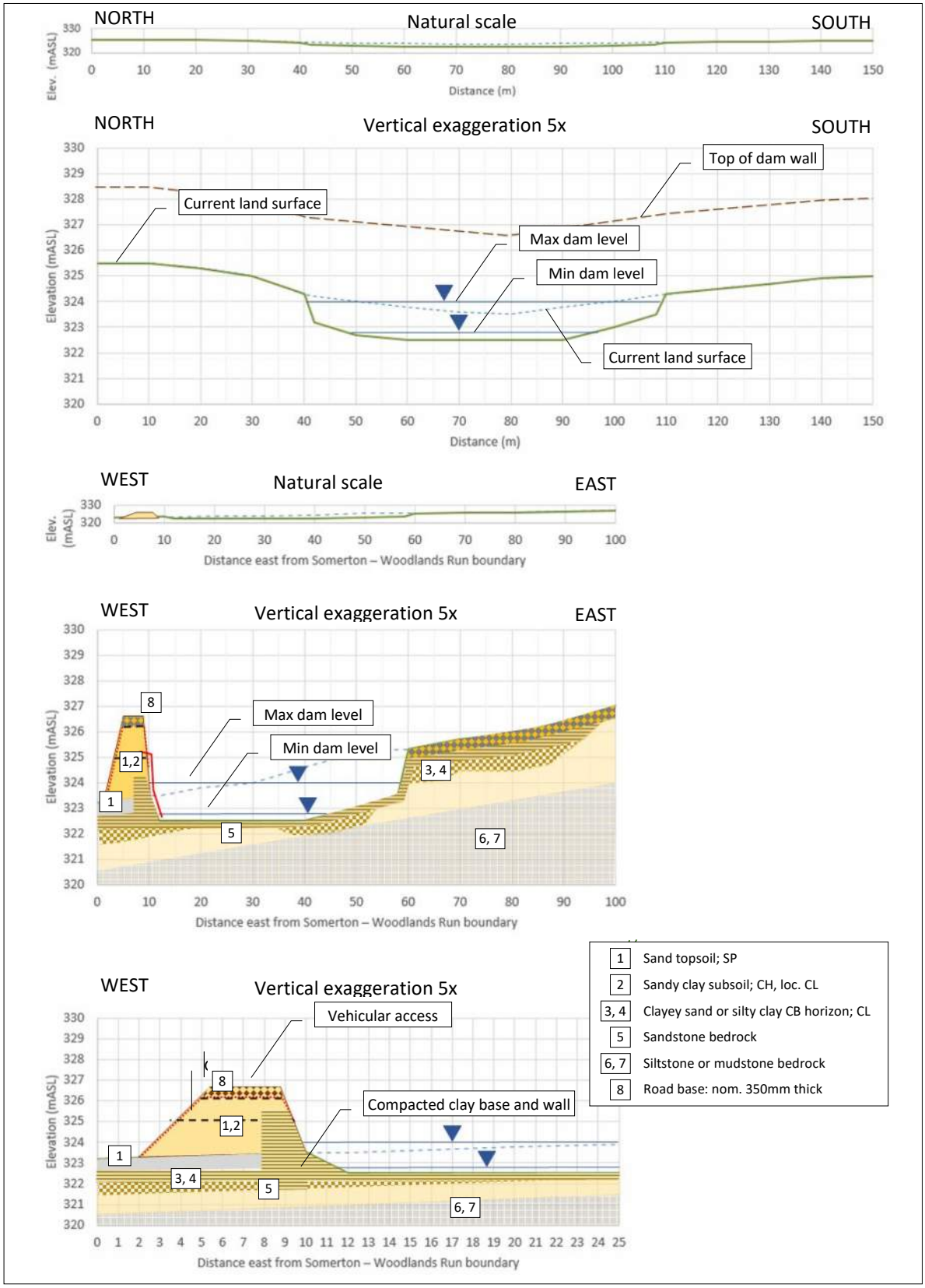

Figure 9. Proposed method of dam construction for the facility.

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3.3 Proposed earth wall around the facility

The proposed earth wall around the facility will be constructed from topsoil (and a small proportion of subsoil). It will be nominally 2 – 2.5m high, and nominally 4 – 5m wide at its base. The top will be slightly rounded for pedestrian access, and an animal-proof fence will be constructed on it. Natural grasses will be permitted to vegetate the sides.

3.4 Managing dispersive soil within the facility

The main dispersive material within the facility is the clayey subsoil (B horizon).

Effective management is to avoid point discharges to the subsoil, and this will be achieved by (a) covering the working areas of the facility with hardstand, and (b) avoiding disturbing natural soil, and lining all stormwater diversion and leachate drains with geofabric (Figure 8).

4 CONCLUSIONS

The proposed composting facility is underlain by Triassic sandstone and mudstone bedrock at shallow depth.

The bedrock is variably weathered in places to a low permeability, dense to very dense clayey sand CB horizon. There are also patchy occurrences of massive (ie unjointed), high strength sandstone at ground level.

Soils are duplex profiles with a sandy topsoil over a high plasticity clay subsoil. The subsoil is dispersive.

Field constant head permeability testing of the subsoil returned variable results in the 10^{-6} – 10^{-8}m/s range. Laboratory testing of similar, compacted material returned values around 10^{-10}m/s.

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Attachment 1

Photographs of excavator test pits, 20 August 2020

(14 pages including this page)

The staff in the photographs is graduated in re- and black-coloured segments each one metre long.
The numbers are decimetres.
The excavator was 5 tonne in weight, using a 1.25m wide mud bucket.

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COMPOST KINGS TASMANIA

PROPOSED COMPOSTING FACILITY
LOVELY BANKS ROAD, MELTON MOWBRAY

HYDROGEOLOGICAL REPORT

February 2024

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Cover photo

Drilling groundwater monitoring bore CKMB1 to a depth of 54.4m at the site of the proposed composting facility off Lovely Banks Road, Melton Mowbray,
Photo: 15 December 2020

Refer to this report as

Cromer, W. C. (2024). *Hydrogeological report, proposed composting facility, Lovely Banks Road, Melton Mowbray.* Unpublished report for Compost Kings Tasmania by William C. Cromer Pty. Ltd., 28 February 2024.

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SUMMARY

At and in the vicinity of the proposed Compost Kings composting facility, all bedrock types constitute a single fractured hard-rock aquifer with groundwater in unconfined conditions.

Twenty five records of drilling for groundwater in the district show 88% bores were in Triassic sedimentary rocks (and the remainder in dolerite), the average depth drilled was 80m (range 5 – 150m), four bores (16%) were functioning, yields ranged from 0 – 10L/s and salinity in the Triassic rocks ranged from 500 – 1700mg/L total dissolved solids.

At a local scale, shallow groundwater moves in all directions towards minor un-named watercourses, in a westerly direction directly beneath the facility. At this scale also, the facility lies wholly within a single sub-subcatchment, but its southern and southeastern boundaries correspond to sub-subcatchment divides. At an intermediate scale, groundwater flow beneath the facility is to the west southwest towards Serpentine Valley Creek. Still deeper groundwater flows generally westwards towards the Jordan River.

Groundwater travel times across catchments of all sizes are estimated to range from decades (local-scale) to millennia (regional-scale), at rates of a few centimeters per year.

Beneath the facility, the local-scale groundwater in a monitoring bore is at depths up to 10m. In this nested bore, a 15m difference in hydraulic head between two short separated screened sections 32m vertically apart indicates groundwater movement is downwards so that the site is in a recharge (not discharge) area. Further, the rate of head loss of about 0.5m/m of water movement indicates relatively low permeability.

In the monitoring bore, the electrical conductivity of the groundwater entering the higher screened interval was 8.9mS/cm and 7.8mS/cm in January and June 2021 respectively. The electrical conductivity of the groundwater entering the lower screened interval was 2.9mS/cm and 2.1mS/cm in January and June 2021 respectively.

With appropriate management, risks to current groundwater conditions from the proposed composting operations are judged to be Very Low to Low. Management includes adequate initial compaction of hardstand subgrade, stormwater/leachate collection drains discharging to two dams, and continued groundwater monitoring.

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1 INTRODUCTION

1.1 Background

Compost Kings Tasmania ("Compost Kings") proposes a 10,000tpa composting facility on about 6.5ha of agricultural land on *Somerton*, a property on Lovely Banks Road, near Melton Mowbray (Figure 1).

This hydrogeological report is intended to accompany an Environmental Impact Statement EIS for the Stage 2B activity. It describes existing local-, intermediate- and regional-scale groundwater conditions at and near the proposed facility.

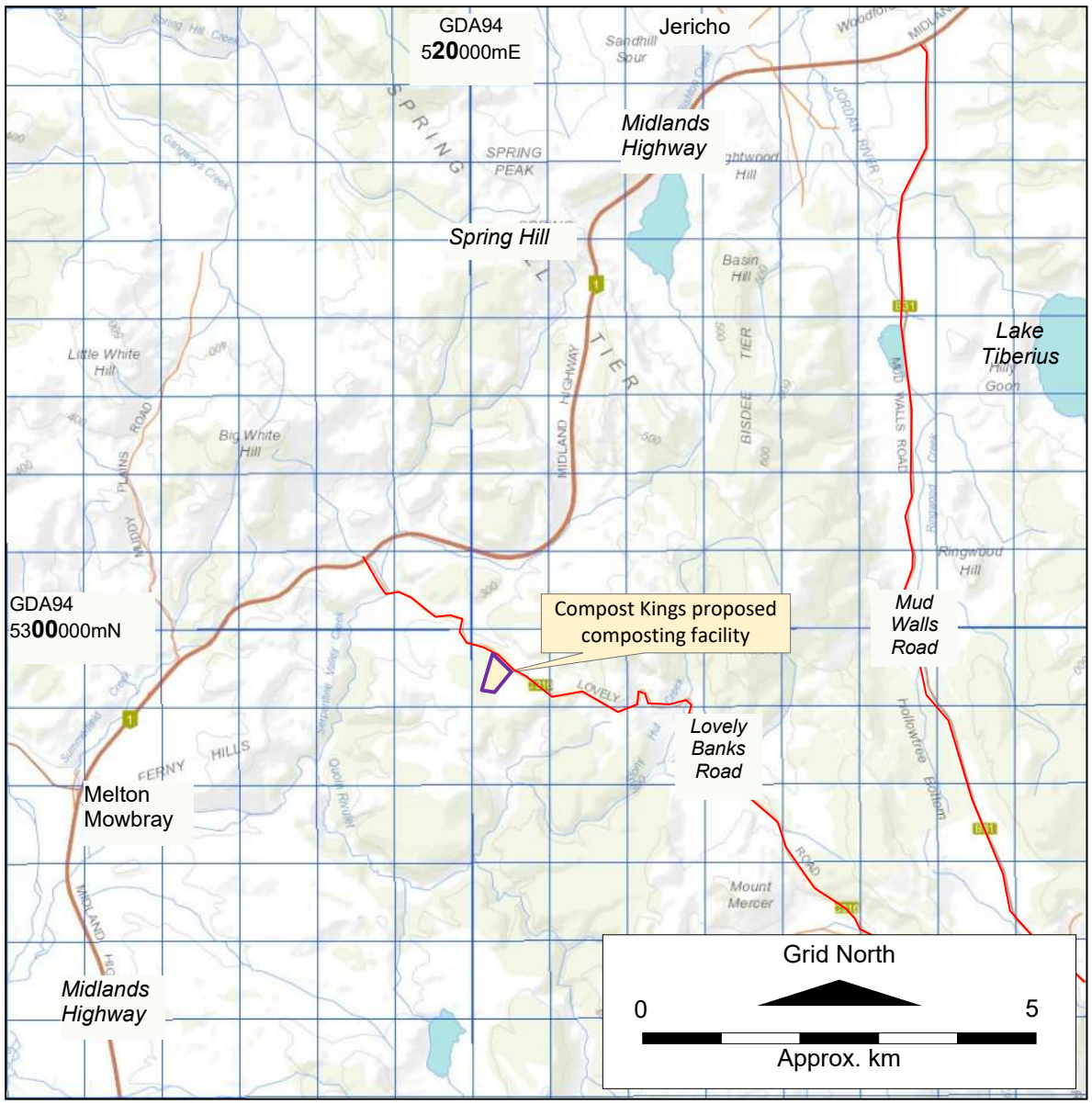

Figure 1. Location of the proposed Compost Kings composting Site on Lovely Banks Road, 2.8km east of its junction with the Midlands Highway.

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1.2 Brief for this report

In relation to groundwater issues, Section 6.3 of the General Guidelines for EIS's[1] require the EIS to discuss "potential impacts of the proposal on groundwater (quality and quantity), including

- a map showing the location of any groundwater bores.
- a conceptual groundwater model for regional and local aquifer flows."

Key issues listed in the site-specific EIS Guidelines[2] include "*Potential for contamination of surface and/or ground water with leachate or from other sources related to operation of the proposed compost facility."*

Section 6.3 of the same EIS requires the following to be addressed:

- "Describe the seasonal variation in depth to groundwater and direction of groundwater flow.
- Identify risks in relation to leachate/wastewater potentially contaminating groundwater.
- Details of whether there are any groundwater users in the immediate catchment of the proposed composting facility, including a map showing the location of any groundwater bores in the immediate catchment of the proposed composting facility."

1.3 Groundwater investigations for this report

Investigations in relation to the scope of this report included desk-top studies and field work.

The desk-top studies comprised on-line searches for relevant hydrogeological reports, water bore records, and geological maps.

The field work at the site of the proposed facility included:

- geotechnical investigations in August 2020 (site mapping, test pitting, soil sampling and field and laboratory permeability testing)[3],
- the drilling, logging, and completion of a nested pair of groundwater monitoring bores installed in December 2020, and
- an initial surface water and groundwater sampling event (SWGWME#1) in January 2021, and a second event (SWGWME#2) in June 2021.

[1] EPA (2019). *Guidelines for Preparing an Environmental Impact Statement.* Environment Protection Authority, March 2019.

[2] EPA (2020). *Environmental Impact Statement Project Specific Guidelines For Seaton Waterfield/Compost Kings Composting facility, Lovely Banks Road, Melton Mowbray, Tasmania.* Environment Protection Authority, December 2020

[3] The site investigations in August 2020 were done following the submission by Compost Kings of two earlier DAs to SVC – in July and August 2020, for permits to first compost 30,000tpa and subsequently 1000tpa. Both were withdrawn and replaced by the current DA for 10000tpa. See Cromer, W. C. (2024). *Geotechnical report, proposed composting facility, Lovely Banks Road, Melton Mowbray.* Unpublished report for Compost Kings Tasmania by William C. Cromer Pty. Ltd., 28 February 2024.

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2 HYDROGEOLOGY

2.1 Topography, relief, surface drainage, rainfall and evaporation

2.1.1 Topography, relief, and surface drainage

The topography in the district is youthful (Figures 2 and 3). Relief is about 400m, rising from 200 – 250m in the valley of Quoin Rivulet near Melton Mowbray, to 600 – 650m along the north-south trending Bisdee Tier, Green Timbers and Mt. Mercer a few kilometres east of the proposed composting facility.

The site of the facility is on a broad (400m wide) south-facing hilltop between about 320m and 330m elevation, on a hillside segment sloping west at an average gradient of 3^0. The site is located very close to a surface water sub-subcatchment divide, so that all surface drainage is westwards via an un-named tributary of Serpentine Valley Creek.

2.1.2 Rainfall and evaporation

Rainfall

Rainfall has been recorded since 1908 at *Lovely Banks* on the Midlands Highway, 2.8km north-northwest of the proposed compost facility.

Mean annual rainfall is 501mm, and the 95%ile annual rainfall is 722mm. Mean monthly rainfall is fairly evenly distributed during the year in the 40 – 50mm range, and 95%ile monthly rainfall is approximately twice mean monthly rainfall and more variable (70 – 100mm).

Evaporation[4]

Annual evaporation at *Lovely Banks* totals about 1250mm. On a monthly basis, evaporation exceeds mean rain in all months except June and July, and exceeds 95%ile monthly rain in six months.

On a seasonal basis, evaporation ranges from 0 – 1mm/day in winter (June – July) to 5 – 12mm in summer (November – January). Evaporation on average exceeds rainfall on about 290 days per year (80% of days).

2.2 Geology

The proposed composting facility and the broader district lies wholly within the Tasmania Basin, a large area of midland and southeastern Tasmania occupied by Permian marine and Triassic non-marine sedimentary rocks, and intruded by sheets of Jurassic-age dolerite (Figure 4). The sedimentary rocks include mostly sub-horizontal sandstone, siltstone, and mudstone. Normal faulting is fairly common. However, there are no mapped faults within a kilometre or so of the facility.

Within the proposed composting facility, subhorizontal subcrops and outcrops of medium-grained, light yellowish grey sandstone are scattered sporadically at ground level over the area.

In monitoring bore CKMB1 drilled at the southwestern corner of the facility, sandstone bedrock occurred in the intervals 1 – 2mbg and 9.5 – 10.5mbg, but the rest of the hole to 54.4m depth consisted of siltstone and silty mudstone.

[4] Evaporation x relevant crop factor = evapotranspiration. The crop factor may be less than or greater than unity. But the composting facility will be covered by hardstand and not crops, and it is considered that evaporation is the more appropriate factor to use for this site. In the warm windrows it may be >1 much of the time, but a value of unity is conservatively used here.

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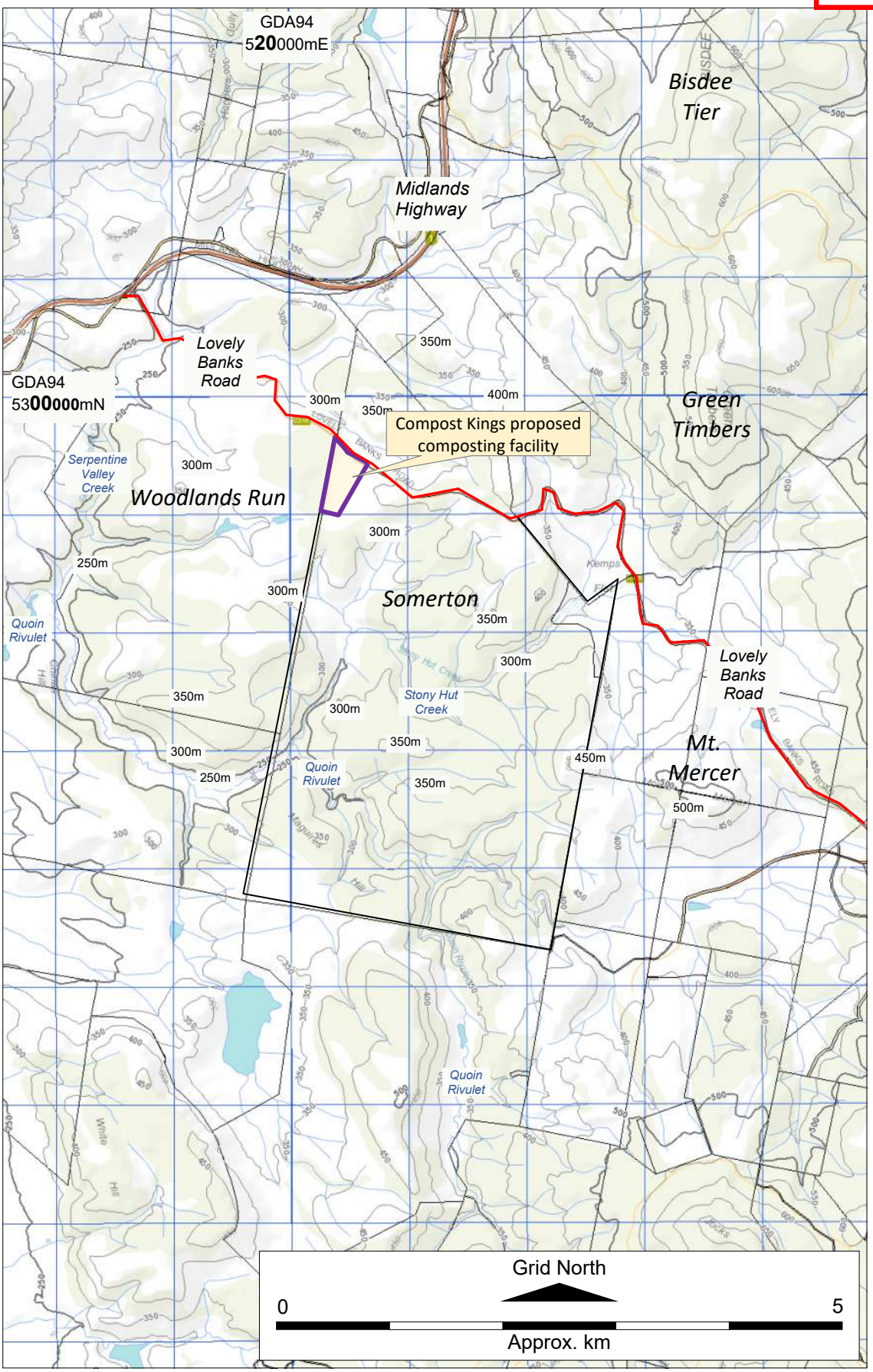

Figure 2. Topography, relief, and surface drainage.
Source of base map: www.thelist.tas.gov.au

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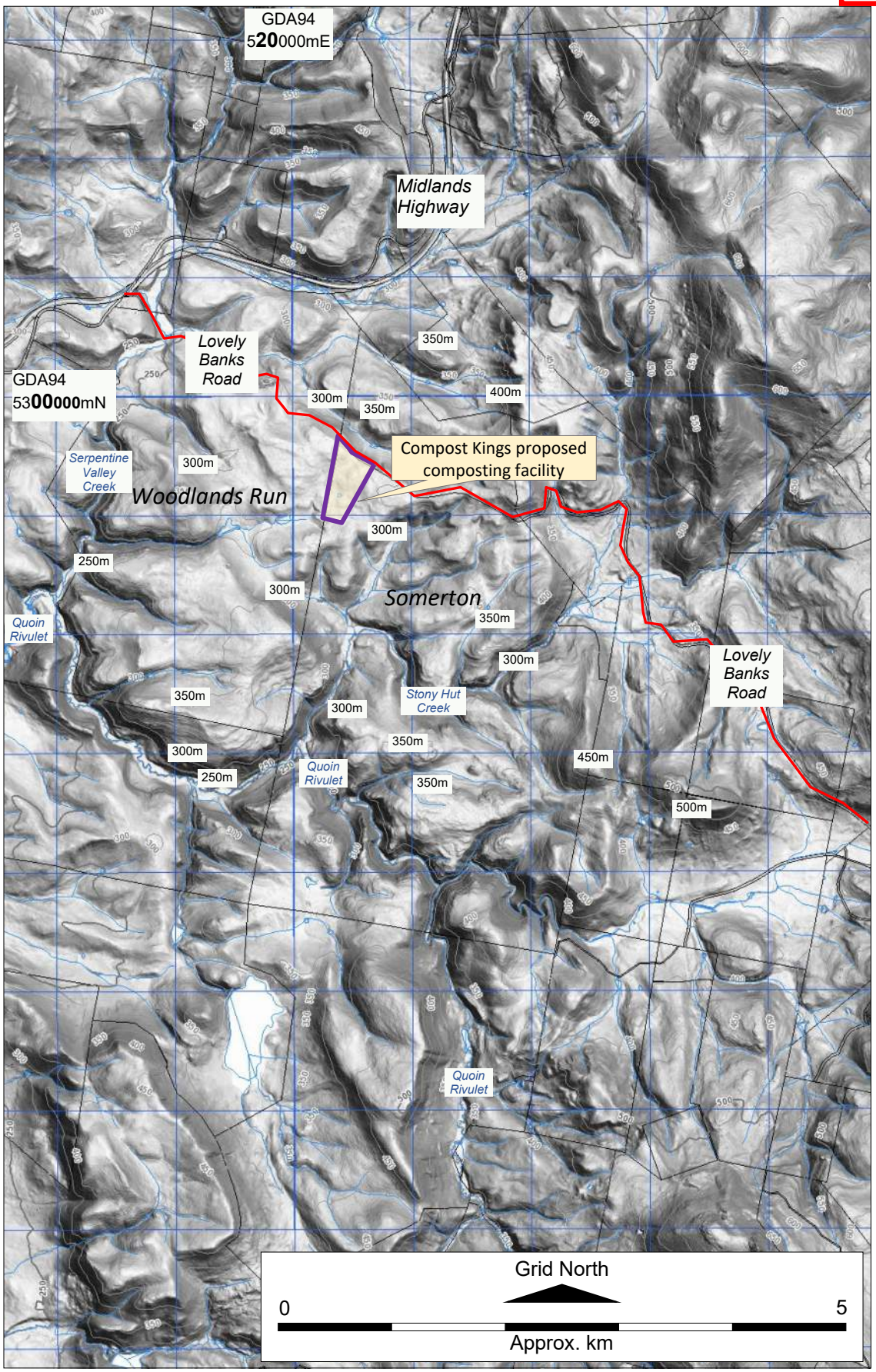

Figure 3. Topography, relief, and surface drainage (hillshading base map).
Source of base map: www.thelist.tas.gov.au

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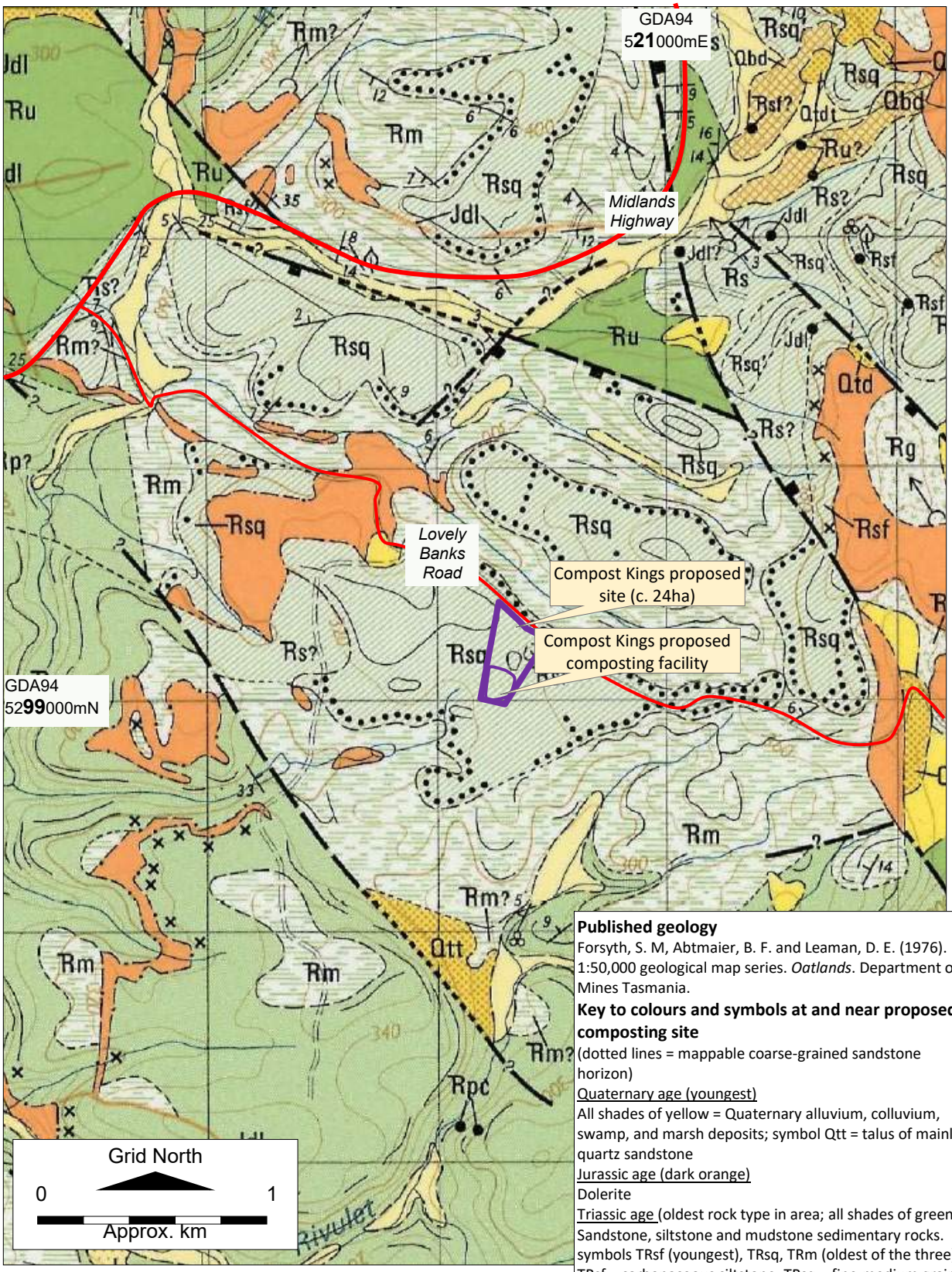

Published geology
Forsyth, S. M, Abtmaier, B. F. and Leaman, D. E. (1976). 1:50,000 geological map series. *Oatlands*. Department of Mines Tasmania.

Key to colours and symbols at and near proposed composting site
(dotted lines = mappable coarse-grained sandstone horizon)
Quaternary age (youngest)
All shades of yellow = Quaternary alluvium, colluvium, swamp, and marsh deposits; symbol Qtt = talus of mainly quartz sandstone
Jurassic age (dark orange)
Dolerite
Triassic age (oldest rock type in area; all shades of green)
Sandstone, siltstone and mudstone sedimentary rocks. [eg symbols TRsf (youngest), TRsq, TRm (oldest of the three)]. TRsf = carbonaceous siltstone; TRsq = fine-medium grained laminated sandstone; TRm = micaceous mudstone and very fine-fine grained sandstone; TRu = undifferentiated sedimentary rocks.
Black dashed lines are faults

Figure 4. Published geology in the vicinity of the proposed composting facility

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2.3 Groundwater

2.3.1 Groundwater fundamentals

Based on general hydrogeological principles, and records of drilled bores, at all scales the sedimentary rocks and intruded dolerite in the general vicinity of Lovey Banks Road are regarded as a single, fractured, hard-rock, unconfined aquifer[5].

In such an environment, Figure 5 illustrates different components of the land-based part of the hydrological cycle[6] at the scale of a single catchment or smaller. Effective rain (precipitation less evapotranspiration) flows overland to surface streams, or infiltrates (at a rate determined by soil and rock permeability) through the unsaturated zone to the water table.

An important aspect of Figure 5 is the interconnectivity between surface water and groundwater.

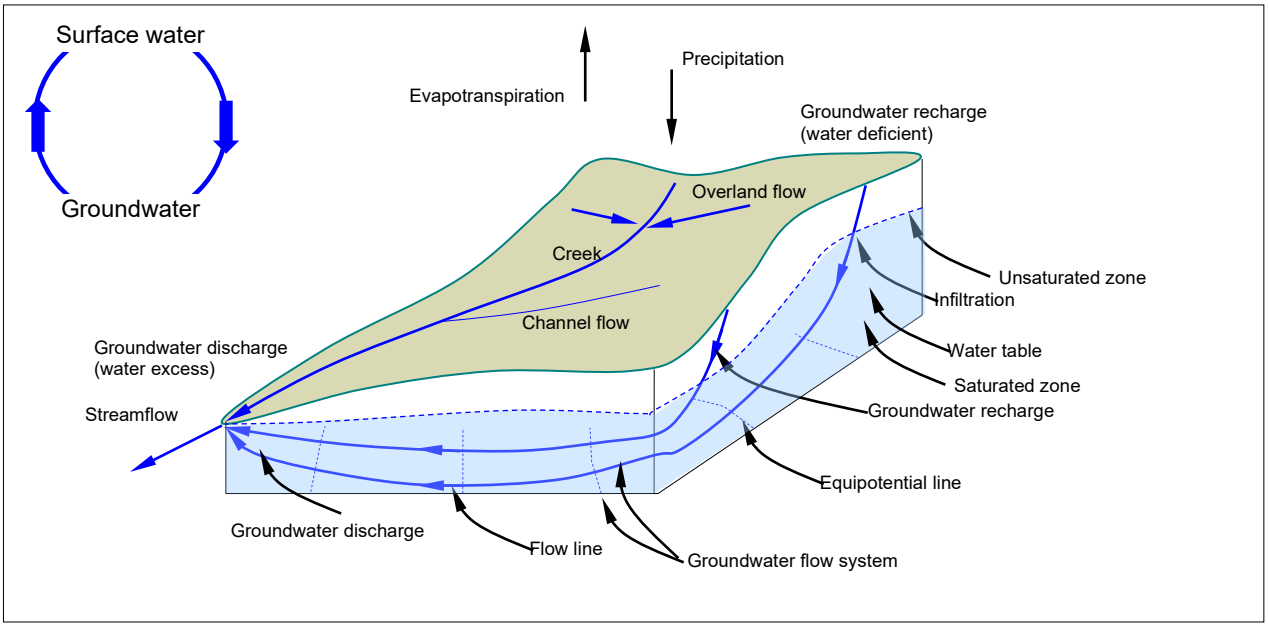

Figure 5. Aspects of the land-based hydrological cycle

The fundamentals of groundwater movement in an unconfined, gravity-driven groundwater flow system (GFS)[7] similar to that in the Lovely Banks Road – Melton Mowbray district are depicted schematically in Figure 6. Important points are:

- the hydraulic heads in recharge areas are relatively high and decrease with depth. In discharge areas, the energy and flow conditions are reversed; heads are low and increase

[5]Localised confined conditions may exist where water in fractures is not in hydraulic continuity with adjacent groundwater with a water table under atmospheric conditions, but within the local – intermediate – regional systems these are regarded as of very minor importance.

[6] The *hydrological cycle* is the circulation of water in various phases through the atmosphere, over and under the earth, to the oceans, and back to the atmosphere. The cycle is solar-powered. Because water is a solvent it dissolves elements, and geochemistry is a fundamental part of the cycle, which is a flux for water, energy, and chemicals. Water enters the land-based cycle as precipitation; it leaves as surface streamflow (runoff) or evapotranspiration. The route which groundwater takes from a recharge point to a discharge point is a *flow path.*

[7] GFSs are identified in the field based on geology and geomorphology. Examples are local-scale GFSs in moderate-high relief fractured rock (such as at the proposed composting facility), local- to intermediate-scale GFSs in low relief dolerite areas, local-scale GFSs in high relief dolerite, etc.

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with depth. In between, the throughflow is almost horizontal as shown by the steeply dipping equipotential lines.

- the concept of a groundwater flow system (GFS[8]) is fundamental to understanding groundwater conditions at the proposed composting facility. Given the moderate relief of the area, it can be expected that the near-surface dominant groundwater flows to depths of a few tens of metres or so will be as local systems, with recharge on most elevated areas discharging to un-named minor streams. Some of the recharge will penetrate to depths of perhaps 50 – 100m or more, and will travel towards larger streams like Serpentine Valley Creek. This scale of groundwater movement is regarded as intermediate. Still deeper groundwater infiltration results in regional systems discharging to major rivers or the coast.

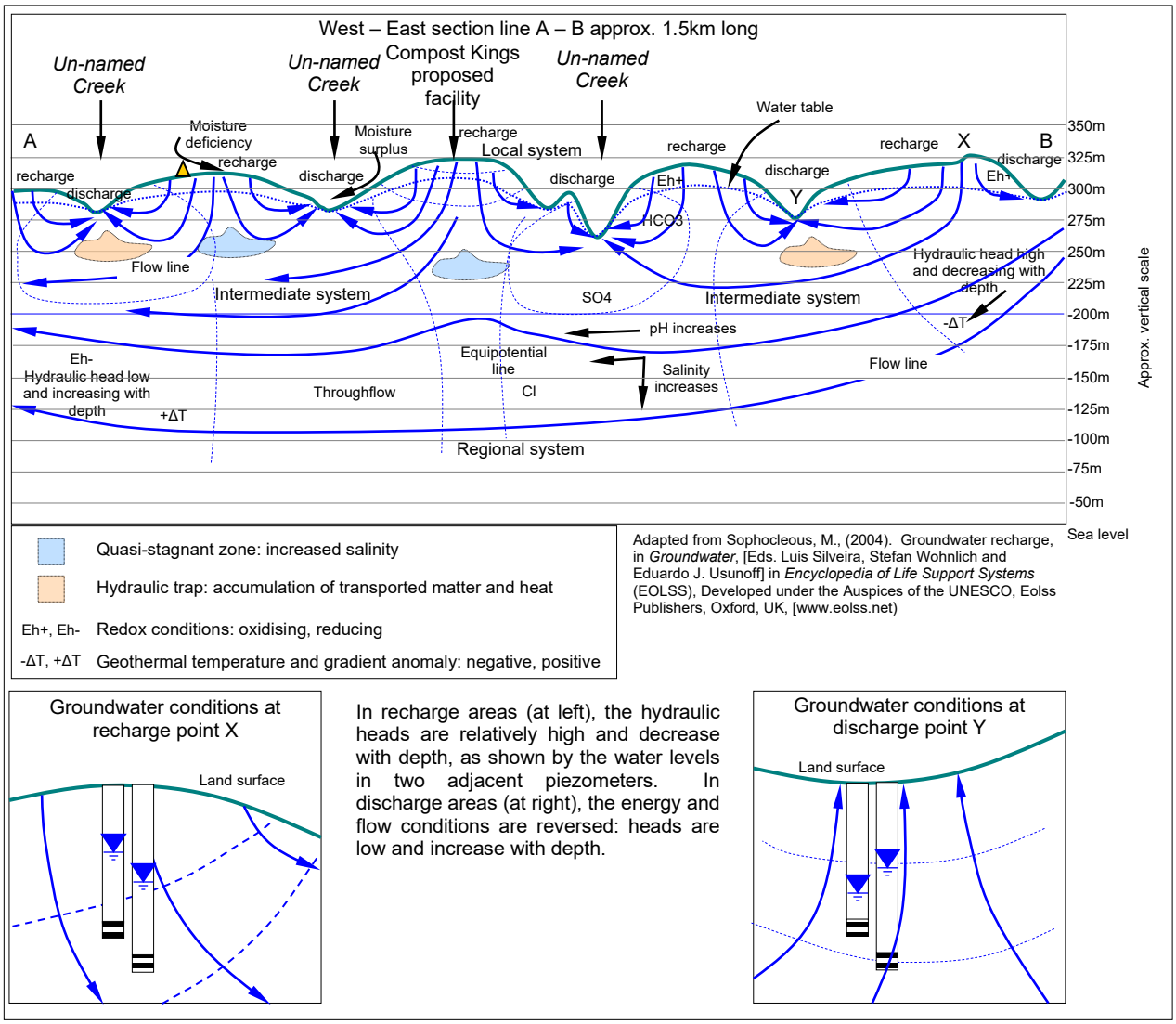

Figure 6. Fundamentals of groundwater hydrology in a gravity-driven groundwater system like that at and near the proposed composting facility. Vertical exaggeration for the top section is about 5.

[8] Sophocleous (2004) cited in Figure 6 defines a GFS as "a set of groundwater flow paths with common recharge and discharge areas. Flow systems are dependent on the hydrogeologic properties of the soil/rock material, and landscape position. Areas of steep or undulating relief tend to have dominant lo*cal flow systems* (discharging to nearby topographic lows such as ponds and streams). Areas of gently sloping or nearly flat relief tend to have dominant *regional flow systems* (discharging at much greater distances than local systems in major topographic lows or oceans)." A three-dimensional closed groundwater flow system that contains all the flow paths is called the *groundwater basin*.

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2.3.2 Local, intermediate, and regional groundwater flow systems

Hocking *et al* (2005) have studied groundwater and salinity issues in the Tasmania southern Midlands, and have recognised many local- and intermediate-scale GFS. Their generalised scale of GFSs is shown in Figure 13, together with adopted response times for groundwater flow through each system.

The scale of GFSs depends on topography and geology, with local, intermediate and regional systems defined by the sizes of sub-subcatchments, subcatchments and catchments respectively of surface drainage systems[9].

Accordingly, in the vicinity of the proposed composting facility, the scale of local systems is reduced to nominally less than a kilometre or so, intermediate systems to 1 – 10km, and regional systems to >10km. The response times are similarly reduced in proportion, but these are only conceptual since they depend on bulk rock permeability and transmissivity which may change over orders of magnitude at all scales.

Figure 8 depicts sub-subcatchments (all un-named) within the Quoin – Serpentine Valley Creek Subcatchment in the vicinity of the proposed composting facility. Their sizes range from a few hectares up to about 150ha, and each defines a local GFS. At this scale, shallow groundwater flow is towards the watercourse within the sub-subcatchment. Local groundwater flows are therefore in all directions. Intermediate groundwater flows west southwest beneath these minor watercourses to Serpentine Valley Creek. Still deeper regional groundwater flows west beneath Serpentine Valley Creek to the Jordan River.

The proposed composting facility is mostly within a 60ha sub-subcatchment with local westward flow. Local-scale groundwater catchment divides exist nearby to the south and east, and near Lovely Banks Road to the north.

Table 1 The geographical extent and response time of local, intermediate and regional scale GFSs

Category	Length of flow (km)		Response time (yr)
Local	<1km	<5	<30
Intermediate	1 – 10km	5-50	30-100
Regional	>10km	>50	>100

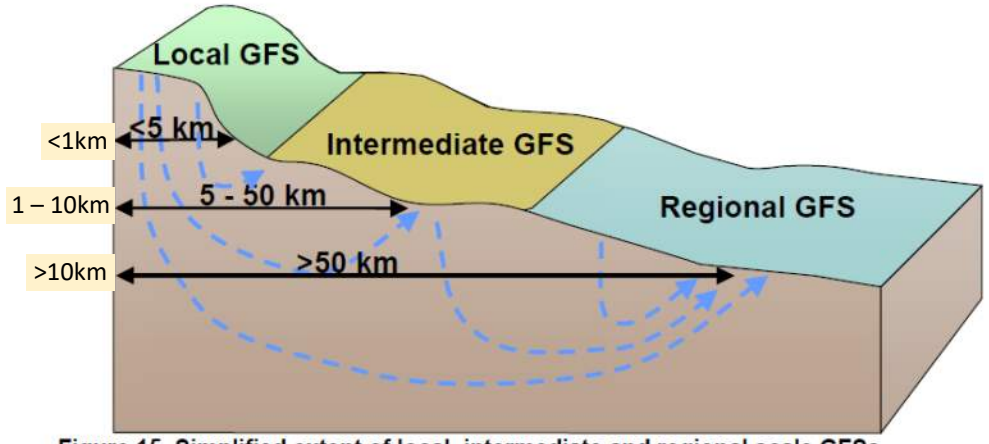

Figure 15 Simplified extent of local, intermediate and regional scale GFSs

Figure 7. Figure 15 and Table 1 from Hocking *et al* (2005). The scale are based on mainland Australian conditions, and are not regarded as appropriate for the geological complexity and moderate relief in the vicinity of the proposed composting facility. Suggested modified scales are superimposed on the Figure and Table. Response times are conceptual only, depending on aquifer permeability and transmissivity at all scales.

[9] Sub-subcatchments ("CFEV River Section Catchments"), subcatchments and catchments are shown as overlays on www.thelist.tas.gov.au.

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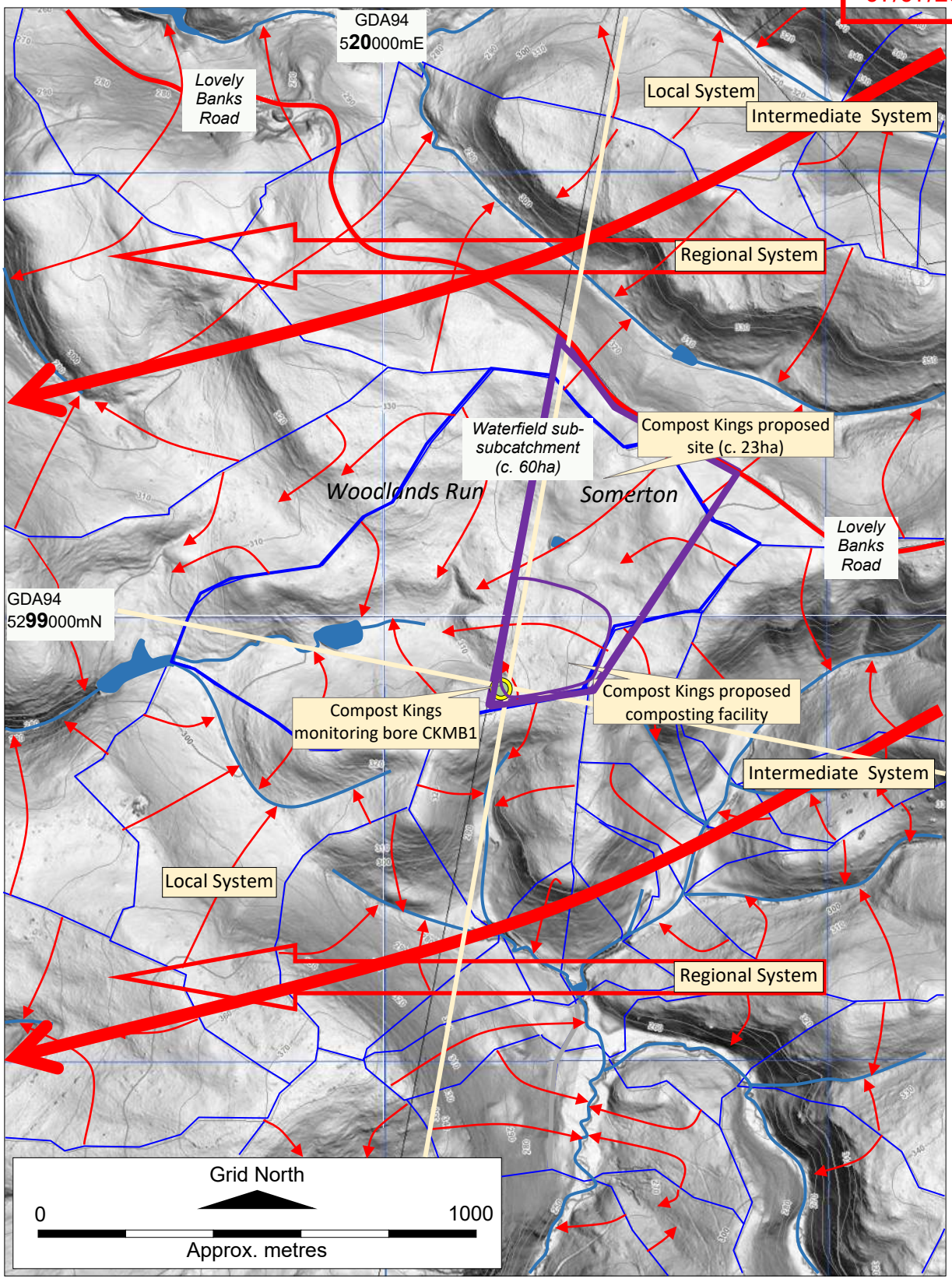

Figure 8. Local, intermediate, and regional groundwater flow directions in the vicinity of the proposed compost facility. Flow directions are inferred from site observations, groundwater levels in bores, and groundwater fundamentals. Local flow (thin red arrows) is in all directions in small sub-subcatchments ("CFEV River section subcatchments" on www.thelist.tas.gov.au), intermediate flow (thicker red arrows) is interpreted as west southwest within the Quoin – Serpentine Valley Creek Subcatchment (110km^2), and regional flow (thick, red-bordered arrows) is mostly westwards in the Jordan Catchment (1250km^2). The proposed compost facility (purple border) is in a sub-subcatchment of about 60ha (thick blue border). Light yellow lines at right angles are parts of hydrogeological cross sections A – B and C – D. Source for hillshading: www.thelsit.tas.gov.au.

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2.3.3 Results of drilling for groundwater

State-wide results for Triassic rocks

Table 1 describes Triassic and Permian sedimentary rocks in Tasmania as fractured rock aquifers of high prospectivity. Of more than 1200 bores in Triassic rocks, 77% yielded more than 0.03L/s (100L/hr or 2,500L/day) and the average yield was 1L/s. The maximum recorded yield is reported as 19L/s. It is noted that salinity is variable (range 100 – 13,000mg/L total dissolved solids) and often restrictive of use. Near-surface lower-yielding zones in such aquifers often display higher salinity groundwater than deeper, higher-permeability zones. Vulnerability to pollution is described as high, but low permeability surface material may mitigate the pollution risk.

District results of drilling for water in Triassic rocks and Jurassic dolerite

Figure 9 shows the locations of 25 groundwater bores drilled in the district. Drilling results are summarised in Table 2. Of the 25 bores,

- 22 (88%) were drilled in Triassic rocks, and the remaining three were drilled in dolerite
- the average depth drilled of all bores was 80m (range 5 – 150m), and of the bores in Triassic rocks, 80m also (range 8 – 150m). The average depth drilled is markedly higher than the average for all bores in Tasmania.
- four bores (16%) were recorded as functioning after drilling; all of these were in Triassic rocks
- initial yields ranged from 0 – 10L/s, with 8 bores (32%) recording no water. As is typical of unconfined fractured rock aquifers, there was no relationship between yield and bore depth.
- groundwater salinity was reported for 10 bores: salinity ranged from 500 – 2700mg/L (average 1360mg/L) for all bores, and in the Triassic rocks the range was 500 – 1700mg/L (average 1050mg/L). There was no relationship between salinity and bore depth, although as a general comment for bores in both Triassic and Permian rocks groundwater in near-surface low-yielding zones is often of higher salinity than deeper groundwater in higher-yielding zones (Table 1).

Local results: groundwater monitoring bore CKMB1 at the proposed composting facility

Bore CKMB1 was drilled at the proposed composting site on 15 and 16 December 2020. Its log is presented in Figure 10. Photographs of the drill returns are shown in Figure 11. Apart from a metre of soil and a metre of sandstone in the surface two metres, and a metre of fine-grained sandstone at 9.5 – 10.5m, all materials in the hole were logged as interbedded siltstone and silty mudstone. Traces of groundwater were encountered at 12.4mbg[10], 18mbg and 52.5mbg.

The hole was completed as two nested[11] bores as depicted in Figure 10. Bore CKMB1S (S = shallow) and bore CKMB1D (D = deep) were screened over the intervals 16 – 19mbg and 51.4 – 54.4m respectively, and each was separated from the other by bentonite seals.

Following bore completion on 16 December 2020, there was no free water in CKMB1S, and the standing water level (SWL) in CKMB1D was 50mbg.

[10] mbg = metres below ground

[11] A nested monitoring bore has (at least) two bore casings in the same drillhole, each screened (and hydraulically separated) over different short depth intervals of the same aquifer, to test aquifer recharge/discharge conditions depicted in the insets to Figure 6)

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Table 1. Summary of drilling for groundwater in Triassic rocks in Tasmania [after Matthews and Latinovic (2006)]

AQUIFER TYPE	PROSPECTIVITY (Whole of Tasmania)	ROCK GROUPS	NUMBER OF BORES	PERCENTAGE SUCCESSFUL (YIELD >0.03)	AVERAGE YIELD (L/s) #	MAXIMUM YIELD (L/s)	PERCENT IRRIGATION SUCCESSFUL (YIELD >=1.5)	SALINITY RANGE (mg/L) *
FRACTURED ROCK (Intergranular or some horizons)	HIGH	Triassic sandstone (lithic and quartz), mudstone, minor coal, terrestrial origin.	1215	77.2	0.99 (877)	18.95	15.4	116 - 13225
		Permian mudstone, siltstone, sandstone (often pebbly), minor limestone and conglomerate. Mainly marine origin, glacial conditions, minor zones of terrestrial origin.	572	79.6	1.7 (439)	25.30	26.4	145 - 13790
			1787	78	1.23 (1316)	25.3	19.1	116 - 13790
GENERAL AQUIFER CHARACTERISTICS							VULNERABILITY TO POLLUTION	
Triassic and Permian rocks are mainly regarded as fractured rock aquifers although there is likely to be some intergranular storage and flow in the coarser grained units (sandstone, conglomerate). Transmission of water to bores is probably largely via joints and bedding planes. These rocks are the most commonly drilled in the region. Yields range up to irrigation quantities and groundwater is used for domestic, garden, stock and irrigation purposes. Quality is variable and salinity restricts use at many locations. Near surface lower yielding zones often have poorer quality groundwater than deeper higher yielding zones. High sulphate groundwater occurs in the Permian at some locations e.g. just north of central Tunnack. Triassic rocks at Dodges Ferry are particularly prospective but water quality limits use in some locations. Elevated and / or steeply sloping areas are likely to be less prospective than lower lying locations in most cases. Aquifers are mainly unconfined to confined locally.							High. Low permeability material at the surface will offer some protection and vulnerability may be reduced to low to moderate.	

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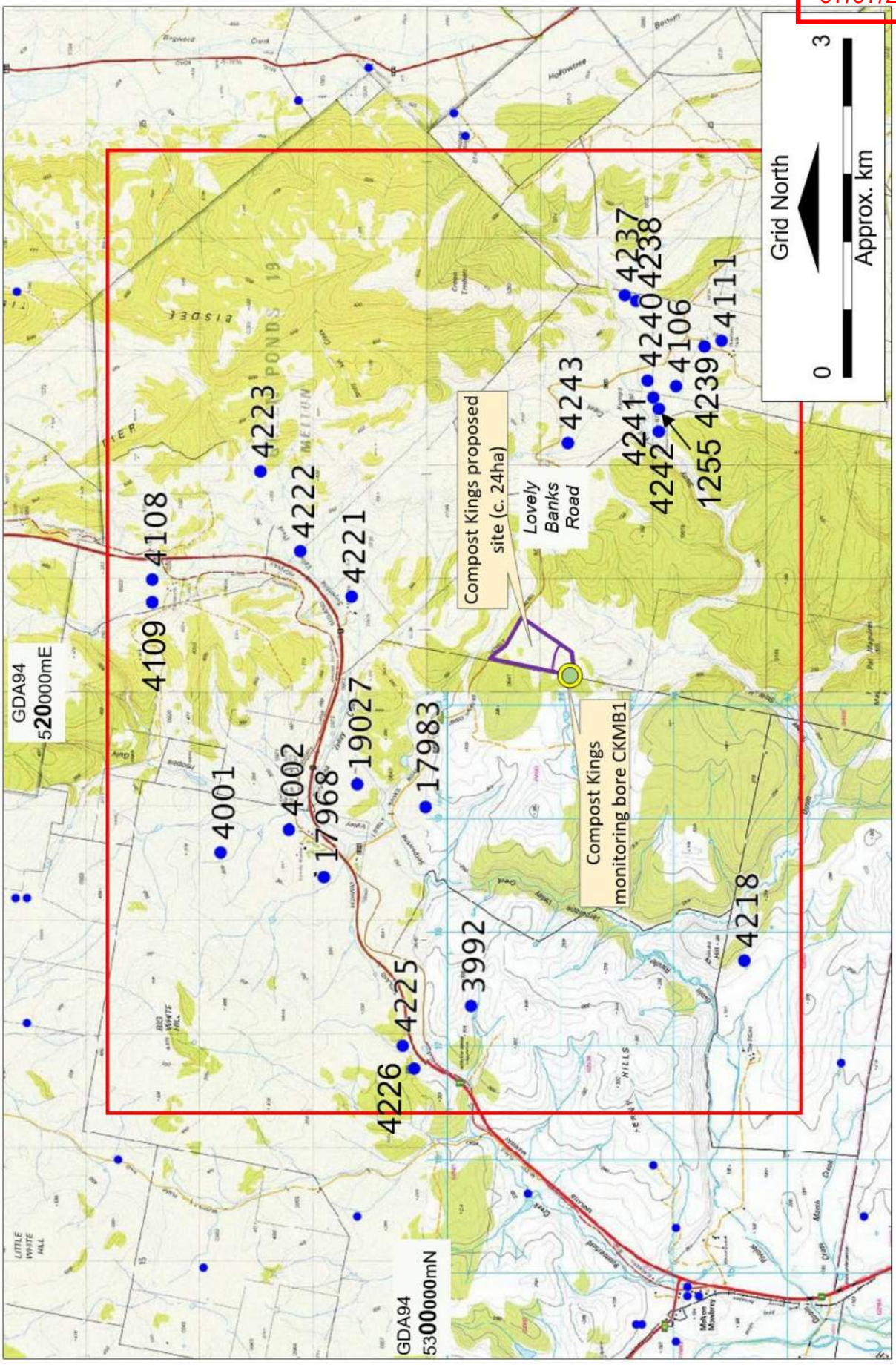

Figure 9. Locations of water bores drilled in the vicinity of the proposed composting facility. Bore numbers correspond to those in Table 2. Source: DPIPWE Groundwater Information Access Portal: https://wrt.tas.gov.au/groundwater-info/

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Table 2. Summary of drilling for water in the vicinity of the proposed compost facility. Bore numbers correspond to those in Figure 9. Depth is m, Initial yield is L/s, SWL = standing water level (m), TDS = total dissolved solids (salinity; mg/L). Source: DPIPWE Groundwater Information Access Portal https://wrt.tas.gov.au/groundwater-info/

Feature id	Feature type	Locality name	Easting	Northing	Datum	Coordinate accuracy (m)	Drilled date	Drilling company	Depth	Initial yield	SWL list	Last SWL date	Final TDS	Main aquifer geology	Last operating status	Last operating status date
1255	Bore	Melton Mowbray	522614	5298133	GDA94	2000	03/08/1987	Gerald Spaulding Drillers Pty Ltd		5.05				Triassic	functioning	03/08/1987
3992	Bore	Melton Mowbray	517363	5299783	GDA94	200	26/01/1954	Mines Department (=Tasmania Department of Mines)	100.60	0.13				Triassic	functioning	26/01/1954
4001	Bore	Melton Mowbray	518713	5301983	GDA94	200	01/01/1954	Mines Department (=Tasmania Department of Mines)	4.90	0.00				Jurassic Dolerite	abandoned	01/01/1954
4002	Bore	Melton Mowbray	518913	5301383	GDA94	200	08/04/1954	Mines Department (=Tasmania Department of Mines)	24.40	0.32				Triassic	abandoned	08/04/1954
4106	Bore	Colebrook	522814	5297983	GDA94	200	08/03/1955	Mines Department (=Tasmania Department of Mines)	38.70	0.00				Triassic	Unknown	08/03/1955
4108	Bore	Melton Mowbray	521113	5302583	GDA94	200	14/07/1954	Mines Department (=Tasmania Department of Mines)	59.40	0.00				Triassic	abandoned	14/07/1954
4109	Bore	Melton Mowbray	520913	5302583	GDA94	200	02/11/1954	Mines Department (=Tasmania Department of Mines)	25.60	0.00				Triassic	abandoned	02/11/1954
4110	Bore	Melton Mowbray	520913	5302583	GDA94	200	29/11/1954	Mines Department (=Tasmania Department of Mines)	48.80	0.10				Triassic	functioning	29/11/1954
4111	Bore	Melton Mowbray	523214	5297583	GDA94	200	16/12/1954	Mines Department (=Tasmania Department of Mines)	18.30	0.00				Triassic	abandoned	16/12/1954
4218	Bore	Melton Mowbray	517763	5297383	GDA94	200	24/10/1983	Mines Department (=Tasmania Department of Mines)	78.00		16.4	24/10/1983	508	Triassic	Unknown	24/10/1983

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Table 2 (continued). Bore numbers correspond to those shown in Figure 9. Depth is m, Initial yield is L/s, SWL = standing water level (m), TDS = total dissolved solids (salinity; mg/L).

Feature id	Feature type	Locality name	Easting	Northing	Datum	Coordinate accuracy (m)	Drilled date	Drilling company	Depth	Initial yield	SWL list	Last SWL date	Final TDS	Main aquifer geology	Last operating status	Last operating status date
4221	Bore	Melton Mowbray	520963	5300833	GDA94	200	10/04/1986	Mines Department (=Tasmania Department of Mines)	134.00	1.64	24	10/04/1986	2683	Jurassic Dolerite	capped	10/04/1986
4222	Bore	Melton Mowbray	521363	5301283	GDA94	200	17/04/1986	Mines Department (=Tasmania Department of Mines)	150.00	0.06			1330	Triassic	Unknown	17/04/1986
4223	Bore	Melton Mowbray	522063	5301633	GDA94	200	29/04/1986	Mines Department (=Tasmania Department of Mines)	120.00	0.13			1190	Triassic	Unknown	29/04/1986
4225	Bore	Melton Mowbray	517013	5300383	GDA94	200	29/08/1985	Mines Department (=Tasmania Department of Mines)	145.00	8.84			1702	Triassic	capped	29/08/1985
4226	Bore	Melton Mowbray	516813	5300283	GDA94	200	26/11/1985	Mines Department (=Tasmania Department of Mines)	102.00	0.25			2420	Jurassic Dolerite	abandoned	26/11/1985
4237	Bore	Melton Mowbray	523614	5298433	GDA94	25	21/10/1985	Mines Department (=Tasmania Department of Mines)	8.00	0.00				Triassic	abandoned	21/10/1985
4238	Bore	Melton Mowbray	523564	5298333	GDA94	25	22/10/1985	Mines Department (=Tasmania Department of Mines)	78.00	10.10			1444	Triassic	capped	22/10/1985
4239	Bore	Melton Mowbray	523164	5297733	GDA94	25	29/10/1985	Mines Department (=Tasmania Department of Mines)	72.00	0.00				Triassic	abandoned	29/10/1985
4240	Bore	Melton Mowbray	522864	5298233	GDA94	25	05/11/1985	Mines Department (=Tasmania Department of Mines)	150.00	0.00				Triassic	abandoned	05/11/1985
4241	Bore	Melton Mowbray	522714	5298183	GDA94	25	07/11/1985	Mines Department (=Tasmania Department of Mines)	150.00	0.13	3	07/11/1985		Triassic	abandoned	07/11/1985

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Table 2 (continued). Bore numbers correspond to those shown in Figure 9. Depth is m, Initial yield is L/s, SWL = standing water level (m), TDS = total dissolved solids (salinity; mg/L).

Feature id	Feature type	Locality name	Easting	Northing	Datum	Coordinate accuracy (m)	Drilled date	Drilling company	Depth	Initial yield	SWL list	Last SWL date	Final TDS	Main aquifer geology	Last operating status	Last operating status date
4242	Bore	Melton Mowbray	522414	5298133	GDA94	25	13/11/1985	Mines Department (=Tasmania Department of Mines)	102.00	1.26			690	Triassic	Unknown	13/11/1985
4243	Bore	Melton Mowbray	522314	5298933	GDA94	25	19/11/1985	Mines Department (=Tasmania Department of Mines)	150.00	2.53			540	Triassic	abandoned	19/11/1985
17968	Bore	Jericho	518497	5301076	GDA94	2000	28/01/1999	Gerald Spaulding Drillers Pty Ltd	39.70	1.26				Triassic	functioning	28/01/1999
17983	Bore	Spring Hill	519113	5300183	GDA94	2000	26/10/1998	Tasmanian Drilling Services Pty Ltd	55.50		9.2	26/10/1998		Triassic	capped	26/10/1998
19027	Bore	Spring Hill	519313	5300783	GDA94	2000	23/10/1998	Tasmanian Drilling Services Pty Ltd	55.50				1100	Triassic	capped	23/10/1998

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Log of groundwater monitoring bore

CKMB1
Sheet: 1 of 2

Project Compost Kings **Location** "*Somerton*", Lovely Banks Rd, Melton Mowbray

Coordinates 520265mE, 5298850mN (est., unsurveyed)
Datum GDA94
RL 324mASL (unsurveyed)
Inclination Vertical
Bearing

Drill type Truck mounted Rig No.1
Equipment 170mm Blade bit, 140mm down hole hammer
Drill fluid(s) Air

Hole started 15 Dec 2020
Hole finished 16 Dec 2020
Drilled by KMR Drilling
Logged by W. C. Cromer
Checked by W. C. Cromer

Bit type/size	Lift	Water	Notes (Samples and tests)	Metres RL mAHD	Metres Depth	Graphic log	USCS	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	Moisture condition	Consistency Density index	Core tray photos (1/m)	Notes on completion	Completion details (CKMB1S CKMB1D Stick-ups 0.56m)	Structure, geology, interpret
Hammer			Blade bit 0-1m				SP	SAND: grey.	D	St		Concrete		Soil
			Dust					SANDSTONE: silty; pale orange	N/A	N/A		0.5 – 3m bentonite		Triassic interbedded sandstone, siltstone and mudstone
			At 12.4m, stopped drilling; waited 10mins; on airlift only slightly damp siltstone returns. No free water.		5			Silty MUDSTONE and SILTSTONE, pale orange-yellow darkening with depth to tan, grey and dark grey					Class 18 50mm PVC casing; Class 18 50mm PVC casing	
		Trace	No dust @ 12.4m		10			SANDSTONE: fine grained, brown				3-19m sand-silt backfill using drill returns		SWGWME#1 1330hrs 12/1/21 SWL = 9.1mbg; EC= 8.89 mS/cm; pH= 7.07; Redox= 172 mV; DO= 1.53 mg/L; Turb.= 677 NTU. Sample CKMB1 S collected after hand-bailing from 15+m removed 60L over 70 mins (at start, casing contained 20L)
			Dust					Interbedded silty MUDSTONE and SILTSTONE, light grey blue						
		Trace	Dust		15							16m - 19m: C18 50mm PVC screen with 0.4mm slots		
			No dust @ 18m									19m: cap		
			At 18m, stopped drilling; waited 10mins; on airlift only slightly damp siltstone returns. No free water.		20							19m - 20.5m bentonite		
			Dust		25									SWGWME#1 1300hrs 12/1/21 SWL = 23.7mbg; EC= 2.85mS/cm; pH= 6.62; Redox= -114 mV; DO= 0.93 mg/L; Turb.= 540 NTU. Sample CKMB1 D collected after submersible var. flow pump removed 67L over 73 mins (at start, casing contained 60L). Pump intake 38mbg.
			At 30m, stopped drilling; waited 50mins; on airlift only slightly damp siltstone returns. No free water.		30			Interbedded silty MUDSTONE and SILTSTONE, light grey blue				20.5m - 54.4m gravel		
			Dust		35									
					40			Interbedded silty MUDSTONE and SILTSTONE, light grey blue						
					45									

SOIL: Consistency (silt, clay, sandy clay, silty clay) **VS** = Very Soft (<25kPa; exudes in fingers when squeezed); **S** = Soft (25-50kPa; easily penetrated by fist); **F** = Firm (50-100kPa; easily penetrated by thumb); **St** = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); **VSt**= Very Stiff (200-400kPa; easily penetrated by thumbnail); **H** = Hard (>400kPa; indented by thumbnail with difficulty); **Fb** = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) **VL** = Very Loose (ravelling); **L** = Loose (easy shovelling); **MD** = Medium Dense (hard shovelling); **D** = Dense (picking); **VD** = Very Dense (hard picking)
ROCK: **Weathering (changes caused by subaerial processes)**: **FR** = Fresh (no decomp or colour changes); **SW** = Slightly Weathered (stained/bleached on joints; no or little change in strength); **MW** = Moderately Weathered (Whole rock stained/bleached; original colour not recognisable; no or little change in strength); **HW** = Highly Weathered (Whole rock stained/bleached; original colour not recognisable; significant change in strength; some primary minerals now clay; change in porosity); **XE** = Extremely Weathered (material has soil properties; structure, texture and fabric still visible); **RS** = Residual Soil (material has soil properties; original texture, fabric no longer visible; no significant transport)
Alteration (changes caused by hot gases/liquids at depth): **SA** = Slightly Altered (Slightly discoloured; no or little change in strength); **MA** = Moderately Altered (Whole rock stained/bleached; original colour not recognisable; no or little change in strength); **HA** = Highly Altered (Whole rock stained/bleached; original colour not recognisable; significant change in strength; some primary minerals now clay; change in porosity); **XA** = Extremely Altered (material has soil properties; structure, texture and fabric still visible)
Strength **VL** = Very Low (Material crumbles under firm blow with sharp end of pick; can be peeled with knife; pieces up to 30mm thick broken by finger pressure); **L** = Low (Easily scored with knife; indentations 1-3mm with firm blow of pick point; dull hammer sound; sharp edges friable, broken by handling); **M** = Medium (Readily scored with knife; piece of core 150mm x 50mm broken by hand with difficulty); **H** = High (rock rings under hammer; piece of core 150mm x 50mm broken by pick with single firm blow); **VH** = Very High (hand specimen breaks with >1 blow of pick; rock rings); **EH** = Extremely High (specimen needs many hammer blows to break; rock rings under hammer)

Figure 10. Log of nested monitoring bore CKMB1, comprising shallow bore CKMB1S, and deep bore CKMB1D

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Log of groundwater monitoring bore

CKMB1

Sheet: 2 of 2

Project Compost Kings **Location** "*Somerton*", Lovely Banks Rd, Melton Mowbray

Coordinates	520265mE, 5298850mN (est., unsurveyed)	**Drill type**	Truck mounted Rig No.1	**Hole started**	15 Dec 2020
Datum	GDA94	**Equipment**	170mm blade bit 140mm hammer	**Hole finished**	16 Dec 2020
RL	324mASL (unsurveyed)			**Drilled by**	KMR Drilling
Inclination	Vertical	**Drill fluid(s)**	Air	**Logged by**	W. C. Cromer
Bearing				**Checked by**	W. C. Cromer

Bit type/size	Lift	Water	Notes (Samples and tests)	Metres RLmAHD	Metres Depth	Graphic log	USCS	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	Moisture condition	Consistency Density index	Core tray photos (1/m)	Notes on completion	Completion details	Structure, geology, interpret
Hammer		Trace	Dust EC: 6800µS T°C:13.5 SWL @ 1000 15/12/20= 50m	50				Interbedded silty MUDSTONE and SILTSTONE, light grey blue	N/A	N/A		20.5m - 54.4m gravel 51.4m – 54.4m: C18 50mm PVC screen with 0.4mm slots	Class 18 50mm PVC casing	Triassic interbedded sandstone, siltstone and mudstone
				55				EOH 54.4m				54.4m cap		
				60										
				65										
				70										
				75										
				80										
				85										
				90										

SOIL: **Consistency** (silt, clay, sandy clay, silty clay) **VS** = Very Soft (<25kPa; exudes in fingers when squeezed); **S** = Soft (25-50kPa; easily penetrated by fist); **F** = Firm (50-100kPa; easily penetrated by thumb); **St** = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); **VSt**= Very Stiff (200-400kPa; easily penetrated by thumbnail); **H** = Hard (>400kPa; indented by thumbnail with difficulty); **Fb** = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) **VL** = Very Loose (ravelling); **L** = Loose (easy shovelling); **MD** = Medium Dense (hard shovelling); **D** = Dense (picking); **VD** = Very Dense (hard picking)
ROCK: **Weathering (changes caused by subaerial processes)**: **FR** = Fresh (no decomp or colour changes); **SW** = Slightly Weathered (stained/bleached on joints; no or little change in strength); **MW** = Moderately Weathered (Whole rock stained/bleached; original colour not recognisable; no or little change in strength); **HW** = Highly Weathered (Whole rock stained/bleached; original colour not recognisable; significant change in strength; some primary minerals now clay; change in porosity); **XE** = Extremely Weathered (material has soil properties; structure, texture and fabric still visible); **RS** = Residual Soil (material has soil properties; original texture, fabric no longer visible; no significant transport)
Alteration (changes caused by hot gases/liquids at depth): **SA** = Slightly Altered (Slightly discoloured; no or little change in strength); **MA** = Moderately Altered (Whole rock stained/bleached; original colour not recognisable; no or little change in strength); **HA** = Highly Altered (Whole rock stained/bleached; original colour not recognisable; significant change in strength; some primary minerals now clay; change in porosity); **XA** = Extremely Altered (material has soil properties; structure, texture and fabric still visible)
Strength **VL** = Very Low (Material crumbles under firm blow with sharp end of pick; can be peeled with knife; pieces up to 30mm thick broken by finger pressure); **L** = Low (Easily scored with knife; indentations 1-3mm with firm blow of pick point; dull hammer sound; sharp edges friable, broken by handling); **M** = Medium (Readily scored with knife; piece of core 150mm x 50mm broken by hand with difficulty); **H** = High (rock rings under hammer; piece of core 150mm x 50mm broken by pick with single firm blow); **VH** = Very High (hand specimen breaks with >1 blow of pick; rock rings); **EH** = Extremely High (specimen needs many hammer blows to break; rock rings under hammer)

Figure 10 (cont'd)

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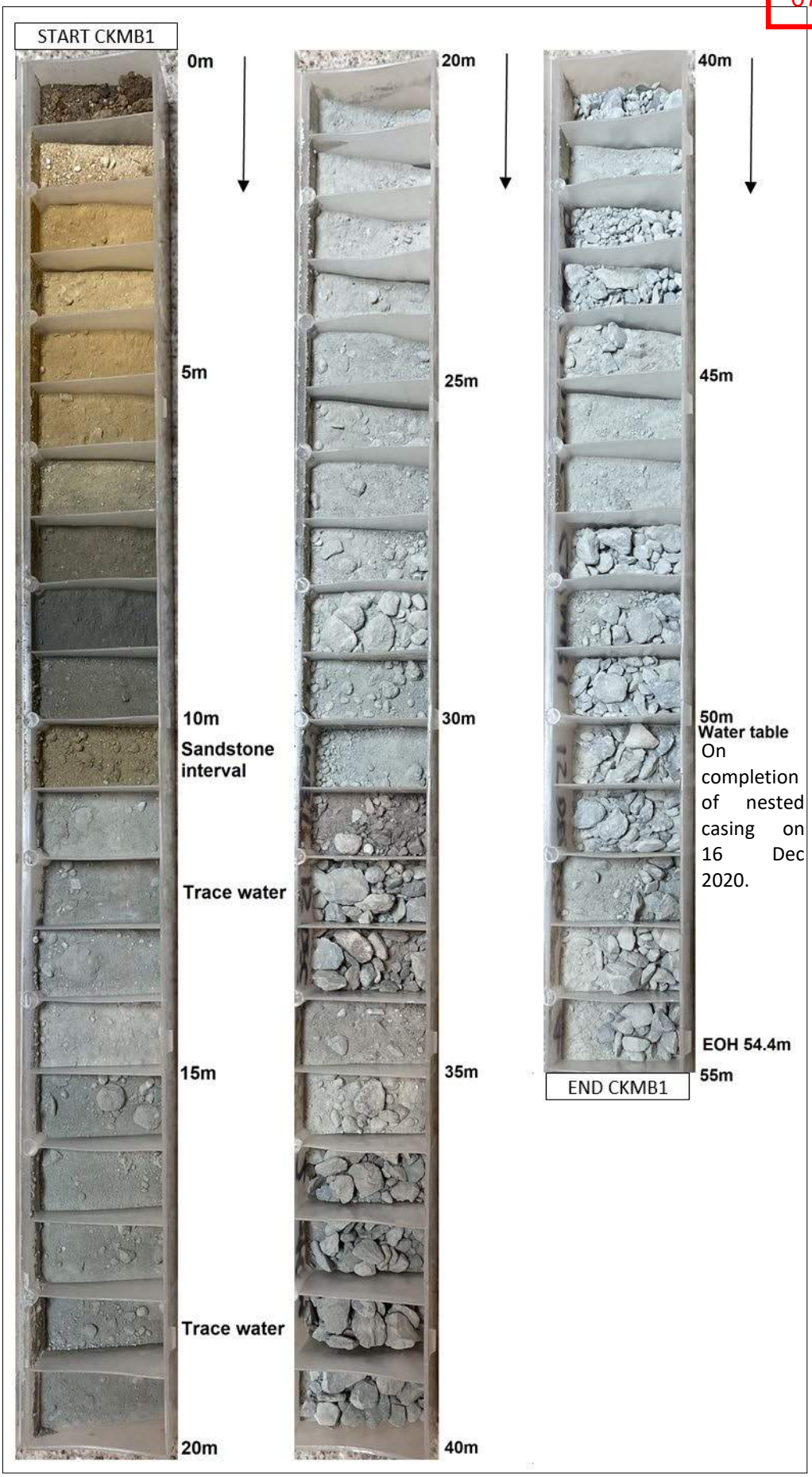

Figure 11. Photos of drill returns from down-hole-hammer drilling of monitoring bore CKMB1. Samples were collected each metre.

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2.3.4 Groundwater sampling in January and June 2021

The groundwater in nested bores CKMB1S and CKMB1D was sampled[12] during the first combined surface water and groundwater sampling event (SWGWME#1) on 12 January 2021 (Plate 1), and during a second event (SWGWME#2) on 19 June 2021. The two events therefore tested summer and winter conditions.

Plate 1. Sampling CKMB1S and CKMB1D during SWGWME#1 on 12 January 2021.

Sampling on completion on 16 December 2020

An opportunistic sample of groundwater was hand-bailed from CKMB1 on completion of the bore. The water was inferred to be mostly from the base of the hole near 50mbg since no water was present in the upper screened interval. Electrical conductivity (EC) of the sample was 6.8mS/cm.

The sample (labelled CKMB1) was submitted to Analytical Services Tasmania (AST) on 18 December 2020. The AST laboratory report is included in Attachment 1.

The lab-reported pH and EC were 7.2 and 3.56mS/cm respectively. The reported salinity was 5690mg/L total dissolved solids (TDS)[13]. Chemically, the water appears to be a calcium chloride-sodium chloride type.

[12] Sampling procedures were in general accord with Sundaram *et al* (2009) Section 6.5. Field sheets are available on request.

[13] The TDS and EC values may have been juxtaposed by AST: typically, EC (uS/cm) x 0.65 = TDS (mg/L). The lab EC is also at odds with field measurement on 16 December 2020.

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Sampling during SWGWME#1 on 12 January 2021

On 12 January 2021 the standing water level (SWL) in CKMB1S was 9.65mbtoc, and the groundwater EC was 8.89mS/cm. The SWL in CKMB1D was 24.3mbtoc, and its EC was 2.85mS/cm.

The almost-15m difference in hydraulic head between two short separated screened sections 32m vertically apart in the same bore indicates groundwater movement is mostly downwards (refer to the inset diagrams in Figure 6) so that the facility is in a recharge (not discharge) area. Further, the rate of head loss of about 0.5m/m of water movement indicates relatively low permeability – an observation supported by:

- the uniformly fine-grained drilling returns,
- the absence of groundwater in the upper screened section on completion,
- the low bailing rate for CKMB1S (c. 1L/min) and low pump rate (0.9L/min) for CKMB1D achievable during SWGWME#1, and
- the difference in groundwater salinity, with the shallow sample significantly higher in electrical conductivity than the deeper sample (see Section 2.3.3, dot point 5).

Sampling during SWGWME#1 on 19 June 2021

On 19 June 2021, the SWL in CKMB1S was 9.66mbtoc, and the groundwater EC was 7.82mS/cm. The SWL in CKMB1D was 15.1mbtoc, and its EC was 2.06mS/cm.

The hand-bailed rate for CKMB1S was 0.5L/min, and the maximum pump rate in CKMB1D was 0.9L/min (decreasing with time).

Like the January 2021 SWLs, the 5.4m difference in hydraulic head between two short separated screened sections 32m vertically apart in the same bore indicates groundwater movement at the site is downwards (refer to the inset diagrams in Figure 6) so that the site is in a recharge (not discharge) area. Further, the head loss of about 0.2m/m of water movement indicates relatively low permeability.

Table 3 summarises the field parameters for CKMB1S and CKMB1D for both sampling events.

Table 3. Groundwater field parameters recorded during the two sampling events in January and June 2021

	Units	SWGWME#1 12/01/21 CKMB1S	SWGWME#2 19/06/21 CKMB1S	SWGWME#1 12/01/21 CKMB1D	SWGWME#2 19/06/21 CKMB1D
Initial SWL*	mbtoc**	9.65	9.66	24.3	15.1
pH Value	pH Unit	7.07	6.49	6.62	6.82
Electrical Conductivity	mS/cm	8.89	7.82	2.85	2.06
Dissolved Oxygen	mg/L	1.53	1.32	0.93	0.75
REDOX	mV	172	288	-114	8
Turbidity	NTU	677	68	540	75
Temperature	^{0}C	14.1	13.4	17.8	15.2

*SWL = standing water level; **mbtoc = metres below top of casing

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Laboratory results for January and June 2021 sampling of CKMB1S and CKMB1D

Table 4 summarises the January and June 2021 ALS laboratory results for CKMB1S and CKMB1D, and compares them with AWDG (2011) and ANZECC (2000) guideline values. The full laboratory reports are presented in Attachment 2.

Table 4. Groundwater quality in CKMB1S and CKMB1D compared to guideline values, for the first two sampling events on 12 January and 19 June 2021 respectively. See Attachment 2 for full ALS reports.

							ADWG 2011	ANZECC 2000			
		Date	12/01/2021	19/06/2021	12/01/2021	19/06/2021	Drinking water guidelines (only applied if TDS <1200mg/L)	Aquatic Ecosystem	Irrigation		Livestock Drinking
		Sample	CKMB1S	CKMB1S	CKMB1D	CKMB1D		(Freshwater/ Lowland River)	STV (short-term; <20yrs)	LTV (long-term; 100yrs)	
Laboratory analyses	**Units**	**LOR**									
pH Value	pH Unit	0.01	6.66	3.11	8.74	7.13	(6.5-8.5)	6.5-8.0	**6.0-8.5		-
Electrical Conductivity @ 25Â°C	µS/cm	1	9130	9970	3070	617		125-2200	-	-	-
Total Dissolved Solids (Calc.)	mg/L	1	5930	6480	2000	401	(600-1200)	-	-	-	(2)2000-13000
Total Hardness as CaCO3	mg/L	1	2760	2980	539	354	(200)	-	-	-	-
Hydroxide Alkalinity as CaCO3	mg/L	1	<1	<1	<1	<1		-	-	-	-
Carbonate Alkalinity as CaCO3	mg/L	1	<1	<1	43	<1		-	-	-	-
Bicarbonate Alkalinity as CaCO3	mg/L	1	353	<1	298	408		-	-	-	-
Total Alkalinity as CaCO3	mg/L	1	353	<1	341	408		-	-	-	-
Dissolved major anions											
Sulfate as SO4	mg/L	1	52	456	104	97	500 (250)	-	-	-	1000-2000
Chloride	mg/L	1	3420	330	834	522	(250)		(3)(3)(3)<175->700		
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	1.5	-	-	-	-
Dissolved major cations											
Calcium	mg/L	1	413	458	163	109					
Magnesium	mg/L	1	419	447	32	20		-	-	-	250-2000
Sodium	mg/L	1	706	818	368	330	(180)	-	(4)115->460		-
Potassium	mg/L	1	15	12	9	5		-	-	-	-
Dissolved metals											
Arsenic	mg/L	0.001	<0.001	0.004	0.004	0.006	0.01	0.013(AsV)-0.024(AsIII)	2	0.1	0.5-5
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	-	-	1	0.1	-
Barium	mg/L	0.001	0.333	0.444	0.192	0.012	0.7	-	0.5	0.1	-
Boron	mg/L	0.05	0.1	0.08	0.16	0.15	4	0.37	0.5	-	-
Cadmium	mg/L	0.0001	0.0002	<0.0001	0.0001	<0.0001	0.002	0.0002	0.05	0.01	0.01
Chromium	mg/L	0.001	<0.001	0.002	0.001	0.002	0.05	0.001	1	0.1	1
Cobalt	mg/L	0.001	0.005	0.004	0.002	<0.001	-	-	0.1	0.05	1
Copper	mg/L	0.001	0.003	0.001	0.002	0.001	2	0.0014	5	0.2	0.4-5
Lead	mg/L	0.001	<0.001	0.002	<0.001	<0.001	0.01	0.0034	5	2	0.1
Manganese	mg/L	0.001	2.15	1.88	0.837	0.417	0.5	1.9	10	0.2	-
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.001	0.0006	0.002	0.002	0.002
Nickel	mg/L	0.001	0.005	0.004	0.005	0.004	(0.18)	0.011	0.002	0.2	1
Selenium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.005	0.05	0.02	0.02
Vanadium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-
Zinc	mg/L	0.005	0.032	0.021	0.025	<0.005	(3)	0.008	5	2	20
Nutrients											
Ammonia as N	mg/L	0.01	0.15	0.31	0.08	0.3	(0.5)	0.9	-	-	-
Nitrite as N	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	-	0.04	-	-	-
Nitrate as N	mg/L	0.01	0.03	0.01	0.02	0.02	-	0.04	-	-	-
Nitrite and Nitrate as N	mg/L	0.01	0.03	0.01	0.02	0.02	-	-	-	-	-
Total Kjeldahl as N	mg/L	0.1	1.6	0.6	3.3	0.7	-	-	-	-	-
Total Nitrogen as N	mg/L	0.1	1.6	0.6	3.3	0.7	-	0.5	25-125[a]	5	-
Total Phosphorus as P	mg/L	0.01	1.57	0.03	1.46	0.19	-	0.05	0.8-12.0[a]	0.05[b]	-
Bacteria											
E. coli	MPN/100ml	1	<10	-	20	-	0	-	-	-	-
Faecal coliforms	MPN/100ml	1	<10	10	30	220					

Notes

Sampler W.C.Cromer. Lab: ALS reports #EM2100341 and #EM211705 issued 19 Jan 2021 and 29 June 2021 respectively.

Guideline references: HMRC, NHMRC (2011, updated March 2021) and ANZECC, ARMCANZ (2000)

Results shading has been applied in the following order, with shadings higher in the order overriding those lower, if applicable.

Exceeds ANZECC aquatic ecosystem DTV

Exceeds ADWG health-based guideline value or aesthetic guideline range. Exceeds ANZECC irrigation/livestock drinking value or is above upper value or guideline range.

Exceeds ADWG aesthetic guideline value. Within an ANZECC irrigation/livestock drinking guideline range, requiring specific suitability assessment.

Values in parentheses indicate aesthetic (not health based) values only e.g. (250)

STV - Short term trigger value for contaminant in irrigation water (<20 years) use

LTV - Long term trigger value or contaminant in irrigation water (100 years) use

DTV- Default trigger values

a - requires site-specific assessment

b - set to minimise bioclogging of irrigation equipment

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Table 4 shows:

- an unexplained discrepancy in pH between the two sampling events for CKMB1S. The first value (6.66) is in reasonable agreement with the field parameter in Table 6, but the value of 3.11 for the second event is much lower than the field parameter of 6.49,
- an unexplained discrepancy in EC between the two sampling events for CKMBD. The first value (3.07mS/cm)) is in reasonable agreement with the field parameter (2.85mS/cm) in Table 7, but the value of 0.62mS/cm for the second event is much lower than the field parameter of 6.82mS/cm,
- between the two sampling events in CKMBS, a ten-fold increase in dissolved sulphate (52 to 458mg/L), and a ten-fold decrease in dissolved chloride (3,420 to 330mg/L),
- in CKMB1S, across both sampling events, total dissolved solids, hardness, chloride, sulphate and sodium levels exceed ADWG aesthetic and health-based guideline levels, and may exceed ANZECC and ADWG irrigation/stock drinking guideline levels, and
- in CKMB1D, in the first sampling event, total dissolved solids, chloride and sulphate levels exceed ADWG aesthetic and health-based guideline levels, and may exceed ANZECC and ADWG irrigation/stock drinking guideline levels,

Continued groundwater sampling and analysis are required to track changes in groundwater quality.

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3 DISCUSSION

3.1 Estimated groundwater flow rates

Table 5 characterises regional, intermediate and local GFSs, assigns permeabilities[14], effective porosities and lengths of flow paths, and estimates rates of groundwater flow and the travel time within each groundwater system

Estimated travel times for flow in local-scale, intermediate-scale and regional-scale systems are broadly in agreement with Figure 7. In southeastern Tasmania, depending mainly on the length of flow path and hydraulic gradient, travel times:

- for regional flow systems probably range over millennia,
- for intermediate flow systems probably range over centuries, and
- for local systems probably range over decades.

3.2 Conceptual hydrogeological models

Figures 12 shows hydrogeological sections lines A – B and C – D superimposed on the published geological map in Figure 4. shown is the location of groundwater monitoring bore CKMB1 (S and D).

Figures 13 and 14 are conceptual hydrogeological models through each of the section lines in Figure 12., at natural scale and with 5x vertical exaggerations.

Figure 15 (at 10x vertical exaggeration) is a detailed hydrogeological model at and in the vicinity of the proposed composting facility.

Observations from the conceptual models are:

- all rock types in the district are unconfined hard-rock aquifers.
- groundwater moves through secondary openings (mainly joints) between otherwise dry bulk rock.
- groundwater at local-scale comprises recharge and discharge areas between neighbouring sub-subcatchments and un-named minor creeks (the creeks are discharge zones)
- groundwater at intermediate-scale comprises recharge and discharge areas between neighbouring subcatchments and major creeks and rivulets (discharge zones)
- groundwater at regional-scale comprises recharge and discharge areas between neighbouring catchments and rivers (discharge zones),
- groundwater flow rates are judged to be very low (of the order of a few cm/day) and travel times are relatively long (from decades in local-scale systems, to millennia in regional-scale systems).

[14] All rock types in Table 5 are assigned a permeability of 0.01m/day. There is limited data available for permeabilities generally in Tasmania. However, values of 0.01m/day have been obtained from testing in fractured rocks in western Tasmania (W. C. Cromer unpublished data). In any case, the flow rates and travel times in Table 5 are intended to be indicative only, and should not be relied upon to reflect actual conditions at any site.

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Table 5. Estimated groundwater travel times for local-, intermediate- and regional-scale groundwater systems in unconfined fractured rock aquifers in southeaster Tasmania

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Groundwater system	Characteristics of flow paths	Aquifer	Example in and adjacent to the proposed composting facility	Aquifer permeability (m/day)	Head difference (m)	Length of flow path (m)	Hydraulic gradient	Flow volume (m3/day/m2)	Flow volume (L/day/m2)	Effective porosity	Flow rate (m/day)	Travel time (days; rounded)	Travel time (years; rounded)	Descriptor for travel time
Regional	Irregular pathways through intersecting secondary openings	Unconfined fractured hard rock	Triassic and Permian sedimentary rocks; Jurassic dolerite	0.01	500	20,000	0.03	0.0003	0.3	0.01	0.03	800,000	2,200	"Millennia"
Intermediate	Irregular pathways through intersecting secondary openings	Unconfined fractured hard rock	Triassic and Permian sedimentary rocks; Jurassic dolerite	0.01	100	5,000	0.02	0.0002	0.2	0.01	0.02	250,000	700	"Centuries"
Local	Irregular pathways through intersecting secondary openings	Unconfined fractured hard rock	Triassic and Permian sedimentary rocks; Jurassic dolerite	0.01	50	1,000	0.05	0.0005	0.5	0.01	0.05	20,000	100	"Decades"

IMPORTANT: Inputs to this Table after Column 4 are rough estimates based on limited or no field data. Results should be treated with caution.

