EPA WORKS APPROVAL APPLICATION
PINEGRO PRODUCTS PTY LTD
300 MONASH WAY, MORWELL VIC 3840

APRIL 2020

Table of Contents

LIST OF ATTACHMENTS

ABBREVIATIONS

C:N	Carbon to Nitrogen ratio
ERMP	Environmental Risk Management Plan
EPA	Environment Protection Authority (Victoria)
FOGO	Food Organics and Garden Organics
GWRRG	Gippsland Waste and Resource Recovery Group
MSW	Municipal Solid Waste
PAN	Pollution Abatement Notice
p.a.	Per Annum

INTRODUCTION

This Works Approval Application (WAA) has been prepared for Pinegro Products Pty Ltd (Pinegro). The purpose of the WAA is to outline the planned works and their suitability to effectively manage environmental impacts associated with the proposed change in operations.

Pinegro currently hold EPA Licence 74310 at 300 Monash Way, Morwell, and plan to amend their current licence conditions to increase the volume, type of feedstock to be processed and significantly upgrade the composting technology used.

The specific details for the amendments are;

	Current Licence	**Proposed Amended Licence**
Property Address:	Parish of Hazelwood Lot C615, (300) Monash Way, Morwell Vic. 3840	Parish of Hazelwood 300 Monash Way, Morwell Vic. 3840
Property Details:	6.295 Hectares Vol. 10303 Folio 812	9.231 Hectares ******An additional 2.936 Hectares Purchased Vol. 11845 Folio 556
EPA Licence Details:	Premises Ref. No. 72867 Scheduled Category: • AO7 Organic Waste Processing	Scheduled Category: • AO7 Organic Waste Processing
Description & Volume of Wastes Processed:	• 25,000 tonnes p.a. of Municipal Garden Organics**.** • 50,000 tonnes p.a. of Pinebark & sawdust .	• 55,000 tonnes p.a. of Food Organics Garden Organics (FOGO) • 5,000 tonnes p.a. Commercial Food Waste • 5,000 tonnes p.a. Biosolids • 30,000 tonnes p.a. of Pinebark & Pine/Hardwood Sawdust
Processing Technology:	• Open Air Receival. • Open Turned Windrow. • Open Air Maturation.	**FOGO/BIOSOLIDS/FOOD WASTE** • Enclosed Receival with Air Capture and Secondary Odour Treatment. • Invessel Aerobic Composting with Air Capture and Secondary Odour Treatment. • Open Air Maturation. **PINEBARK/SAWDUST** • Open Air Receival. • Open Turned Windrow. • Open Air Maturation

The composting of Pinebark and sawdust will continue to be managed under current siting and management practices of outdoor receival, open windrow composting and outdoor maturation.

WASTE CHARACTERISATION;

The tables below contain a detailed characterisation of current & proposed feedstocks in accordance with EPA Waste Characterisation Guidelines;

Current Feedstocks

Waste Type	Source	Definition	Mass
Garden Organics	Municipal source separated kerbside & transfer station	Grass, leaves, plants, branches, tree trunks & stumps	25,000 tonnes p.a.
Pinebark	Wood residue from paper mill/saw mill	Bark removed from timber at paper mill/saw mill	35,000 tonnes p.a.
Sawdust	Wood residue from paper mill/saw mills	Pine/hardwood sawdust from paper mill/saw mill	15,000 tonnes p.a.

Proposed Feedstocks

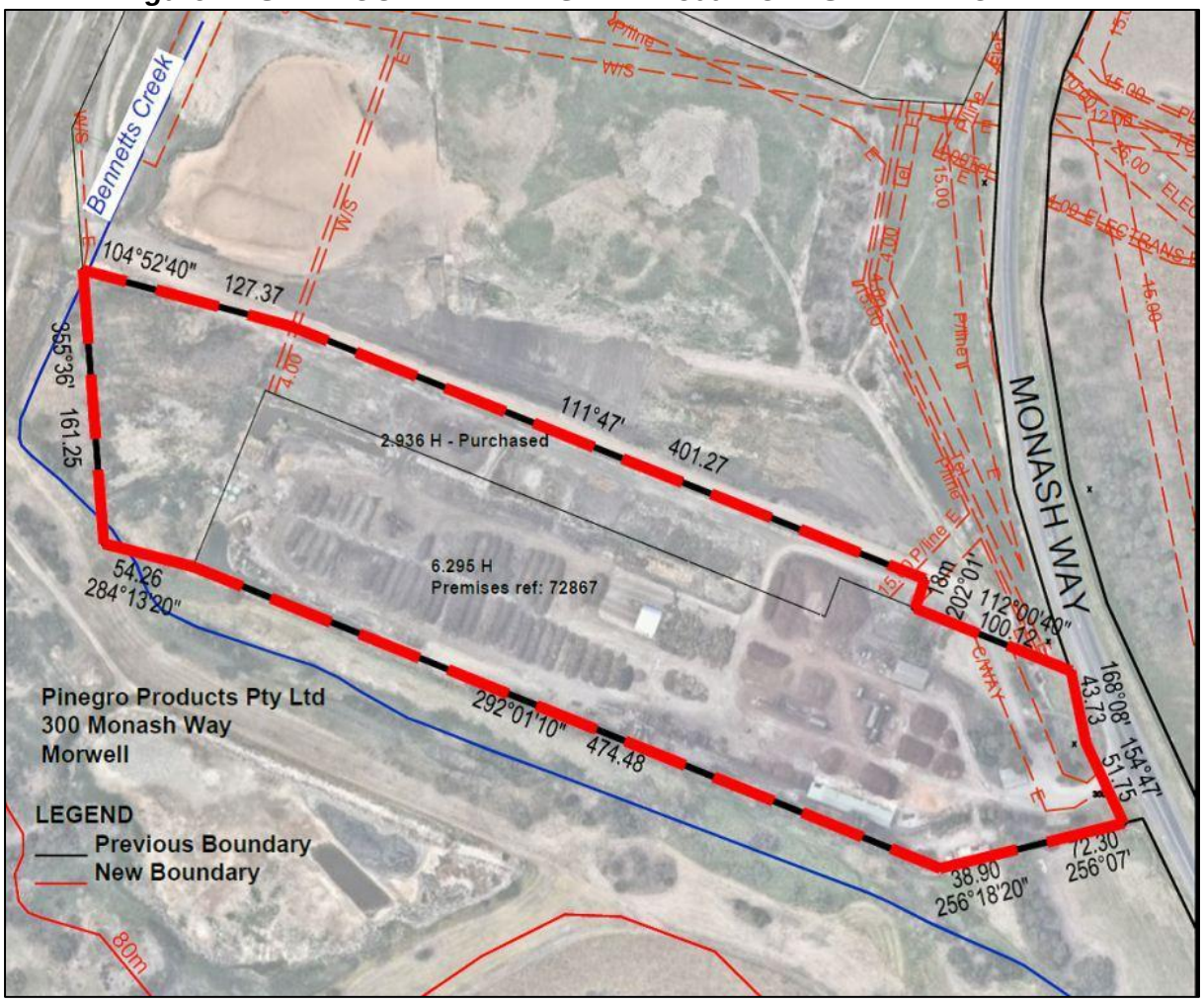
Waste Type	Source	Definition	Mass
FOGO (Food & Garden Organics)	Municipal – Mixed Sourced separated Kerbside & Transfer Station	Grass, leaves, plants, branches, tree trunks & stumps, vegetables & fruit, kitchen scraps, paper waste & domestic food waste.	55,000 tonnes p.a.
Commercial Food Waste	Commercial Food Processors	Vegetables, fruits and seeds and processing wastes, food organics excluding liquid organic waste, meat, fish & fatty food waste.	5,000 tonnes p.a.
Biosolids	Water Authorities	Dewatered sludge (does not meet the T1 to T3 standards) as per EPA Guideline 943.	5,000 tonnes p.a.
Pinebark	Wood residue from paper mill/saw mills	Bark removed from timber at paper mill/saw mill.	15,000 – 20,000 tonnes p.a.
Sawdust	Wood residue from paper mill/saw mills	Pine/hardwood sawdust from paper mill/saw mill	10,000 - 15,000 tonnes p.a.

SITE BOUNDARY RE-ALIGNMENT – 300 MONASH WAY, MORWELL

Pinegro holds an EPA Composting Licence Premises Reference No. 72867 for our property at 300 Monash Way, Morwell – highlighted in the black outline on the site boundary diagram below. The property size is 6.295 hectares, resides in the Parish of Morwell with volume No. 10303 & Folio No. 812.

Our works approval application seeks to amend our current licence and include an adjacent parcel of land purchased recently – higlighted in the red outline on the site boundary diagram below. The additional parcel of land is 2.936 hectares to the Northern Boundary of the current site.

Figure 1 - SITE BOUNDARY DIAGRAM – 300 MONASH WAY MORWELL



The two parcels of land were consolidated onto one certificate of land title and is owned by Pinegro Products Pty Ltd. **See Attachment 1 - Certificate of Property Title.**

The new property details are;

Property Address: Parish of Hazelwood, 300 Monash Way, Morwell Vic 3840
Property Details: Volume No. 11845 Folio No. 556

PROPOSED WORKS TIMELINE

The key dates targeted for the development and operation of the compost facility are:

Commence Site Works:	Within 6 months of EPA approval – anticipated to be June 2020
Complete Site Works:	Anticipated 12 to 36 months
Commence Compost Operations:	Within 3 months of construction and licence approval – December 2021.

Under the provisions of the Environmental Protection (Scheduled Premises) Regulations 2017, the proposed amendment to the composting licence mentioned in this application is classified as the following Schedule type:

- Organic Waste Processing (A07) facility designed to process more than 100 tonnes in any month.