Notes for Columns

Column 1	Figures 6, 7, and 8 in report	Column 8	Column 6 divided by Column 7
Column 2	Schematic, conceptual types of flow paths in the cross sections in Figures 12 – 14.	Column 9	From Darcy's Law: Flow volume = Column 5 x Column 8
Column 3	Figures 13 – 15	Column 10	Column 9 x 1000. The flow through unit area of aquifer.
Column 4	Publishedand observed geology, interpreted cross sections; log of bore hole CKMB1	Column 11	Reasonable estimates
Column 5	0.01m/day is fairly typical of fractured rock aquifers in Tasmania.	Column 12	Column 9 divided by Column 11
Column 6	Figures 13 – 15	Column 13	Column 7 divided by Column 12
Column 7	Figures 13 – 15	Column 14	Column 13 divided by 365

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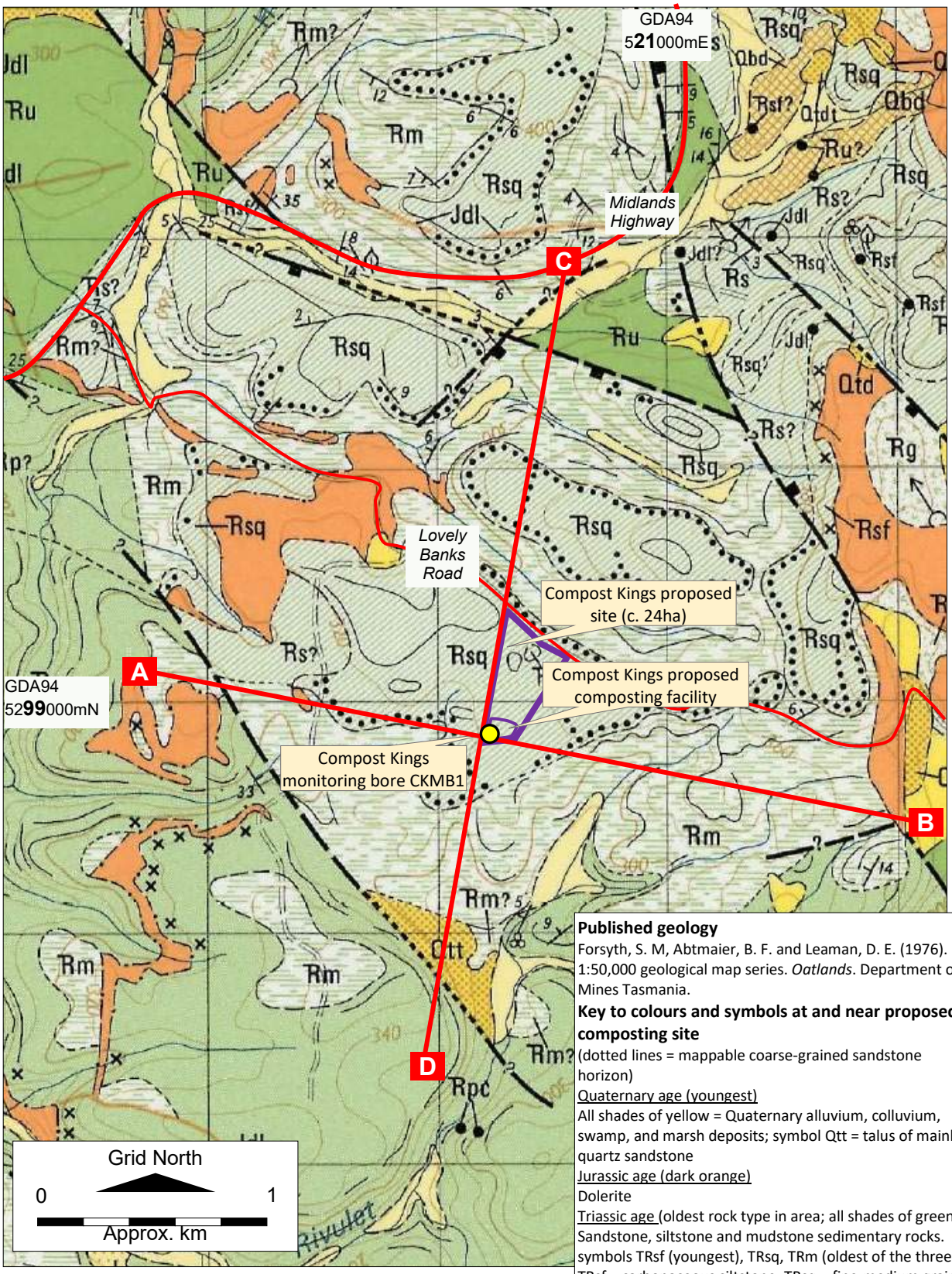

Published geology

Forsyth, S. M, Abtmaier, B. F. and Leaman, D. E. (1976). 1:50,000 geological map series. *Oatlands*. Department of Mines Tasmania.

Key to colours and symbols at and near proposed composting site

(dotted lines = mappable coarse-grained sandstone horizon)

Quaternary age (youngest)

All shades of yellow = Quaternary alluvium, colluvium, swamp, and marsh deposits; symbol Qtt = talus of mainly quartz sandstone

Jurassic age (dark orange)

Dolerite

Triassic age (oldest rock type in area; all shades of green) Sandstone, siltstone and mudstone sedimentary rocks. [eg symbols TRsf (youngest), TRsq, TRm (oldest of the three)]. TRsf = carbonaceous siltstone; TRsq = fine-medium grained laminated sandstone; TRm = micaceous mudstone and very fine-fine grained sandstone; TRu = undifferentiated sedimentary rocks.

Black dashed lines are faults

Figure 12. Locations of hydrogeological section lines A – B and C – D, and monitoring bore CKMB1, with respect to the published geology of the district near the proposed composting facility.

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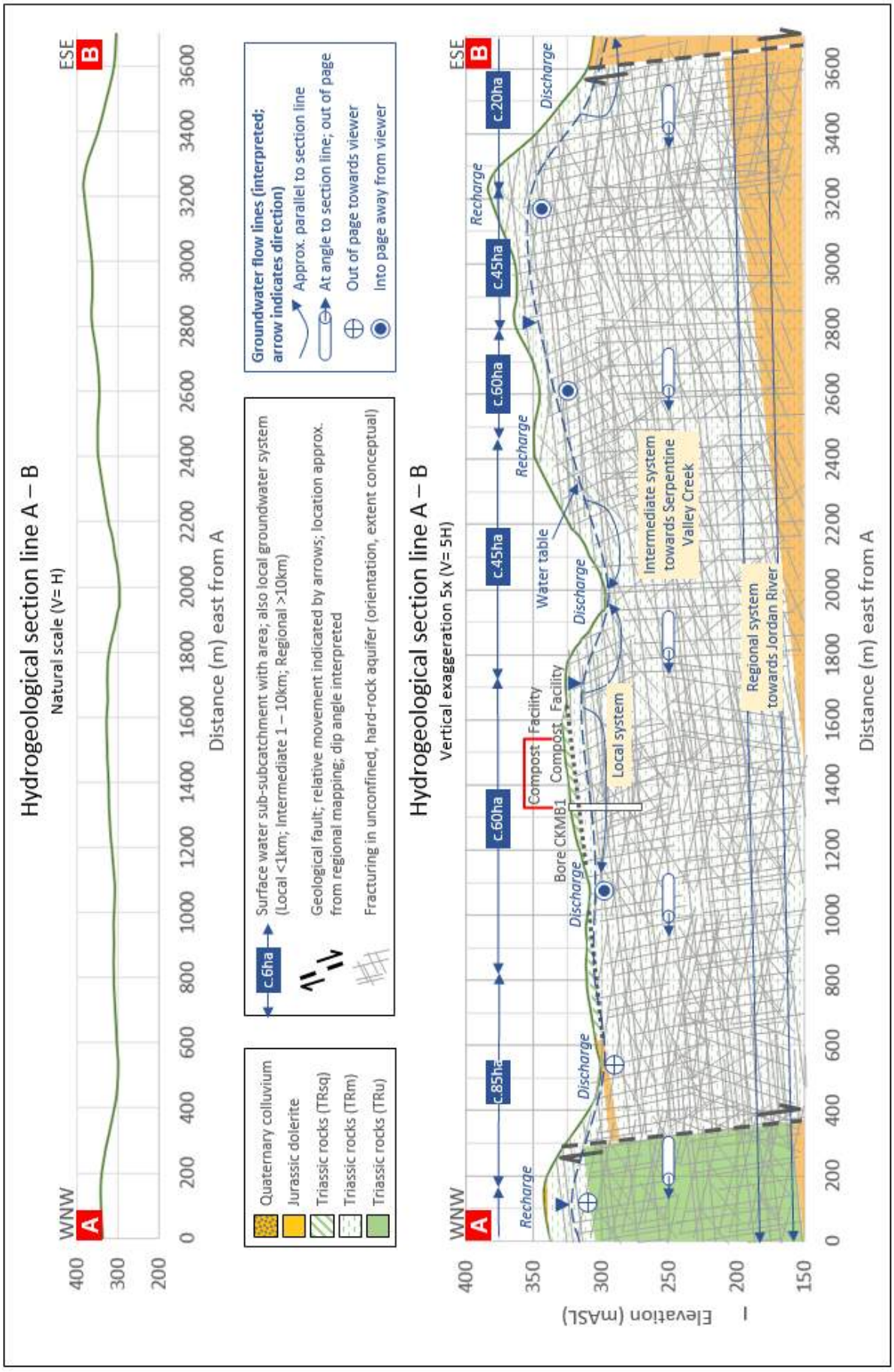

Figure 13. Conceptual east – west hydrogeological model through section line A – B in Figure 12.

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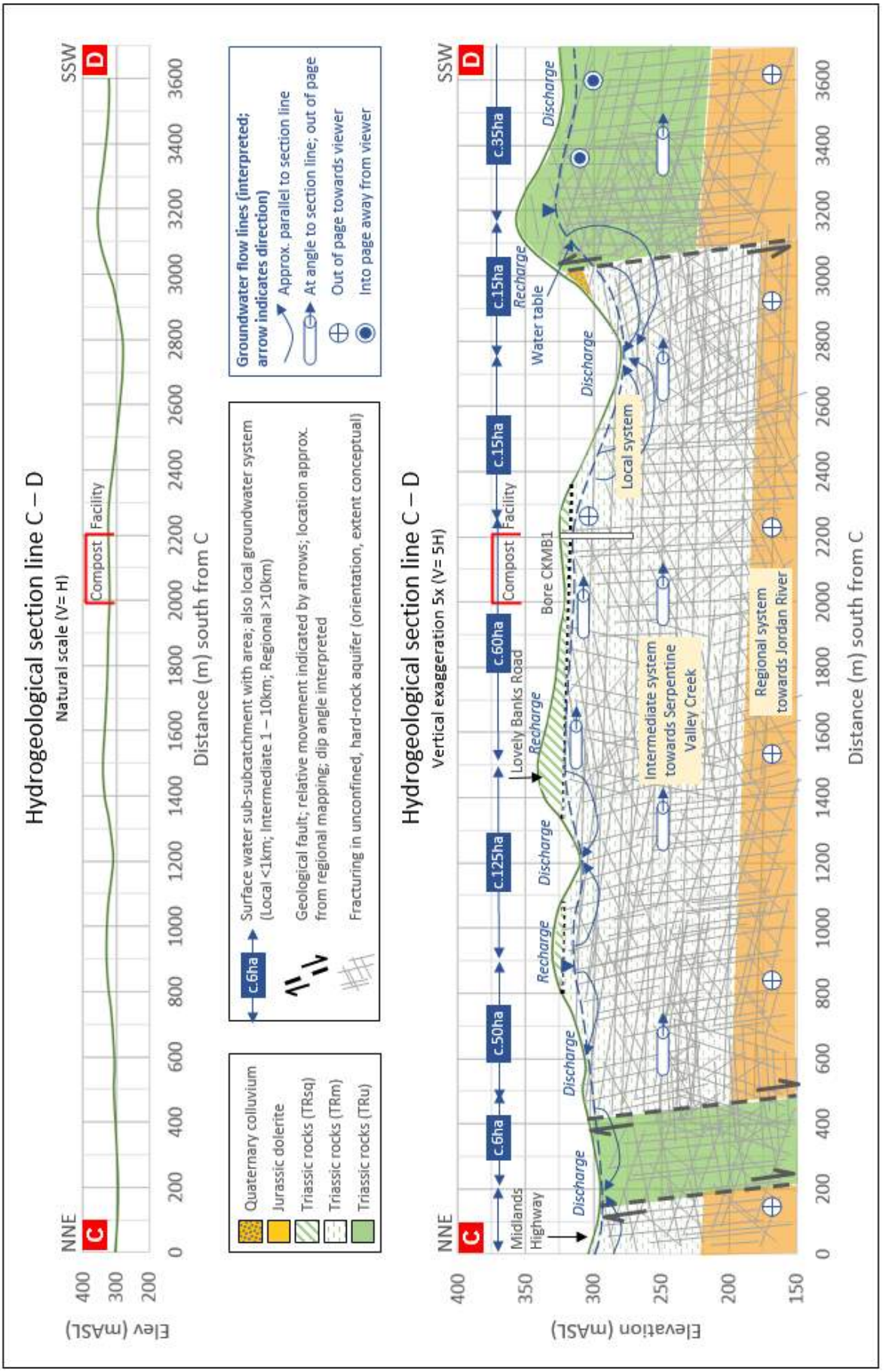

Figure 14. Conceptual NNE – SSW hydrogeological model through section line C – D in Figure 12.

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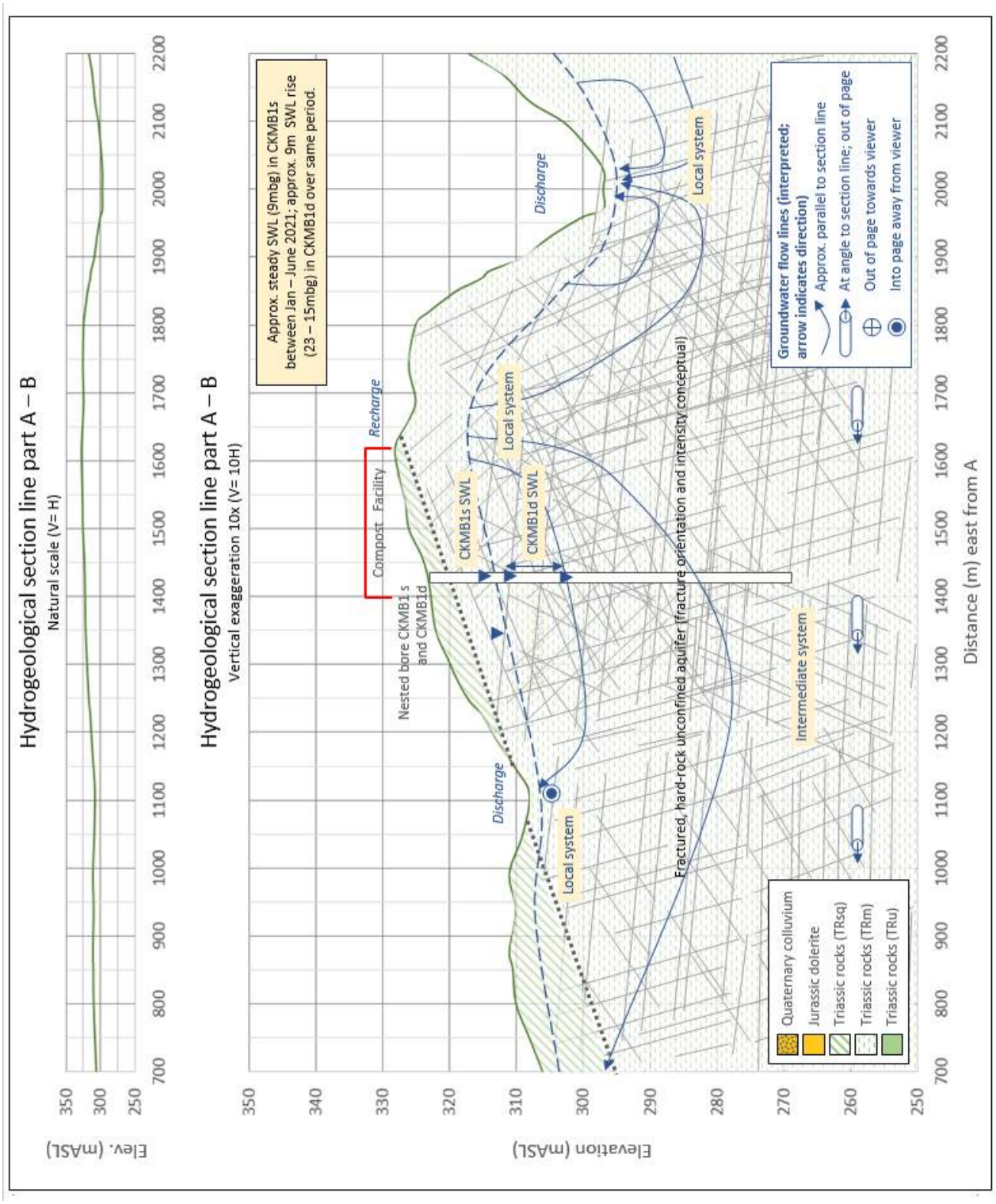

Figure 15. Conceptual WNW – ESE hydrogeological model through part of section line A – B in Figure 12.

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3.3 Seasonal variation in depth to groundwater

Depth to groundwater (ie standing water level; SWL) in unpumped bores varies annually, seasonally and at shorter scales everywhere. However, such information for the district in the vicinity of the proposed composting facility is apparently limited to the following:

- A network of several dozen groundwater bores were monitored for SWL fluctuations by Mineral Resources Tasmania for a few years up until at least 2004 (Ezzy, 2006). As part of the network, bore 16529 drilled near Melton Mowbray[15] in November 1990 to a depth of 80m in Triassic sedimentary rocks (yield 0.5L/s and other data) was monitored at roughly six-monthly intervals from late 1991 to late 2004. A generally rising water level trend of about 0.02m/year was indicated, and annual fluctuations over the monitoring period were in the 0.2 – 0.6m range (Figure 16). There is no reported data on shorter-term SWL fluctuations.
- In Compost Kings' nested monitoring bore CKMB01, the SWL in the shallow screened interval moved down 0.6m between January and June 2021, and the SWL in the deeper screened interval moved up 8.6m over the same period. The latter might reflect an extremely slow recharge rate (and hence extremely low permeability) between the two summer/winter sampling/pumping events.

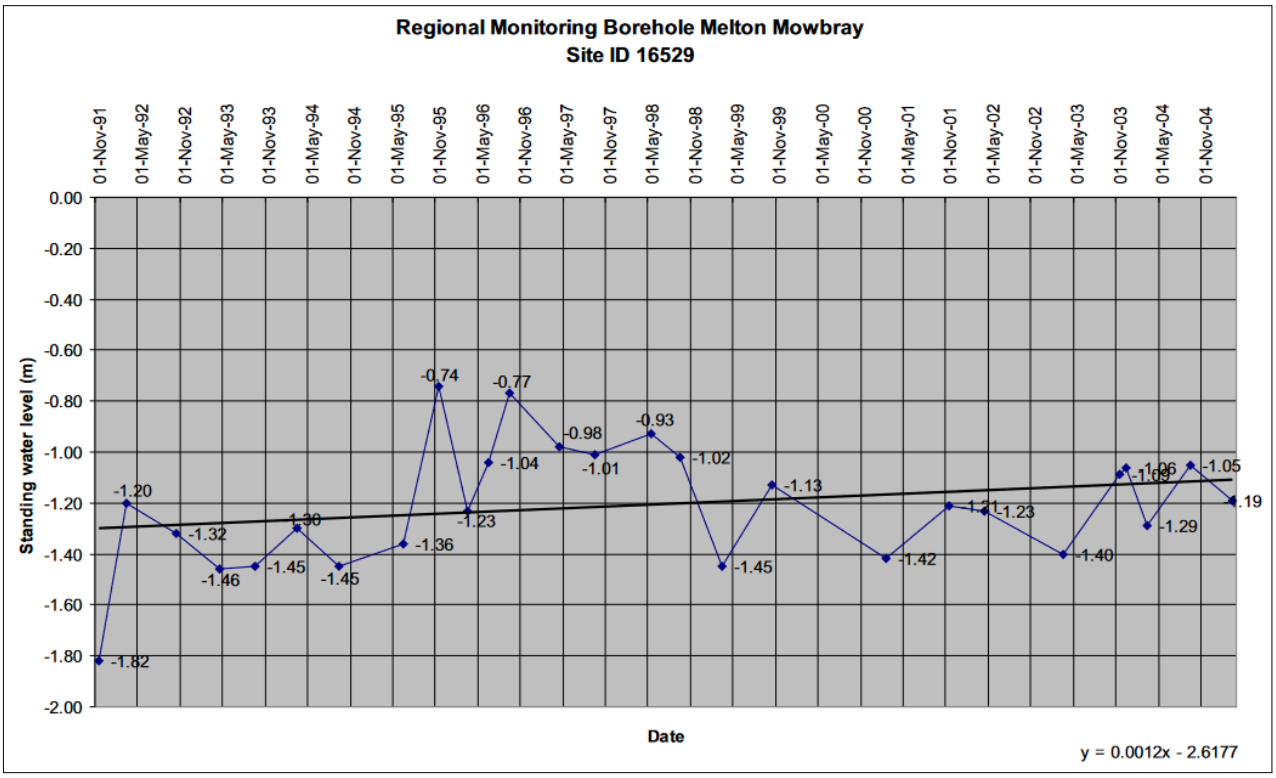

Figure 16. Fluctuations in monitoring bore 16529 from November 1991 to November 2004 (Ezzy, 2006)

3.4 Directions of groundwater flow beneath the facility

As shown in Figure 8, groundwater flow directions beneath the proposed composting facility are:

- westerly for the local-scale system,

[15] GDA94 grid reference 515281mE; 5295616mN; stated to be accurate to +/-2m. Salinity = 1203mg/L TDS.

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- west-southwesterly for the intermediate-scale system, and
- westerly for the regional-scale system,

3.5 Groundwater use in the district

3.5.1 In the local-scale catchment

There are no current groundwater users in the local-scale catchment.

3.5.2 In the intermediate-scale catchment

Figure 9 and Table 2 show that there were 24 recorded groundwater bores at roughly intermediate-scale in the district. Four were reported as operating after drilling. No reportedly operating bore is closer than 2km from the facility.

Groundwater travel times from the facility to the nearest of these reportedly functioning bores is probably measured in decades to centuries (Table 4).

3.5.3 In the regional-scale catchment

A few hundred water bores are recorded on DPIPWE's groundwater information portal in the Melton Mowbray district. An unknown number (almost certainly a small minority) are functioning.

Groundwater travel times from the facility to the nearest of these functioning bores is probably measured in centuries to millennia (Table 5).

3.6 Risks to groundwater from leachate/wastewater from the facility

Potential risks to groundwater occasioned by the proposed composting facility are depicted in Table 6.

The existing conditions (the hydrogeological model) are summarised at the top of the Table.

Given this model, risks to current groundwater conditions (occurrence, movement and quality) are judged to range from Very Low to Moderate with no management.

Management actions to reduce risks to Very Low to Low (and Acceptable) primarily involve:

- compaction of subsoil (subgrade) during hardstand construction,
- dam construction in accord with DPIPWE (2015a) or 2015b)[16], and
- continuing (and if necessary modifying) the current surface water and groundwater monitoring program.

[16] Consultation with Southern Midlands Council will determine whether one or both dams will require a Division 3 or 4 Permit.

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Table 6. Potential risks to groundwater beneath the composting facility, and their management

The hydrogeological model (Figure 15) for this facility is: existing soil profile (topsoil; clay subsoil, clayey sand weathered bedrock horizon); overlying Triassic sandstone, siltstone and silty mudstone bedrock to 50+m; water table at c. 9mbg. Existing local-scale groundwater quality unsuitable for domestic and livestock consumption.

		Before treatment				After treatment		
1		2	3	4		2	3	4
	Scenario	**Likelihood of occurrence**	**Consequence to groundwater**	**Level of risk to groundwater**	**Suggested risk treatments**	**Likelihood of occurrence**	**Consequence to groundwater**	**Level of risk to groundwater**
	Elements at risk = local-, intermediate- and regional-scale groundwater in fractured hard rocks beneath the site							
1	Vertical infiltration to water table of on-site domestic wastewater from in-ground disposal of primary-treated wastewater in absorption trench(es)	Barely credible (very small-scale wastewater volume; subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Minor (local scale); Insignificant (larger scales; probably decades of g'water travel time); No groundwater use within +/- 2km.	Very Low	REDUCE LIKELIHOOD. Conduct Site and Soil Assessment, and design on-site system in accord with AS/NZS1547:2012 *On-site domestic wastewater management* and Tasmanian Director of Building Control's (2017) *Guidelines for On-site Wastewater Management Systems.*	Barely credible	Minor (local scale); Insignificant (larger scales; probably decades of g'water travel time)	Very Low
2	Vertical infiltration to water table of compost leachate from mixing area, floor of facility, compost stockpiles, and beneath windrows, on existing soil profile	Possible (subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time); No groundwater use within +/- 2km.	Moderate	REDUCE LIKELIHOOD. Remove topsoil; compact underlying subsoil with vibrating roller to reduce permeability nom. to 1E-10m/s; replace topsoil with compacted road base. Continue six-monthly groundwater monitoring of bore CKMB1S and D.	Unlikely	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time)	Low
3	Vertical infiltration to water table of leachate/stormwater from dams inside facility	Possible (subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time); No groundwater use within +/- 2km.		REDUCE LIKELIHOOD. Construct dams to engineering principles and local regulatory requirements, employing compacted clay and bedrock bases. Continue six-monthly groundwater monitoring of bore CKMB1S and D.			
4	Rapid failure of above-ground tanks storing liquid fish wastes	Possible (e.g., from impacts from delivery trucks and operating plant)	Minor Spilt liquids report rapidly to downgradient stormwater and leachate dams with very minor vertical infiltration.		Maintain adequate safety barriers (eg bollards) around tanks; monitor state of bollards and tanks regularly			

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4 CONCLUSIONS

This hydrogeological assessment concludes:

- unconfined groundwater exists in fractured, hard-rock Triassic sedimentary rocks beneath the proposed composting facility,
- the site of the facility is a recharge zone, with groundwater movement vertically downward and then laterally to the nearest (un-named) watercourse to the west,
- bulk rock permeability is judged to be very low, and rates of groundwater movement also very low (perhaps centimetres/day); the travel time from facility to the nearest minor watercourse to the west may be decades,
- the water table in CKMB1S was at a depth of about 10mbg in summer/winter 2021, but appears to be variable in CKMB1D,
- based on two sampling events, groundwater quality is poor and variable; it is not suitable for domestic consumption, it probably exceeds aquatic ecosystem (freshwater lowland rivers) guidelines for various constituents, and may be marginal for irrigation.
- with appropriate management, the proposed composting facility will present acceptably low risks to groundwater.

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5 REFERENCES

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ATTACHMENTS

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Attachment 1

Analytical Services Tasmania results for report 100124
for opportunistic water sample CKMB1 sampled 16 December 2020
(6 pages)

ANALYTICAL SERVICES TASMANIA
New Town Laboratory
18 St Johns Avenue
New Town Tasmania AUSTRALIA 7008
Telephone: +61 3 6165 3300 .
Email: enquiries@ast.tas.gov.au

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Tasmanian Government

Sample Receipt FOR AST Job No. 100124

18-Dec-20

***** PLEASE CHECK CAREFULLY *****

Client: William C Cromer Pty Ltd
Submitted By: Bill Cromer to the New Town Laboratory
Purchase Order No.: CKMB1
Invoice To: Bill Cromer
Customer Project: Compost Kings **AST Project:**
Quote No.: N/A **Estimated Report Date:** 11-Jan-21
Date Received: 18-Dec-20 *10 working days unless otherwise negotiated*
Estimated Cost Including GST: **$494.45** *This is not an invoice. Once results are received an invoice will be issued.*

Report Recipients:

Recipient:	Job Summary	Final Report	Export File
Bill Cromer	☑	☑	☑

Enquiries to AST Client Services: PH (6165 3300) or email: ASTclientservices@ast.tas.gov.au

Your project has been logged in for the following analyses.

Sample: 0405110 **Date Time Sampled: 16-Dec-2020 10:30** **ID: CKMB1**

Acidity
Acidity

Alkalinity and Forms of Alkalinity
Alkalinity CO3, Alkalinity HCO3, Alkalinity Total

Anions in Water by Ion Chromatography
Bromide, Chloride, Fluoride, Sulphate

Colour
Colour Apparent*, Colour True

Conductivity in Water
Conductivity

Hardness by Calculation
Hardness

Mercury in Water
Hg Dissolved

Metals in Water by ICP-AES
Al Dissolved, As Dissolved, Ba Dissolved, Ca Dissolved, Cd Dissolved, Co Dissolved, Cr Dissolved, Cu Dissolved, Fe Dissolved, K Dissolved, Mg Dissolved, Mn Dissolved, Mo Dissolved, Na Dissolved, Ni Dissolved, Pb Dissolved, Se Dissolved, Zn Dissolved

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Job Summary	Lab. Project N	100124	18-Dec-20

Nutrients, Dissolved by FIA
Ammonia, Nitrate, Nitrate + Nitrite, Nitrite, Phosphorus, Dissolved Reactive

pH in Water
pH

Sulphide in Water
Sulphide Dissolved

Total Dissolved Solids dried at 180 ± 5 °C
TDS

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Tasmanian Government

ANALYTICAL SERVICES TASMANIA
New Town Laboratory
18 St Johns Avenue
New Town Tasmania AUSTRALIA 7008
Telephone: +61 3 6165 3300 .
Email: enquiries@ast.tas.gov.au

Laboratory Report

Report No: 100124 **Issue No: 1** **Report Date: 05-Jan-2021 15:22**

Status: Full Report

Site Description: Compost Kings

Received: 18-Dec-20

Submitted to: New Town Laboratory

Submitted By: Bill Cromer

Client Order No: CKMB1

Report To: Bill Cromer

Client: William C Cromer Pty Ltd

Address: 74A Channel Highway TAROONA TAS 7053

Samples for dissolved nutrients diluted 1/10 before analysis. Reporting limit raised to 0.05 mg-N/L for ammonia, 0.03 mg-P/L for dissolved reactive phosphorus and 0.02 mg-N/L for nitrate, nitrite and nitrate+nitrite.

ilac-MRA NATA Accreditation No. 5589

Accredited for compliance with ISO/IEC 17025 - Testing.

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Samples analysed as received.

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ANALYTICAL SERVICES TASMANIA

Report No: 100124 **Issue No:** 1 **Report Date:** 05-Jan-2021 15:22

			Lab No:	405110
			Sample ID:	CKMB1
			Sampled On:	16/12/20 10:30
Method	**Analyte**	**Units**		
1001-Water	pH			7.2
1002-Water	Conductivity	µS/cm		3560
1004-Water	TDS	mg/L		5690
1007-Water	Colour Apparent*	CU		>500
	Colour True	CU		5
1101-Water	Alkalinity CO3	mg CaCO3/L		<2
	Alkalinity HCO3	mg CaCO3/L		120
	Alkalinity Total	mg CaCO3/L		121
1102-Water	Acidity	mg CaCO3/L		18
1103-Water	Bromide	mg/L		<10.0
	Chloride	mg/L		2390
	Fluoride	mg/L		<5.00
	Sulphate	mg/L		35.9
1109-Water	Hardness	mg CaCO3/L		1910
1126-Water	Sulphide Dissolved	µg/L		<20
1205-Water	Ammonia	mg-N/L		0.53
	Nitrate	mg-N/L		0.11
	Nitrate + Nitrite	mg-N/L		0.12
	Nitrite	mg-N/L		<0.020
	Phosphorus, Dissolved Re	mg-P/L		<0.030
1301-Water	Al Dissolved	µg/L		<20
	As Dissolved	µg/L		<20
	Ba Dissolved	µg/L		643
	Ca Dissolved	mg/L		591
	Cd Dissolved	µg/L		<2
	Co Dissolved	µg/L		<3
	Cr Dissolved	µg/L		<2
	Cu Dissolved	µg/L		<2
	Fe Dissolved	µg/L		<20
	K Dissolved	mg/L		23.5
	Mg Dissolved	mg/L		106
	Mn Dissolved	µg/L		1070
	Mo Dissolved	µg/L		35
	Na Dissolved	mg/L		730
	Ni Dissolved	µg/L		<10
	Pb Dissolved	µg/L		<10
	Se Dissolved	µg/L		<30
	Zn Dissolved	µg/L		8
1305-Water	Hg Dissolved	µg/L		<0.05

* NATA accreditation does not cover this analyte.
Underlined results denote the sample holding time/preservation from point of sampling to start of testing was inadequate or could not be assessed. Please take this into account when interpreting results. Assessment made against AS/NZS 5667.

Page 2 of 4

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ANALYTICAL SERVICES TASMANIA

Report No: 100124 **Issue No:** 1 **Report Date:** 05-Jan-2021 15:22

Lab. No.	*Analyte*	*Method Used:*	*Date Time Sampled.*	*Client Sample ID.*
405110	Bromide	Anions in Water by Ion Chromatography	16/12/2020 10:30:00	CKMB1

Reporting limit has been increased as sample matrix required dilution prior to analysis.

Lab. No.	*Analyte*	*Method Used:*	*Date Time Sampled.*	*Client Sample ID.*
405110	Colour Apparent	Colour in Water by absorbance at 455nm	16/12/2020 10:30:00	CKMB1

Sample is very turbid affecting the colour reading.

Lab. No.	*Analyte*	*Method Used:*	*Date Time Sampled.*	*Client Sample ID.*
405110	Fluoride	Anions in Water by Ion Chromatography	16/12/2020 10:30:00	CKMB1

Reporting limit has been increased as sample matrix required dilution prior to analysis.

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ANALYTICAL SERVICES TASMANIA

Report No: 100124 **Issue No:** 1 **Report Date:** 05-Jan-2021 15:22

Test Method(s) :		**Test Date**
Inorganic Testing		
1001-Water:	pH in Water	18-Dec-2020
1002-Water:	Conductivity in Water at 25°C	18-Dec-2020
1007-Water:	Colour in Water by absorbance at 455nm	18-Dec-2020
1007-Water:	Colour in Water by absorbance at 455nm	18-Dec-2020
1101-Water:	Alkalinity in Water to pH 4.5	18-Dec-2020
1102-Water:	Acidity in Water	18-Dec-2020
1103-Water:	Anions in Water by Ion Chromatography	18-Dec-2020
1109-Water:	Hardness by APHA Method 2340	24-Dec-2020
1126-Water:	Sulphide in Water by Discrete Analyser	24-Dec-2020
1301-Water:	Metals in Water by ICP-AES	23-Dec-2020
1305-Water:	Mercury in Water by CV-AFS	22-Dec-2020

Authorised By:

Alison Featherstone
Business Development Manager

1004-Water:	Solids, Total Dissolved dried at 180 ± 5 °C	21-Dec-2020

Authorised By:

Cameron Johns
Section Head - Inorganic (Metals)

Organic and Nutrient Testing

1205-Water:	Dissolved Nutrients by FIA	23-Dec-2020

Authorised By:

Alison Featherstone
Business Development Manager

NATA
Accredition No. 5589

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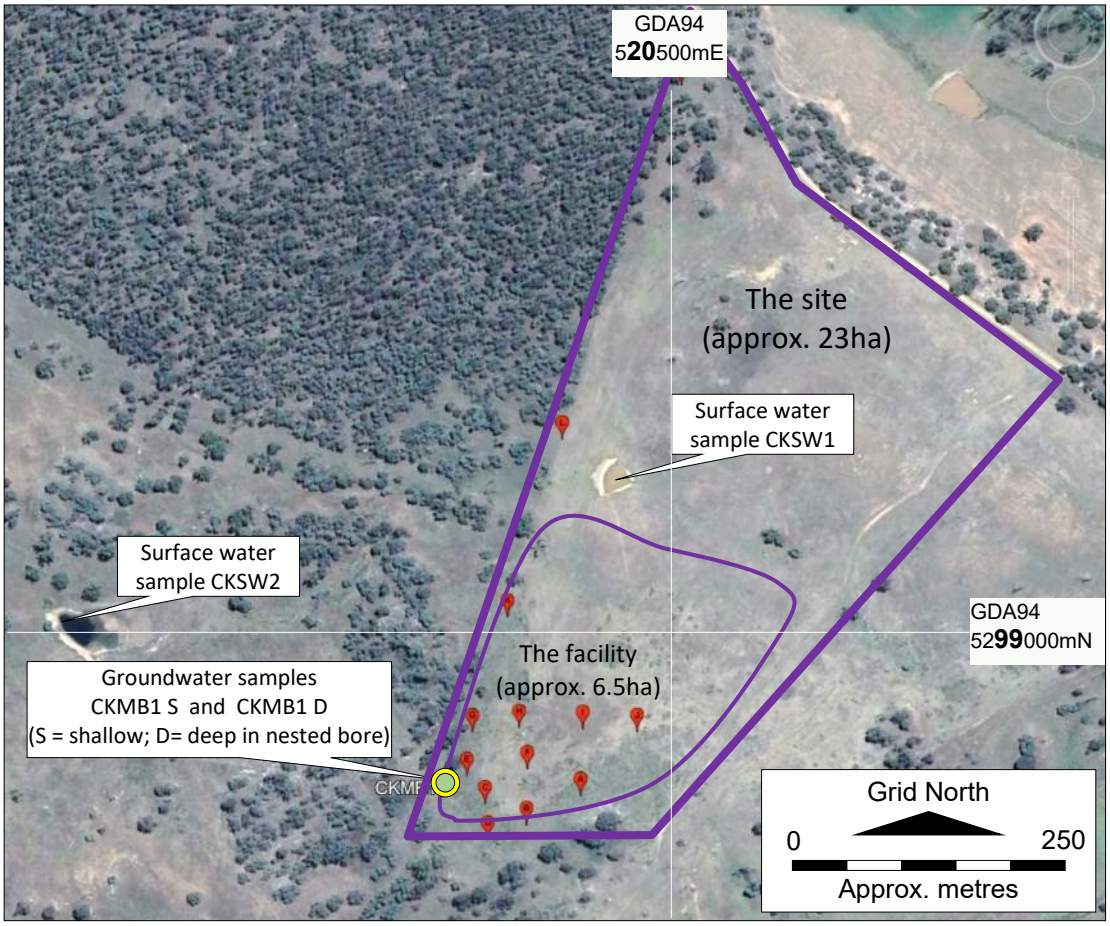
Attachment 2

Australian Laboratory Services results for jobs EM2100341 and EM2111705
(23 pages)

EM2100341: 12 January 2021 Surface Water and Groundwater Monitoring Event SWGWME#1
EM21111705: 19 June 2021 Surface Water and Groundwater Monitoring Event SWGWME#2



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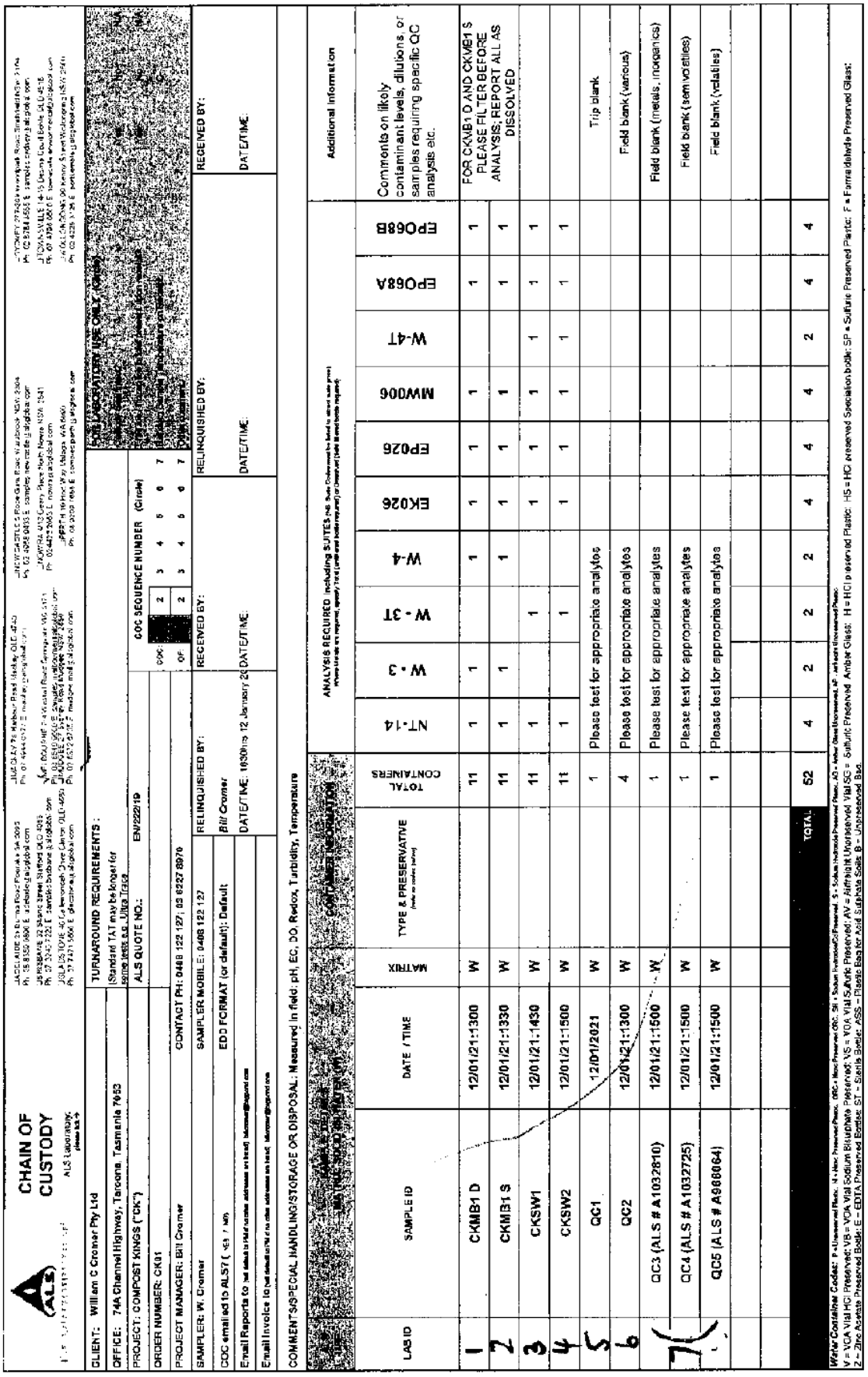
EM2100341: 12 January 2021 Surface Water and Groundwater Monitoring Event SWGWME#1



CHAIN OF CUSTODY

ALS Laboratory: (please tick →)

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

HOBART 6 Hercules Crescent Chigwell TAS 7011 Ph: 03 8549 9600 E: samples.hobart@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: perth.mail@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WAGGA WAGGA 90 Hanna Street Wagga Wagga NSW 2650 Ph: 02 6971 9696 E: wagga.mail@alsglobal.com

CLIENT:	William C Cromer Pty Ltd
OFFICE:	74A Channel Highway, Taroona, Tasmania 7053
PROJECT:	COMPOST KINGS ("CK")
ORDER NUMBER:	CK01
PROJECT MANAGER:	Bill Cromer
SAMPLER:	W. Cromer
COC emailed to ALS?	
Email Reports to:	
Email Invoice to:	

TURNAROUND REQUIREMENTS: Standard TAT may be longer for some tests e.g. Ultra Trace

ALS QUOTE NO.: EM2122119

CONTACT PH: 0448 122 127; 03 6227 8970

SAMPLER MOBILE: 0448 122 127

EDD FORMAT (or default): Default

DATE/TIME: 1630hrs 12 January 20

COC SEQUENCE NUMBER (Circle): COC 2 3 4 5 6 7; OF 2 3 4 5 6 7

RELINQUISHED BY: Bill Cromer

RECEIVED BY:

DATE/TIME:

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Measured in field: pH, EC, DO, Redox, Turbidity, Temperature

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL CONTAINERS	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite prices)										Additional Information	
						NT-14	W-3	W-3T	W-4	EK026	EP026	MW006	W-4T	EP068A	EP068B	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	CKMB1 D	12/01/21 1300	W		11	1	1		1	1	1	1		1	1	FOR CKMB1 D AND CKMB1 S PLEASE FILTER BEFORE ANALYSIS; REPORT ALL AS DISSOLVED	
2	CKMB1 S	12/01/21 1330	W		11	1	1		1	1	1	1		1	1		
3	CKSW1	12/01/21 1430	W		11	1		1		1	1	1	1	1	1		
4	CKSW2	12/01/21 1500	W		11	1		1		1	1	1	1	1	1		
5	QC1	12/01/2021	W		1	Please test for appropriate analytes										Trip blank	
6	QC2	12/01/21 1300	W		4	Please test for appropriate analytes										Field blank (various)	
7	QC3 (ALS # A1032810)	12/01/21 1500	W		1	Please test for appropriate analytes										Field blank (metals, inorganics)	
	QC4 (ALS # A1032725)	12/01/21 1500	W		1	Please test for appropriate analytes										Field blank (semivolatiles)	
	QC5 (ALS # A988664)	12/01/21 1500	W		1	Please test for appropriate analytes										Field blank (volatiles)	
				TOTAL:	52	4	2	2	2	4	4	4	2	4	4		

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Preserved Plastic; AG = Amber Glass Unpreserved; AP = Amber Glass Preserved; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial SA Sulfuric Preserved; AV = Air Freight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2100341**	Page	: 1 of 10
Client	: **WILLIAM C CROMER PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR BILL CROMER	Contact	: Shirley LeCornu
Address	: 74A CHANNEL HIGHWAY TAROONA TASMANIA 7053	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6227 8970	Telephone	: +6138549 9630
Project	: CK01	Date Samples Received	: 13-Jan-2021 12:50
Order number	: ----	Date Analysis Commenced	: 13-Jan-2021
C-O-C number	: ----	Issue Date	: 19-Jan-2021 15:23
Sampler	: WC		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Arenie Vijayaratnam	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Laboratory Coordinator	WRG Subcontracting, Springvale, VIC

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www.williamccromer.com

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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA010-P: Electrical Conductivity @ 25°C was analysed by manual method (EA010).
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP026SP: EM2100341 #2 Sample required dilution due to matrix interference. LOR has been raised accordingly.
- Ionic Balance out of acceptable limits for sample #3 and #4 due to analytes not quantified in this report.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- EP026SP: EM2100341 #2 Poor matrix spike recovery for COD due to sample matrix. Confirmed by re-extraction and re-analysis. Confirmed by reanalysis.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

www.williamccromer.com

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CKMB1 D	CKMB1 S	CKSW1	CSKW2	QC1
			Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 13:30	12-Jan-2021 14:30	12-Jan-2021 15:00	12-Jan-2021 00:00
Compound	CAS Number	LOR	Unit	EM2100341-001	EM2100341-002	EM2100341-003	EM2100341-004	EM2100341-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.74	6.66	7.74	6.81	---
EA006: Sodium Adsorption Ratio (SAR)								
^ Sodium Adsorption Ratio	----	0.01	-	6.90	5.85	2.45	3.19	---
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3070	9130	450	435	---
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	2000	5930	292	283	---
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	539	2760	73	56	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	43	<1	<1	<1	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	298	353	106	48	---
Total Alkalinity as CaCO3	----	1	mg/L	341	353	106	48	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	104	52	4	8	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	834	3420	82	111	---
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	163	413	6	6	---
Magnesium	7439-95-4	1	mg/L	32	419	14	10	---
Sodium	7440-23-5	1	mg/L	368	706	48	55	---
Potassium	7440-09-7	1	mg/L	9	15	11	5	---
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.004	<0.001	---	---	---
Boron	7440-42-8	0.05	mg/L	0.16	0.10	---	---	---
Barium	7440-39-3	0.001	mg/L	0.192	0.333	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0002	---	---	---
Cobalt	7440-48-4	0.001	mg/L	0.002	0.005	---	---	---
Chromium	7440-47-3	0.001	mg/L	0.001	<0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	0.002	0.003	---	---	---
Manganese	7439-96-5	0.001	mg/L	0.837	2.15	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.005	0.005	---	---	---

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CKMB1 D	CKMB1 S	CKSW1	CSKW2	QC1
			Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 13:30	12-Jan-2021 14:30	12-Jan-2021 15:00	12-Jan-2021 00:00
Compound	CAS Number	LOR	Unit	EM2100341-001	EM2100341-002	EM2100341-003	EM2100341-004	EM2100341-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	---	---	---
Zinc	7440-66-6	0.005	mg/L	**0.025**	**0.032**	---	---	---
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	---	---	**0.002**	<0.001	---
Boron	7440-42-8	0.05	mg/L	---	---	<0.05	<0.05	---
Barium	7440-39-3	0.001	mg/L	---	---	**0.112**	**0.035**	---
Beryllium	7440-41-7	0.001	mg/L	---	---	<0.001	<0.001	---
Cadmium	7440-43-9	0.0001	mg/L	---	---	<0.0001	<0.0001	---
Cobalt	7440-48-4	0.001	mg/L	---	---	**0.006**	<0.001	---
Chromium	7440-47-3	0.001	mg/L	---	---	**0.003**	<0.001	---
Copper	7440-50-8	0.001	mg/L	---	---	**0.004**	<0.001	---
Manganese	7439-96-5	0.001	mg/L	---	---	**0.986**	**0.018**	---
Nickel	7440-02-0	0.001	mg/L	---	---	**0.008**	**0.003**	---
Lead	7439-92-1	0.001	mg/L	---	---	**0.009**	<0.001	---
Selenium	7782-49-2	0.01	mg/L	---	---	<0.01	<0.01	---
Vanadium	7440-62-2	0.01	mg/L	---	---	<0.01	<0.01	---
Zinc	7440-66-6	0.005	mg/L	---	---	**0.042**	**0.008**	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	---	---	<0.0001	<0.0001	---
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	---
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	**0.4**	**0.2**	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.15**	**0.08**	**0.54**	**0.06**	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	**0.05**	<0.01	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.03**	**0.02**	**0.19**	<0.01	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CKMB1 D	CKMB1 S	CKSW1	CSKW2	QC1
				Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 13:30	12-Jan-2021 14:30	12-Jan-2021 15:00	12-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		EM2100341-001	EM2100341-002	EM2100341-003	EM2100341-004	EM2100341-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		0.03	0.02	0.24	<0.01	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.6	3.3	5.8	3.9	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.6	3.3	6.0	3.9	---
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		1.57	1.46	0.27	0.20	---
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	0.04	---
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		32.5	105	4.51	4.26	---
ø Total Cations	----	0.01	meq/L		27.0	86.2	3.82	3.64	---
ø Ionic Balance	----	0.01	%		9.24	9.66	8.32	7.77	---
EP026SP: Chemical Oxygen Demand (Spectrophotometric)									
Chemical Oxygen Demand	----	10	mg/L		164	<20	178	152	---
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
beta-BHC	319-85-7	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
gamma-BHC	58-89-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
delta-BHC	319-86-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Heptachlor	76-44-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Aldrin	309-00-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Dieldrin	60-57-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Endrin	72-20-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	---

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CKMB1 D	CKMB1 S	CKSW1	CSKW2	QC1
			Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 13:30	12-Jan-2021 14:30	12-Jan-2021 15:00	12-Jan-2021 00:00
Compound	CAS Number	LOR	Unit	EM2100341-001	EM2100341-002	EM2100341-003	EM2100341-004	EM2100341-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4.4`-DDT	50-29-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	---
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Methoxychlor	72-43-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	---
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	---
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	---
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	---
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	---
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	60	<50	<50	<50	---
C15 - C28 Fraction	----	100	µg/L	280	200	<100	<100	---
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	---
^ C10 - C36 Fraction (sum)	----	50	µg/L	340	200	<50	<50	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								

COMPOST KINGS TASMANIA: Proposed composting facility, Lovely Banks Road, Melton Mowbray
Hydrogeological Report
28 February 2024
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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CKMB1 D	CKMB1 S	CKSW1	CSKW2	QC1
				Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 13:30	12-Jan-2021 14:30	12-Jan-2021 15:00	12-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		EM2100341-001	EM2100341-002	EM2100341-003	EM2100341-004	EM2100341-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		110	<100	<100	<100	---
>C16 - C34 Fraction	----	100	µg/L		250	200	<100	<100	---
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	---
^ >C10 - C40 Fraction (sum)	----	100	µg/L		360	200	<100	<100	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		110	<100	<100	<100	---
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
MM301: E.coli & Faecal Coliforms MPN									
Escherichia coli	----	1	MPN/100mL		<10	20	200	31	---
Faecal Coliforms	----	1	MPN/100mL		<10	30	210	41	---
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.5	%		99.0	108	85.6	89.8	---
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.5	%		94.8	102	95.0	97.8	---
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		113	112	114	112	111
Toluene-D8	2037-26-5	2	%		112	107	107	108	105
4-Bromofluorobenzene	460-00-4	2	%		115	112	111	112	108

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	QC2	QC3, QC4, QC5	----	----	----
			Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2100341-006	EM2100341-007	------	------	------
				Result	Result	---	---	---
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	---	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	---	---	---
Barium	7440-39-3	0.001	mg/L	<0.001	<0.001	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	---	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	---	---	---
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	---	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	---	---	---
C10 - C14 Fraction	----	50	µg/L	<50	<50	---	---	---
C15 - C28 Fraction	----	100	µg/L	<100	<100	---	---	---
C29 - C36 Fraction	----	50	µg/L	<50	<50	---	---	---
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	---	---	---
>C10 - C16 Fraction	----	100	µg/L	<100	<100	---	---	---
>C16 - C34 Fraction	----	100	µg/L	<100	<100	---	---	---
>C34 - C40 Fraction	----	100	µg/L	<100	<100	---	---	---
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	---	---	---
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	---	---	---

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC2	QC3, QC4, QC5	----	----	----
				Sampling date / time	12-Jan-2021 13:00	12-Jan-2021 15:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2100341-006	EM2100341-007	------	------	------
					Result	Result	---	---	---
EP080: BTEXN - Continued									
Toluene	108-88-3	2	µg/L		<2	<2	----	---	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	---	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	---	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	---	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	---	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	---	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	---	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		108	109	----	---	----
Toluene-D8	2037-26-5	2	%		106	104	----	---	----
4-Bromofluorobenzene	460-00-4	2	%		106	109	----	---	----

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Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	117
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	51	127
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

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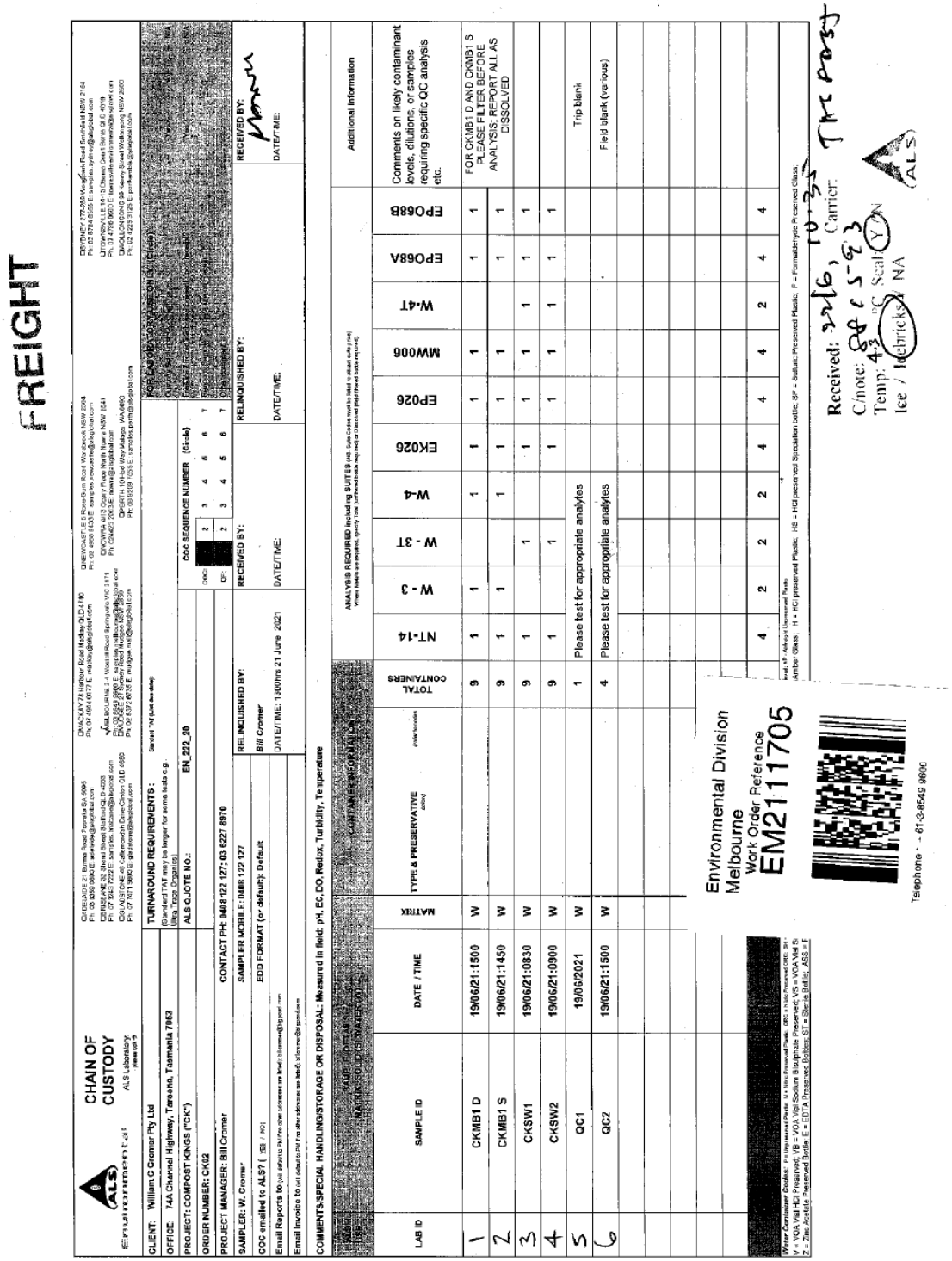
EM21111705: 19 June 2021 Surface Water and Groundwater Monitoring Event SWGWME#2



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CERTIFICATE OF ANALYSIS

Work Order	: **EM2111705**	Page	: 1 of 10
Client	: **WILLIAM C CROMER PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: MR BILL CROMER	Contact	: Shirley LeCornu
Address	: 74A CHANNEL HIGHWAY TAROONA TASMANIA 7053	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6227 8970	Telephone	: +6138549 9630
Project	: COMPOST KINGS ("CK")	Date Samples Received	: 22-Jun-2021 10:35
Order number	: CK02	Date Analysis Commenced	: 22-Jun-2021
C-O-C number	: ---	Issue Date	: 29-Jun-2021 17:29
Sampler	: W. Cromer		
Site	: ---		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Samantha Smith	Laboratory Coordinator	WRG Subcontracting, Springvale, VIC

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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP026SP - EM2111705 # 2 ; sample required dilution prior to analyse due to matrix interfernces. LOR values have been adjusted accordingly.
- EG035F: EM2111676 #6 Poor matrix recovery for dissolved mercury due to sample matrix. Confirmed by re-preparation and re-analysis.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- Samples were filtered through a 0.45um filter prior to the dissolved metals analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- EK057G: EM2111676-002 Poor matrix spike recovery for Nitrite as N due to matrix effects.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CKMB1 D	CKMB1 S	CKSW1	CKSW2	QC1
				Sampling date / time	19-Jun-2021 15:00	19-Jun-2021 14:50	19-Jun-2021 08:30	19-Jun-2021 09:00	19-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EM2111705-001	EM2111705-002	EM2111705-003	EM2111705-004	EM2111705-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.13	3.11	7.54	7.23	----
EA006: Sodium Adsorption Ratio (SAR)									
^ Sodium Adsorption Ratio	----	0.01	-		7.62	6.51	2.00	4.18	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		617	9970	149	149	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		401	6480	97	97	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		354	2980	64	69	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		408	<1	78	58	----
Total Alkalinity as CaCO3	----	1	mg/L		408	<1	78	58	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		97	456	5	1	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		522	3300	48	150	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		109	458	6	8	----
Magnesium	7439-95-4	1	mg/L		20	447	12	12	----
Sodium	7440-23-5	1	mg/L		330	818	37	80	----
Potassium	7440-09-7	1	mg/L		5	12	12	6	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.006	0.004	----	----	----
Boron	7440-42-8	0.05	mg/L		0.15	0.08	----	----	----
Barium	7440-39-3	0.001	mg/L		0.120	0.444	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	----	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	0.004	----	----	----
Chromium	7440-47-3	0.001	mg/L		0.002	0.002	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		0.417	1.88	----	----	----
Nickel	7440-02-0	0.001	mg/L		0.004	0.004	----	----	----

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CKMB1 D	CKMB1 S	CKSW1	CKSW2	QC1
			Sampling date / time	19-Jun-2021 15:00	19-Jun-2021 14:50	19-Jun-2021 08:30	19-Jun-2021 09:00	19-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EM2111705-001	EM2111705-002	EM2111705-003	EM2111705-004	EM2111705-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Lead	7439-92-1	0.001	mg/L	<0.001	**0.002**	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	**0.021**	---	---	---
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	----	----	**0.002**	<0.001	----
Boron	7440-42-8	0.05	mg/L	----	----	<0.05	<0.05	----
Barium	7440-39-3	0.001	mg/L	----	----	**0.199**	**0.048**	----
Beryllium	7440-41-7	0.001	mg/L	----	----	**0.001**	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	<0.0001	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	----	----	**0.008**	**0.002**	----
Chromium	7440-47-3	0.001	mg/L	----	----	**0.007**	<0.001	----
Copper	7440-50-8	0.001	mg/L	----	----	**0.009**	**0.003**	----
Manganese	7439-96-5	0.001	mg/L	----	----	**0.499**	**0.271**	----
Nickel	7440-02-0	0.001	mg/L	----	----	**0.011**	**0.004**	----
Lead	7439-92-1	0.001	mg/L	----	----	**0.016**	**0.001**	----
Selenium	7782-49-2	0.01	mg/L	----	----	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	----	----	**0.01**	<0.01	----
Zinc	7440-66-6	0.005	mg/L	----	----	**0.052**	**0.008**	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	----	----	<0.0001	<0.0001	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	**0.3**	**0.2**	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.31**	**0.30**	**0.12**	**0.05**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	**0.01**	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.01**	**0.02**	**1.35**	**0.02**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CKMB1 D	CKMB1 S	CKSW1	CKSW2	QC1
			Sampling date / time	19-Jun-2021 15:00	19-Jun-2021 14:50	19-Jun-2021 08:30	19-Jun-2021 09:00	19-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EM2111705-001	EM2111705-002	EM2111705-003	EM2111705-004	EM2111705-005
				Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued								
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.02	1.36	0.02	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.7	2.9	2.6	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.6	0.7	4.3	2.6	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.03	0.19	0.24	0.08	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.10	0.01	0.03	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	24.9	102	3.02	5.41	----
ø Total Cations	----	0.01	meq/L	21.6	95.5	3.20	5.02	----
ø Ionic Balance	----	0.01	%	7.16	3.56	3.00	3.75	----
EP026SP: Chemical Oxygen Demand (Spectrophotometric)								
Chemical Oxygen Demand	----	10	mg/L	20	<50	130	154	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
4,4`-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
4,4`-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CKMB1 D	CKMB1 S	CKSW1	CKSW2	QC1
				Sampling date / time	19-Jun-2021 15:00	19-Jun-2021 14:50	19-Jun-2021 08:30	19-Jun-2021 09:00	19-Jun-2021 00:00
Compound	CAS Number	LOR	Unit		EM2111705-001	EM2111705-002	EM2111705-003	EM2111705-004	EM2111705-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
^ Total Chlordane (sum)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Diazinon	333-41-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Malathion	121-75-5	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Fenthion	55-38-9	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Parathion	56-38-2	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Ethion	563-12-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	**210**	**210**	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	**80**	**60**	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	**290**	**270**	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									

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Hydrogeological Report
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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CKMB1 D	CKMB1 S	CKSW1	CKSW2	QC1
		Sampling date / time		19-Jun-2021 15:00	19-Jun-2021 14:50	19-Jun-2021 08:30	19-Jun-2021 09:00	19-Jun-2021 00:00
Compound	CAS Number	LOR	Unit	EM2111705-001	EM2111705-002	EM2111705-003	EM2111705-004	EM2111705-005
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	250	240	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	250	240	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
MM301: E.coli & Faecal Coliforms MPN								
Faecal Coliforms	----	1	MPN/100mL	10	220	270	110	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	109	102	97.4	106	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	107	96.8	94.2	102	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	97.2	99.1	104	110	108
Toluene-D8	2037-26-5	2	%	92.0	92.4	99.3	101	110
4-Bromofluorobenzene	460-00-4	2	%	103	99.8	101	113	123

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	QC2	----	----	----	----
			Sampling date / time	19-Jun-2021 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2111705-006	--------	--------	--------	--------
				Result	---	---	---	---
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	---	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	----	---	---	---
Barium	7440-39-3	0.001	mg/L	<0.001	----	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	---	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	----	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	----	---	---	---
Manganese	7439-96-5	0.001	mg/L	<0.001	----	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	----	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	----	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	----	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	----	---	---	---
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	---	---	---
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	---	---	---
C10 - C14 Fraction	----	50	µg/L	<50	----	---	---	---
C15 - C28 Fraction	----	100	µg/L	<100	----	---	---	---
C29 - C36 Fraction	----	50	µg/L	<50	----	---	---	---
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	---	---	---
>C10 - C16 Fraction	----	100	µg/L	<100	----	---	---	---
>C16 - C34 Fraction	----	100	µg/L	<100	----	---	---	---
>C34 - C40 Fraction	----	100	µg/L	<100	----	---	---	---
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	---	---	---
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	---	---	---

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC2	----	----	----	----
				Sampling date / time	19-Jun-2021 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2111705-006	--------	--------	--------	--------
					Result	---	--	--	--
EP080: BTEXN - Continued									
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		95.2	----	----	----	----
Toluene-D8	2037-26-5	2	%		93.6	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		96.8	----	----	----	----

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Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	117
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	51	127
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

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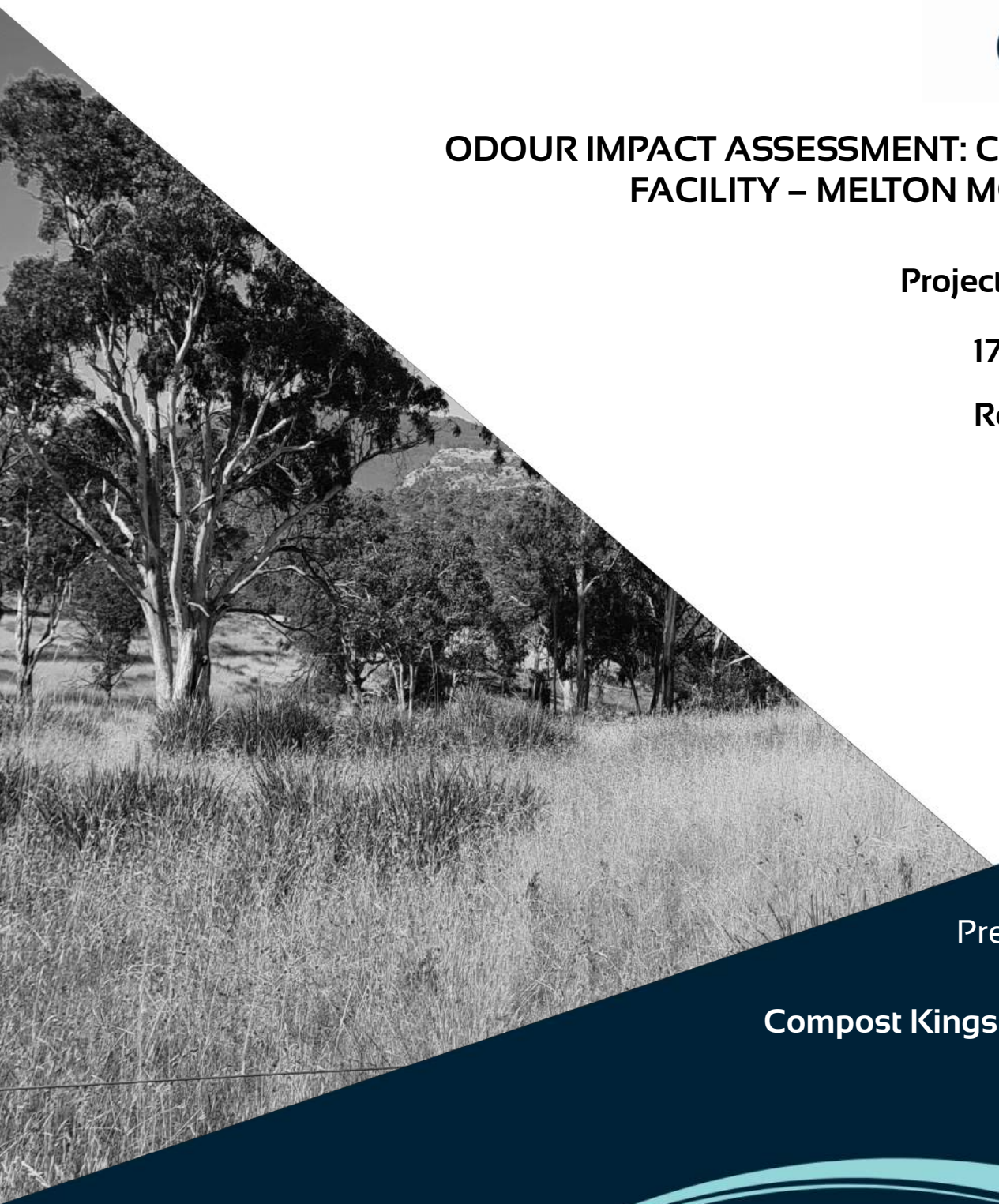

ODOUR IMPACT ASSESSMENT: COMPOST FACILITY – MELTON MOWBRAY

Project ID: 15578

17/12/2024

Release: R2

Prepared For:

Compost Kings Tasmania

Assured Environmental

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DOCUMENT CONTROL PAGE

Project Title: ODOUR IMPACT ASSESSMENT: COMPOST FACILITY – MELTON MOWBRAY

Project Reference ID: 15578

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Table 1: History of Revisions

Revision	Date	Issued to	Changes
R0	11/04/2024	W. Cromer	Initial Release: Feedstock Alteration
R1	30/04/2024	W. Cromer	Comments
R2	17/12/2024	W. Cromer	Comments – Section 8

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GLOSSARY

Hedonic Tone	A judgement of the relative pleasantness or unpleasantness of an odour
Odour	The property of a substance which affects the sense of smell
Odour annoyance	The generation of one or more of a wide variety of responses due to the intensity and hedonic tone of an odour. Odour annoyance is considered to occur at levels of 5 - 10 times the detection threshold.
Odour character	The property that identifies an odour and differentiates it from another odour of equal intensity. The character of an odour results from the combination and concentration of compounds in a mixture.
Odour complaints	Odour complaints are formal acknowledgments of odour annoyance to a person and usually requires persistent or repeated odour annoyance over a considerable length of time.
Odour concentration	The concentration of the odorous gas relative to the concentration at the threshold of detection.
Odour emission rate (OER)	Total rate of emissions from an odour source expressed in units of odour units per unit time (ou/sec).
Odour intensity	An assessment of odour strength based on an initial perception. This perception will rapidly diminish with constant exposure.
Odour threshold	For individuals, the odour detection threshold is that concentration of an odorant above which the individual can smell the odorant and below which they cannot. Human odour sensitivity varies over a significant range; therefore, the odour threshold is defined as the level at which 50 % of the population can just detect the odour.
Panel	A group of panel members (assessors who are qualified to judge samples of odorous gas, using dynamic olfactometry in accordance with AS 4323.3).
Peak to mean ratio	A conversion factor that adjusts mean dispersion model predictions to the peak concentrations perceived by the human nose
Percentile	The frequency of occurrence, for example the 99.5th percentile gives the value exceeded by 0.5% of the measurements or predictions.
Perception	Awareness of the effects of single or multi-sensory stimuli.
Nose-response time	Instantaneous response of the human nose which is typically between 0.1 and 1 second.
Source odour emission rate (SOER)	Rate of emission from an odour source expressed in odour units per unit area per unit time (ou/sec).

ABBREVIATIONS

BOM	Bureau of Meteorology
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EPP(Air)	Environmental Protection Policy (Air Quality) 2004
FOGO	Food Organics and Garden Organics
SRTM	Shuttle Radar Topography Mission
TAPM	The Air Pollution Model
TPS	Tasmanian Planning Scheme

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1 INTRODUCTION

1.1 Background

Compost Kings Tasmania propose to develop a 10,000 tpa composting operation on the Somerton property at Lovely Banks Road, Melton Mowbray, Tasmania (facility).

An Air Quality Assessment (AQA)[a] was prepared by Assured Environmental (AE) to assess the compost facility in 2021 for the initial design, with subsequent report variants issued in 2022 and 2023 to address information requests from the Environmental Protection Authority (EPA).

In late 2023, Compost Kings informed EPA that they propose to change the feedstock categories. After discussions with EPA and a review of best-practice mitigation for certain products, it was deemed that accepting some feedstocks was financially unviable. In early 2024 Compost Kings confirmed to EPA that they will restrict the feedstocks to Category 1 and 2 (including biosolids) feedstocks only.

In response to the changed feedstock, the facility layout has been revised. At the request of EPA, the odour assessment will be updated for the change in feedstock and changes to the layout.

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by William C. Cromer Pty. Ltd on behalf of Compost Kings Tasmania to undertake an odour impact assessment of the proposed composting operation.

In this assessment, the terms "site" and "facility" have separate meanings:

- "site" means the 23-ha area bordering Lovely Banks Road;
- "facility" means the 6.5 ha area wholly contained within the site, and which contains all the composting activities".

The odour impact assessment has been undertaken to assess the potential impacts of the composting facility in accordance with the following documents:

- General Guidelines for the Preparation of an Environmental Impact Statement (EIS General Guidelines);
- EIS Project Specific Guidelines for Compost Kings, Composting Facility, Lovely Banks Road, Melton Mowbray, Tasmania; and
- EPA (2020). Atmospheric Dispersion Modelling Guidelines.

[a] Assured Environmental (2023). Compost Kings, Melton Mowbray - Odour Assessment. Reference 13484 version R4 dated 04/05/2023.

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In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to assess the potential for adverse impacts upon the surrounding environment.

1.3 Project Specific Guidelines

This assessment has been prepared in accordance with the EIS Project Specific Guidelines for Compost Kings Tasmania, Composting Facility, dated December 2020. The required information relating to air quality impact assessment and the location in this report where the information is provided, are listed in Table 2.

Table 2: Project Specific Guidelines

Item	Terms of Reference Requirements	Section in Report
1	An area map showing the location of all potential sources of atmospheric emissions (i.e., materials, equipment and activities including transport, waste management and maintenance) from the proposed composting facility.	Section 6
2	A description of each potential emission source, including the composition (i.e., types of constituents), quantities and rates of emissions to the atmosphere.	Section 6
3	An assessment of the potential for emissions to air from the different stages of the composting process (from receipt of input material to removal of product) at the proposed facility. The assessment should cover a variety of conditions including "worst case" scenario and upset conditions, and it should contain information about time (of the day), duration, frequency, and impact of the atmospheric emissions from the facility in order to establish suitable parameters for air dispersion modelling.	Section 6
4	The results of atmospheric dispersion modelling to assess the impacts of odour and other emissions from the proposed composting facility relative to the requirements of the Environment Protection Policy (Air Quality) 2004. Modelling should be conducted by a suitably qualified specialist and in accordance with the Guidelines for Atmospheric Dispersion Modelling	Section 7
5	Discussion of measures to be implemented to avoid or mitigate any potential impacts that may cause environmental nuisance or environmental harm. Consideration should be given to management of potential impacts associated with supply and handling of the odorous raw material as well as potential impacts associated with malfunction of equipment used on the site or limited availability of carbon-rich material. Operation of the proposed facility in adverse weather conditions should also be considered.	Section 8

1.4 This Report

This report summarises the methodology, results, and conclusions of the odour impact assessment.

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2 DESCRIPTION OF ENVIRONMENTAL VALUES

2.1 Location

The proposed composting operations will be located on a 23-ha parcel of land in the north-western corner of the Somerton Property (title reference 134018/1).

The site and surrounding land are primarily agricultural with the Somerton Property being used for sheep grazing. The Subject Site is located 2.2 km from Midland Highway and is adjacent to Lovely Banks Road with private vehicle access. The site location is presented in Figure 1.

2.2 Terrain

Figure 2 illustrates the local topography, as obtained from a combination of Lidar data at 10 m resolution and NASA Shuttle Radar Topography Mission (SRTM) at 1-second digital elevation model (30 m resolution).

The topography of the project area is dominated by several peaks surrounding the site; the most noticeable is one to the southeast and one to the west of the site, with both peaks at over 800 m above sea level.

2.3 Receptors

Table 3 and Figure 3 the nearest sensitive receptors to the site. It can be seen that there is only one receptor within 2 km of the site boundary.

Table 3: Receptors

ID	Location (UTM Zone 55)		Elevation (m)	Land Use	Address
	X	Y			
R1	520823	5300822	304	Dwelling	4208 Midland Highway
R2	518753	5301263	283	Dwelling	1231 Lovely Banks Rd
R3	518660	5300800	258	Dwelling	1231 Lovely Banks Rd
R4	520823	5300822	304	Dwelling	539 Lovely Banks Rd
R5	522875	5294967	384	Dwelling	221 Beards Rd
R6	516954	5294317	244	Dwelling	3012 Midland Highway
R7	516903	5297314	202	Dwelling	3454 Midland Highway

All the receptors identified are residential dwellings, with no health care facilities, educational facilities, or other sensitive receptors identified nearby

2.4 Climate

The climate of Tasmania is oceanic on the coasts, with mild, rainy winters and cool summers, with a colder interior. Westerly winds prevail throughout the year, resulting in variable weather. The area can receive short heat waves from the Australian desert in the summer (December to February). The warmest month is typically January, with an average maximum temperature of 22°C. The coolest month is July, with an average maximum temperature of 10°C.

The average annual rainfall recorded at the Bureau of Meteorology (BOM) monitoring station located Tunnack Fire Station is 627 mm across an average of 166 rain days. A summary of the long-term climate analysis at Tunnack Fire Station is presented in Figure 4..

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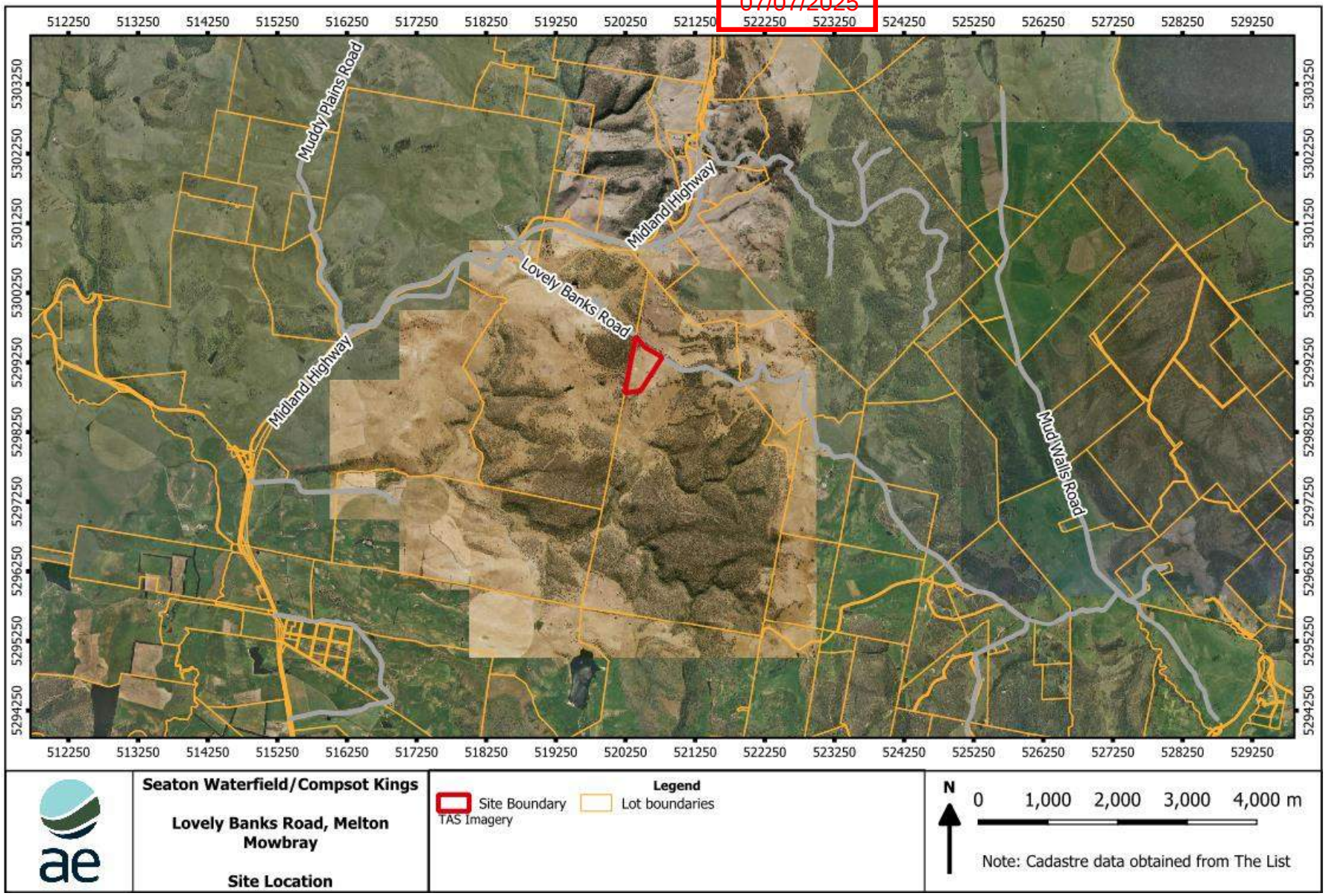

Figure 1: Site Location

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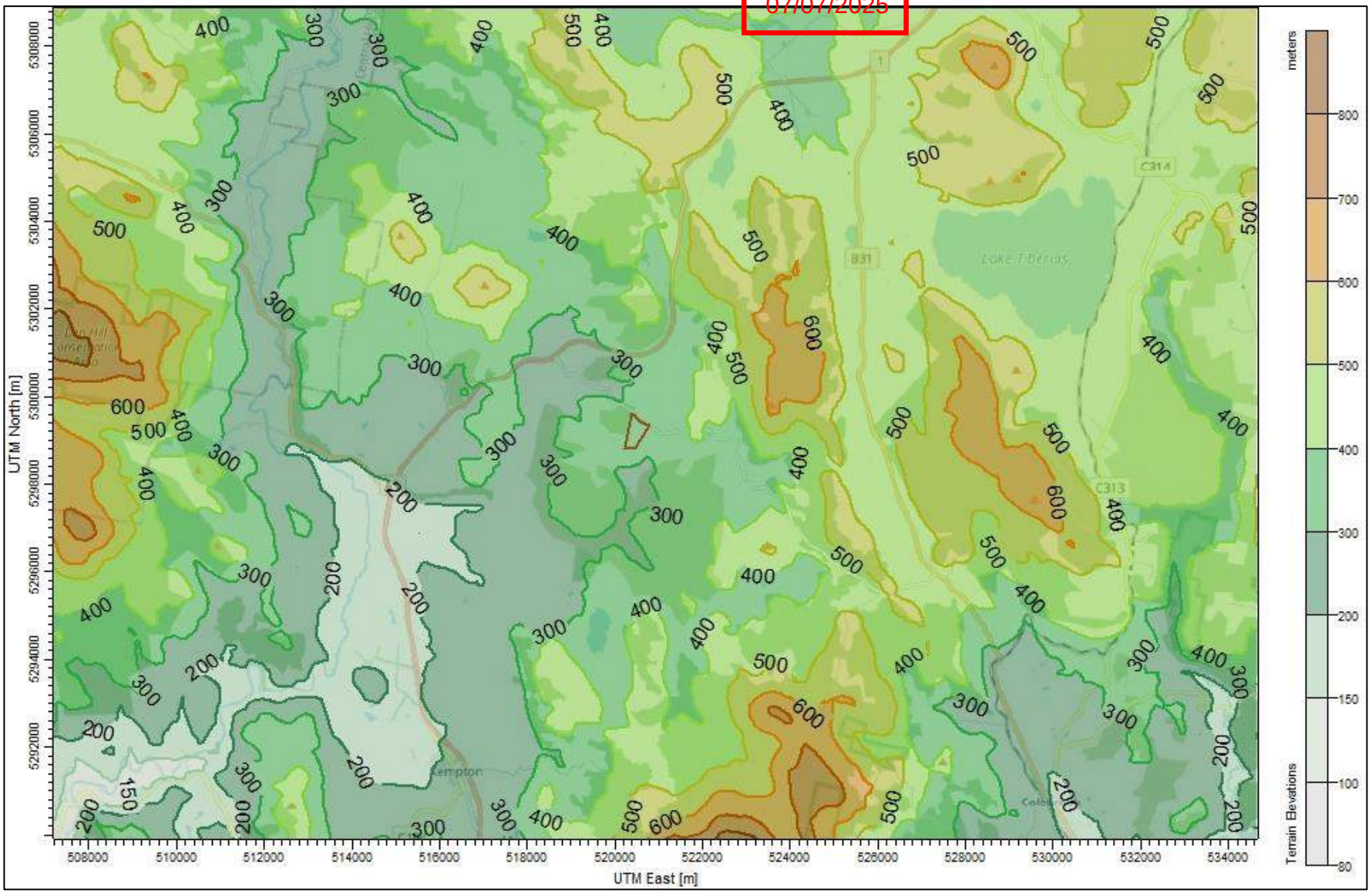

Figure 2: Surrounding Topography

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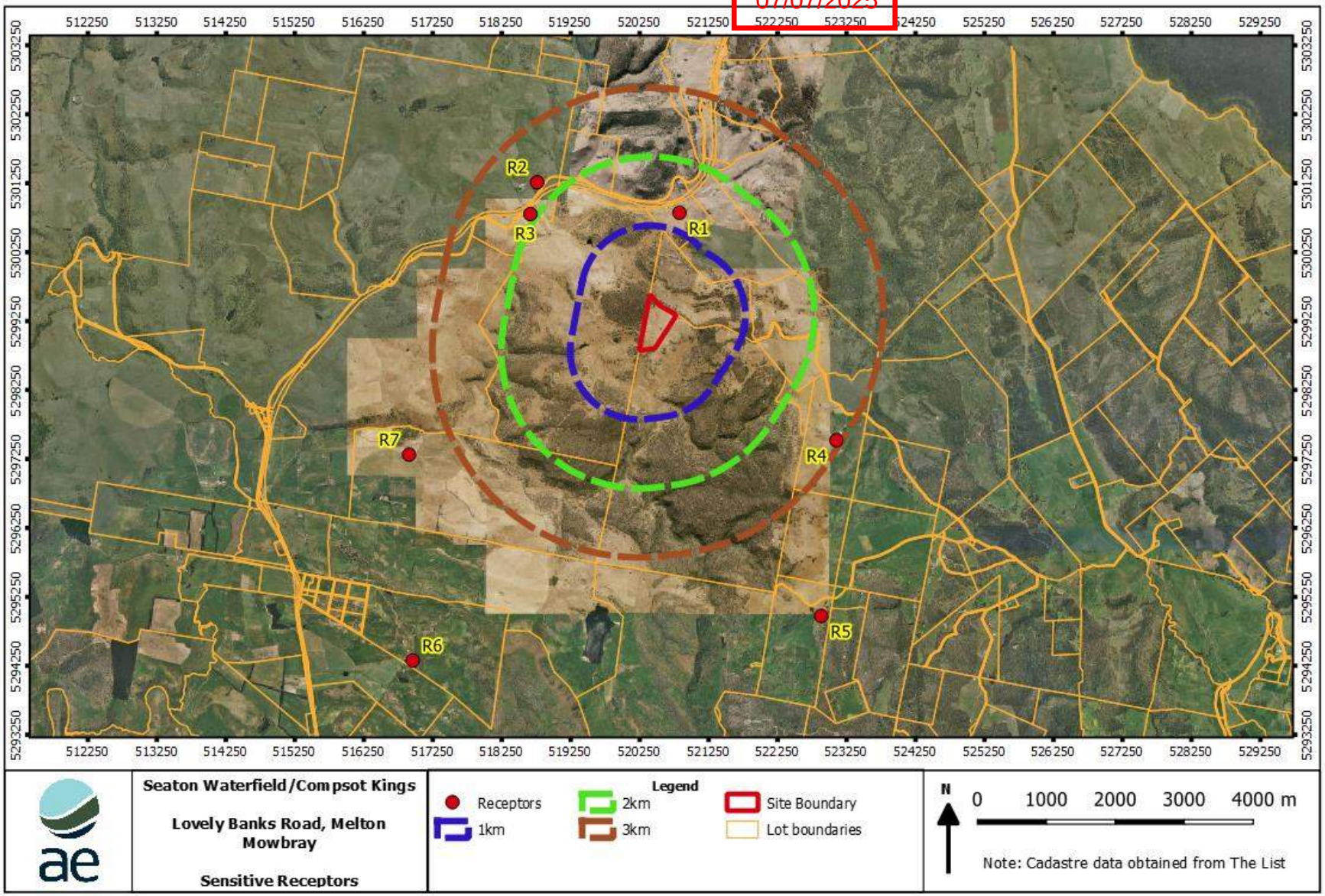

Figure 3: Receptors

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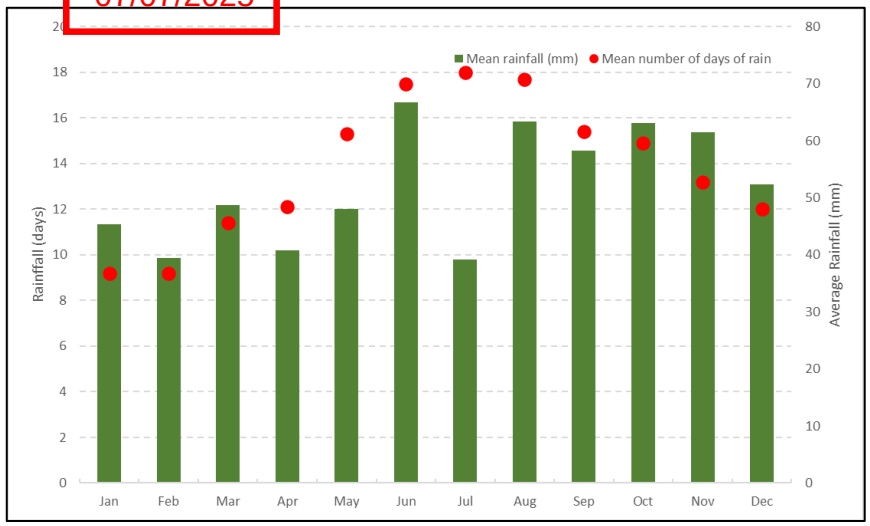
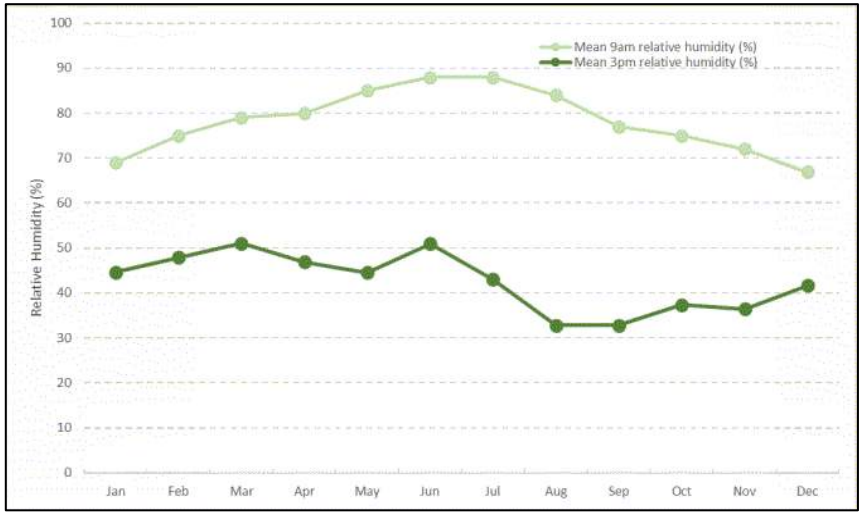
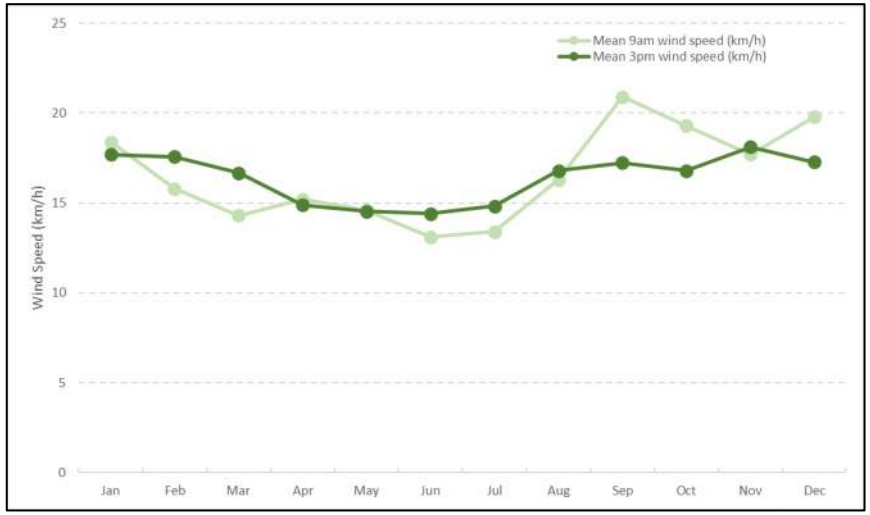
Average Temperature (Min, Max, Mean over 26-year Average)



Average Rainfall and Rainfall Days (26-year Average)



Relative Humidity (26-year Average)



Wind Speed (26-year Average)

Figure 4: Climatic Conditions (BOM Tunnack Fire Station)

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3 PROJECT DESCRIPTION

3.1 Facility Layout

Figure 5 presents a schematic of the proposed facility layout, which is located at the southern end of the site. A detailed facility plan is currently unavailable. The facility comprises:

- a gravelled internal access road;
- internal earth wall/fence, nominally 2 m high x 5 m wide at the base with a gap of 10 m to allow vehicles access to the processing area;
- raw materials will be mixed on hard standing located south of the windrows;
- windrows (nominally 12 windrows each measuring 55 m long, 2.5 m high and wide and 3 m spacing. There will not be any covers or fans assisting in the composting process;
- stockpiled composting areas (up to 5000 m^3);
- leachate and stormwater dam (Dam 1);
- stormwater dam (Dam 2); and
- facility amenities.

The proposed facility will operate 0700 – 1700 hours, five days a week. Figure 7 provides a process flow diagram of the proposed operation of the facility.

3.2 The Composting Process

The facility will produce up to 10,000 tpa of compost, the physical properties and quality of which will comply with AS4454 – 2012 Composts, soil conditioners and mulches.

3.2.1 Types, Quantities and Sources of Materials to be Composted

Compost Kings is in preliminary discussions with various suppliers of raw materials (feedstock) for composting.

Table 4 sets out the types, quantities and sources of material proposed to be composted. About 80% of feedstock will be Category 1 wastes as defined in Table 4 of EPA Victoria (2017). These mostly green and timber wastes are regarded as the lowest risk category with respect to the "*potential risk of harm to human health and the environment*". The balance (up to about 20%) of the feedstock will be Category 2 medium risk level biosolids and aged manures.

3.2.2 Biosolids

Biosolids will not be stockpiled but will be immediately mixed with category 1 feedstock on the same day and moved to the windrows to commence pasteurisation.

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Table 4: Proposed Types, Sources and Quantities of Materials to be Composted

Waste Category	Risk level	Waste type	Examples	Potential sources	Est. annual feedstock weight by example t	Est. annual feedstock weight by type t	Est. annual feedstock weight by type %	Average bulk density t/m3	Est. moisture content %	Est. C:N ratio per example range	Est. C:N ratio per example average	Est. average C:N ratio per type
1	Lowest	Garden and landscaping organics	Grass	Local farms, landscapers, etc	250	1,050	8	0.3	80	10-25	17	40:1
			Leaves		400			0.3	40	40-80	50	
			Plants		200			0.3	15		50	
			Tree trimmings		200			0.8	70		15	
		Untreated timber	Sawdust	Local sawmills	250	500	4	0.25	40	200-750	450	450:1
			Woodchips, shavings		250			0.4	40	450-820		
			Pine bark	Norske Skog	200	200	1	0.4	25	130-1200	500	
		Natural fibrous organics	Hay and harvesting residues	Local farms incl. *The Follies*, *Redside*	2500	2,500	18	0.2	10	15-30		25:1
2	Medium	Municipal-sourced garden and landscaping supplies	Grass	Waste transfer stations at local councils including Kingborough, Hobart, Clarence, Glenorchy, Brighton, Southern Midlands	2500	7,250	52	0.3	80	10-25	17	40:1
			Leaves		2500			0.3	40	40-80	50	
			Plants		1500			0.3	15		50	
			Tree trimmings		750			0.8	70		15	
		Biosolids	Contaminant Grade A or B; Stabilisation Grade A or B	TasWater WWTPs	2000	2,000	14	0.8	70	10:1	10:1	10:1
		Aged manures (moisture <65%)	Cattle manure	Local feedlots	500	500	4	0.8	60	10-30	20:1	20:1
				Total feedstock weight (rounded)		**14,000**	**100**					
				Est. final compost weight (rounded)		**10,000**						

Notes to Columns

1 From Table 4 of EPA Victoria (2017). *Designing, constructing and operating composting facilities*. Publication 1588, EPA Victoria, 1 June 2017
2 Risk level from EPA Victoria (2017) Section 5.1 relates to "potential risk of harm to human health and the environment"
3 Adapted from Table 4 of EPA Victor4ia (2017)
4 Adapted from Table 4 of EPA Victor4ia (2017)
5 Potential sources may be amended from time to time.
6 Weights are rounded. Weight of feedstock by example may change from time to time
The facility is designed to operate without Category 2 biosolids, because their availability is uncertain.
7 Weights are rounded. Weight of feedstock by type may change from time to time. Average weight loss during composting assumed to be 30%.
8 Percentages are rounded.
9-13 Various sources, including:
Cornell Waste Management Institute (https://cwmi.css.cornell.edu/composting.htm)
C:N mix calculator (https://compost.css.cornell.edu/calc/2.html)
Composting Magazin e (https://www.compostmagazine.com/carbon-nitrogen-ratio-tables/)
On-Farm Composting Handbook Appendix A: Table A.1 (https://cwmi.css.cornell.edu/AppendixATable1OFCH.pdf)

3.3 Feedstock Delivery

Feedstock will be brought into the facility in a range of vehicles; the odorous raw materials are the biosolids, hay and greenwaste. Whilst odour emissions will occur that are specific to each type of waste during unloading of incoming trucks, these emissions are transient. The facility is expected to produce 10,000 tpa of materials thereby requiring an estimated 14,000 tpa of raw materials to be delivered to the facility.

The delivery of materials to the facility occurs in a short timeframe of 5-10 mins per truck for all solid wastes.

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3.4 Feedstock Acceptance

Based on visual inspection, loads may not meet waste acceptance (Figure 6) criteria:

- loads required to be covered but arriving uncovered will be rejected,
- loads containing FOGO will be rejected, and
- anything other than minimal other contamination (e.g., easily removable foreign matter like plastics) will be rejected.
- from the facility office and load checking area, all loads are directed to the waste mixing area.

Communications with the operators of McRobies Gully Waste Management Centre in Hobart on 14 March 2024 confirmed that they do not accept FOGO contaminated waste even though domestic FOGO is placed in the greenwaste collection bins. The FOGO is diverted to Barwick's facility.

3.4.1 Mixing

The composting process begins with mixing of the raw material in the nominal proportions listed in Table 4. The mixing will be conducted using a 7t excavator and front-end loader on the mixing pad.

Given the proportion of each type of waste as shown in Table 4, it is expected that the characteristic of the odour will be relatively consistent during the first few weeks. The initial mixing pad is expected to be the most odorous activity.

3.4.2 Composting

Once mixing is completed the front-end loader will transport the matured mixture to the main composting area to begin the nominally 12-week composting cycle. The method of windrow construction during the initial stages will be undertaken using a windrow turner, excavator and front-end loader.

Composting windrows will be aligned in parallel rows up-and-down the slope, each separated by several metres to allow access for plant and equipment. Rows are of increasing compost-age from the first (fresh from the mixing area, undergoing pasteurisation) to last (matured, and ready for screening and stockpiling). Sufficient rows will be created in the windrow area for three rows to ensure the final rows have completed maturation under upset weather conditions. As the windrows continue to mature, odorous emissions are expected to reduce and the character change to one that is less offensive and best described as earthy.

The windrow process is shown in Figure 8.

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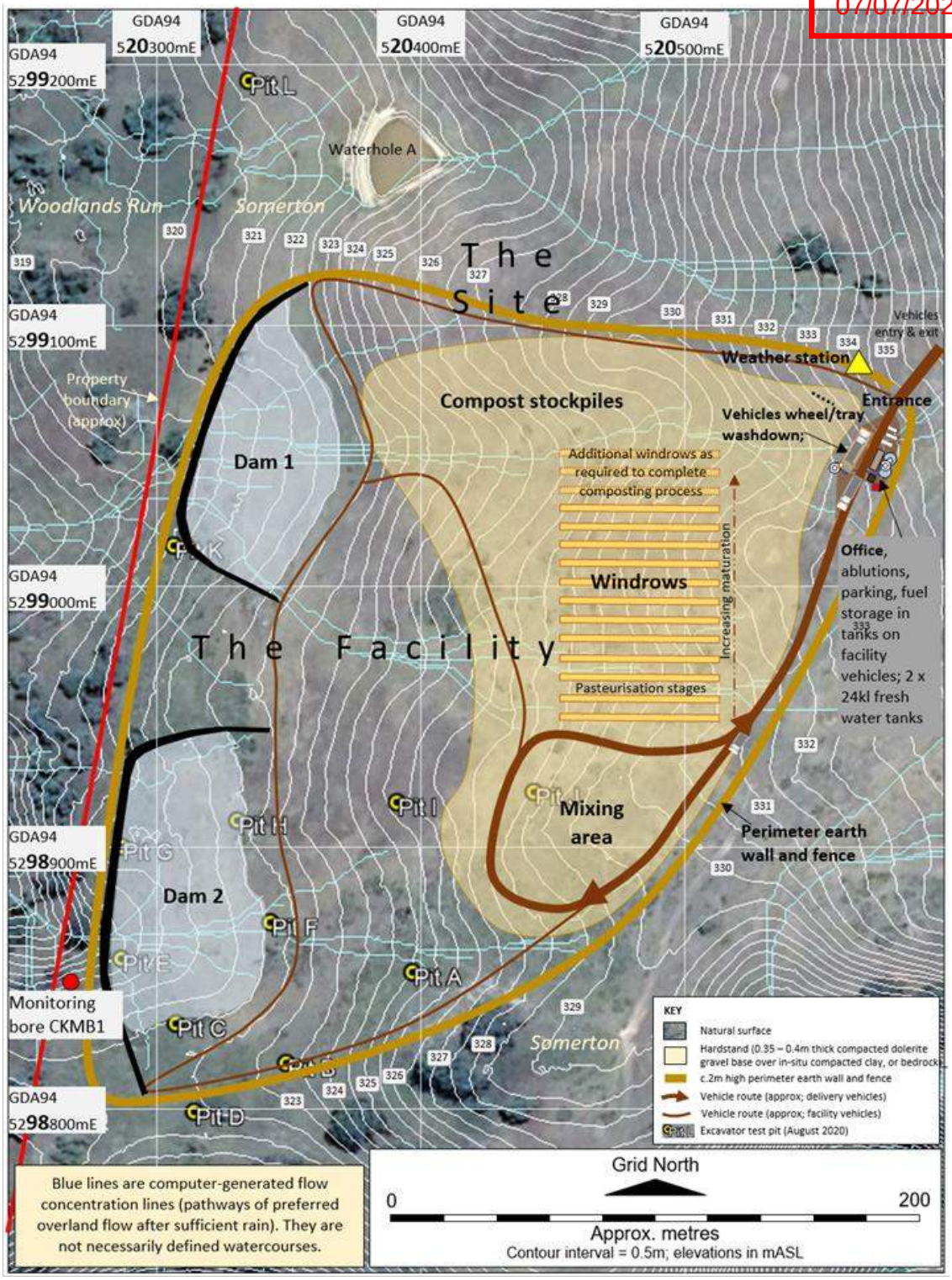

Figure 5: Facility Layout Schematic

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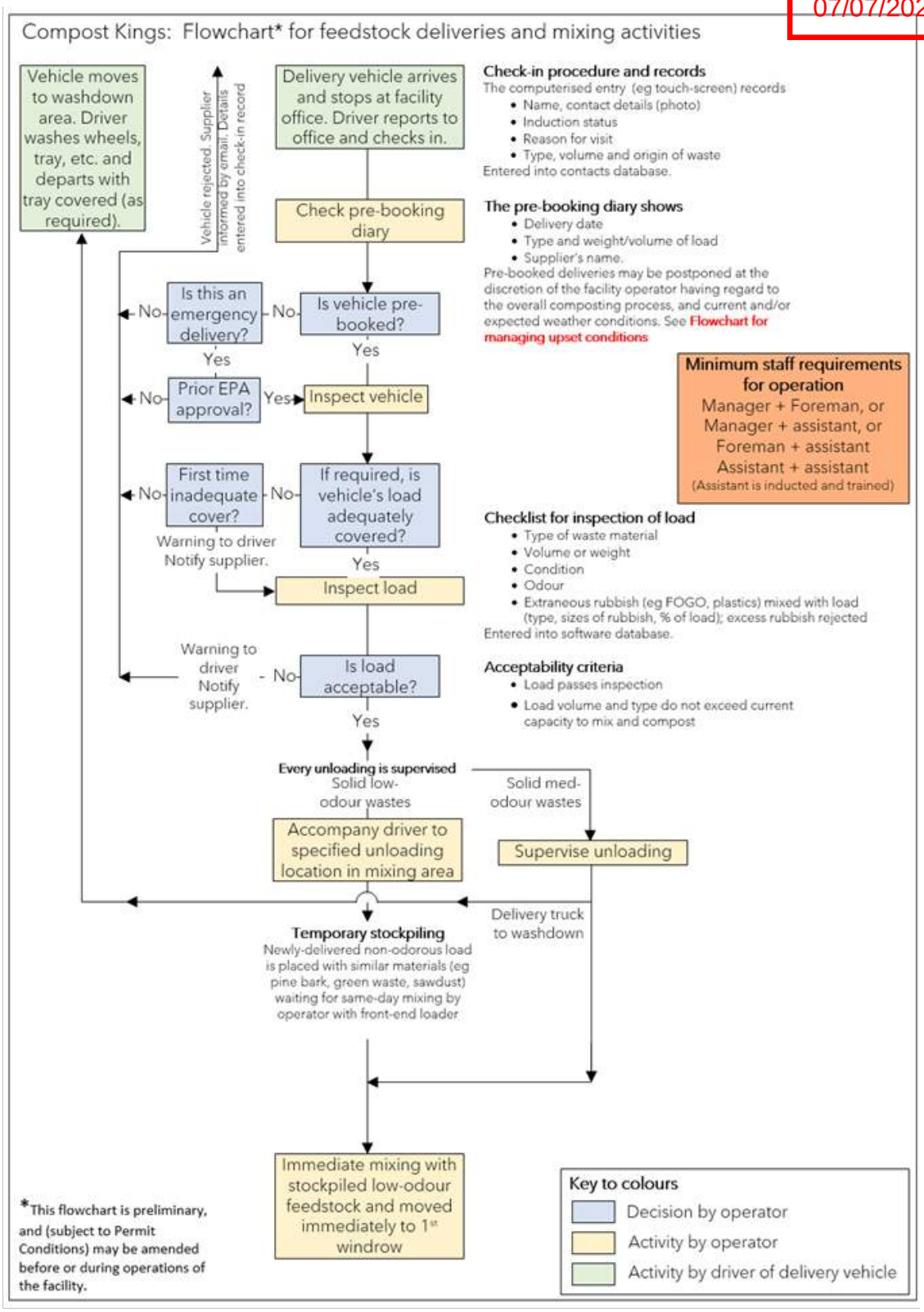

Figure 6: Waste Acceptance and Mixing Activities Flow Chart

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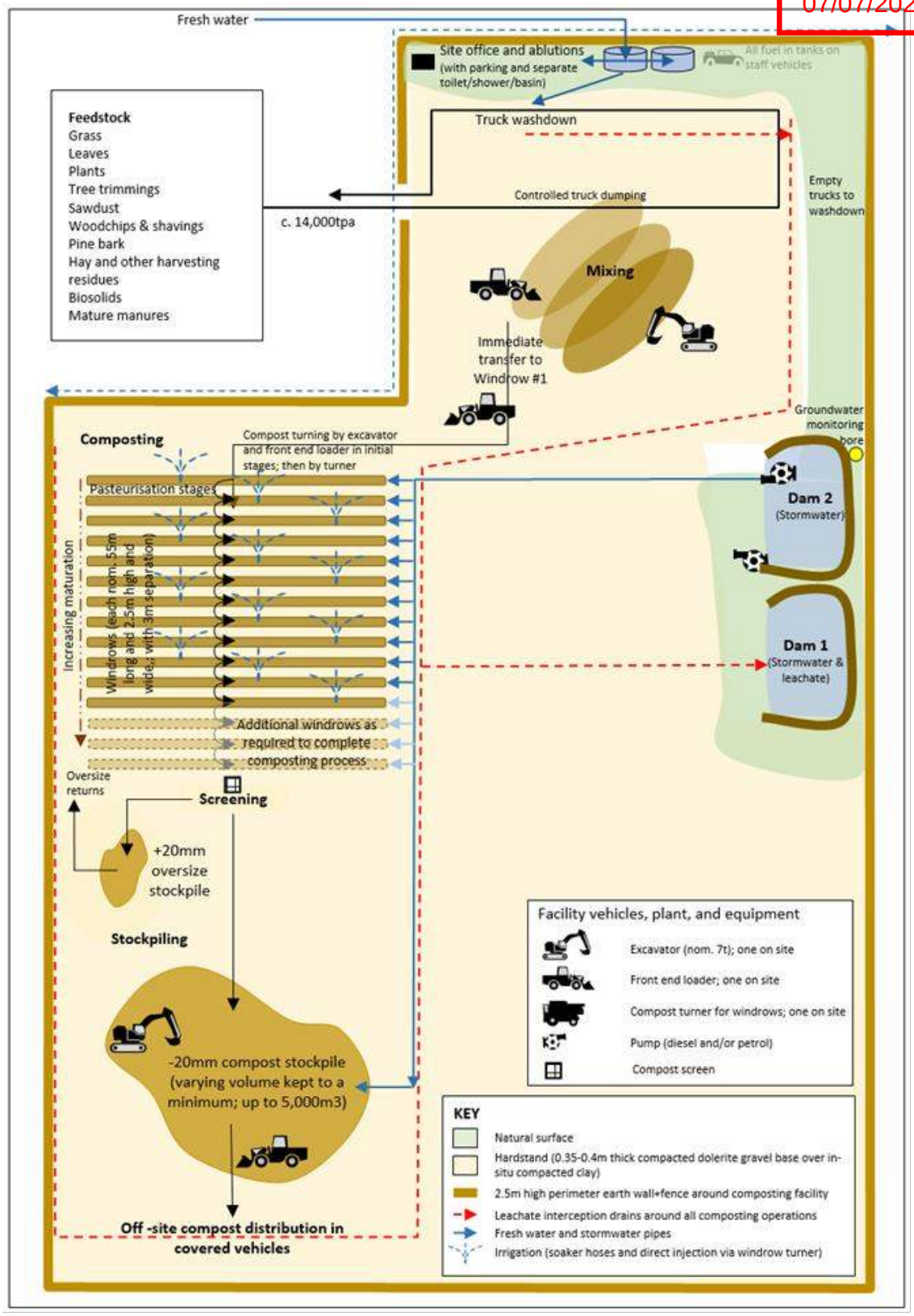

Figure 7: Process Diagram (Overview)

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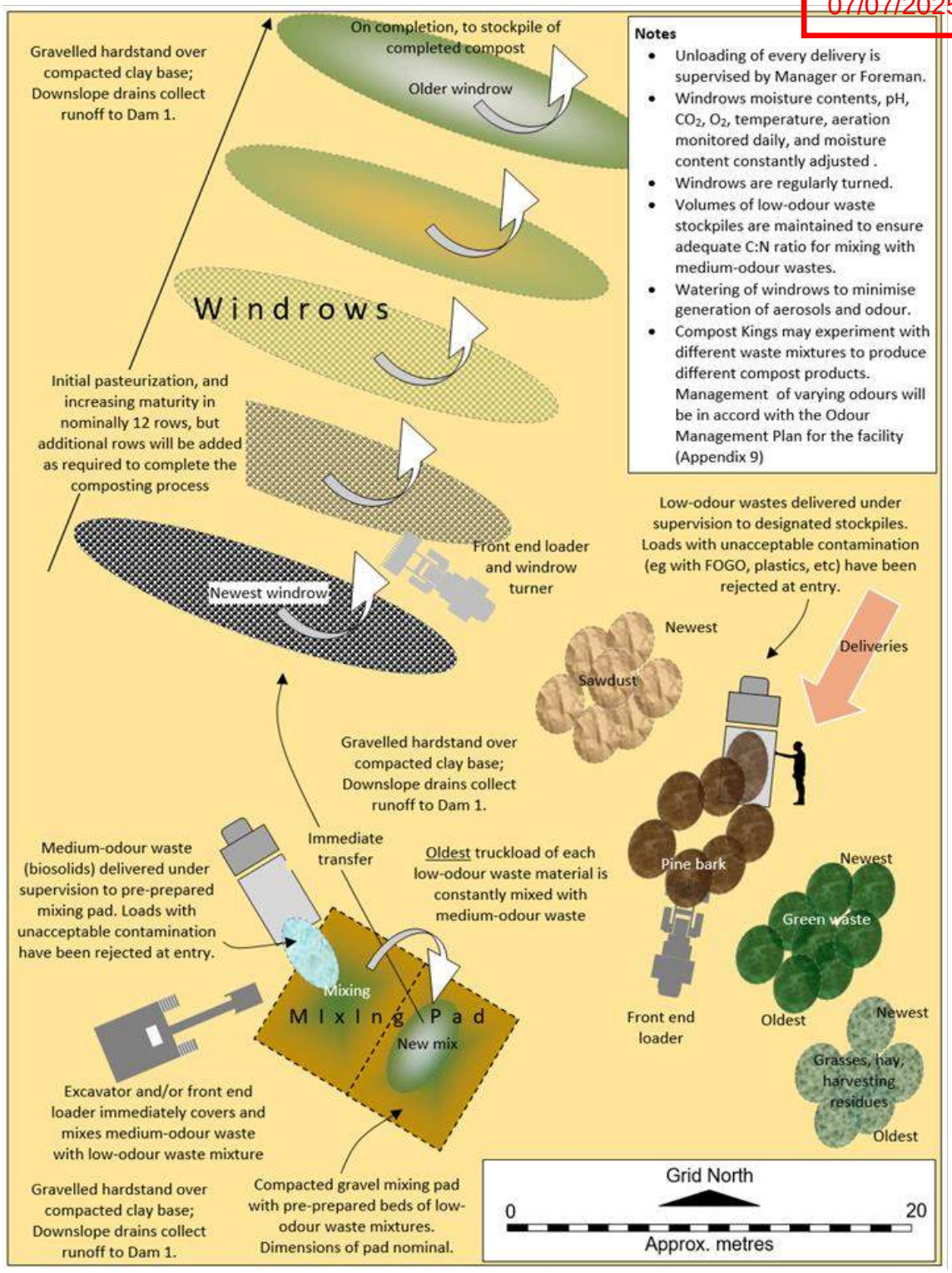

Figure 8: Composting Mixing and Windrow Process

3.4.3 Screening

After significant maturation, composted material is screened to generate saleable products (-20 mm compost). Screening occurs continuously during operating hours. Oversized material (+20 mm) is returned to be added to the material commencing the composting process.

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Screening stockpiles are typically non-offensive and represent the change in odour character that is known to occur during the composting process, with mature compost typically having a comparatively inoffensive but unique odour.

3.4.4 Stockpiling

Stockpiling of the final product will not comprise more than 5,000 m^3 at any one time; with the size of the stockpile kept to a minimum. The product will be moved from the composting windrows to the stockpile by excavator and front-end loader during operational hours.

3.4.5 Off-Site Vehicles

The saleable compost is removed in poly covered trucks of varying sizes. The largest truck expected to be used for removing product compost from the facility is 40 m^3. It is expected that up to two product trucks will pick up compost a day.

3.4.6 Stormwater & Leachate Collection

There are two dams proposed for the facility. Dam 1 will collect stormwater and leachate to prevent release. The leachate is expected to be no more than 20% of the Dam 1 contents. Dam 2 will be stormwater collection only.

3.4.7 Truck Washout

Figure 9 shows the truck washout operations. The wash out liquid will be piped to Dam 1.

3.5 Odorous Sources

Odour sources at the facility have been identified as either transient or continuous. These sources are listed in Table 5.

Table 5: Continuous and Transient Odour Sources

Continuous Odour Sources	Transient Sources
Windrows	Raw waste unloading
Raw material stockpiles	Windows formation and turning
Mixing area	Truck movements (raw material delivery and product pickup).
Dam 1	Truck Washout
Screening and product stockpile	

Assured Environmental have undertaken odour monitoring at numerous composting facilities throughout Australia. Based on the operations of the facility, the odour emission rates have been calculated for normal and worst-case conditions. The database used for this assessment are presented in Appendix C. The emission rates include conservatism for varying feedstock.

Overall, the SOER proposed by EPA are considered to be conservative for the proposed operation. The emission rates used in this assessment are listed in Table 6.

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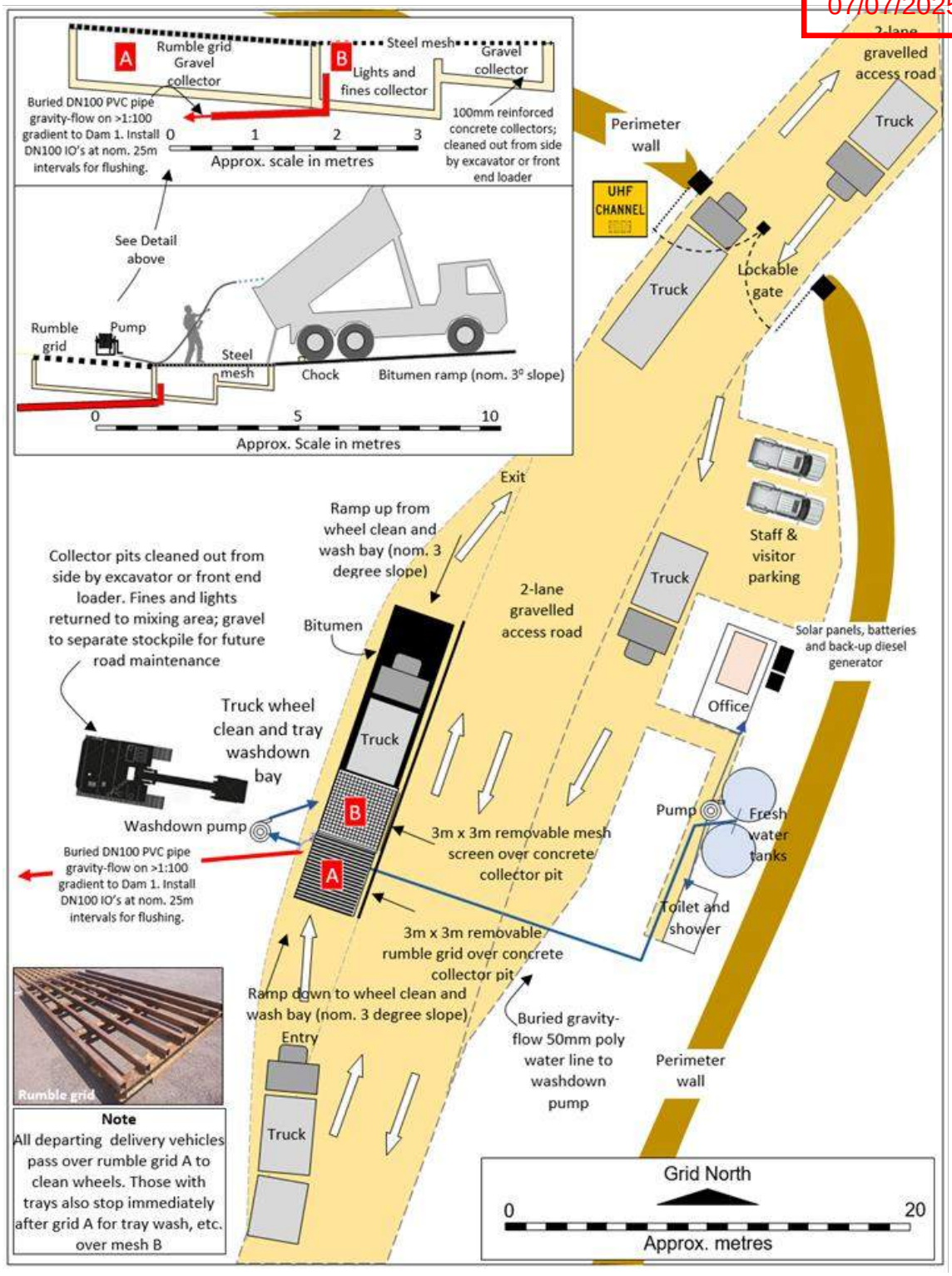

Figure 9: Truck Wash Out Operations

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Table 6: Odour Emission Rates

Source	Area (m^2)	Normal		Worst-case		Modelled Operating Hours
		SOER (ou/m^2/sec)	OER (ou/s)	SOER (ou/m^2/sec)	OER (ou/s)	
Raw material deliveries (based on biosolids) [a]	5	-	-	6.7	33	1x return truck movement per hour during 07:00-17:00. Only worst-case conditions modelled.
Truck washout	5	3.6	18	6.7	33	07:00-17:00
Saw Dust stockpile	79	0.1	8	0.2	12	All hours
Pine bark stockpile	79	0.4	32	1.0	75	All hours
Green waste stockpile	139	0.4	56	1.0	133	All hours
Hay stockpile	139	1.0	163	2.2	354	All hours
Mixing Pad (including immediate transfer)	414	5.2	2150	6.7	2770	07:00-17:00
Windrow - Week 1	414	3.3	1365	5.7	2357	All hours
Windrow - Week 2	414	3.0	1241	5.7	2357	Constant with turning activities 1200-1600 hours
Windrow - Week 3	414	2.5	1034	5.0	2068	
Windrow - Week 4 to 6	414	1.9	765	5.0	2068	All hours
Windrow - Week 5	414	1.9	765	2.9	1191	All hours
Windrow - Week 6	414	1.4	587	2.9	1191	All hours
Windrow-Week 7 to 12[c]	414	1.4	575	2.9	1199	All hours
Freshly Turned	414	3.5	1447	5.8	2398	Applied to windrow week 2 for 4 hours pd
Screening	50	1.4	70	1.6	80	07:00-17:00
Product Stockpile	3441	1.4	4817	1.6	5506	All hours
Stormwater and leachate dam (Dam 1)	328	1.9	1231	2.6	1706	All hours. Assumes 20% leachate
Product Truck (40 m^3) [d] [e]	16	1.4	22	1.6	25	1x return truck movement per hour during 07:00-17:00.
Total (OU/m^2/sec)			**18,661**		**35,148**	

a) Emission rate based on biosolids material and truck size per truck. Deliveries will occur between 07:00-17:00 hours only. This represents the worst-case emission rate for any raw material and is applied to both normal and worst-case operations. The modelling of trucks is based on vehicle pass-bys, which will be for a select a return truck movement on the section of road which passes receptors. The emissions are based on speed.

b) Received odorous raw materials (will be covered immediately with saw dust and mixed immediately.

c) By week 7 of the composting process, the windrows have stabilised, and the odour character changes to become more earthy.

d) Based on return trip of a 40 m^3 truck with a surface area of 16 m^2 travelling the length of the internal haul road (578 m) at 10 km/hour speed limit.

e) Three separate road sections (to represent the worst-case impacts for receptors R1, R2 and R3) modelled based on return trip of an 8 m^3 truck with a surface area of 5 m^2.

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4 ASSESSMENT CRITERIA

4.1 Tasmanian Planning Scheme

The Tasmanian Planning Scheme (TPS) is a single state-wide planning scheme endorsed in 2017. Review of the TPS has confirmed that there are no restrictions to the facility in relation to existing odour sources (i.e., sewerage facilities).

Table C9.1 of the TPS presents the attenuation distances from industrial uses which may cause environmental nuisance and at sensitive receptors. The attenuation distances are presented in Table 7.

Table 7: Tasmanian Planning Scheme Attenuation Distances

Activity	Category	Attenuation Distance	
		Level 1	Level 2
Composting works Excluding backyard composting for domestic use, on-farm composting for use on agricultural land having the same owner on which the compost is produced and works in respect of silage for use on agricultural land.	Vegetation only – emission such as odour and noise	250 m	500 m
	Human or animal wastes – emissions such as odour and noise.	500 m	1,000 m

Review of the attenuation distances and the sensitive receptors in Figure 3, identify that the closest receptor (R1) is greater than 1,000 m from the boundary of the facility and therefore complies with the attenuation distances listed in Table 7.

4.2 Environmental Protection Policy (Air Quality) 2004

In Tasmania, the Environment Protection Policy (Air Quality) 2004 (EPP Air), provides regulatory framework for managing air quality impacts from industrial activities.

Schedule 3 of the EPP Air specifies the odour assessment criteria, which is outlined in Table 8. The odour from the Subject Site is a mixture of compounds and as such the 1-hour, 99.5th percentile criterion of 2 OU is appropriate for use in the assessment as the boundary of the site.

Table 8: Schedule 3 - Odour Criteria

Substance	Criterion	Averaging Period	Percentile
Known pollutant(s)	See schedule 2	See schedule 2	99.9th a)
Unknown mixture	2 OU 1)	1 hour	99.5th b)

1) "Odour unit" has the same meaning as in Australian Standard AS/NZS 4323.3 Stationary source emissions – Determination of odour concentration by dynamic olfactometry.

a) Modelled 99.9 percentile concentration at or beyond the boundary of a site (whichever is higher) in cases where local high-quality meteorological and emissions data are available. In cases where such data are not available, the 100-percentile concentration modelled at or beyond the boundary of a site applies.

b) Modelled 99.5 percentile concentration at or beyond the boundary of a site (whichever is higher) in cases where local high-quality meteorological and emissions data are available. In cases where such data are not available, the 100-percentile concentration modelled at or beyond the boundary of a site applies.

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Figure 10 identified landholders immediately surrounding the site. Both landholders (Somerton, whose land will be leased for the development and Woodlands Run) are the primary landholders.

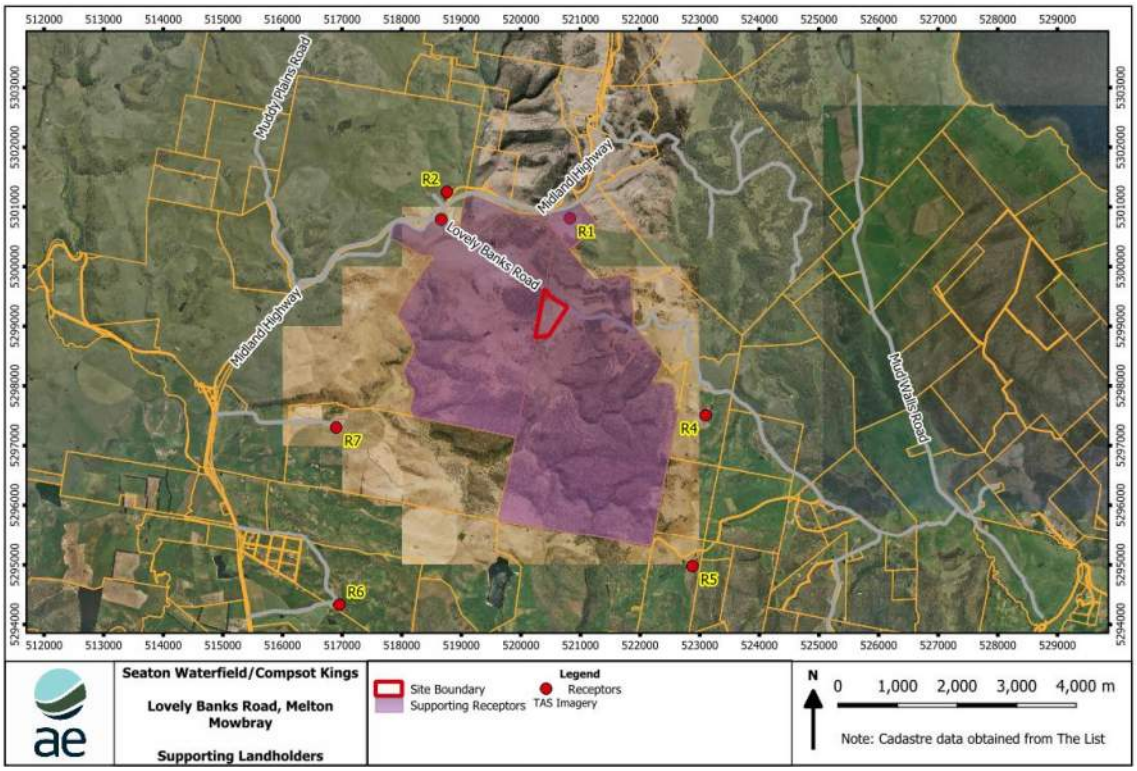

Figure 10: Surrounding Landowners

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5 ASSESSMENT METHODOLOGY

5.1 Modelling Methodology

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source including:

- meteorological data for surface and upper air winds, temperature, and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information;
- emissions parameters including source location and height, source dimensions and physical parameters (e.g. exit velocity and temperature) along with pollutant mass emission rates;
- terrain elevations and land use both at the source and throughout the surrounding region; and
- the location, height, and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume.

For the purpose of the assessment, meteorological modelling has been undertaken using TAPM (The Air Pollution Model) and CALMET to predict localised meteorological conditions. The meteorological data derived from these models have been used as an input for the CALPUFF dispersion modelling.

5.2 TAPM Predictions

A site-specific meteorological dataset has been determined using the prognostic model TAPM (The Air Pollution Model). Prognostic models, such as TAPM, permit the development of localised meteorological datasets, based on synoptic weather conditions. The model predicts the regional flows important to dispersion, such as sea breezes and terrain induced flows, against a background of larger-scale meteorology provided by synoptic analyses.

The output of this model, when used with a diagnostic meteorological model, such as CALMET, provides a meteorological dataset suitable for introduction into the wind field results. This methodology is the recommended approach for the modelling of contaminant concentrations using CALMET[b].

The model parameters for TAPM and CALMET are summarised in Table 9.

[b] TRC Environmental Corporation (March 2011) 'Generic Guidance and Optimum Model Settings for the CALPUFF Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia' prepared on behalf of the NSW Office of Environment and Heritage

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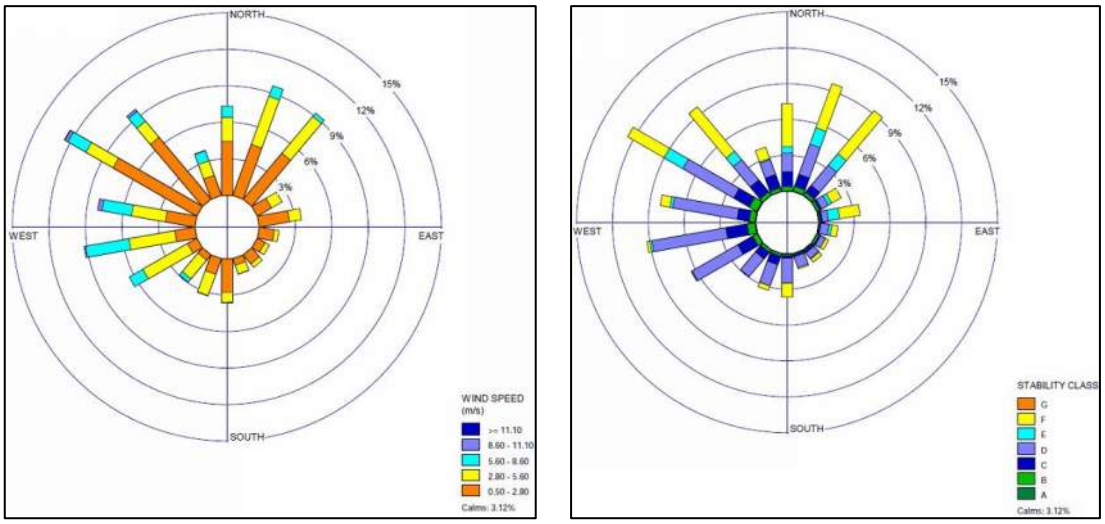
Table 9: Summary of Meteorological Modelling Parameters

Model	Aspect	Assigned Parameter
TAPM (v4.04)	Year Modelled	One full year - 2015 which is compared to long-term observations to demonstrate suitability.
	Centre Coordinates	Latitude - 42°27.5' / Longitude - 147°15.0' Easting - 520555 / Northing - 5299303
	Domains Grid	31 x 31 x 30 grid points
	Nesting Spacing	30 km, 10 km, 3 km, and 1 km
	Databases	Default databases for sea temperature and terrain and land cover applied for Tasmania at 250 m resolution.
CALMET (v 7.10)	Model Domain	28-km x 28-km grid (200 m grid intervals)
	Terrain Data	Nasa Shuttle Radar Topography Mission (SRTM) 1-second (approximately 30 m) digital elevation model
	Land Use	Default from USGS for 1 km spacing. Review of the land use was undertaken and updated based on recent aerial imagery and TAS EPA data
	Vertical Layers	12 Layers - 20 m, 50 m, 75 m, 150 m, 200 m, 500 m, 750 m, 1,000 m, 1,500 m, 2,000 m, 3,000 m, and 4,000 m
	TAPM Input	3D meteorological data (no-obs mode) was derived from the 1 km meteorological grid from TAPM used as initial guess field to predict meteorological conditions

Figure 11 presents the annual wind rose for the facility for 2015. Detailed meteorological analysis of the dataset is presented in Appendix B.



Wind Rose

Stability Class Rose

Figure 11: Predicted Annual Wind and Stability Class Roses at Subject Site for 2015

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6 AIR DISPERSION MODELLING

6.1 CALPUFF Dispersion Modelling

The CALPUFF modelling system treats emissions as a series of puffs. These puffs are then dispersed throughout the modelling area and allowed to grow and bend with spatial variations in meteorology. In doing so, the model is able to retain a memory of the plume's movement throughout a single hour and from one hour to the next while continuing to better approximate the effects of complex air flows.

CALPUFF uses the meteorological processing and prediction model CALMET to provide three-dimensional wind field predictions for the area of interest. The final wind field developed by the model (for consideration by CALPUFF) includes an approximation of the effects of local topography, the effects of varying surface temperatures (as is observed in land and sea bodies) and surface roughness (resulting from varied land uses and vegetation cover in an area). The CALPUFF model is able to resolve complex terrain influences on local wind fields including consideration of katabatic flows and terrain blocking.

Post processing of modelled emissions is undertaken using the CALPOST package. This allows the rigorous analysis of pollutant predictions generated by the CALPUFF system. In particular, CALPOST is able to provide an analysis of predicted pollutant concentrations for a range of averaging periods from 1 hour to 1 year.

6.2 Receptors

A computational grid of 9 km by 9 km at 200 m spacing has been modelled. A nested grid centred on the site was modelled as at 1 km from centre at varying spacings:

- 100 m from source – 20 m spacing;
- 500 m from source – 50 m spacing; and
- 1000 m from source – 100 m spacing.

Receptors were modelled along the site boundary at 20 m intervals. Additionally, the existing sensitive receptors presented in Figure 3 were also included as discrete receptors in the model.

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7 PREDICTED CONCENTRATIONS

7.1 Overview

The compost odour emissions have been grouped into major process activities, with the odour emissions source contributions modelled as follows:

- Truck Movements;
- Raw materials storage, and handling activities;
- Mixing pad activities;
- Windrow progression;
- Compost products and product truck movements;
- Truck wash out operations; and
- Stormwater dam emissions.

7.2 Normal Operations

Table 10 and Figure 13 presents the 1-hour 99.5th percentile ground level odour concentrations for the individual activities and the cumulative emissions when the composting operations are operating under normal conditions.

Table 10: Predicted 1-hour, 99.5th Percentile Odour Concentration from Cumulative Activities during Normal Operations

Receptor	Predicted 1-hour, 99.5th Percentile Odour Concentration (OU)							
	Truck	Dam	Mixing	Product Stockpiles	Raw Material	Windrow	Wash Out	Total
R1	<0.01	0.02	0.04	0.09	<0.01	0.19	<0.01	0.34
R2	<0.01	<0.01	<0.01	0.02	<0.01	0.04	<0.01	0.08
R3	<0.01	<0.01	<0.01	0.02	<0.01	0.04	<0.01	0.09
R4	<0.01	<0.01	<0.01	0.01	<0.01	0.03	<0.01	0.06
R5	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01
R6	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.02
R7	<0.01	<0.01	<0.01	0.02	<0.01	0.03	<0.01	0.06
Max at Site Boundary	<0.01	11.1	10.1	9.9	0.9	29.3	0.1	41.5

Review of the 1-hour, 99.5th percentile predicted odour ground level concentrations shows that the 2 OU criterion will not be achieved at the boundary of site, with the highest predicted concentration of 41.5 OU occurring at the boundary under normal operational conditions.

A review of the discrete result results has identified that if the facility is operating under normal conditions for all activities, a predicted 0.34 OU 1-hour, 99.5th percentile will occur at sensitive receptor R1. This odour concentration is below the limit of detection (1 OU) as detailed in the EPA Board Review Statement[c].

[c] EPA Tasmania (2022). Update to Air Pollutant Design Criteria used in the Environmental Impact Assessment Process.

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Figure 12 presents the contribution percentage of each activity during normal conditions. It can be seen that the windrows and mixing activities are the highest contributors to the odour concentrations.

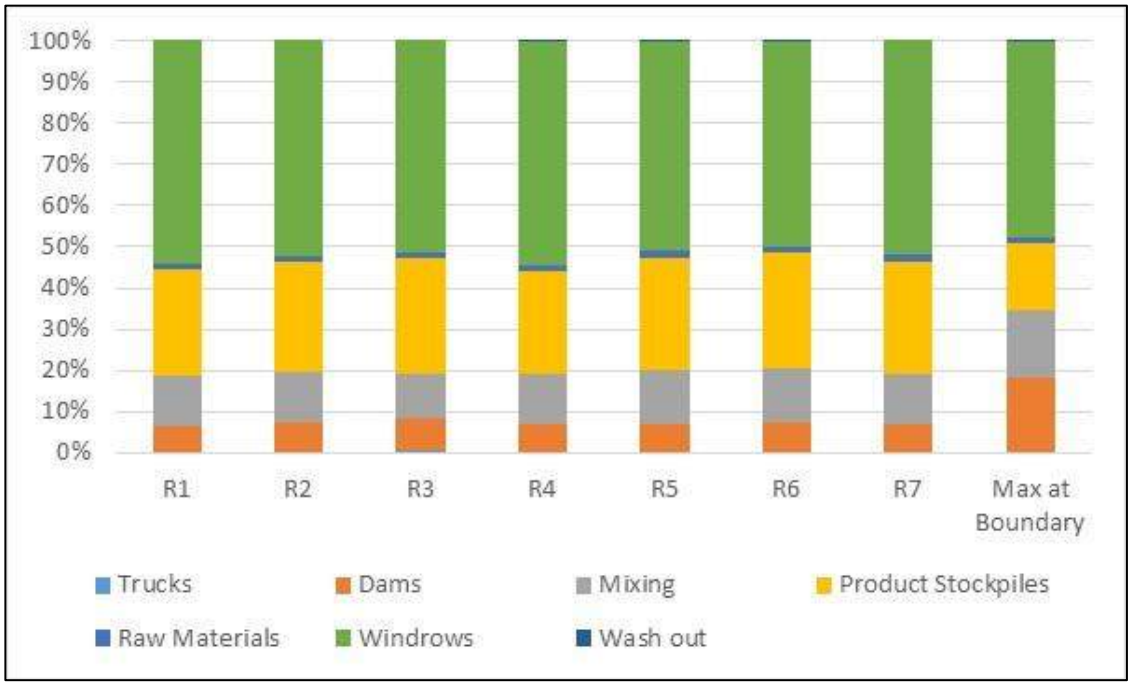

Figure 12: Contribution Percentage of Each Activity for Each Receptor for Normal Operations

Figure 13 to Figure 18 illustrates the contribution of individual activities. It can be seen that the two largest contributions are from windrow and stockpiling activities, respectively. Emissions from truck movements are assessed for upset conditions only, as discussed in the following section.

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Figure 13: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Cumulative Activities Under Normal Operating Conditions

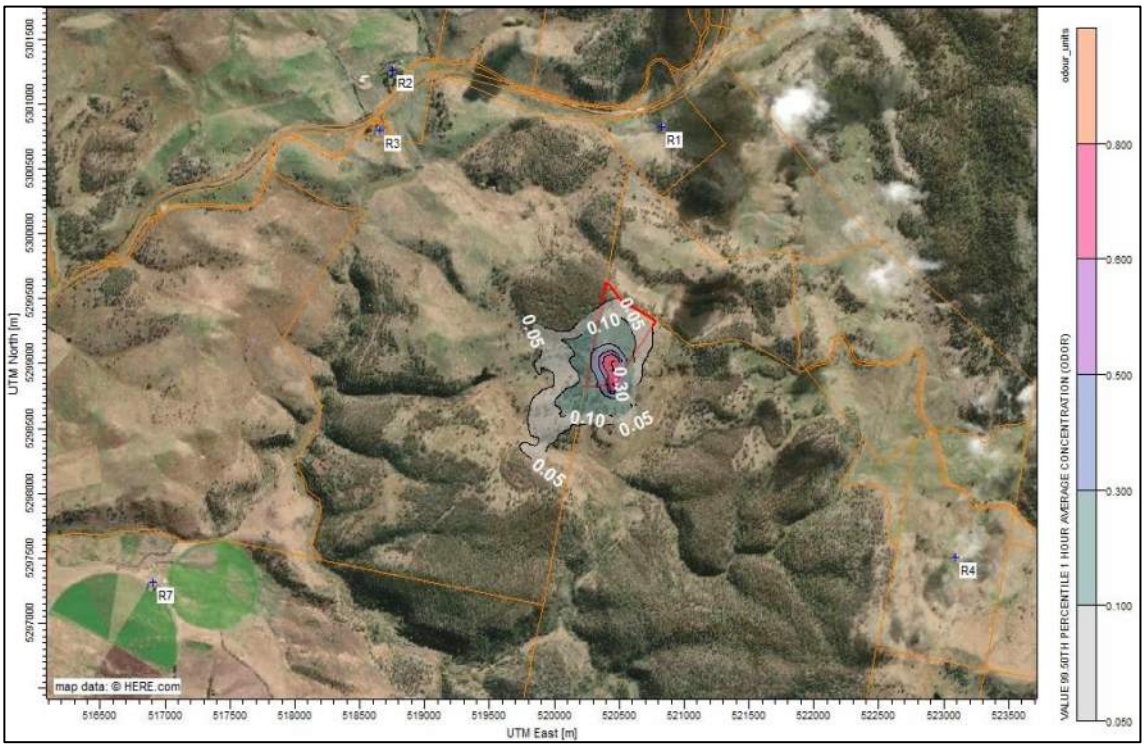

Figure 14: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Raw Material Activities Under Normal Operating Conditions

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Figure 15: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Windrow Activities Under Normal Operating Conditions

Figure 16: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Mixing Activities Under Normal Operating Conditions

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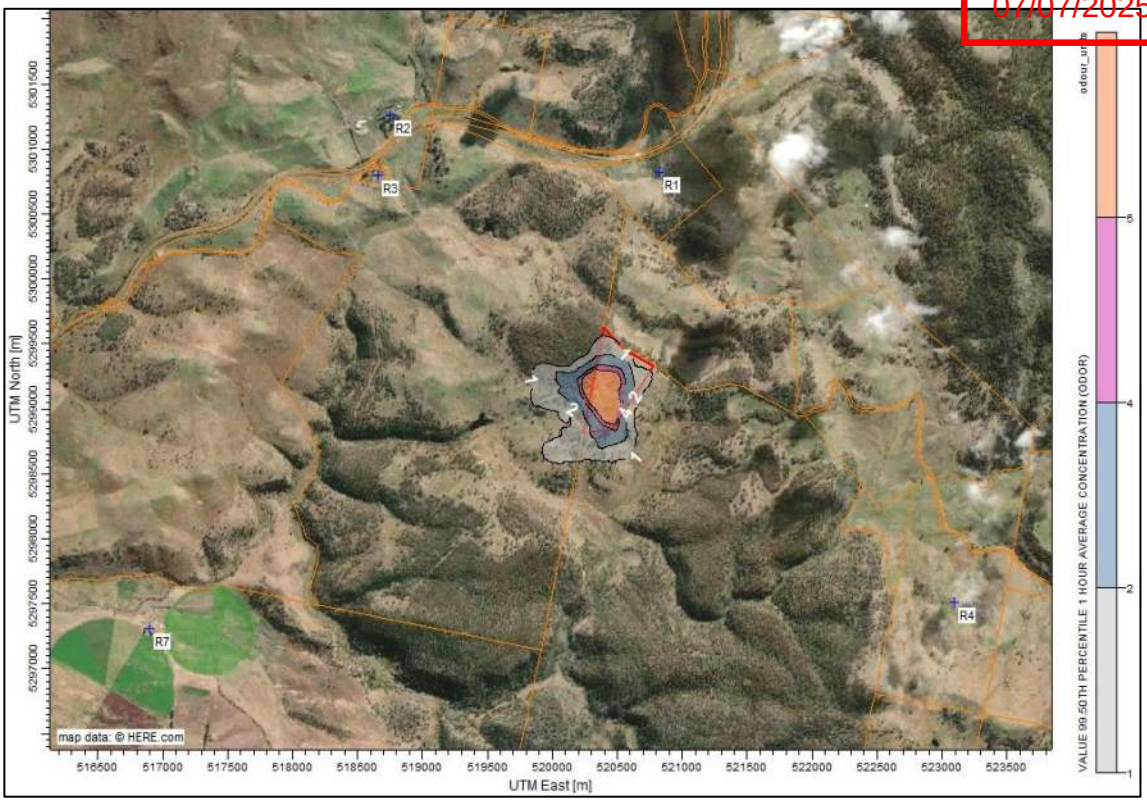

Figure 17: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Product Activities Under Normal Operating Conditions

Figure 18: Predicted 1-Hour 99.5th Percentile Odour Ground Level Contours from Dam 1 Under Normal Operating Conditions

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7.3 Upset Conditions

Table 11 and Figure 20 present the 1-hour 99.5th percentile ground level odour concentrations for the individual activities and the cumulative emissions when the facility is operating under upset conditions.

Table 11: Predicted 1-hour, 99.5th Percentile Odour Concentration from Cumulative Activities during Upset Conditions

Receptor	Predicted 1-hour, 99.5th percentile Odour Concentration (OU)							
	Truck	Dam	Mixing	Product Stockpiles	Raw Material	Windrow	Wash out	Total
R1	<0.01	0.03	0.05	0.10	0.01	0.47	<0.01	0.66
R2	<0.01	0.01	0.01	0.02	<0.01	0.10	<0.01	0.14
R3	<0.01	0.01	0.01	0.03	<0.01	0.11	<0.01	0.16
R4	<0.01	0.01	0.01	0.02	<0.01	0.08	<0.01	0.11
R5	<0.01	<0.01	<0.01	0.00	<0.01	0.01	<0.01	0.02
R6	<0.01	<0.01	<0.01	0.01	<0.01	0.03	<0.01	0.04
R7	<0.01	0.01	0.01	0.02	<0.01	0.08	<0.01	0.12
Max at Site Boundary	<0.01	15.4	13.1	11.3	1.9	70.9	0.2	85.4

Review of the 1-hour, 99.5th percentile predicted odour ground level concentrations shows that the 2 OU criterion will not be achieved at the site boundary, with the highest predicted concentration of 85.4 OU 1-hour, 99.5th percentile.

A review of the results at receptor R1 has identified that if the compositing operations are upset for all activities, the predicted 0.66 OU 1-hour, 99.5th percentile will occur at sensitive receptor R1. This odour concentration is below the limit of detection (1 OU) as detailed in the EPA Board Review Statement[d].

Figure 19 presents the contribution percentage of each activity during upset conditions. It can be seen that the windrows and stockpiling activities are the highest contributors to the odour concentrations.

[d] EPA Tasmania (2022). Update to Air Pollutant Design Criteria used in the Environmental Impact Assessment Process.

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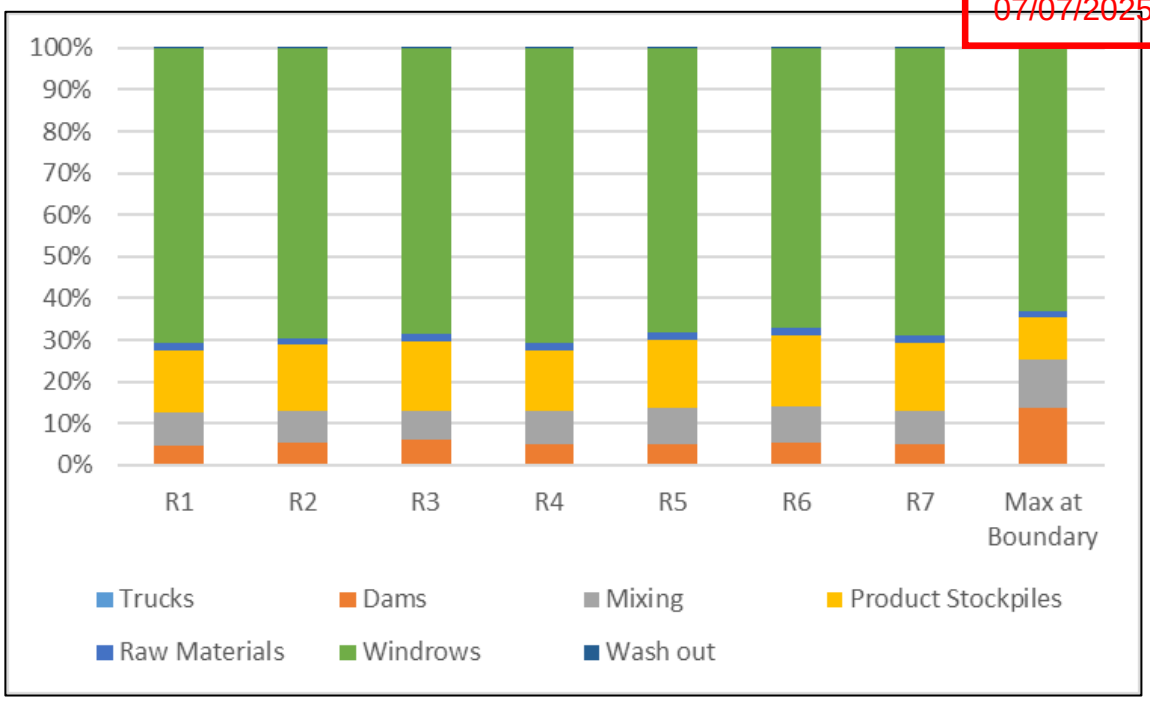

Figure 19: Contribution Percentage of Each Activity for Each Receptor for Upset Conditions

Whilst there is a risk of odour nuisance occurring from the operations during upset conditions, the proponent has an Odour Management Plan (OMP) to ensure that operations are managed accordingly to prevent upset conditions.

Figure 21 to Figure 26 illustrates the contribution of individual activities. It can be seen that the two largest contributions are from windrow and stockpiling activities, respectively. Emissions from truck movements were assessed as vehicle pass-bys in front of the three receptors located closest to the road as well as the internal haul road movements. The odour concentrations are presented in Figure 26 and show the predicted concentrations are extremely low due to the transient nature of the vehicle movements.

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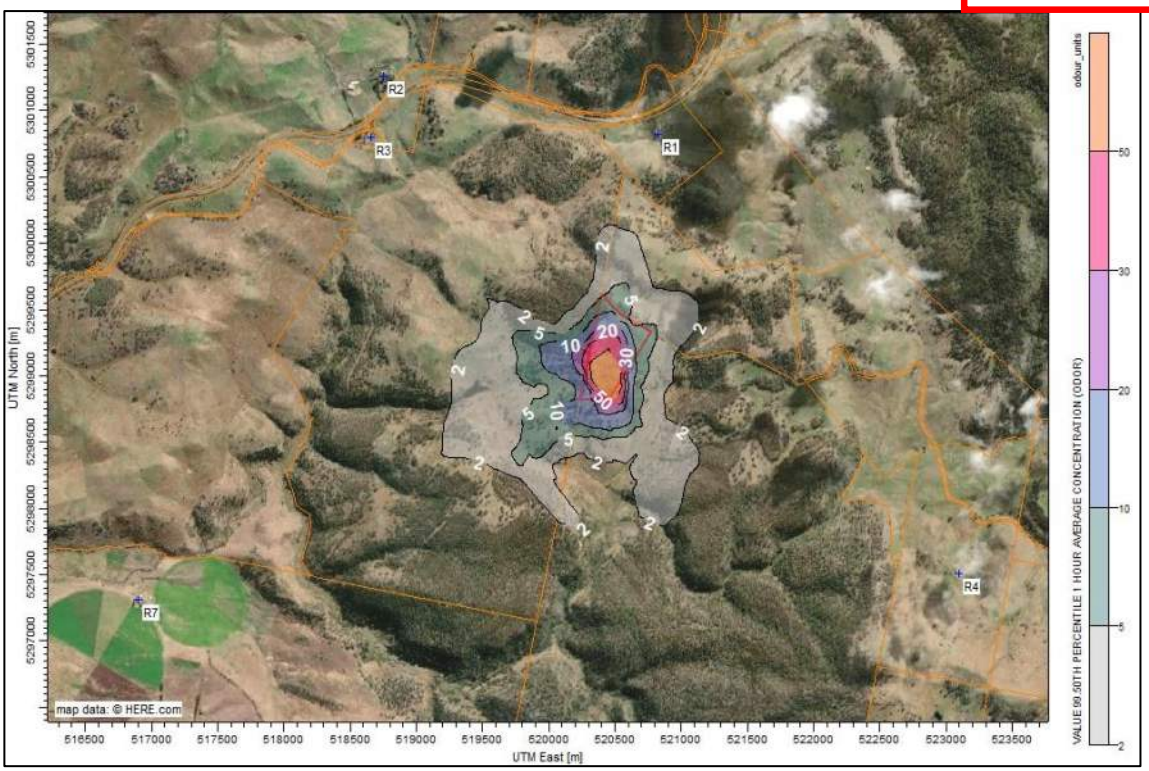

Figure 20: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours During Upset Conditions for Cumulative Activities

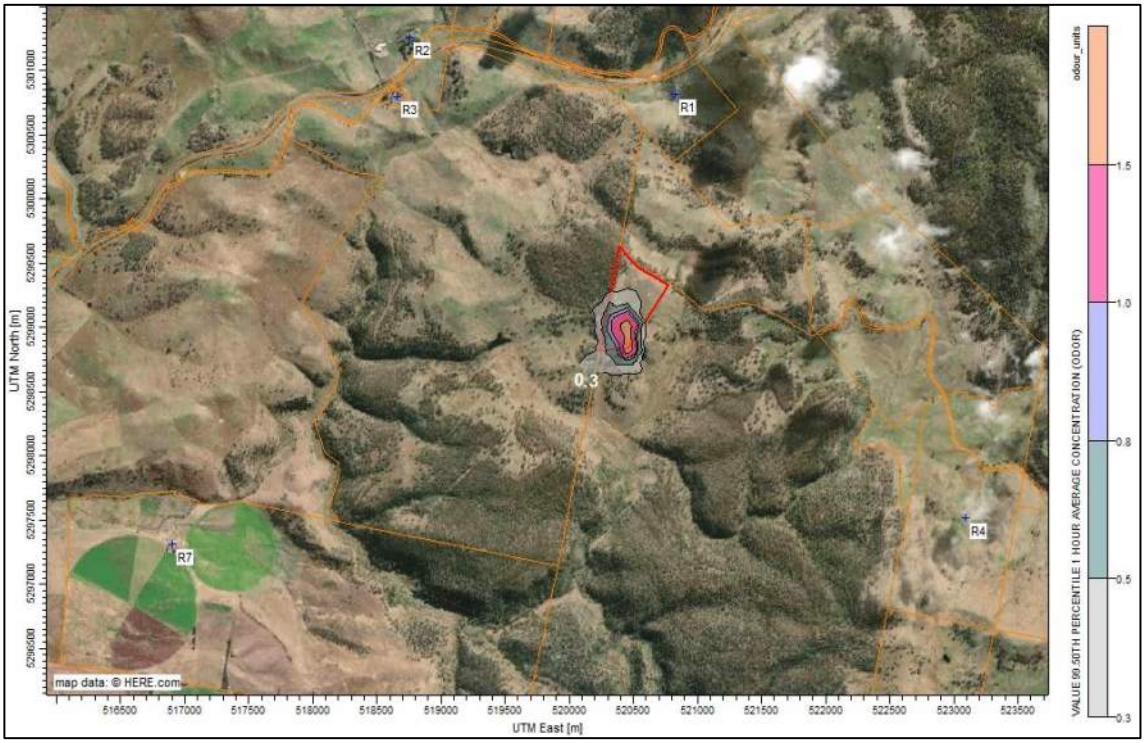

Figure 21: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Raw Material Activities During Upset Conditions

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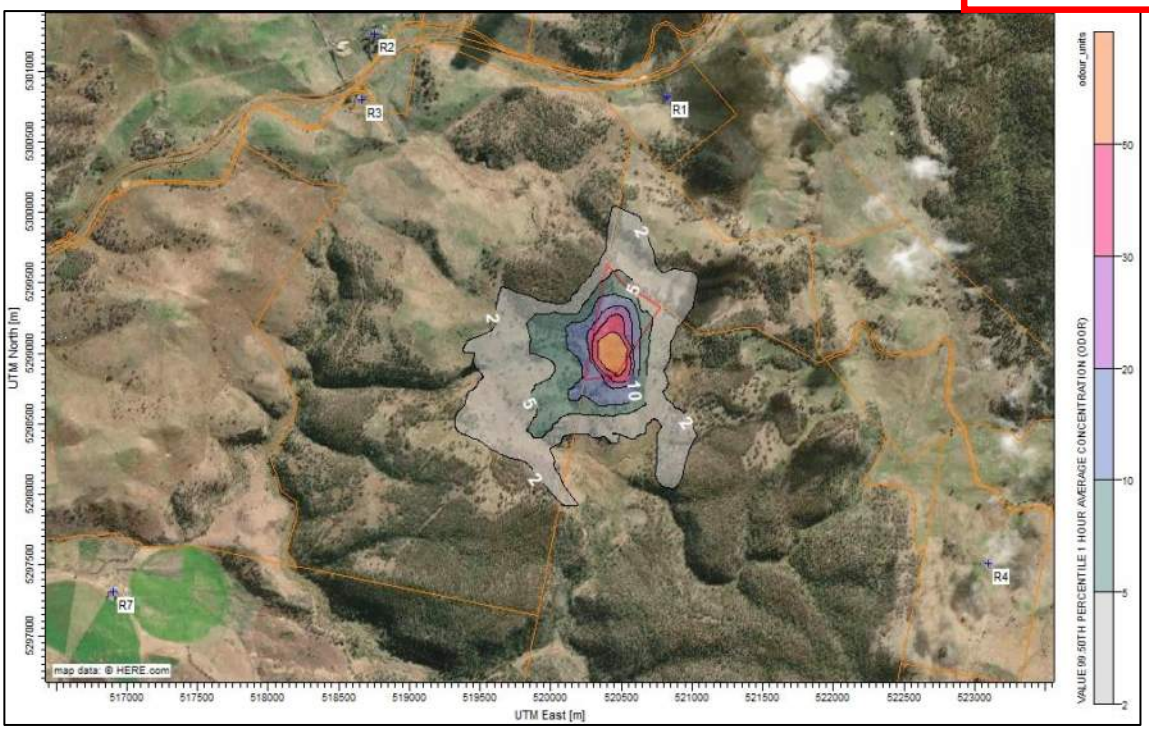

Figure 22: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Windrow Activities During Upset Conditions

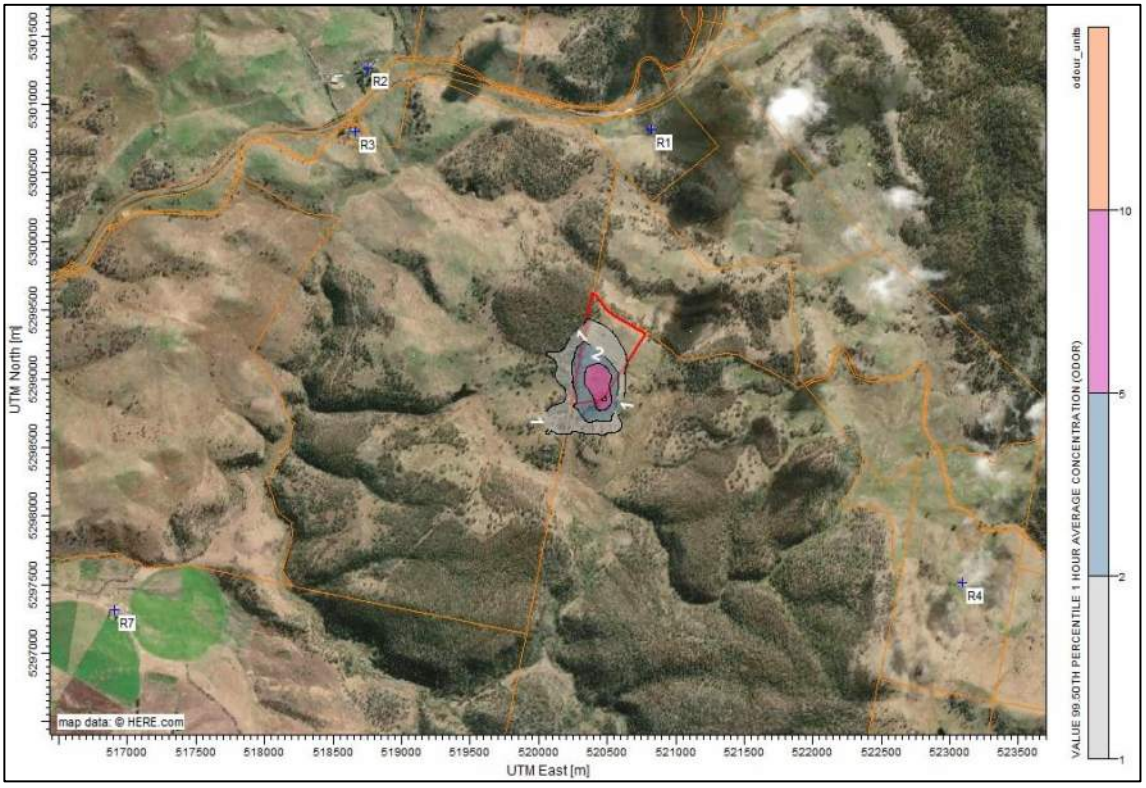

Figure 23: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Mixing Activities During Upset Conditions

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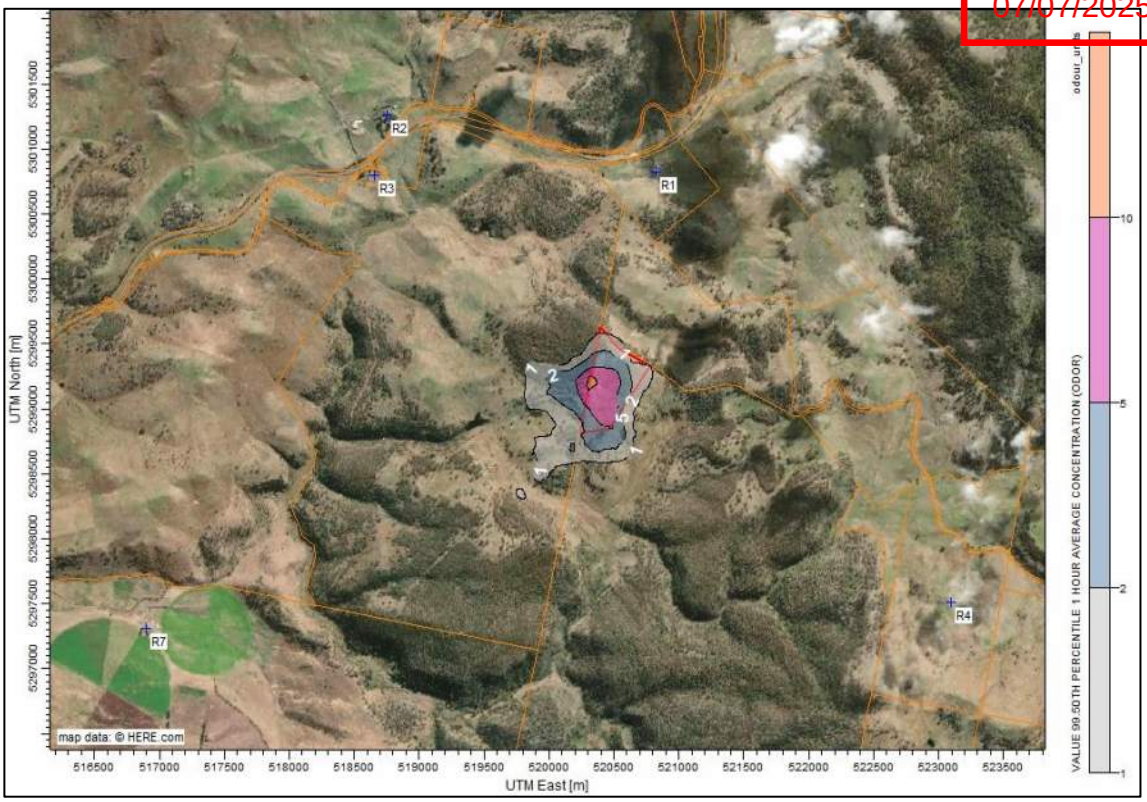

Figure 24: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Product Activities During Upset Conditions

Figure 25: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Dam 1 During Upset Conditions

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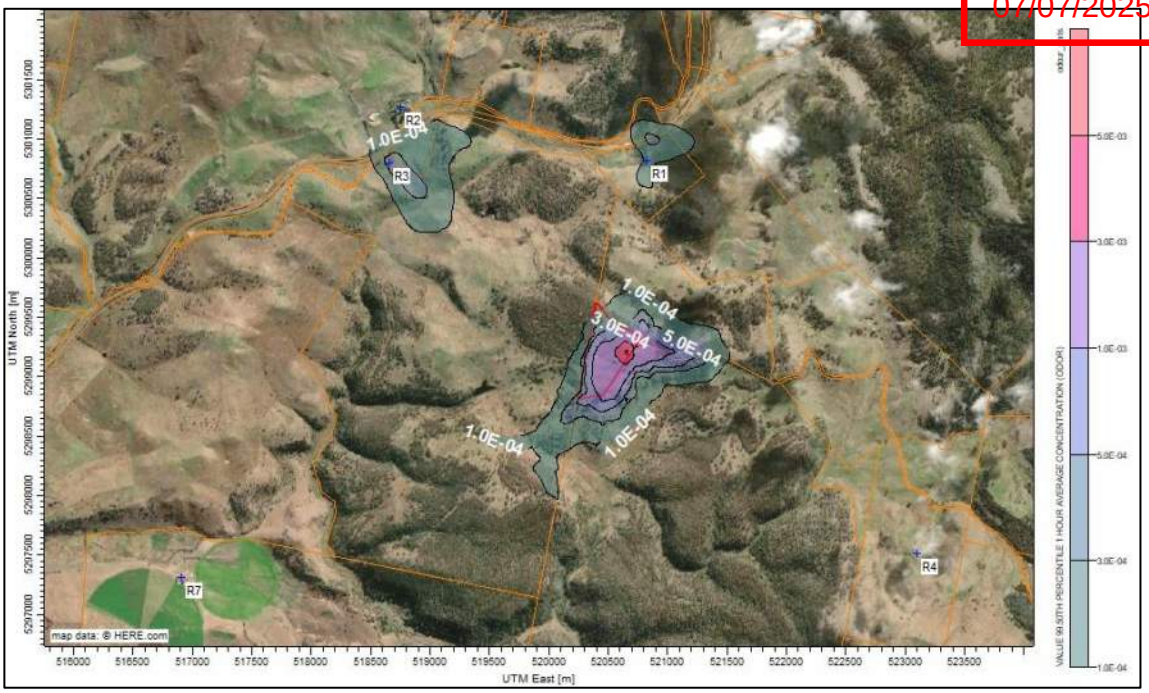

Figure 26: Predicted 1-hour 99.5th Percentile Odour Ground Level Contours from Truck Movements During Upset Conditions

The results for the upset conditions represent unfavourable conditions, which limits the bacterial breakdown of the materials.

Based on best practice management, the incoming material such as FOGO will be refused entry to the site and that odorous raw material is mixed with carbon rich material immediately. These procedures will significantly reduce the emissions from the front-end of the composting process and the likelihood of these emissions occurring is low. For more information, refer to the Odour Management Plan (OMP).

7.4 Comparison with Previous Assessment

The previous AQA (see Section 1) was based on the acceptance of fish morts and the use of fish liquid to maintain moisture in the windrows; the revised feedstock acceptance removes fish by-products.

Table 12 presents the predicted odour concentrations at sensitive receptors and site boundary for the previous assessment and the revised feedstock (this assessment). It can be seen that there is a 60 – 90% reduction in odour concentrations for the revised feedstocks.

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Table 12: Comparison of Predicted Odour Concentrations for Normal Operations for Previous Assessment (Fish Morts) and Revised Feedstock

Receptor	Predicted 1-hour, 99.5th Percentile Odour Concentration (OU)		% Change	Criteria (OU)	Compliant
	Previous Assessment	Revised Feedstock			
R1	0.92	0.34	-63%	-	N/A
R2	0.19	0.08	-60%	-	N/A
R3	0.22	0.09	-61%	-	N/A
R4	0.16	0.06	-63%	-	N/A
R5	<0.1	0.01	-90%	-	N/A
R6	<0.1	0.02	-80%	-	N/A
R7	0.16	0.06	-60%	-	N/A
Max at Site Boundary	107	41.5	-61%	2	N

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8 BEST PRACTICE MANAGEMENT

The section outlines the recommended best practice management techniques for managing odour.

8.1 Best Practice Environmental Management Definition

The Environmental Management and Pollution Control Act 1994 defines best practice environmental management as:

- *The best practice environmental management of an activity is the management of the activity to achieve an ongoing minimization of the activity's environmental harm through cost-effective measures assessed against the current international and national standards applicable to the activity.*
- *In determining the best practice environmental management of an activity, regard must be had to the following measures:*
  - *strategic planning by the person carrying out, or proposing to carry out, the activity;*
  - *administrative systems implemented by the person, including staff training;*
  - *public consultation carried out by the person;*
  - *product and process design;*
  - *waste prevention, treatment, and disposal.*
- *Subsection (2) does not limit the measures to which regard may be had in determining the best practice environmental management of an activity.*

As per the Environment Protection Policy (Air Quality), best practice environmental management includes adopting the following measures, in order of preference, wherever reasonable and practicable:

- avoid creation of odours by employing management techniques;
- manage unavoidable emissions to minimise impacts on health and amenity.

8.2 Monitoring of Compost Parameters & Odour Management Plan

The proponent has developed a specific compost recipe which will be developed. Whilst the recipe is unknown, the key parameters that should be measured are typically:

- Nutrient balance (carbon to nitrogen ratio);
- Total moisture content;
- Oxygen content;
- pH;
- Porosity and bulk density; and
- Temperature.

The monitoring of these parameters will be essential in the maturation of the compost and management of emissions. The development of an odour management plan (OMP) is recommended to assist with understanding the compost recipe and how the parameters should be monitored.

The OMP includes:

- an inventory of all sources of odour;
- odour sources and odour controls under normal operations;
- outline a procedure by which there is plenty of carbon rich material to allow for immediate mixing of odorous material;

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- odour monitoring and recording regime;
- odour management during upset conditions;
- routine management and staff responsibilities;
- outline a waste acceptance policy;
- develop a complaints procedure; and
- recording compost parameters (listed above) to ensure the compost is suitable.

8.3 Best Practice Methods

The following recommendations are made to manage odour:

- In order to facilitate microbial growth and reduce odour, ensure feedstock for windrows is prepared through thorough mixing activities to establish uniform particle size distribution, nutrient balance, and moisture content.
- Monitor key composting parameters within the windrows including pH, moisture content oxygen content and temperature. This should be undertaken at various stages through the composting process.
- Odorous feedstock materials are mixed immediately into the compost process.
- Leachate is prevented from pooling in the work areas and is directed to Dam 1.
- All leachate holding dams are aerated to prevent anaerobic conditions.
- Waste from composting process is appropriately stored until it is removed from the facility.
- Install a weather station suitable for continuous monitoring of wind speed, wind direction, temperature, and rainfall. This will allow for monitoring of weather conditions to ensure that risks associated with odour are minimised and the data can be used to respond to complaints or plan activities when weather conditions are favourable.
- All incoming feedstock which is high risk for odour (i.e., biosolids) is transported in covered vehicles.
- Where possible, enclose raw material storage areas. Rapidly biodegradable material (i.e., food waste) should be stored in moisture proof bins.
- Set up and implement waste characterisation and pre-acceptance procedures for suppliers to comply with and staff to enforce at the gate.
- Ensure waste is sufficiently segregated in the mixing area.
- Set up and implement an output quality management system.
- Set up and implement a handling and transfer procedures (i.e., measures to prevent, detect, and mitigate spills).
- Set up and implement a cleaning procedure for the mixing and windrow areas to ensure unnecessary odours are minimised.

8.4 Operational Flow Charts

This assessment has identified that the quality of raw materials can highly affect the odour from the mixing activities and windows. As part of the operations of the facility, procedures to

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minimise upset conditions have been developed and presented in the Odour Management Plan.

8.5 Dust Management

Lovely Banks Roads is a gravel covered road maintained by local council. Particulate emissions from light and heavy vehicles have not been considered in this assessment based on the infrequent traffic and the separation distance for the road to receptors.

In order to minimise particulate emissions from the road and facility the following recommendations are made:

- set up and implement reduced speed limits for delivery trucks during dry weather. This could be outlined in waste acceptance contracts;
- report potholes or other road defects to council;
- for internal haul roads, ensure the road is as smooth as possible and well maintained;
- during dry periods, water the internal road with fresh water (where available); and
- reduce speeds on internal roads to 10 km/h.

8.6 Future Development

It is understood that the facility may expand in future. It is recommended that prior to any expansion of the facility a full odour sampling regime is undertaken to fully characterise the SOER's from composting.

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9 CONCLUSIONS

Assured Environmental (AE) was appointed by William Cromer to undertake an odour impact assessment for the proposed composting operation. The odour impact assessment was carried out to assess the potential impacts on the surrounding sensitive receptors in accordance with the requirements of applicable guidelines and criteria detailed in EPP Air 2004.

Dispersion modelling has been undertaken for all activities associated with the composting facility including vehicle movements on-site and off-site, raw material handling, mixing, windrow maturation, and turning and product stockpiles. Using the proposed project design and conservative odour emission rates discussed with EPA, the facility's odour emissions were derived for normal and upset conditions for the 10,000 tpa product compost.

The results of the predictive modelling show the following:

- During normal and upset operating conditions, the 2 OU criterion will not be achieved at the site boundary, with the highest predicted concentration of 45.5 OU and 85.4 OU 1-hour, 99.5th percentile respectively.

- During normal scenario, the highest predicted concentration of 0.34 OU 1-hour, 99.5th percentile, occurring at receptor R1. A concentration under 1 OU is considered to be detectable, therefore during normal operations, the operations are not expected to be detectable at sensitive receptors.

During upset scenario, the highest predicted odour concentration is 0.66 OU 1-hour, 99.5th percentile, occurring at receptor R1. Which is below the limit of detection of 1 OU.

- A review of the results at receptor R1 has identified the highest contributing activities are stockpiling and windrow maturation under both normal and upset conditions.

- The truck movements delivery raw material will not cause an odour nuisance due to the transient nature of the source. Unloading of the trucks is included in the mixing activity.

Whilst there is a risk of odour nuisance occurring from the operations during upset conditions, the proponent has an Odour Management Plan (OMP) to ensure that operations are managed accordingly to prevent upset conditions.

Whilst the facility will release odour emissions to air, this assessment has demonstrated that the emissions are not expected to cause a nuisance at the sensitive receptors if best practice management techniques are employed in accordance with the Environmental Management and Pollution Control Act 1994.

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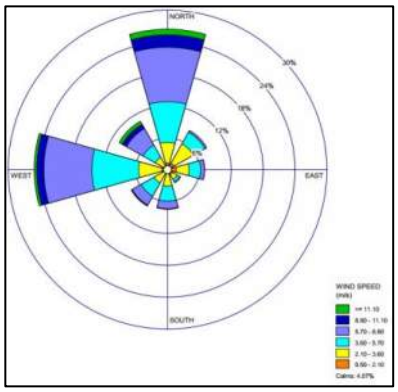
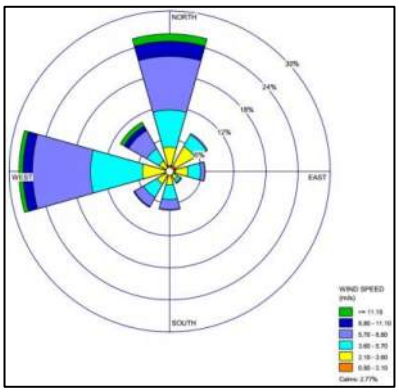
APPENDIX A: METEOROLOGICAL ANALYSIS

Selection of Meteorological Year

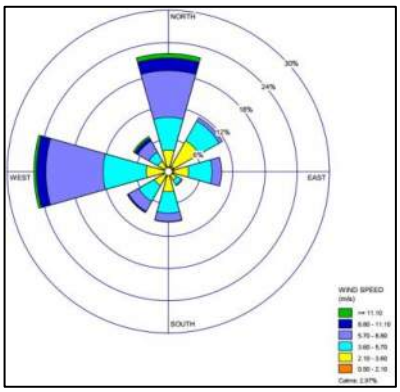
To determine the most representative meteorological year to use in the modelling, seven years (2012 - 2019) of meteorological observations from BOM Tunnack Fire Station (station number 094195) were reviewed. Whilst it is acknowledged that the Tunnack Fire Station is not representative of local wind conditions, it is considered suitable to determining long-term patterns for dispersion modelling purposes. Figure 27 presents the wind roses for 2012 – 2019 and Figure 28 presents annual wind roses.



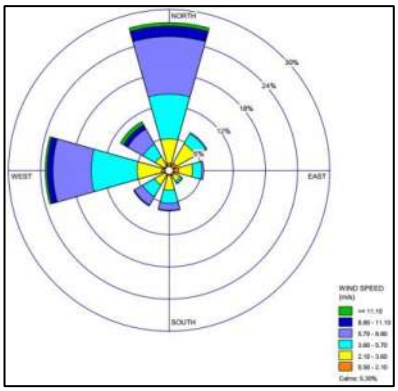
Annual 2012 - 2019



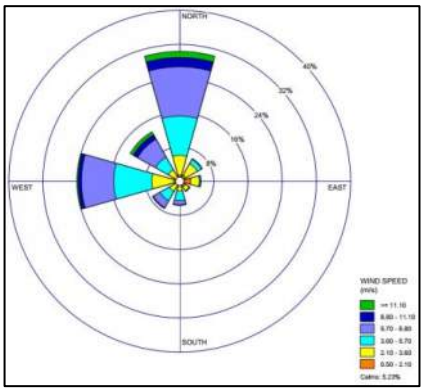
Spring 2012 - 2019



Summer 2012 - 2019



Autumn 2012 - 2019



Winter 2012 - 2019

Figure 27: Long-term wind roses from BOM Tunnack Fire Station (2012 - 2019)

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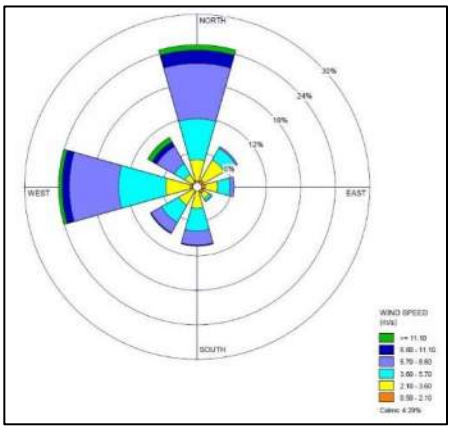
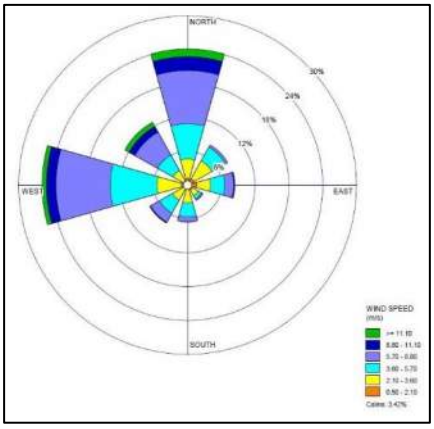
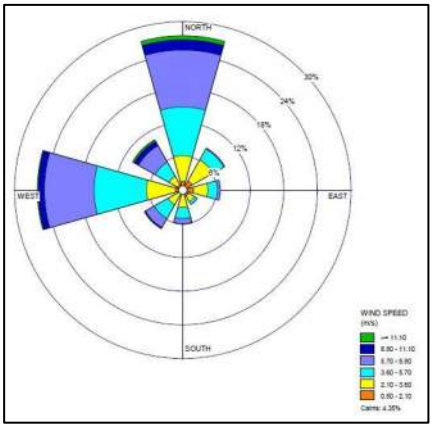


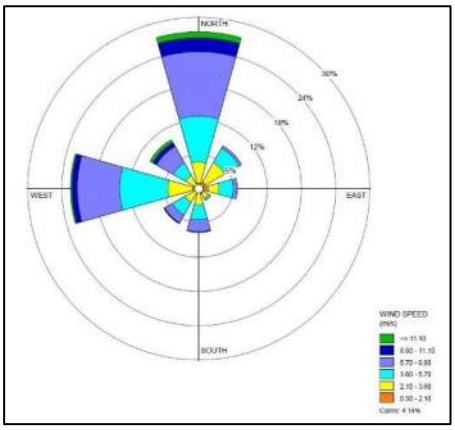
Annual 2015



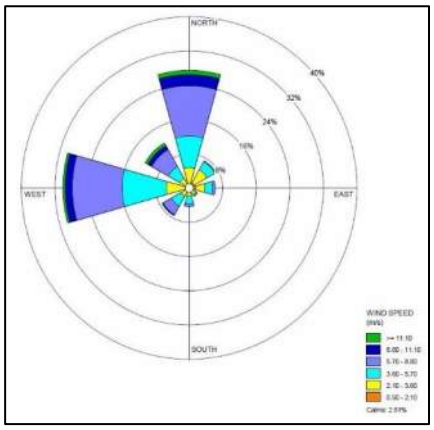
Annual 2016



Annual 2017



Annual 2018



Annual 2019

Figure 28: Annual BOM Tunnack Fire Station wind roses (2015 – 2019)

Figure 27 present the observed annual wind roses for BOM Tunnack Fire Station. The following is noted:

- The annual wind roses for 2015 are very similar in wind direction and wind speed to the seven-year wind roses presented in Figure 27. All seasons have slightly fewer northern flows compared to the seven-year average.

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- The annual wind roses for 2016 and 2017, and 2019 are similar in wind direction and wind speed to the seven-year wind roses presented in Figure 27. All seasons have slightly fewer southern flows compared to the seven-year average.
- The annual wind roses for 2018 are similar in wind direction and wind speed to the seven-year wind roses presented in Figure 27, however there are more westerly flows by comparison.

Based on the wind roses alone, 2015 and 2019 are considered the most representative years. Table 13 presents a yearly comparison of various meteorological parameters against the seven-year dataset. It can be seen form the Table that 2015, 2016 and 2017 are the most representative years based on the analysis of individual parameters.

Table 13: Data Analysis

Parameter		Year					
		2012 - 2019	2015	2016	2017	2018	2019
Wind Conditions	Data Availability	99.1	99.82	99.87	99.98	96.14	99.76
	Calm Conditions (%)	3.68	4.29	3.42	4.35	4.14	2.18
	Ave. Wind Speed (m/s)	4.69	4.65	4.84	4.37	4.64	4.95
Rainfall	Data Availability	99.1	99.82	99.87	99.98	96.14	99.76
	Rainfall (mm)	621 [a)]	426.4	774	461.4	241	368.4
	Average Hourly Rainfall (mm/hour)	0.07	0.05	0.09	0.05	0.03	0.04
Correlations of Datasets by Month	RH (%)		0.79	0.91	0.93	0.93	0.42
	Temperature (°C)		0.92	0.98	0.93	0.93	0.75
	Wind Speed (m/s)		0.24	0.17	0.27	0.27	0.10

a) Based on long-term data from BOM website

Overall, 2015 is considered the most representative year for locations close to Tunnack Fire Station. It should be noted that 2015 is currently Tasmania EPA's preferred year for meteorological modelling.

Model Performance

This section provides an analysis of the prognostic meteorological dataset extracted from the CALMET model for 2015 at the site.

Wind Roses

The predicted wind roses for the site for 2015 are presented in Figure 29 and Figure 30 for season and time of day, respectively.