Contact Details:

Company	Pinegro Products Pty Ltd
Contact Name	John Van Meel
Position	General Manager
Phone	(03) 5367 3222
Email	jvanmeel@pinegro.com.au
Office Address	Suite 1, 137 Main Street Bacchus Marsh VIC 3340

1 PRIMARY INFORMATION

ENVIRONMENT PROTECTION ACT 1970

WORKS APPROVAL APPLICATION
COMPANY LEGAL ENTITY

1.1 Company Legal Entity

Applicant type (select ☒ relevant box below)

Company	×	State government		Owners corporation	
Partnership		Local government			

Corporation

Full name of company^	PINEGRO PRODUCTS PTY LTD
Trading name	
ABN	72 005 531 546
ACN	005 531 546
Registered address	Suite 1, 137 Main Street
Suburb/Town	Bacchus Marsh
State	Vic
Post Code	3340

Attach – ASIC company search, not more than 14 days old

^ In the case of a partnership, the application must specify the full names of the individual partners under company name, in addition to referring to the trading name and supplying a business name certificate. Please see page 2.

ASIC
Australian Securities & Investments Commission

Australian Company

PINEGRO PRODUCTS PROPRIETARY LIMITED
ACN 005 531 546

Extracted from ASIC's database at AEST 11:14:56 on 30/03/2020

Company Summary	
Name:	PINEGRO PRODUCTS PROPRIETARY LIMITED
ACN:	005 531 546
ABN:	72 005 531 546
Previous State Number:	C0153071J
Previous State of Registration:	Victoria
Registration Date:	10/04/1979
Next Review Date:	10/04/2020
Status:	Registered
Type:	Australian Proprietary Company, Limited By Shares
Locality of Registered Office:	BACCHUS MARSH VIC 3340
Regulator:	Australian Securities & Investments Commission

Further information relating to this organisation may be purchased from ASIC.

1.2 Application Fee

In accordance with the provisions of the Environment Protection (Fees) Regulations 2012, the Works Approval Application fee has been calculated at $66,645, and a payment of this fee accompanies this Application.

1.3 Polices, Regulations, Protocol and Guidelines consideration in developing this application

This works approval has been developed to ensure that the proposal is consistent with the relevant Regulatory environmental practices, policies and guidelines in conjunction with employing best available technology. Pinegro endeavours to design and operate a facility that does not cause or contribute to pollution including nuisance odour with consideration to the following documents:

- Environment Protection Act 1970
- Climate Change Act 2017
- State Environment Protection Policy (Air Quality Management)
- State Environment Protection Policy (Ambient Air Quality)
- State Environment Protection Policy (Prevention and Management of Contamination of Land)

- SEPP (Control of Noise from Commerce, Industry and Trade No. N1)
- State Environment Protection Policy (Waters of Victoria)
- State Environment Protection Policy (Ground Waters of Victoria)
- Environment Protection (Scheduled Premises) Regulation 2017
- The Protocol for Environmental Management: Greenhouse Gas Emissions and Energy Efficiency in Industry EPA publication 824
- EPA Publication 1588.1 (2017) Designing, Construction and Operating Composting Facilities
- EPA Publication 1517.1 (2017) Demonstrating Best Practice Guideline
- EPA Publication 1677.2 (2018) Management and Storage of Combustible Recyclable and Waste materials – Guideline
- EPA Publication 1658 (2017) Works Approval Application guideline
- EPA Publication 1518 (2013) Recommended Separation Distances for Industrial Residual Air Emissions.
- Australian Standard 4454: 2012 – Composts, Soil Conditioners and Mulches (AS 4454: 2012)

Pinegro is committed to applying the principles of the Environmental Protection Act as outlined in section 1B to 1 L of the Act which are:

- s.1B The Principle of integration of economic, social and environmental considerations
- s.1C The Precautionary principle
- s.1D The Principle of Intergenerational quity
- s.1E The Principle of conservation of biological diversity and ecological integrity
- s.1F The Principle of improved valuation, pricing and incentive mechanisms
- s.1G The Principle of shared responsibility
- s.1H The Principle of product stewardship
- s.1I The Principle of the wastes hierarchy
- s.1J The Principle of integrated environmental management
- s.1K The Principle of enforcement
- s.1L The Principle of accountability

2 LAND USE

2.1 City of Latrobe Planning Approval

Pinegro currently operates under Planning Permit 1994/2033 which allows for the development and use of the site for composting, packaging and storage of potting mix.

The Proposed Pinegro Compost facility property at 300 Monash Way, Morwell, Volume 11845 Folio 556 is zoned IN1Z – Industrial Zone 1 and we have lodged an application for an amendment to the current planning permit for the change in use and processing technology upgrade. We have engaged Nicole Stow from Beveridge Williams to amend our existing town planning permit. The details of our planning permit application are:

Planning Authority:	**City of Latrobe**
Application No:	**1994/2033/A**
Proposal:	**To Develop an Invessel Composting Facility**
Property:	**300 Monash Way, Morwell**
Description:	**L 1 PS 725239**
Council Contact:	**Jarrod Raun**
	Senior Statutory Planner
	Ph: 03 5128 5476

No objections were received by the City of Latrobe to the Pinegro Planning permit application. Subsequently on the 27th February, 2020 the Latrobe City Council issued an amended planning permit to allow the development of land for materials recycling; composting facility subject to Pinegro complying with the permit conditions outlined.