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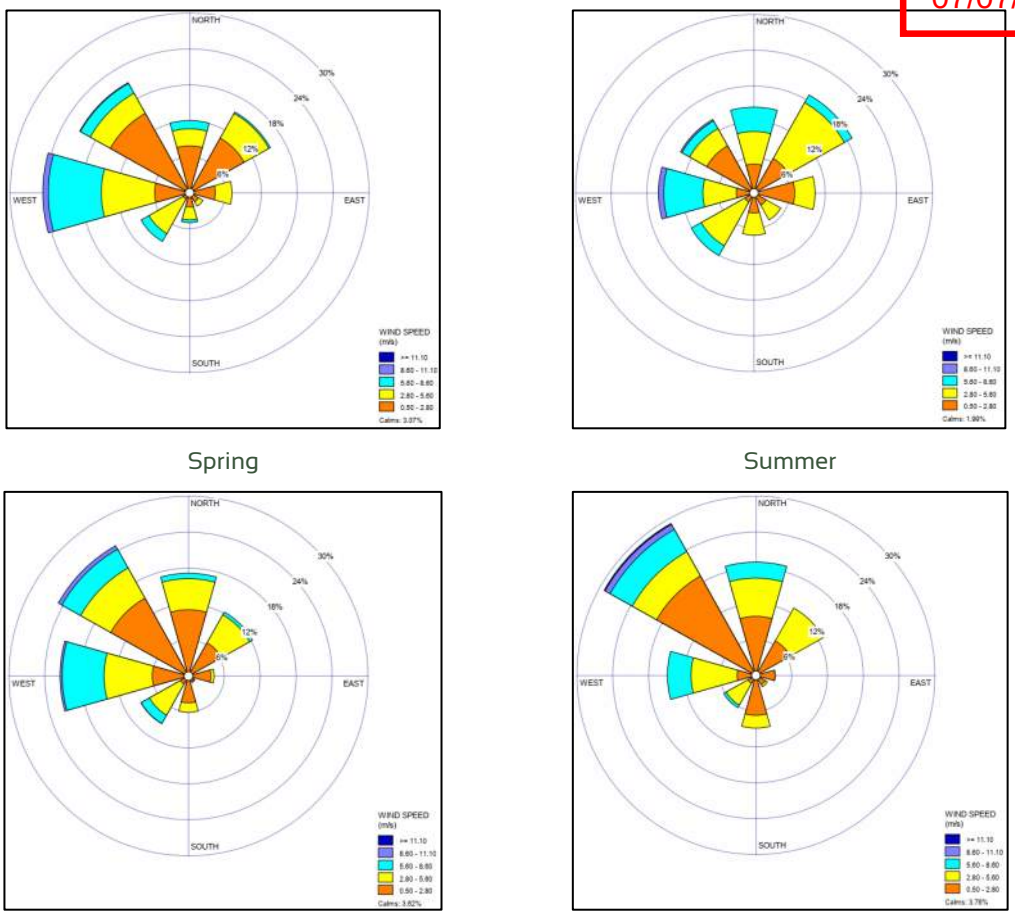

Figure 29: Prognostic Wind Roses at Site by Season (2015)

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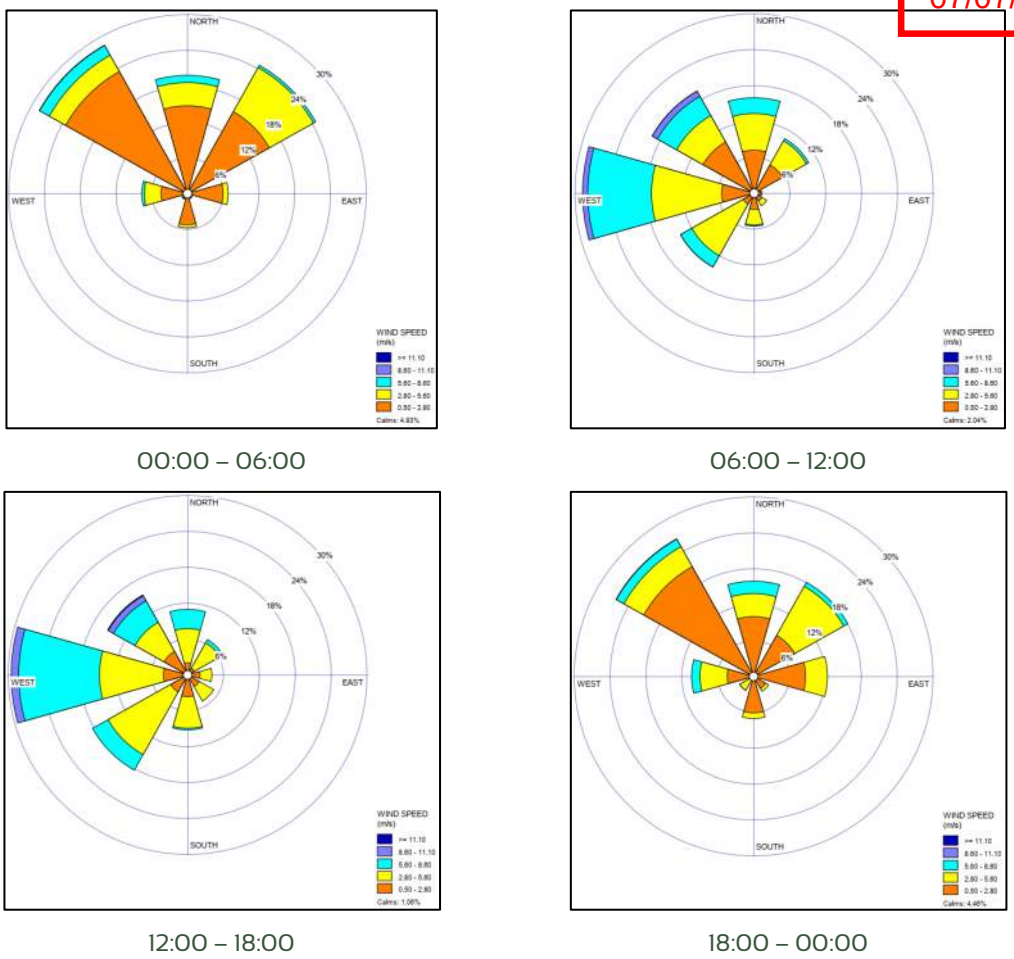

Figure 30: Prognostic Wind Roses at Site by Time of Day (2015)

Predicted Atmospheric Stability

The amount of turbulence in the ambient air has a major effect upon the rise and dispersion of emissions. In particular, the amount of turbulence in the atmosphere plays a key role in diffusion of an emitted plume in the air with stronger turbulence (increased instability) increasing the rate of diffusion. Where the atmosphere exhibits weak turbulence (increased stability), downwind contaminant concentrations can be expected to increase due to the limited diffusion.

Figure 31 presents the diurnal variability in atmospheric stability identified in the predicted meteorological dataset. As can be seen, atmospheric instability increased during the day where the influence of the solar energy drives convection in the atmosphere. Conversely, increased stability can be seen during night periods where stable conditions are predicted for more than 70% of the time.

Prognostic Dataset Review at Project Site

This Section provides an analysis of the prognostic meteorological dataset extracted from the CALMET model for 2015 at the Project Site.

Predicted Atmospheric Stability

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The amount of turbulence in the ambient air has a major effect upon the rise and dispersion of emissions. In particular, the amount of turbulence in the atmosphere plays a key role in diffusion of an emitted plume in the air with stronger turbulence (increased instability) increasing the rate of diffusion. Where the atmosphere exhibits weak turbulence (increased stability), downwind contaminant concentrations can be expected to increase due to the limited diffusion.

Figure 31 presents the diurnal variability in atmospheric stability identified in the predicted meteorological dataset. As can be seen, atmospheric instability increased during the day where the influence of the solar energy drives convection in the atmosphere. Conversely, increased stability can be seen during night periods where stable conditions are predicted for more than 90 % of the time.

Monin-Obukhov Length

The Monin-Obukhov Length represents a parameter (with dimension of length) which provides a relationship between parameters characterising dynamic, thermal, and buoyant processes. The parameter, first described by Obukhov in 1946, is the characteristic height scale of the dynamic sub-layer of the atmosphere and is positive for stable stratifications and negative for unstable stratifications.

Figure 31 below presents a graphical representation of the reciprocal of the Monin-Obukhov length (1/L) for the 2015 prognostic (CALMET) dataset. In this figure, neutral stability conditions have the 1/L value of zero (0), stable conditions have positive values of 1/L, and unstable conditions have negative values of 1/L. The more positive 1/L value, the more stable the atmosphere is assumed to be by the model. Similarly, the more negative 1/L becomes, the more unstable the atmosphere is assumed to be by the model.

Predicted Atmospheric Mixing Height

Figure 31 presents an illustration of diurnal variations in maximum and average mixing heights predicted by CALMET at the Project across the 2015 prognostic meteorological dataset. As expected, an increase in mixing height during the morning is apparent, arising due to the onset of vertical mixing following sunrise. Maximum mixing heights generally occur in the mid to late afternoon, due to the dissipation of ground-based temperature inversions and growth of the convective mixing layer. The highest maximum mixing height for the Project occurs during the afternoon.

Temperature

Figure 31 presents an illustration of diurnal variations in maximum and average temperatures predicted by CALMET at the Facility across the 2015 prognostic meteorological dataset

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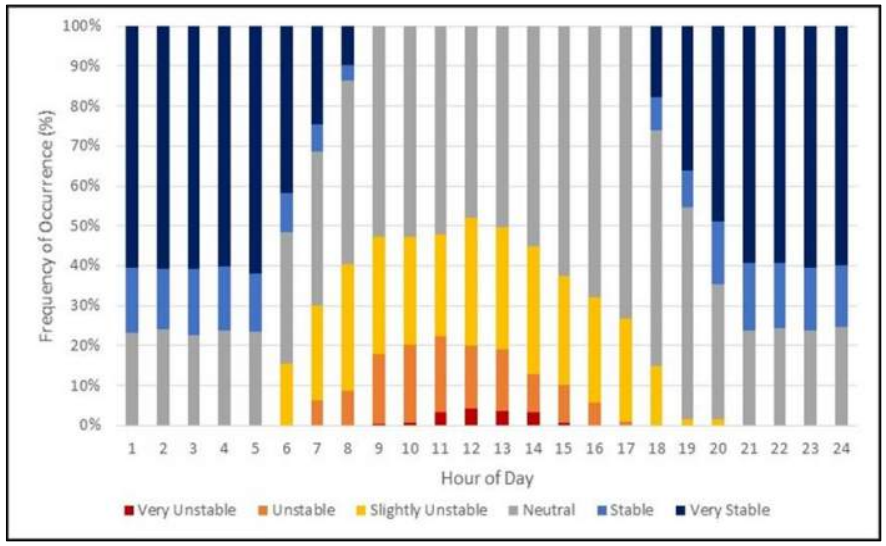
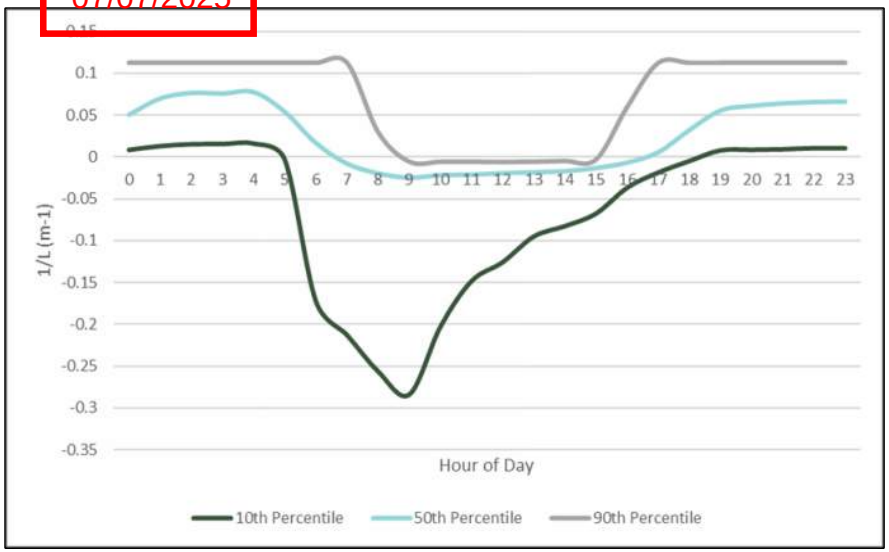
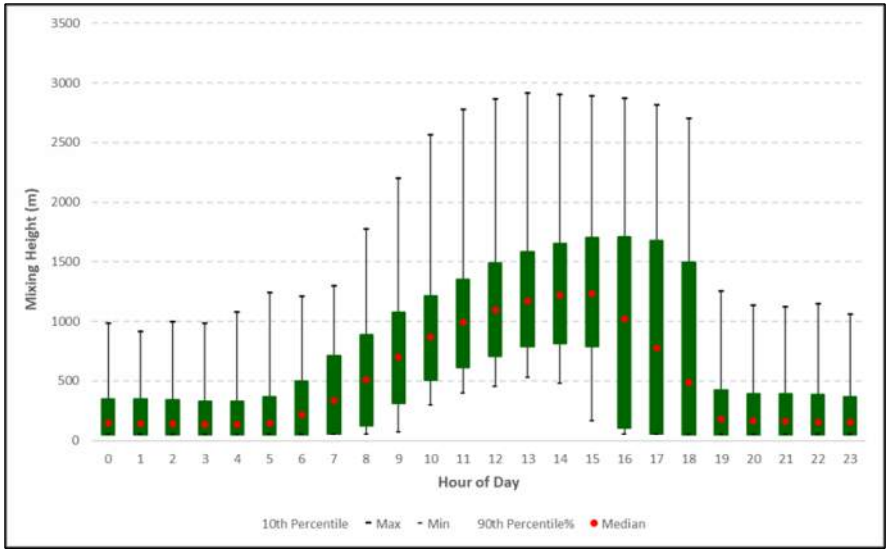


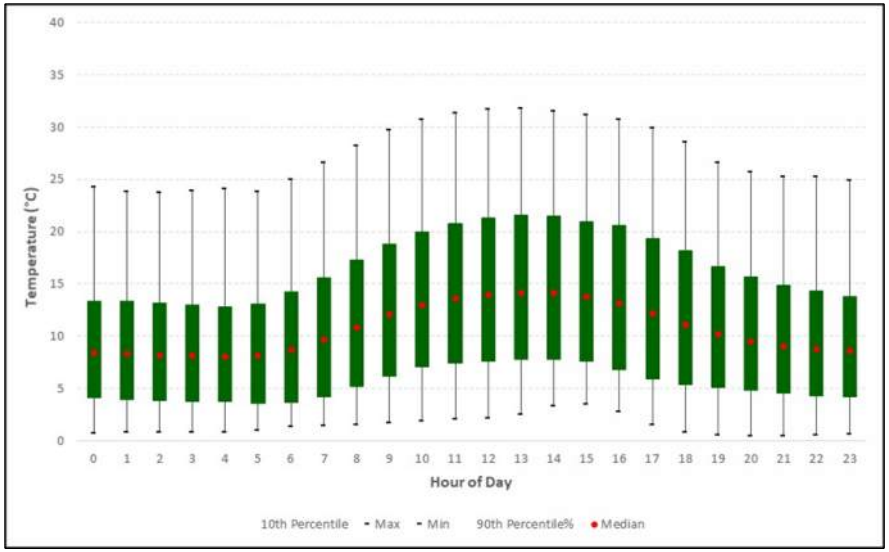
Annual Atmospheric Stability by Hour



Annual Variability of Monin-Obukhov Length by Hour



Atmospheric Mixing Height by Hour



Temperature by Hour

Figure 31: Meteorological Analysis at Project Site

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Composting & Odour Types

When considering the stages of composting odours produced at the beginning of the composting period are caused by the nature of the material used. Material such as biosolids processing wastes often has a strong odour in the initial stages of composting that diminishes as composting proceeds[e].

Odours generated during the composting period result from the production and release of odorous compounds through either biological (microbial respiration) or nonbiological means (chemical reactions).

The main compounds responsible for odour generation from agriculture are:

- volatile organic compounds (VOCs) such as volatile fatty acids (VFAs), indoles, phenols, aldehydes, amides, amines, esters, ethers, and ketones;
- odorous sulphur compounds (hydrogen sulphide (H_2S), dimethyl sulphide, methanethiol, ethanethiol, propanethiol, mercaptans); and
- ammonia.

The production of odorous compounds within a compost pile does not necessarily mean that odours will be released. These compounds can move to other parts of the composting pile where they are decomposed to non-odorous compounds. For example, hydrogen sulphide that is produced through anaerobic decomposition can be converted to sulphur quickly in aerobic zones. If this does not occur, then the compounds are released into the atmosphere and odour results.

Ecological factors influence the amount and type of odorous compounds produced and whether they are released. The initial chemical composition of the compost mix, oxygen concentration, oxygen diffusion rates, particle size, moisture content, and temperature influences odour production.

Factors Affecting Odour Emissions

Odour emission from composting can be affected by many factors such as characteristics:

- C/N ratio determines nutrient balance. A lower ratio (too much nitrogen) can result in higher ammonia emission, which is odorous. Excess nitrogen can also cause accelerated microbial growth, which will rapidly use up the available oxygen, resulting in anaerobic conditions. A higher C/N ratio, however, may result in insufficient nitrogen for optimum growth of microorganisms and slow down the composting process.

- moisture content affects free air space, microbial activity, heat and mass transports, and nitrogen dynamics. Excess moisture fills the pore space, and thus creates larger water filled zones between particles, which slow oxygen diffusion and result in anaerobic clumps.

[e] US Department of Agriculture (2010). National Environmental Engineering Handbook. Chapter 2: Composting.

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- temperature is an important factor to odour emissions as odour concentration is dependent upon its vapor pressure, which is a dependant on composting temperature.
- particle size distribution – inadequate distribution can lead to anaerobic conditions.

Unaerated Windrow Composting

Unaerated windrows allow the odour emissions are directly discharged into the atmosphere. The odorant concentrations on unaerated windrows can also be considered as decreasing with an increasing progress of degradation[f]. Unlike covered windrows, the odour emission is uniform in nature across the entire surface area.

[f] Bidlingmaier, W., Grauenhorst, V., Schlosser, M., Müsken, J. (2007). Odour Emissions from Compost Plants Dimensioning Values for Enclosed and Open Plants.

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APPENDIX C: ODOUR EMISSIONS DATABASE

Assured Environmental have conducted odour emissions monitoring in accordance with AS 4323.3: 2001 at composting and other facilities throughout Australia. In addition, Assured Environment maintain a library of technical papers for cross reference purposes.

This Appendix presents a selection of our measurement database which is suitable for this Project. The emission sources are separated into the following categories:

- Raw waste and operational activities;
- Uncovered and unaerated windrow emissions by week; and
- Windrow turning activities.

The charts presented in Figure 32 to Figure 34 provide the minimum, maximum, mean, and lower and upper quartiles of the measurement data.

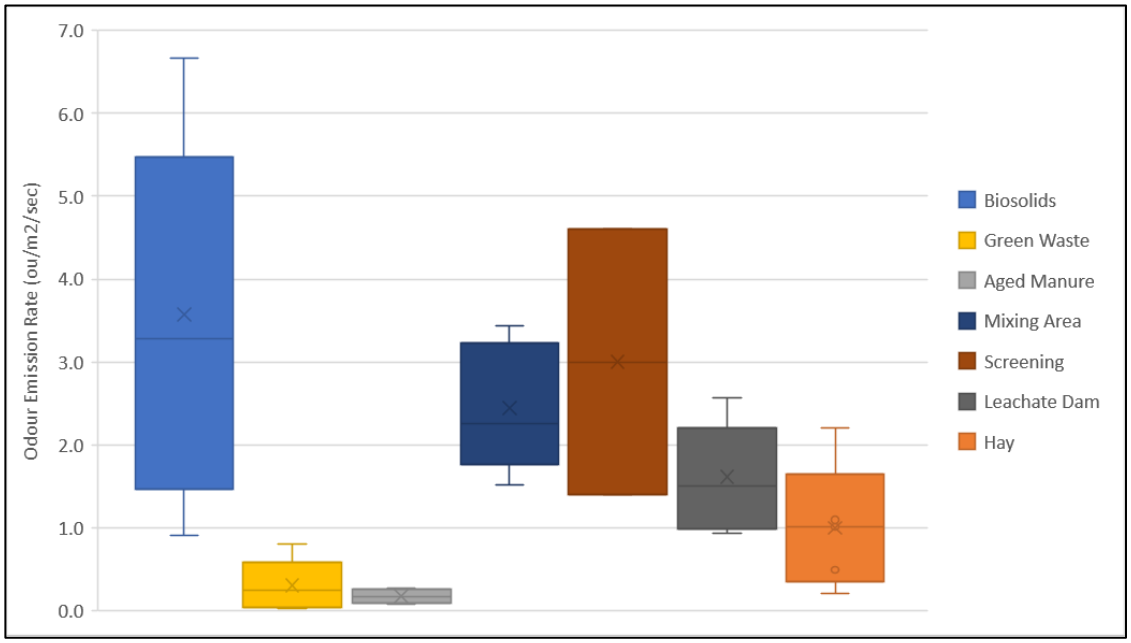

Figure 32: Odour Emission Rate Database for Raw Materials and Activities

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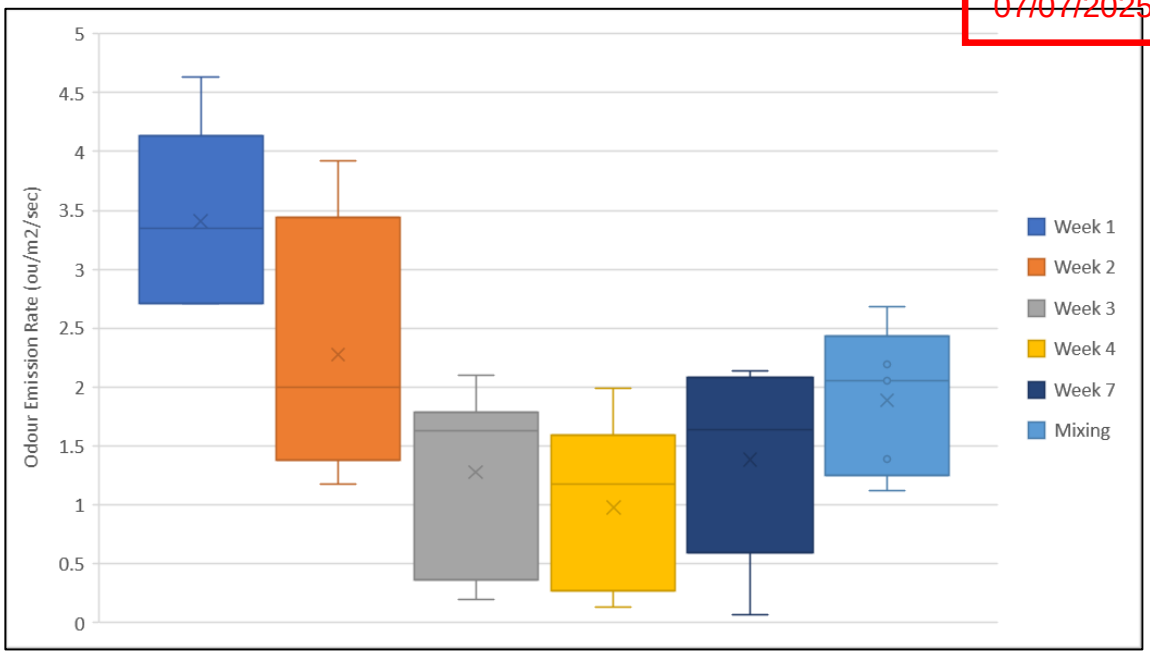

Figure 33: Odour Emission Rate Database for Windrows by Age

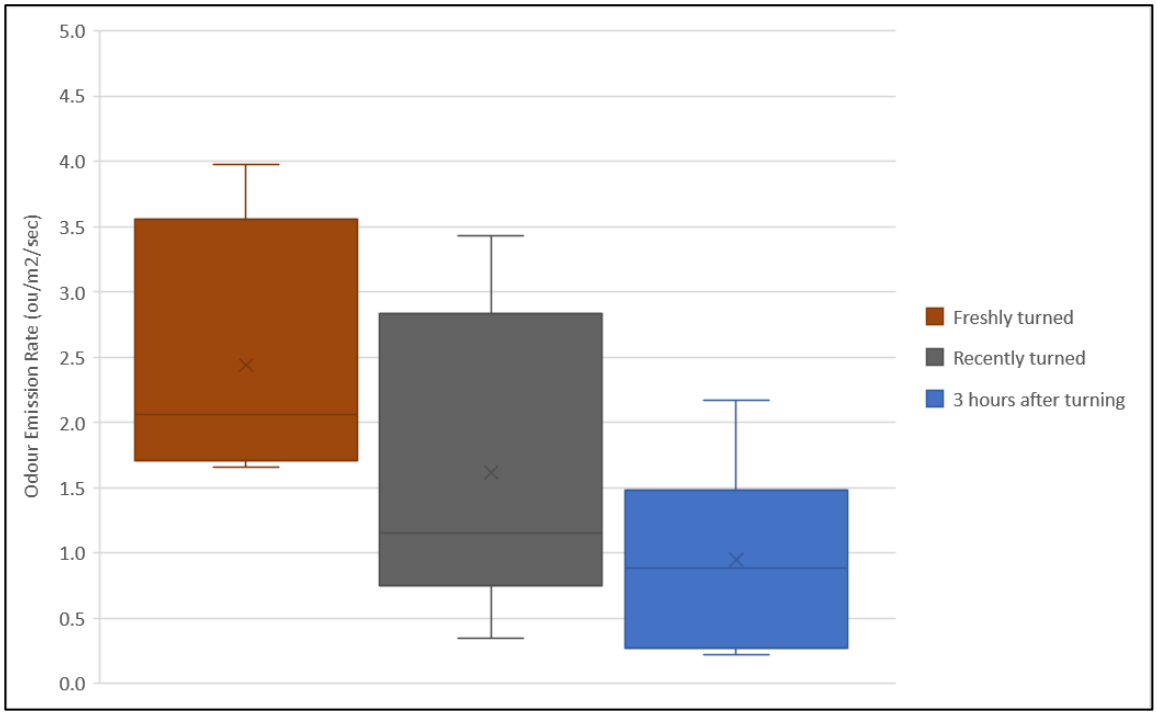

Figure 34: Odour Emission Rate for Windrow Turning

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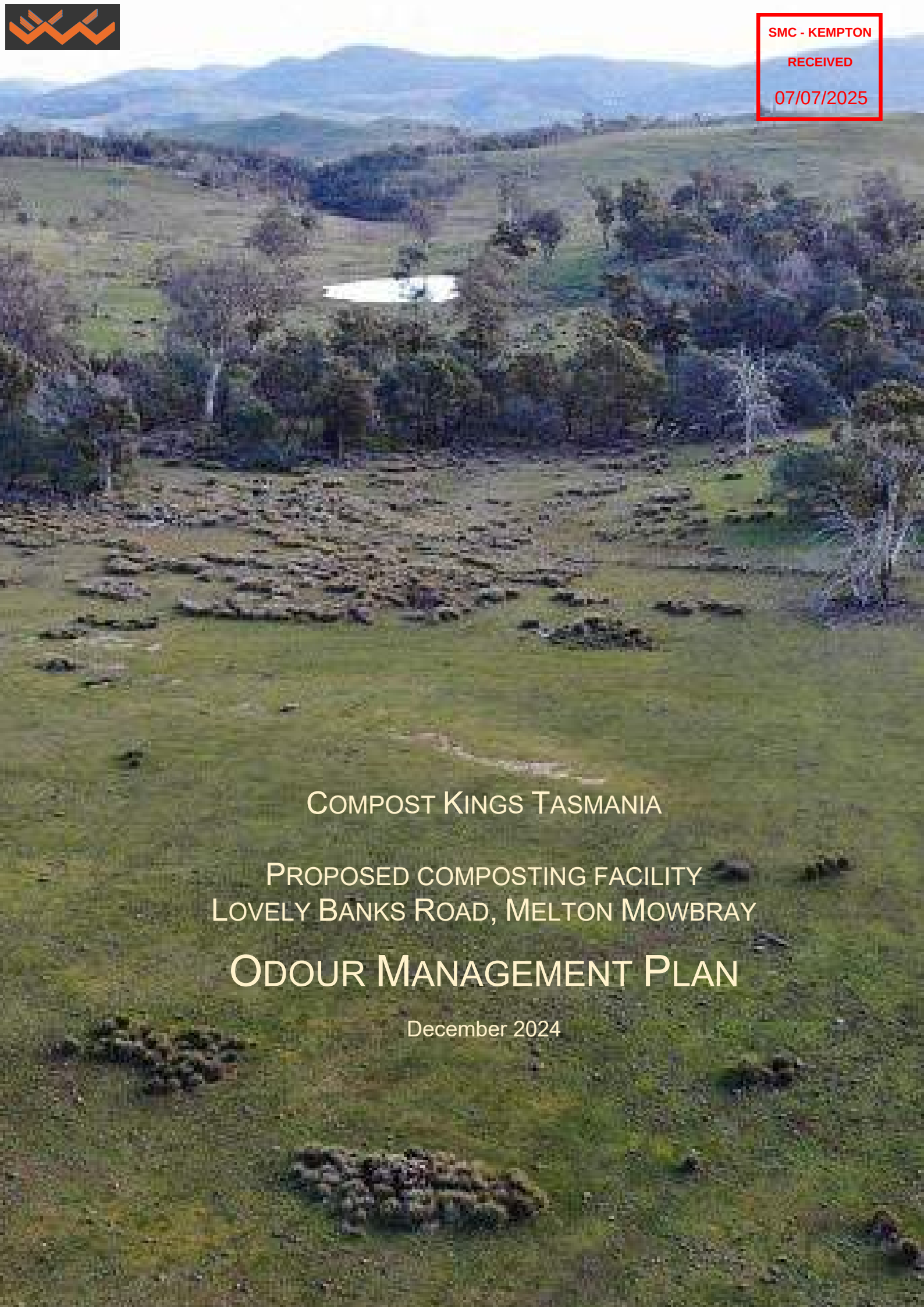

COMPOST KINGS TASMANIA

PROPOSED COMPOSTING FACILITY
LOVELY BANKS ROAD, MELTON MOWBRAY

ODOUR MANAGEMENT PLAN

December 2024

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Cover photo

View west over part of the proposed composting facility. The property boundary between *Somerton* (foreground) and *Woodlands Run* is the line of trees running left to right in the middleground. Proposed Dam 1 is in the shallow depression in the centre middleground. Composting windrows will occupy the foreground.

Drone photo: 26 July 2021

Refer to this document as:

Cromer, W. C. (2024). *Odour Management Plan, proposed composting facility, Lovely Banks Road, Melton Mowbray*. Unpublished report for Compost Kings Tasmania by William C. Cromer Pty. Ltd., 18 December 2024

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1 Introduction

The purpose of this Odour Management Plan (OMP) is to outline the management of air quality controls relevant to the proposed Compost Kings composting facility (the 'facility') on Lovely Banks Road near Melton Mowbray in the Tasmanian Midlands (Figure 1).

The proponent of the facility is Mr. Seaton Waterfield, who is the sole owner and manager/operator of *Compost Kings Tasmania*.

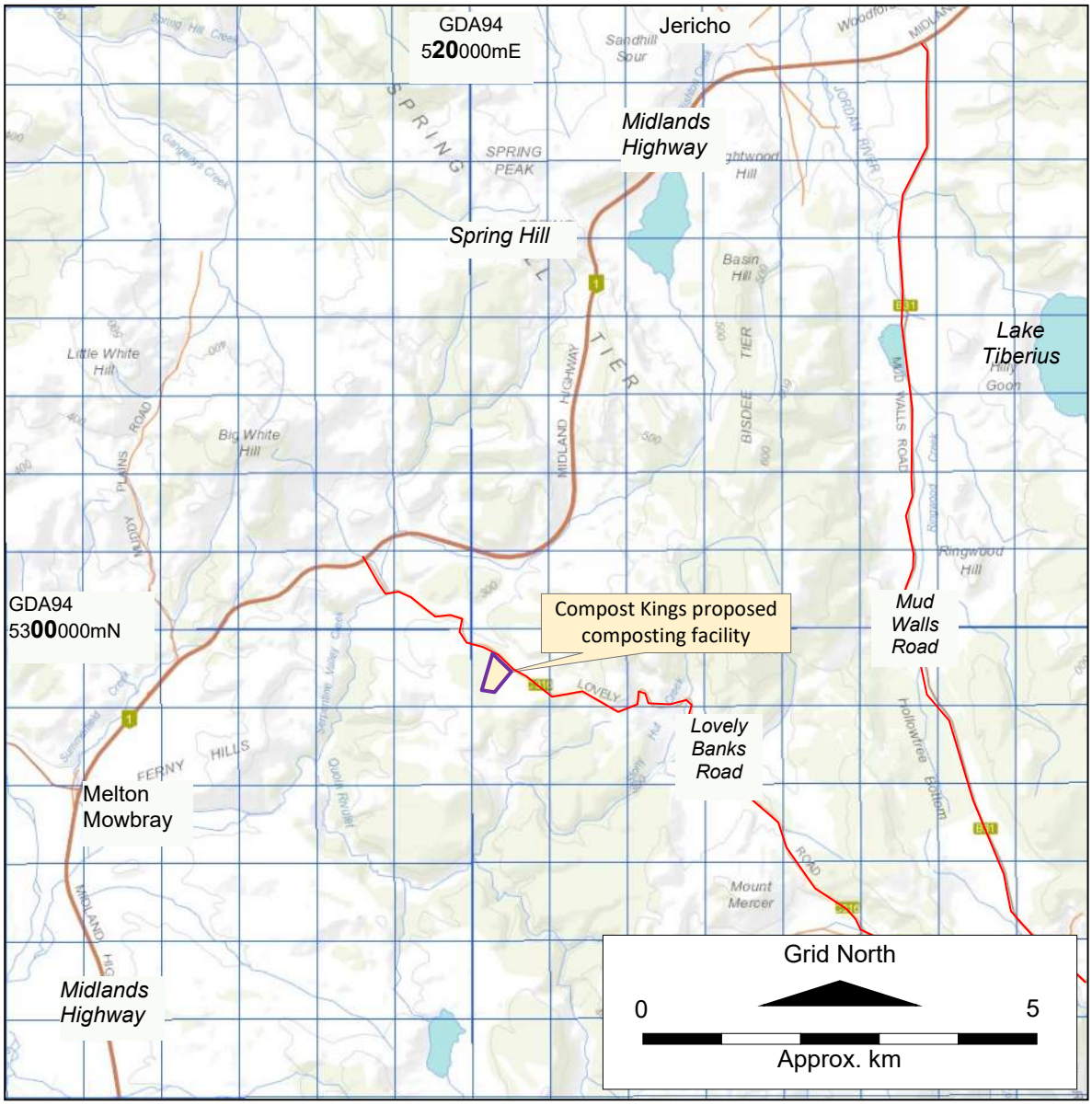

Figure 1. Location of the proposed Compost Kings composting facility on Lovely Banks Road.
Source of base map: www.thelist.tas.gov.au

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The Facility will add 10,000tpa composting capability to the recycling and composting industry in Tasmania. The range of raw materials to be imported to and incorporated into the composting process will be restricted to Category 1 and 2 feedstock as defined in Table 4 of EPA Victoria (2017)[1]:

- Category 1 low-odour wastes – mostly municipal-sourced landscaping and garden supplies such as grasses, leaves, plants, tree trimmings, pine bark, sawdust, hay and harvesting residues – will make up at least 80% of the total feedstock, and
- Category 2 medium-odour wastes will consist of biosolids and aged manures, comprising up to about 20% of the total feedstock. Biosolids accepted at the facility will be sourced only from licenced producers and transporters, and will be rated as Class 1 and 2, contaminant grades A and B, and stabilisation grades A and B [Table 9.1 of EPA(2020)[2]]. Compost Kings will not accept sewage sludge.

The objectives of this OMP are set out in Table 1.

Table 1. OMP objectives

OMP Objectives	Section of this OPM
Objectives	2.2
Identification of odour sources	5.2
Minimisation of odour at source (includes management and control strategies)	5.5
Monitoring of odour emissions	6.1
Management strategies for the general approach to be taken to meet and maintain the objectives	6.3
Actions needed to implement the management strategies	6.3
Performance indicators against which the level of achievement of the objectives will be measured	6.2
Responsibilities of personnel	6.4
Reporting and review arrangements (including any auditing) for each action; how often; and to whom	6.7
Corrective actions to be undertaken if the objectives are not being met or maintained, including who is responsible for taking the required actions	6.4
In the event of an odour-related complaint from a sensitive receptor, undertake an investigation to identify the odour emission source responsible for the issue, and take reasonable actions to mitigate the emission	6.5

[1] EPA Victoria (2017). *Designing, constructing and operating composting facilities.* Publication 1588, Environment Protection Authority Victoria, 1 June 2017.
[2] EPA (2020). *Tasmanian Biosolids Reuse Guidelines.* Environment Protection Authority Tasmania, June 2020.

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2 Regulatory framework

2.1 Overview

The manager/operator of the facility is committed to conducting composting operations in a manner that will protect the environment. The commitment extends to addressing all operations including air emissions and odour, soil and groundwater contamination, and general housekeeping.

The facility will minimise the risk of odour to the environment by complying with all aspects of this OMP. The OMP will assist management in complying with regulatory requirements of:

- The Southern Midlands Council Development Approval for the operations, and
- the *Environment Protection Policy (Air Quality) 2004*

2.2 Objectives

The objectives of this OMP are to detail how odour aspects and effects might arise from facility operations, how they are to be managed and monitored, how responsibilities are shared, and how any odour complaints are handled.

From this OMP Compost Kings will develop protocols for facility personnel to manage odour. The odour management protocols will be part of a Facility Operations Manual.

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3 Environmental considerations

3.1 Location

The site on Lovely Banks Road near Melton Mowbray in the Tasmania Midlands is wholly contained within the rural property *Somerton*, on its western border with *Woodlands Run*, an adjoining rural property. These two and all other surrounding properties are broad-acre agricultural holdings, with grazing the principal land use (Figure 2).

Within *Somerton*, the proposed 6.5ha facility is included in a 23ha site with a 400m frontage on Lovely Banks Road (Figure 3).

3.2 Terrain

The district has a youthful topography dissected by many un-named watercourses draining to Quoin Rivulet and its tributary Serpentine Valley Creek, in the Quoin – Serpentine Valley subcatchment.

Relief in the district is about 400m, rising from 200 – 250m in the valley of Quoin Rivulet near Melton Mowbray, to 600 – 650m along the north-south trending Bisdee Tier, Green Timbers and Mt. Mercer several kilometres east of the proposed composting facility.

The facility is on a 400m wide west-facing "plateau" between about 320m and 330m elevation, on a hillside segment sloping gently west at an average gradient of 3^0. About 100m south of the site boundary, the hillsides steepen to angles of 10^0 – 15^0, falling south to an un-named tributary of Stony Hut Creek.

3.3 Meteorological conditions

3.3.1 Rainfall

Rainfall has been recorded since 1908 at *Lovely Banks* on the Midlands Highway, 2.8km north-northwest of the proposed compost facility. At *Lovely Banks*,

- mean annual rainfall is 501mm, and the 95%ile annual rainfall is 722mm.
- mean monthly rainfall in the 40 – 50mm range is fairly evenly distributed during the year, and 95%ile monthly rainfall is approximately twice mean monthly rainfall and more variable (70 – 100mm).

Since 1908, about 73% of days recorded no rain, and a further 12% of days recorded less than 2mm of rain. Less than 1% of days received 30mm or more of rain (Figure 4).

3.3.2 Temperature

Mean maximum temperature in the district[3] ranges from 10 – 11^0C in June – August, to 20 – 22^0C in January – February.

Mean minimum temperature ranges from 2 – 3^0C in June – July, to 8 – 9^0C in January – February.

3.3.3 Winds

Dominant winds (about 43% of the time) are from the west and northwest (Figure 5). Low (<2.8m/s) wind speeds occur approximately 30% of the time in summer, and up to 50% of the time in winter, indicating relatively poor atmospheric dispersion conditions for the site.

[3] Bureau of Meteorology data for Tunnack Fire Station.

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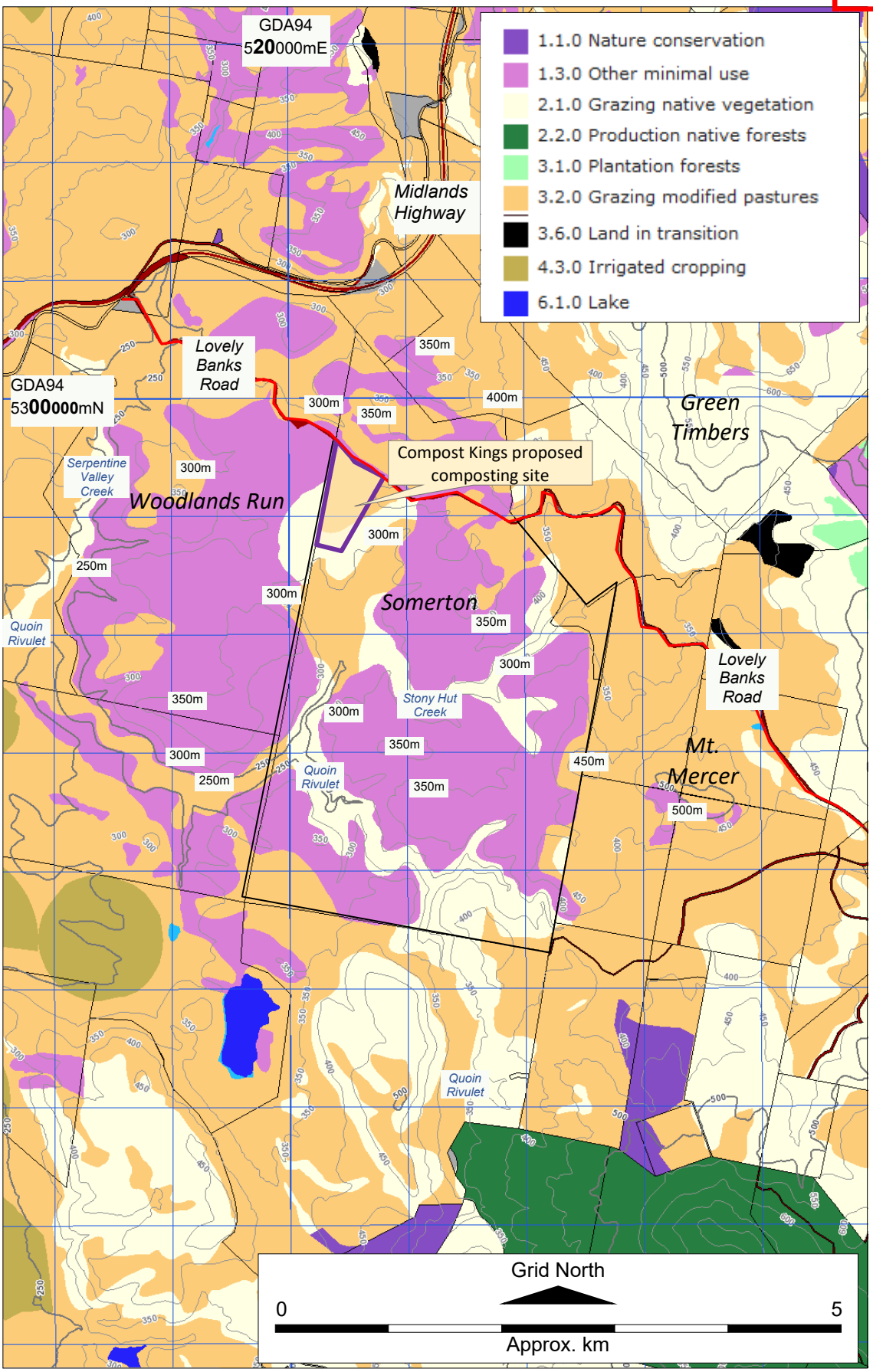

Figure 2. Land use (2019) in the vicinity of the proposed composting facility.
Source: www.thelist.tas.gov.au

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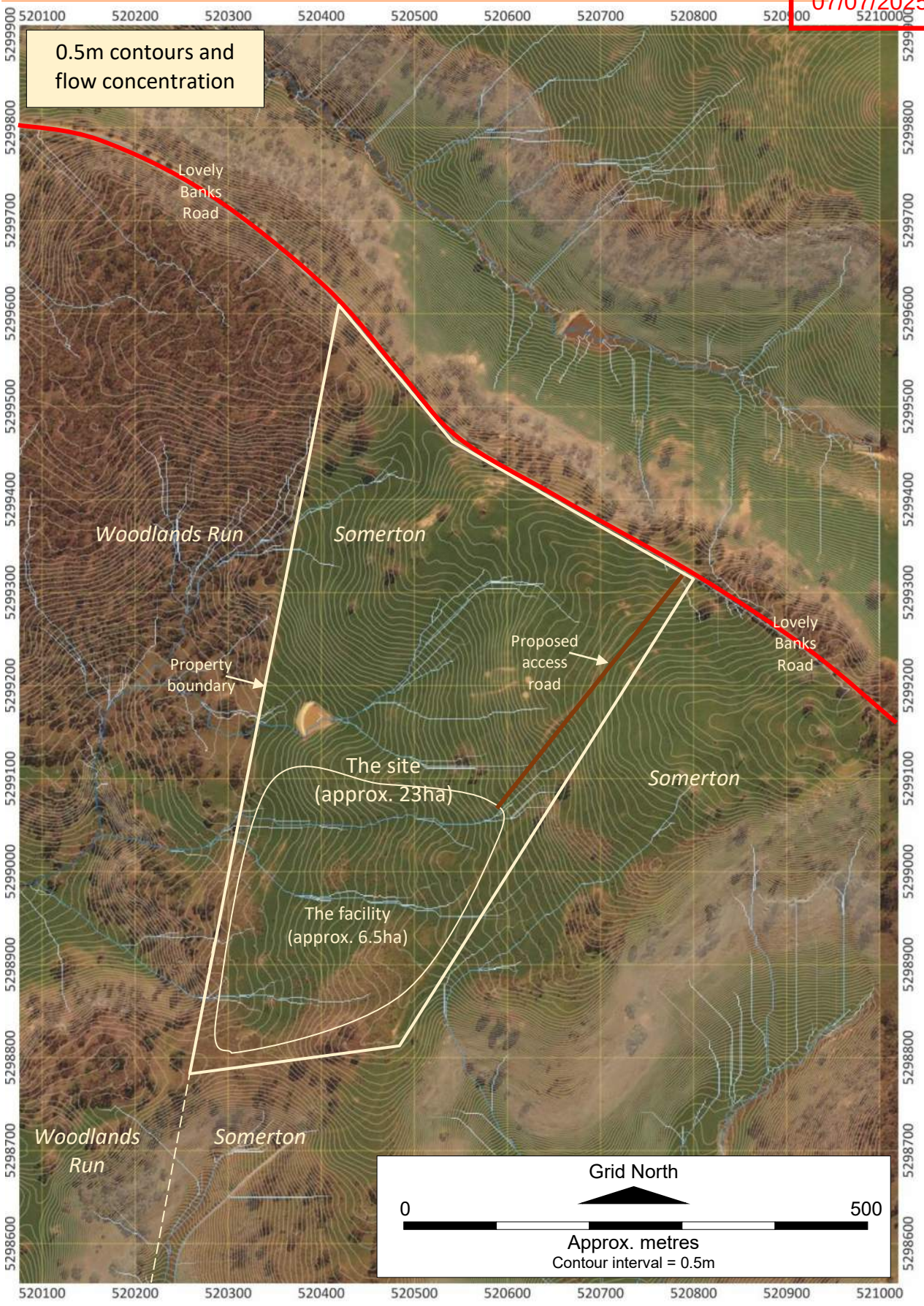

Figure 3. The proposed 6.5ha composting facility within the 23ha site on *Somerton*. (Blue lines on the site are computer-generated flow concentration lines after sufficient rain, not established watercourses.)
Source of base map: www.thelist.tas.gov.au

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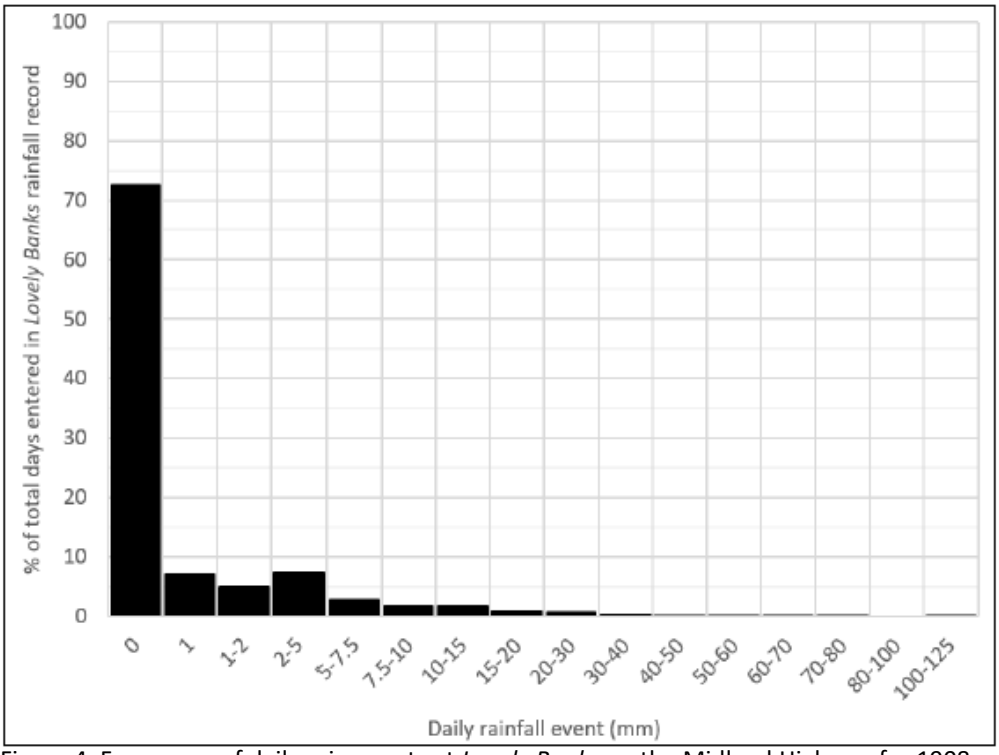

Figure 4. Frequency of daily rain events at *Lovely Banks* on the Midland Highway for 1908 – 2020. Source: Compiled from Bureau of Meteorology rain records for Station 94140 (Lovely Banks)

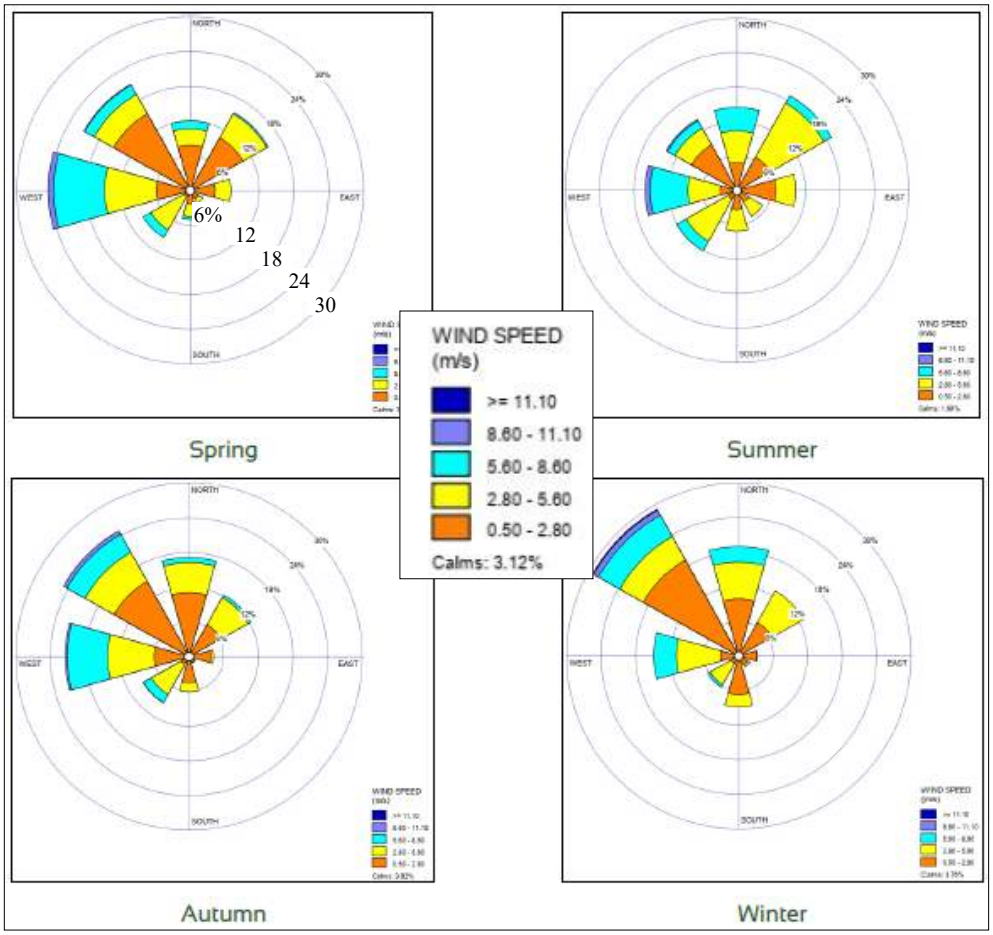

Figure 5. Predicted wind roses by season for the site. Low (<2.8m/s) wind speeds occur 30% of the time in summer, and up to 50% of the time in winter, indicating poor atmospheric dispersion conditions. Source: Adapted from Figure 29 of Appendix 8 of the Environmental Impact Statement.

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4 Technical considerations

4.1 Factors influencing odour impact

The effect of an odour can be described by a combination of its Frequency, Intensity, Duration, Offensiveness and Location (FIDOL):

- Frequency: at low odour concentrations, high frequency is more noticeable,
- Intensity: the strength of the odour, proportional to the log10 of the concentration,
- Duration: the period of time the odour concentration remains above the odour threshold,
- Offensiveness: a combination of its character and how unpleasant (or pleasant) it is, and
- Location: describes the type of land use and human activities in the vicinity of the odour source, with emphasis on sensitive receptors (typically the closest to the odour source)

4.2 The odour pathway

Four factors need to be present for an odour to become a nuisance:

- an odour source,
- the release of the odour to the atmosphere – either by natural causes or mechanical introduction,
- its off-site transport – emissions which leave the facility (and are therefore outside the Operator's control) to nearby properties, and
- odour perception – off-site people judge the odours to be offensive and register a complaint.

If any one or more of these factors is absent, no odour problem exists.

4.3 Odour transport

Odours are low-density gasses transported by wind. Wind produces horizontal movement of humidity, warm air, pollutants and odours, and wind turbulence is responsible for vertical transport. Typically, the concentration of odours leaving a source decreases as distance from the source increases. However, pervasive odours can be detected at considerable distances from a source.

Odours emitted from a source at ground level remain most concentrated during periods of stable air, particularly at night and early morning. During the day, warming of air by the sun increases dispersion and decreases odour concentration.

Windy days disperse odour more rapidly than calm days, but also tend to carry odour further distances.

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5 Odour emissions

5.1 Summary of activities at the facility

The facility will receive a range of Category 1 and 2 solid wastes (Table 2) delivered by covered trucks from different suppliers – mainly from southern Tasmania but also from other parts of the state.

Table 2. Proposed types, sources and quantities of materials to be composted

1	2	3	4	5	6	7	8	9	10	11	12	13
Waste Category	Risk level	Waste type	Examples	Potential sources	Est. annual feedstock weight by example t	Est. annual feedstock weight by type t	Est. annual feedstock weight by type %	Average bulk density t/m3	Est. moisture content %	Est. C:N ratio per example range	Est. C:N ratio per example average	Est. average C:N ratio per type
1	Lowest	Garden and landscaping organics	Grass	Local farms, landscapers, etc	250	1,050	8	0.3	80	10-25	17	40:1
			Leaves		400			0.3	40	40-80	50	
			Plants		200			0.3	15		50	
			Tree trimmings		200			0.8	70		15	
		Untreated timber	Sawdust	Local sawmills	250	500	4	0.25	40	200-750	450	450:1
			Woodchips, shavings		250			0.4	40	450-820		
			Pine bark	Norske Skog	200	200	1	0.4	25	130-1200	500	
		Natural fibrous organics	Hay and harvesting residues	Local farms incl. *The Follies*, *Redside*	2500	2,500	18	0.2	10	15-30		25:1
2	Medium	Municipal-sourced garden and landscaping supplies	Grass	Waste transfer stations at local councils including Kingborough, Hobart, Clarence, Glenorchy, Brighton, Southern Midlands	2500	7,250	52	0.3	80	10-25	17	40:1
			Leaves		2500			0.3	40	40-80	50	
			Plants		1500			0.3	15		50	
			Tree trimmings		750			0.8	70		15	
		Biosolids	Contaminant Grade A or B; Stabilisation Grade A or B	TasWater WWTPs	2000	2,000	14	0.8	70	10:1	10:1	10:1
		Aged manures (moisture <65%)	Cattle manure	Local feedlots	500	500	4	0.8	60	10-30	20:1	20:1
				Total feedstock weight (rounded)		**14,000**	**100**					
				Est. final compost weight (rounded)		**10,000**						

Notes to Columns

1 From Table 4 of EPA Victoria (2017). *Designing, constructing and operating composting facilities*. Publication 1588, EPA Victoria, 1 June 2017
2 Risk level from EPA Victoria (2017) Section 5.1 relates to "potential risk of harm to human health and the environment"
3 Adapted from Table 4 of EPA Victor4ia (2017)
4 Adapted from Table 4 of EPA Victor4ia (2017)
5 Potential sources may be amended from time to time.
6 Weights are rounded. Weight of feedstock by example may change from time to time
The facility is designed to operate without Category 2 biosolids, because their availability is uncertain.
7 Weights are rounded. Weight of feedstock by type may change from time to time. Average weight loss during composting assumed to be 30%.
8 Percentages are rounded.
9-13 Various sources, including:
Cornell Waste Management Institute (https://cwmi.css.cornell.edu/composting.htm)
C:N mix calculator (https://compost.css.cornell.edu/calc/2.html)
Composting Magazin e (https://www.compostmagazine.com/carbon-nitrogen-ratio-tables/)
On-Farm Composting Handbook Appendix A: Table A.1 (https://cwmi.css.cornell.edu/AppendixATable1OFCH.pdf)

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All customers and cartage contractors will be required to phone ahead (ie to make verbal, not electronic, contact) before each delivery to make sure the waste is acceptable material, and the facility is capable of accepting the delivery.

At the facility,

- all vehicles transporting wastes to the facility will be required to stop at the office, so that their loads can be visually checked. Loads with anything other than minimal contamination (e.g., easily removable foreign matter like plastics) will be rejected.
- loads will be received in the mixing area where sufficient amounts of low-odour green wastes are stockpiled, awaiting mixing. Any medium-odour waste will immediately be mixed with high-carbon, low-odour Category 1 feedstock and on the same day moved to the windrows to commence pasteurisation.
- the progressive pasteurisation-to-maturation process (Section 6.3.4) is expected to require nominally 12 windrows (more is added as required), each turned at least three times to achieve internal temperatures of at least 55^0C for three consecutive days before each turn. Maturation is achieved when active composting is completed – indicated by low odour, moisture content typically about 25%, pH in the 5 – 8 range, and a declining trend of peak towards ambient temperature.
- the product is screened to remove oversize, and then stockpiled on site. Stockpiled volumes are kept to a minimum, but there is sufficient area on site for up to 5,000m^3.

These operations are depicted schematically in Figures 6 and 7. The proposed layout of the facility is shown in Figure 8.

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Compost Kings: Flowchart* for feedstock deliveries and mixing activities

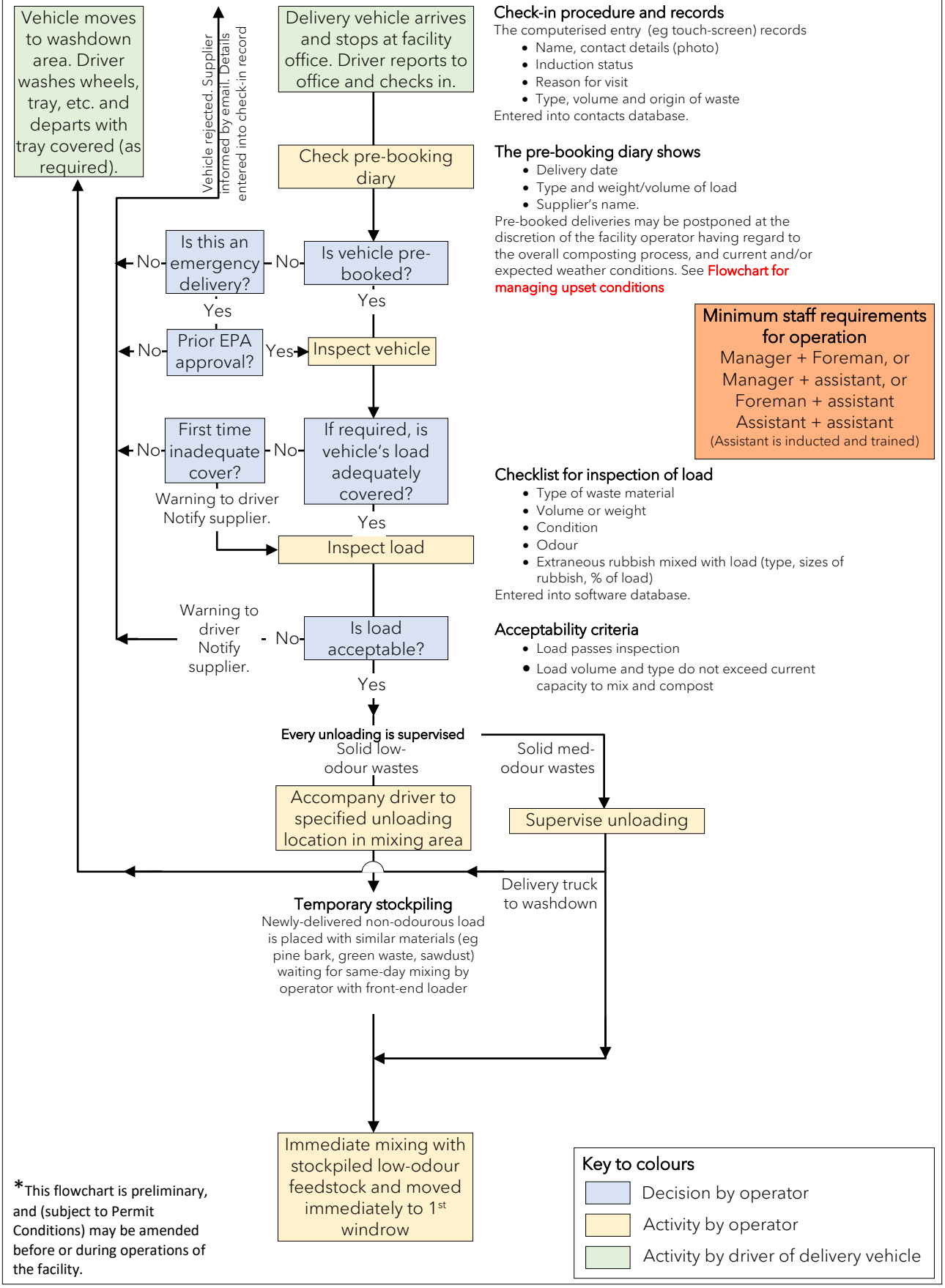

Figure 6. Flowchart for feedstock deliveries and mixing activities.

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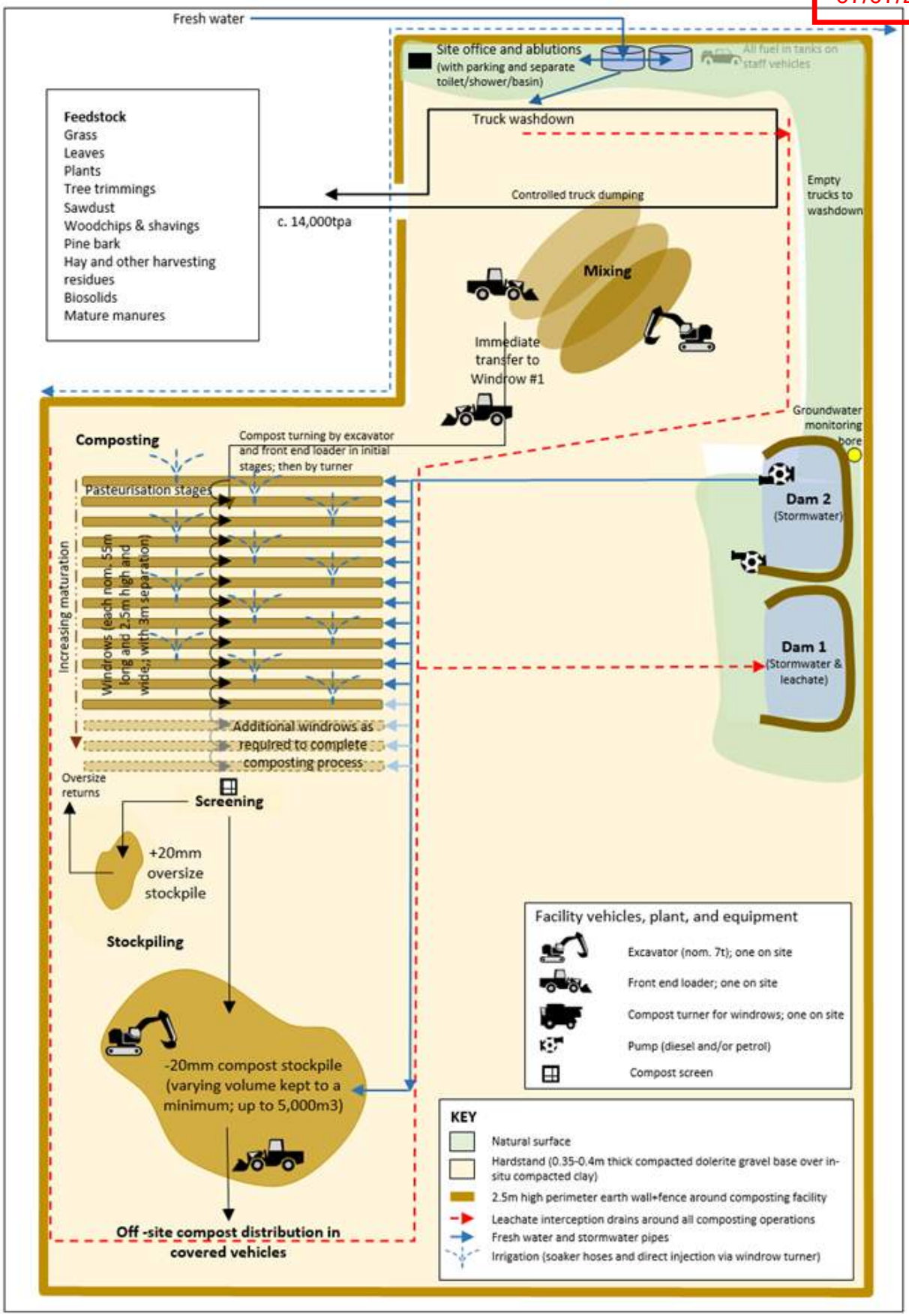

Figure 7. Schematic layout of proposed operations, plant, equipment, materials and vehicles at the composting facility.

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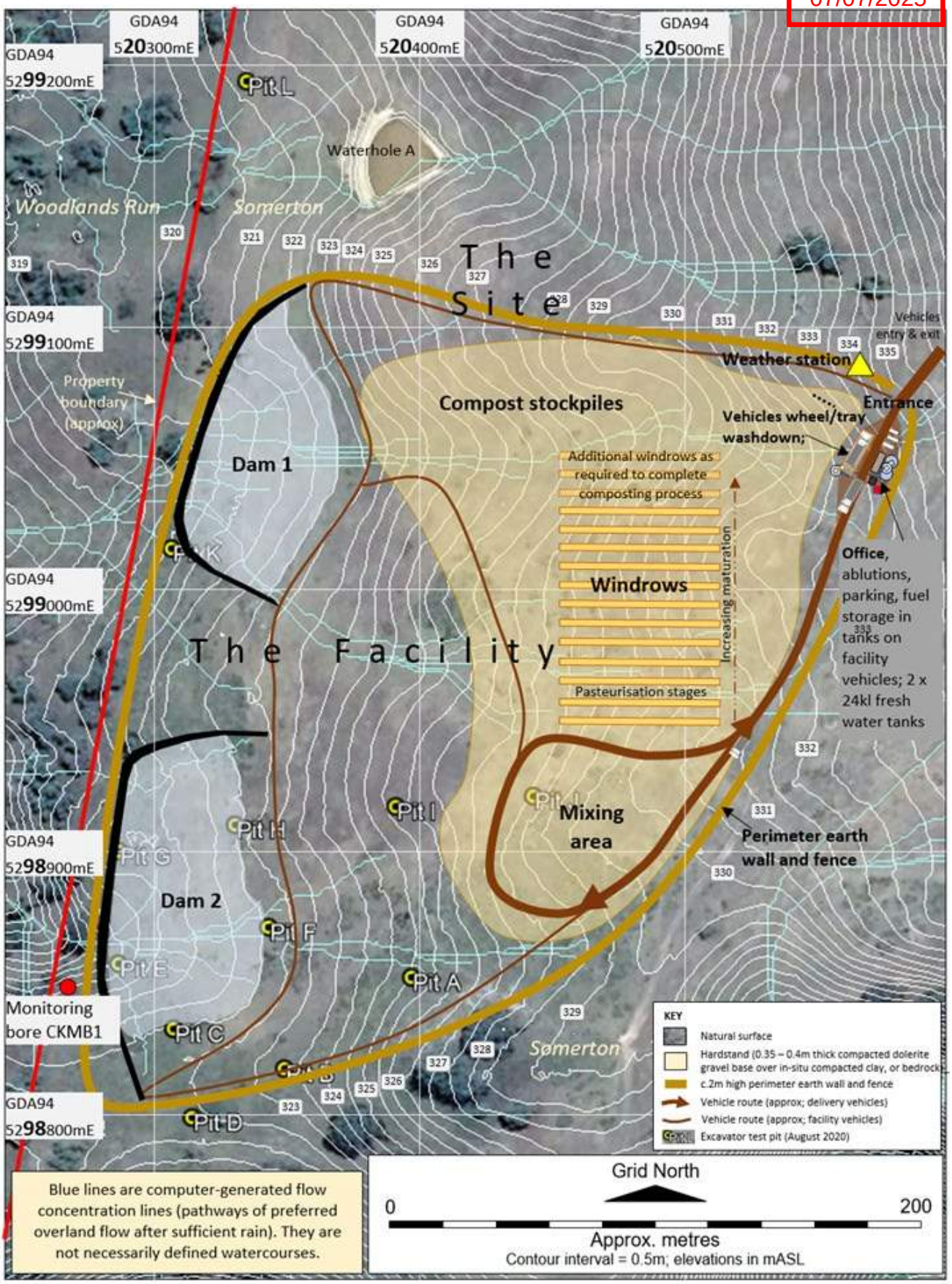

Figure 8. Facility layout.

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5.2 Identification of odourous sources

The potential odour sources (Figure 9) are:

- Waste reception
- Waste mixing
- Vehicle washdown
- Windrows
- Screening of finished compost
- Finished stockpiled compost, and
- Dam 1 (leachate/stormwater), and to a lesser extent Dam 2 (stormwater only)

Some of these odours are continuous, and some are transient (Table 3). The most significant points of odour emissions are the mixing area (unloading and mixing), the moving (by front end loader) of material from the mixing area to the windrows, the vehicle washdown area, and the first few windrows. As composting continues to completion in the windrows, the potential for malevolent odours decreases.

All odour-generating sources are contained within the hardstand area in Figures 8 and 9.

Table 3. Continuous and transient odour sources

Odour source	Continuous or transient
Raw waste unloading	Transient
Raw material stockpiles	Continuous
Mixing area	Continuous
Truck movements (raw material delivery and product pickup)	Transient
Vehicle washdown	Transient
Windrows	Continuous
Windrows (formation and turning)	Transient
Screening and product stockpile	Continuous
Dam 1 (leachate/stormwater)	Continuous

Adapted from Table 5 of Clifton, M. (2024). Odour Impact Assessment: Compost Facility, Melton Mowbray. Project ID: 15578. Report prepared for Compost Kings Tasmania by Assured Environmental, 30 April 2024. Release R1.

5.3 Sensitive receptors

The sensitive receptors closest to the site are seven residences on broad-acre agricultural properties (Figure 10) at distances ranging from 1.27km (*Redside*, to the north) to 5.90km (*Stockman*, to the southwest).

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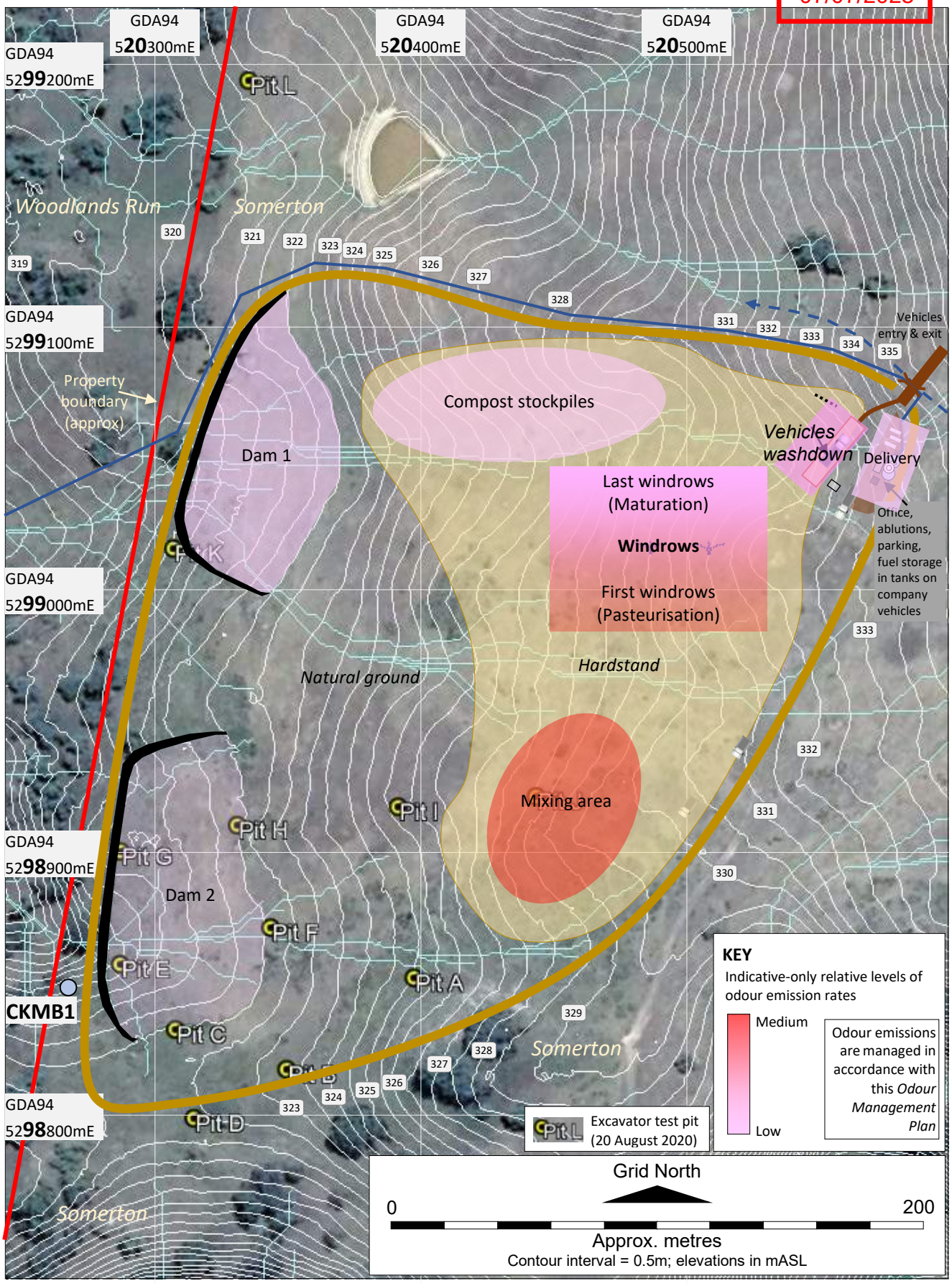

Figure 9. Main sources of odour at the facility.

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5.4 Odour Assessment Report

Compost Kings commissioned Queensland consultants *Assured Environmental* (AE) to prepare an odour assessment report for the proposed facility.

An initial AE report was released on 1 April 2021. Revised versions were issued in September 2021, August 2022, May 2023 and 30 April 2024[4]. The second and third revisions were done to accommodate a proposed increase in area (almost a doubling) of the facility within the site (August 2022), and the fourth (May 2023).addressed EPA comments in relation to odour receptors. The latest revision (Revision R1) addressed a change of feedstock (no high-odour wastes) and is included as Appendix 8 of the Environmental Impact Statement. The reports were done in accordance with EPA (2019a) and EPA (2020), and Air Quality EPP[5].

Dispersion modelling was completed for all the activities identified in Section 5.2 above, for the proposed design in Figures 7 and 8. Conservative odour emission rates were first discussed with EPA.

Odour emissions were derived for normal and worst-case scenarios for 10,000tpa compost production. The modelling shows that:

- normal and upset operations generate odour concentrations which do not comply with the required maximum level of 2 OU at the boundary of the site: the highest predicted 1-hour 99.5th percentile normal and upset concentrations are 46 OU and 85 OU respectively,
- odour generated from normal operations is not expected to be detectable at any of the seven closest receptors: at *Redside*, the closest receptor, the highest predicted 1-hour 99.5th percentile odour level is 0.34 OU (1 OU is typically presumed to be the lower level of detectability),
- during worst-case conditions (Figure 11), the 1-hour 99.5th percentile odour level remains less than 1 OU at all closest receptors (at *Redside* it is predicted to be 0.66 OU.
- mixing (including truck unloading) and window turning are the main activities contributing to odour concentrations under normal and worst-case scenarios, and
- truck deliveries will not cause an odour nuisance because the movements are transient[6].

These modelling results indicate the need for an effective OMP with defined procedures for all activities and conditions.

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[4] Clifton, M. (2024). Odour Impact Assessment: Compost Facility, Melton Mowbray. Project ID: 15578. Report prepared for Compost Kings Tasmania by Assured Environmental, 30 April 2024. Release R1.

[5] EPA (2019). *Guidelines for Preparing an Environmental Impact Statement.* Environment Protection Authority, March 2019.
EPA (2020). *Environmental Impact Statement Project Specific Guidelines For Seaton Waterfield/Compost Kings Composting facility, Lovely Banks Road, Melton Mowbray, Tasmania.* Environment Protection Authority, December 2020.
Environment Protection Policy (Air Quality) 2004. Environment Division, Department of Tourism, Arts and the Environment, Tasmania.

[6] All delivery trucks will have covered trays on all roads and to the facility, and trays will be covered again for empty loads on and after departure.

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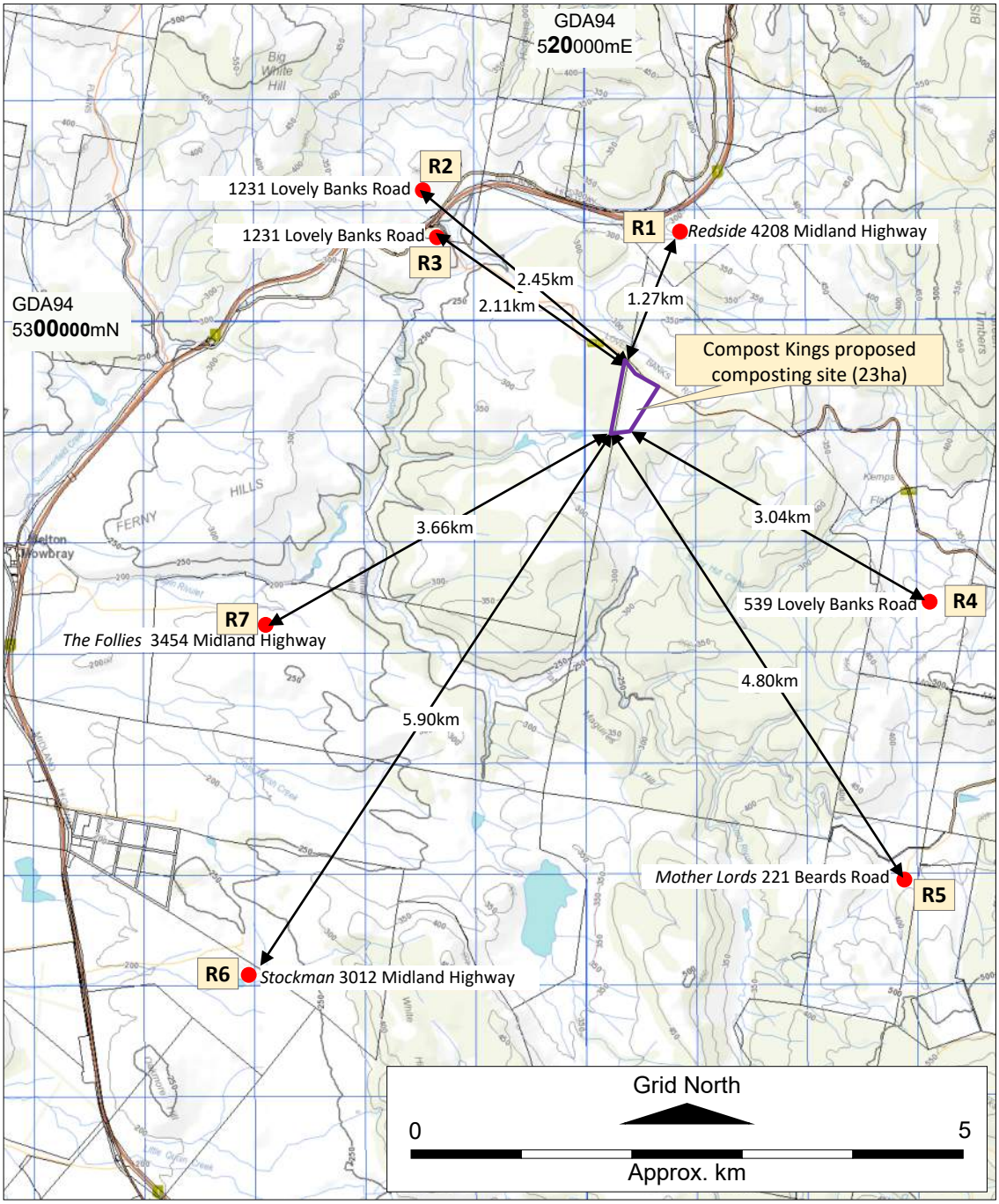

Figure 10. The seven residences closest to the site.
Source for base map: www.thelist.tas.gov.au

5.5 Minimisation of odours

5.5.1 Hierarchy of controls

In the management hierarchy of air emission controls *Avoid* (most effective) – *Recycle* – *Minimise* – *Manage* (least effective), the composting facility will have the following controls:

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- Avoid and minimise
  - locked access gates when the facility is unattended, to prevent unwanted dumping of wastes;
  - no contractual obligation to accept any waste,
  - waste deliveries refused if they are unable to be satisfactorily treated at the facility,
  - unacceptable wastes (e.g., too contaminated) refused.
- Recycle The whole process of receiving and beneficially composting wastes is recycling.
- Manage This OMP and operating procedures are management controls used to ensure the facility operates efficiently as possible.

5.5.2 Best Practice Procedures and Controls

Best Practice procedures and controls are discussed in Section 6.3.

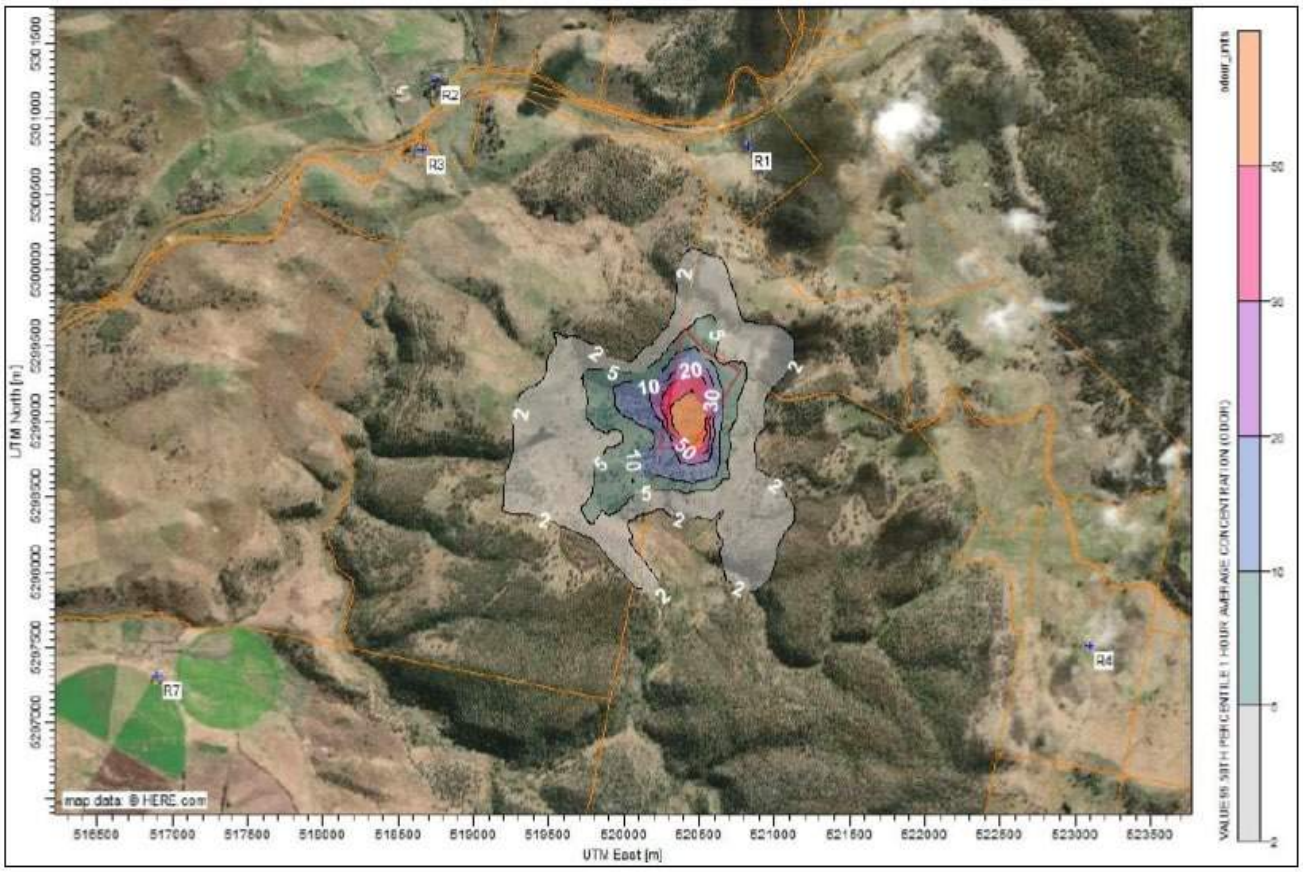

Figure 11. Predicted 1-hour 99.5th percentile ground level odour contours during upset conditions for cumulative activities. Source: Figure 20 of the Odour Assessment Report (Appendix 8).

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6 Management Procedures

6.1 Monitoring of emissions

Daily visual and "sniff-test" inspections of the facility and its perimeter will be carried out using an Inspection Checklist, updated daily to record:

- any spills of waste or compost and their removal,
- any ponded leachate, directed to Dam 1,
- any instances of uncovered odourous waste in the mixing area, immediately covered with low-odour waste, and
- instrument monitoring recording temperatures and moisture contents of mixing stockpiles and windrows.

6.2 Performance indicators

Minimising odour generation is dependent on maintaining efficient operations at the facility. The performance indicators of unnecessary odour generation will be:

- identification by personnel of on-site odour, originating from non-compliant uncovered delivery trucks, the mixing area and windrows, vehicle washdown area, dams, and accidental spillages, and
- excessive temperatures and/or moisture contents which are too low or too high, of the mixing stockpiles or windrows.

6.3 Best Practice Odour Management Procedures

6.3.1 Management strategies for normal and upset conditions

Normal conditions are the day-to-day operations of receiving, mixing and composting wastes. Associated activities include monitoring and managing C:N ratios, moisture levels and temperatures in stockpiles and windrows, and dam water levels.

Upset (including unexpected) conditions prevail when normal activities are disrupted. They may be caused by:

- lack of water for composting,
- inadequate or no supply of low-odour wastes to mix with on-site medium-odour wastes,
- meteorological conditions (e.g., adverse winds, high rainfall events, high temperatures),
- bushfire risk,
- excessive water levels in dams,
- plant and equipment breakdown,
- downtime of computerised management system (eg Compost Manager or similar)
- staffing issues, and
- unforeseen circumstances.

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Odour management procedures for the odour sources identified in Section 5.2 are schematically depicted in Figure 12, and are summarised in Table 4.

The flowchart in Figure 14 sets out operational procedures to manage odour generation and its off-site effects under normal and upset conditions..

Instructions for on-site personnel to manage normal and triggered upset events are listed in Tables 5 – 10. These instructions form part of the day-to-day operation manual for the facility.

During normal and upset conditions, in order to maintain efficient operation of the facility, (including the minimisation and control of odour), management will be assisted by:

- an on-site weather station recording wind speed and direction, rain, temperature, pressure, humidity, etc,
- continuous digital recording of water levels in Dams 1 and 2,
- flow meters on water lines to record pumped water flows from Dam 2 for irrigation of stockpiles and windrows, and
- the use of proprietary software (eg Compost Manager) which includes:
    - field measurement equipment of composting operations (pH, humidity, temperature, O_2 and CO_2),
    - computer (including cloud-based) storage of records, and
    - real-time guidance on optimum moisture and temperature of stockpiles, and as a result, better control of odours and their generation[7].

During upset conditions, when the facility may be closed for waste deliveries, the manager and/or the foreman will be present at all times, including weekends.

Off-site odour effects from normal and upset conditions

If during normal or upset conditions off-site odour impacts are suspected of occurring, or have been reported as occurring, facility personnel will do all or some of the following:

- determine the source and extent of the odour issue (one or more specific areas within the mixing area and windrows may be generating the most pronounced odour),
- if the odour is from spillages, immediately clean up and combine the spillage with low-odour material in the mixing area,
- if the odour source is medium-odour feedstock in the mixing area (combined or not with other feedstock), immediately cover and/or combine it with low-odour material,
- if the odour source is from one or more windrows or product stockpiles, carry out one or more of the activities in Section 6.3.4,
- contact neighbours potentially or actually affected by the odour, explain the management activities being done, and maintain open communication with them,
- ensure compliance with local regulations and permit requirements related to odour emissions from composting; liaise with and report incident(s) to regulators, and

[7] Weather station records and dam water levels will be stored on and available via a GIS-centric cloud-based platform to allow remote wireless review by permitted users. Decisions related to operation and/or weather-dependent closure of the facility will be able to be made on-site or off-site and in a timely fashion.

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- be proactive in odour management: continuously evaluate and improve operational practices. Incorporate feedback from odour monitoring efforts and stakeholders to refine mitigation strategies

6.3.2 Waste reception

All vehicles transporting wastes to the facility will be required to stop at the office, so that their loads can be visually checked, and details entered into a Deliveries Inventory.

Waste delivery on roads is at low risk of odour generation because of its transient nature, and because all vehicles carrying waste will be required to have their loads covered from source to destination, and on the return journey when empty.

Based on visual inspection, loads may not meet waste acceptance criteria:

- loads arriving uncovered will be rejected, and
- anything other than minimal contamination (e.g., easily removable foreign matter like plastics) will be rejected as not meeting waste acceptance criteria.

From the facility office and load checking area, all loads are directed to the waste mixing area.

6.3.3 Mixing area

The facility Manager, Foreman or other responsible person will supervise the unloading of every waste delivery[8].

The mixing area (Figures 12 and 13) is at a relatively high risk of generating odour. It will:

- be kept supplied with sufficient feedstock of Category 1 low-odour, high-carbon waste to enable mixing to achieve suitable C:N ratios for composting, and
- maintain on site a reserve of high-carbon low odour feedstock of at least 10% of weekly intake by weight to enable sufficient material to be continuously available for mixing with or capping odorous windrows.