2.2 Choice of Location

2.2.1 Selection of Location for Existing Premises

The compost facility will be located on our existing property at 300 Monash Way, Morwell. The property is currently EPA licenced as a compost facility and is company owned. The property is situated in the zone IN1Z – Industrial Zone 1.

The surrounding zoning to the property is;

South of Property - Special Use Zone 1
West of Property - Special Use Zone 1
North of Property - Industrial Zone 2
East of Property - Farming Zone

Pinegro believe the location of the compost facility is appropriate given the surrounding land use. Please **See Below – Figure 2 - Locality & Zoning Map.**

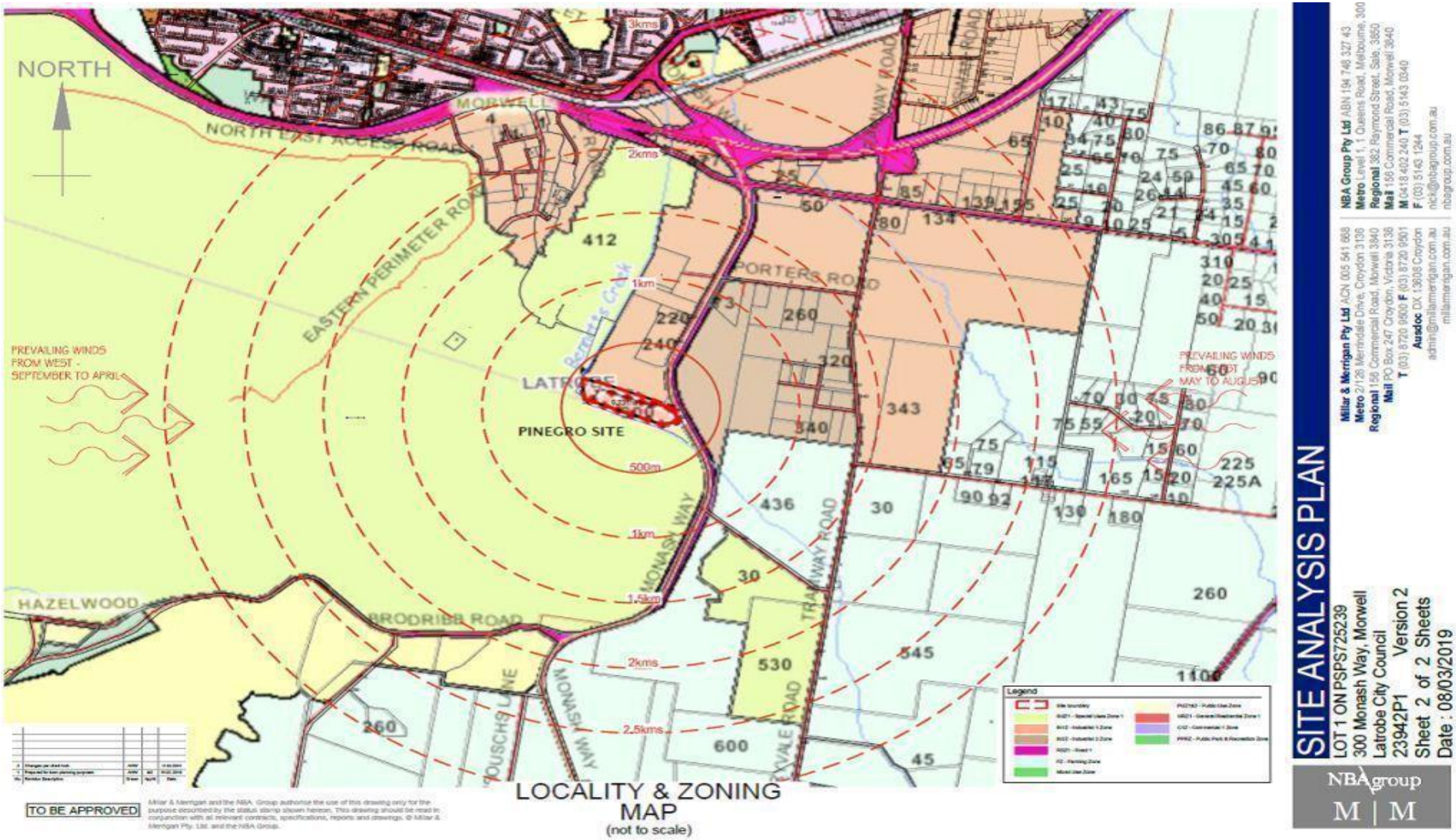


Figure 2 – LOCALITY & ZONING MAP

2.2.2 Key Benefits for the use of the Existing Premises

Key benefits of utilising the existing premises for the composting facility at the 300 Monash Way, Morwell premises include:

(a) Separation distance to sensitive receptors

EPA Publication 1588.1 June 2017 *Designing, Constructing and Operating Composting Facilities* recommends separation distances from sensitive land use and/or residential dwelling based on three key parameters:

1. Type of feedstock;
2. Technology being used; and
3. Size of the compost facility.

Table 1 summarises the recommended separation distance for the proposed compost facility at Morwell based on the above parameters;

Table 1 Recommended buffer distance for the proposed Pinegro compost facility

Types of Feedstock	Risk Level	Technology being used	Size of the plant	Recommended separation distance (metres)
FOGO/Commercial Food Waste/Biosolids Pinebark/Sawdust	Medium to High	Enclosed/covered environment with secondary odour control	95,000 tonnes p.a.	>1,400

As the site is situated in a sparsely populated rural area Pinegro believe the separation distance should be calculated from the activity boundary. However, Pinegro have calculated the separation distances from both the activity boundary and the site boundary.