Mixing feedstock in the optimum weight proportions for composting will be the responsibility of and directed by the Manager or Foreman. On the mixing pad, the process will be volumetric, using the front end loader and/or excavator to combine different numbers of bucket loads of various feedstocks. The number of bucket loads required of each will be provided in real time from the operator's on-site laptop computer[9]. All mix details (feedstock type, amounts, and resulting ratios) will be entered into the laptop for future reference.

After calculating the number of bucket loads required for the target C:N ratio of a mix, the front end loader or excavator will be used to:

- Load the required number of buckets of each feedstock into the mixing area.
- Mix thoroughly by layering the materials and repeatedly turning them over.

[8] During all opening hours, the facility will be operated by at least two responsible people who have been inducted and trained in all operations: Manager + Foreman, or Manager + assistant, or Foreman + assistant, or (rarely) 2 x assistants.

[9] The information needed to achieve a target C:N ratio in the final mix includes the volume of the bucket, the bulk density of each feedstock, the C:N ratio of each feedstock, and the carbon and nitrogen content as a percentage by weight in each feedstock. All these will be obtained from the Compost Kings Inventory of feedstock properties, which will be continually upgraded as fresh data become available.

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- Continue mixing for an even, consistent mix.

The operator will also visually inspect the mix for uniformity—no clumps of one material should dominate. Adjustments to the mix will be made as required: eg adding more nitrogen-rich feedstock like grass clippings or more carbon-rich feedstock like sawdust or wood chips.

These activities in the mixing area are conceptually shown in Figure 10. Incoming medium-odour biosolids will not be stockpiled, but will be immediately mixed with high-carbon, low-odour feedstock and on the same day moved to the windrows to commence pasteurisation.

6.3.4 Windrows

Windrows are at high risk of generating odour. The control of moisture content and temperature mitigates the risks, and these and other parameters will be monitored daily in each windrow.

Composting windrows will be aligned in parallel rows up-and-down the slope, each separated by several metres to allow access for plant and equipment (Figure 12). Rows are of increasing compost-age from the first (fresh from the mixing area, undergoing pasteurisation) to last (matured, and ready for screening and stockpiling).

Material at the end of the windrowing stage has completed active composting and is stable with a lower odour potential. Moisture levels decrease, and temperatures slowly decrease to ambient levels.

Timeframes and temperatures for pasteurisation and maturation

Compost Kings' experience of windrowing in Tasmanian conditions indicates that the timeframe for pasteurisation to maturation is typically about 12 weeks, but may vary depending mainly on feedstock composition and weather conditions. A general overview of the typical timeframes for these stages is:

- **Pasteurization stage**:
  - Duration: 1 to 2 weeks
  - Temperature range: 55°C to 65°C
  - Odour levels increasing
  - temperature and microbial activity increase; pathogens, weed seeds, etc. killed
- **Active Composting stage**:
  - Duration: 2 to 4 weeks
  - Temperature range: 55°C to 65°C
  - Odour levels potentially highest
  - continued microbial activity and decomposition of organic materials; temperatures remain elevated; regular turning and aeration required
- **Maturation (and curing[10]) stage**:
  - Duration: 6 to 10 weeks
  - Odour levels decreasing
  - Temperature range: Gradually decreases from 55°C to ambient temperature
  - Temperature and microbial activity gradually decrease; compost undergoes slowing decomposition and tends towards stability – shown by monitoring of temperature, moisture levels, pH, O_2, CO_2.

[10] Curing is the gradual and final stage of maturation, during which active composting has stopped but further stabilisation and decomposition continue with decreasing microbial activity.

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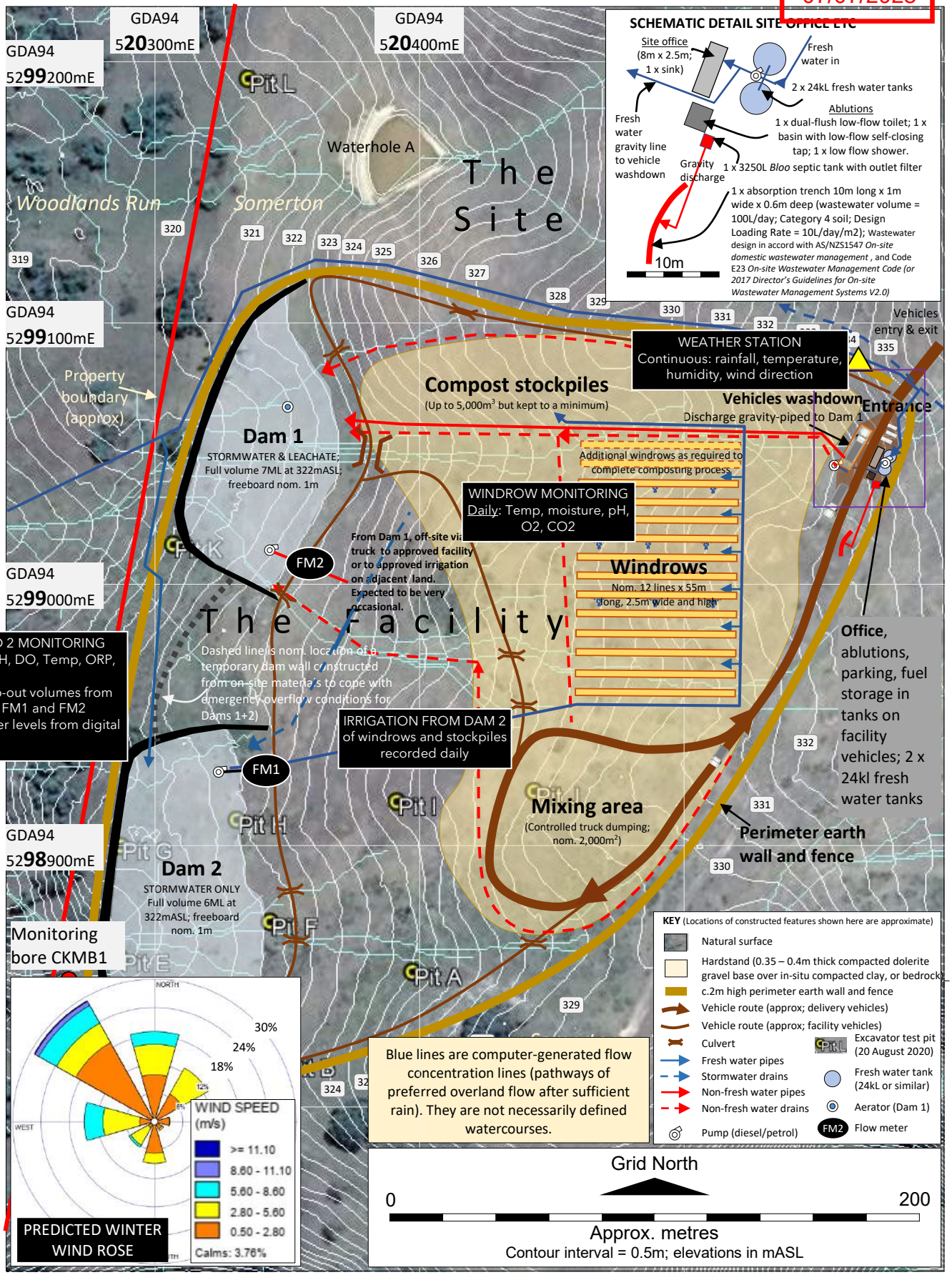

Figure 12. Schematic layout of the facility showing management strategies for odour control.
Source for base map: www.thelist.tas.gov.au

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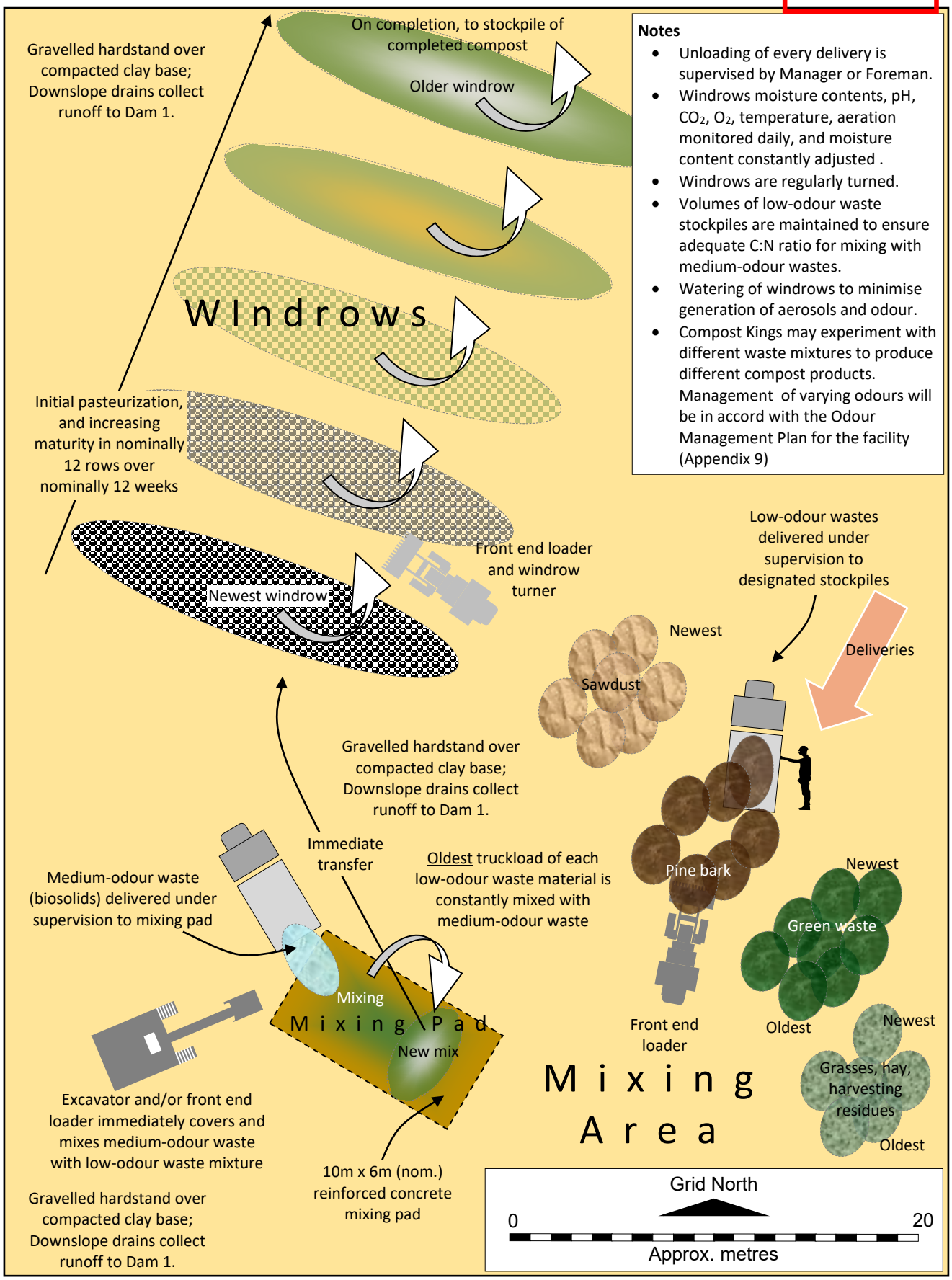

Figure 13. Proposed activities in the mixing area before windrowing.

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Table 4. Best Practice Odour Management Controls proposed at the facility

Aspect		Hierarchy of Controls	Controls
Arrangements with suppliers, and access to facility	1a	Avoid, minimise	Only approved suppliers permitted to deliver wastes. No contractual arrangements for on-going acceptance of waste types or volumes. Approved suppliers have agreed in writing to (a) verbally pre-book and receive approval for each waste load before leaving source, (b) supply only weed- and FOGO-free waste, and deliver wastes only in appropriately covered vehicles.
	1b		At the verbal pre-booking stage, the site operator refuses delivery if the waste type or volume cannot be accepted at the facility and dealt with appropriately.
	1c		The main access gate on Lovely Banks Road, and the internal gate to the facility, will both be locked at all times (i.e., after hours, at weekends and public holidays) unless the site operator or other staff are in attendance to receive wastes. The gates will also be locked during upset conditions.
Waste reception	2a	Avoid	All incoming waste vehicles stopped at facility office; uncovered loads refused entry and suppliers notified. All loads checked for contamination status. Hand-picked contaminants separately stored in dedicated, enclosed container and removed as required off-site to approved facility. Loads with unacceptably high contamination levels refused entry.
	2b	Manage	All accepted loads entered into daily Wastes Received Record.
	2c		Wastes directed to mixing area.
Mixing	3a	Manage	Solid wastes segregated by type: low-odour high-carbon solid wastes to separate stockpiles (i.e., green waste, sawdust, bark to separate piles); medium-odour low-carbon putrescible solids to be immediately mixed and covered with low-odour wastes. Regular checks of stockpiles for moisture, pH, O2 and CO2 to optimise composting rates and reduce odour; regular turning as required.
	3b		Moving mixed wastes to the windrows is done via front end loader. Solid spillages will occur. The track of the loader shall be as constant as possible, to avoid spreading spillages over the hardstand; all spillages shall be removed to the windrows immediately the transfer of materials is complete.
Windrows	4	Manage	Regular checks of windrows for moisture, pH, O_2 and CO_2 to optimise composting rates and reduce odour; irrigation and turning is done as required.
Compost stockpile	5	Manage	Regular checks of stockpile for moisture, pH, O_2 and CO_2 to optimise composting rates and reduce odour; irrigation is done as required.
General	6a	Manage	Daily visual and sniff-testing of facility perimeter and internal areas; clean-up of any areas of spilt waste or compost; enter monitoring results into daily Inspection Checklist.
	6b		Continuous records from on-site weather station (rain, temperature, humidity, wind speed and direction), and dam water levels; record daily flow meter readings of water pumped from dams.

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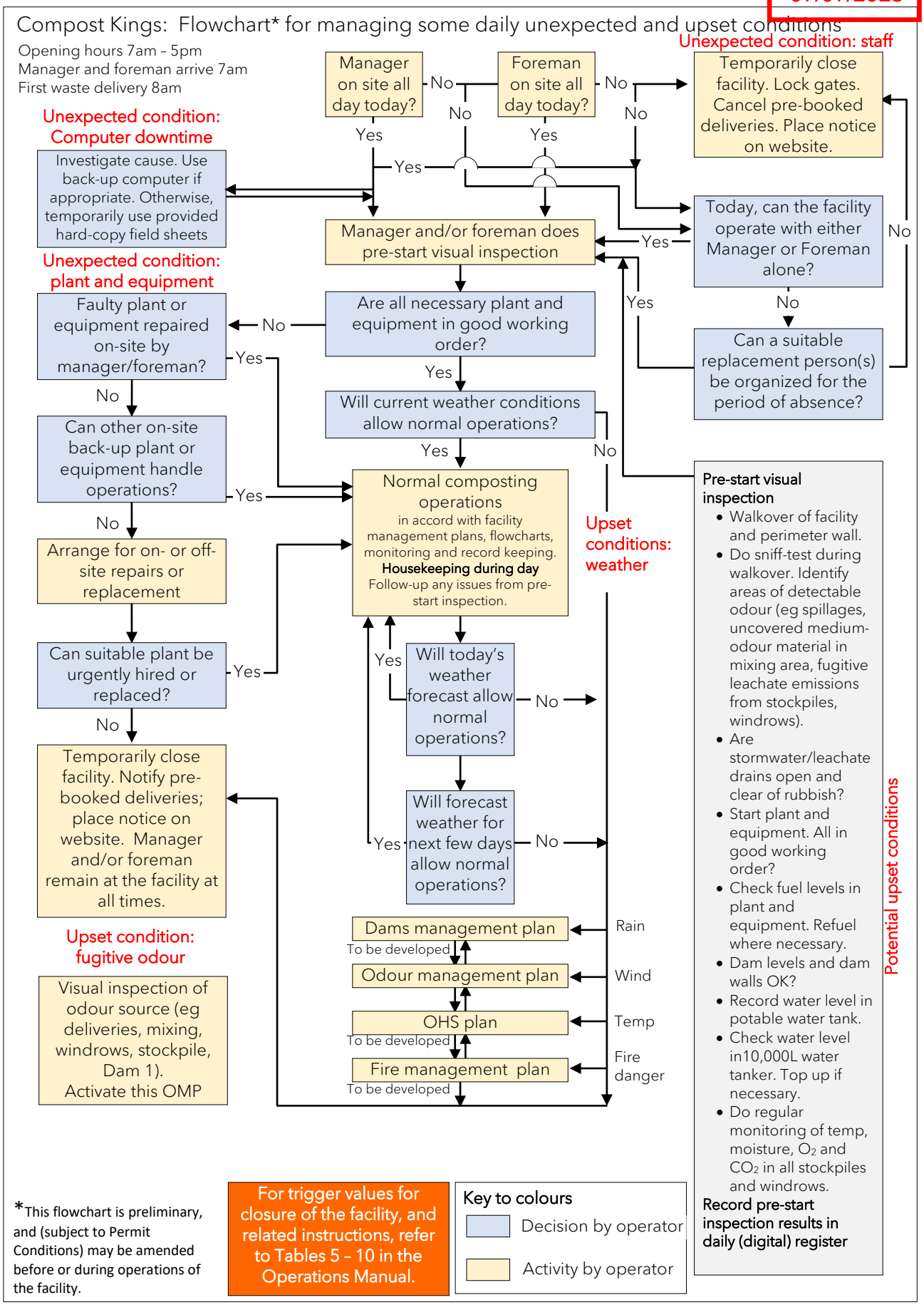

Figure 14. Flowchart for managing upset (including unexpected) conditions at the facility.

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Anaerobic conditions in windrows

In the event that one or more windrows (or medium-odour waste deliveries in the mixing area) is generating odour and is suspected of being anaerobic (lack of microbial activity; excessive wetness), facility staff will do one or more of the following:

- aerate the windrow by turning, and if there is room available, consider dividing larger than average ones into smaller ones,
- check moisture levels, and if required, add dry bulking agents like woodchips, hay, etc from the stockpiles in the mixing area ,to assist in air circulation and help adjust C:N ratios,
- monitor the internal temperature of the windrows to ensure they remain within the optimal range for decomposition,
- add compost activators or inoculants containing aerobic bacteria and fungi, and
- continuously monitor the composting process.

6.3.5 Compost screening

This activity located after the windrow area is at relatively low risk of odour generation because the final windrow is matured product of low odour.

Oversize from screening is either returned to the mixing area, or into the first windrows.

6.3.6 Compost stockpiling

The volume and area of completed compost stockpiled on site will be kept to a minimum, but provision is made to store up to about 5,000m^3 waiting for off-site transport. This activity located after the screening area is also at low risk of odour generation because the finished product is of low odour.

6.3.7 Dams 1 and 2

In this low-rainfall district where annual evaporation exceeds annual rain, and daily evaporation[11] exceeds most recorded daily rain events, compost generation will operate under moisture deficits most of the time. Accordingly, moisture addition to stockpiles and windrows will be required most days, and it is not anticipated that normal operations will generate excess liquid waste which by itself would report to Dam 1 only (Figure 12). However, a small proportion of rain events will be of sufficient intensity and/or duration to produce runoff which has the potential to also mix with and transport liquids leached from stockpiles and windrows. At times, therefore, Dam 1(only) will receive potentially odiferous liquids. Left unmanaged, the organic content and odour risk of the dam will increase, and present an increasing risk of odour.

Management of dam water odour, quality and levels will be a daily occurrence, including any combinations of:

[11] Since 1904, about 72% of days have been rain-free, and another 12% received no more than 2mm of rain. Daily evaporation ranges from about 0.5mm in winter, up to about 8 – 10mm in summer. About 97% of days received less than 10mm rain.

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- aeration of Dam 1 with a floating or submerged aerator,
- topping up low Dam 2 levels with fresh water[12], and
- off-site removal of Dam 1 water to irrigation on adjacent land under an approved management plan.

As a contingency plan, Compost Kings will also explore the feasibility of using proprietary odour neutralisers to manage dam odour.

6.4 Responsibilities

Responsibility for all operations at the facility and site rests with Compost Kings as facility Operator.

Mr. Seaton Waterfield will be Compost Kings' Facility Manager.

A Facility Foreman will be appointed.

The Manager will ensure that the Foreman and any other staff are aware of this OMP, and are able at all times to fulfil their obligations to it. The obligations include taking any necessary corrective measures to ensure the Best Practice Odour Management procedures set out in Section 6.3 are being observed at all times.

The Facility Manager is responsible for investigating any odour complaints and incidents, and to work with the Facility Foreman to ensure any necessary corrective actions are taken.

6.5 Complaints procedures

If a complaint is received from a sensitive receptor whose residence is affected by odour originating from the facility[13], the Facility Manager will ensure:

- the complaint details are recorded in an Odour Complaint Form,
- the complaint is investigated, and excessive off-site effects are verified (this would include a visit to the complainant's residence to assess the odour level),
- corrective measures, including modifications of any operational methods, are implemented to avoid recurrence and/or minimise ongoing odour effects,
- monitoring and other investigations are completed to assess the effectiveness of the corrective measures,
- the complainant is notified of the actions taken,
- operations are continued to be monitored for the specific odour incident, and
- the need to modify this OMP is reviewed.

[12] Fresh water is pumped to the facility from off-site sources for use for vehicle washdown, dam top up, staff ablutions and drinking, and irrigation of stockpiles, windrows and pasture.

[13] The residence at *Redside* is the closest to the facility, and according to the Assured Environmental odour report it will not be affected by detectable odour during normal and upset conditions. The occupant at the residence, and owner of *Redside* and *Somerton*, is Mr. R. Jones. In November 2022, Mr. Jones stated in writing to Compost Kings that (a) he supports the proposed composting operations, (b) is aware that the house at *Redside* probably won't but might sometimes be affected by odour, and (c) if this happens, he will contact Compost Kings directly for a response to the issue.

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6.6 Training and awareness

Training and awareness of staff, and visitors to the facility, is an important part of this OMP. Visitors include drivers of vehicles delivering wastes, and subcontractors.

All these people have environmental management responsibilities. Their awareness of this will be done by inductions, each valid for 12 months (or less if operations change) and each recorded. The inductions will cover:

- the general operations of the facility,
- the significance of potential environmental impacts (including off-site odour),
- the importance of conforming with environmental policy and procedures to mitigate potential off-site environmental effects,
- the role and environmental responsibilities of the inductee to help achieve conformance with environmental policy, and
- the consequences of departure from specified operation procedures.

6.7 Review of this OMP

The Facility Manager will ensure this OMP is reviewed and if necessary revised annually, or more frequently whenever:

- there is a significant change to operations at the facility,
- there is a significant incident or breach,
- there is a change in applicable regulatory requirements or
- otherwise requested

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Table 5. Operating instructions for normal and upset rain conditions. Rain is recorded directly from the on-site weather station.

This Table will form part of the daily operations manual for all personnel at the facility.

RAIN

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	Forecast rain up to 20mm (average occurrence 3-4 days per year)	Forecast rain up to 30mm (average occurrence once a year)	Forecast rain up to 50mm (average occurrence once every five years)	Forecast rain >50mm
Action today	NORMAL OPERATIONS Compare current Dam 1 and 2 levels (ie volumes) to those predicted by WBM-V6[1] for this rain event. If new levels exceed trigger levels set in *Water balance input table* in WBM-V6, pump out dams1 and/or 2[2] as required (eg bring forward planned windrow irrigation with soaker hose or windrow turner, and consider irrigating (after approval) on adjacent land. . Operate facility in accord with OMP[3] and all other procedures.		UPSET CONDITION As for Columns 1 and 2. Cancel pre-booked deliveries of all medium-odour wastes. Consider closing facility and site.	UPSET CONDITION As for columns 1 and 2. Close facility and site. Insert closure time and expected re-opening time on website; notify today's pre-booked suppliers by email and/or text. Min. responsible staff[4] remain at facility.
Next few days including today	Forecast rain up to 50mm	Forecast rain up to 75mm	Forecast rain up to 100mm	Forecast rain >=100mm
Action today and next few days	NORMAL OPERATIONS Compare current Dam 1 and 2 levels (ie volumes) to those predicted by WBM-V6 for this rain event. If new levels exceed trigger levels set in ***Water balance input table*** in WBM-V6, instigate off-site water disposal plan (as above) and pump out dams as required.	NORMAL OPERATIONS As for Column 1. Cancel all pre-booked deliveries of medium-odour waste. Limit machine movements.	UPSET CONDITION As for Columns 1 and 2. Cancel all pre-booked deliveries of medium-odour waste. Minimise machine movement. Consider closing facility and site.	UPSET CONDITION As for columns 1 and 2. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Min. responsible staff[4] remain at facility.

1 WBM-V6 = Water Balance Model (Interactive spreadsheet V6 dated 24 February 2024)

2 Dams 1 and 2 have been sized to accept at least several 5%AEP rain events when water levels are maintained (after daily inspection) less than the trigger level. Pump-out ought not be normally required.

3 OMP = Odour Management Plan

4 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

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Table 6. Operating instructions for normal and upset temperature conditions. Temperature is recorded directly from the on-site weather station.
This Table will form part of the daily operations manual for all personnel at the facility.

TEMPERATURE (https://www.safeworkaustralia.gov.au/resource/managing-risks-working-hot-conditions-guide-employers)

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	WBGT[1]<22^{0}C (nom. air temp <c. 24 – 27^{0}C)	WBGT<25^{0}C (nom. air temp 27 – 30^{0}C)	WBGT<28^{0}C (nom. air temp 32 – 35^{0}C)	WBGT>=28^{0}C (nom. air temp >=35^{0}C)
Action today	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP, OHS[2] management plan, and all other procedures.		UPSET CONDITION Instigate heat management plan for facility personnel. As for Columns 1 and 2. Cancel pre-booked deliveries of all medium-odour wastes. Consider closing facility and site.	UPSET CONDITION As for columns 1 and 2. Instigate heat management plan for facility personnel. Stop all non-essential machine use. Close facility and site but consider accepting emergency deliveries which require no machine use. Insert closure time and expected re-opening time on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[3] remain at facility.
Next few days including today	WBGT[1]<22^{0}C (nom. air temp <c. 24 – 27^{0}C)	WBGT<25^{0}C (nom. air temp 27 – 30^{0}C)	WBGT<28^{0}C (nom. air temp 32 – 35^{0}C)	WBGT>=28^{0}C (nom. air temp >=35^{0}C)
Action today and next few days	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP, OHS management plan, and all other procedures.	UPSET CONDITION Instigate heat management plan for facility personnel. As for Column 1. Cancel pre-booked deliveries of all medium-odour wastes. Consider closing facility and site.	UPSET CONDITION Instigate heat management plan for facility personnel. As for columns 1 and 2. Stop all non-essential machine use. Close facility and site but consider accepting emergency deliveries which require no machine use. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[3] remain at facility.	

1 WBGT = wet bulb globe temperature (combines temperature, humidity and radiant heat); measured on site by portable meter. Digital alarm set to WBGT>=28^{0}C.

2 OHS = Occupational Health and Safety

3 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

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Table 7. Operating instructions for normal and upset wind conditions. Temperature is recorded directly from the on-site weather station.
This Table will form part of the daily operations manual for all personnel at the facility.

WIND [Low wind trigger of 2m/s from Odour Assessment Report (Appendix 8) amended to 3m/s]

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	Up to 11m/s (40km/h) from any direction	Up to 14m/s (50km/h) from any direction	Up to 17m/s (60km/h) from any direction, or 3 – 6m/s from SSE – SSW quadrant	<3m/s from SSE – SSW quadrant, or >17m/s (60 km/h)[2] from any direction
Action today	NORMAL OPERATIONS Ensure OMP[1] (including appropriate housekeeping) is operating, and check that all medium-odour wastes (eg mixtures on mixing pad) are covered with low-odour material.			UPSET CONDITION As for Columns 1, 2 and 3. Close facility and site. Notify all pre-booked suppliers. Insert closure time and expected re-opening time on website. Visit or contact closest receptors to assess odour detectability. Min. responsible staff[3] remain at facility.
Next few days including today	>9m/s from any direction	>6m/s from any direction	3 – 6m/s from SSE – SSW quadrant	<3m/s from SSE – SSW quadrant, or >17m/s (60 km/h) from any direction
Action today and next few days	NORMAL OPERATIONS Ensure OMP (including appropriate housekeeping) is operating, and check that all medium-odour mixtures on mixing pad are covered with low-odour material.		UPSET CONDITION As for Columns 1 and 2. Consider cancelling all deliveries of pre-booked medium-odour wastes. Visit or contact closest receptors to assess odour detectability.	UPSET CONDITION As for Columns 1 and 2. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Min. responsible staff[3] remain at facility. Visit or contact closest receptors to assess odour detectability.

1 OMP = Odour Management Plan

2 McRobies Gully tip is required to stop operations and close to the public if wind speeds reach or exceed 60km/h. *McRobies Gully Waste Management Centre Environmental Management Plan (EMP) 2020-2030*. The weather station wind speed and direction alarm will be set to >17m/s for all winds, and <3m/s from SSW – SSE quadrant.

3 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

Table 8. Operating instructions for fire danger ratings
This Table will form part of the daily operations manual for all personnel at the facility.

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FIRE DANGER RATING (Midlands District; at https://www.fire.tas.gov.au/fire-danger-rating/summary/)

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	NO RATING	MODERATE	HIGH	EXTREME to CATASTROPHIC
Action today	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP and all other procedures. Ensure 10,000L water tanker is full and fuelled, and pumps on dams are fuelled and operate.		UPSET CONDITION As for Columns 1 and 2. Monitor fire danger ratings. Liaise with local fire service. Activate Bushfire Management Plan. Obey fire restrictions. If fire rating is increasing, consider closure of facility and site. Manager and/or foreman remain at facility.	UPSET CONDITION As for columns 1 and 2. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[1] remain at facility.
Next few days including today	NO RATING	MODERATE	HIGH	EXTREME to CATASTROPHIC
Action today and next few days	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP and all other procedures. Ensure 10,000L water tanker is full and fuelled, and pumps on dams are fuelled and operate.	UPSET CONDITION As for Column 1. Monitor fire danger ratings at https://www.fire.tas.gov.au/fire-danger-rating/summary/ Liaise with local fire service. Activate Bushfire Management Plan. Obey fire restrictions. If fire rating is increasing, consider closure of facility and site. Min. responsible staff[1] remain at facility.		UPSET CONDITION As for columns 2 and 3. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[1] remain at facility.

1 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

Table 9. Operating instructions for upset staff situations
This Table will form part of the daily operations manual for all personnel at the facility.

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STAFF

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	Manager and foreman present	Manager or foreman + at least one responsible staff present		Manager and foreman absent
Action today	NORMAL OPERATIONS Operate in accord with usual protocols and procedures	UPSET CONDITION Back-up inducted and trained personnel available and attend facility. Facility otherwise operates in accord with usual protocols and procedures		UPSET CONDITION Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Organise emergency personnel to manage facility and site.
Next few days including today	Manager and foreman present	Manager or foreman + at least one responsible staff present		Manager and foreman absent
Action today and next few days	NORMAL OPERATIONS As above	UPSET CONDITION As above		UPSET CONDITION As above

PLANT & EQUIPMENT

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	All essential plant & equipment operating	Faulty essential plant and/or equipment replaced or repaired same day on site	Faulty essential plant and/or equipment cannot be replaced or repaired same day	Faulty essential plant and/or equipment cannot be replaced or repaired
Action today	NORMAL OPERATIONS Operate in accord with usual protocols and procedures		UPSET CONDITION Consider closing facility and site. Otherwise, limit volumes and types of waste deliveries depending on capability of equipment.	UPSET CONDITION Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Min. responsible staff[1] remain at facility.
Next few days including today	All essential plant & equipment operating	Faulty essential plant and/or equipment replaced or repaired same day on site	Faulty essential plant and/or equipment cannot be replaced or repaired same day	Faulty essential plant and/or equipment cannot be replaced or repaired
Action today and next few days	NORMAL OPERATIONS As above		UPSET CONDITION As above	

1 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

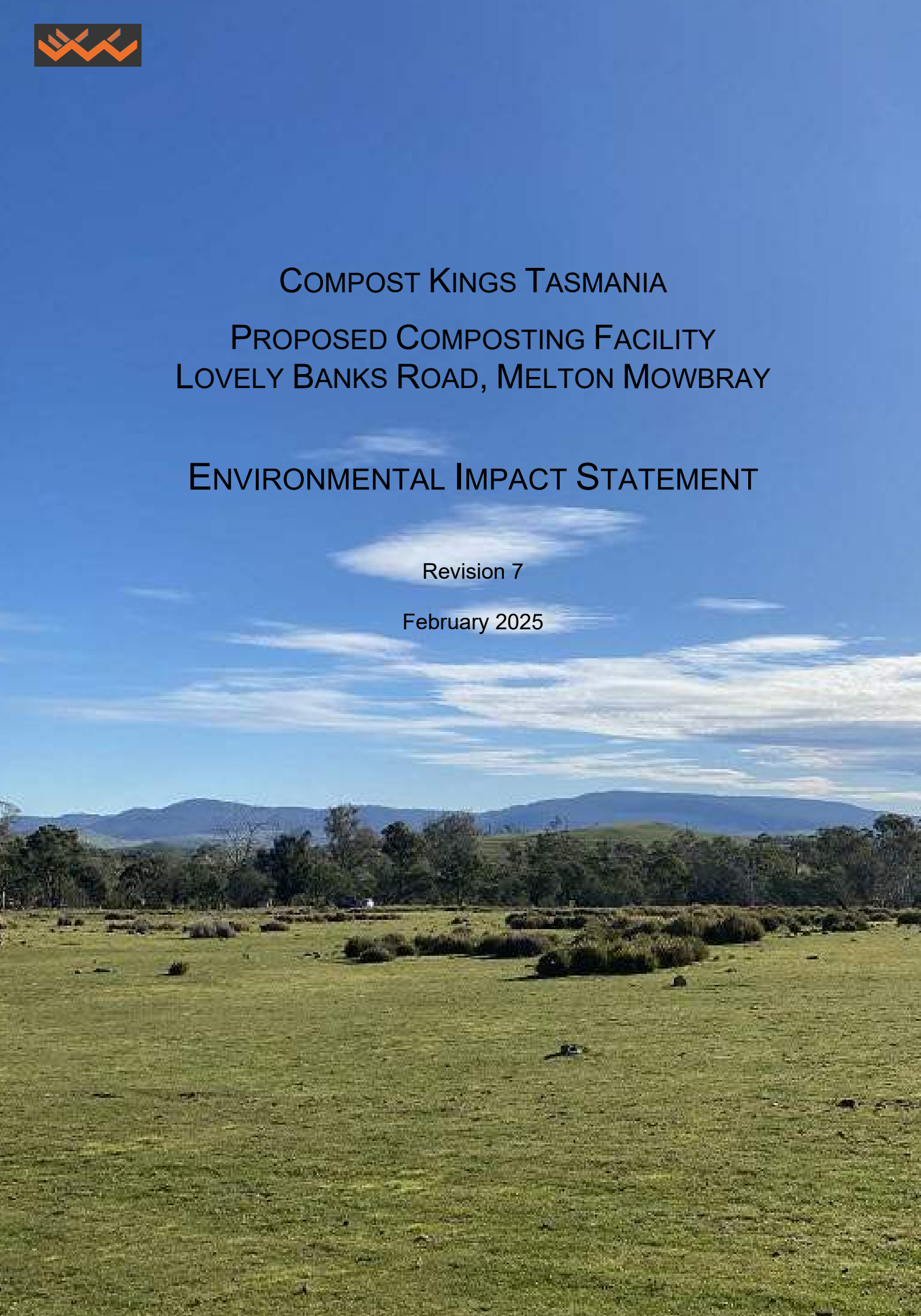
COMPOST KINGS TASMANIA

PROPOSED COMPOSTING FACILITY
LOVELY BANKS ROAD, MELTON MOWBRAY

ENVIRONMENTAL IMPACT STATEMENT

Revision 7

February 2025



Cover photo

Image looking west on *Somerton* over part of the proposed site and composting facility towards the adjoining property *Woodlands Run* (the fenced boundary runs left to right along the tree-lined middleground). Photo: Bill Cromer, 26 July 2020.

Photo this page

Drone image looking south-southwest over most of the area proposed for composting operations. The dashed line is the approximate southern and western extent of the facility.
Photo: Bill Cromer, 26 July 2020.

Citation

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Revision 3	29 November 2022	EPA Tasmania
Revision 4	12 May 2023	EPA Tasmania
Revision 5	19 June 2024	EPA Tasmania
Revision 6	20 December 2024	EPA Tasmania
Revision 7	12 February 2025	EPA Tasmania

Note

In this document, the terms “site” and “facility” have separate meanings:

- “site” means the 23ha area bordering Lovely Banks Road and containing the facility.
- “facility” means the 6.5ha earth-walled and fenced area wholly contained within the site, and which encloses all the composting activities.

EXECUTIVE SUMMARY

Compost Kings is a privately-owned Tasmanian enterprise which recognises an un-met demand in southern Tasmania for composting operations, and which proposes to operate up to a 10,000tpa facility in the Tasmanian midlands. The product will add value to organic waste otherwise destined for landfill, and it is expected to be mainly used as a soil enhancer for improved agricultural productivity.

The site covers about 23ha of broad-acre land on *Somerton*, a farming property on Lovely Banks Road near Melton Mowbray. At the site it is proposed to conduct the composting operations within a 6.5ha earth-walled facility. All of the product is expected to be used on *Somerton* and the neighbouring property *The Follies* (same owner) although other customers may in time also be supplied.

The proposal is classed as a Stage 2B activity by the Tasmanian Environmental Protection Authority. Compost Kings is required to produce this Environmental Impact Statement based on general and site specific guidelines issued by the Authority.

Various waste streams (feedstock) will be received for composting, including high-carbon low-odour green wastes, tree trimmings, sawdust and pine bark, and from time to time if and when available, medium-odour biosolids and aged manures. No high-odour wastes will be received. No contractual arrangements will be in place to require the operator to accept all arriving wastes: Compost Kings will maintain control over (and wherever necessary limit) the types and volumes of waste materials delivered.

The facility will operate on week days only (excluding public holidays) and will not be open to the public. The facility and the larger surrounding site will both be locked and inaccessible after normal operating hours (7am to 5pm).

Only seven houses are within 6km of the facility, with the nearest house being about 1.3km away to the north, on the agricultural property *Redside*. The owner of *Redside* is also the owner of *Somerton*, and has expressed his support for the proposal in writing.

The site and environs are underlain by sedimentary rocks of Triassic age. Soils developed on the sedimentary bedrock are duplex (two-layered) profiles with sandy topsoils and low permeability clayey subsoils. There are no current groundwater users in the local-scale catchment and no water bores within about 2km of the site. There are no downstream potable water supplies.

A risk assessment of the proposed operations indicates that with appropriate management, the facility can operate with acceptable environmental impacts. Odour from composting is probably the most significant environmental issue. To evaluate the effects of odour, an assessment using air dispersion modelling showed that:

- normal and upset operations at the facility generate odour concentrations which do not comply with the required maximum level of 2 OU at the boundary of the site,
- however,
    - during normal operations, odour will not be detected at any of the seven closest residences: the 1-hour 99.5th percentile cumulative odour level from all modelled activities is less than 1 OU (presumed to be the lower level of detectability) and the highest predicted concentration is 0.34 OU at *Redside*, the closest receptor, and

- during worst-case conditions, odour will still not be detected at any of the seven closest residences: the 1-hour 99.5th percentile odour level remains less than 1 OU at all receptors; at the closest, *Redside*, it is predicted to be 0.66 OU.

Nevertheless, the potential for odour emissions from the facility to cause environmental nuisance or harm has been addressed in an Odour Management Plan which (among other measures) specifies triggers for action to mitigate odour, including postponing deliveries of the medium-odour waste, and temporary plant closure. Compost Kings is also developing a range of other plans and procedures to help manage the facility with the least environmental impact.

A traffic report estimated the extra traffic on Lovely Banks Road would comprise eight two-way vehicles and three two-way heavy vehicles each weekday.

The concluding remarks to this Environmental Impact Statement emphasise that the proposal has the support of adjoining landowners, it will have an acceptably low odour effect on neighbours, and the finished compost is primarily intended to enhance agricultural production in the district.

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SOUTHERN MIDLANDS COUNCIL LIKELY PLANNING REQUIREMENTS CROSS-REFERENCED TO THIS EIS

Compost Kings' composting proposal described in this EIS is considered a Discretionary use under *21.2 Use Table* for the Agriculture zone of the State Planning Provisions in the Tasmanian Planning Scheme (TPS; Gray, 2024).

Before the introduction of the TPS, Southern Midlands Council's Interim Planning Scheme 2015 required [Section 5.1 of EPA (2020a)] that the issues in the accompanying Table on the next page be addressed for the composting proposal. The Local Provision Schedules in the TPS – Southern Midlands do not specifically list such uses. Nevertheless, it is considered that similar matters will still be required to be addressed, so the Table is retained and the original Interim Planning Scheme numbering remains for reference.

The right hand column cross-references the issues to the relevant Sections, Figures and Appendices in this EIS.

Southern Midlands Council likely Planning Requirements for the current proposal

Southern Midlands Council Interim Planning Scheme 2015

Part 8.0: Assessment of an Application for Use or Development	**Relevant Sections, Figures etc of this EIS***
Part 8.1.2 Mandatory requirements	
(a) details of the location of the proposed use or development	S1.6; Figs 1 – 4, 7
(b) a copy of the current certificate of title for the site to which the permit sought is to relate, including the title plan and any schedule of easements;	S3.1.2; Fig 11
(c) a full description of the proposed use or development;	S2.2; Figs 5 – 8
(d) a description of the manner in which the proposed use or development will operate	S2.2.4; Figs 5 – 8
Part 8.1.3	
(a)	
(i) the existing and proposed use(s) on the site	Fig 4
(ii) the boundaries and dimensions of the site	Fig 4
(iii) topography including contours showing AHD levels and major site features	S3.2.1, Figs 7, 15
(iv) natural drainage lines, watercourses and wetlands on or adjacent to the site	S3.2.3; Figs 7, 15
(v) soil type	S3.2.6; Plates 1 – 3
(vi) vegetation types and distribution, and trees and vegetation to be removed;	S3.2.4
(vii) the location and capacity of any existing services or easements on the site or connected to the site;	None
(viii) existing pedestrian and vehicle access to the site	None
(ix) the location of existing and proposed buildings on the site	None existing; Fig 37
(x) the location of existing adjoining properties, adjacent buildings and their uses	S3.1.4, Fig 14
(xi) any natural hazards that may affect use or development on the site	S4.10
(xii) proposed roads, driveways, car parking areas and footpaths within the site	Fig 37
(xiii) any proposed open space, communal space, or facilities on the site	Fig 37
(xiv) main utility service connection points and easements	None
(xv) proposed subdivision lot boundaries, where applicable	N/A
(c) where it is proposed to erect buildings, a plan of the proposed landscaping	Fig 37
(i) planting concept	N/A
(ii) paving materials and drainage treatments and lighting for vehicle areas and footpaths	N/A
(iii) plantings proposed for screening from adjacent sites or public places	N/A

Other Planning Scheme requirements

A Traffic Impact Assessment (TIA) prepared by a suitably qualified consultant is required, incorporating road access design, internal access design, and internal parking layout. The internal access design must demonstrate stormwater management through onsite management to avoid, as far as practicable, discharge of waters into the Council road reserve. Council would anticipate that the internal access would follow natural contours to avoid visual impacts and reduce concentration of stormwaters	Appendix 2; Fig 37 of EIS
Written assessment against the relevant zone standards and code standards by a suitably qualified or competent person. This can be in the form of a 'planning assessment' report. The report must include assessment of land use in adjoining properties, and hours of operation (including vehicle movements).	Appendix 4
Assessment of the impact of the Standard Recommended Attenuation Distance (SRAD) that would be created by the facility per the Attenuation Code should a permit be granted on land and land use in the area. A diagram demonstrating the full extent of the SRAD must be provided.	S4.1; Fig 30
Any pre-consultation with adjoining landowners, especially those within the SRAD. Written confirmation of the outcomes of the consultation should be included.	Appendix 3; S2.4 in this EIS

*N/A = Not applicable

1 INTRODUCTION

1.1 Title of the proposal

The title of the proposal is:

Composting Facility, Lovely Banks Road, Melton Mowbray, Tasmania

1.2 Proponent details

1.2.1 Name of proponent (legal entity)

Seaton Edward Clarence Waterfield

1.2.2 Name of proponent (trading name)

Compost Kings Tasmania

1.2.3 Registered address of proponent

10 Kingfisher Street
KINGSTON Tasmania 7050

1.2.4 Postal address of proponent

10 Kingfisher Street
KINGSTON Tasmania 7050

1.2.5 ABN of the proponent

55 462 022 986

1.3 Contact person's details

The contact person for Compost Kings Tasmania is

Mr. Seaton Waterfield
10 Kingfisher Street
KINGSTON Tas 7050
Mobile: 0452 383 485
s.waterfield1984@hotmail.com

1.4 Operator of the composting facility

The proponent will be the operator.

1.5 Proponent's background information and experience

Seaton Waterfield is the sole owner of Compost Kings Tasmania (hereafter abbreviated to Compost Kings). He is Tasmanian born, with twenty five years' experience working in different Tasmanian industries including earthmoving, mining, transport, heavy haulage and composting. Over this time, Seaton observed large volumes of material going to landfill which could otherwise be composted. He also noted a lot of room for improvement in the composting industry, including the need for a cleaner and more efficient process.

Seaton was approached by the manager of the Interlaken facility to assist with cleaning up the site and improving its productivity. This he achieved by "being forward thinking, productive and processing materials as they came onsite." Seaton firmly intends that treating materials as they arrive on site (thus avoiding large piles of odorous waste) will be the operational focus of his facility.

1.6 Background information on the proposal

1.6.1 Current status of the proposal

Compost Kings has applied to Southern Midlands Council (SMC) for a Planning Permit to produce up to 10,000tpa (tonnes per annum) of compost on land at *Somerton* off Lovely Banks Road near Melton Mowbray (Figures 1, 2 and 3). SMC referred the application to the Tasmanian Environmental Protection Authority (EPA) who assessed the proposal as a "Stage 2B" activity.

Accordingly, Compost Kings is required to produce and submit an Environmental Impact Statement (EIS; this document) to the EPA in accord with general and site-specific guidelines (EPA 2019a, 2020). Subject to EPA approval, the EIS would form the basis of a Planning Permit of Approval issued by SMC.

1.6.2 Principal components of the proposal

The principal components of the proposed operations (Figures 4, 5 and 6) are:

- a defined fenced area ("the site"[1]) of some 23ha with frontage on Lovely Banks Road, extending about 500m south from the road along the *Somerton* – *Woodlands Run* property boundary, and wholly within *Somerton*,
- a defined earth-walled and fenced composting facility ("the facility"; Figure 4) of approximately 6.5ha inside and at the southern end of the site; about 50% of the facility will be covered with hardstand on which all composting and associated activities will occur:
    - truck deliveries of compostable raw materials, from the Midlands Highway along 2.8km of Lovely Banks Road to the site, and then via 500m of internal gravel access road through the site to the facility,
    - mixing of raw materials in specified proportions for composting, in a designated area within the facility,
    - windrowing of composting material, nominally at one row per week, in up to 12 rows (or more if required), for 12 weeks' (or more if required) turning and composting,
    - screening and on-site stockpiling of final compost for off-site delivery, and

[1] This EIS consistently distinguishes between the "site" and the "facility". The facility is fully contained within the larger site.

- two dams (Dam 1 will collect combined stormwater/leachate from all operational hardstand areas; Dam 2 will collect only stormwater from non-operational, non-hardstand parts of the facility, for recycling to the composting windrows and stockpiled finished product. The dams will maintain a combined storage capacity to cope with runoff from within the facility during a rain event of 1:20 AEP.

The operation of a neat and tidy composting facility – achievable by not only processing materials as soon as they arrive onsite, but also by controlling and limiting the volumes and types of materials delivered – provides an opportunity to improve the image of the composting industry in Tasmania.

Figure 1. Regional setting of the proposed Compost Kings composting site.
Source of base map: www.thelist.tas.gov.au

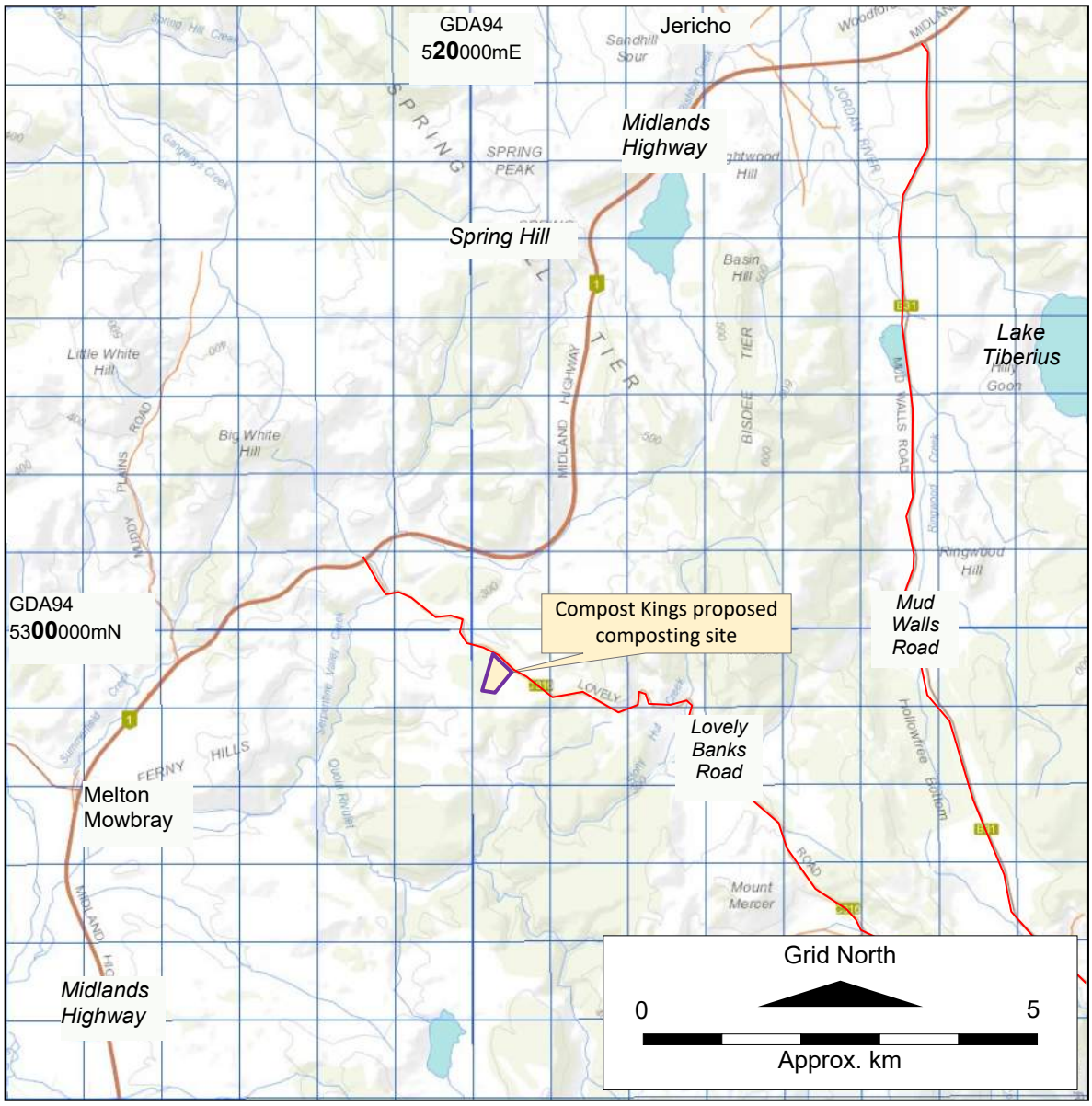


Figure 2. Location of the proposed Compost Kings composting site on Lovely Banks Road, 2.8km east of its junction with the Midlands Highway.
Source of base map: www.thelist.tas.gov.au

1.6.3 Anticipated establishment costs

Anticipated costs of establishment are summarised in Table 1.

1.6.4 Likely markets for Compost Kings' compost

The most likely markets for the compost are local and district landowners, for pasture improvement, replacing some or most other commercial fertilisers. The properties managed by Mr. Justin Jones – including *Somerton* and *The Follies* – are likely to receive most of the compost.

Compost Kings will be working with Mr. Justin Jones and Mr. Jones' agricultural consultant Mr. Rod Hancl of *Nutrien Ag Solutions* with periodic testing throughout the composting process. Different combinations of raw materials may be trialled to (a) improve the product without resulting in unmanageable odour or leachate emissions (DEC 2004, page 56), and (b) extend the range of products to include rich blends, light blends, fine blends for mid-crop growth spreading, and a coarse blend to help improve sandy and overworked soils and paddocks.

Table 1. Anticipated establishment costs for the composting proposal

Item	Anticipated establishment costs (including labour, plant hire, materials)
Permit Application Costs (legals, EIS preparation; consultant's reports, groundwater monitoring bore)	$150,000
Upgrade entrance off Lovely Banks Road	$5,000
Upgrade access track through site	$5,000
Site fencing; gates	$10,000
Strip topsoil and build earthen perimeter wall	$5,000
Hardstand construction	$20,000
Construction of leachate/stormwater dams	$20,000
Washdown facility	$3,000
Front end loader	$40,000
Fresh water storage tanks	$10,000
Pumps for fresh water tanks/vehicle washdown	$3,000
Pumps for dams	$3,000
Irrigation lines	$3,000
Weather station	$5,000
Dam 1 aerator	$4,000
Office/ablutions	$15,000
Estimated total (rounded)	**$301,000**

1.6.5 Land tenure for the facility

Compost Kings and the Mr. R. Jones, the owner of *Somerton,* have agreed to enter into a land-tenure arrangement in which Compost Kings will lease the site and facility.

Compost Kings will be responsible for all operations at the site and facility, including all environmental matters (including potential pollution) arising from it.

The lease agreement is confidential, but will be made available to EPA if required.

1.6.6 Possibilities for future expansion

Subject to regulatory approval (where required), Compost Kings will undertake small-scale testing and trials to:

- determine different strengths of compost to potentially reduce quantities and application rates on paddocks[2], and
- assess different stages of compost use on paddocks (e.g., could premature/half composted compost[3] be beneficially spread on and disced into paddocks to finish the breakdown process with slow nutrient release into soils, while crops grow?).

It is expected than as the beneficial uses of Compost Kings' different blends of compost become more widely appreciated, more (including large) agriculturists from other parts of Tasmania will become customers. Demand for the composted products is likely to increase.

Expansion is therefore definitely a plan for the future[4]. However, expansion is outside the scope of the present EIS, and would in any case likely be the subject of further assessment by the EPA and Southern Midlands Council.

1.7 The proposal in relation to other composting facilities in southern Tasmania

Several permitted composting facilities are located in southern Tasmania. In addition to green waste composting at some existing regulated waste disposal sites, three licenced facilities accept more general waste, and are briefly discussed in the following Sections.

1.7.1 Glenfern composting facility

The 10,000tpa composting operation at 47 Plenty Valley Road at Glenfern (Palmer, 2008) commenced in 2009 and is supported by *Microbial Activity* and *Norske Skog Boyer*.

1.7.2 Interlaken composting facility

The Interlaken composting facility on the Interlaken Road about 8km west of Oatlands is a joint venture between *B. G. and J. M. Barwick Pty. Ltd*. and *Pure Living Soil Pty. Ltd*. It produces about 10,000tpa of compost.

1.7.3 Bridgewater composting facility

This facility at Bridgewater is owned and operated by *B. G. and J. M. Barwick Pty. Ltd.* in partnership with *Pure Living Soil Pty. Ltd.* (Williams, 2019). The operation receives organic pine bark from the Norske Skog paper mill at Boyer and green waste from Mornington Waste Transfer Station, and is permitted to produce up to 2,000tpa of mature compost and 500tpa of potting mix.

The facility is currently not operating.

[2] Compost Kings will also review research done by others into pressing finished compost into pellet form to reduce transport costs. Pellets may also permit more even compost application rates to paddocks.

[3] Consideration of this possibility will be informed by (among other things) EPA(2019b).

[4] Longer-term operations might include indoor operations on a concrete floor, with fans in the roof to extract gases from the composting process to be burned in combustion engines to generate power for the grid and facility. Solar panels on the roof and associated battery storage would generate more power for the grid and also run screens and chippers. Electric loaders and turners if available would also be an option.

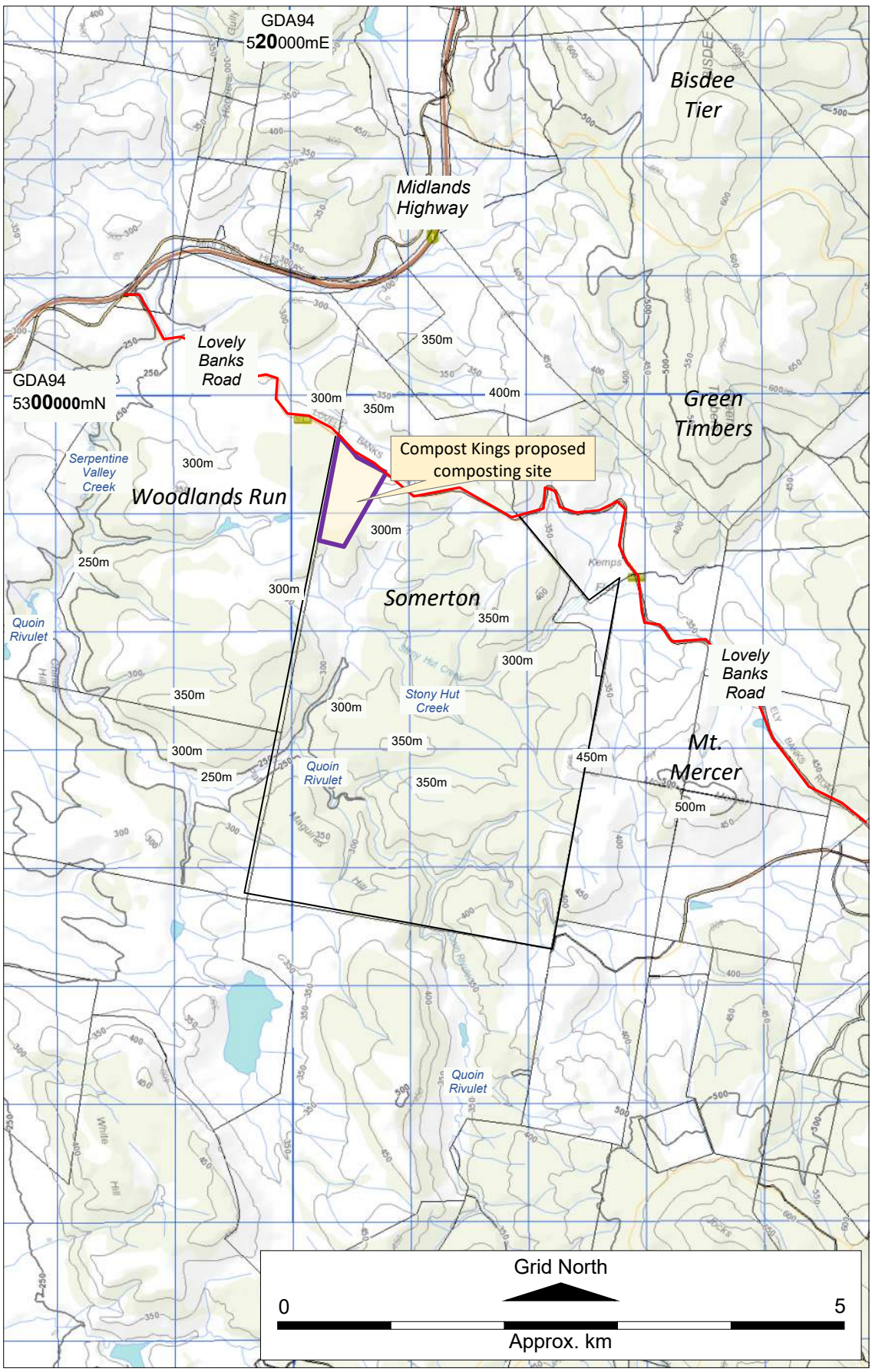


Figure 3. Location of the proposed Compost Kings composting site on *Somerton.*
Source of base map: www.thelist.tas.gov.au

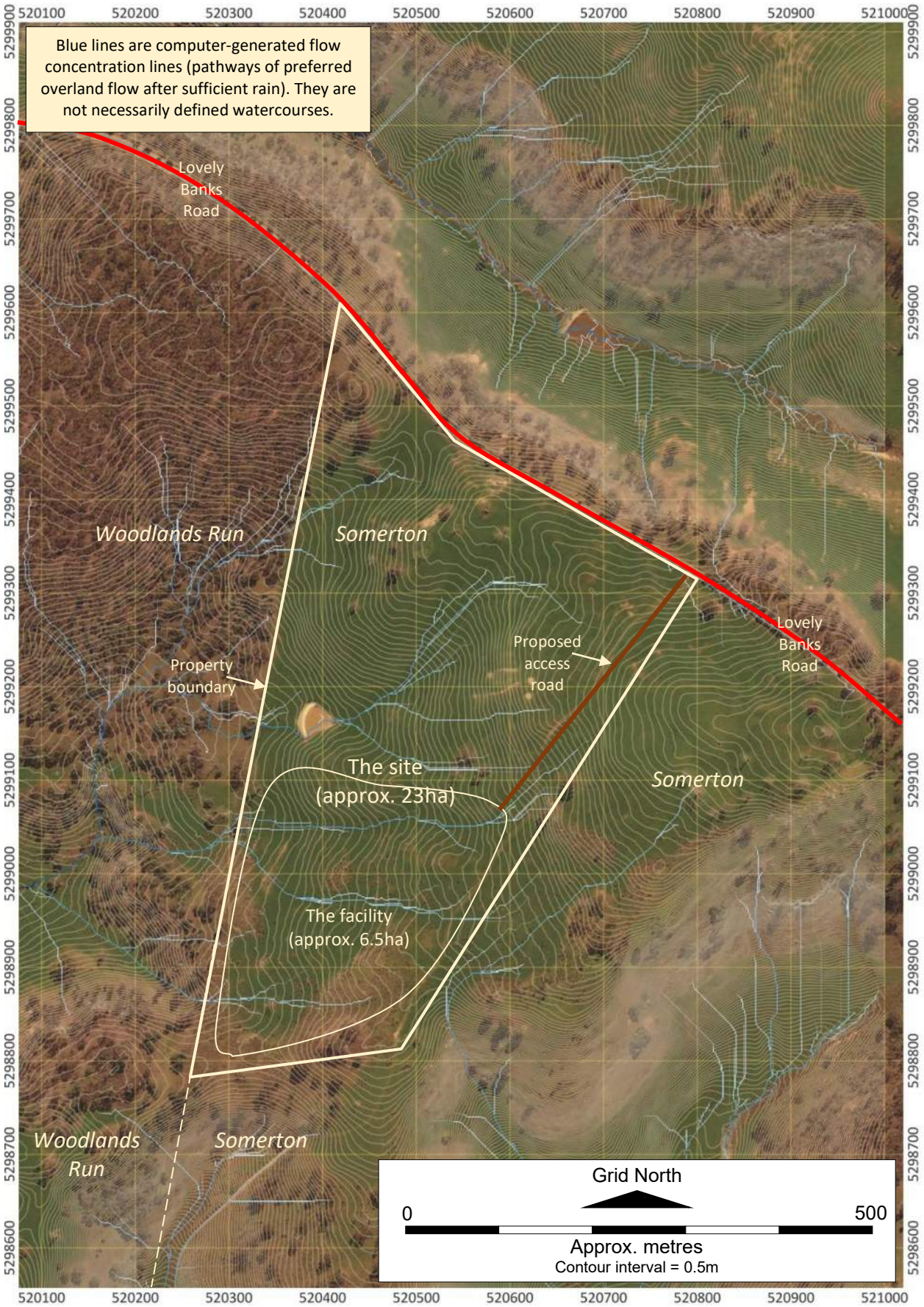


Figure 4. The proposed Compost Kings facility within the site on *Somerton.* The site and facility are currently agricultural land. Source of base map: www.thelist.tas.gov.au

2 GENERAL DESCRIPTION OF THE PROPOSAL

2.1 On-site plant and equipment

In the early stages of operation, the on-site plant and equipment will be:

- 1 x front-end loader
- 1 x 7t excavator
- Office and adjacent toilet/shower/septic tank system
- Diesel and petrol pumps
- Irrigation pipework (for windrows: eg soaker hoses to reduce aerosol generation)
- 1 x 10,000L water truck
- 2 x 24kL fresh water tanks
- Vehicle washdown equipment
- Aerator for Dam 1 (leachate and stormwater dam)

The front end loader has been purchased, and the excavator is on-site and owned by the proponent.

Stand-alone windrow compost turners are available for hire, lease or purchase. Compost Kings will obtain a turner within the first six months of the start of operations[5].

2.2 The composting process

The facility will produce up to 10,000tpa of compost, the physical properties and quality of which will comply with AS4454 – 2012 *Composts, soil conditioners and mulches.* At least initially, annual production is likely to be less than 10,000t.

2.2.1 Types, quantities and sources of materials to be composted

Compost Kings is in preliminary discussions with various suppliers of raw materials (feedstock) for composting.

Table 2 sets out the types, quantities and sources of material proposed to be composted. All the feedstock will be Category 1[6] wastes as defined in Table 4 of EPA Victoria (2017). Approximately 80% of the feedstock will be green wastes from municipal and other sources. The green wastes will include grass[7], leaves, plants, tree trimmings, sawdust, wood chips and shavings, and hay and other harvested residues, which from the perspectives of odour generation and potential environmental harm are at the lower risk level of the feedstock scale. The balance (up to about 20%) will be Category 2 medium risk level biosolids and aged manures.

[5]Replacement parts and servicing of windrow compost turners may not be available in Tasmania, but are available in/from Victoria. Compost Kings will arrange for all repairs and servicing, and in the interim will use the on-site front end loader and excavator for windrow turning.

[6] The terms Category 1 and Category 2 used throughout this EIS refer to the categories defined in Table 4 of EPA Victoria (2017).

[7] Compost Kings recognises that compared to most green wastes, grass clippings are generally higher in nitrogen, have potential to generate relatively high odour, and require careful management of mixing and odour.

2.2.2 Biosolids

Guidelines for the production, transport, reprocessing and end-use of biosolids and biosolid products (including compost) are set out in EPA (2020b and 2020c).

Compost Kings is a reprocessor. From licenced producers and transporters it will accept biosolids rated as Class 1 and 2, contaminant grades A and B, and stabilisation grades A and B [Table 9.1 of EPA (2020b)]. Compost Kings will not accept sewage sludge.

Table 2. Proposed types, sources and quantities of materials to be composted

1	2	3	4	5	6	7	8	9	10	11	12	13
Waste Category	Risk level	Waste type	Examples	Potential sources	Est. annual feedstock weight by example t	Est. annual feedstock weight by type t	Est. annual feedstock weight by type %	Average bulk density t/m3	Est. moisture content %	Est. C:N ratio per example range	Est. C:N ratio per example average	Est. average C:N ratio per type
1	Lowest	Garden and landscaping organics	Grass	Local farms, landscapers, etc	250	1,050	8	0.3	80	10-25	17	40:1
			Leaves		400			0.3	40	40-80	50	
			Plants		200			0.3	15		50	
			Tree trimmings		200			0.8	70		15	
		Untreated timber	Sawdust	Local sawmills	250	500	4	0.25	40	200-750	450	450:1
			Woodchips, shavings		250			0.4	40	450-820		
			Pine bark	Norske Skog	200	200	1	0.4	25	130-1200	500	
		Natural fibrous organics	Hay and harvesting residues	Local farms incl. *The Follies*, *Redside*	2500	2,500	18	0.2	10	15-30		25:1
2	Medium	Municipal-sourced garden and landscaping supplies	Grass	Waste transfer stations at local councils including Kingborough, Hobart, Clarence, Glenorchy, Brighton, Southern Midlands	2500	7,250	52	0.3	80	10-25	17	40:1
			Leaves		2500			0.3	40	40-80	50	
			Plants		1500			0.3	15		50	
			Tree trimmings		750			0.8	70		15	
		Biosolids	Contaminant Grade A or B; Stabilisation Grade A or B	TasWater WWTPs	2000	2,000	14	0.8	70	10:1	10:1	10:1
		Aged manures (moisture <65%)	Cattle manure	Local feedlots	500	500	4	0.8	60	10-30	20:1	20:1
				Total feedstock weight (rounded)		**14,000**	**100**					
				Est. final compost weight (rounded)		**10,000**						

Notes to Columns

1 From Table 4 of EPA Victoria (2017). *Designing, constructing and operating composting facilities*. Publication 1588, EPA Victoria, 1 June 2017
2 Risk level from EPA Victoria (2017) Section 5.1 relates to "potential risk of harm to human health and the environment"
3 Adapted from Table 4 of EPA Victor4ia (2017)
4 Adapted from Table 4 of EPA Victor4ia (2017)
5 Potential sources may be amended from time to time.
6 Weights are rounded. Weight of feedstock by example may change from time to time
The facility is designed to operate without Category 2 biosolids, because their availability is uncertain.
7 Weights are rounded. Weight of feedstock by type may change from time to time. Average weight loss during composting assumed to be 30%.
8 Percentages are rounded.
9-13 Various sources, including:
Cornell Waste Management Institute (https://cwmi.css.cornell.edu/composting.htm)
C:N mix calculator (https://compost.css.cornell.edu/calc/2.html)
Composting Magazin e (https://www.compostmagazine.com/carbon-nitrogen-ratio-tables/)
On-Farm Composting Handbook Appendix A: Table A.1 (https://cwmi.css.cornell.edu/AppendixATable1OFCH.pdf)

2.2.3 Reliability of supply of raw materials

There continues to be an unsatisfied demand in Tasmania for sites to receive compostable wastes, and their reliability of supply of Category 1 feedstock is not considered an issue for the on-going operation of the facility. The availability of Category 2 biosolids is uncertain, so the facility is designed to operate satisfactorily without them.

At least initially, Compost Kings does not intend to enter into contracts to receive wastes from any supplier. This is an important management tool to control the types and volumes of materials delivered to the facility. It prevents the accumulation of unwanted and often odorous wastes, maximises the efficiency of the composting operations, and allows the proportions and types of feedstock to be varied to produce a range of compost types[8].

2.2.4 Step-by-step composting process

Compost Kings' objectives are to efficiently produce high quality compost while mitigating the risks of fugitive odours. Rigorous monitoring is proposed.

The step-by-step composting process is described in the following Sections and summarised in the flowcharts in Figure 5 and Figure 6. All activities will take place on about 2.5ha of hardstand within the 6.5ha earth-walled facility (Figure 7).

The operations are depicted schematically in the facility layout in Figure 8.

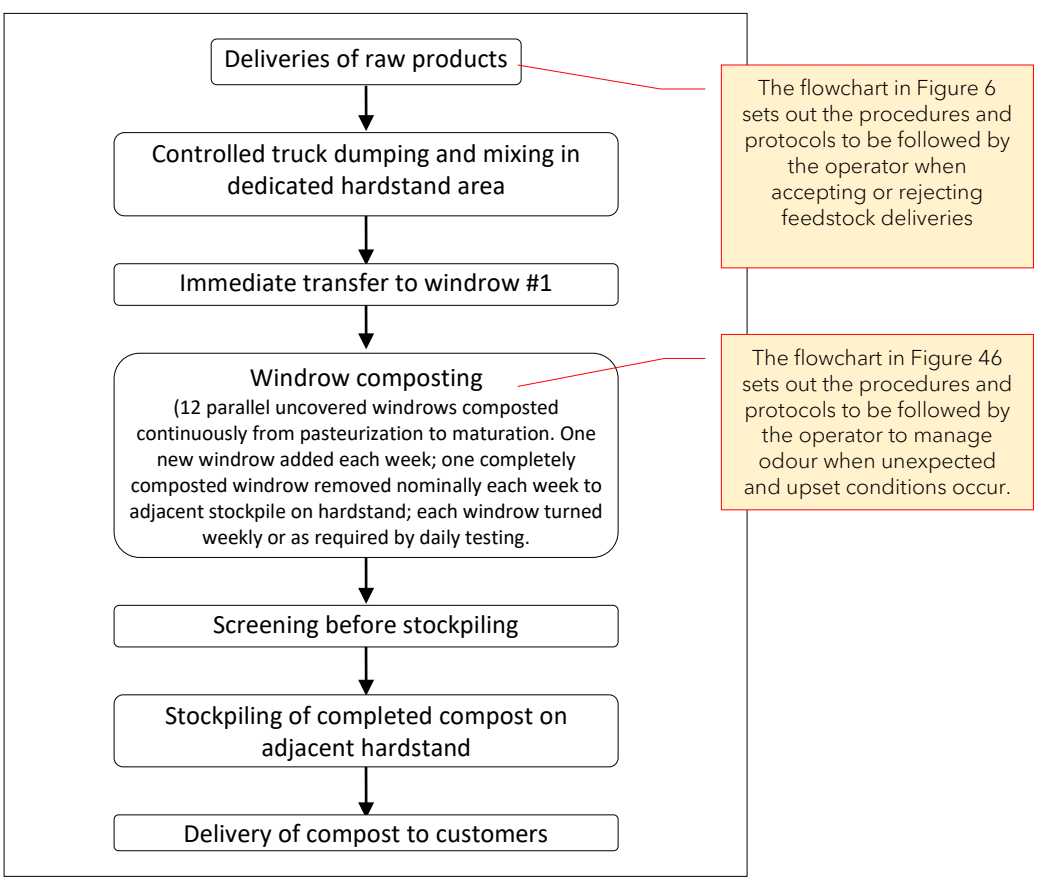


Figure 5. Flowchart for Compost Kings composting facility. See also Figure 6.

[8]Varying the proportions and types of wastes has the potential to affect odour emissions. See Section 4.2.3.1.

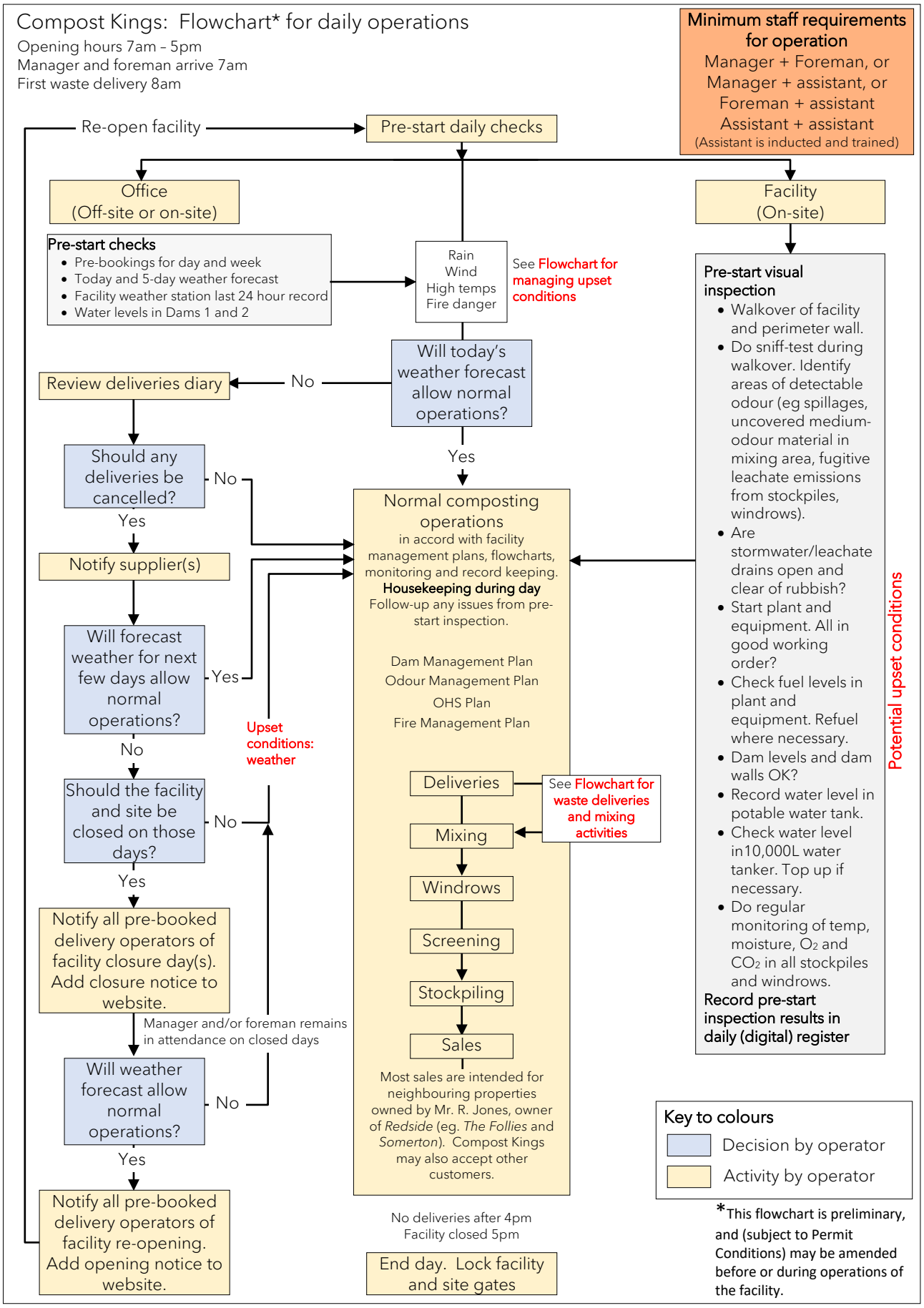


Figure 6. Flowchart for daily operations.

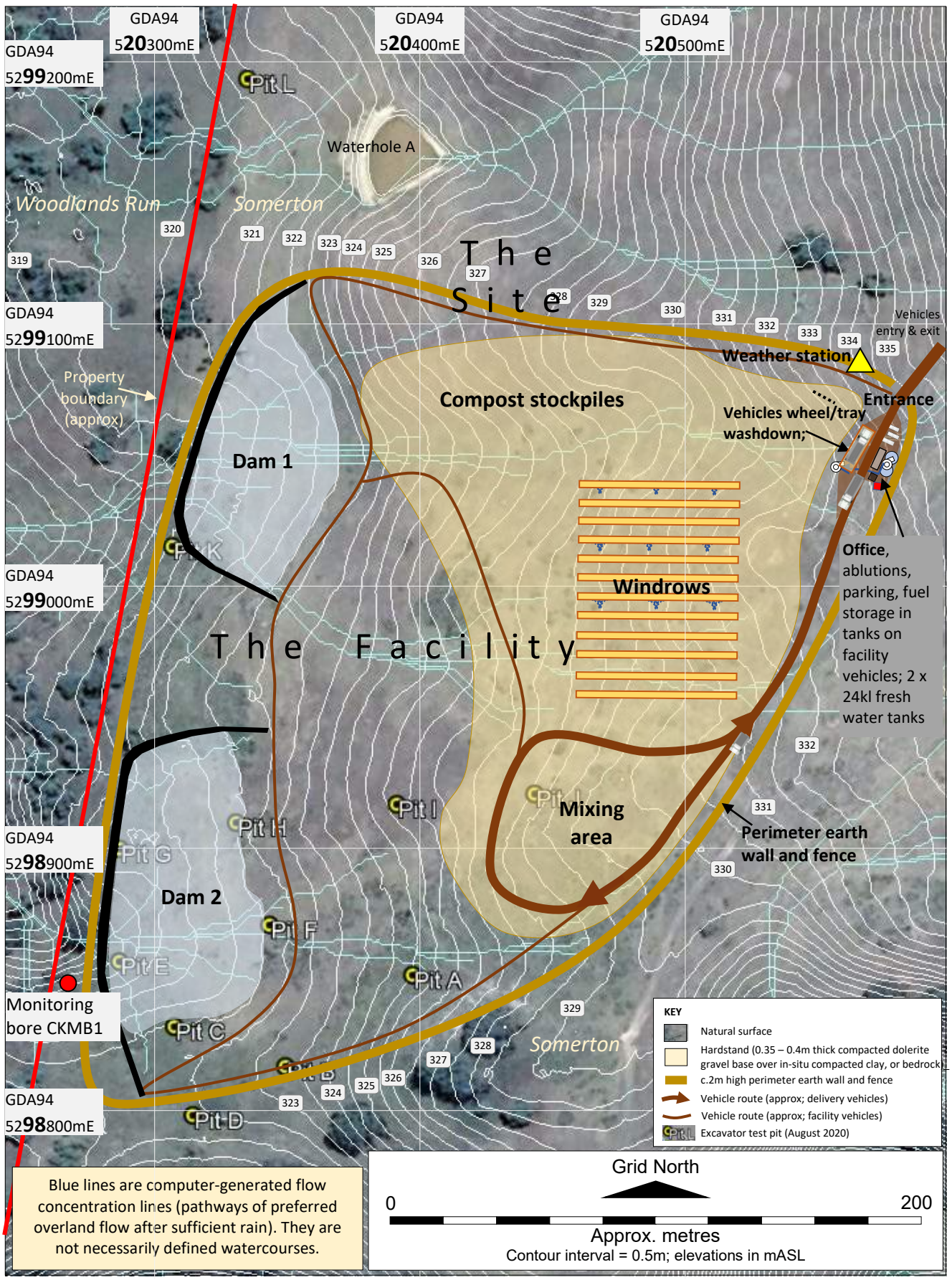


Figure 7. Layout of the facility, showing main components of the proposed operations.

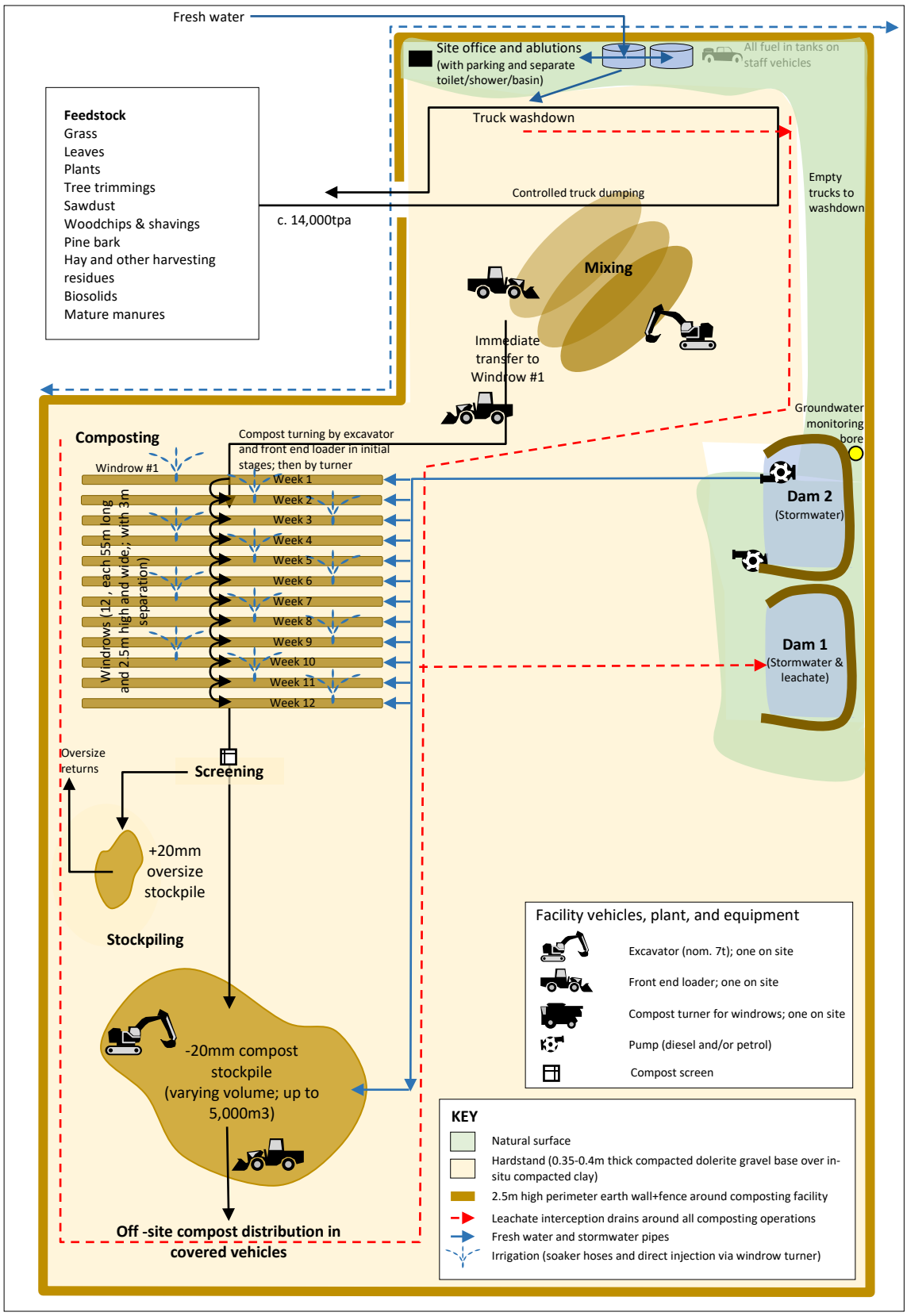


Figure 8. Schematic layout of proposed operations, plant, equipment, and materials at the composting facility.

2.2.4.1 *Process monitoring*

Meteorological conditions

A weather station will be installed in a suitable location on the facility wall (Figure 7). It will be solar-powered, and measure temperature, rain, humidity, and wind speed and direction, at nominally 15 minute intervals. All data including trigger alerts for wind, temperature, etc. will be downloadable directly to laptop on site, and available via a GIS-centric cloud-based platform to mobile phones and on- site PCs (and off-site PCs to allow remote wireless review by permitted users). Decisions related to operation and/or weather-dependent closure of the facility will be able to be made on-site or off-site and in a timely fashion.

Composting monitoring

The condition and progress of the composting materials will be monitored daily with the aid of proprietary software (e.g., Compost Manager or similar product) which will include:

- field measurement equipment of composting operations (pH, humidity, temperature, O_2 and CO_2), and
- real-time guidance on optimum moisture and temperature of stockpiles, and as a result, better control of odours and their generation.

The field monitoring results will be available via the GIS-centric cloud-based platform to allow remote wireless review by permitted users[9].

Monitoring of dams and dam water levels

Regular surveillance of the conditions of the dam walls will be undertaken. To help manage storage capacities in the two dams, and their responses to various rain intensity-duration events, water levels in each will be monitored (to the nearest millimetre) every 15 minutes (nominal) by a digital submersible logger. The data including trigger alerts for high and low water levels will be available via the GIS-centric cloud-based platform to allow remote wireless review by permitted users.

2.2.4.2 *Waste reception*

All customers and cartage contractors will be required to phone ahead (ie to make verbal, not electronic, contact) before each delivery (Figure 9) to:

- provide details of the volume of feedstock,
- to make sure the waste is acceptable material, and
- to confirm the facility is capable of accepting, and will accept, the delivery.

All vehicles transporting wastes to the facility will be required to stop at the office, so that their loads can be visually checked, and details (date, time, supplier's and carter's name, vehicle registration, vehicle type, tare and gross weight where available etc) entered into a computerised Wastes Deliveries Inventory.

It is not intended to install a weighbridge at the facility. Supplier's trucks from most municipal sources, representing approximately 80% of all feedstock, will have passed over a weighbridge on departure from the Council site, so that tare weights will be available. For deliveries of unweighed

[9]During any periods of computer downtime, field measurements will be recorded manually on field sheets and transferred later to computer files.

feedstock from other sources, volume-based methods will convert cubic meters to weight on arrival. The following information for unweighed deliveries will be recorded:

- the full volume of each truck or tailer tray,
- the volume of feedstock as a proportion of the full truck or trailer tray, and
- the feedstock type or mix of feedstock in the load.

The weights of feedstock will be calculated using reasonable estimates of bulk densities from a Compost Kings database[10].

Waste delivery to the site and facility along public roads is at low risk of odour generation because of its transient nature, and because all vehicles carrying waste will be required to have their loads covered from source to destination.

Based on visual inspection, loads may not meet waste acceptance criteria:

- loads required to be covered but arriving uncovered will be rejected, and
- anything other than minimal contamination (e.g., easily removable foreign matter like FOGO and plastics) will be rejected as not meeting site waste acceptance criteria. FOGO-contaminated deliveries – especially from municipal sources, are particularly important: to minimise the risk of this issue arising at reception, Compost Kings will require that all carriers of green feedstock visually inspect the feedstock at source and reject any unacceptable material (including FOGO).

From the facility office and load checking area, all loads are directed to the waste mixing area.

2.2.4.3 Mixing area

The facility Manager, Foreman or other responsible person will supervise the unloading of every waste delivery[11]. Activities within the mixing area (Figure 7) are described in the Odour Management Plan (Cromer 2025) and are repeated here:

The mixing area "will:

- be kept supplied with sufficient feedstock of Category 1 low-odour, high-carbon waste to enable mixing to achieve suitable C:N ratios for composting, and
- maintain at the mixing area a reserve of high-carbon low odour feedstock (eg sawdust, woodchips, of appropriate particle size) of 10 – 20% of weekly intake by weight[12]. This enables sufficient material to be continuously available for adjusting composting mixtures as required, or for mixing with or capping odorous windrows. The reserve weight will vary seasonally and with differing feedstocks: reserves closer to 20% will be maintained when feedstocks have low consistency in C:N ratios, and/or if biosolids are accepted.

Mixing feedstock in the optimum weight proportions for composting will be the responsibility of and directed by the Manager or Foreman. On the mixing pad, the process will be volumetric, using the front end loader and/or excavator to combine different numbers of bucket loads of various feedstocks. The number of bucket loads required of each will be provided in real time from the

[10] The densities in Table 2 are indicative only. They will be supplemented by bulk densities calculated from loads of known weight. The database of bulk densities will accumulate and be maintained.

[11] During all opening hours, the facility will be operated by at least two responsible people who have been inducted and trained in all operations: Manager + Foreman, or Manager + assistant, or Foreman + assistant, or (rarely) 2 x assistants.

[12] For example, see Felton, G. (2002). Practical Guide to Managing Odor. US Composting Council, and Dept Environmental Science & Technology, University of Maryland.

operator's on-site laptop computer[13]. All mixing details (feedstock type, amounts, and resulting ratios) will be entered into the laptop for future reference.

After calculating the number of bucket loads required for the target C:N ratio of a mix, the front end loader or excavator will be used to:

- load the required number of buckets of each feedstock into the mixing area.
- mix thoroughly by layering the materials and repeatedly turning them over, and
- continue mixing for an even, consistent mix.

The operator will also visually inspect the mix for uniformity—no clumps of one material should dominate. Adjustments to the mix will be made as required: eg adding more nitrogen-rich feedstock like grass clippings or more carbon-rich feedstock like sawdust or wood chips.

These activities in the mixing area are conceptually shown in Figure 10. Incoming medium-odour biosolids will not be stockpiled, but will be immediately mixed with high-carbon, low-odour feedstock and on the same day moved to the windrows to commence pasteurisation."

2.2.4.4 Windrows: number, pasteurisation and maturation

Composting windrows will be aligned in parallel rows up-and-down the slope, each separated by several metres to allow access for plant and equipment (Figures 7 and 8). Rows are of increasing compost-age from the first (fresh from the mixing area, undergoing pasteurisation) to last (matured, and ready for screening and stockpiling).

Number of windrows needed

It is expected that up to about 12 windows will be sufficient to produce a mature compost, but the number will depend on feedstock type, weather conditions, etc. sufficient room is available on site to add more windrows as required to complete the process.

Pasteurisation

Daily management of the windrows will focus on maintaining optimum conditions for composting. In the pasteurisation stage (to reduce pathogens and weed/plant propagules), the aim is to maintain key parameters in the following ranges or values [Table 6 of EPA Victoria (2017)]:

temperature:	55^0C – 75^0C
C:N ratio:	25 – 35
moisture content:	45 – 60% range
oxygen levels:	c.10%
pH:	6.5 – 8
porosity:	45 – 65% of total volume
bulk density:	0.4 – 0.6t/m^3

To facilitate pasteurisation of the low- to medium-risk feedstock, each windrow will be turned a minimum of three times (outer material to the inside) by front-end loader, excavator or windrow turner with the internal temperature reaching at least 55^0C for three consecutive days before each turn [AS4454:2012 Section 3.2.1(a), and DWER (2020) Table 10], and moisture in the 40 – 65% range (DWER (2022, p.31).