DISTANCE FROM ACTIVITY BOUNDARY	DISTANCE FROM SITE BOUNDARY	PROPERTY	DIRECTION FROM SITE
0 - 1.85 km	0 - 1.70 km	0 rural	
1.85 km	1.70 km	1 rural	South East
2.30 km	2.15 km	2 rural	East
2.40 km	2.25 km	1 rural	East
2.46 km	2.31 km	2 rural	South East

OUR PROPOSAL EXCEEDS THE REQUIRED BUFFER ZONE REQUIREMENT FROM BOTH THE ACTIVITY & SITE BOUNDARY.

We refer to EPA Publication 1588.1 June 2017 *Designing, Constructing and Operating Composting Facilities* page 9 - Table 2 Reference Facility 1. This reference facility closely represents our proposed in-vessel compost facility - types of feedstock and technology proposed.

The guidance allows open air receival of waste for reference facility 1. Our risk assessment identified receival of waste outdoors as a medium to high risk of odour generation. This waste can be odorous and when handled can generate high levels of fugitive emissions.

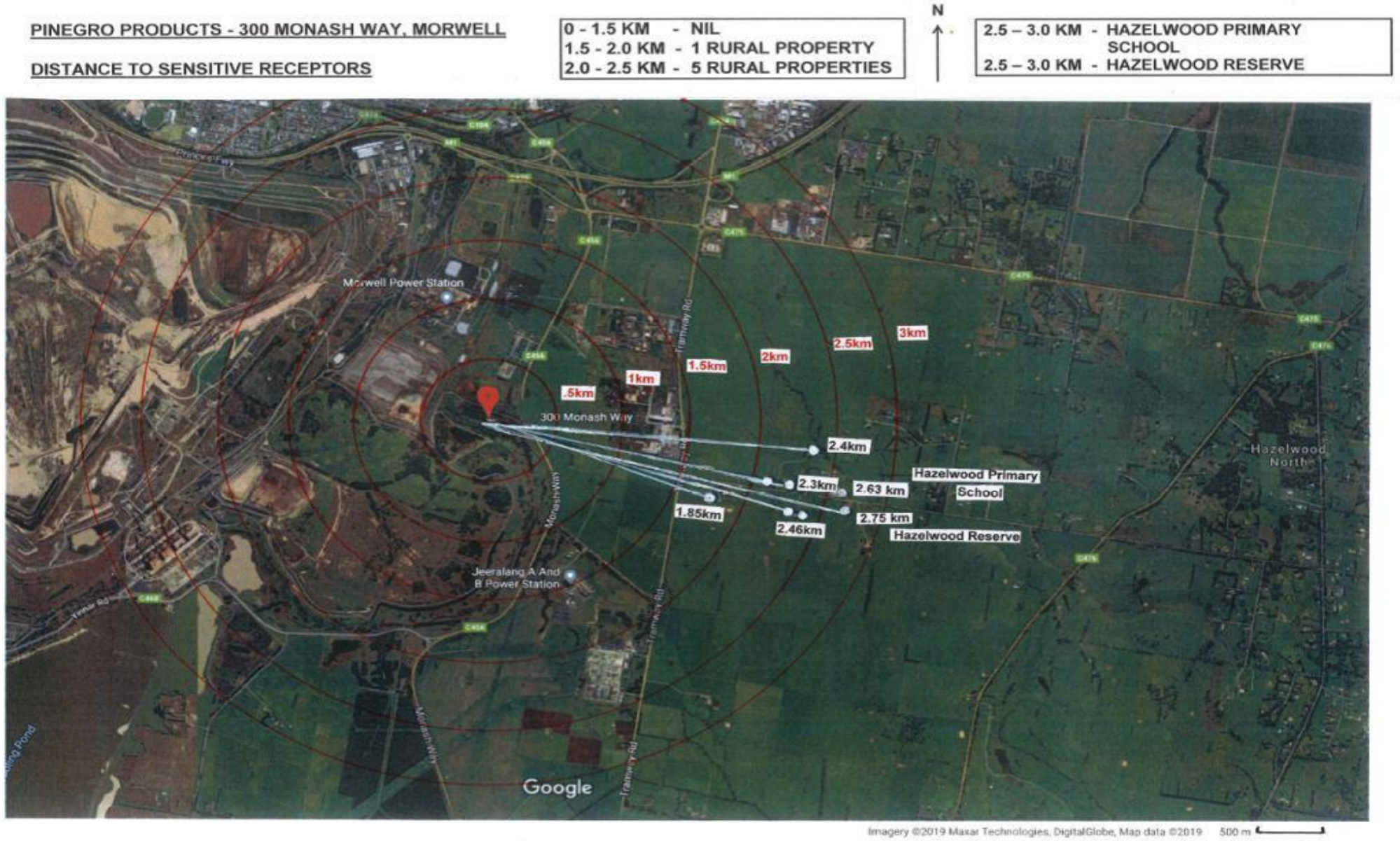
Our proposal facilitates mitigation of this high-risk activity by ensuring that there are no fugitive emissions directly to the atmosphere. All receival and handling is undertaken in an

enclosed receival hall maintained under negative pressure with secondary control of emissions.

Based on our proposed invessel compost facility processing 95,000 tonnes p.a. the recommended separation distance is >1,400 metres to the nearest sensitive receptor. Our nearest sensitive receptor is 1,850 metres, providing an additional 450 metres of buffer zone to the nearest sensitive receptor.

Given the addition controls in place for the receival of waste and the low risk processing of approximately 30% of the waste stream (pine bark and saw dust) we are confident that there will be no impact in the sensitive use areas identified.

(b) Figure 3 - Distance to Sensitive Receptors



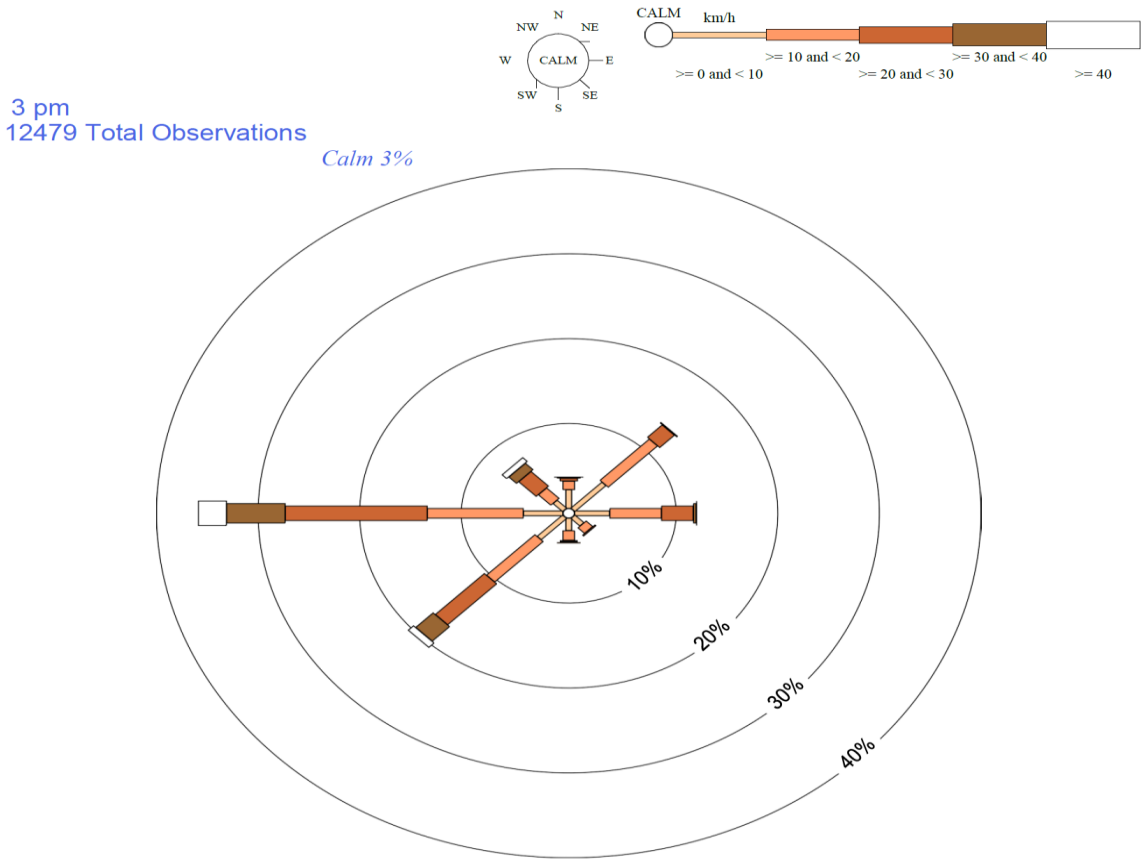
(c) Meteorology

A review of historical meteorological data from the Morwell (Latrobe Valley Airport) weather station has shown that the majority of the prevailing winds at the site are toward the:

East - 36% **North East** - 20% **South East** - 15% **West** - 13%

Figure 4 – Wind Rose

Rose of Wind direction versus Wind speed in km/h – Period 10 Jan 1984 to 10 Aug 2018
MORWELL (LATROBE VALLEY AIRPORT)
Site No: 085280 • Opened Jan 1984 • Still Open • Latitude: -38.2094° • Longitude: 146.4747° • Elevation 55.m



Interpreting the wind rose

• The percentage of calm conditions is represented by the size of the centre circle – the bigger the circle, the higher is the frequency of calm conditions.

• Each branch of the rose represents wind coming from that direction, with north to top of the diagram. Eight directions are used.