[13] The information needed to achieve a target C:N ratio in the final mix includes the volume of the bucket, the bulk density of each feedstock, the C:N ratio of each feedstock, and the carbon and nitrogen content as a percentage by weight in each feedstock. All these will be obtained from the Compost Kings Inventory of feedstock properties, which will be continually upgraded as fresh data become available.

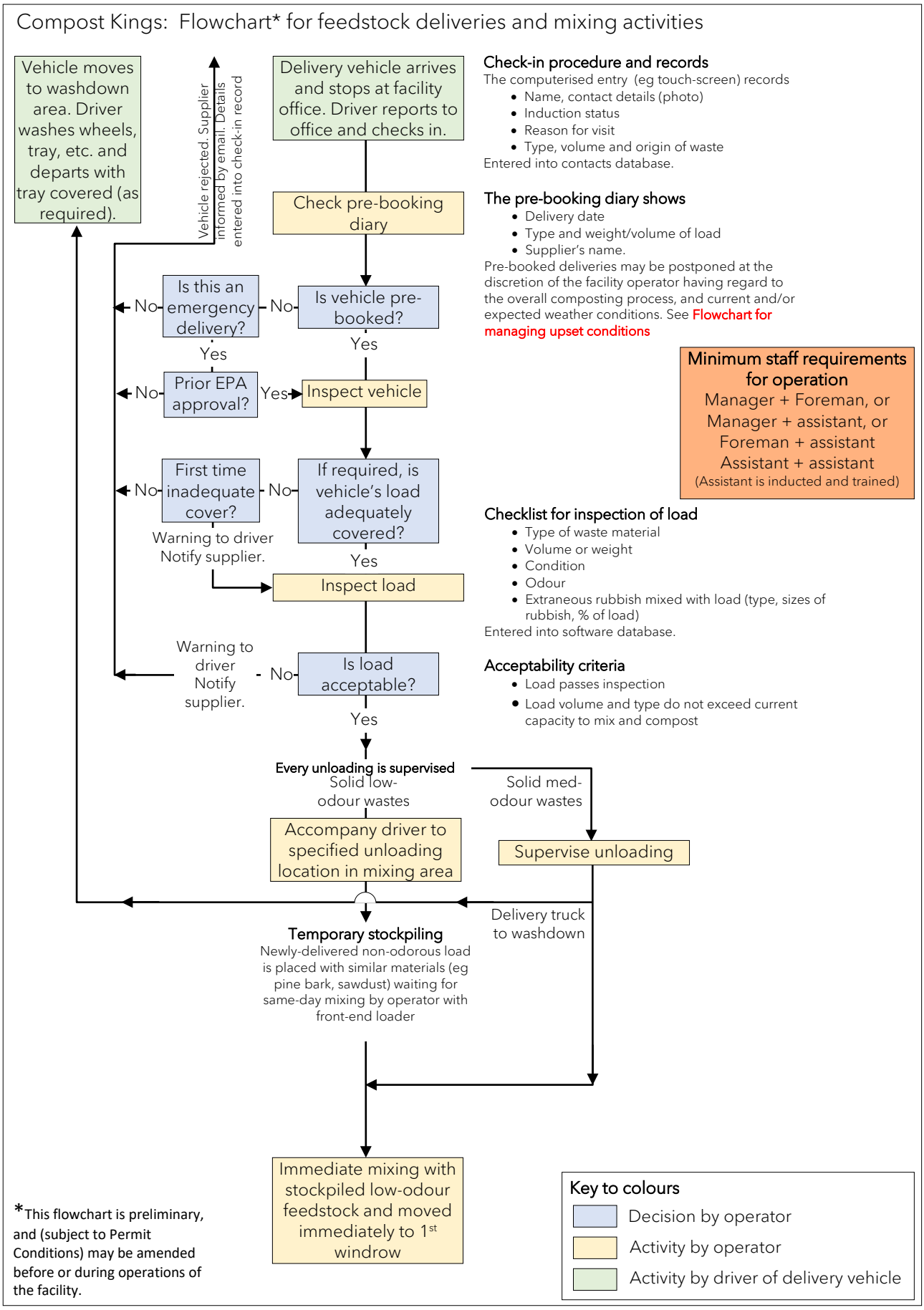


Figure 9. Flowchart for feedstock deliveries and mixing activities.

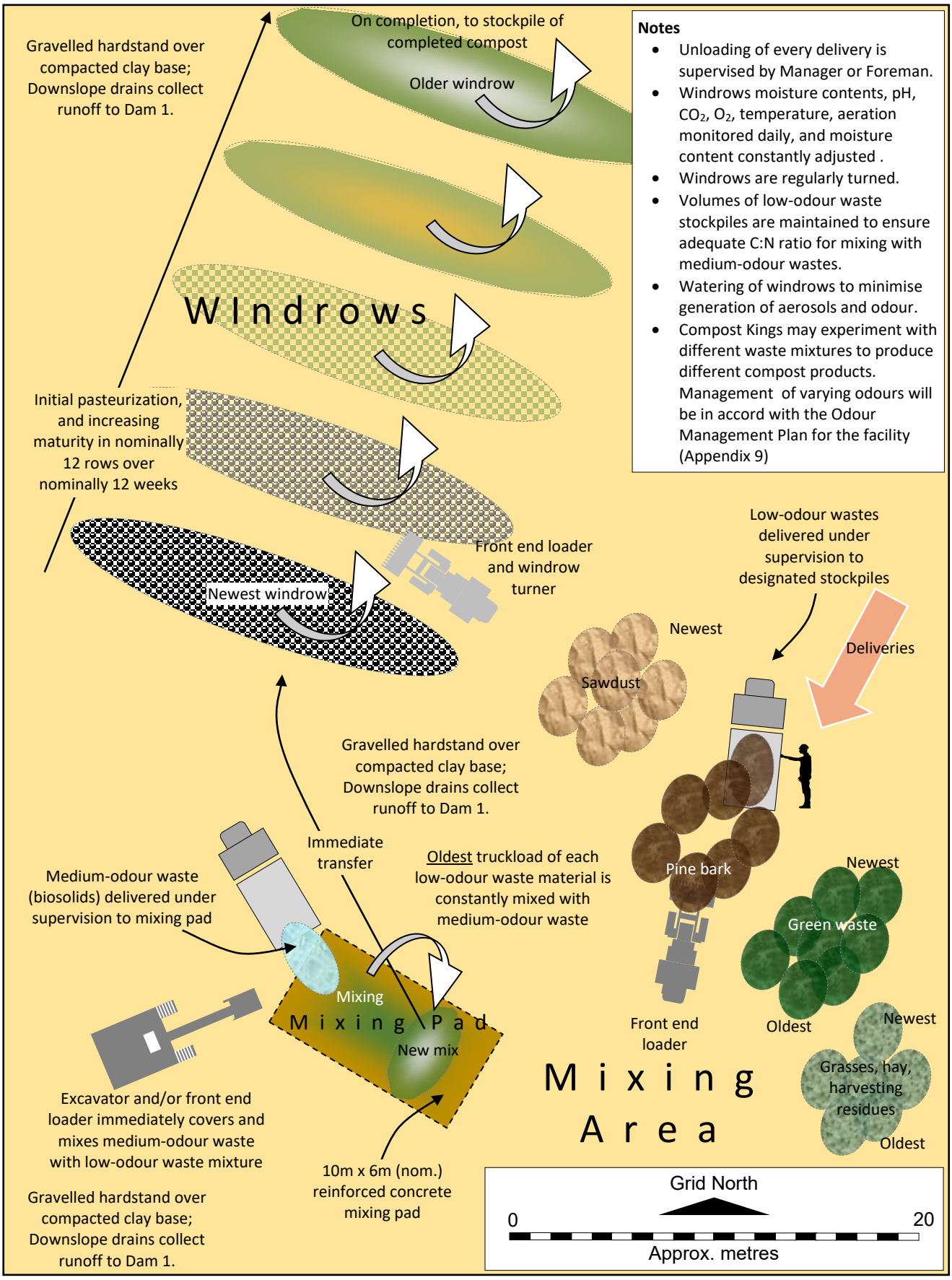


Figure 10. Proposed activities in the mixing area before windrowing [Figure 13 of Cromer 2025)]

Depending on weather conditions and the stages of composting, water may need to be added daily to the rows to maintain optimum moisture content. To avoid leachate cross-contamination, water only from stormwater Dam 2 will be added to each windrow as required – via a trash pump and soaker hoses, and via direct injection from a windrow turner. A 10,000L pump truck will also be stationed on site to aid in windrow irrigation.

Maturation

Material at the end of the windrowing stage has completed active composting and is stable with a lower odour potential. Moisture content is typically about 25%, pH is in the 5 – 8 range, and there is a declining trend of peak temperature. Compost Kings will determine the maturity index of the finished product in accord with Appendix N of AS4454:2012 Section N3(a) –(d).

2.2.4.5 Compost screening

This activity located at the lower end of the windrow area is at relatively low risk of odour generation because the final windrow is matured product of low odour.

Oversize from screening is either returned to the mixing area, or into the first windrows. Persistently oversize material is typically not organic, is at low odour potential, and is temporarily stored on-site before transport off-site to an appropriate landfill.

2.2.4.6 Compost stockpiling

The volume and area of completed compost stockpiled on site will be kept to a minimum, but provision is made to store up to about 5,000m^3 awaiting off-site transport. This activity located after the screening area is also at low risk of odour generation because the finished product is of low odour.

The stockpiles will be monitored daily for temperature and moisture, and water from Dam 2 may need to be pumped and irrigated on them.

2.2.4.7 Dams 1 and 2

Two dams are proposed in the facility (Figure 7):

- Dam 1 is located to capture via lined surface drains runoff from only the operational hardstand areas on the facility, and
- Dam 2 is located to capture via lined surface drains stormwater runoff from only non-operational, non-hardstand areas of the facility.

This arrangement separates stormwater/leachate (Dam 1) from stormwater only (Dam 2).

In this low-rainfall district where annual evaporation exceeds annual rain, and daily evaporation[14] exceeds most recorded daily rain events, compost generation will operate under moisture deficits most of the time. Accordingly, moisture addition to stockpiles and windrows will be required most days, and it Is not anticipated that normal operations will generate excess liquid waste which by itself would report to Dam 1. However, a small proportion of rain events will be of sufficient intensity and/or duration to produce runoff which has the potential to also mix with and transport liquids

[14] Since 1904, about 72% of days have been rain-free, and another 12% received no more than 2mm of rain. Daily evaporation ranges from about 0.5mm in winter, up to about 8 – 10mm in summer. About 97% of days received less than 10mm rain.

leached from stockpiles and windrows. At times, therefore, Dam 1 will receive potentially odiferous liquids. Left unmanaged, the organic content and odour risk of the dam will increase.

Dams 1 and 2 are proposed to have nominally 7ML and 6ML full capacities respectively[15], each with nominal one metre freeboards. Water balance modelling (Section 4.3.7) indicates that with appropriate management this combined capacity is sufficient to store stormwater/leachate (to Dam 1) and stormwater (to Dam 2) from a 1:100 AEP rain event, and from several 1:20 AEP rain events annually.

Managing the odour, quality and levels of dam water will be a daily occurrence, including any combinations of:

- topping up low dam levels with fresh water[16],
- recycling of water to the mixing area, to windrows, and to two 24kL holding tanks if capacity is available, and
- pump-out and approved irrigation on adjacent agricultural land[17].

Where indicated by daily monitoring (Table 16 Section 6), aeration of Dam 1 will be done with a permanently-installed floating or submerged aerator[18].

Compost Kings is also reviewing proprietary dam odour neutralisers as a contingency plan.

2.2.5 Energy requirements and types

There is no reticulated electricity supply for the site.

Energy types required and used at the facility will be:

- diesel and petrol for on-site plant and equipment, and
- solar energy and battery storage for the weather station and office.

All fuel will be brought to the site and stored in portable tanks on staff vehicles.

2.2.6 Water requirements and sources

2.2.6.1 Water requirements

Water is required for composting, vehicle washdown, staff ablutions, dust suppression and emergency firefighting.

- Each windrow is nominally 55m long (Figures 7 and 8), with a compost volume of approximately 250m^3. Past experience by the proponent suggests that each will require up to perhaps 10kL of water weekly during pasteurisation and early maturation, increasing to about 20kL/week towards maturation, but rapidly decreasing thereafter for the final maturation and curing.

[15] Under Section 8A of the *Water Management Act 1999*, Part 8A (*Safety of Dams*) Section 165A applies to dams with capacities equal to or more than one megalitre, and Section 165F requires the relevant authority (ie Southern Midlands Council) to refer an application for such a dam to the Minister. The Minister in turn may impose terms and conditions relating to dam safety which must be included in the permit condition issued by Council.

[16] Fresh water is pumped to the facility from off-site sources (eg from farm dams on *Somerton,* by agreement with the landowner) for use for vehicle washdown, dam top up, staff ablutions, and irrigation of stockpiles and windrows..

[17] The pump out trigger is nominally set at about 15 – 20% of full dam capacity.

[18] Compost Kings is investigating available aerators, including floating solar-powered versions.

- Vehicle washdown is estimated to use up to approximately 75 – 100L/vehicle, or up to about 4kL/week.
- Staff ablutions are estimated to require 200L/week.
- Water will be obtained from Dam 2 as required for irrigation of windrows and stockpiles, watering/dust suppression on hardstand areas within the facility, and on the access road across the site from Lovely Banks Road, and
- At least 10kL water will be retained at all times in tanks (and a water truck) for firefighting.

2.2.6.2 Water sources

Sources of water used at the facility will include: fresh water, stormwater, and leachate.

Fresh water

Proposed fresh water supplies include:

- an on-site limited supply from the small waterhole (Waterhole A) immediately north of the facility (Figure 7),
- off-site water trucked in by contractors, and
- off-site water from neighbouring properties[19].

The water will be stored on-site in the dams, and in two 24kL poly tanks (Figure 7).

Stormwater

Rain of sufficient duration and/or intensity falling within the facility will report to Dams 1 and 2. The dams are sized (and levels will be managed on a daily basis) to accommodate at least 1:20 AEP rainfall events (see Section 4.3.6 and Section 4.3.8.1). Water only from Dam 2 will be recycled back to the mixing area, windrows, and finished compost stockpile.

Leachate

Leachate from the mixing area and windrows is expected to be minimal except during and after unusually high rainfall events of sufficient duration and/or intensity, when leachate will mix with stormwater and report to Dam 1.

2.2.7 Compost production capacity and rates

Delivery of raw materials to the facility will be limited to that required – up to about 14,000tpa depending on material types and density – to produce up to 10,000tpa of compost (Table 2).

2.2.8 Operating times and opening hours

The site and facility will operate from 7am – 5pm five days a week, but not on weekends or public holidays. After-hours emergency access for waste deliveries can be arranged subject to receipt by Compost of prior, in-writing approval from EPA[20].

[19] Water availability from dams on *Redside* and *Somerton* is confirmed, and discussions are planned with the owner of *Woodlands Run* and/or *Lovely Banks*.

[20] Emergency waste deliveries will only be accepted if the facility is capable of handling the material in an appropriate manner which does not compromise composting operations.

2.2.9 Use of final product, and ongoing trials

It is proposed that all compost produced by Compost Kings will be used as a pasture enhancer on *Somerton* and other properties in similar ownership. It is also expected that in time additional customers will be local and district agriculturists, who will also use the product for pasture improvement, replacing some or most other commercial fertilisers.

Section 1.6.6 briefly lists proposed compost testing by Compost Kings. It is also intended to continue trials of compost application to pasture on *Somerton*, following on from the successful trial in 2019 [Appendix 1; Hancl (2021)][21].

2.2.10 Traffic movements, types and volumes

A limited traffic count at the site indicates traffic use on Lovely Banks Road at up to approximately 20 to 30 vehicles per day with 40% as heavy vehicles (Appendix 2). The estimated types and volumes of traffic entering and leaving the facility will be:

Light vehicles (staff, visitors)	40 two-way (ie 80) movements per week
Rigid trucks	10 two-way(ie 20) movements per week
Semi-trailers	20 two-way (ie 40) movements per week
	Total 70 two-way (ie 140) per week
	i.e. average 14 two-way (ie 28) vehicle movements per day

2.2.11 Commissioning steps

No formal commissioning steps are required. Construction will comprise, in order,

- fencing the site
- constructing the access road and entrance off Lovely Banks Road,
- simultaneous stripping of topsoil in the facility and formation of the earthen perimeter wall,
- simultaneous compacting of the clay base of the hardstand area, and compacting the hardstand cover,
- construction and commissioning of Dams 1 and 2 in accord with regulatory requirements[22]
- construction of the vehicle washdown area,
- installation of the weather station and all monitoring equipment, and
- erecting the site office and staff facilities, and associated computer systems incorporating the Environmental Management System.

[21] In the 2019 trial, compost produced by Seaton Waterfield was applied at the rate of 3t/ha and incorporated into the soils on two paddocks (called Pivot #1 and Pivot #2) on Justin Jones' farm *Follies*. Both paddocks had light sandy soils. Subsequent to compost application, Pivot #1 was sown to lucerne, and Pivot #2 to barley. On Pivot #1, the natural decline in soil organic matter was arrested. On Pivot #2, the barley crop was visually greener where the compost had been applied.

[22] Including but not restricted to DPIPWE (2015a) or DPIPWE (2105b) depending on the dam risk levels indicated by Southern Midlands Council.

2.3 Project rationale and alternatives

2.3.1 Site selection

Site selection was based on the following criteria:

- Distance from Hobart,
- Length and condition of road access from state highways,
- Distance from potentially sensitive users (principally residential houses),
- Land availability and degree of landowner support,
- Minimal site clearance requirement,
- Distance from significant watercourses, and
- Availability of water supply.

The *Somerton* site off Lovely Banks Road scored favourably in all these aspects – and in particular with respect to significant landowner support (on-site composting trials; intention to take all or most of the product).

2.3.2 Alternative sites considered

One other location closer to Hobart, which shared similar attributes to the *Somerton* site, was seriously considered. Preliminary and follow-up discussions were held with the landowner. The early level of support from the landowner was not continued, and further consideration of the site was abandoned.

2.3.3 Alternative composting techniques

Closed (including in-vessel) composting is regarded as best-practice composting for most types of feedstock including high-odour, high-risk materials. Advantages include rapid waste degradation, effective pasteurization of pathogens, weeds, etc, control and recycling of leachate, maturation of product in windrows with reduced odour generation.

However, as a start-up operation, closed composting was considered by Compost Kings as prohibitively expensive. Accordingly, this EIS proposes only low- to medium odour feedstock for windrowing.

Compost Kings also intends to investigate different windrow-composting practices, and will be collaborating in testing and research with agricultural consultants. Support for relevant research topics will also be provided to Tertiary or similar-level students interested in furthering composting science in Tasmania.

2.4 Consultation about the Compost Kings proposal

2.4.1 Current consultation

2.4.1.1 Consultation with regulators

In addition to public consultation in June 2021, Compost Kings attended:

- an on-site meeting with EPA representatives and SMC on 13 November 2020,

- a meeting in Hobart on 11 March 2021 with EPA and odour consultants *Assured Environmental* to review odour methodology,
- a meeting in Hobart with SMC and *Gray Planning* on 9 May 2021 to discuss planning issues,
- a meeting in Hobart with EPA on 9 March 2023 to review a draft of the then-current document,
- a meeting (with Southern Midlands Council) in Hobart with EPA on 12 September 2023 to review a draft of the then-current document, and
- a meeting in Hobart with EPA on 4 October 2023 to review a draft of the then-current water balance modelling,
- a meeting in Hobart with EPA on 12 September 2024 to review Revision 5 of the EIS, and
- a meeting in Hobart with EPA on 4 December 2024 to review odour issues.

In addition, an on-line meeting was held between EPA and *Assured Environmental* on 13 March 2024 to review methodologies for odour modelling and aspects of odour management.

2.4.1.2 Public consultation

Public consultation for the proposed composting facility was intentionally restricted to a small group of surrounding landowners. On Friday 4 June 2021, proponent Seaton Waterfield hand-delivered to each landowner a letter of invitation (and information brochure) to a consultative meeting.

The invitation letters and brochure are included in Appendix 3.

The consultative meeting was held on-site at the proposed facility on *Somerton* on Saturday 19 June at 10am. The meeting was addressed by Bill Cromer (consultant geologist and author of this EIS), consultant planner Danielle Gray (planning facilitator for the proposal and author of the planning review in Appendix 4), and the proponent, Seaton Waterfield. The attending property owners were:

- Mr. Justin Jones (*Somerton; lessee of Charlton Park*)
- Mr. Adam Jones (*Redside*)
- Ms. Jill Copping (*Charlton Park*)
- Mr. Wayne Carnes (*Tassie Concrete Tanks*)

Mr. Andrew McShane (*Woodlands Run; Lovely Banks)* was unable to attend.

At the meeting the main environmental issues raised by EPA (2020) and others were discussed, and attendees' comments were received and considered. It was noted that Compost Kings would keep attendees informed of developments.

Subsequently on 29 June 2021 a draft summary of the meeting was circulated among attendees for any comments or amendments, and then issued as a final version on 1 August 2021 (Appendix 3).

At the time of writing, two letters of support for the composting proposal have been received (copies available for EPA on request). One of the letters is from Mr. R. Jones, the owner of *Somerton*, *Redside* and neighbouring properties. The house at *Redside* is the closest of all houses to the facility, and is regarded as the most sensitive receptor for potential odours from it (Appendices 8 and 9).

2.4.2 Current and future consultation

Compost Kings is in frequent, informal contact with *Somerton's* Mr. Justin Jones and others in relation to a range of composting and operational/logistical matters, including sources of gravel for hardstand and internal road construction, and arrangements for fresh water supplies.

A community consultative meeting is planned on site at *Somerton* after responses are received from EPA to the current draft EIS.

3 THE EXISTING ENVIRONMENT

3.1 Planning aspects of the proposal

3.1.1 Use class

A compost facility is not defined as a separate Use Class in Table 6.2 of the *Tasmanian Planning Scheme*. Probably the most applicable use is:

- "recycling and waste disposal: *use of land to collect, dismantle, store, dispose of, recycle or sell used or scrap material. Examples include a recycling depot, refuse disposal site, scrap yard, vehicle wrecking yard and waste transfer station*",

or alternatively,

- "resource processing: *use of land for treating, processing or packing plant or animal resources". Examples include: "an abattoir, animal saleyard, cheese factory, fish processing, milk processing, winery, brewery, cidery, distillery, and sawmilling*".

3.1.2 Land zoning, tenure, title details and easements/covenants

Somerton and the Compost Kings site is zoned *Agriculture* in the Southern Midlands Local Provisions Schedule of the Tasmanian Planning Scheme (Gray 2024).

The land tenure is *Private Freehold*.

The title plan for the property is shown in Figure 11. There is no Schedule of Easements over the property.

3.1.3 Land use and planning history of the site

Figure 12 summarises the ownership, land use and planning history of the site.

3.1.4 Land use and ownership in the vicinity of the proposal

Land use (Figure 13) on most of the site on *Somerton* is described as *Grazing modified pastures* (Code 3.2.0), and land use in the southern portion where the facility is proposed is described as *Grazing native vegetation* (Code 2.1.0).

These two land uses, and *Grazing native cover* (Code 1.3.3 but included in Code 1.3.0 in Figure 13) makes up all of the land surrounding the proposed operations for several kilometres in all directions.

The properties surrounding *Somerton* and the proposed facility (Figure 14) are owned by five entities:

- Mr. Rodney Jones (*Redside*)
- Mr. Justin Jones (*Follies)*
- Mr. Andrew McShane (*Woodlands Run; Lovely Banks; Stockman*)
- Mr. Andrew Bailey (*Mother Lords)*
- Ms. Jill Copping (*Charlton Park; LLangollan*)

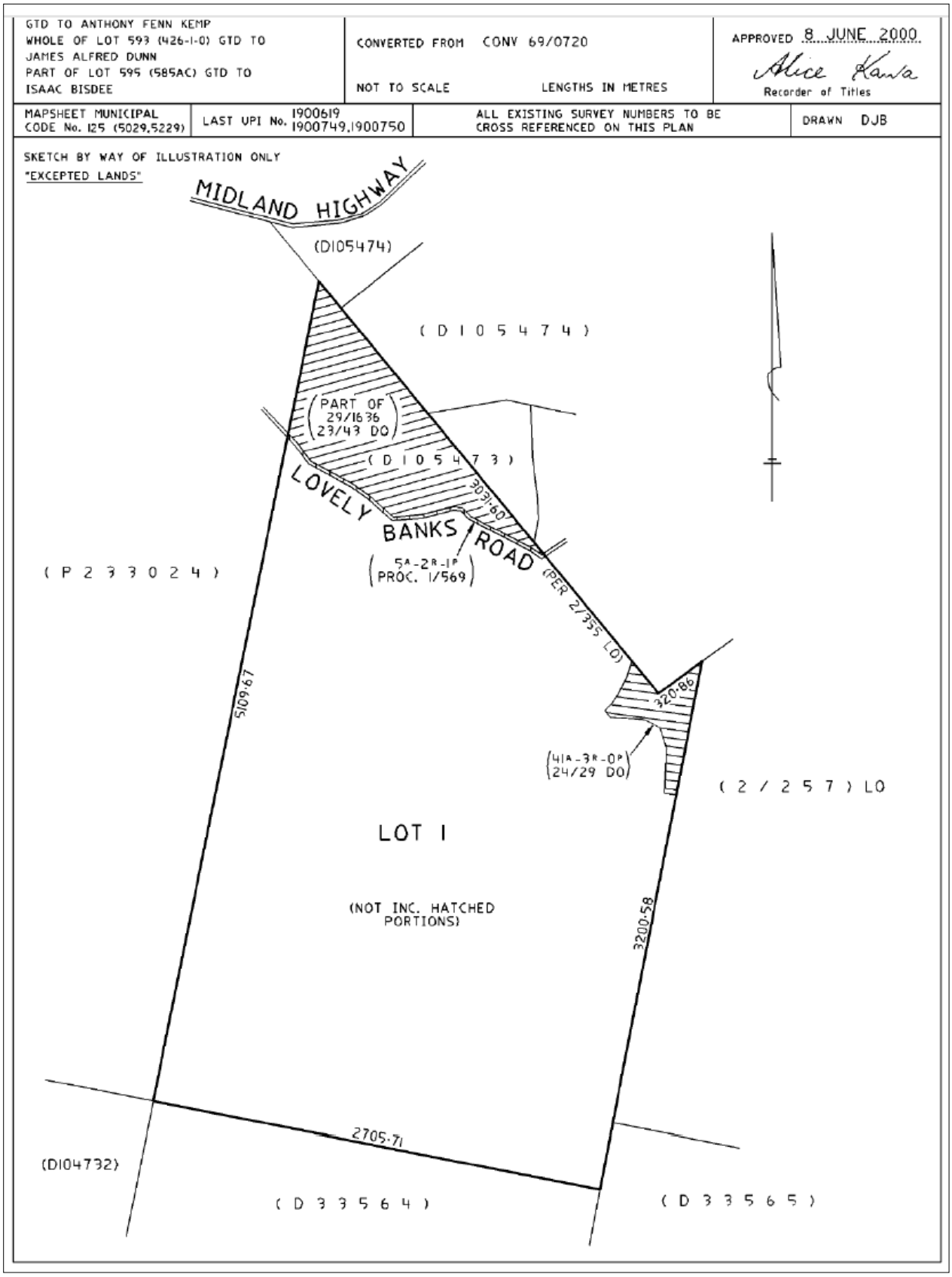


Figure 11. Title plan of *Somerton* (Lot 1).
Source: www.thelist.tas.gov.au

PREMIUM PROPERTY Information Report

PROPERTY DETAILS - LOVELY BANKS RD MELTON MOWBRAY

Property Name:	SOMERTON	
Land Use:	Primary Production - GRAZING/PASTORAL-OPEN,RUN,BUSH (valuation purposes only)	
Improvements:	FARM IMPTS	
Improvement Sizes (Top 3 by Size):	**Improvement:** OTHER IMPROVEMENTS	**Area:**
Number of Bedrooms:		
Construction Year of Main Building:		
Roof Material:		
Wall Material:		
Land Area:	898.0 hectares	
Title References:	134018/1	
Municipality:	SOUTHERN MIDLANDS View Municipality Information Report	
Title owner:	134018/1 : RODNEY CLIFFORD JONES	
Interested parties:	RODNEY CLIFFORD JONES	
Postal address: (Interested Parties)	4208 MIDLAND HWY MELTON MOWBRAY TAS 7030	

OWNERSHIP HISTORY - LOVELY BANKS RD MELTON MOWBRAY

TYPE	NAME	ADDRESS	FROM	TO
Ownership	RODNEY CLIFFORD JONES	REDSIDE 4208 MIDLAND HWY MELTON MOWBRAY TAS 7030	02/11/1993	
Ownership	ALEC WILLIAM JONES	SOMERTON LOVELY BANKS ROAD MELTON MOWBRAY TAS 7030	01/07/1982	02/11/1993

Figure 12. Land use and planning history of *Somerton* (May 2021).
Source: www.thelist.tas.gov.au and Figure 2 of Gray (2024).

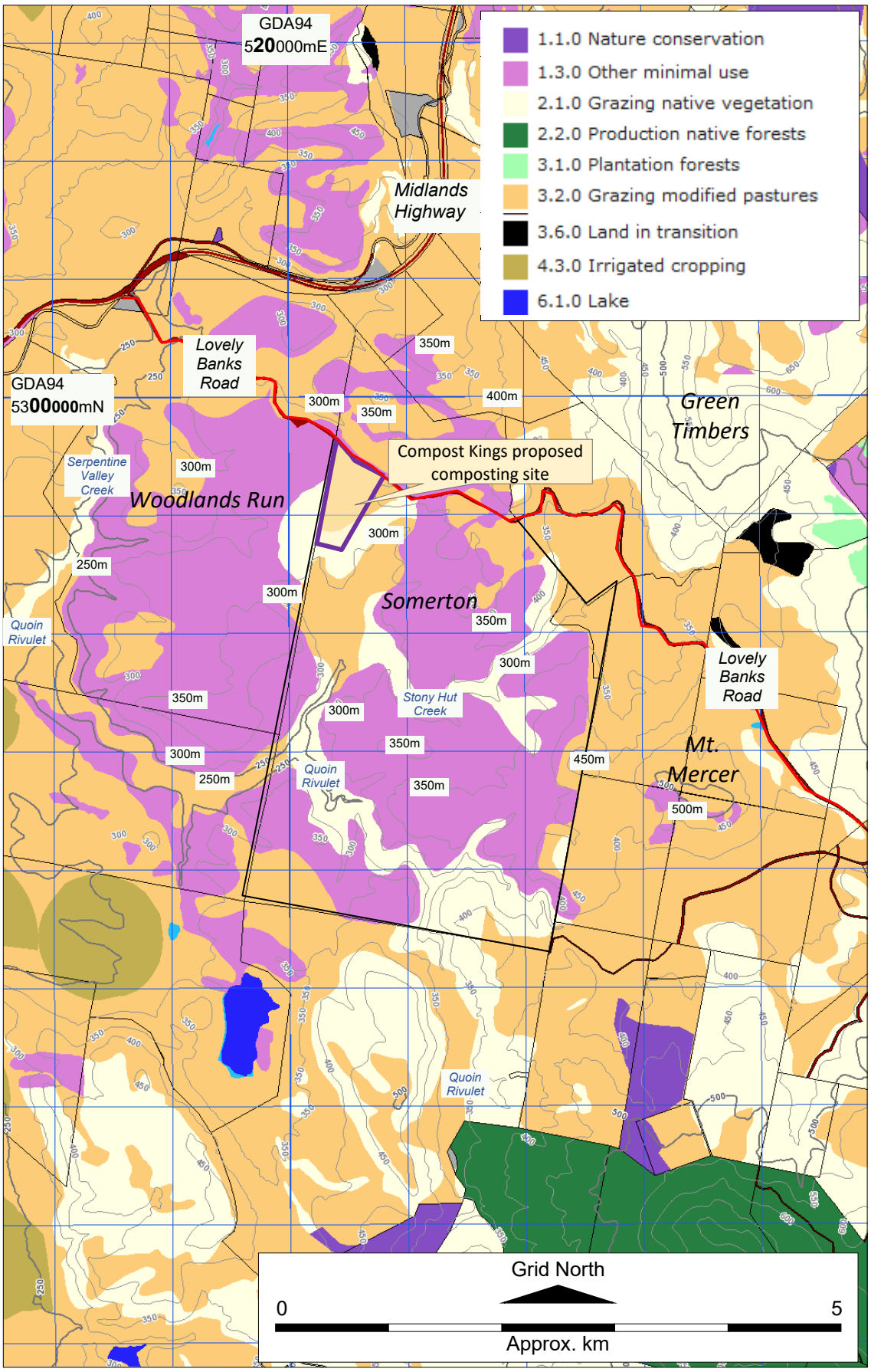


Figure 13. Land use (2019) in the vicinity of the proposed composting facility.
Source: www.thelist.tas.gov.au

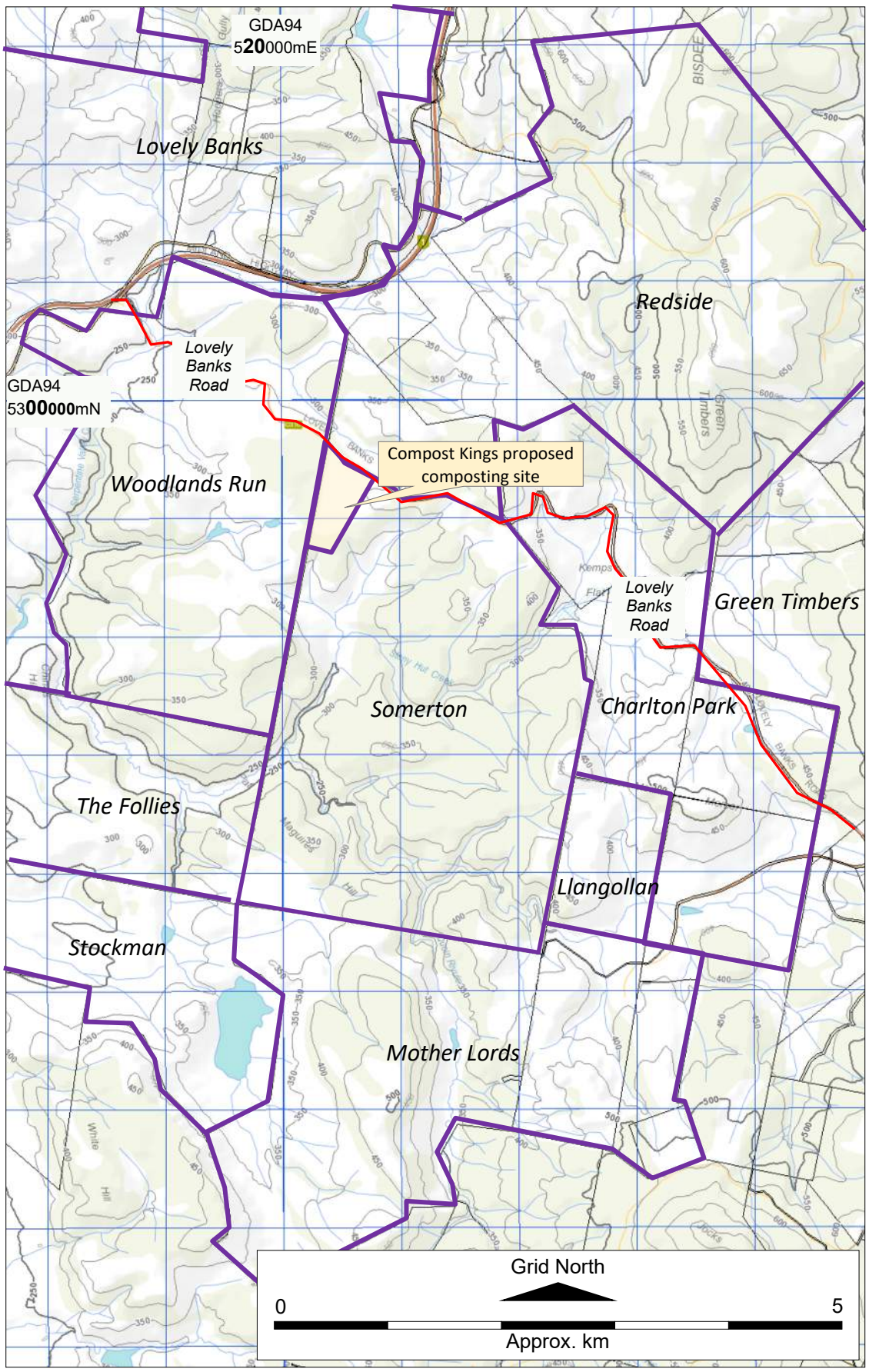


Figure 14. Ownership (2019) in the vicinity of the proposed composting facility.
Source: www.thelist.tas.gov.au

3.2 Environmental aspects of the site and environs

3.2.1 Topography and geomorphology

The district is characterised by a youthful topography dissected by numerous un-named watercourses draining to Quoin Rivulet and its tributary Serpentine Valley Creek, in the Quoin – Serpentine Valley subcatchment (Figure 15).

Relief in the district is about 400m, rising from 200 – 250m in the valley of Quoin Rivulet near Melton Mowbray, to 600 – 650m along the north-south trending Bisdee Tier, Green Timbers and Mt. Mercer a few kilometres east of the proposed composting facility.

The site of the facility is on a broad (400m wide) southwest-facing "plateau" between about 320m and 330m elevation, on a hillside segment sloping west at an average gradient of 3^0. Within about 100m south of the site boundary, the hillsides steepen to angles of 10^0 – 15^0, falling to an un-named tributary of Stony Hut Creek. However, the site is located very close to a surface water sub-subcatchment divide, so that all surface drainage is not south but westwards via an un-named tributary of Serpentine Valley Creek.

3.2.2 Climate

3.2.2.1 Annual rainfall

Rainfall has been recorded since 1908 at *Lovely Banks* on the Midlands Highway, 2.8km north-northwest of the proposed compost facility. At *Lovely Banks*,

- mean annual rainfall is 501mm, and the 95%ile annual rainfall is 722mm (Table 3).
- mean monthly rainfall (Figure 16) in the 40 – 50mm range is fairly evenly distributed during the year, and 95%ile monthly rainfall is approximately twice mean monthly rainfall and more variable (70 – 100mm).

Table 3. Rainfall and evaporation records for *Lovely Banks.*
Source: Bureau of Meteorology

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	38	35	36	43	36	42	38	39	41	49	45	49	501
Lowest	1	0	3	0	2	2	2	0	3	2	5	0	277
5th %ile	7	4	8	7	7	10	10	11	14	16	12	12	337
10th %ile	9	8	12	9	10	13	14	14	17	19	17	15	362
Median	33	26	30	39	31	33	34	33	36	45	39	42	495
90th %ile	73	78	74	83	68	81	68	75	71	89	74	96	643
95th %ile	102	95	85	101	73	92	79	86	79	101	93	102	722
Highest	132	138	132	184	177	149	122	142	100	128	202	239	888
Evaporation	193	162	124	77	50	34	28	53	87	95	166	183	1252

All numbers are millimetres

Evaporation for Jan and Feb are 2021 figures; for March-December are 2020 figures

Station: Melton Mowbray (Lovely Banks) **Number:** 94140

Opened: 1901 **Now:** Open

Lat: 42.44° S **Lon:** 147.23° E **Elevation:** 275 m

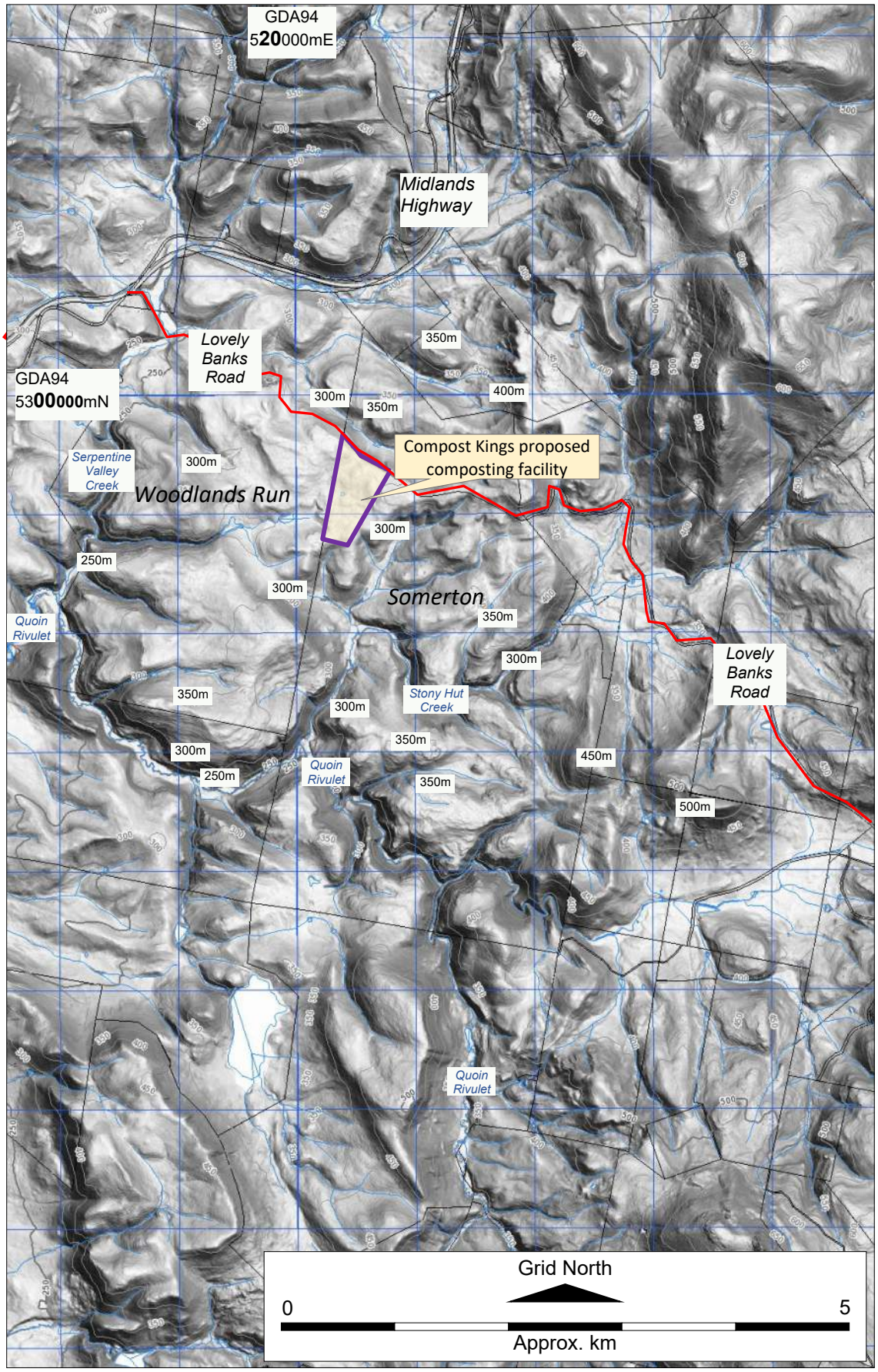


Figure 15. Topography, relief, and surface drainage (hillshading base map).
Source of base map: www.thelist.tas.gov.au

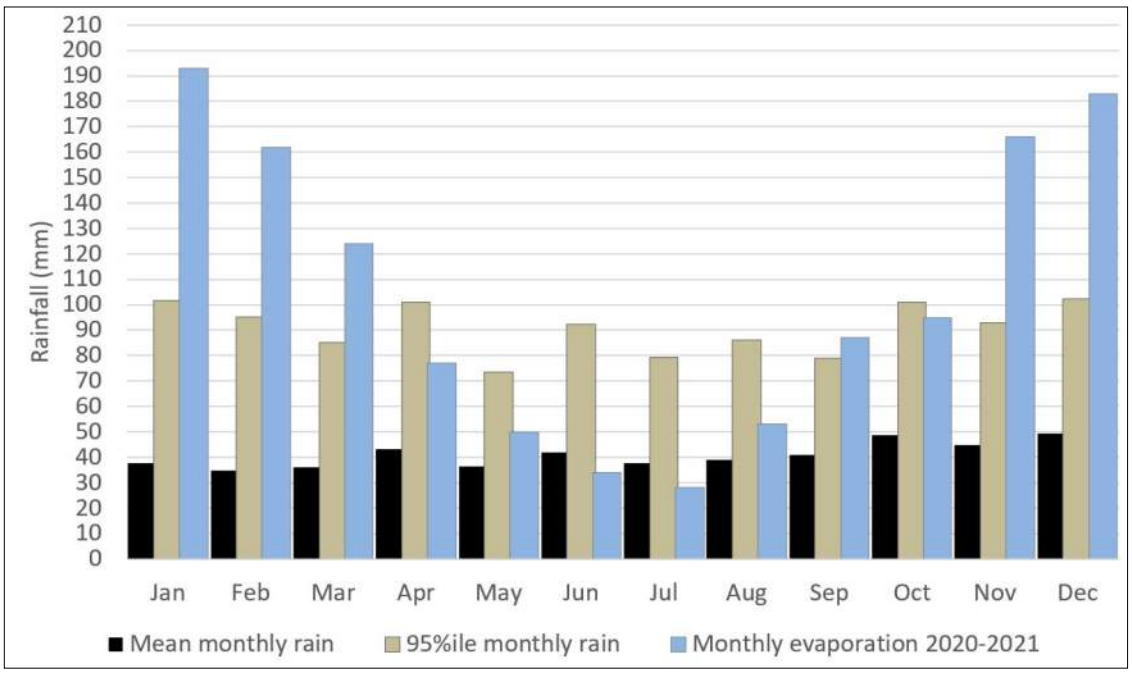


Figure 16. Mean and 95%ile monthly rainfall, and monthly evaporation at *Lovely Banks*. The evaporation figures for Jan and Feb are actual values for 2021; the figures for Mar-Dec are actual values for 2020.
Source: Bureau of Meteorology

3.2.2.2 Daily rainfall records and frequency of rain events

Table 4, and Figures 17 and 18, show that during the past 110 years:

- 73% of 40,120 daily readings (265 days per year on average) recorded no rain,
- 80% of days received 1mm/day or less of rain,
- 92% of all rain readings were no more than 5mm/day,
- rain days of more than 20mm were recorded, on average, about 3 – 4 days per year,
- rain days of more than 30mm were recorded, on average, about once a year,
- rain days of more than 50mm were recorded, on average, about once every five years, and
- the highest rainfall was 116mm in 1975 – the only event in 110 years which exceeded 100mm/day.

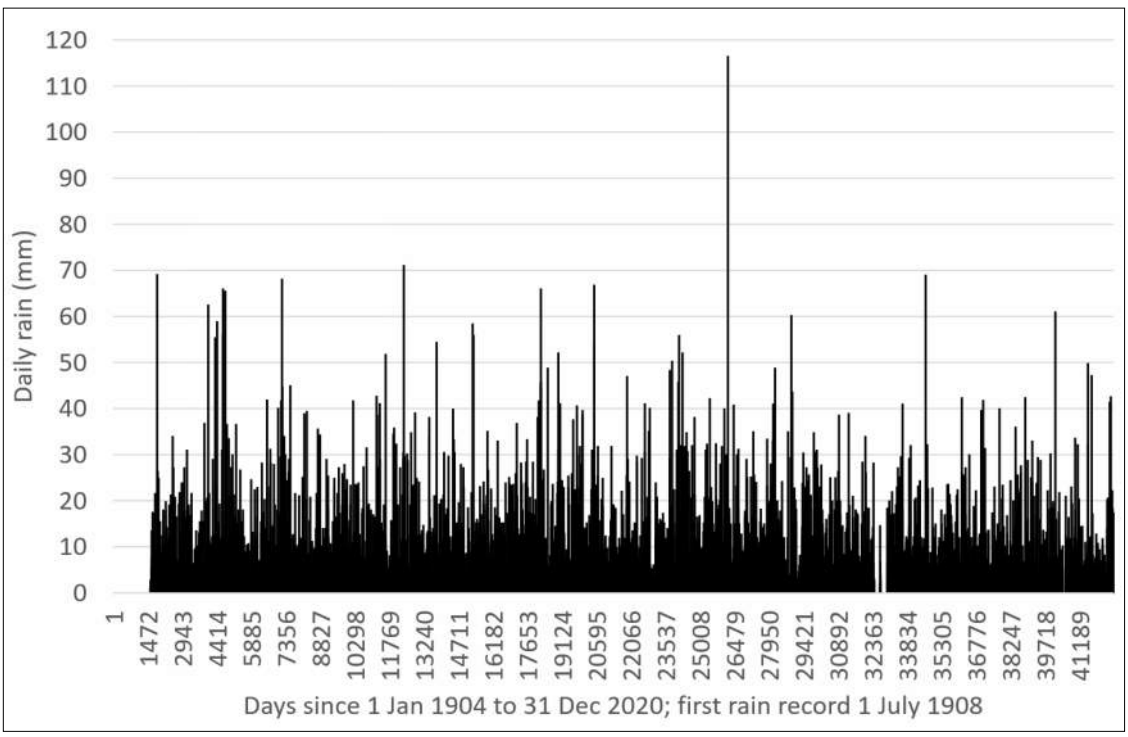


Figure 17. Daily rainfall at *Lovely Banks* since 1 July 1908. Source: Bureau of Meteorology

Table 4. Frequency of daily rain events at Lovely Banks since 1 July 1908.

Daily rainfall event (mm)	No. of days event is recorded	% of total days entered in record	Average number of days per year
0	29123	73	265
1	2877	7	26
1-2	1986	5	18
2-5	2883	7	26
5-7.5	1127	3	10
7.5-10	721	2	7
10-15	694	2	6
15-20	299	1	3
20-30	274	1	2
30-40	80	0.2	0.7
40-50	32	0.1	0.3
50-60	12	0.03	0.11
60-70	10	0.02	0.09
70-80	1	0.002	0.009
80-100	0	0.000	0.000
100-125	1	0.002	0.009

Total days in *Lovely Banks* rainfall record = 40,120 (109.9 years)

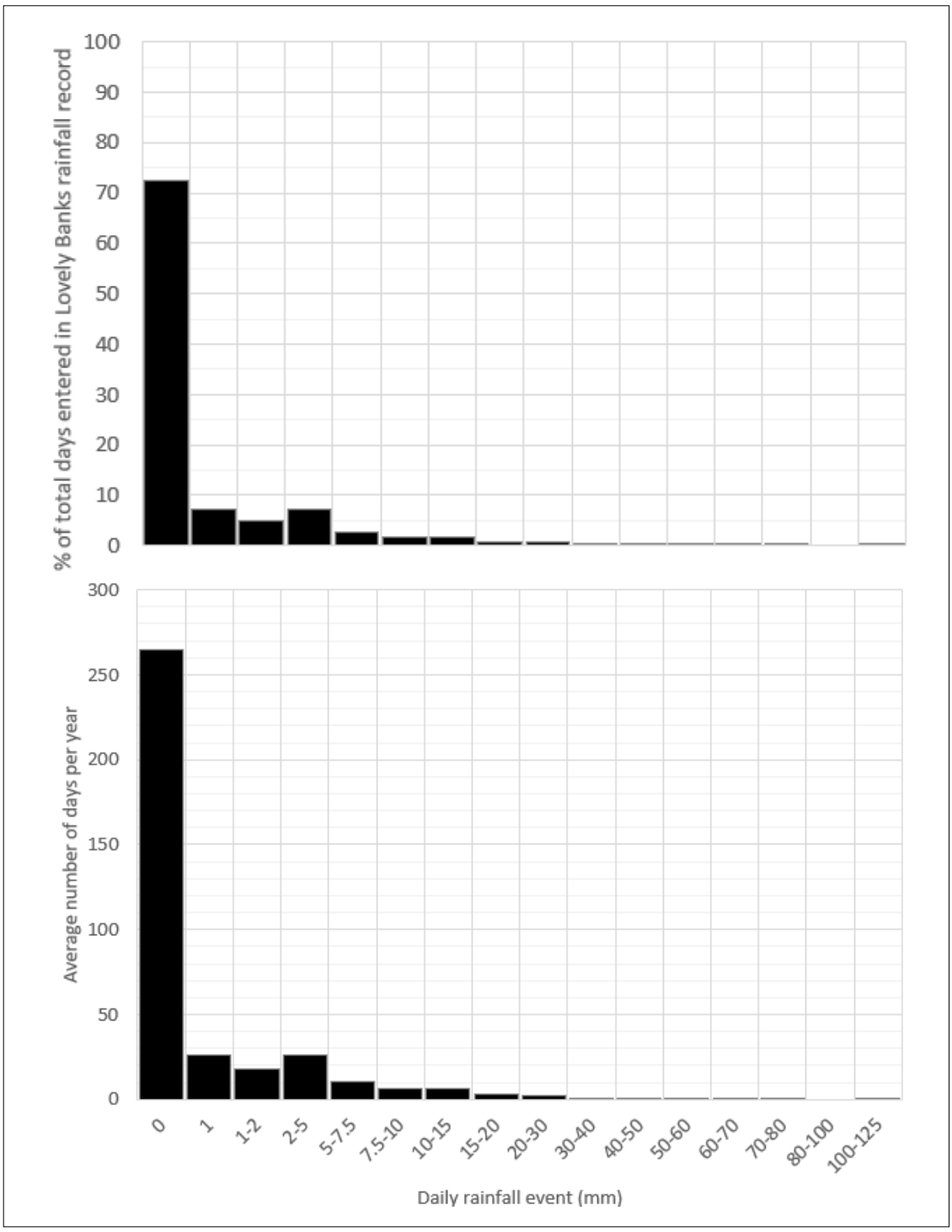


Figure 18. Frequency of daily rainfall events at *Lovely Banks* 1908 – 2020. 40,120 events are recorded. The top figure shows percentage frequency of each rainfall event category; the bottom figure shows the same data converted to average number of days per year.
Source: Table 5 this report, and Bureau of Meteorology

3.2.2.3 Annual and daily evaporation[23]

No mean monthly evaporation records are available for *Lovely Banks*. Daily evaporation since March 2020 (compared to mean and 95%ile rain in Figure 16) is shown separately in Figure 19.

Assuming the Jan-Feb 2021 evaporation is similar to Jan-Feb 2020, and is similar to mean monthly evaporation, annual evaporation at *Lovely Banks* totals about 1250mm. On a monthly basis (Figure 16), evaporation exceeds mean rain in all months except June and July, and exceeds 95%ile monthly rain in six months.

On a daily basis, during 2020 and early 2021, evaporation at *Lovely Banks* ranged from 0 – 1mm/day in winter (June – July) to 5 – 12mm in summer (November – January). The 30-day running average ranged from about 1mm/day in July, to 7mm in February 2021.

On these figures, evaporation on average exceeds rainfall on about 290 days per year (80% of days).

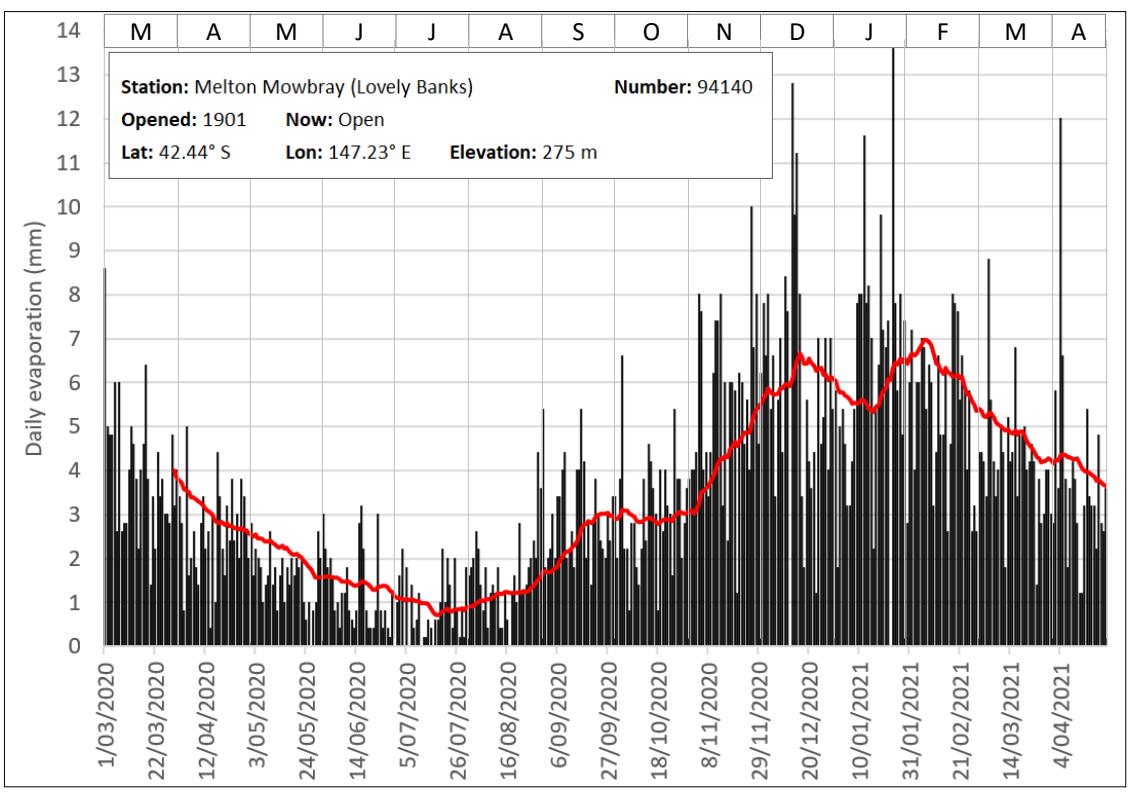


Figure 19. Daily evaporation at *Lovely Banks* for the almost-eleven months 1 March 2020 – 23 April 2021. The red curve is the 30-day running average.

3.2.2.4 Rainfall intensity-frequency-duration data

Table 5 and Figure 20 present rainfall intensity-frequency-duration data for the proposed facility.

Rainfall events at the 1:20 AEP (5%) level range from 2mm in 1 minute, through 20mm in one hour and 60mm in 12 hours, to 100mm in 48 hours.

[23] Evaporation x relevant crop factor = evapotranspiration. The crop factor may be less than or greater than unity. But about 50% of the facility will be covered by hardstand, and the windrows will be internally warm (with elevated evaporation),. Accordingly, it is considered that evaporation is the more appropriate factor to use for the facility.

Table 5. Rainfall intensity-frequency-duration data for the proposed composting facility.

Rainfall depth (mm) for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).

	Annual Exceedance Probability (AEP)						
Duration	**63.2%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
1 min	0.97	1.1	1.54	1.87	2.21	2.7	3.11
2 min	1.7	1.91	2.61	3.09	3.57	4.17	4.63
3 min	2.24	2.53	3.47	4.13	4.79	5.65	6.32
4 min	2.68	3.03	4.18	5.01	5.85	6.99	7.9
5 min	3.05	3.45	4.8	5.78	6.79	8.19	9.33
10 min	4.4	5	7.04	8.58	10.2	12.6	14.6
15 min	5.36	6.09	8.6	10.5	12.5	15.5	18
20 min	6.13	6.97	9.82	12	14.2	17.6	20.4
25 min	6.8	7.72	10.8	13.2	15.7	19.2	22.2
30 min	7.38	8.38	11.7	14.2	16.8	20.6	23.7
45 min	8.86	10	13.9	16.8	19.7	23.8	27.1
1 hour	10.1	11.4	15.7	18.8	22.0	26.2	29.6
1.5 hour	12.1	13.6	18.6	22.1	25.5	30.1	33.7
2 hour	13.7	15.5	21	24.8	28.5	33.3	37
3 hour	16.4	18.5	24.9	29.2	33.4	38.7	42.8
4.5 hour	19.5	22	29.6	34.6	39.3	45.6	50.3
6 hour	22	24.8	33.4	39	44.4	51.5	56.8
9 hour	26	29.3	39.5	46.2	52.6	61.5	68.2
12 hour	29	32.7	44.3	52	59.4	69.8	77.8
18 hour	33.4	37.8	51.6	60.9	70.1	83.2	93.5
24 hour	36.7	41.6	57	67.7	78.3	93.5	106
30 hour	39.2	44.5	61.3	73.1	84.8	102	115
36 hour	41.3	46.8	64.8	77.4	90.1	108	123
48 hour	44.4	50.4	70	84	98.3	118	135
72 hour	48.5	55.1	76.8	92.4	108	130	148
96 hour	51.3	58.2	80.8	97.3	114	137	154
120 hour	53.3	60.3	83.6	100	118	140	158
144 hour	54.9	62.1	85.5	102	120	142	159
168 hour	56.3	63.5	87	104	121	143	160

Notes
Issued: 06 May 2021
The 50% AEP IFD **does not** correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.
* The 20% AEP IFD **does not** correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 year ARI.

3.2.2.5 Winds

Wind records form Tunnack (Figure 21) 18km east of the Compost Kings site may not be fully representative of local conditions for composting operations at the facility, but they are the closest available. Predominant wind directions on an annual basis are from the north and west, at similar velocities. The same patterns persist seasonally, but winter winds are of lesser intensity.

Low (<2.8m/s) wind speeds occur approximately 30% of the time in summer, and up to 50% of the time in winter, indicating relatively poor atmospheric dispersion conditions for the site.

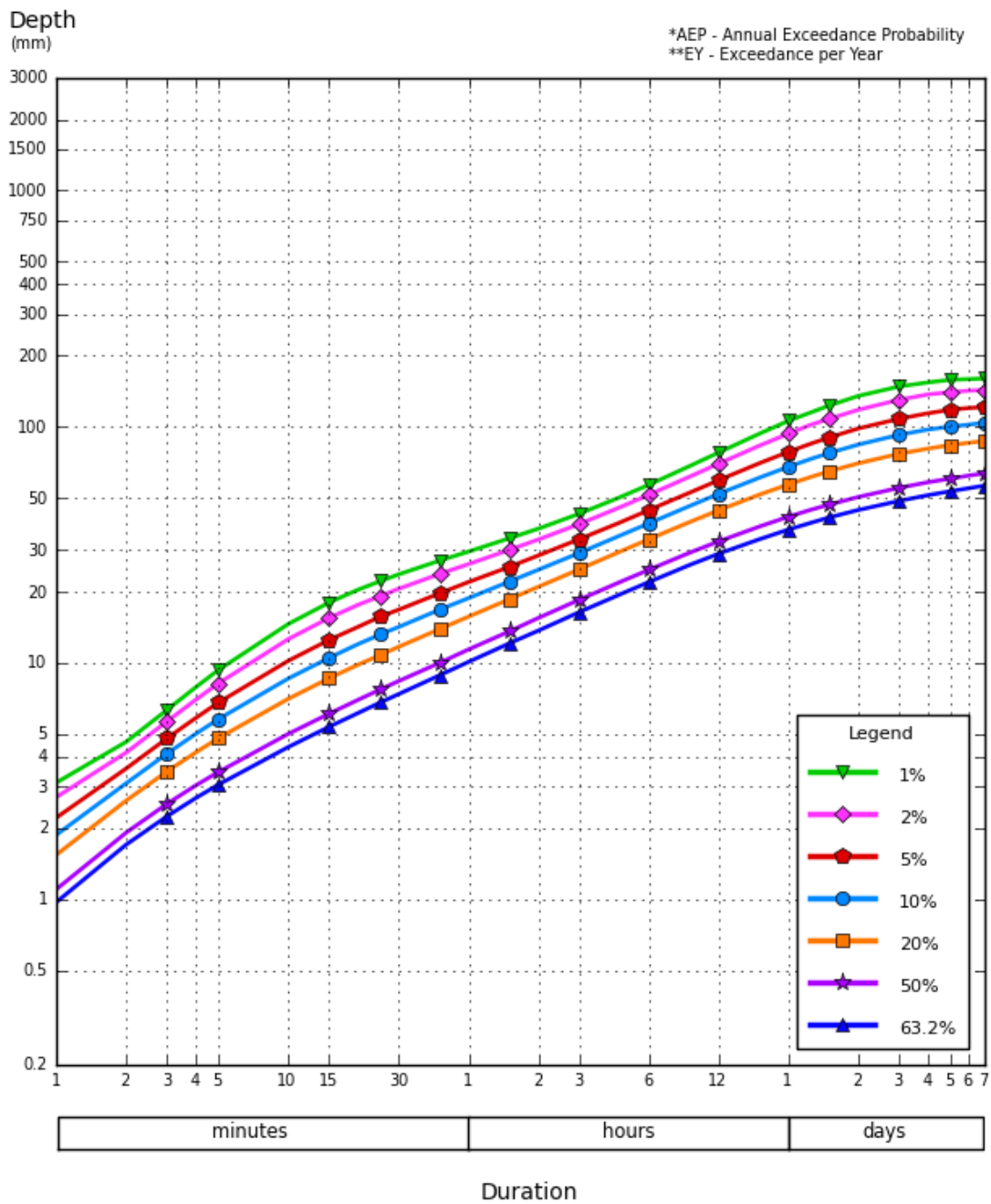


Figure 20. Rainfall intensity-frequency-duration curves for the proposed composting facility.
Source: Bureau of Meteorology

3.2.3 Surface drainage

3.2.3.1 Main watercourses and subcatchments

The proposed composting facility lies within the Jordan Catchment, covering about 1,250km^2.

Within the Jordan Catchment, the Quoin – Serpentine Valley Subcatchment (Figure 22) includes the site and composting facility, and extends over about 111km^2. Within it, the main watercourses are Quoin Rivulet and its tributaries Serpentine Valley Creek and Stony Hut Creek. Quoin Rivulet rises at Quoin Mountain (at the southern extremity of the Subcatchment), and flows northwest and then west for about 17km, joining the Jordan River about 3km south of Melton Mowbray.

Most watercourses are dry for much of the year under most rainfall conditions.

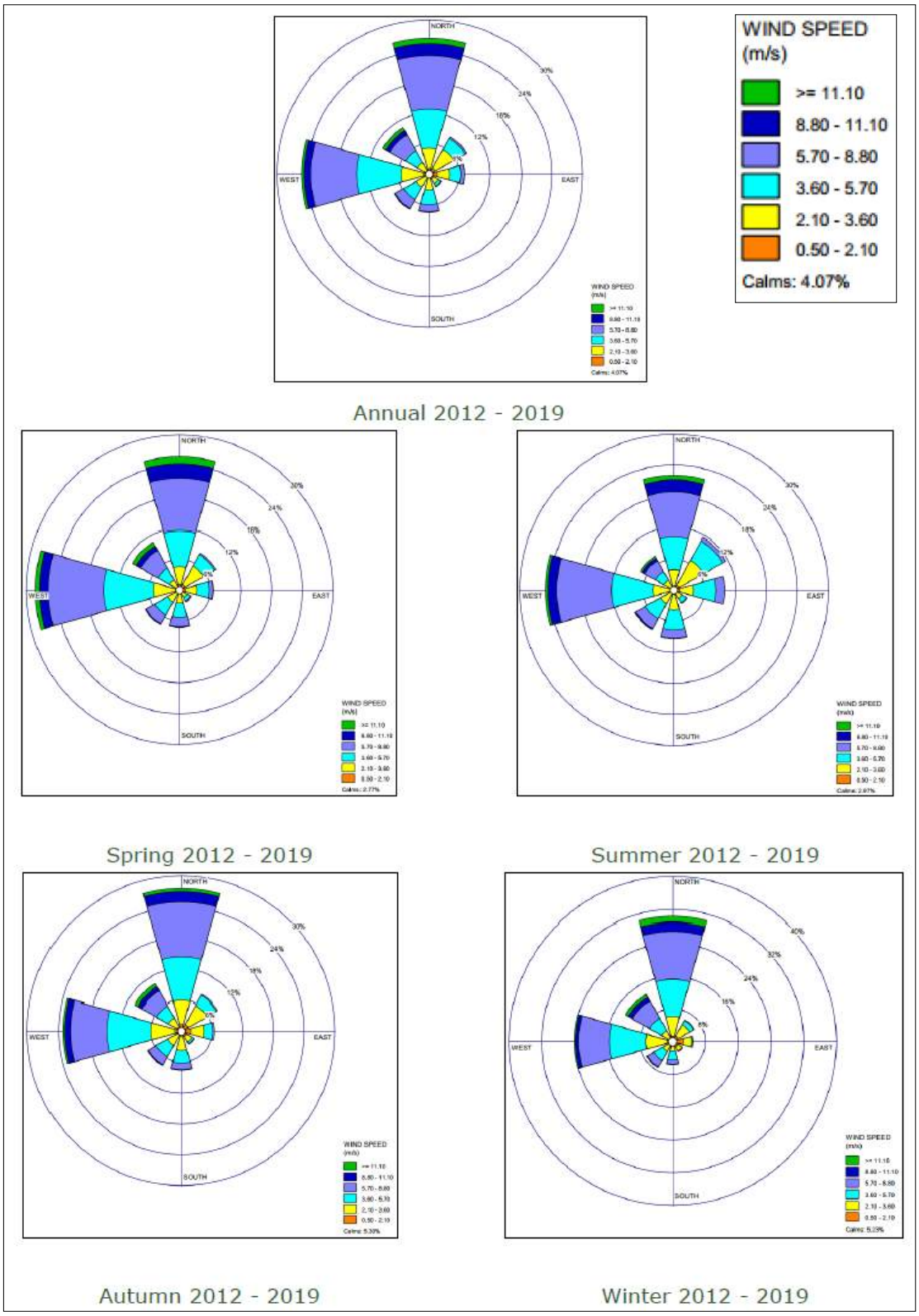


Figure 21. Annual and seasonal wind roses from the Tunnack Fire Station, 18km east of the facility, for the period 2012 – 2019.
Source: Figure 27 of Appendix 8 (with enlarged key added).

3.2.3.2 Minor watercourses and sub-subcatchments

With the exception of Stony Hut Creek about a kilometre south of the site, all other minor creeks are un-named. They drain sub-subcatchments ranging in size from 5 – 120ha (Figure 23).

The site and facility are almost entirely located within a 60ha sub-subcatchment (here called the Waterfield Sub-subcatchment) with no established watercourses. A shallow depression in the southwestern corner of the site develops downstream on *Woodlands Run* to an un-named minor tributary of Serpentine Valley Creek.

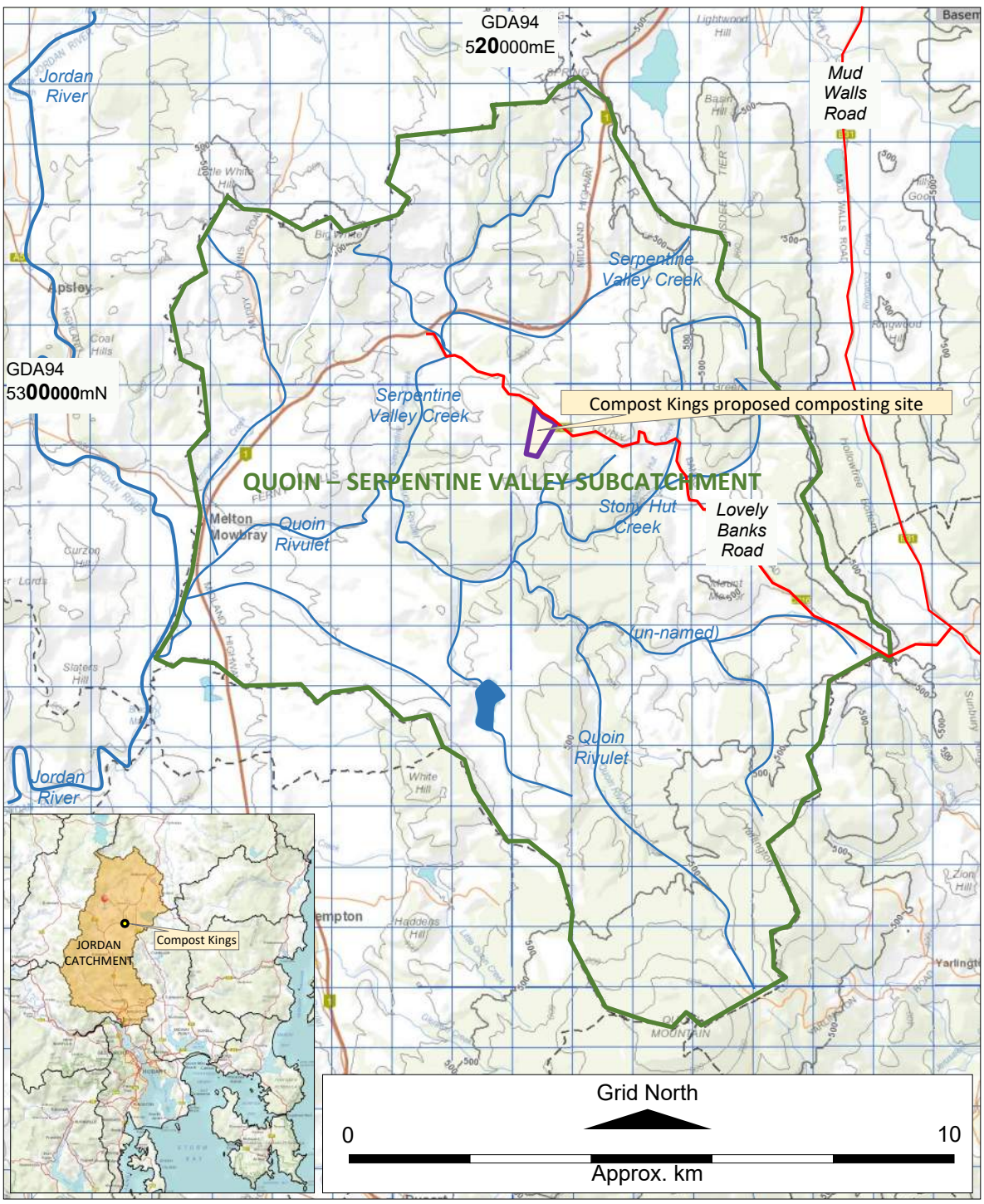


Figure 22. The proposed composting site is in the Quoin – Serpentine Valley Subcatchment (110km^2) within the Jordan Catchment (1,250km^2). Source: www.thelist.tas.gov.au

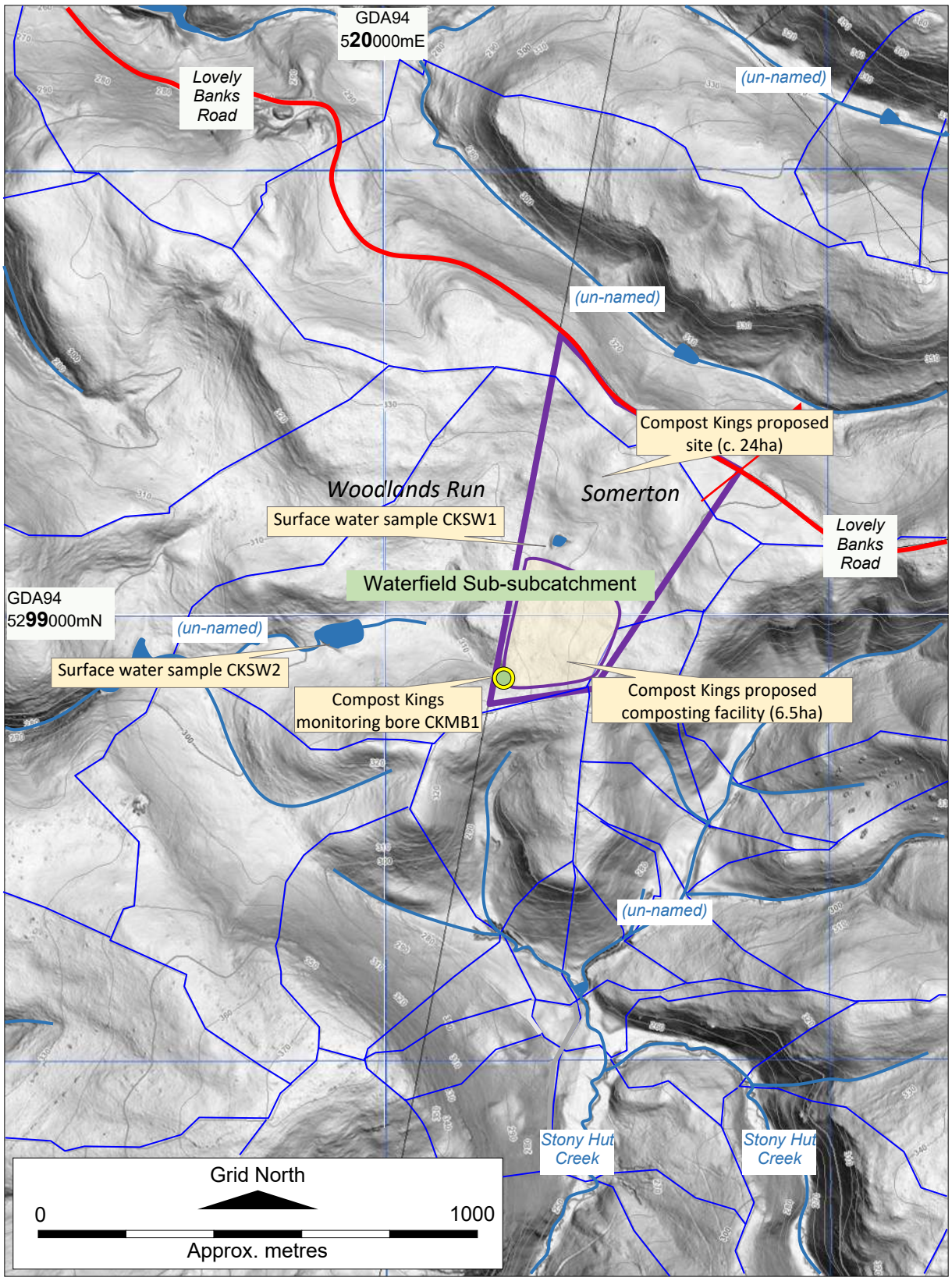


Figure 23. Sub-subcatchments (enclosed by thin blue straight line segments, delineating "CFEV River section subcatchments") in part of the Quoin – Serpentine Valley Subcatchment. The proposed compost facility is in a sub-subcatchment of about 60ha (here called the Waterfield Sub-subcatchment). Also shown are surface water sampling points CKSW1 and CKSW2, and groundwater monitoring bore CKMB1.
Source for hillshading and sub-subcatchments: www.thelsit.tas.gov.au.

3.2.4 Natural values, flora and fauna

3.2.4.1 Natural values, processes and site vulnerability

A desk-top analysis (NCH, 2015) including a review of published terrestrial natural values maps of the district showed (Figure 24):

- no threatened fauna or flora points, or weeds watchlist points, within about 2km of the proposed composting site,
- the nearest raptor nest is about 2km away to the east southeast, and
- no sites or areas of geoconservation value have been recognised in the district.

On these bases, it was concluded that the scale of the proposed composting operations and associated activities would present acceptably low risks to natural values.

3.2.4.2 Initial natural values field survey

In June 2021 consultants North Barker were commissioned by Compost Kings to undertake a preliminary field survey of the proposed site and facility. Relevant observations and recommendations from their initial natural values summary report were:

Flora

In relation to flora at the site and facility:

- about half the site (not including the proposed facility) is GCL (Lowland Grassland Complex), described as "Very disturbed grassland with threatened species unlikely…",
- about 1.5ha of DAS *Eucalyptus amygdalina* forest and woodland borders Lovely Banks Road in the northern corner of the site,
- most of the balance, extending as a 50m wide strip along the *Somerton – Woodlands Run* boundary and about 6ha within and surrounding the proposed facility, is also GCL but described as "Better quality grassland with higher potential for threatened species". Within this latter GCL, and mostly contained within the facility, is an area of GSL (Lowland grassy sedgeland), and
- within the facility, over an area of about 1m^2, are two individual shortleaf beardheath (*Leucopogon virgatus* var. *brevifolius)* plants. This plant is listed as Rare under the *Threatened Species Protection Act 1995* (TSPA). A permit is required to damage or remove the plants.

Fauna

In relation to fauna at the site,

- about 150m north of the facility, near the *Somerton – Woodlands Run* boundary, a single *Eucalyptus pauciflora* tree has potential hollows for Tasmanian masked owl (threatened under TSPA/EPBCA), but North Barker recommend no design considerations in relation to the project,
- several *Eucalyptus ovata* trees more than 200m north of the facility offer foraging potential for swift parrot (threatened under TSPA/EPBCA), but again, North Barker recommend no design considerations in relation to the project, and

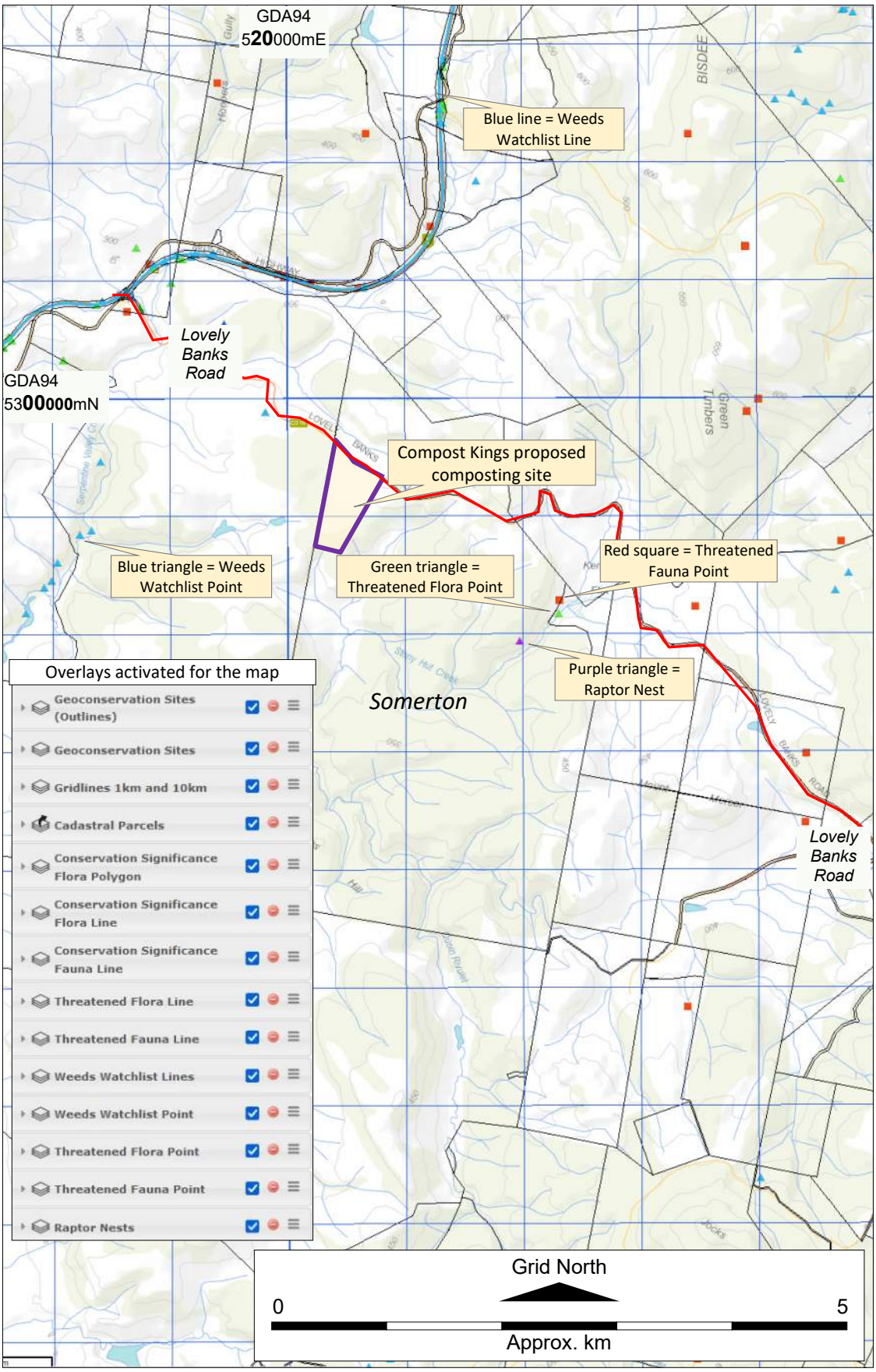


Figure 24. Published natural values in the vicinity of the proposed composting facility.
Source: www.thelist.tas.gov.au

- the GCL in better condition (including the proposed facility) is potential habitat for tussock skink (vulnerable under TSPA).

A spring-time follow-up survey was recommended to further investigate threatened flora and fauna.

3.2.4.3 Follow-up natural values field survey

In November 2021 consultants North Barker conducted the recommended follow-up spring field survey of the proposed site and facility, and adjacent areas on *Somerton* and *Woodlands Run*. Relevant observations and recommendations from this work were:

- in addition to the two shortleaf beardheath (*Leucopogon virgatus* var*. brevifolius)* plants detected in the winter survey inside the proposed composting facility, four other specimens were observed in the vicinity, and a further 300 were noted (mostly in one cluster) on *Woodlands Run* about 400m north of the proposed facility,
- four individual *Scleranthus* fasciculatus (spreading knawel; TPSA vulnerable) plants were detected inside the facility with a further 74 outside, and
- no tussock skinks were caught during a targeted survey.

3.2.4.4 Natural Values Assessment Report

In August 2022 consultants North Barker consolidated their previous surveys into a Natural Values Assessment (NVA) Report (North Barker, 2022; Appendix 5) which also reviewed the effect of increasing the size of the facility proposed (in 2022) by Compost Kings from the original 3.2ha to 6.5ha (the area of the enclosing site remained unchanged at 23ha).

To manage the natural values of the site and facility recognised in the two previous reports, the NVA Report made several recommendations which have been accepted by Compost Kings and incorporated into this EIS (Section 6.4).

3.2.5 Geology

3.2.5.1 Regional setting

Cromer (Appendix 7; 2022, page 6) states: "*The proposed composting Facility and the broader district lies wholly within the Tasmania Basin, a large area of midland and southeastern Tasmania occupied by Permian marine and Triassic non-marine sedimentary rocks, and intruded by sheets of Jurassic-age dolerite (*Figure 25, this EIS*). The sedimentary rocks include mostly sub-horizontal (almost flat-lying) sandstone, siltstone, and mudstone. Normal faulting is common*."

3.2.5.2 Published geology at and near the site

Cromer (Appendix 6; 2024a ,page 7) states: "*The published geology at and near the proposed composting facility includes Triassic sandstone, siltstone and mudstone, but the dominant rock type beneath the Facility is shown as fine – medium grained laminated sandstone (symbol TRsq* in Figure 26; this EIS*). The outcrop patterns of an adjacent mappable sandstone unit (the dotted black lines in Figure 8) are subparallel to contours, indicating the sedimentary rocks in the area are essentially flat-lying*."

There are no mapped faults within a kilometre or more of the facility.

3.2.5.3 Observed geology at and near the facility

Outcrops

Subhorizontal subcrops and outcrops of medium-grained, light yellowish grey sandstone are scattered sporadically over the site of the proposed facility (Plate 1). The rock is sparsely jointed and slightly weathered (ie high strength). It dips roughly parallel to the slope of the land (approximately west), and the hillside feature is interpreted as a cuesta[24].

Similar subhorizontal sandstone forms small cliffs a few hundred metres south of the facility.

From drilling groundwater monitoring bore CKMB1

Monitoring bore CKMB1 (Cromer 2022) was drilled to 54.4m below ground (mbg) in December 2020 at the southwestern corner of the proposed facility (Figures 26 and 27). Beneath a metre of soil, sandstone bedrock occurred in the intervals 1 – 2mbg and 9.5 – 10.5mbg, but the rest of the hole consisted of siltstone and silty mudstone.

From test pitting

Geotechnical site investigations including excavator test pitting were conducted at and near the facility in August 2020 (Cromer, 2024a; Appendix 6 this report). Thirteen test pits were dug (Figure 27)[25].

The test pitting showed mostly a duplex soil profile between the sporadic bedrock subcrops and outcrops. The profile comprises a dark-coloured sandy topsoil (A horizon) over a lighter-coloured high plasticity clay subsoil (B horizon), over light-coloured highly to extremely weathered sandstone, siltstone or mudstone bedrock (Plates 2 and 3). The 7t excavator with a 1.25m wide mud bucket refused or was close to refusal at depths in the 0.3 – 1.2m range in all but one test pit.

3.2.6 Soils

3.2.6.1 Soil texture and thickness

Cromer (2024a; Appendix 6) reports:

"The profile comprises a dark-coloured sandy topsoil (SP; A1 and A2 horizons; Layer 1 in Table 1; Appendix 5) over a lighter-coloured high plasticity sandy clay subsoil (CH, CL; B horizon; Layer 2), over a light-coloured extremely weathered sandstone (CL; Layer 3), siltstone or mudstone (CL; Layer 4) bedrock. The 7t excavator with a 1.25m wide mud bucket refused or was close to refusal in all but one test pit at depths in the 0.3 – 1.2m range.

The layer occurrences and thicknesses in the 10 test pits within the facility are:

- *Topsoil (Layer 1 A1 and A2 horizons): Present in all 10 test pits; 0.25 – 0.8m thick; average 0.4m;*
- *Subsoil (Layer 2 B horizon): Present in 6 of 10 test pits; 0.1 – 0.55m thick; average 0.3m;*
- *EW sandstone (Layer 3 CB horizon): Present in 6 of 10 test pits; 0.15 – 0.3m thick; average 0.3m;*
- *EW siltstone/mudstone (Layer 4 CB horizon): Present in 2 of 10 test pits; 0.3m thick in both pits"*

[24] A *cuesta* (from Spanish *cuesta* "slope") is a topographic feature with a gentle slope on one side, and a steeper slope on the other, underlain by sedimentary rocks, the dip of which is the same as the gentler slope.

[25] The locations of the August 2020 pits were determined by the then-defined footprint of the facility. Subsequently, the proposed footprint has almost doubled in size. No additional test pits have been done at the time of writing. It is expected that given the same bedrock geology, ground conditions over the increased area will be similar to those already dug, and this assumption will be investigated with additional pits dug before construction of the facility.