• The branches are divided into segments of different thickness and colour, which represent wind speed ranges from that direction. Speed ranges of 10 km/h are used in this wind rose. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

Based on the Wind Rose speed and direction data there is minimal likelihood of Environmental impact to the nearest sensitive receptors. These meteorological conditions in context with predicted odour emissions and the separation distance to residents provide significant mitigation of potential offsite odour impacts.

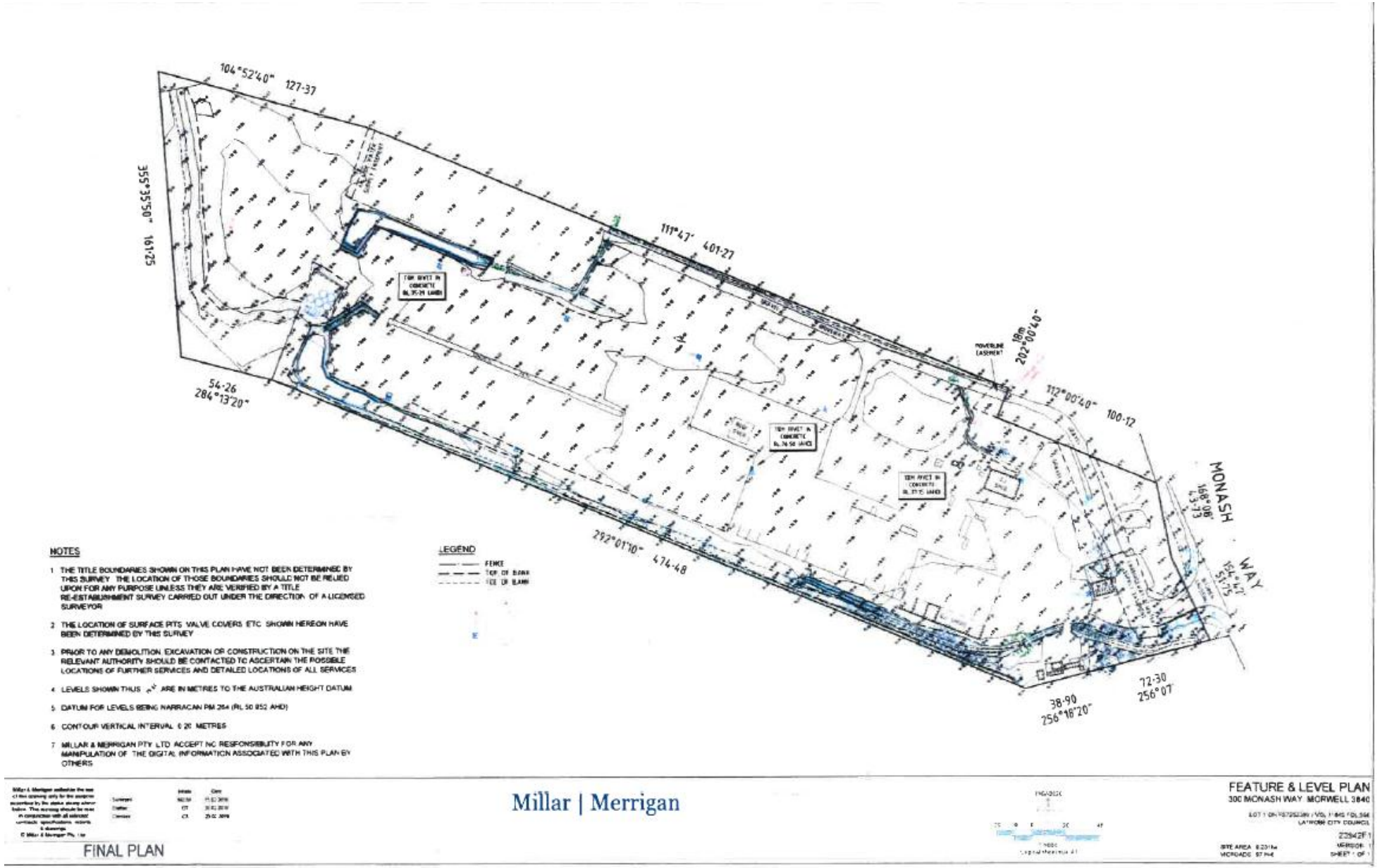
Detailed below in Table 2 – Meteorological conditions we have included the direction (% of time) and average speed (km/h) of the prevailing winds that are in the direction of the nearest rural properties;

Table 2 – Meteorological conditions

ACTIVITY DISTANCE	PROPERTY	DIRECTION FROM SITE	WIND DIRECTION %	AVE. WIND SPEED
0 - 1.85 km	0 rural			
1.85 km	1 rural	South East	15	>20
2.30 km	2 rural	East	36	>20
2.40 km	1 rural	East	36	>20
2.46 km	2 rural	South East	15	>20

(d) Topography

- ***Figure 5 - Feature & Level Plan***



The Morwell site is on relatively flat land **See Figure 5 – Feature and Level Plan.** Surrounding land towards the East, South and North remains relatively flat. The land to the West and South West of the site is surrounded by a 50 metre high bund wall. This serves to protect the site from the winds coming from the West towards the East.