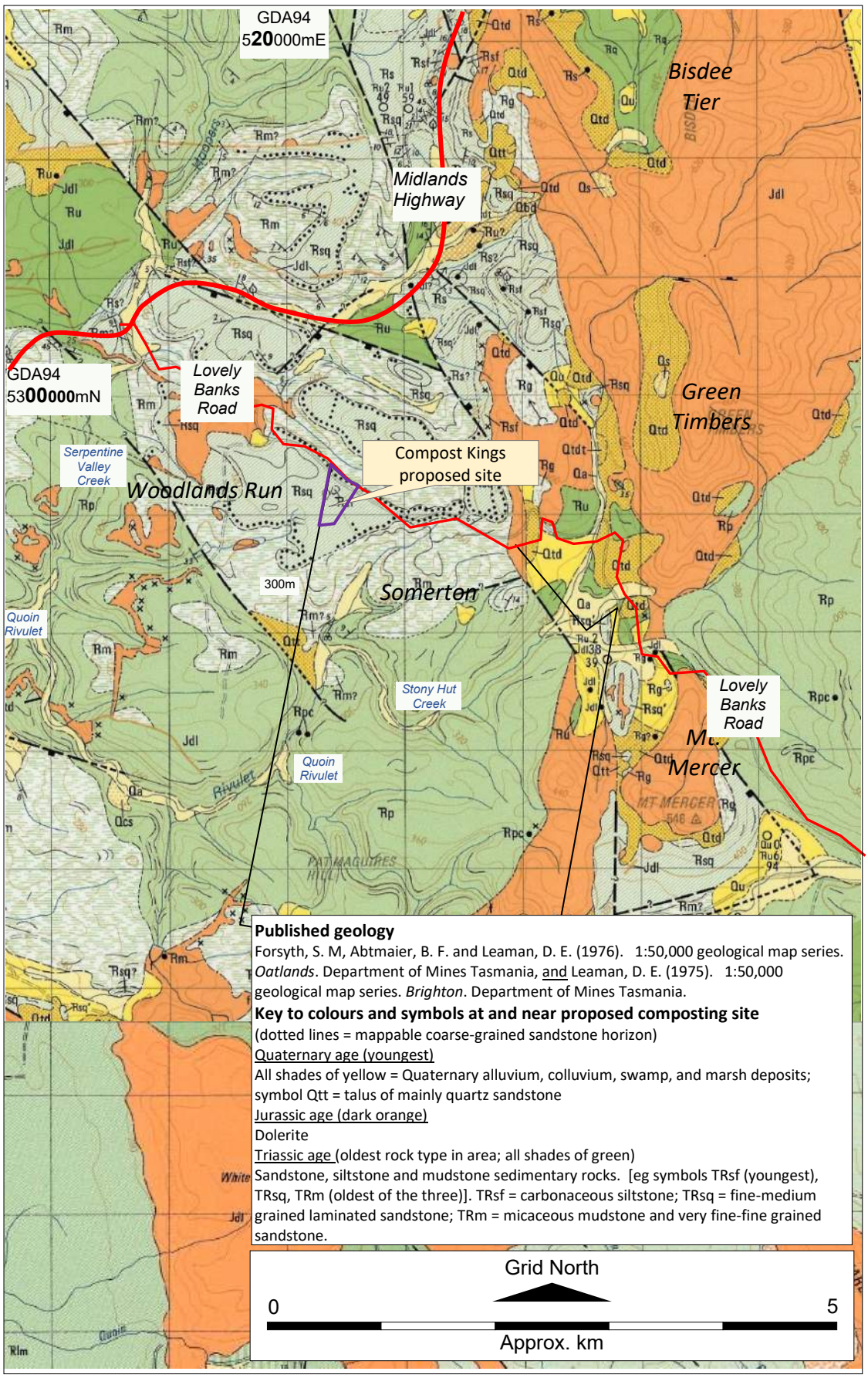
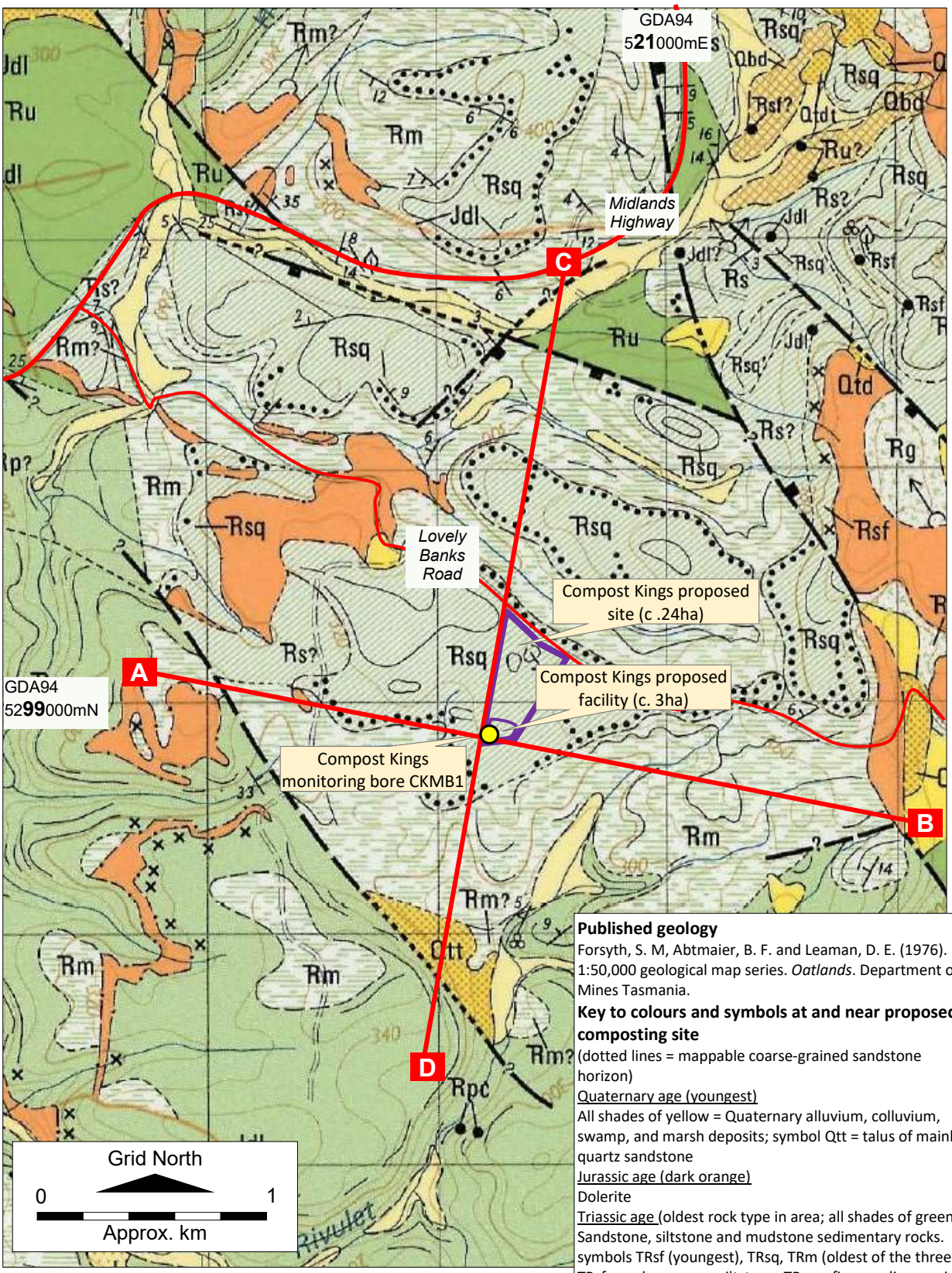


Figure 25. Published regional geology of the Melton Mowbray – Mt. Mercer area



Published geology

Forsyth, S. M, Abtmaier, B. F. and Leaman, D. E. (1976). 1:50,000 geological map series. *Oatlands*. Department of Mines Tasmania.

Key to colours and symbols at and near proposed composting site

(dotted lines = mappable coarse-grained sandstone horizon)

Quaternary age (youngest)

All shades of yellow = Quaternary alluvium, colluvium, swamp, and marsh deposits; symbol Qtt = talus of mainly quartz sandstone

Jurassic age (dark orange)

Dolerite

Triassic age (oldest rock type in area; all shades of green) Sandstone, siltstone and mudstone sedimentary rocks. [eg symbols TRsf (youngest), TRsq, TRm (oldest of the three)]. TRsf = carbonaceous siltstone; TRsq = fine-medium grained laminated sandstone; TRm = micaceous mudstone and very fine-fine grained sandstone; TRu = undifferentiated sedimentary rocks.

Black dashed lines are faults

Figure 26. Published geology at and near the proposed site, and the locations of monitoring bore CKMB1 and hydrogeological section lines A – B and C – D (see Section 4.4.2).

Plate 1. Subhorizontal outcrop of relatively unjointed (massive) quartz sandstone at the proposed composting facility. The rock is interpreted as Triassic in age. The staff is one metre long.

3.2.6.2 Soil permeability

Constant head field permeability and laboratory falling head permeability testing of subsoil at the hardstand test site near test pit C (Figure 24) returned:

Field test 1: Permeability = 0.23m/day = 2.7 x10^{-6}m/s
Field test 2: Permeability = 0.002m/day = 2.4 x10^{-8}m/s
Laboratory test: Permeability = 0.00003m/day = 3.18 x 10^{-10}m/s

See Appendix 7 [Cromer (2024b)] for details and the laboratory report.

3.2.6.3 Soil reactivity

During test pitting, no undisturbed samples were collected for shrink swell index (Iss) testing, but in keeping with subsoils developed on Triassic sedimentary rocks elsewhere in Tasmania, the Layer 2 subsoil sandy clay is expected to be moderately reactive across the facility.

This reactivity is not expected to require management, since the subsoils are relatively thin and the only buildings on site will be a small office, and an adjacent ablutions (1 x shower/1 x toilet) block.

3.2.6.4 Acid sulphate soils

The soils developed on Triassic sedimentary rocks over the site and facility are not acid-forming (Figure 28). The nearest potentially acid-forming soils are about 2km east southeast of the site.

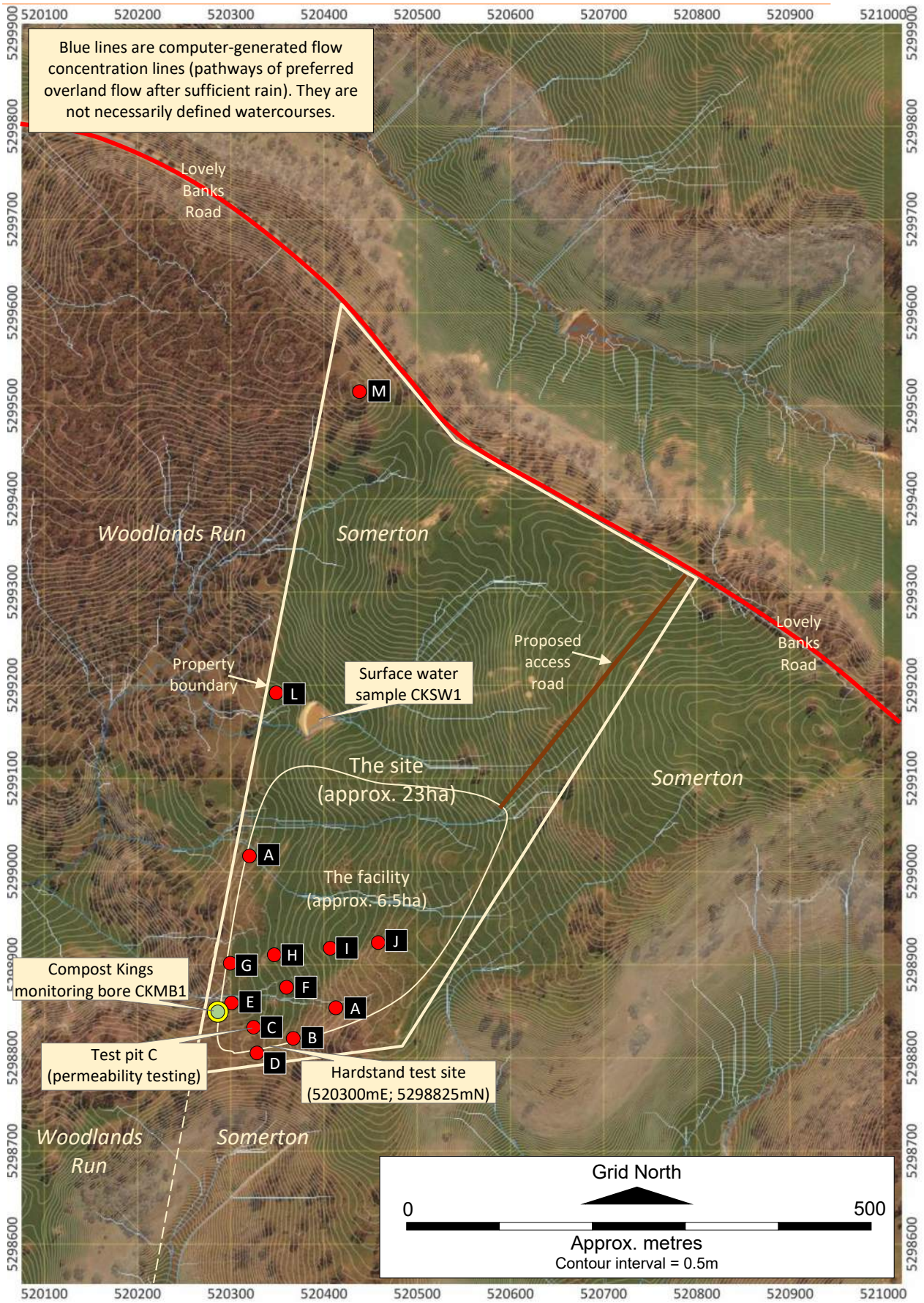


Figure 27. Locations of excavator test pits A – M dug in August 2020 at and near the proposed composting facility, the hardstand test site, and monitoring bore CKMB1.

Source of base map: www.thelist.tas.gov.au

Plate 2 (above). Sparsely jointed, subhorizontal mudstone beneath 0.3m of brown sandy silt in test pit I (Figure 23). The black numbers on the staff are decimetres. See Appendix 6 for details.

Plate 3 (below). In test pit H (Figure 23), the 7t excavator was close to refusal in sandstone bedrock beneath a metre of brown sandy topsoil, sandy clay subsoil, and clayey sand. The black numbers on the staff are decimetres. See Appendix 6 for details.

3.2.6.5 Soil dispersion

Dispersive soils may cause surface and tunnel erosion. During test pitting, ten samples of sandy clay subsoil were tested for dispersion (Appendix 6; Cromer 2024a) and Section 2.3.3 states:

"No evidence of tunnel erosion…..was noted at the facility, but possible localised collapsed tunnel erosion is present on the higher side of the small dam about 250m to the north….and also in the creek about 500m to the south……Most samples at and near the proposed facility are highly dispersive, and will require management."

Management options are canvassed in DPIW (2009) and typically include:

- reducing upslope runoff,
- eliminating point discharges of water to ground, and
- applying gypsum to exposed dispersive soils on disturbed ground.

At the composting facility, all three will be variously employed, and non-dispersive soils will be used in construction (eg dams).

3.2.7 Hydrogeology

The hydrogeology of the district, site and facility has been described in detail in Appendix 7 (Cromer, 2022), on which the following Sections are based.

3.2.7.1 Aquifer types in the district

At regional, intermediate and local scales, the sedimentary rocks and intruded dolerite in the general vicinity of the proposed composting facility are regarded as a single, fractured, hard-rock, unconfined aquifer. Groundwater flows very slowly under gravity in a three-dimensional network of intersecting secondary openings (eg joints); the intervening rock is dry.

Regional, intermediate and local scales are defined in Section 2.3.2 (page 12) of Appendix 7.

3.2.7.2 Results of drilling for water in the district

A few hundred water bores are recorded on DPIPWE's groundwater information access portal in the Melton Mowbray district. The results of drilling the closest 25 of these to the site are summarised in Table 1 (page 15) of Appendix 7, and their locations are shown in Figure 9 (page 16) in Appendix 7.

Cromer (2024b, Section 2.3.3, page 14) states:

"Of the 25 bores,

- *22 (88%) were drilled in Triassic rocks, and the remaining three were drilled in dolerite*
- *the average depth drilled of all bores was 80m (range 5 – 150m), and of the bores in Triassic rocks, 80m also (range 8 – 150m). The average depth drilled is markedly higher than the average for all bores in Tasmania.*
- *four bores (16%) were recorded as functioning after drilling; all of these were in Triassic rocks*
- *initial yields ranged from 0 – 10L/s, with 8 bores (32%) recording no water. As is typical of unconfined fractured rock aquifers, there was no relationship between yield and bore depth."*

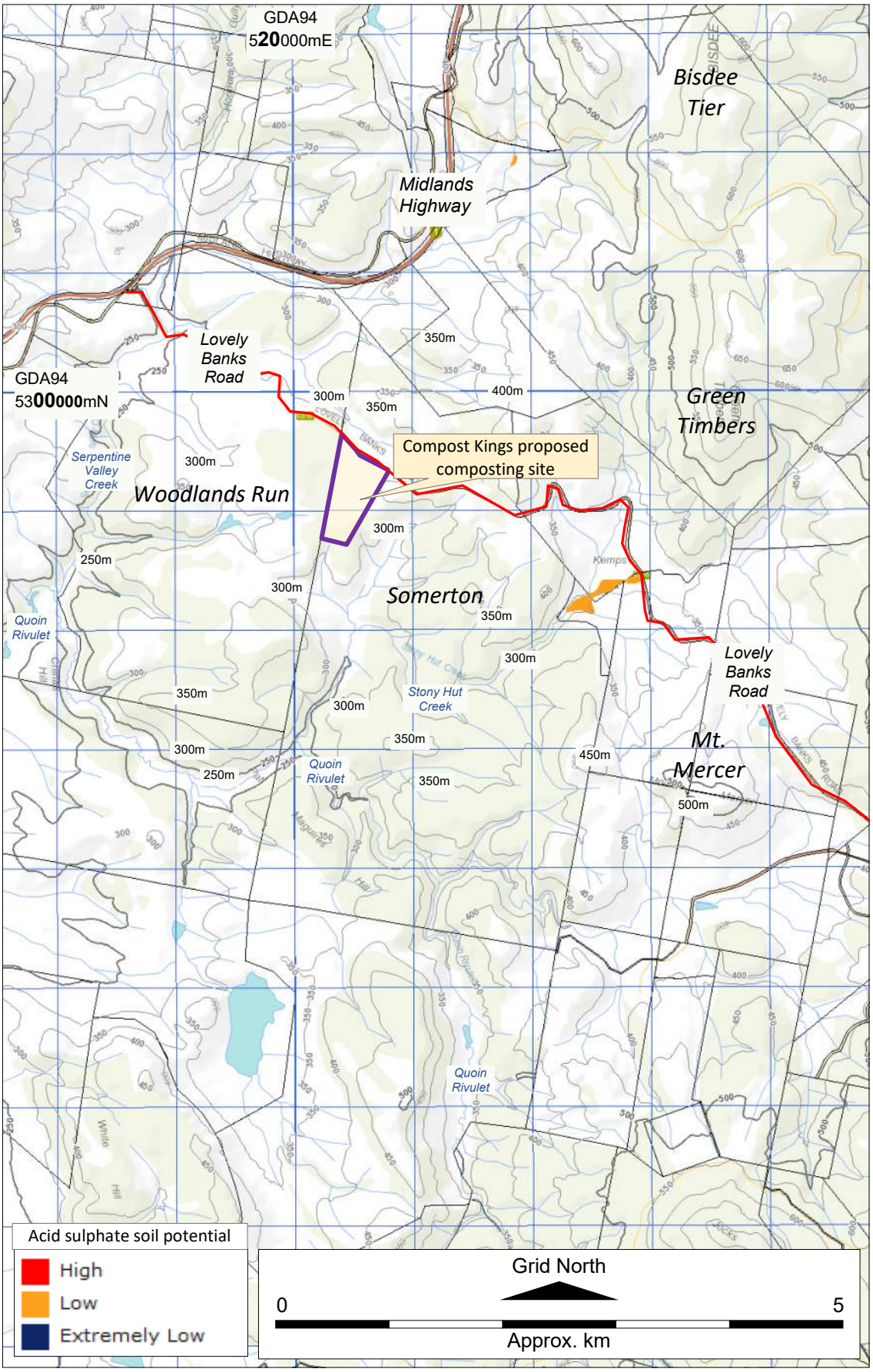


Figure 28. A small area of inland low potential acid sulphate soils occurs in an un-named creek in the north eastern corner of *Somerton*, near Lovely Banks Road. Source: www.thelist.tas.gov.au

3.2.7.3 Groundwater quality in the district

In relation to groundwater quality in the same 25 bores, Cromer (2024b, Section 2.3.3, page 14) states:

"Of the 25 bores,

- *groundwater salinity[26] was reported for 10 bores: salinity ranged from 500 – 2700mg/L (average 1360mg/L) for all bores, and in the Triassic rocks the range was 500 – 1700mg/L (average 1050mg/L). There was no relationship between salinity and bore depth, although as a general comment for bores in both Triassic and Permian rocks groundwater in near-surface low-yielding zones is often of higher salinity than deeper groundwater in higher-yielding zones (Table 1). "*

3.2.7.4 Groundwater occurrence and quality at the facility

Occurrence

Other than Compost Kings' nested monitoring bore[27] CKMB1 (Figure 27) drilled at the proposed facility in December 2020, there are no current groundwater users in the local-scale catchment and no water bores within about 2km of the site. In Appendix 7 Cromer (2024b; Section 3.5.3 page 34) states:

> *"Groundwater travel times from the facility to the nearest of these functioning bores is probably measured in centuries to millennia…."*

In relation to monitoring bore CKMB1, Cromer (2024b; Section 2.3.3 page 14; Appendix 7) states:

- *"Apart from a metre of soil and a metre of sandstone in the surface two metres, and a metre of fine-grained sandstone at 9.5 – 10.5m, all materials in the hole were logged as interbedded siltstone and silty mudstone",* and
- *"Bore CKMB1S (S = shallow) and bore CKMB1D (D = deep) were screened over the intervals 16 – 19mbg and 51.4 – 54.4mbg[28] respectively, and each was separated from the other by bentonite seals."*

The bore is very low yielding (less than about 1L/min).

Quality

Two combined surface water – groundwater monitoring events have so far been conducted at and near the site (Figure 27): SWGWME#1 on 12 January 2021, and SWGWME#2 on 19 June 2021:

Field parameters (Table 6) show:

- a 15m difference in standing water level between CKMB1S and CKMB1D in the first event, and a 5m difference in the second event. The differences indicate groundwater flow directions are mostly vertically downwards[29] which in turn means the facility (and probably the site) are recharge rather than discharge zones, and ecosystems are not groundwater dependent,

[26] Groundwater salinity is expressed here as mg/L of total dissolved solids (TDS). To convert TDS to approximate electrical conductivity (EC) in milliSiemens/cm (ie mS/cm), divide TDS by 650. To convert EC (mS/cm) to TDS (mg/L) multiply EC by 650.

[27] A nested monitoring bore has (at least) two bore casings in the same drillhole, each screened (and hydraulically separated) over different short depth intervals of the same aquifer, to test aquifer recharge/discharge conditions.

[28] mbg = metres below ground

[29] For an explanation of this, see Figure 6 and Section 2.3.1 in Cromer (2024b)

- a relatively high electrical conductivity (EC: averaging about 8.5mS/cm) in CKMB1S compared to the deeper water in CKMB1D (averaging 2.4mS/cm),
- slightly acidic pH in both bores on both occasions, and
- groundwater temperature slightly higher at depth compared to the shallower groundwater.

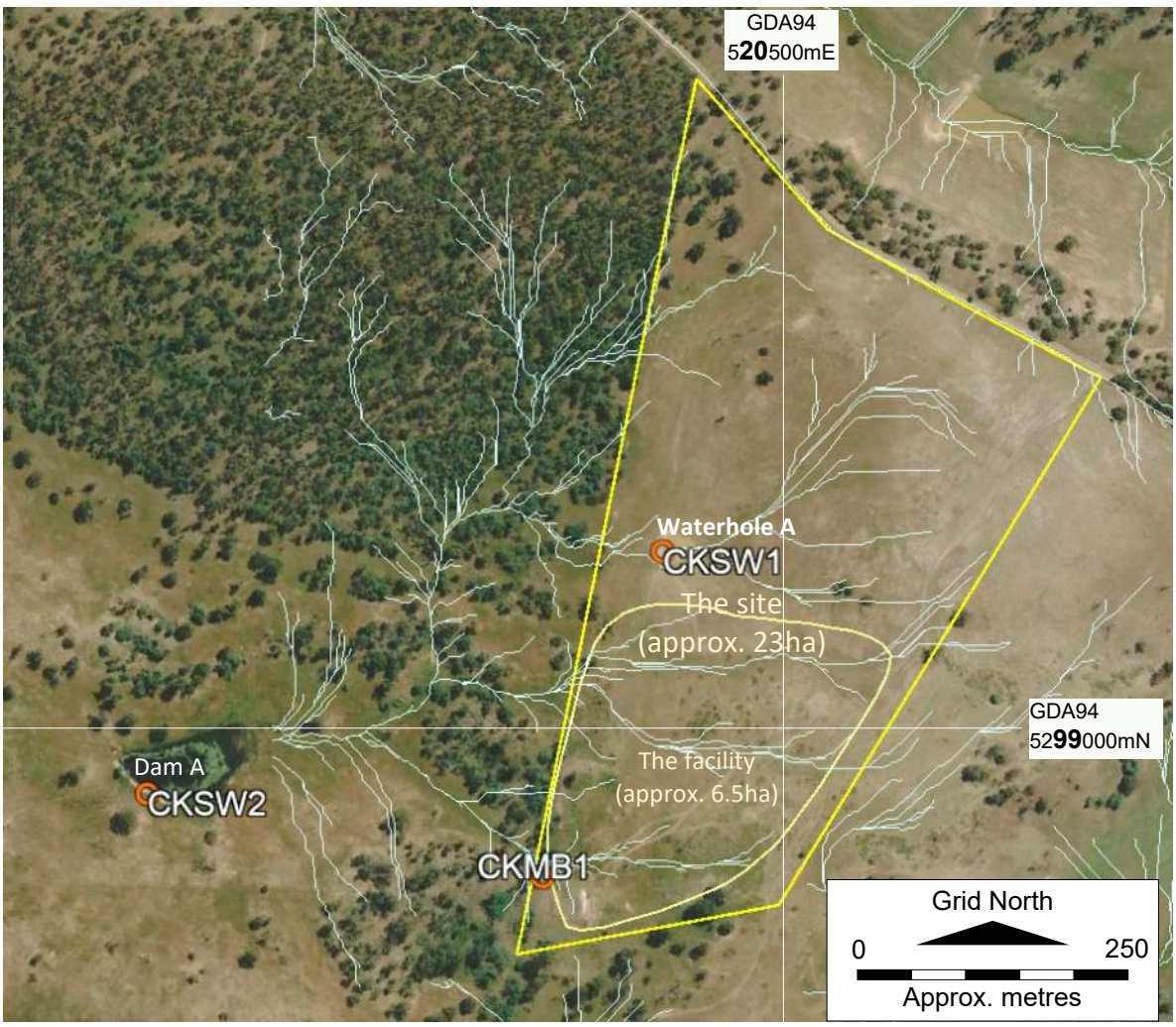


Figure 29. Locations of the two groundwater sampling locations in nested monitoring bore CKMB1 (samples CKMB1S and CKMB1D), and the two surface water sampling points (CKSW1 and CKSW2).

Table 6. Groundwater field parameters recorded during the two sampling events in January and June 2021.
This Table is Table 3 of Appendix 7 [Cromer (2024b)]

		SWGWME#1	SWGWME#2	SWGWME#1	SWGWME#2
		12/01/21	19/06/21	12/01/21	19/06/21
	Units	CKMB1S	CKMB1S	CKMB1D	CKMB1D
Initial SWL*	mbtoc**	9.65	9.66	24.3	15.1
pH Value	pH Unit	7.07	6.49	6.62	6.82
Electrical Conductivity	mS/cm	8.89	7.82	2.85	2.06
Dissolved Oxygen	mg/L	1.53	1.32	0.93	0.75
REDOX	mV	172	288	-114	8
Turbidity	NTU	677	68	540	75
Temperature	^{0}C	14.1	13.4	17.8	15.2

*SWL = standing water level; **mbtoc = metres below top of casing

Laboratory results [Table 7; the full laboratory reports are included as Attachment 2 in Cromer (2024b)] show (quoted from Appendix 7, Section 2.3.4, page 26):

- *""an unexplained discrepancy in pH between the two sampling events for CKMB1S. The first value (6.66) is in reasonable agreement with the field parameter in Table 6, but the value of 3.11 for the second event is much lower than the field parameter of 6.49,*
- *an unexplained discrepancy in EC between the two sampling events for CKMBD. The first value (3.07mS/cm)) is in reasonable agreement with the field parameter (2.85mS/cm) in Table 7, but the value of 0.62mS/cm for the second event is much lower than the field parameter of 6.82mS/cm,*
- *between the two sampling events in CKMBS, a ten-fold increase in dissolved sulphate (52 to 458mg/L), and a ten-fold decrease in dissolved chloride (3,420 to 330mg/L),*
- *in CKMB1S, across both sampling events, total dissolved solids, hardness, chloride, sulphate and sodium levels exceed ADWG aesthetic and health-based guideline levels, and may exceed ANZECC and ADWG irrigation/stock drinking guideline levels, and*
- *in CKMB1D, in the first sampling event, total dissolved solids, chloride and sulphate levels exceed ADWG aesthetic and health-based guideline levels, and may exceed ANZECC and ADWG irrigation/stock drinking guideline levels,*

Continued groundwater sampling and analysis are required to track changes in groundwater quality."

3.2.8 Socio-economic aspects of the proposal

The proposed composting site lies within the 100km^2 Melton Mowbray township area, itself wholly contained within the Southern Midlands Local Government Area (LGA). The township includes all of the properties *Somerton*, *Woodlands Run*, *Redside*, *Lovely Banks*, *Green Timbers*, and *The Follies*, and parts of several other nearby pastoral properties.

The latest demographic summary from the Australian Bureau of Statistics [ABS (2021)] census showed (Table 8):

- Melton Mowbray had a population of 65, with a median weekly household income of $1,333 and a median age of 40,
- the Southern Midlands LGA had a population of 6660, with a median weekly household income of $1,332, and a median age of 44,
- Melton Mowbray had a significantly higher proportion of males to females (64% to 36%), compared to Southern Midlands (52%:48%), Tasmania, and Australia (both 49%:51%).

Other demographic and societal results for Southern Midlands LGA[30] from the 2021 Census are (some numbers are rounded):

- 91% are of Australian and English ancestry, compared to 84% for Tasmania
- 6% are of Australian Aboriginal ancestry, compared to 5% for Tasmania
- 85% were born in Australia, compared to 79% for Tasmania

[30] Melton Mowbray is not separated from Southern Midlands LGA in these data.

- 87% were in full or part-time work, the same as for all of Tasmania
- 5% were unemployed, compared to 6% for Tasmania
- 5% had university or tertiary-level education, compared to 16% for Tasmania
- 5% were sheep farmers, compared to 0.3% for Tasmania

Table 7. Groundwater quality in CKMB1S and CKMB1D compared to guideline values, for the first two sampling events on 12 January and 19 June 2021 respectively.
This Table is Table 4 of Cromer (2024b)

							ADWG 2011	ANZECC 2000			
	Date		12/01/2021	19/06/2021	12/01/2021	19/06/2021	Drinking water guidelines (only applied if TDS <1200mg/L)	Aquatic Ecosystem	Irrigation		Livestock Drinking
	Sample		CKMB1S	CKMB1S	CKMB1D	CKMB1D		(Freshwater/ Lowland River)	STV (short-term; <20yrs)	LTV (long-term; 100yrs)	
Laboratory analyses	**Units**	**LOR**									
pH Value	pH Unit	0.01	6.66	3.11	8.74	7.13	(6.5-8.5)	6.5-8.0	**6.0-8.5		-
Electrical Conductivity @ 25Å°C	µS/cm	1	9130	9970	3070	617		125-2200	-	-	-
Total Dissolved Solids (Calc.)	mg/L	1	5930	6480	2000	401	(600-1200)	-	-	-	[2]2000-13000
Total Hardness as CaCO3	mg/L	1	2760	2980	539	354	(200)	-	-	-	-
Hydroxide Alkalinity as CaCO3	mg/L	1	<1	<1	<1	<1		-	-	-	-
Carbonate Alkalinity as CaCO3	mg/L	1	<1	<1	43	<1		-	-	-	-
Bicarbonate Alkalinity as CaCO3	mg/L	1	353	<1	298	408		-	-	-	-
Total Alkalinity as CaCO3	mg/L	1	353	<1	341	408		-	-	-	-
Dissolved major anions											
Sulfate as SO4	mg/L	1	52	456	104	97	500 (250)	-	-	-	1000-2000
Chloride	mg/L	1	3420	330	834	522	(250)		[3][8][11]<175 - >700		
Fluoride	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	1.5	-	-	-	-
Dissolved major cations											
Calcium	mg/L	1	413	458	163	109					
Magnesium	mg/L	1	419	447	32	20		-	-	-	250-2000
Sodium	mg/L	1	706	818	368	330	(180)	-	[4]115->460		-
Potassium	mg/L	1	15	12	9	5		-	-	-	-
Dissolved metals											
Arsenic	mg/L	0.001	<0.001	0.004	0.004	0.006	0.01	0.013(AsV)-0.024(AsIII)	2	0.1	0.5-5
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	-	-	1	0.1	-
Barium	mg/L	0.001	0.333	0.444	0.192	0.012	0.7	-	0.5	0.1	-
Boron	mg/L	0.05	0.1	0.08	0.16	0.15	4	0.37	0.5	-	-
Cadmium	mg/L	0.0001	0.0002	<0.0001	0.0001	<0.0001	0.002	0.0002	0.05	0.01	0.01
Chromium	mg/L	0.001	<0.001	0.002	0.001	0.002	0.05	0.001	1	0.1	1
Cobalt	mg/L	0.001	0.005	0.004	0.002	<0.001	-	-	0.1	0.05	1
Copper	mg/L	0.001	0.003	0.001	0.002	0.001	2	0.0014	5	0.2	0.4-5
Lead	mg/L	0.001	<0.001	0.002	<0.001	<0.001	0.01	0.0034	5	2	0.1
Manganese	mg/L	0.001	2.15	1.88	0.837	0.417	0.5	1.9	10	0.2	-
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.001	0.0006	0.002	0.002	0.002
Nickel	mg/L	0.001	0.005	0.004	0.005	0.004	(0.18)	0.011	0.002	0.2	1
Selenium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.005	0.05	0.02	0.02
Vanadium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-
Zinc	mg/L	0.005	0.032	0.021	0.025	<0.005	(3)	0.008	5	2	20
Nutrients											
Ammonia as N	mg/L	0.01	0.15	0.31	0.08	0.3	(0.5)	0.9	-	-	-
Nitrite as N	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	-	0.04	-	-	-
Nitrate as N	mg/L	0.01	0.03	0.01	0.02	0.02	-	0.04	-	-	-
Nitrite and Nitrate as N	mg/L	0.01	0.03	0.01	0.02	0.02	-	-	-	-	-
Total Kjeldahl as N	mg/L	0.1	1.6	0.6	3.3	0.7	-	-	-	-	-
Total Nitrogen as N	mg/L	0.1	1.6	0.6	3.3	0.7	-	0.5	25-125[a]	5	-
Total Phosphorus as P	mg/L	0.01	1.57	0.03	1.46	0.19	-	0.05	0.8-12.0[a]	0.05[b]	-
Bacteria											
E. coli	MPN/100ml	1	<10	-	20	-	0	-	-	-	-
Faecal coliforms	MPN/100ml	1	<10	10	30	220					

Notes

Sampler W.C.Cromer. Lab: ALS reports #EM2100341 and #EM211705 issued 19 Jan 2021 and 29 June 2021 respectively.
Guideline references: HMRC, NHMRC (2011, updated March 2021) and ANZECC, ARMCANZ (2000)
Results shading has been applied in the following order, with shadings higher in the order overriding those lower, if applicable.

Exceeds ANZECC aquatic ecosystem DTV
Exceeds ADWG health-based guideline value or aesthetic guideline range. Exceeds ANZECC irrigation/livestock drinking value or is above upper value or guideline range.
Exceeds ADWG aesthetic guideline value. Within an ANZECC irrigation/livestock drinking guideline range, requiring specific suitability assessment.

Values in parentheses indicate aesthetic (not health based) values only e.g. (250)
STV - Short term trigger value for contaminant in irrigation water (<20 years) use
LTV - Long term trigger value or contaminant in irrigation water (100 years) use
DTV- Default trigger values
a - requires site-specific assessment
b - set to minimise bioclogging of irrigation equipment

Table 8. Socio-economic aspects of the township of Melton Mowbray and Southern Midlands LGA, with Tasmanian and Australian comparisons. Some numbers are rounded. Source: ABS (2021)

	Melton Mowbray township	Southern Midlands LGA	Tasmania	Australia
People	65	6,660	557,500	25,400,000
Males (%)	64	52	49	49
Females (%)	36	48	51	51
Median age	40	44	42	38
Australia as country of birth (%)	94	85	79	67
In the labour force (%)	59	57	58	61
Sheep farmers (specialised, %)	3.1	5	0.3	0.2
Personal median weekly income	$668	$660	$701	$805
Household median weekly income	$1,333	$1,332	$1,358	$1,746
No long-term health conditions (%)	59	53	55	60

Earlier data for the Tasmanian Midlands derived from the 2001, 2006 and 2011 censuses (Gadsby *et. al.* 2013) are likely to now be somewhat outdated, but some useful demographic indicators are:

- 7% were farmers/farm managers compared to 8% for Tasmania
- 63% of farmers used the Internet compared to 59% for Tasmania,
- there were 24% less farmers in 2011 relative to 2001, compared to 8% less for Tasmania, and
- the average area of agricultural holdings was 1,750ha compared to 405ha for Tasmania

The landowners surrounding the proposed composting facility are mainly sheep farmers on relatively large holdings. They are in the main highly entrepreneurial.

4 POTENTIAL IMPACTS AND THEIR MANAGEMENT

4.1 Attenuation Code

In accord with Table C9.1 *Attenuation Distances* (*Attenuation Code)* in the *Tasmanian Planning Scheme,* the Standard Recommended Attenuation Distance (SRAD) for the proposed Level 2 composting facility is 1,000m.

The SRAD applies from all boundaries of the defined site, creating an Attenuation Area (Figure 30). Within the Attenuation Area, an application for a sensitive use by a neighbour may need to demonstrate that the proposed sensitive use would not be adversely affected by the composting facility.

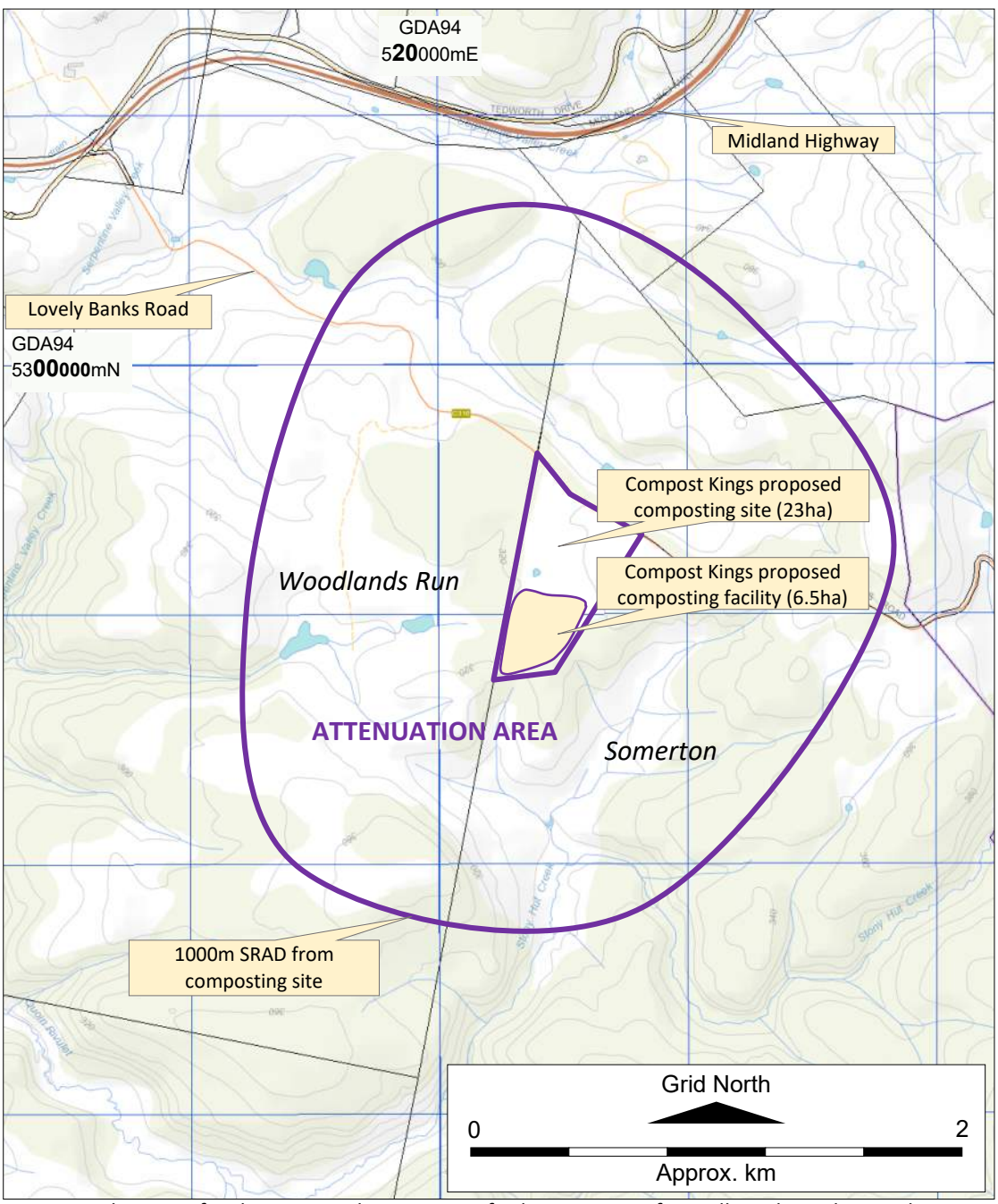


Figure 30. The SRAD for the proposed composting facility is 1,000m from all site boundaries. There are no residences or other buildings within the Attenuation Area. Source for base map: www.thelist.tas.gov.au

4.2 Air quality

4.2.1 Policy requirements

Legislative requirements for air quality are set out in Schedule 3 of the *Environment Protection Policy (Air Quality) 2004* ("Air Quality EPP"). Schedule 3 requires that for diffuse or point sources of emissions the maximum ground level concentration shall be 2 odour units (OU) under worst case conditions measured at the boundary of the proposed 6.5ha facility.

4.2.2 Sources of atmospheric emissions

4.2.2.1 During transport to and from the site

Actual or potential atmospheric emissions during transport are:

- vehicle exhaust emissions to and from the site,
- dust generated by vehicle movements on Lovely Banks Road,
- odour from trucks transporting biosolids or aged manures to the site,
- odour from diesel and/or petrol pumps, and mobile plants, and
- odour from compost being transported off-site

Apart from (currently) unavoidable exhaust emissions, all other odours will be minimised by requiring all truck trays to be covered during transport.

4.2.2.2 During composting operations

Actual or potential atmospheric emissions during operations at the facility are:

- dust generated by vehicle movement on the hardstand,
- unloading of raw materials on the mixing area,
- blending of raw materials on the mixing area,
- bioaerosols and dust from windrows during all composting operations: waste delivery and mixing, and compost turning, screening and stockpiling,
- diesel and/or petrol odours from pumps, and
- stormwater/leachate dam odour emissions

4.2.3 Odour

4.2.3.1 Sources of odour at the facility

The composting process releases – in varying amounts depending on the degree of aeration and the types and proportions of wastes – carbon dioxide and monoxide, methane, nitrous oxides, sulphur oxides and volatile organic compounds [VOC's; EPA Victoria (2017) Section 6.2].

Figure 31 depicts the main odour sources within the facility. In order from the potentially most odorous to least odorous activities, these are:

- the mixing area, where Category 1 and 2 feedstocks are blended,

- the windrows, and particularly its first rows of composting material undergoing pasteurisation,
- the vehicle washdown area where residues (including medium-odour wastes) from truck trays are washed out into a concrete-lined settling pit before being recycled to the mixing area,
- the delivery area where the contents of covered truck trays are examined before being accepted (or rejected),
- the stockpiles of finished compost awaiting removal from the facility, and
- Dam 1 (combined stormwater and leachate).

4.2.3.2 Closest sensitive receptors

The sensitive receptors closest to the site are seven residences (Figure 32) at distances ranging from 1.27km (*Redside*, to the north) to 5.90km (*Stockman*, to the southwest).

4.2.3.3 Odour Assessment Report

Compost Kings commissioned an odour impact assessment report (Clifton, 2024) from Queensland consultants *Assured Environmental* (AE)[31].

An initial AE report was released on 1 April 2021. Revised versions were issued in September 2021, August 2022, May 2023, 30 April 2024 and 17 December 2024[32]. The second and third revisions were done to accommodate a proposed increase in area (almost a doubling) of the facility within the site (August 2022), the fourth (May 2023) addressed EPA comments in relation to odour receptors. The April 2024 revision (Revision R1) addressed a change of feedstock (high-odour wastes no longer received), and the latest (R2; Appendix 8)) removed remaining references to fish feedstock. The reports were done in accordance with EPA (2019a) and EPA (2020), and Air Quality EPP, and conservative odour emission rates were discussed with EPA in March 2021 and March 2024.

Dispersion modelling was completed for normal and worst-case situations for 10,000tpa production, for the range of feedstock listed in Table 2 and the following activities

- truck movements and wash out operations,
- raw materials storage, and handling activities,
- mixing pad activities,
- windrow progression,
- compost products and product truck movements, and
- dam emissions.

[31] On 11 March 2021 AE inspected the proposed composting facility, did road passes of two other sites (Interlaken and Glenfern; Section 1.7) in southern Tasmania, and met with EPA Tasmania to review methodologies for odour assessment.

[32] Clifton, M. (2024). Odour Impact Assessment: Compost Facility, Melton Mowbray. Project ID: 15578. Report prepared for Compost Kings Tasmania by Assured Environmental, 17 December 2024. Release R2.

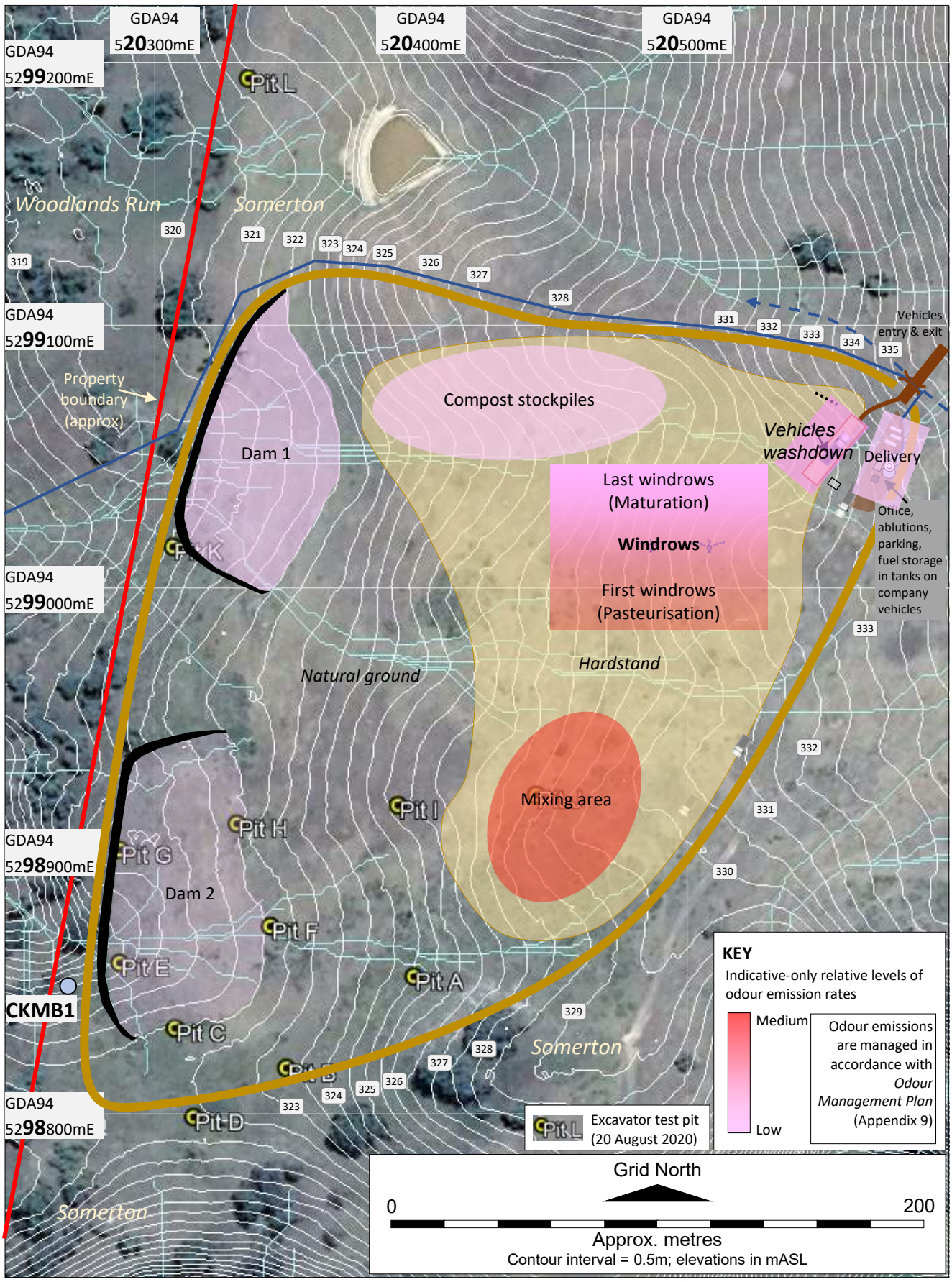


Figure 31. Main sources of odour at the facility.

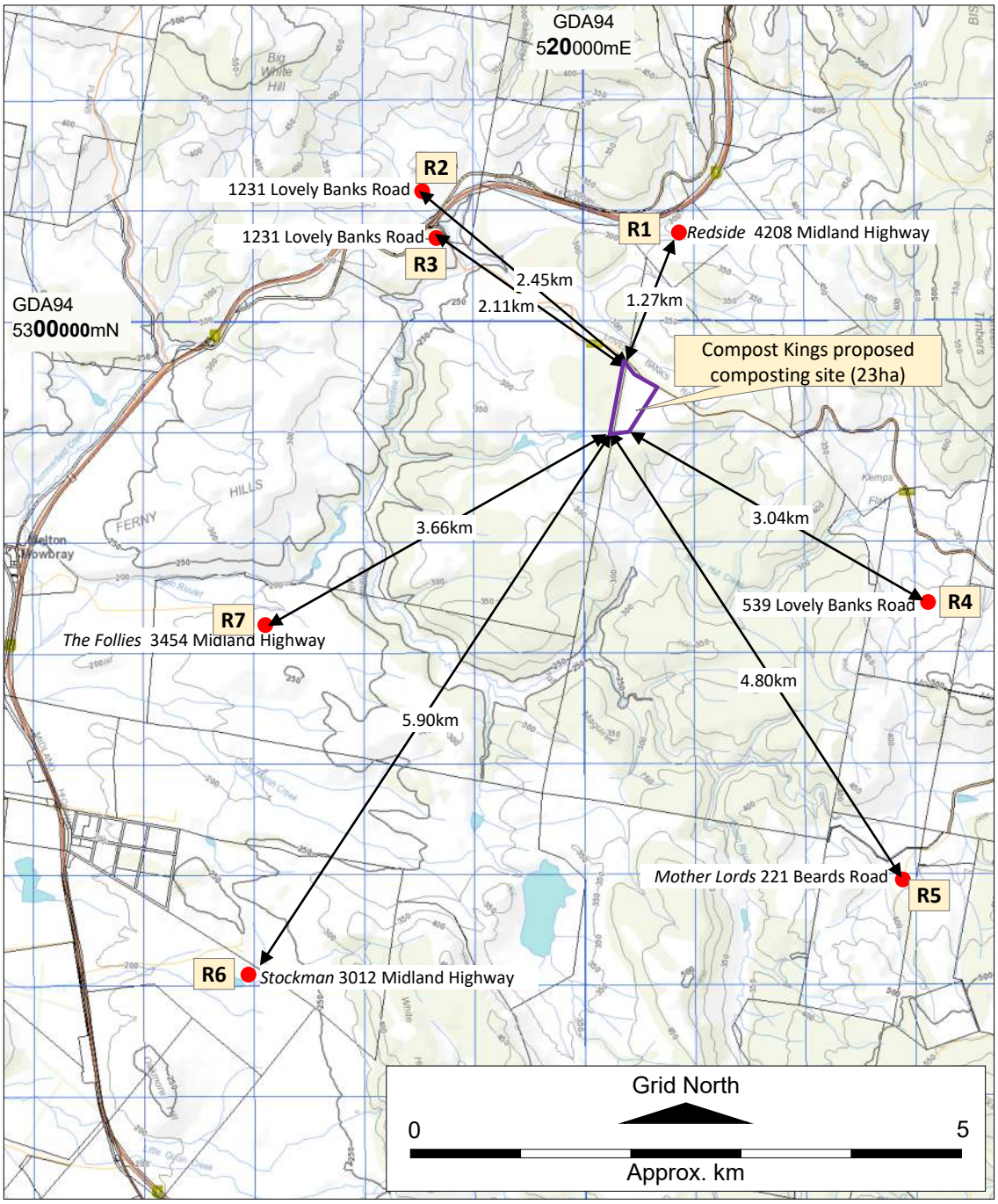


Figure 32. The seven residences closest to the proposed composting site. R1, R2….refer to receptor numbers in the Odour Assessment Report (Appendix 8). Source for base map: www.thelist.tas.gov.au

The modelling shows that:

- normal and upset operations generate odour concentrations which do not comply with the required maximum level of 2 OU at the boundary of the site,
- during normal operations (Figure 33), the 1-hour 99.5th percentile cumulative odour level from all modelled activities is less than 1 OU (presumed to be the lower level of detectability) at all seven closest receptors; the highest predicted concentration is 0.34 OU at *Redside*, the closest receptor,
- during worst-case conditions (Figure 34), the 1-hour 99.5th percentile odour level remains less than 1 OU at all receptors; at the closest, *Redside*, it is predicted to be 0.66 OU,

- at the closest receptor, *Redside*, the highest odour-contributing activities are windows maturation and to a considerably lesser extent stockpiling at mixing, for both normal and upset conditions,
- truck deliveries will not cause an odour nuisance because the movements are transient, and
- during exceedances, winds are low (<2m/s) and from the south southwest.

The Odour Assessment Report concludes (page 44): "While the facility will release odour emissions to air, this assessment has demonstrated that the emissions are not expected to cause a nuisance if best practice management techniques are employed in accordance with the Environmental Management and Pollution Control Act 1994."

An Odour Management Plan (Appendix 9) has been developed by Compost Kings to manage odour generation in normal and upset conditions.

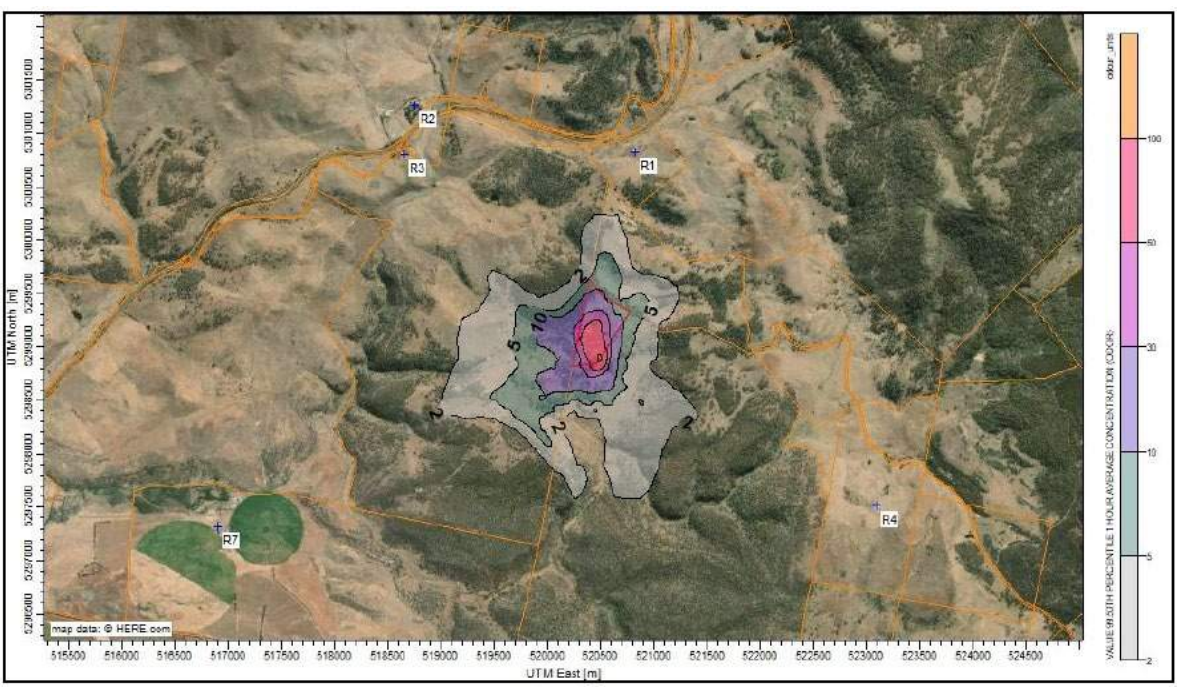


Figure 33. Predicted 1-hour 99.5th percentile ground level odour contours during normal cumulative activities. Source: Figure 13 of the Odour Assessment Report (Appendix 8).

4.2.3.4 Odour from varying composting mixtures

From time to time, Compost Kings may explore a range of compost types, partly in response to feedback from customers and from any research projects supported by the operator.

This in turns means that different types and sources of odour may emerge – particularly from the mixing area and windrows. Management of these will be addressed (like all other odours) by the Odour Management Plan (Appendix 9).

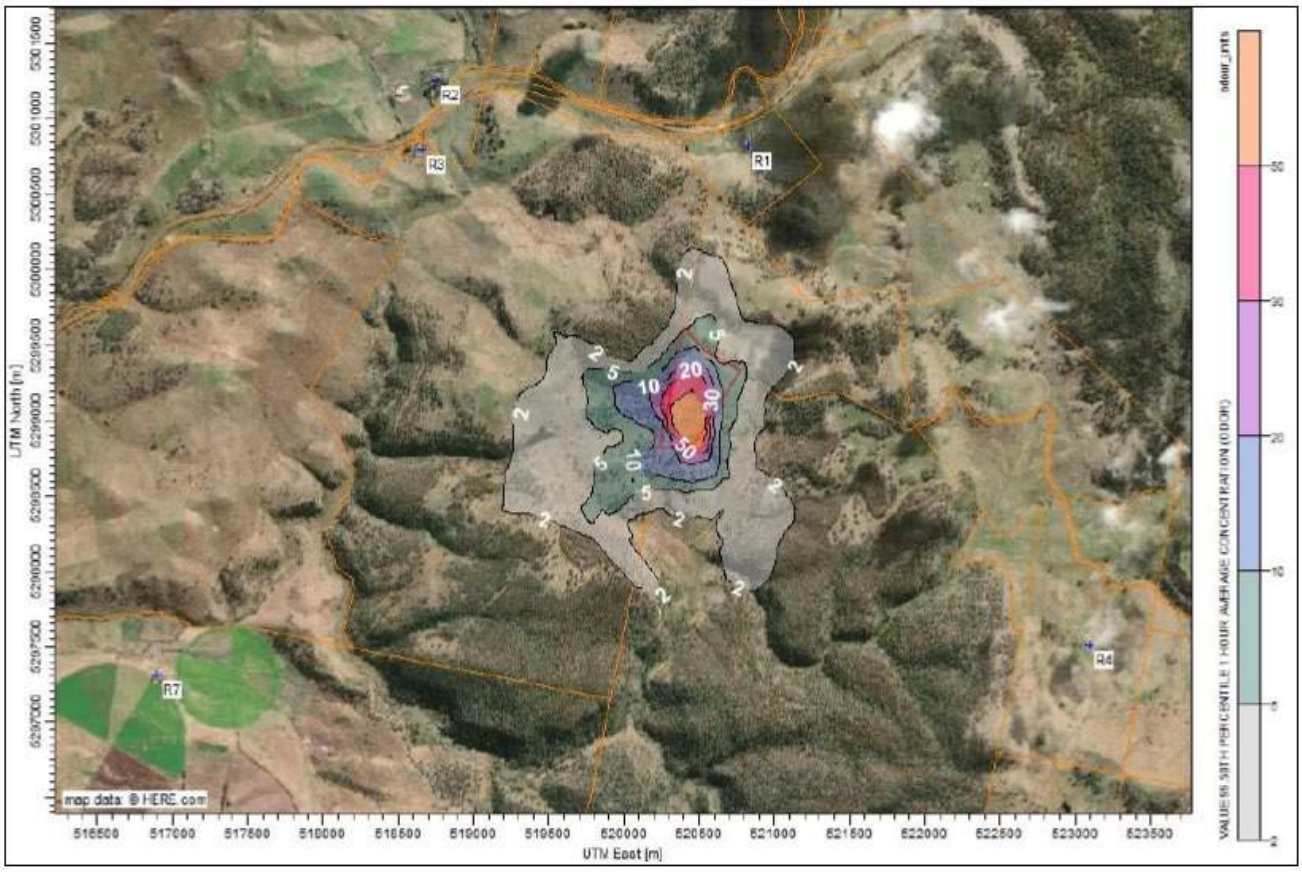


Figure 34. Predicted 1-hour 99.5th percentile ground level odour contours during upset conditions for cumulative activities. Source: Figure 20 of the Odour Assessment Report (Appendix 8).

4.2.4 Dust

4.2.4.1 Dust generation on Lovely Banks Road

Lovely Banks Road is gravelled its full length, and is maintained by Southern Midlands Council. Traffic movements along it are light (Appendix 2) but will be increased by about 50% during composting operations, and will generate dust in dry windy conditions[33].

4.2.4.2 Dust generation and health issues within the facility

Within the facility, dust and bioaerosols (airborne micro-organisms) will be generated in dry windy conditions from all activities involved with composting. These activities and sources include:

- high moisture content: moisture is essential for the composting process, but excessive moisture can create ideal conditions for microbial growth and bioaerosol generation,
- high temperatures: composting generates heat as a by-product of microbial activity, and high temperatures can increase the rate of decomposition and bioaerosol generation,
- turning and mixing: turning and mixing of compost piles is necessary to promote aeration and decomposition, but it can also generate significant amounts of bioaerosols,

[33] The frequency of windy conditions is difficult to assess. Meteorological records between 2012 – 2019 [Clifton, 2024), Table 14] indicate calm conditions prevail on average about 3.7% of the time, and the average wind speed over the same period was 4.7m/s. It is likely that dust generation will be relatively common in dry seasons.

- particle size: smaller particles have a higher surface area and can support greater microbial growth and bioaerosol generation,
- length of storage: long-term storage of finished compost can create ideal conditions for microbial growth and bioaerosol generation,
- type of waste: biosolids have higher microbial loads and can generate more bioaerosols,
- seasonal variations: environmental conditions, such as temperature and humidity, can vary seasonally and affect microbial activity and bioaerosol generation.

These activities within the facility create potential exposure to a range of respiratory or breathing hazards, including asthma and chronic obstructive pulmonary disease (COPD), and the condition called Composter's Lung[34].

4.2.5 Managing air emissions

4.2.5.1 Managing odour

Compost Kings has compiled and is committed to the Odour Management Plan (Appendix 9) developed specifically for the facility.

4.2.5.2 Managing dust

Dust mitigation actions listed in Appendix 8, and in Sections 6.2.1 and 6.2.2 of this EIS, will be a part of the day-to-day operations of the facility, and will be incorporated into Compost Kings Occupational Health and Safety Plan.

4.3 Surface water

4.3.1 Policy requirements

The *State Policy on Water Quality Management 1997* sets out standards for managing point and diffuse emissions to surface waters and groundwater. In relation to the proposed composting facility, the environmental values to be protected include:

- aquatic ecosystems,
- raw water for town drinking supply, and
- agricultural water use

4.3.2 Protection of aquatic ecosystems

Aquatic ecosystems downgradient and crossgradient from the composting facility will be unaffected by operations. Where required, stormwater exterior to the perimeter earth wall will be diverted around the facility in surface cut-off drains. Internally, the earth wall and Dams 1 and 2 will contain all stormwater and leachate.

The two closest surface water bodies to the facility are Waterhole A and Dam A (Figure 29). They are and will remain part of the surface water/groundwater monitoring program.

[34] Composter's Lung is a respiratory (and sometimes skin) condition caused by repeated and/or excessive exposure to ubiquitous micro-organisms such as the fungus *Aspergillus fumigatus,* and certain types of bacteria called actinomycetes.

4.3.3 Protection of raw water for town drinking supplies

Two dams are proposed within the facility (Figure 37), and both will be contained within the facility's 2m high perimeter earth wall. Dam 1 of nominally 7ML capacity will capture stormwater and leachate from all operational areas, and Dam 2 of nominally 6ML capacity will capture only stormwater from non-operational areas.

A significant failure of either dam wall and the perimeter earth wall at the facility is considered very unlikely (Section 4.10.1). However, should failure occur, the dam contents would flow down the adjacent un-named watercourse to enter (in turn):

- two adjacent farm dams (combined storage about 25 – 30ML) on *Woodlands Run*,
- Serpentine Valley Creek,
- Quoin Rivulet and
- the Jordan River (about 1.5km south of Melton Mowbray – a distance of about 9km.

The Jordan River then takes a circuitous 60km-long route west and south of the Midlands Highway before entering the Derwent River at Herdsmans Cove near Brighton.

Towns along the Midlands Highway south of Melton Mowbray include Kempton, Dysart, Bagdad, Mangalore, Pontville, Brighton, Bridgewater, Gagebrook and Herdsmans Cove.

Except for Melton Mowbray, all these towns are part of Taswater's "serviced land", in which reticulated drinking water (from Bryn Estyn on the Derwent River) is provided via a 150mm bulk transfer main (along the Midlands Highway), and then in 100mm reticulation mains and 20mm lateral lines to individual properties.

Melton Mowbray (population about 65) is not part of Taswater's serviced land and most residents obtain drinking water from rainwater tanks at individual houses. [Some house may use groundwater from water bores, but there are no records of site-specific use and in any case the groundwater throughout the district is generally unsuitable (too saline for drinking; Section 3.2.7.2)].

A failure of Compost Kings' dams will therefore not threaten downstream potable water supplies.

4.3.4 Protection of agricultural water use

Composting operations will not affect agricultural (irrigation) water in the district, which is served by the Southern Midlands Irrigation Scheme.

4.3.5 Proposed hardstand details

Hardstand will cover approximately 40 – 50% of the internal footprint of the 6.5ha earth-walled facility (Figure 37). It will include all internal accesses, and

- the raw material mixing area (nominal area 2,000m^2)
- the windrows (nominal area 3,000m^2),
- the compost stockpile (nominally 3,000m^2), and
- the truck washdown area (nominally 100m^2).

The proposed step-wise construction of the hardstand is set out in Figure 38. It will be of sufficient thickness (350mm), compacted, regularly inspected and maintained to ensure it is capable of

withstanding all truck and plant movements during operations. Any small areas of exposed sandstone bedrock will be covered with hardstand.

4.3.6 Storm runoff calculations

Table 9 summarises Bureau of Meteorology intensity-frequency-duration data for the facility, for 10%AEP and 5%AEP rain ("storm") events, approximately the same as 1 in 10 year and 1 in 20 year events respectively.

During these 90%ile events, it is assumed that all the rain falling on the hardstand runs off to the leachate dam, with no evaporation. Conservatively, it is also assumed that runoff occurs over the full area of hardstand, and none is retained via adsorption into stockpiles and windrows.

The 1 in 10 year and 1 in 20 year events are 90%ile and 95%ile rain events respectively. Both have been used in the water balance calculations for the leachate dam. Specifically, the 2-day duration events (84mm and 98mm of rain) are used in the water balance (bordered in red in Table 1).

These short-term inputs to the leachate dam are added to mean monthly rain to obtain a monthly total. It is these total inputs which are matched with monthly pump-out volumes to (a) prevent dam overflow, and (b) maintain minimum volumes in the dam to accommodate any unusually high rain events in following months.

4.3.7 Water balance for the leachate dam (Dam 1)

4.3.7.1 No unusual rain events

In Table 10, monthly water balance calculations are summarised for inputs to and outputs from the leachate dam. Assumptions are listed in the Notes to the Table. Mean monthly rain for the last 30 years for Lovely Banks has been used. The station has no evaporation records, so evaporation has been estimated from mean monthly solar exposure for Tunnack Fire Station (18kn east; the closest station for such records). Table 2 is for a year with no unusually high rain events (Row B is blank).

There is no net direct rain onto the dam surface because monthly evaporation exceeds or is equal to monthly rain in all months. However, the same monthly rain produces runoff from the hardstand (because evaporation from the hardstand is considerably less than from the dam). Monthly hardstand runoff (Row J) ranges from 0.6ML in January, to 1.4ML in June, and totals 12ML for the year. Evaporation losses from the dam (Row L) total about 2ML for the year, and leakage from its base (Row M) is ignored as insignificant.

Pump out of the leachate to irrigation on neighbouring agricultural land on *Somerton* is required in each of 10 months (Row N) to maintain dam leachate levels more or less the same from month to month (Row O). Monthly pump out ranges from 0 – 1.3ML, totalling 10ML. The minimum size of the dam required to accommodate the hardstand runoff in this example is 1.4ML (Row P).

4.3.7.2 Two and three rainfall months of 2-day 10%AEP rain

Table 11 has the same inputs and assumptions as Table 2, but also includes two months of 2 day10%AEP rain[35]. The extra rain (84mm in Row B) is not in place of monthly rain, but is added to it as a conservative measure.

[35] The probability of receiving two months of 10%AEP rain in any 12 months is 0.2, and of three months is 0.09.

Table 9. Inputs to the leachate dam for a range of rainfall intensities and durations, for 10%AEP and 5%AEP events. The two 2-day events bordered in red are used in following water balance estimates.

1 in 10 year (AEP 10%) rain events					
Duration of event	**Rain (mm)**	**Rain onto leachate dam (m3)**	**Flow into leachate dam from hardstand (m3)**	**Total input to leachate dam (m3)**	**Total input to leachate dam (ML)**
5 mins	6	22	216	238	0.2
1 hour	19	68	684	752	0.8
1 day	68	245	2,448	2,693	2.7
2 days	84	302	3,024	3,326	3.3
4 days	97	349	3,492	3,841	3.8

1 in 20 year (AEP 5%) rain events					
Duration of event	**Rain (mm)**	**Rain onto leachate dam (m3)**	**Flow into leachate dam from hardstand (m3)**	**Total input to leachate dam (m3)**	**Total input to leachate dam (ML)**
5 mins	7	25	252	277	0.3
1 hour	22	79	792	871	0.9
1 day	78	281	2,808	3,089	3.1
2 days	98	353	3,528	3,881	3.9
4 days	114	410	4,104	4,514	4.5

Notes

Rainfall-intensity-duration data from Bureau of Meteorology for the facility
AEP – Annual Exceedance Probability
Leachate dam area (m2) 3,600
Hardstand area (m2) 36,000
All rain to hardstand runs off to leachate dam
No evaporation losses from dam or hardstand for duration of event

Pump out is still required in each of 10 months (Row N), this time ranging from 0.6 – 4.6ML, totalling 16ML for the year. The minimum size of the dam required to accommodate the peak monthly input to the dam is 4.7ML.

If three months of 2-day 10%AEP rain are received in the year, neither the minimum volume of the dam required to accommodate the input nor the required pump out volume change (because the maximum monthly input remains the same) but the annual pump out volume increases from 16ML to 20ML.

If the extra monthly rain occurred in different months to those shown, the annual pump out and minimum dam size would be slightly less because evaporation rates in other months are higher.

4.3.7.3 Two and three rainfall months of 2-day 5%AEP rain

Table 12 has the same inputs and assumptions as Tables 2 and 3, but now includes two months of 2-day 5%AEP rain[36] (Table 1 shows the short-term rain for this event is 98mm; Row B.)

Pump out is still required in each of 10 months (Row N), this time ranging from 0.6 – 5.2ML, totalling 18ML for the year. The minimum size of the dam required to accommodate the peak monthly input to the dam is 5.2ML.

If three months of 2-day 5%AEP rain are received in the year, neither the minimum volume of the dam required to accommodate the input nor the required pump out volume change (because the maximum monthly input remains the same) but the annual pump out volume increases from 18ML to 21ML.

Table 10. Monthly water balance for the leachate dam, assuming mean monthly rain and no unusual rain events.

	Rainfall	Row		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mean rainfall	mm	A	Note 1	38	35	36	43	36	42	37	39	41	50	45	49	**491**
2-day 10%AEP events	mm	B	Note 2													**0**
Total rainfall	mm	C	A + B	38	35	36	43	36	42	37	39	41	50	45	49	**491**
Evaporation																
Mean solar exposure	MJ/m2)	D	Note 3	23	20	15	10	6	5	6	9	13	17	21	23	**167**
Evaporation	mm	E	Note 4	206	157	130	82	57	42	50	76	114	154	180	204	**1453**
Evaporation from hardstand	mm	F	Note 5	21	16	13	8	6	4	5	8	11	15	18	20	**145**
Inputs to leachate dam																
Net direct rain onto dam	mm	G	C - E	-169	-122	-94	-40	-20	0	-13	-37	-73	-105	-135	-155	**-962**
Net direct rain onto dam	ML	H	Note 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0**
Runoff from hardstand	mm	I	A-F+B	17	19	23	34	31	38	32	32	30	34	27	28	
Runoff from hardstand	ML	J	Note 7	0.6	0.7	0.8	1.2	1.1	1.4	1.2	1.1	1.1	1.2	1.0	1.0	**12**
Combined monthly inputs	ML	K	H + J	0.6	0.7	0.8	1.2	1.1	1.4	1.2	1.1	1.1	1.2	1.0	1.0	**12**
Output from leachate dam																
Evaporation	ML	L	Note 6	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	**2**
Leakage from base of dam	kL	M	Note 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.04**
Pump out to *Somerton* irrigation	ML	N	Note 9	0.0	0.0	0.6	1.2	1.0	1.3	1.1	1.1	0.9	1.1	0.8	0.8	**10**
Volume in dam after pump out	ML	O	Note 10	0.4	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
		P	Note 10	Min dam volume required to contain all inputs including storm events											**1.4**	**ML**

Notes

1 Mean rain for period 1993 - 2023 from Bureau of Meteorology for Melton Mowbray (Lovely Banks) station (BOM #94140)
2 Bureay of Meteorology Intensity-Frequency-Duration curves for the site for 10% AEP rain (duration 2 hours)
3 Bureau of Meteorology mean monthly solar exposure for Tunnack Fire station (BOM # 94195)
4 Conversion solar exposure (Q; MJ/m2) to evaporation E: E = (Q/L)*f; L = latent evap heat (MJ/kg); f= conversion factor
L = latent heat of evaporation (MJ/kg) 2.45 adopted
f is unusally in range 0.7 - 1.2 0.7 adopted
5 Evaporation from hardstand as % of total evaporation 10
6 Dam 1 footprint (m2) 3,600 For evaporation from dam, effective area is 30% of footprint
7 Hardstand area (m2) 36,000 No evaporation during storm events
8 Permeability (m3/day/m2) of dam base 1.E-07
9 Pump out to irrigation is triggered when volume of leachate in dam (ML) exceeds 1
10 Pump out to irrigation is designed to maintain constant leachate volume in dam not esxceeding volume specified in Note 9
This minimum dam volume excludes freeboard. Min. freeboard (m) is set at 0.5

4.3.8 Leachate management

Leachate runoff to the leachate dam (Dam 1) from windrows, mixing area and stockpiles has the potential to overflow the dam, particularly following unusually high rainfall (storm) events. Any overflow might discharge down the intermittent watercourse to the dam about 500m downstream on *Woodlands*.

[36]The probability of receiving two months of 5%AEP rain in any 12 months is 0.09, and of three months is 0.02..

The leachate dam has been sized to contain all leachate water. It is proposed to maintain the leachate level in it at or below a minimum volume by pump-out to irrigation of agricultural land on *Somerton*. Pump out will be triggered by leachate volumes in the dam exceeding this volume.

Table 11. Monthly water balance for the leachate dam, assuming mean monthly rain and two months of 2-day 10%AEP rain

Rainfall		Row		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mean rainfall	mm	A	Note 1	38	35	36	43	36	42	37	39	41	50	45	49	**491**
2-day 10%AEP events	mm	B	Note 2						84	84						**168**
Total rainfall	mm	C	A + B	38	35	36	43	36	126	121	39	41	50	45	49	**659**
Evaporation																
Mean solar exposure	MJ/m2)	D	Note 3	23	20	15	10	6	5	6	9	13	17	21	23	**167**
Evaporation	mm	E	Note 4	206	157	130	82	57	42	50	76	114	154	180	204	**1453**
Evaporation from hardstand	mm	F	Note 5	21	16	13	8	6	4	5	8	11	15	18	20	**145**
Inputs to leachate dam																
Net direct rain onto dam	mm	G	C - E	-169	-122	-94	-40	-20	84	71	-37	-73	-105	-135	-155	**-794**
Net direct rain onto dam	ML	H	Note 6	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	**1**
Runoff from hardstand	mm	I	A-F+B	17	19	23	34	31	122	116	32	30	34	27	28	
Runoff from hardstand	ML	J	Note 7	0.6	0.7	0.8	1.2	1.1	4.4	4.2	1.1	1.1	1.2	1.0	1.0	**18**
Combined monthly inputs	ML	K	H + J	0.6	0.7	0.8	1.2	1.1	4.7	4.4	1.1	1.1	1.2	1.0	1.0	**19**
Output from leachate dam																
Evaporation	ML	L	Note 6	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	**2**
Leakage from base of dam	kL	M	Note 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.04**
Pump out to *Somerton* irrigation	ML	N	Note 9	0.0	0.0	0.6	1.2	1.0	4.6	4.4	1.1	0.9	1.1	0.8	0.8	**16**
Volume in dam after pump out	ML	O	Note 10	0.4	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
		P	Note 10	Min dam volume required to contain all inputs including storm events											**4.7**	**ML**

Notes

1 Mean rain for period 1993 - 2023 from Bureau of Meteorology for Melton Mowbray (Lovely Banks) station (BOM #94140)
2 Bureay of Meteorology Intensity-Frequency-Duration curves for the site for 10% AEP rain (duration 2 hours)
3 Bureau of Meteorology mean monthly solar exposure for Tunnack Fire station (BOM # 94195)
4 Conversion solar exposure (Q; MJ/m2) to evaporation E: E = (Q/L)*f; L = latent evap heat (MJ/kg); f= conversion factor
L = latent heat of evaporation (MJ/kg) 2.45 adopted
f is unusally in range 0.7 - 1.2 0.7 adopted
5 Evaporation from hardstand as % of total evaporation 10
6 Dam 1 footprint (m2) 3,600 For evaporation from dam, effective area is 30% of footprint
7 Hardstand area (m2) 36,000 No evaporation during storm events
8 Permeability (m3/day/m2) of dam base 1.E-07
9 Pump out to irrigation is triggered when volume of leachate in dam (ML) exceeds 1
10 Pump out to irrigation is designed to maintain constant leachate volume in dam not esxceeding volume specified in Note 9
This minimum dam volume excludes freeboard. Min. freeboard (m) is set at 0.5

4.3.8.1 Sizing of the leachate dam

At the facility, approximately 3,600m^2 of area is available to accommodate a leachate dam (Dam 1). A similar adjacent area is available for a freshwater dam (Dam 2) receiving stormwater from non-hardstand areas of the facility. The freshwater would be used for irrigation of windrows, mixing area and stockpiles[37].

Table 12 indicates that the minimum required capacity of a leachate dam to accommodate direct rain and hardstand runoff is approximately 5ML.

To allow for contingencies, it is proposed to construct the leachate dam to a full capacity of 7ML with a minimum 0.5m high freeboard (the adjacent freshwater dam will have a full capacity of 6ML).

[37] Leachate could be used to irrigate the mixing area and the initial stages of windrowing, but this practice involves relatively minor volumes compared to hardstand runoff and has not been included in the monthly water balance in Tables 2, 3 and 4.

Table 12. Monthly water balance for the leachate dam, assuming mean monthly rain and two months of 2-day 5%AEP rain

	Rainfall	Row		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mean rainfall	mm	A	Note 1	38	35	36	43	36	42	37	39	41	50	45	49	**491**
2-day 10%AEP events	mm	B	Note 2						98	98						**196**
Total rainfall	mm	C	A + B	38	35	36	43	36	140	135	39	41	50	45	49	**687**
Evaporation																
Mean solar exposure	MJ/m2)	D	Note 3	23	20	15	10	6	5	6	9	13	17	21	23	**167**
Evaporation	mm	E	Note 4	206	157	130	82	57	42	50	76	114	154	180	204	**1453**
Evaporation from hardstand	mm	F	Note 5	21	16	13	8	6	4	5	8	11	15	18	20	**145**
Inputs to leachate dam																
Net direct rain onto dam	mm	G	C - E	-169	-122	-94	-40	-20	98	85	-37	-73	-105	-135	-155	**-766**
Net direct rain onto dam	ML	H	Note 6	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	**1**
Runoff from hardstand	mm	I	A-F+B	17	19	23	34	31	136	130	32	30	34	27	28	
Runoff from hardstand	ML	J	Note 7	0.6	0.7	0.8	1.2	1.1	4.9	4.7	1.1	1.1	1.2	1.0	1.0	**19**
Combined monthly inputs	ML	K	H + J	0.6	0.7	0.8	1.2	1.1	5.2	5.0	1.1	1.1	1.2	1.0	1.0	**20**
Output from leachate dam																
Evaporation	ML	L	Note 6	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	**2**
Leakage from base of dam	kL	M	Note 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.04**
Pump out to *Somerton* irrigation	ML	N	Note 9	0.0	0.0	0.6	1.2	1.0	5.2	4.9	1.1	0.9	1.1	0.8	0.8	**18**
Volume in dam after pump out	ML	O	Note 10	0.4	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
		P	Note 10	Min dam volume required to contain all inputs including storm events											**5.2**	**ML**

Notes

1 Mean rain for period 1993 - 2023 from Bureau of Meteorology for Melton Mowbray (Lovely Banks) station (BOM #94140)
2 Bureay of Meteorology Intensity-Frequency-Duration curves for the site for 10% AEP rain (duration 2 hours)
3 Bureau of Meteorology mean monthly solar exposure for Tunnack Fire station (BOM # 94195)
4 Conversion solar exposure (Q; MJ/m2) to evaporation E: E = (Q/L)*f; L = latent evap heat (MJ/kg); f= conversion factor
L = latent heat of evaporation (MJ/kg) 2.45 adopted
f is unusally in range 0.7 - 1.2 0.7 adopted
5 Evaporation from hardstand as % of total evaporation 10
6 Dam 1 footprint (m2) 3,600 For evaporation from dam, effective area is 30% of footprint
7 Hardstand area (m2) 36,000 No evaporation during storm events
8 Permeability (m3/day/m2) of dam base 1.E-07
9 Pump out to irrigation is triggered when volume of leachate in dam (ML) exceeds 1
10 Pump out to irrigation is designed to maintain constant leachate volume in dam not esxceeding volume specified in Note 9
This minimum dam volume excludes freeboard. Min. freeboard (m) is set at 0.5

4.3.8.2 No recycling of leachate to windrows

To avoid re-contamination of feedstock undergoing pasteurisation and maturation, no leachate/stormwater from Dam 1 will be recycled to windrows. Water needed for composting will be pumped only from Dam 2.

4.3.8.3 Potential for off-site discharge of leachate

Depending on operation of the facility and rain events, leachate may combine with stormwater in Dam 1. Off-site discharge of stormwater/leachate would occur:

- if Dam 1 overflowed and caused failure of the adjacent perimeter wall of the facility, or
- failure of the Dam 1 wall occurred, and caused failure of the adjacent perimeter wall.

The risk of either event occurring is regarded as acceptably low, because (a) Dam 1 (and Dam 2) will be constructed in accord with sound engineering principles under Permit conditions (DPIPWE 2015a or 2015b), and (b) water levels in Dam 1 (and Dam 2) will be monitored and managed on a day-to-day basis via water pump-in or pump-out.

4.3.8.4 Monitoring of surface and groundwaters for leachate contamination

Following on from the two background sampling events in January and June 2021 (Cromer, 2024b), a program of six-monthly surface water and groundwater monitoring will be instigated when composting operations commence (Table 16 in Section 6).

Monitoring sites are shown in Figure 26:

- Bore CKMB1 (S and D) is located adjacent to the wall of Dam 2,
- background (crossgradient) surface water sample CKSW1 is at Waterhole A, and
- downgradient surface water sample CKSW2 is at the first dam on *Woodlands Run* 250m downstream from the facility.

4.3.8.5 Regulatory framework and construction requirements for Dams 1 and 2

Dams 1 and 2 are subject to the requirements of the *Water Management Act* (1999), and in particular Section 8 which regulates dam works and permits. Permits will be required for both dams.

Compost Kings will seek advice from Southern Midlands Council as to whether Dams 1 and 2 qualify for a Division 3 or 4 Permit. Dams 1 and 2 will be constructed and managed in accord with the regulatory requirements in the *Division 3 and/or Division 4 Permit Dam Works Code 2015* (DPIPWE 2015a, 2015b)[38].

4.3.8.6 Sources of water

See Section 2.2.6.2.

4.3.9 Irrigating leachate on *Somerton*

4.3.9.1 Area available

Approximately 40ha of land available for leachate irrigation has been allocated by *Somerton*, in seven areas (1 – 7; Figure 1). Areas 1 – 3 (Figure 2) totalling 17ha will be preferentially used, with the remaining areas as back-ups.

4.3.9.1 Irrigation Management Plan

Leachate irrigation on *Somerton* will be done in accordance with an approved management plan developed in conjunction with or by the owners and managers of *Somerton*.

Of particular concern for the Plan is odour management. Among other components, the Plan will consider the following practices with respect to odour:

- Monitor wind direction and speed**:** Irrigation will be avoided during low-wind periods to reduce risks of odour accumulation.
- Air temperature: Irrigation will preferentially be done in periods of cooler temperatures (eg, most winter days, and earlier in mornings and later in afternoons during other seasons).

[38]Dams 1 and 2 are not on defined watercourses (there are no channels for water) and will have maximum wall heights less than 10 metres. They will not involve the clearing of more than 1ha of native vegetation. The risk rating of Dam 2 (stormwater only) in the event of failure is arguable low, but the rating is unclear for Dam 1 (stormwater/leachate) for which assessment of the consequences of failure may be required under ANCOLD (2012). Division 4 dams require the Permit applicant to be the owner of the land.

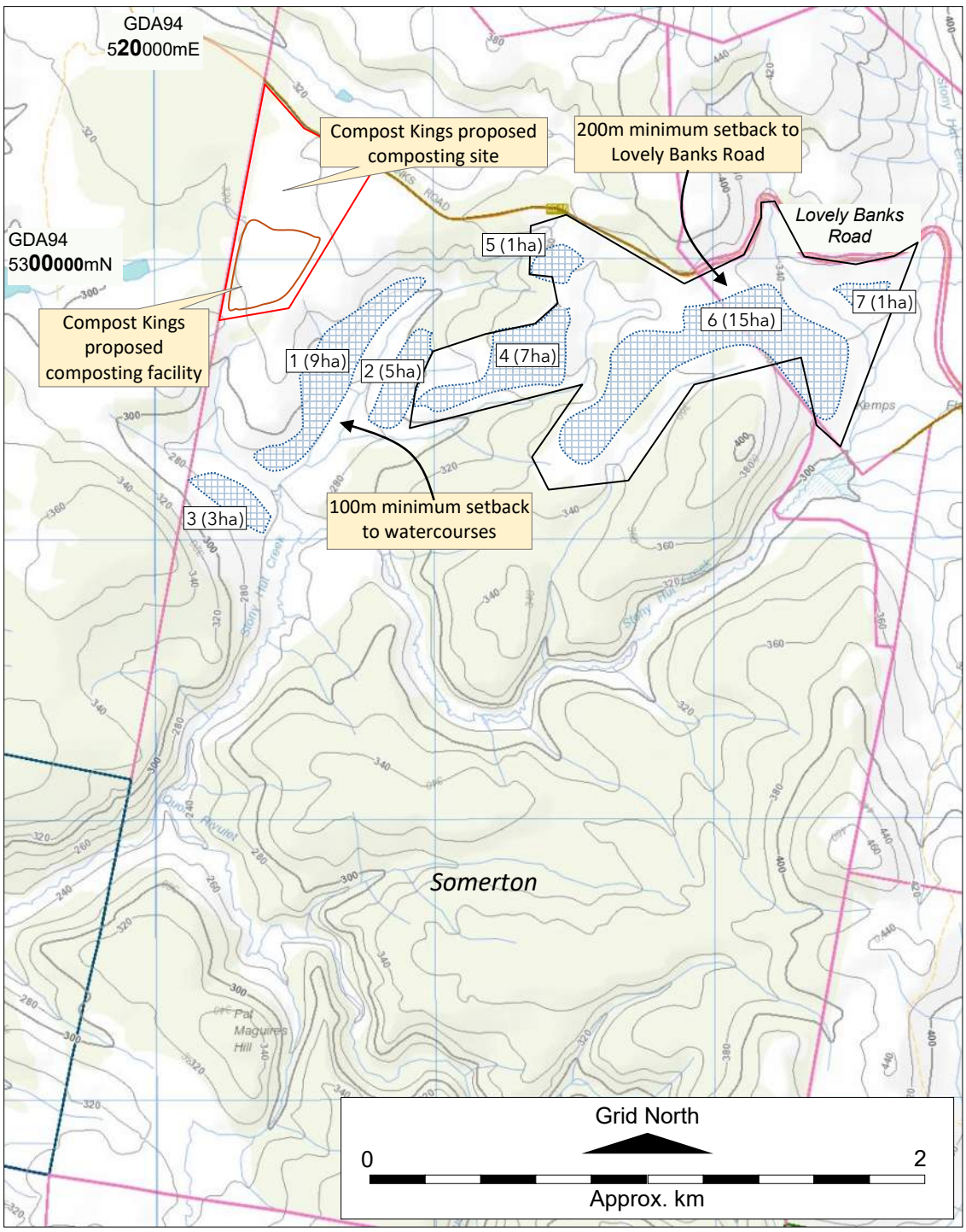


Figure 35. Areas allocated on *Somerton* total approximately 40ha for the controlled irrigation of leachate from the composting facility. Areas 1 – 3 (Figure 36) will be irrigated preferentially.

- to reduce odour volatility and the potential for odours to spread, humid conditions will be avoided.
- .Setbacks for irrigation: Each area has been setback nominally 100m from watercourses, and 200m from Lovely Banks Road.

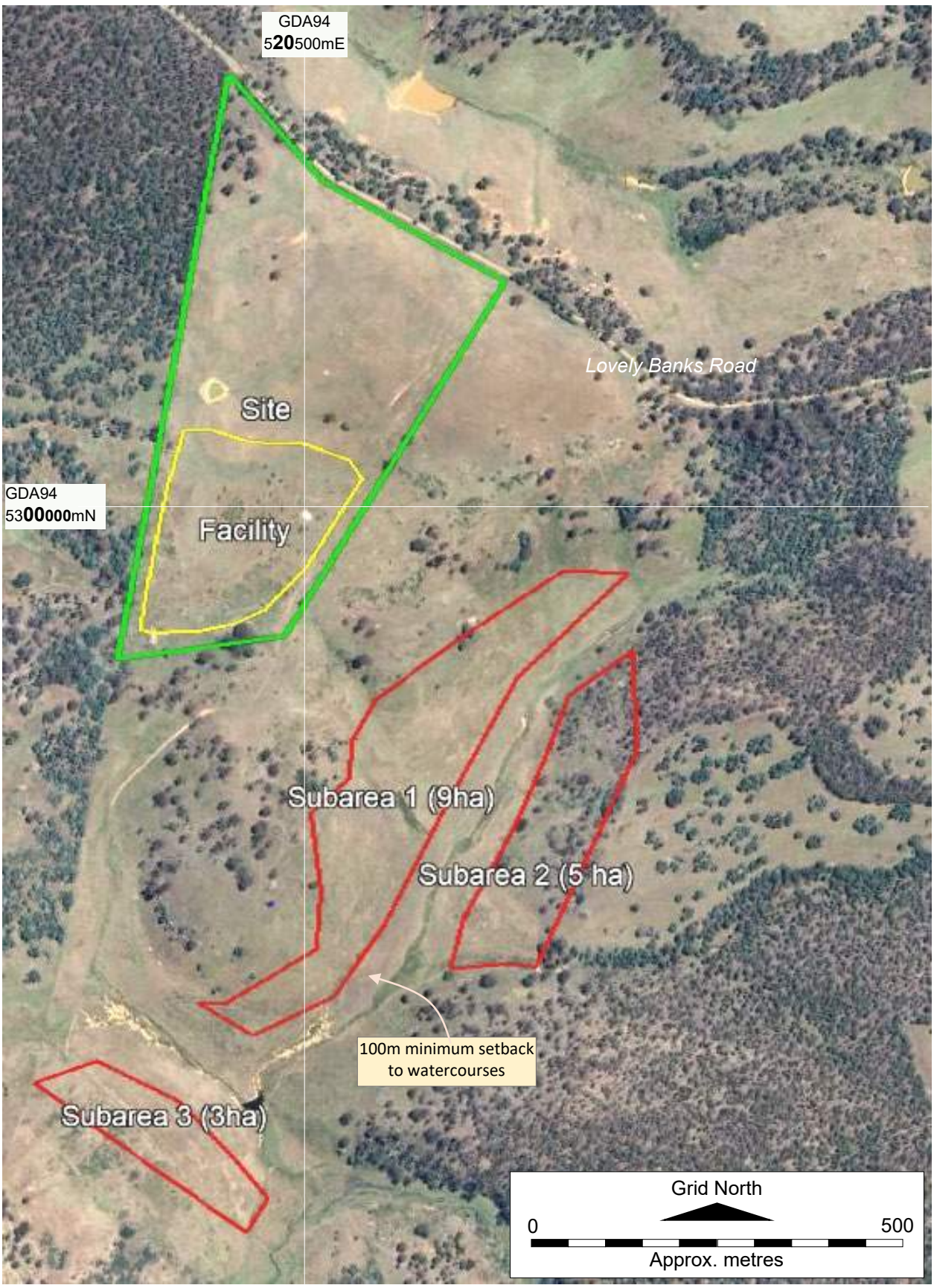


Figure 36. Subareas 1 – 3 (Figure 35) will be preferentially irrigated with leachate.

- Rotation of irrigation areas: This will allow for natural soil and microbial breakdown of residual odour-causing compounds
- Buffer Zones: Establish buffer zones between irrigation areas and sensitive receptors (e.g., houses, public areas) to minimize odour impact.
- Lowest practicable application rates: Where practicable, leachate will be applied in small doses to prevent saturation (ie it matches soil infiltration capacity) to prevent pooling, to reduce anaerobic conditions and odour.
- Application Method: Sprinklers will be used, but near ground level to limit spray drift and volatilization.
- Soil and odour monitoring: Routine soil moisture and odour monitoring will be done to ensure that conditions remain within acceptable thresholds, and so irrigation practices can be adjusted as needed.
- Application of leachate to high-absorption areas first: Within each irrigation area, and if practicable, leachate will be irrigated first on high-absorption areas to reduce surface exposure.

4.3.10 Stormwater management

4.3.10.1 Size and design of Dams 1 and 2

Dams 1 and 2 (Figure 37) will act as stormwater/leachate and stormwater-only collection facilities respectively. Dam 1 full volume is 7ML, and Dam 2 is 6ML.

The design and construction of each will be in accord with engineering principles and the works codes for Division 3 or 4 dams (DPIPWE 2015a or DPIPWE 2015b).

4.3.10.2 Recycling of stormwater to windrows

Stormwater from Dam 2 will be pumped via poly pipes to windrows and stockpiles at the discretion of the operator (Figure 37).

4.3.10.3 Potential for off-site discharge of contaminated stormwater

Stormwater collected in Dam 2 is not expected to be contaminated with leachate. Off-site discharge of uncontaminated stormwater would occur:

- if Dam 2 overflowed, and caused failure of the adjacent perimeter wall of the facility, or
- failure of the Dam 2 wall occurred, and caused failure of the adjacent perimeter wall.

The risk of either event occurring is regarded as acceptably low, because (a) Dam 2 will be constructed in accord with sound engineering principles under Permit conditions (DPIPWE 2015a or 2015b), and (b) water levels in Dam 2 will be monitored and managed on a day-to-day basis via water pump-in or pump-out (Table 18 in Section 6).

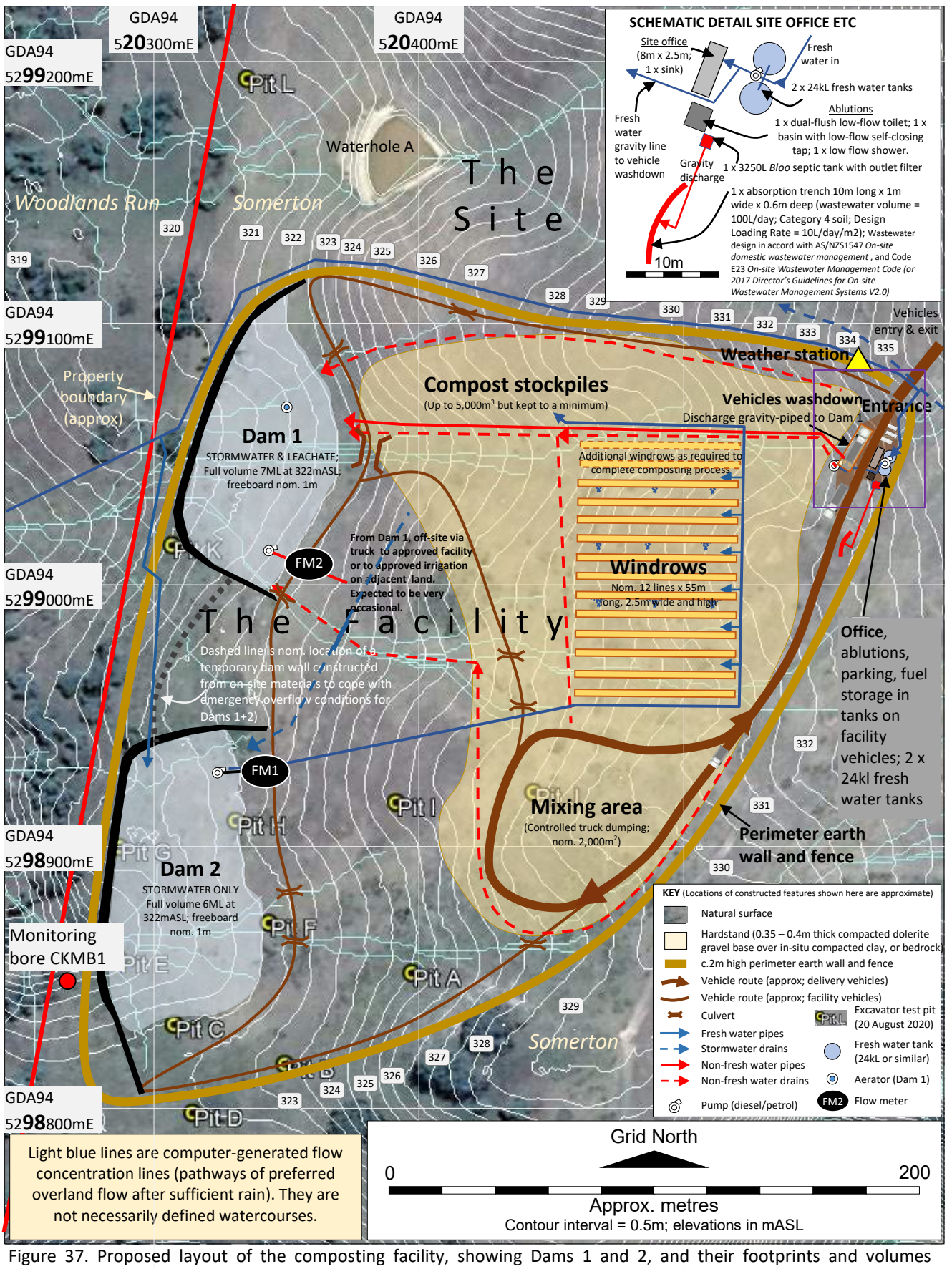


Figure 37. Proposed layout of the composting facility, showing Dams 1 and 2, and their footprints and volumes (Section 4.3.8.1). Source of base map: www.thelist.tas.gov.au

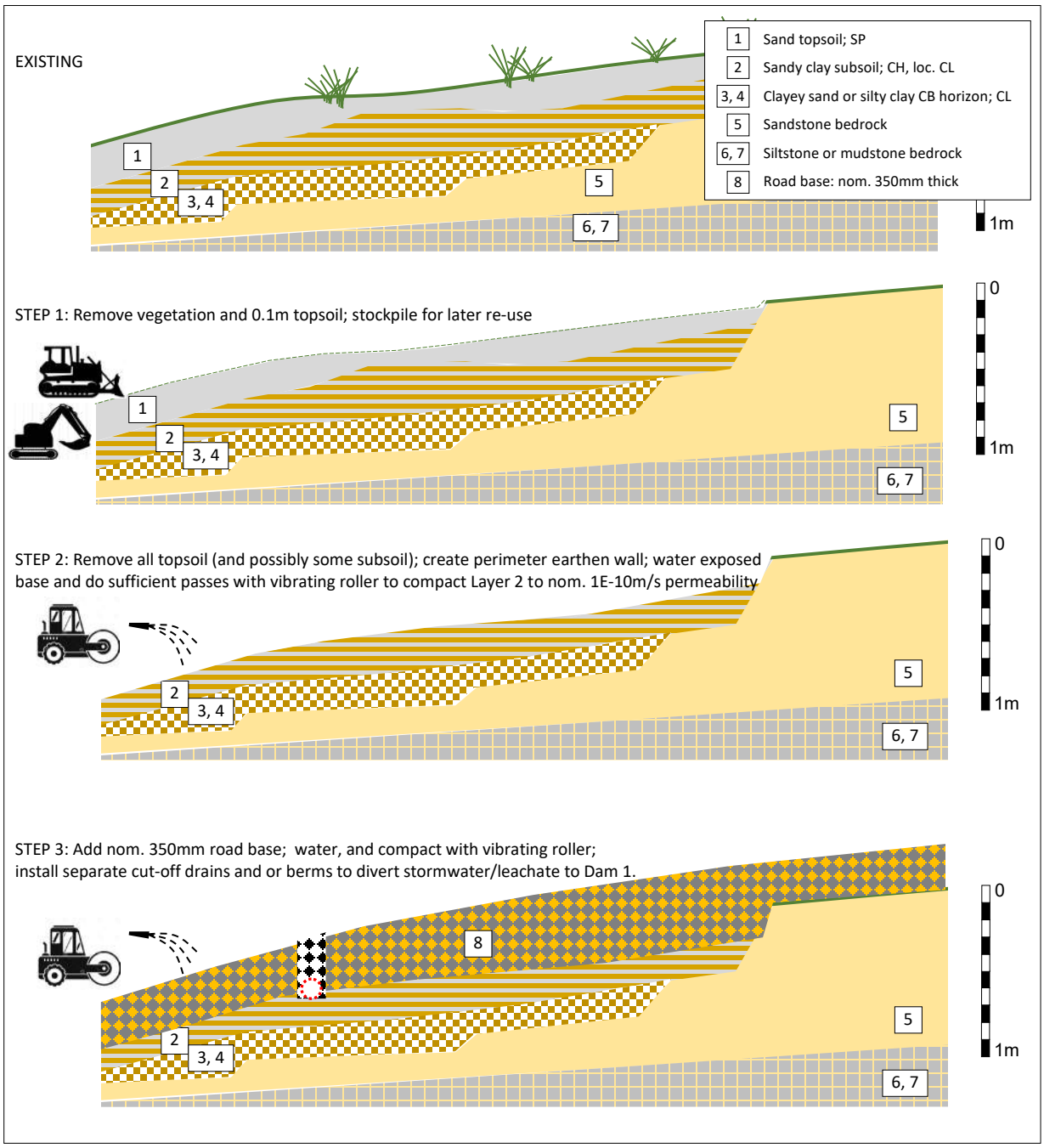


Figure 38. Proposed method of hardstand construction for the facility (reproduced from Figure 8 of Appendix 6.)

4.3.10.4 Dispersive soils

Subsoils over the facility are dispersive (Appendix 6). Dispersive soils may cause surface and tunnel erosion, and the main cause is uncontrolled discharge of water to the natural ground surface.

There are no current examples of surface or tunnel erosion over the facility footprint.

The compacted nature of the proposed hardstand areas will prevent such erosion. However, the potential remains for the issue to develop in areas not covered by hardstand, and the bases and walls of Dam1 and 2. To mitigate the effects of dispersive soils,

- all surface drains which collect stormwater/leachate from hardstand areas (the catchment for Dam 1) and stormwater from natural surface areas (the catchment for Dam 2) will be lined with geofabric/heavy duty plastic to prevent point sources of discharge from developing along their lengths, and
- the earthen bases and clay-core walls of Dams 1 and 2 will be constructed of appropriately-compacted low-permeability non-dispersive clay.

4.3.11 Vehicle and plant wheel clean and washdown

4.3.11.1 Wheel cleaning

All departing empty delivery vehicles will necessarily pass over rumble grid A (Figure 39) to remove material adhering to tyres.

4.3.11.2 Washdown facilities

All departing empty delivery vehicles will be required to wash down trays before departing the facility. Each of these vehicle will pass over mesh screen B (Figure 39) to park on a gently-inclined 10m long x 3m wide bitumen or concrete ramp.

Fresh washdown water from the nearby 2 x 24kL storage tanks will gravity-feed to a diesel or petrol pump next to the ramp, to provide pressurised hose water for tray washdown by the driver. All washdown residues (liquid and solid) will report to a concrete-lined pit beneath rumble grid A and mesh screen B.

Solid residue accumulating in the two-stage pit will be cleaned out by excavator as regularly as required. The heavier, mainly gravel fraction will be stockpiled nearby for later use in road maintenance, and the lighter fraction (mainly organic) will be returned to and recycled in the mixing area.

4.3.11.3 Estimated washdown volumes

Washdown volumes are estimated to be 30L/small vehicle, 50L/medium truck, and 75 – 100L/large truck. The daily volume based on vehicle movements (Section 2.2.10) is 600 – 800L/day.

4.3.11.4 Collection, storage and use of washdown water

Washdown water will be discharged via a buried 100mm PVC pipe to Dam 1 (Figure 39). Inspection openings will be placed at nominally 25m spacings in the discharge line to enable flushing.

4.4 Groundwater

4.4.1 Legislative and policy requirements

The *State Policy on Water Quality Management 1997* sets out standards for managing point and diffuse emissions to surface waters and groundwater. In relation to the proposed composting facility, the environmental values to be protected include aquatic ecosystems, raw water for town drinking supply, and agricultural water use

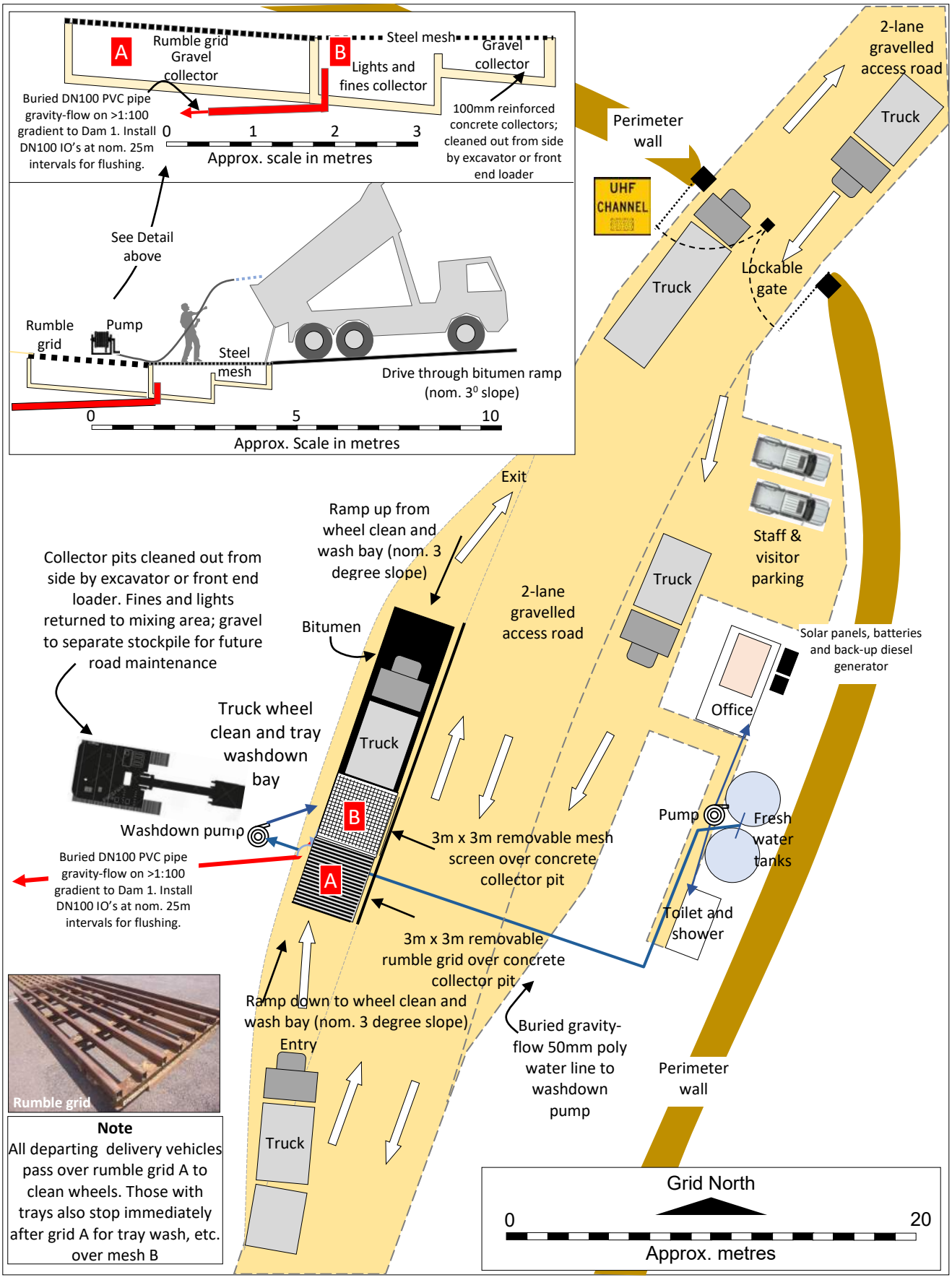


Figure 39. Proposed setup for wheel cleaning and washdown for departing vehicles.

4.4.2 Conceptual hydrogeological models

Cromer (2024b; Appendix 7 this report) compiled conceptual hydrogeological models through the section lines A – B and C – D in Figure 26.

The models are repeated here as Figures 40, 41 and 42, referring to section lines AB, part AB and CD respectively. Observations from the models (Cromer, 2024b, Section 3.2, page 27) are:

- *"all rock types in the district are unconfined hard-rock aquifers.*
- *groundwater moves through secondary openings (mainly joints) between otherwise dry bulk rock.*
- *groundwater at local-scale comprises recharge and discharge areas between neighbouring un-named minor creeks (discharge zones)*
- *groundwater at intermediate-scale comprises recharge and discharge areas between neighbouring un-named minor creeks (discharge zones)*
- *groundwater at regional-scale comprises recharge and discharge areas between neighbouring un-named minor creeks (discharge zones),*
- *groundwater flow rates are judged to be very low (of the order of a few centimetres/day) and travel times are relatively long (from decades in local-scale systems, to millennia in regional-scale systems).*

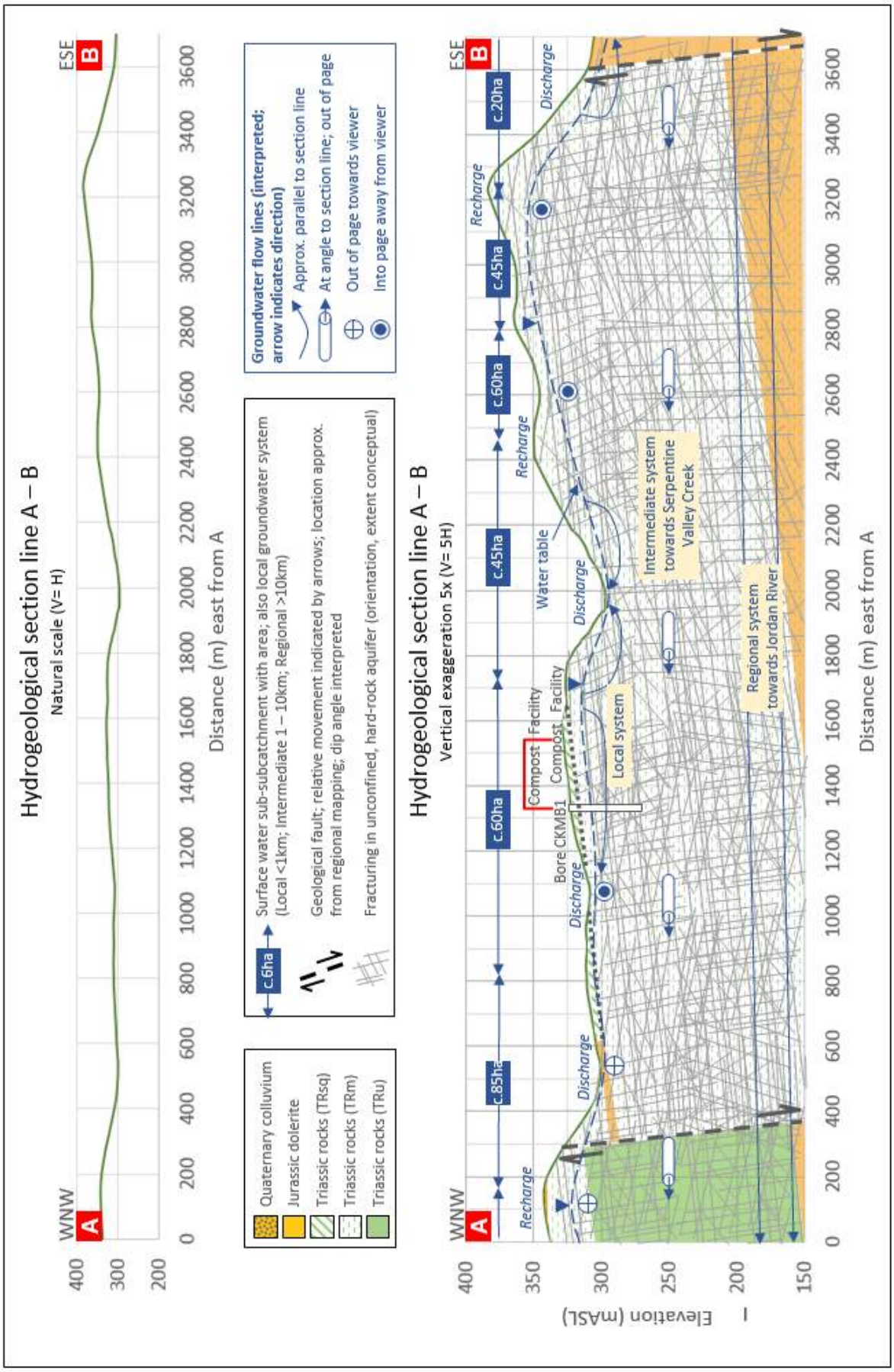


Figure 40. Conceptual WNW – ESE hydrogeological model through section line A – B in Figure 26.
Source: Figure 13 of Cromer (2024b)

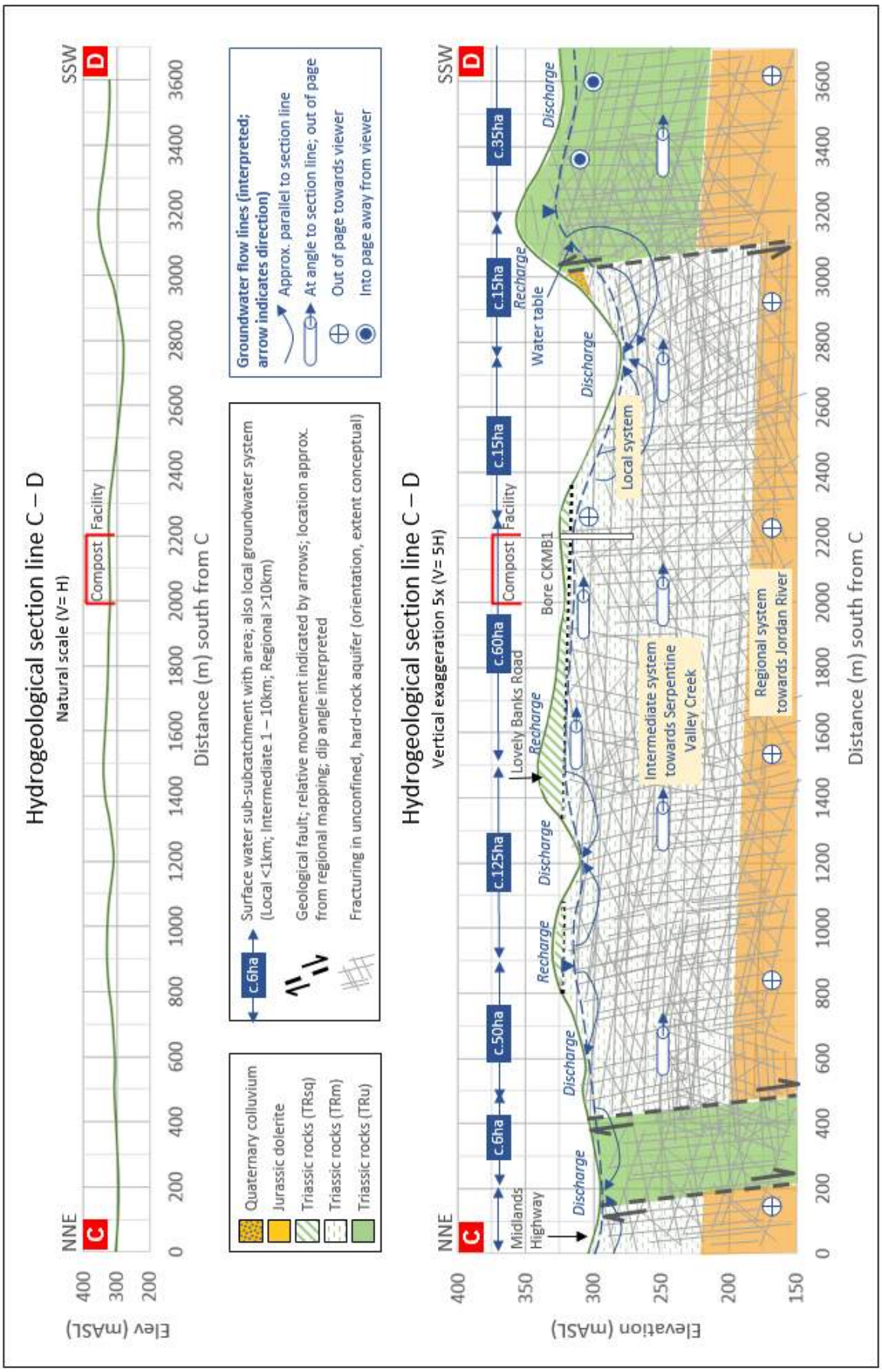


Figure 41. Conceptual NNW – SSW hydrogeological model through section line C – D in Figure 26.
Source: Figure 14 of Cromer (2024b)

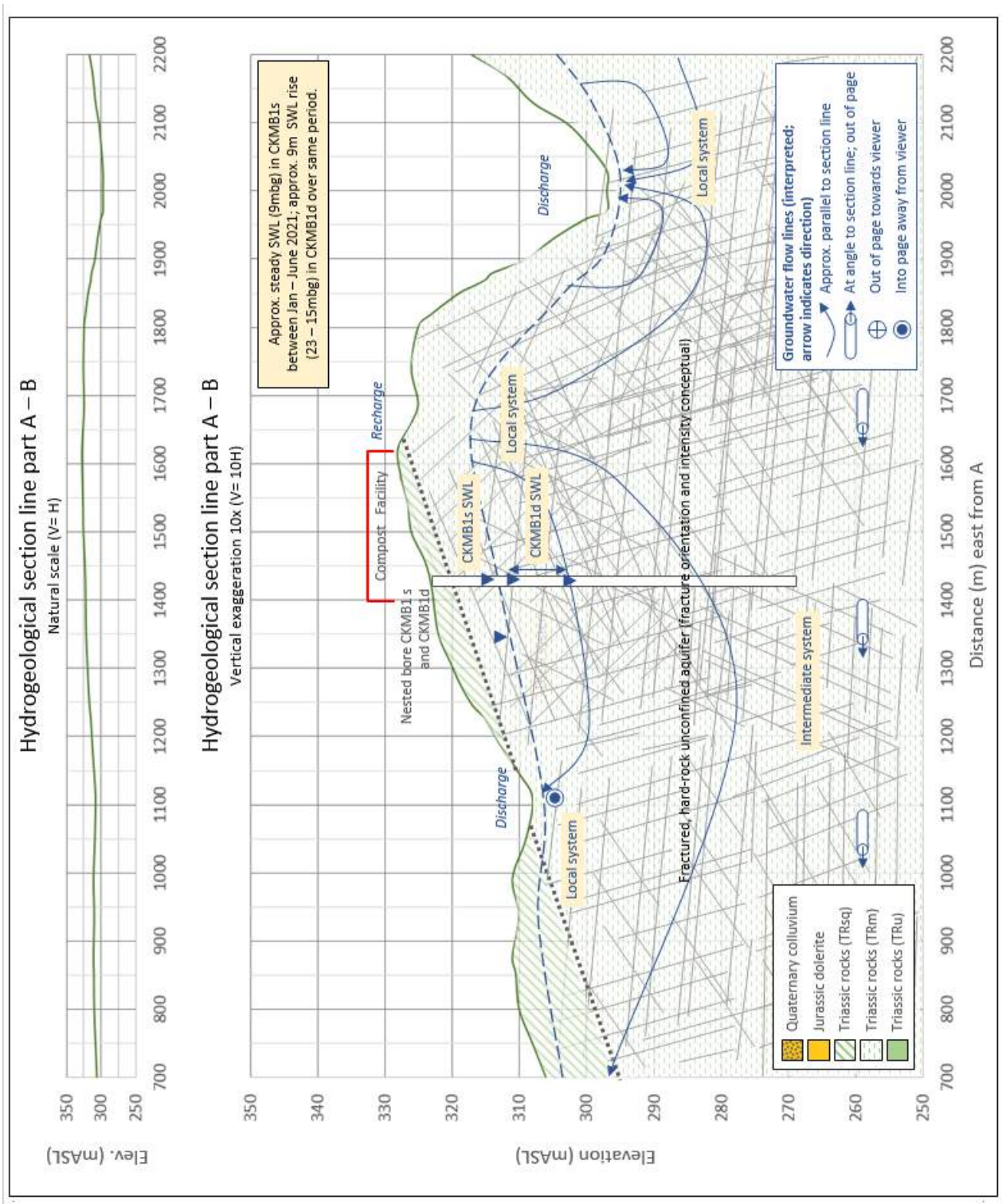


Figure 42. Conceptual NNW – SSW hydrogeological model through part of section line A – B in Figure 26.
Source: Figure 15 of Cromer (2024b)

4.4.3 Local, intermediate and regional groundwater flow directions

The concepts of groundwater flow systems (GFSs), and the relative sizes of local, intermediate, and regional GFSs are discussed in Appendix 7 [Cromer (2024b)].

In the vicinity of the proposed compost facility, flow directions (Figure 43) are inferred from site observations, groundwater levels in bores, and groundwater fundamentals:

- local flow (thin red arrows) is in small sub-subcatchments ("CFEV River section subcatchments" on www.thelist.tas.gov.au) in all directions,
- intermediate flow (thicker red arrows) is interpreted as west southwest within the Quoin – Serpentine Valley Creek Subcatchment (110km^2), and
- regional flow (thick, red-bordered arrows) is mostly westwards in the Jordan Catchment (1,250km^2).

The proposed compost facility (purple border) is in a sub-subcatchment of about 60ha (thick blue border; here informally called the Waterfield sub-subcatchment). Light yellow lines at right angles are parts of hydrogeological cross sections A – B and C – D. In the immediate vicinity of the facility, inferred local groundwater flow directions are westward.

4.4.4 Estimating groundwater flow rates

Cromer (2024b) assigned permeabilities, effective porosities, lengths of flow paths and hydraulic gradients to GFSs to estimate rates of groundwater flow and travel times within each.

Flow rates are of the order of a few centimetres/day irrespective of the size of the GFS. Travel times from recharge to discharge zones depend on the length of flow path and hydraulic gradient, and:

- probably range over millennia for regional flow systems,
- probably range over centuries for intermediate flow systems, and
- probably range over decades for local systems.

4.4.5 Potential for groundwater contamination from operations

A risk assessment approach (Appendix 7; Cromer 2024b) to potential groundwater contamination from the composting operations at the facility combines likelihood and consequences of groundwater contamination, and demonstrates that with appropriate management, the proposed composting facility will present acceptably low risks to groundwater.

Table 13 summarises the risk assessment process for potential groundwater contamination at the facility.

4.4.6 Groundwater management and monitoring

Based on the hydrogeology of the site and environs (Section 3.2.7) and water balance modelling (Section 4.3.7) it is proposed that nested downgradient bores CKMB1 S and D are sufficient to adequately manage and monitor the effects of composting on local-scale groundwater conditions.

If groundwater contamination is detected in future, the need for one or more additional bores will be assessed.

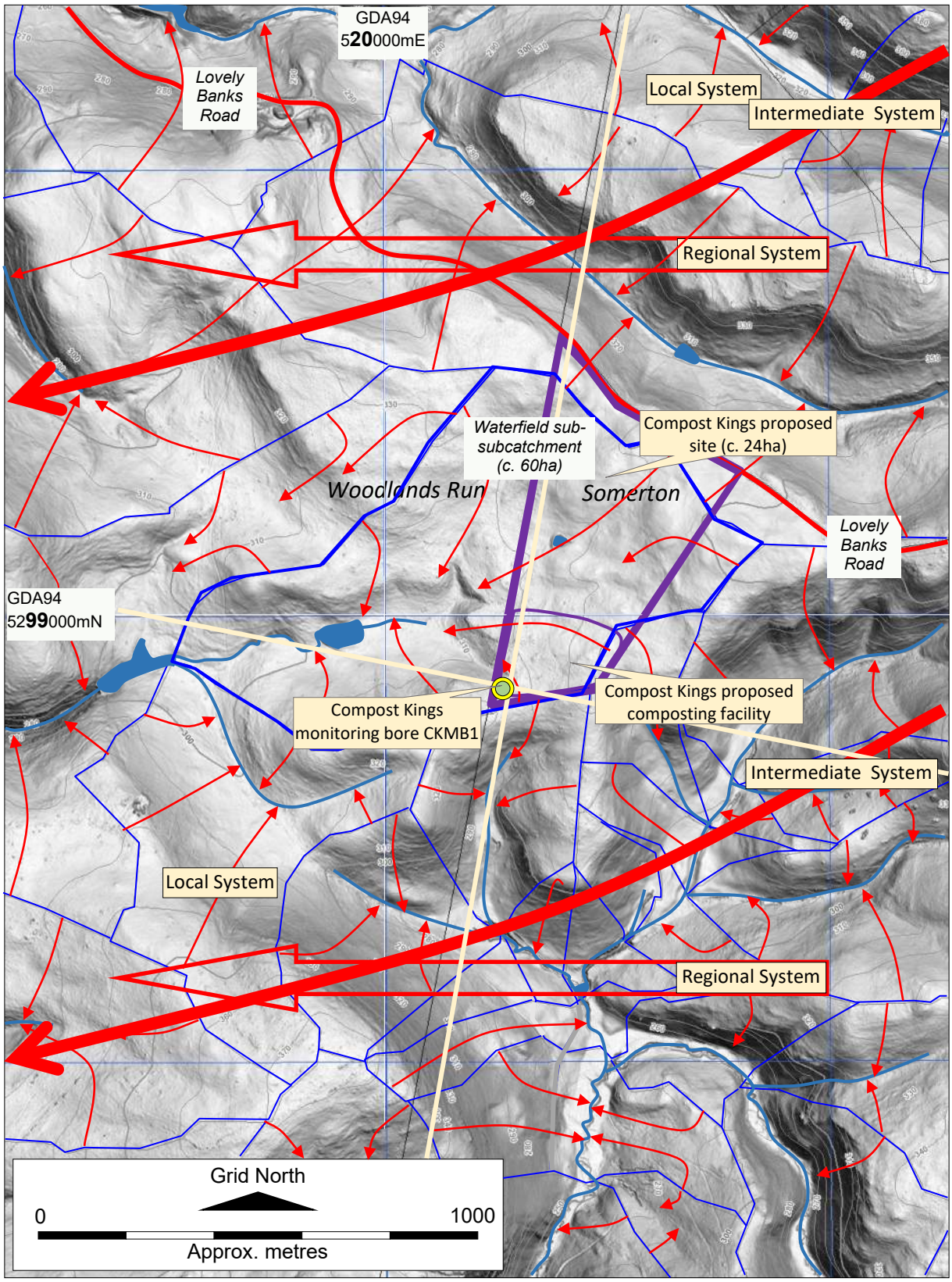


Figure 43. Inferred groundwater flow directions in the vicinity of the proposed composting facility.
Source: Figure 8 of Cromer (2024b).

Table 13. Potential risks to groundwater beneath the composting facility, and their management.
Reproduced from Figure 9 in Appendix 7; Cromer (2024b).

The hydrogeological model (Figure 15) for this facility is: existing soil profile (topsoil; clay subsoil, clayey sand weathered bedrock horizon); overlying Triassic sandstone, siltstone and silty mudstone bedrock to 50+m; water table at c. 9mbg. Existing local-scale groundwater quality unsuitable for domestic and livestock consumption.

		Before treatment				After treatment		
	1	2	3	4		2	3	4
	Scenario	**Likelihood of occurrence**	**Consequence to groundwater**	**Level of risk to groundwater**	**Suggested risk treatments**	**Likelihood of occurrence**	**Consequence to groundwater**	**Level of risk to groundwater**
	Elements at risk = local-, intermediate- and regional-scale groundwater in fractured hard rocks beneath the site							
1	Vertical infiltration to water table of on-site domestic wastewater from in-ground disposal of primary-treated wastewater in absorption trench(es)	Barely credible (very small-scale wastewater volume; subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Minor (local scale); Insignificant (larger scales; probably decades of g'water travel time); No groundwater use within +/- 2km.	Very Low	REDUCE LIKELIHOOD. Conduct Site and Soil Assessment, and design on-site system in accord with AS/NZS1547:2012 *On-site domestic wastewater management* and Tasmanian Director of Building Control's (2017) *Guidelines for On-site Wastewater Management Systems.*	Barely credible	Minor (local scale); Insignificant (larger scales; probably decades of g'water travel time)	Very Low
2	Vertical infiltration to water table of compost leachate from mixing area, floor of facility, compost stockpiles, and beneath windrows, on existing soil profile	Possible (subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time); No groundwater use within +/- 2km.	Moderate	REDUCE LIKELIHOOD. Remove topsoil; compact underlying subsoil with vibrating roller to reduce permeability nom. to 1E-10m/s; replace topsoil with compacted road base. Continue six-monthly groundwater monitoring of bore CKMB1S and D.	Unlikely	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time)	Low
3	Vertical infiltration to water table of leachate/stormwater from unlined dam inside facility	Possible (subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time); No groundwater use within +/- 2km.	Moderate	REDUCE LIKELIHOOD. Remove topsoil; compact underlying subsoil with vibrating roller; line dam with suitable membrane (eg PVC, LDPE). Continue six-monthly groundwater monitoring of bore CKMB1S and D.	Unlikely	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time)	Low
4	Rapid failure of above-ground tanks storing liquid fish wastes	Possible (subsoil and bedrock low permeability; water table relatively deep; groundwater water quality poor)	Minor Spilt liquids report rapidly to downgradient stormwater and leachate dam with very minor vertical infiltration.	Moderate		Unlikely	Medium (local scale); Insignificant (larger scales; probably decades of g'water travel time)	Low

4.5 Noise

4.5.1 Legislative and policy requirements

Noise emissions from the proposed composting facility are required to comply with relevant parts of EMPCA and *Environment Protection Policy (Noise)* 2009 (EPP 2009).

A focus is on noise effects on communities, particularly in relation to Level 2 activities and night-time operations.

Sources of noise during construction, and during operation, of the composting facility are listed in Sections 4.5.2 and 4.5.3. Based on these expected noise levels, the facility will comply with the legislative and policy requirements because:

- the nearest residence to the proposed composting facility is at *Redside*,1.27km away to the north on the Midland Highway (Figure 32), and
- there will be no night-time activities at the facility.

4.5.2 Sources of noise emissions during construction

Noise sources (and their approximate operating noise levels) during construction will include:

- 1 x D7 bulldozer (est. 109dBA)
- 1 x 7t excavator (est. 95dBA; 117dBA with rockbreaker)
- 1 x 18t front end loader (85dBA)
- 1 x diesel-operated vibrating roller (106dBA)
- trucks delivering road base of the hardstand (93dBA)
- 1 x generator (100dBA)
- Light vehicles exit and entry (95dBA)

4.5.3 Sources of noise emissions during operations

Noise sources (and their approximate noise levels) during operation will include:

- 1 x 7t excavator (est. 95dBA)
- 1 x 18t wheel loader (85dBA)
- trucks delivering raw materials (105dBA)
- 1 x over-row compost windrow turner (107dBA)
- 1 x generator and high pressure washdown hose (100dBA)
- 2 x diesel pumps (100dBA)
- Light vehicles exit and entry (95dBA)
- Small chipper (100 dBA)

4.5.4 Managing noise

There are no specific plans to manage noise emissions from the facility, because:

- it will not operate at night time, and
- the nearest residence is 1.27km to the north (Figure 32).

Noise will be generated by the additional vehicles on Lovely Banks Road, but these movements, and noise from operations, are not expected to cause annoyance and disturbance.

4.6 Waste management

4.6.1 Legislative and policy requirements

Waste management at the proposed facility is required to comply with:

- relevant parts of EMPCA, and
- *Environmental Management and Pollution Control (Waste Management) Regulations* 2010

4.6.2 Types and management of waste generated during operations

Almost all materials delivered to the facility will be transformed into compost. However, small volumes of recyclable and nonrecyclable wastes will be generated by operations. These include:

- Compostable and non-compostable oversize from compost screening

  Oversize feedstock at the end of composting will be chipped smaller and returned to the mixing area to introduce micro-organisms. Oversize is expected to be less than 5% of composted material.

- Washdown solids

  Organic washdown solids will be collected and added to mixing stockpiles. Gravel solids from washdown and rumble grids will be temporarily stockpiled for recycling to internal access roads. Other non-usable solids from the washdown area will be temporarily stockpiled on site before off-site transport to an approved waste facility.

- Rejected raw materials

  Deliveries with unacceptably high levels of foreign materials will be rejected at entry. For other deliveries with acceptably low levels of extraneous waste, plastic and all other foreign material will be hand-picked out and held in on-site covered bins for off-site recycling.

4.7 Dangerous goods and environmentally hazardous materials

4.7.1 Legislative and policy requirements

The management of dangerous goods and hazardous materials at the proposed facility is required to comply with:

- relevant parts of EMPCA,
- *Environmental Management and Pollution Control (Waste Management) Regulations* 2010, and
- *Work Health and Safety Act 2012* (current version February 2021)

4.7.2 Types and storage of dangerous and hazardous goods

Types and storages of dangerous or hazardous materials at the proposed facility are:

- diesel fuel for plant and equipment: stored in tanks on light vehicles and driven to each plant for refuelling as required; the light vehicles will leave the facility each day; no diesel will be stored at the facility, and
- waste oil will be collected by a mechanic and taken off site for recycling.

Placarding (signage) will be required for the use of on-site diesel (Schedule 11.1 of the *Work Health and Safety Act 2012*), but the volumes will not exceed the manifest quantities in the Schedule.

4.7.3 Management and contingency plans

Management plans for dangerous and hazardous materials will include:

- staff training as required in the handling and storage of fuels
- appropriate signage on fuel tanks on vehicles, and
- supply of PPE as required.

A hydrocarbon spill kit will be maintained on site.

4.7.4 Occupational health and safety plans

Appropriate OHS plans will be compiled and maintained by the operator, who will also ensure staff are adequately trained. All visitors to the site and facility, including all drivers of waste vehicles, will be required to undergo regular induction.

Each on-site staff will hold a current First Aid Certificate, and relevant machinery tickets/licences.

The emergency meeting point will be at the entry gate, and first aid kits will be in the site office and each company vehicle.

4.8 Biodiversity and Natural Values

4.8.1 Impacts of proposal on flora, fauna and habitat

Consultants North Barker completed natural values field surveys over the facility, and site and adjacent areas, in winter and spring 2021. Their Natural Values Assessment report is presented in Appendix 5, and summaries of their surveys are included in Section 3.2.4.

In the areas studied, identified threatened flora included several hundred shortleaf beardheath (*Leucopogon virgatus var. brevifolius)* plants, and about 100 *Scleranthus fasciculatus* (spreading knawel; TPSA vulnerable) plants.

No threatened fauna were identified inside the proposed facility. Elsewhere within the site, a single *Eucalyptus pauciflora* tree has potential hollows for Tasmanian masked owl (threatened under TSPA/EPBCA), and several *Eucalyptus ovata* trees more than 200m north of the facility offer foraging potential for swift parrot (threatened under TSPA/EPBCA),

Unfortunately, it will not be possible to avoid impacting the identified threatened flora during construction of the composting facility. Accordingly, the North Barker Natural Values Assessment report will support an application to DPIPWE by Compost Kings for a permit to take.

4.8.2 Managing pests, weeds and plant and animal diseases

4.8.2.1 Pests

Compost Kings will take all reasonable and practicable measures to prevent pests/vermin/insects from becoming attracted to the facility, and harbour within it. The following measures will be adopted to manage pests:

- regular clean-up and storage of consumable wastes before off-site removal,
- prevention of water from pooling and stagnating,
- prevention of access for animals, insects and other carriers of pathogens to readily biodegradable materials (eg by adequate storage and enclosure: a suitable animal-proof fence will be built along the top of the earthen perimeter wall; the gate across the only entrance to the facility will be animal-proof, and locked at night and at all times the facility is not operating) and
- minimisation of storage times of materials delivered to the mixing area.

4.8.2.2 Weeds and plant diseases

The most likely source of weeds and plant diseases at the facility is via incoming green waste.

The risk of these weeds and plant diseases reporting to the finished product is managed by (a) requiring all suppliers to ensure wastes are free of weeds and plant diseases, and (b) maintaining ideal composting conditions (ie C/N ratio, temperature, moisture and aeration control of windrows).

Compost Kings will also apply natural weedkiller to vegetated areas within the facility, including the earth walls.

4.8.3 Rehabilitation of disturbed areas

Disturbed areas will be confined to the composting facility and the access road to it. Neither will be rehabilitated during the course of operations.

At some future time if and when operations cease, the facility will be rehabilitated as described in Section 6.

4.9 Socio-economic issues

4.9.1 Capital investment of the proposal

The proposal is funded by the proponent and is not reliant on public funding via government grants.

Initial capital investment in the proposal is $300,000 (Table 1).

4.9.2 Operational expenditures and revenues

Estimated operational revenue and expenses under full production are summarised in Table 14.

4.9.3 Direct and indirect jobs arising from the proposal

Direct jobs

Compost Kings will initially have two full-time employees:

- Facility Manager (Seaton Waterfield), and
- Facility foreman (Michael Holmberg).

As the facility expands towards full capacity, an additional two employees may be required to maintain clean and efficient composting operations.

Indirect jobs

One indirect job via *Glen Edwards Excavations Pty. Ltd* will truck feedstock on-site, and truck finished compost off-site.

Indirect jobs will also include other truck drivers (employed by third parties) delivering raw materials.

4.9.4 Effect of proposal on upstream and downstream industries

No upstream or downstream industries exist.

Table 14. Estimated income and expenses for the proposed composting facility operating at full capacity. Numbers are rounded.

Income		
Sales of compost		$275,000
Acceptance fees for raw wastes		
	Category 1	$50,000
	Category 2	$50,000
	Total income	**$375,000**

Expenses		
Accountancy		$3,000
Advertising & promotion		$1,000
Bank fees and charges		$1,000
Bookkeeping		$3,000
Borrowing expenses		
Compliance cost of operations		
	Reporting	$6,000
	Testing – compost	$5,000
	Testing – waters	$2,000
Computer expenses		$1,000
Debt collection		
Depreciation – plant		$8,000
Fuel – plant		$40,000
Hire/rent of plant & equipment		$10,000
Insurance		$15,000
Legal fees		$2,000
Motor vehicle – depreciation		$5,000
Motor vehicle – fuel & oil		$7,000
Motor vehicle – service & repairs		$4,000
Phone (iPhones x 3)		$2,000
Rent		$25,000
Salary – manager		$60,000
Salary – foreman		$50,000
Salary – associated persons		$50,000
Staff amenities & benefits		$2,000
Staff training		$2,000
Superannuation		$20,000
	Total expenses	**$324,000**

4.10 Hazard analysis

Table 15 identifies the main hazards potentially affecting operations at the composting facility. Without management, most hazards are Moderate risks, with odour posing a High risk. With appropriate management in place, the risks of the hazards are mostly in the Low range. Odour and fire remain Moderate risks with management in place.

Table 15. Identified hazards, likelihoods, consequences and risks before and after recommended management at the proposed facility.

	No management				After management		
Hazard	Likelihood of occurrence	Consequences (and comment)	Level of risk	**Recommended risk treatment**	Likelihood of occurrence	Consequences	Level of risk
Major failure of Dam 1 (stormwater/leachate), causing downstream discharge	Unlikely	Medium – Major (Comment: most if not all discharge would be retained in the two relatively large dams a few hundred metres downgradient on *Woodlands Run*; it is 9km to the Jordan River, and there are no sensitive industries, and no town intakes for potable water, along the river's downstream length of 70km or so.)	Low to Moderate	Design and construct dam in accord with engineering principles and DPIPWE (2015a) or DPIPWE (2015b); inspect dam wall regularly for evidence of potential failure; monitor dam water levels daily, and manage by pump-in and pump-out	Rare	Medium – Major	Low
Overflow of Dam 1 (stormwater/leachate)	Possible	Medium (Comment: this scenario is most likely during or after an unusually heavy or prolonged rain event; dam excess storage at designated max. water level is sufficient for a 5%AEP event)	Moderate	Monitor dam water levels daily, and manage by pump-in and pump-out	Unlikely	Medium	
Anaerobic conditions develop in Dams 1 and/or Dam 2, causing odour issues		Medium (Comment: this scenario would develop slowly with ample time to address it)		Monitor pH, EC and DO in dams daily; if required, add fresh water, continue to use aerator			
Failure of the integrity of the hardstand		Medium (Comment: possible causes include rutting, erosion, vibration, abrasion by plant and trucks; weathering from rain, etc; spills and leakage; poor maintenance)		Conduct regular inspections, maintenance and repair; keep open drains in good condition; investigate whether traffic weight limits might be required			

Table 15. (continued) Identified hazards, likelihoods, consequences and risks before and after recommended management at the proposed facility.

	No management				After management		
Hazard	Likelihood of occurrence	Consequences (and comment)	Level of risk	**Recommended risk treatment**	Likelihood of occurrence	Consequences	Level of risk
Anaerobic conditions develop in windrows causing odour issues	Possible	Medium (Comment: these scenarios could develop as a result of any one or more of: high density, poor aeration, high moisture, inadequate C:N ratio, excessive turning, low temperatures; contaminated or inappropriate feedstock)	Moderate	Maintain C:N ratio of mix in the 25 – 40 range. Monitor odour, visual appearance, pH, oxygen, temperature, moisture content in windrows daily	Unlikely	Medium	Low
Composting process fails and produces an un-usable off-spec product				As above. Consider reprocessing if failure due to incomplete composting; otherwise, depending on specific characteristics, consider direct application (with owner and regulatory approval) on adjacent agricultural land, with or without or mixing with soil to improve structure, fertility, etc.			
Fire originating on-site		Medium (Comment: most likely source is overheating compost in windrows)		Maintain appropriate windrow temperatures; extinguish fires with pumped water from Dam 2, or from fresh water tanks or water tanker			
Fire originating off-site		Medium (Comment: Trees only on western side of facility on *Woodlands Run* ; most surrounding land is paddock.)		Activiate bushfire management plan	Possible		Moderate
Odour from Category 2 medium-odour feedstock (biosolids)	Likely	Medium (Comment: Could result in complaints from sensitive downwind receptors)	High	Ensure medium-odour feedstock is not separately stockpiled; instead, immediately mix it with low-odour feedstock in appropriate C:N proportions and add to windrows fro pasteurization.		Medium	

4.10.1 Dam collapse

Dams 1 and 2 will be constructed using engineering principles for small dam construction, and in accordance with the Division 3 or 4 Permit Dam Works Code (DPIPWE 2015a or 2015b).

Dam overflow during or following heavy or prolonged rain will be prevented by managing water levels towards a designated minimum (sufficient for day-to-day operations), achieved by internal

water use and (when required) off-site disposal (either tankered transport to an approved facility, or, subject to EPA and landowner approval, land-applied on neighbouring properties).

The combination of dam construction and water level management means that the risk of dam collapse is acceptably low. If collapse did occur (releasing up to 7ML of stormwater/leachate from Dam 1), the immediate downstream impacts would be substantially buffered by two farm dams (combined capacity about 25 – 30ML) on *Woodlands Run* 300m and 800m downstream from the facility.

As discussed in Section 4.3.3, there are no downstream intakes for town potable water supplies.

4.10.2 Fire risk within the site

Composting generates heat, and the site is in a bushfire-prone area.

Preliminary advice[39] from *Tasmania Fire Service* in September 2021 is that E1.0 *Bushfire Prone Areas Code* "will only apply to this project if the proposal is a 'hazardous use' as defined in clause E1.3.1 of the Southern Midlands Interim Planning Scheme 2015. The use is defined through reference to the use, handling, generation or storing of hazardous chemicals in volumes that exceed the manifest quantities of the *Work Health and Safety Regulations 2012.*"[40]

As stated in Section 4.7.2, on-site fuel volumes will not exceed the manifest quantities in Schedule 11.1 of these Regulations. Nevertheless, Compost Kings will develop a Fire Contingency Plan for the facility and site. The Plan will identify areas where fires might occur, conditions which might cause fires, and measures to prevent fires occurring.

Compost Kings will maintain adequate fire control measures (pumps/hoses) and water supplies (tanks, dam) around the facility.

4.11 Traffic

Appendix 2 shows that current estimated traffic volumes (all vehicles) on Lovely Banks Road will be increased by approximately 50% when composting operations commence. See also Section 2.2.9.

For road safety reasons, and subject to regulatory approval, UHF radio call-up signs will be positioned along Lovely Banks Road between the site entrance and the Midlands Highway (Figure 44) to warn arriving and departing truck deliveries of each other's movements.

4.12 Cumulative and interactive impacts

There are no identified cumulative and interactive impacts arising from proper management of the facility.

[39] Email dated 23 September 2021 from Tom O'Connor, Senior Planning & Assessment Officer, Bushfire Risk Unit, to Gray Planning and William C Cromer Pty Ltd.

[40] The Interim Scheme has since been superseded. "hazardous use" is now defined in Table C13.3.1 of the *Tasmanian Planning Scheme* as a use where: "(a) hazardous chemicals of a manifest quantity are stored on a site; or (b) explosives are stored on a site….". No explosives will be stored at the facility.

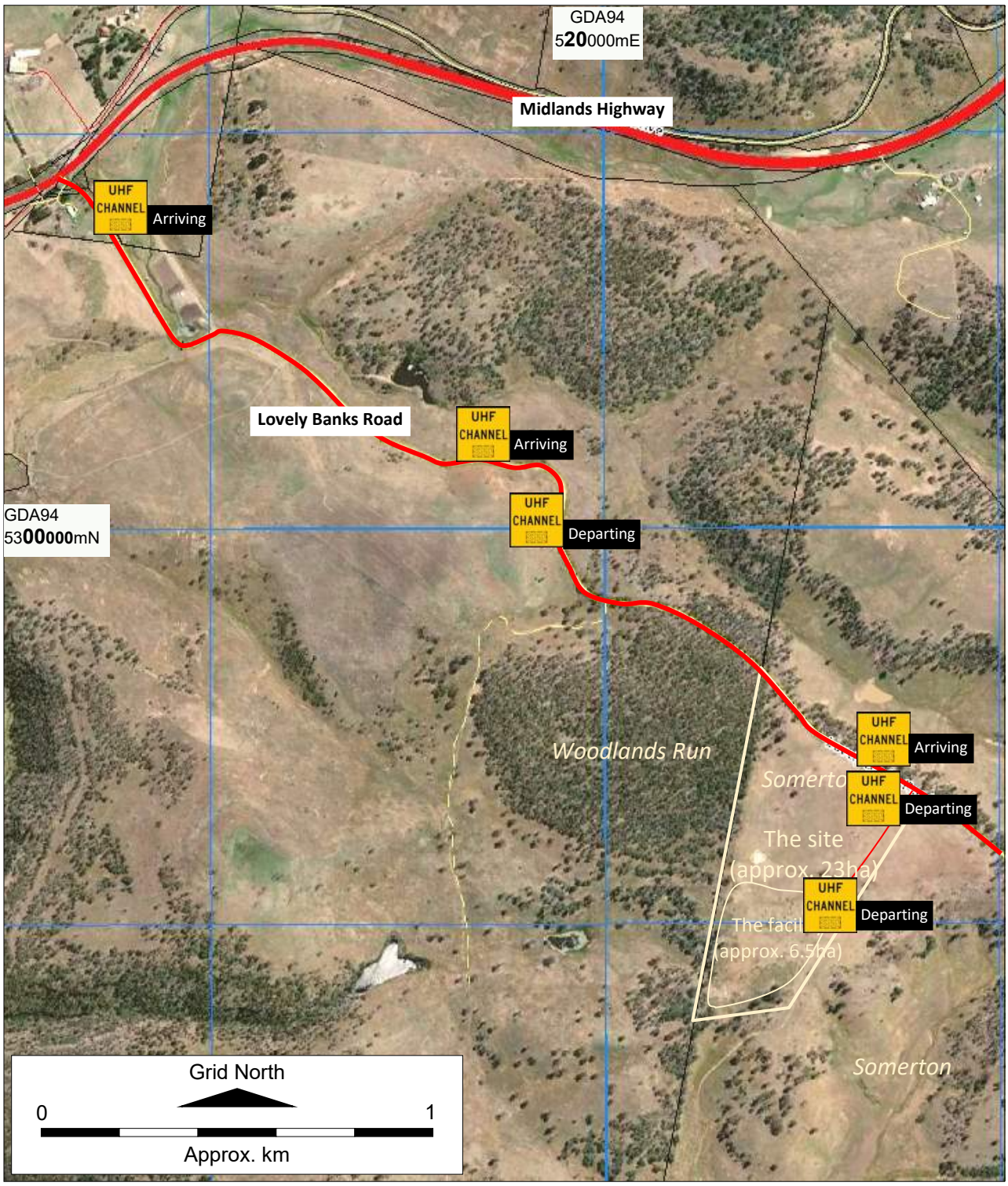


Figure 44. Proposed UHF radio call-up locations for arriving and departing trucks.

4.13 Environmental management systems

Environmental management at the facility has been mentioned numerous times in this report.

Compost Kings will develop a facility-specific Environmental Management System (EMS) before commencing construction and operations.

The EMS will incorporate (but will not be restricted to):

- a computerised system for the weather station, Wastes Deliveries Inventory, daily monitoring of operations , etc
- an Odour Management Plan
- a Dust and bioaerosols Management Plan
- a Bushfire Management Plan, and
- Occupational Health and Safety Procedures

5 DECOMMISSIONING

On cessation of operations, the facility will be decommissioned in the following steps:

- Mixing of Dam 1 water (and if required, Dam 2 water) with imported water from other dams on *Somerton*, and emptying both dams via irrigation to surrounding paddocks,
- filling-in of Dams 1 and 2 using material from the immediately-adjacent perimeter wall,
- removal of all hardstand material and its stockpiling in a secure, bunded location on *Somerton* until testing indicates it is suitable for re-use (eg internal vehicle accesses),
- reinstatement of soil from the perimeter wall over the former hardstand area, and
- removal of all infrastructure from the facility.

At the discretion of the owner of *Somerton*, the site may then be left vacant, or returned to agricultural activities (e.g. sheep grazing, as at present).

6 MANAGEMENT AND MONITORING

6.1 Environmental Management System

All of Compost Kings operations, protocols, environmental records, etc will be computerised. Collectively, they constitute an Environmental Management System, and will include the components brought together in Figure 45. Some of the components will be accessible to stakeholders (including regulators).

Table 16 summarises Compost Kings' proposed monitoring[41] and review of raw materials, composting and finished product, air quality (dust, bioaerosols, odour), stormwater/leachate quality and dam levels, and surface water and groundwater. Some of the actions in Table 16 are regarded as preliminary management tools which may be revised as operations continue.

6.2 Dust

6.2.1 Managing dust emissions on Lovely Banks Road and the site

Dust emissions and potential health risks along Lovely Banks Road and within the site and facility will be mitigated [Appendix 8; (Clifton, 2024)] by:

- reducing speed limits for delivery trucks on Lovely Banks Road during dry weather,
- reporting pot-holes and other defects on Lovely Banks Road to Council,
- maintaining the internal road on the site to the facility in good condition,
- watering the internal road in dry windy conditions,
- limiting speed on the internal road to 10km/h, closing the facility and site during periods of high winds (Table 20).

6.2.2 Managing dust and bioaerosols within the facility

Compost Kings will address dust and bioaerosol emissions and potential health issues within the facility by compiling (and where necessary updating) a Bioaerosols Management Plan as part of its OHS System. The Plan is best formulated during set-up of the facility. It will provisions to:

- identify areas and processes within the facility where bioaerosols are most likely to be generated,
- review on a day-to-day basis, and more frequently as required, local (including weather) conditions which might temporarily increase bioaerosol generation, and assess whether certain activities or operations could be avoided,
- require adequate watering of all affected hardstand areas as and when required,
- require an adequate, well-maintained filtration and ventilation system in the cabin of each operating plant (eg front end loader), and
- for those workers not operating plant, require the wearing of appropriate respiratory protective equipment whenever conditions require it.

[41] Testing for per- and poly-fluoroalkyl substances (PFAS) is included in Table 16.

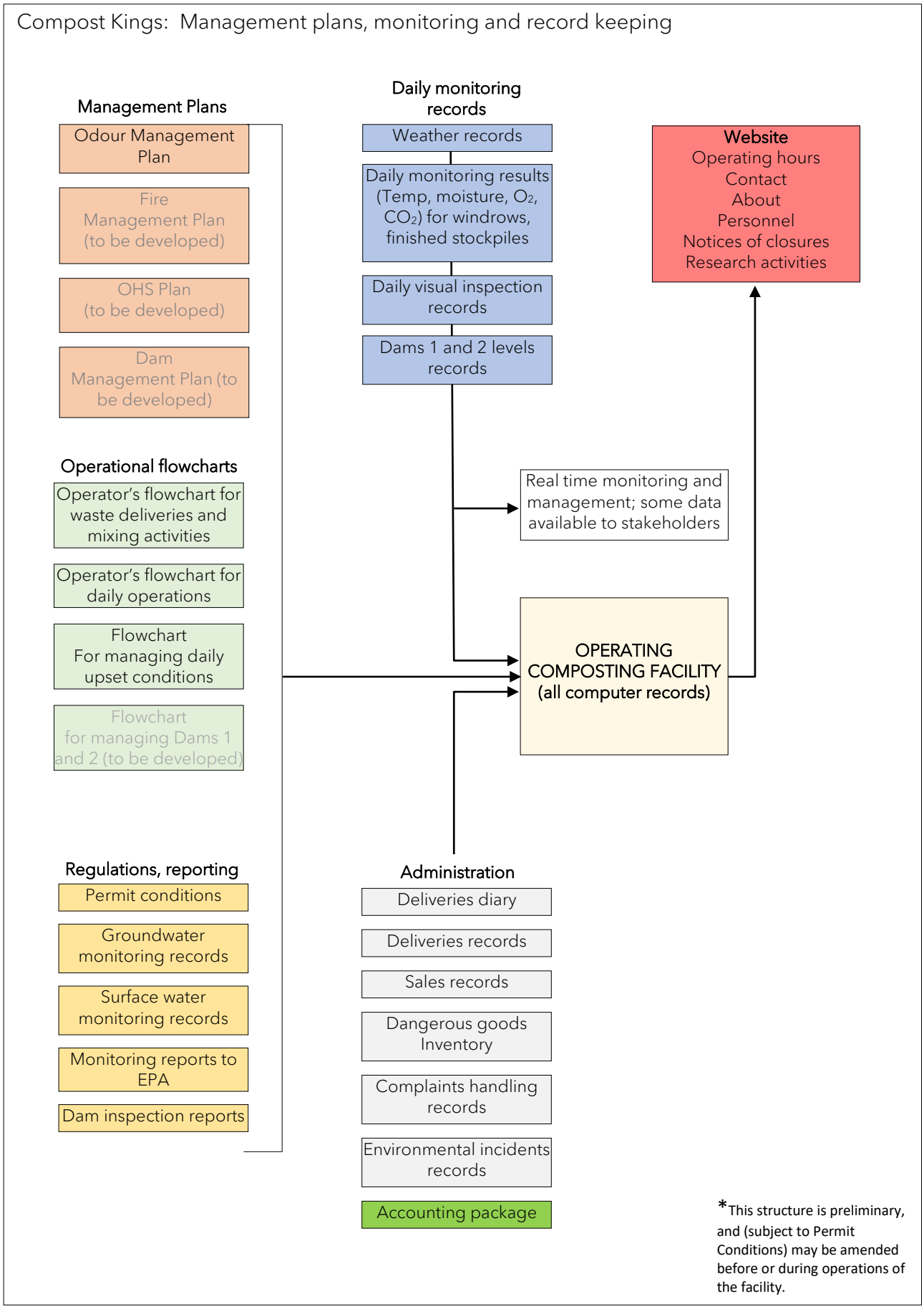


Figure 45. Compost Kings' draft Environmental Management System

A 10,000L general purpose[42] water truck will be permanently present at the facility to water down hardstand areas and the internal access road across the site. Sufficient water will be stored in Dam 2 to cater for dust suppression.

Table 16. Recommended monitoring program at the proposed facility

Item	Method	Frequency of monitoring/testing	Parameters for monitoring/testing	Monitoring and/or testing targets	Management of non-compliance
Climate					
Weather station	Automatic recording; all records to cloud-based storage and retrieval database	Effectively continuous	Rain, wind, temperature, humidity	N/A	N/A
Raw materials					
All incoming wastes	Visual inspection after delivery during composting	Each delivery of green waste	Weeds and weed seeds	No weeds apparent during composting or in final product	Natural weed killers applies to affected areas. All suppliers of green wastes notified.
All incoming wastes	Visual inspection	Each delivery	Coverage of waste	Appropriately covered vehicles	Non-acceptance of delivery
All incoming wastes	Visual inspection	Each delivery	Foreign matter in wastes	Minimal foreign matter	Hand-removal of foreign, or non-acceptance of delivery. Supplier notified.
All incoming wastes	Representative sampling and laboratory analysis	Quarterly (to be revised and amended if appropriate)	PFAS	To be determined after consultation with regulators	Supplier and regulators notified
Biosolids	Visual; field measurement	Each delivery	Odour, moisture content, pH	Not excessivley moist; no very strong odour; pH in range 6-8	Non-acceptance of delivery. Supplier notified.
Compost					
During composting	Field measurement in mixing area, windrows, and finished stockpile; results recorded in daily computer register	At least daily	pH, moisture, temperature (optionally, O_2 and CO_2)	Depending on composting stage, pH 5.5 – 8.0, moisture 50 – 55%, temperature 45°C – 75°C (min 55°C for pasteurisation). C:N ratio 25:1 to 40:1	Adjust C:N ratio; manage watering and turning regime.
Final product	Representative sampling in accord with Appendix A of AS4454 – 2012 *Composts, soil conditioners and mulches* ; samples despatched to NATA-registered laboratory; results recorded in computer register	Nominally, during first 6 months of operation, once per 250m^3 of finished product; subsequently, once per 500m^3 of finished product.	Nutrients (N, P, K, C, Ca, Mg, S, Fe, Mn), metals (As, Cd, B, Cr, Cu, Pb, Hg, Mo, Ni, Se); TOC, OCPs, PCBs, pathogens; TRH	As specified in Tables 3.1(A), 3.1(B) and 3.1(C) in AS4454 – 2012	Resample immediately and review results; Review sources and qualities of wastes (require compliance from suppliers, or change or abandon supplier. Composting procedures (review processes; stop off-site transport of non-compliant product; consider product blending)

[42] For transport of water across the site, for watering down for dust suppression, and firefighting.

Table 16 (continued)

Item	Method	Frequency of monitoring/testing	Parameters for monitoring/testing	Monitoring and/or testing targets	Management of non-compliance
Air quality					
Dust and bioaerosols	Visual inspection; awareness of actual and predicted weather conditions; results recorded in daily computer register	Continuously during operations	Strong winds	No visible dust	On Lovely Banks Road: Water down. Within the facility and site: Water down; activate Bioaerosol Management Plan. Avoid dust/bioaerosol generating activities; operators to wear respiritary protective equipment; operating plant to have adequate
Odour	Sniff testing; awareness of actual and predicted weather conditions; results recorded in daily computer register	At least daily	Strong odour	No odour	Nornal conditions: Maintain Odour Management Plan. Cover all medium-odour wastes immediately on arrival. Maintain aerobic conditions in windrows with appropriate turning intervals. Maintain appropriate C:N ratios in windrows. Upset conditions. Consider temporary closure of facility.
Dams 1 and 2					
Water level	Measurements by permanently-installed digital water level logger; results reported wirelessly to office and cloud-based databases; check of BOM daily rainfall forecasts	Nominally hourly logger readings	Water levels in Dams 1 and 2	Water levels maintained between designated minimum and maximum levels (provides min. volume for compost operations, and	Add fresh water from various sources, or pump-out and transport off-site by licenced operator to licenced wastewater disposal facility
Water quality	Grab sample; results recorded in daily computer	Daily	pH; electrical conductivity (EC)	pH in the range 6 – 8.5; EC<=2,000uS/cm	Add fresh water from various souces
Dam 1 aerator	Visual inspection	Daily	Adequate aeration	Operating to specifications	Regular maintenance and repair
Odour	Sniff testing	At least daily	Strong odour	No odour	Activate Odour Management Plan; operate aerator in Dam 1

Table 16 (continued)

Item	Method	Frequency of monitoring/testing	Parameters for monitoring/testing	Monitoring and/or testing targets	Management of non-compliance
Surface water					
Cross-gradient water sample CKSW1 and downstream water sample CKSW2 (Figure 19)	Grab sample; samples despatched to NATA-registered laboratory; results recorded in computer register	Six-monthly (summer and winter)	*Field parameters*: pH, EC, DO, Redox, Turbidity, Temperature. *Lab parameters*: pH, EC, 15 dissolved metals, BOD (filtered); COD (filtered); nutrients; OC pesticides; OP pesticides	No significant change sto background results of the first two monitoring events in summer and winter 2021. Any changes outside background values to be below trigger values or within specified ranges for ANZECC 2000 Aquatic Ecosystems (Freshwater -	Resample; review and possibly sample other surface water qualities.
Groundwater					
Sampling of monitoring bore CKMB1S & D	Low flow and/or bailer sampling; samples despatched to NATA-registered laboratory; results recorded in computer register	Six-monthly (summer and winter)	*Field parameters*: SWL; volume extracted; pH, EC, DO, Redox, Turbidity, Temperature. *Lab parameters:* pH, EC, 15 dissolved metals, BOD (filtered); COD (filtered); nutrients; OC pesticides; OP pesticides; TRH	No significant change sto background results of the first two monitoring events in summer and winter 2021. Any changes outside background values to be below trigger values or within specified ranges for ANZECC 2000 Aquatic Ecosystems (Freshwater -	Continue twice-yearly sampling. If non-compliance persists, review risk assessment for potential sensitive downstream receptors/users. Review need for second downstream monitoring bore.
Physical structures					
Hardstand areas	Visual inspection	Effectively continuous	rutting, erosion, vibration, abrasion by plant and trucks; weathering from rain, etc; spills and leakage	No visible damage from truck and plant movements	Regular maintenance and repair; keep open drains in good condition; investigate whether traffic weight limits might be required
Perimeter wall and fence	Visual inspection	Effectively continuous	Erosion, damage to fence	No visible damage from animals	Repair of damaged fence
Dam walls	Visual inspection	Effectively continuous	Erosion, piping	No visible damage	Immediate repair of eroded or piped areas

6.3 Odour

Compost Kings will at all times operate under its facility-specific Odour Management Plan (Cromer 2025, Appendix 9). Table 17 (Table 4 of Appendix 9) summarises best practice odour management procedures for the composting operations.

From time to time, various situations (e.g. rain, wind, temperature, fire, staff and equipment disruptions) individually or in combination might present unexpected and upset conditions contributing to potential odour issues. Operating instructions to address these situations have been drawn up for on-site personnel, and presented here as:

- a general flowchart (Figure 46), and
- Tables 18 – 23 (Tables 5 – 10 of Cromer 2025); where appropriate, these Tables specify trigger levels for specified actions.

These instructions will be continually reviewed and most likely amended as the composting activities continue to evolve.

6.4 Natural values management

6.4.1 Actions to be adopted to protect threatened flora

Three native communities are present on site (Section 3.2.4 and Appendix 5):

- *E. amygdalina* forest and woodland (DAS; 1.3ha),
- Lowland grassland complex (GCL; 19.3ha) and
- Lowland grassy sedgeland (GSL; 1.9ha).

The composting facility will affect 5.5ha of GCL and 1ha of GSL.

Two threatened flora species are present within the facility:

- *Leucopogon virgatus* var. *brevifolius* (two of 317 recorded plants occur within the facility), and
- *Scleranthus fasciculatus* (four of 78 recorded plants occur within the facility).

The works area (including the access road) will be marked out in construction plans and on the ground, and works, vehicles and materials will be confined to the works area.

Compost Kings will apply for a permit to take/relocate *Leucopogon virgatus* var. *brevifolius* and *Scleranthus fasciculatus* within the facility. In addition,

- an exclusion zone 15m in radius will be created around each of two trees outside but near the southern boundary of the facility (Figure 3 in North Barker, 2022), where small groups of both threatened species occur. No development or ground disturbance will occur within the exclusion zones.
- a 5m radius exclusion zone (with the same development restrictions) will be created around small groups of both plants near the western boundary of the facility (Figure 3 in North Barker, 2022), and
- a drain will be installed around the outside base of the perimeter earthen wall of the facility to prevent damage to these two locations from surface drainage from the wall.

6.4.2 Actions to be adopted to protect threatened fauna and their habitats

Foraging habitat for Tasmanian devil, eastern quoll, Tasmanian masked owl and Tasmanian wedge-tailed eagle occurs within the facility (and also over the broader area). A single tree close to the northwestern edge of the facility (Figure 2 in North Barker, 2022) may support hollows for the masked owl. It is also recognised that the facility is likely to promote scavenging by native fauna.

To manage these issues, Compost Kings will:

- in relation to the single tree with potential masked owl hollows, review whether the tree will be impacted by the proposed development: if it is, the development footprint will be amended to create a 15m exclusion zone around the tree,
- request of the relevant authorities that signage be erected on Lovely Banks Road near the western and eastern extents of the site to reduce speed and raise awareness of drivers to native fauna crossing the road, and
- maintain good housekeeping practices during composting to cover odorous materials to mitigate fly propagation, pest, etc.

Table 17. Best Practice Odour Management Controls proposed at the facility

Aspect		Hierarchy of Controls	Controls
Arrangements with suppliers, and access to facility	1a	Avoid, minimise	Only approved suppliers permitted to deliver wastes. No contractual arrangements for on-going acceptance of waste types or volumes. Approved suppliers have agreed in writing to (a) verbally pre-book and receive approval for each waste load before leaving source, (b) supply only weed- and FOGO-free waste, and deliver wastes only in appropriately covered vehicles.
	1b		At the verbal pre-booking stage, the site operator refuses delivery if the waste type or volume cannot be accepted at the facility and dealt with appropriately.
	1c		The main access gate on Lovely Banks Road, and the internal gate to the facility, will both be locked at all times (i.e., after hours, at weekends and public holidays) unless the site operator or other staff are in attendance to receive wastes. The gates will also be locked during upset conditions.
Waste reception	2a	Avoid	All incoming waste vehicles stopped at facility office; uncovered loads refused entry and suppliers notified. All loads checked for contamination status. Hand-picked contaminants separately stored in dedicated, enclosed container and removed as required off-site to approved facility. Loads with unacceptably high contamination levels refused entry.
	2b	Manage	All accepted loads entered into daily Wastes Received Record.
	2c		Wastes directed to mixing area.
Mixing	3a	Manage	Solid wastes segregated by type: low-odour high-carbon solid wastes to separate stockpiles (i.e., green waste, sawdust, bark to separate piles); medium-odour low-carbon putrescible solids to be immediately mixed and covered with low-odour wastes. Regular checks of low-odour stockpiles for temperature, moisture, pH, O2 and CO2 to optimise composting rates and reduce odour; regular turning as required.
	3b		Moving mixed wastes to the windrows is done via front end loader. Solid spillages will occur. The track of the loader shall be as constant as possible, to avoid spreading spillages over the hardstand; all spillages shall be removed to the windrows immediately the transfer of materials is complete.
Windrows	4	Manage	Regular checks of windrows for temperature, moisture, pH, O_2 and CO_2 to optimise composting rates and reduce odour; irrigation and turning is done as required.
Compost stockpile	5	Manage	Regular checks of stockpile for moisture, pH, O_2 and CO_2 to optimise composting rates and reduce odour; irrigation is done as required.
General	6a	Manage	Maintaining at the mixing area a reserve of high-carbon low odour feedstock (eg sawdust, woodchips, of appropriate particle size) of 10 – 20% of weekly intake by weight . This enables sufficient material to be continuously available for adjusting composting mixtures as required, or for mixing with or capping odorous windrows. The reserve weight will vary seasonally and with differing feedstocks: reserves closer to 20% will be maintained when feedstocks have low consistency in C:N ratios, and/or if biosolids are accepted.
	6b		Daily visual and sniff-testing of facility perimeter and internal areas; clean-up of any areas of spilt waste or compost; enter monitoring results into daily Inspection Checklist.
	6c		Continuous records from on-site weather station (rain, temperature, humidity, wind speed and direction), and dam water levels; record daily flow meter readings of water pumped from dams.

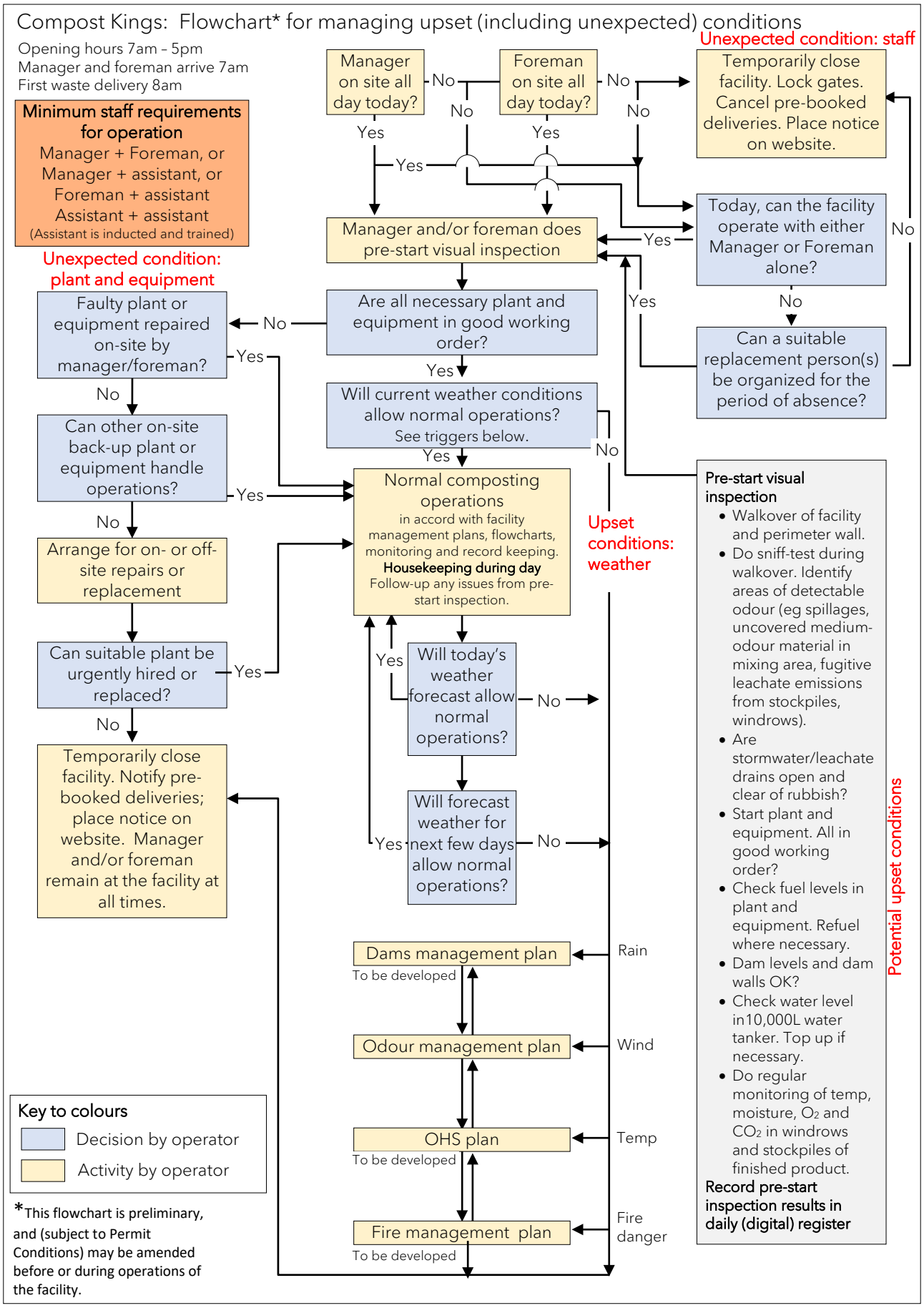


Figure 46. Flowchart for managing unexpected and upset conditions. (Source: Figure 13 of Cromer 2025)

Table 18. Operating instructions for normal and upset rain conditions. Rain is recorded directly from the on-site weather station.

This Table is Table 5 from the Odour Management Plan. It will form part of the daily operations manual for all personnel at the facility.

RAIN

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	Forecast rain up to 20mm (average occurrence 3-4 days per year)	Forecast rain up to 30mm (average occurrence once a year)	Forecast rain up to 50mm (average occurrence once every five years)	Forecast rain up >50mm
Action today	NORMAL OPERATIONS Compare current Dam 1 and 2 levels (ie volumes) to trigger levels. If new levels exceed trigger levels, pump out dams[2] as required (eg bring forward planned windrow irrigation with soaker hose or windrow turner. Operate facility in accord with OMP[3] and all other procedures.		UPSET CONDITION As for Columns 1 and 2. Cancel prebooked deliveries of all medium-odour wastes. Consider closing facility and site.	UPSET CONDITION As for columns 1 and 2. Close facility and site. Insert closure time and expected re-opening time on website; notify today's pre-booked suppliers by email and/or text. Min. responsible staff[4] remain at facility.
Next few days including today	Forecast rain up to 50mm	Forecast rain up to 75mm	Forecast rain up to 100mm	Forecast rain up >=100mm
Action today and next few days	NORMAL OPERATIONS Compare current Dam 1 and 2 levels (ie volumes) to trigger levels. If new levels exceed trigger levels. If new levels exceed trigger levels, instigate off-site water irrigation plan and pump out dams as required.	NORMAL OPERATIONS As for Column 1. Cancel all prebooked deliveries of medium-odour wastes. Limit machine movements.	UPSET CONDITION As for Columns 1 and 2. Cancel pre-booked deliveries of all medium-odour wastes. Minimise machine movement. Consider closing facility and site.	UPSET CONDITION As for columns 1 and 2. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Min. responsible staff[4] remain at facility.

1

2 Dams 1 and 2 have been sized to accept at least several 5%AEP rain events when water levels are maintained (after daily inspection) less than the trigger level. Pump-out ought not be normally required.

3 OMP = Odour Management Plan

4 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

Table 19. Operating instructions for normal and upset temperature conditions. Temperature is recorded directly from the on-site weather station.
This Table is Table 6 from the Odour Management Plan. It will form part of the daily operations manual for all personnel at the facility.

TEMPERATURE (https://www.safeworkaustralia.gov.au/resource/managing-risks-working-hot-conditions-guide-employers)

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	WBGT[1]<22^{0}C (nom. air temp <c. 24 – 27^{0}C)	WBGT<25^{0}C (nom. air temp 27 – 30^{0}C)	WBGT<28^{0}C (nom. air temp 32 – 35^{0}C)	WBGT>=28^{0}C (nom. air temp >=35^{0}C)
Action today	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP, OHS[2] management plan, and all other procedures.		UPSET CONDITION Instigate heat management plan for facility personnel. As for Columns 1 and 2. Cancel pre-booked deliveries of all medium-odour wastes. Consider closing facility and site.	UPSET CONDITION As for columns 1 and 2. Instigate heat management plan for facility personnel. Stop all non-essential machine use. Close facility and site but consider accepting emergency deliveries which require no machine use. Insert closure time and expected re-opening time on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[3] remain at facility.
Next few days including today	WBGT[1]<22^{0}C (nom. air temp <c. 24 – 27^{0}C)	WBGT<25^{0}C (nom. air temp 27 – 30^{0}C)	WBGT<28^{0}C (nom. air temp 32 – 35^{0}C)	WBGT>=28^{0}C (nom. air temp >=35^{0}C)
Action today and next few days	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP, OHS management plan, and all other procedures.	UPSET CONDITION Instigate heat management plan for facility personnel. As for Column 1. Cancel prebooked deliveries of all medium-odour wastes. Consider closing facility and site.	UPSET CONDITION Instigate heat management plan for facility personnel. As for columns 1 and 2. Stop all non-essential machine use. Close facility and site but consider accepting emergency deliveries which require no machine use. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[3] remain at facility.	

1 WBGT = wet bulb globe temperature (combines temperature, humidity and radiant heat); measured on site by portable meter. Digital alarm set to WBGT>=28^{0}C.

2 OHS = Occupational Health and Safety

3 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

Table 20. Operating instructions for normal and upset wind conditions. Wind speed and direction are recorded directly from the on-site weather station.

This Table is Table 7 from the Odour Management Plan. It will form part of the daily operations manual for all personnel at the facility.

WIND [Low wind trigger of 2m/s from Odour Assessment Report (Appendix 8) amended to 3m/s]

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	Up to 11m/s (40km/h) from any direction	Up to 14m/s (50km/h) from any direction	Up to 17m/s (60km/h) from any direction, or 3 – 6m/s from SSE – SSW quadrant	<3m/s from SSE – SSW quadrant, or >17m/s (60 km/h)[2] from any direction
Action today	NORMAL OPERATIONS Ensure OMP[1] (including appropriate housekeeping) is operating, and check that all medium-odour wastes on mixing pad are covered and/or mixed with low-odour material.			UPSET CONDITION As for Columns 1, 2 and 3. Close facility and site. Notify all pre-booked suppliers. Insert closure time and expected re-opening time on website. Visit or contact closest receptors to assess odour detectability. Min. responsible staff[3] remain at facility.
Next few days including today	>9m/s from any direction	>6m/s from any direction	3 – 6m/s from SSE – SSW quadrant	<3m/s from SSE – SSW quadrant, or >17m/s (60 km/h) from any direction
Action today and next few days	NORMAL OPERATIONS Ensure OMP (including appropriate housekeeping) is operating, and check that all medium-odour waste on mixing pad is covered and/or mixed with low-odour material.		UPSET CONDITION As for Columns 1 and 2. Consider cancelling all deliveries of pre-booked medium-odour wastes. Visit or contact closest receptors to assess odour detectability.	UPSET CONDITION As for Columns 1 and 2. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Min. responsible staff[3] remain at facility. Visit or contact closest receptors to assess odour detectability.

1 OMP = Odour Management Plan

2 McRobies Gully tip is required to stop operations and close to the public if wind speeds reach or exceed 60km/h. *McRobies Gully Waste Management Centre Environmental Management Plan (EMP) 2020-2030*. The weather station wind speed and direction alarm will be set to >17m/s for all winds, and <3m/s from SSW – SSE quadrant.

3 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

Table 21. Operating instructions for fire danger ratings

This Table is Table 8 from the Odour Management Plan. It will form part of the daily operations manual for all personnel at the facility.

FIRE DANGER RATING (Midlands District; at https://www.fire.tas.gov.au/fire-danger-rating/summary/)

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	NO RATING	MODERATE	HIGH	EXTREME to CATASTROPHIC
Action today	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP and all other procedures. Ensure 10,000L water tanker is full and fuelled, and pumps on dams are fuelled and operate.		UPSET CONDITION As for Columns 1 and 2. Monitor fire danger ratings. Liaise with local fire service. Activate Bushfire Management Plan. Obey fire restrictions. If fire rating is increasing, consider closure of facility and site. Manager and/or foreman remain at facility.	UPSET CONDITION As for columns 1 and 2. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[1] remain at facility.
Next few days including today	NO RATING	MODERATE	HIGH	EXTREME to CATASTROPHIC
Action today and next few days	NORMAL OPERATIONS Monitor temperatures of mixing stockpiles, windrows and finished stockpiles. Adjust if necessary. Operate in accord with OMP and all other procedures. Ensure 10,000L water tanker is full and fuelled, and pumps on dams are fuelled and operate.	UPSET CONDITION As for Column 1. Monitor fire danger ratings at https://www.fire.tas.gov.au/fire-danger-rating/summary/ Liaise with local fire service. Activate Bushfire Management Plan. Obey fire restrictions. If fire rating is increasing, consider closure of facility and site. Min. responsible staff[1] remain at facility.		UPSET CONDITION As for columns 2 and 3. Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period by email and/or text. Min. responsible staff[1] remain at facility.

1 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

Table 22. Operating instructions for upset staff situations
This Table is Table 9 from the Odour Management Plan. It will form part of the daily operations manual for all personnel at the facility.

STAFF

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	Manager and foreman present	Manager or foreman + at least one responsible staff present		Manager and foreman absent
Action today	NORMAL OPERATIONS Operate in accord with usual protocols and procedures	UPSET CONDITION Back-up inducted and trained personnel available and attend facility. Facility otherwise operates in accord with usual protocols and procedures		UPSET CONDITION Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Organise emergency personnel to manage facility andsite.
Next few days including today	Manager and foreman present	Manager or foreman + at least one responsible staff present		Manager and foreman absent
Action today and next few days	NORMAL OPERATIONS As above	UPSET CONDITION As above		UPSET CONDITION As above

Table 23. Operating instructions for upset plant and equipment situations
This Table is Table 10 from the Odour Management Plan. It will form part of the daily operations manual for all personnel at the facility.

PLANT & EQUIPMENT

	1	2	3	4
	Normal	Caution	Alert	High alert
Today	All essential plant & equipment operating	Faulty essential plant and/or equipment replaced or repaired same day on site	Faulty essential plant and/or equipment cannot be replaced or repaired same day	Faulty essential plant and/or equipment cannot be replaced or repaired
Action today	NORMAL OPERATIONS Operate in accord with usual protocols and procedures		UPSET CONDITION Consider closing facility and site. Otherwise, limit volumes and types of waste deliveries depending on capability of equipment.	UPSET CONDITION Close facility and site. Insert closure date and expected re-opening date on website; notify all suppliers pre-booked for closure period. Min. responsible staff[1] remain at facility.
Next few days including today	All essential plant & equipment operating	Faulty essential plant and/or equipment replaced or repaired same day on site	Faulty essential plant and/or equipment cannot be replaced or repaired same day	Faulty essential plant and/or equipment cannot be replaced or repaired
Action today and next few days	NORMAL OPERATIONS As above		UPSET CONDITION As above	

1 Min. responsible staff = Manager + Foreman, or Manager + assistant, or Foreman+ assistant, or Assistant + assistant. All assistants are inducted and sufficiently trained in operations.

7 CONCLUDING STATEMENT

The reduction of compostable wastes going to landfill is an issue of increasing urgency everywhere.

This Environmental Impact Statement and its supporting expert reports in Appendices 1 – 9 demonstrate that Compost King's proposal to divert some of this waste and create up to 10,000tpa of environmentally-beneficial compost can, with appropriate management, be achieved with acceptable environmental impacts.

Mr. Seaton Waterfield, the proponent of the proposed operations, has witnessed unsatisfactory management of composting facilities elsewhere in Tasmania, and he is keen to demonstrate that his operations on *Somerton* will set an example for others to follow.

To help achieve this, two critical aspects of the proposed operations are that (a) Compost Kings will be under no contractual obligations to accept any wastes at any time, and will refuse deliveries when the facility cannot reasonably cope, and (b) no competitive financial pressures will drive operations because sales are primarily intended for neighbouring properties (eg. *The Follies* and *Somerton*) owned by Mr. R. Jones, owner/occupier of *Redside*.

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9 APPENDICES

This Environmental Impact Statement is and must remain accompanied by Appendices 1 – 9

Appendix 1
(9 pages excluding this page)
Agricultural report

Appendix 2
(12 pages excluding this page)
Traffic assessment

Appendix 3
(18 pages excluding this page)
Community consultation

Appendix 4
(35 pages excluding this page)
Planning review report

Appendix 5
(35 pages excluding this page)
Natural Values Assessment

Appendix 6
(35 pages excluding this page)
Geotechnical report

Appendix 7
(67 pages excluding this page)
Hydrogeological report

Appendix 8
(55 pages excluding this page)
Odour assessment report

Appendix 9
(38 pages including this page)
Odour Management Plan