(e) 26 Years of Operation at Current Location

Pinegro have successfully operated the compost facility at the Monash Way location since 1994. During that period Pinegro have received no complaints from surrounding residents regarding its operations or environmental impact.

The amendment we are seeking will result in the implementation of Best Practice Technology on the site resulting in further improvement in infrastructure controls and processes to eliminate offsite environmental impacts.

(f) Zoning – No Residential Encroachment

The site is located within an IN1Z-Industrial planning zone and is surrounded by land either categorised as SUZ1 Special Use Zone 1, FZ Farming Zone or IN2Z Industrial Zone 2. These zoning categories do not allow for residential infill therefore the current buffer zone will remain with no future residential encroachment concerns.

(g) Existing Infrastructure, Availability of Inputs and End Use Markets.

There is a synergistic benefit to the company in remaining at the current location to take advantage of the existing infrastructure at the facility, close proximity to the main feedstocks to the business and well established sales customer network.

3 TRACK RECORD

3.1 Pinegro Composting Experience

Pinegro has over 40 years of composting experience in a variety of waste streams including: garden organics, biosolids, paper pulp, sawdust and pine bark. Currently we own and operate four composting facilities across two states.

Three of the sites are located in Victoria being Morwell, Mt Wallace (formerly Truganina) and Pinegro also manage the Australian Paper composting operation at the Australian Paper Mill in Morwell composting 90,000 tonnes p.a. of paper pulp at the site. The fourth facility is located in Goulburn, NSW (EPA NSW Licence No. 20727).

Since 1994, Pinegro has operated the composting facility at 300 Monash Way Morwell, composting 50,000 tonnes per annum p.a. of wood wastes and 25,000 tonnes p.a. of garden organics.

In 2000 Pinegro also commenced composting at Truganina and later at Mt Wallace, processing approximately 60,000 tonnes p.a., consisting of garden organics 45,000 tonnes p.a. and biosolids 15,000 tonnes p.a.

The company has a proven track record in the management of viable and high quality composting facilities and is committed to positive environmental practice and awareness.

3.2 EPA (Vic) Pollution Abatements Notices (PANS)

19/11/2012 PAN 90003298. Issued to the former Truganina site to manage their contact water.

Mitigations were completed during the required timeframes to the satisfaction of EPA and the PAN was subsequently REVOKED.

29/11/2017 PAN 90008220 - Issued to the Mt Wallace site. The requirements of this PAN were administrative in nature requiring an amendment to their monitoring plan. This required amending their current plan to include monitoring of discharge to land and water. The monitoring plan was amended meeting the time requirements to the satisfaction of EPA and subsequently REVOKED the PAN.

11/12/2018 PAN 90009540 - Issued to the Morwell site. The requirements of this PAN were regarding configuration of stockpiles so they met EPA Publication 1667 Recommendations, Management and Storage of Combustible Recyclable and Waste Material. Pinegro complied with all requirements as listed in the PAN and EPA subsequently REVOKED the PAN.

Pinegro in all instances acted immediately to resolve the EPA concerns.

4 COMMUNITY ENGAGEMENT

4.1 Community Engagement Undertaken

Pinegro have carried out an extensive Community Communication and Engagement Plan as part of work undertaken to amend the existing composting licence in Morwell.

4.1.1 Establishment of a Community Engagement Plan

The Community Communication and Engagement Plan was prepared and forms the basis of Pinegro's communication and engagement strategy with community stakeholders. Below is a summary of the plan:

Communication & Engagement Plan
Pinegro Morwell Invessel Compost Facility

August 2019

Summary of the Proposal – To be Communicated.

Pinegro Products Pty Ltd is seeking to amend our current Environment Protection Authority (EPA) Licence Number: 74310 at our 300 Monash Way, Morwell facility. The amendments we are seeking are as follows:-

	Current Licence	**Proposed Amended Licence**
Property Address:	Parish of Hazelwood Lot C615, (300) Monash Way, Morwell Vic. 3840	Parish of Hazelwood 300 Monash Way, Morwell Vic. 3840
Property Details:	6.295 Hectares	9.231 Hectares ******An additional 2.936 Hectares Purchased
Licence Details:	Premises Ref. No. 72867 Scheduled Category: • AO7 Organic Waste Processing	• AO7 Organic Waste Processing
Description Of Wastes	• 25,000 tonnes p.a. of municipal Garden organics.	• 55,000 tonnes p.a.of Food Organics Garden Organics (FOGO).

Processed:	• 50,000 tonnes p.a. of pinebark & sawdust	• 5,000 tonnes p.a. Commercial Food Waste • 5,000 tonnes p.a. Biosolids • 30,000 tonnes p.a. of pinebark & sawdust.
Processing Technology:	• Open Air Receival. • Open Turned Windrow. • Open Air Maturation.	**FOGO/BIOSOLIDS/FOOD WASTE** • Enclosed Receival with Air Capture and Secondary Odour Treatment. • Invessel Aerobic Composting with Air Capture and Secondary Odour Treatment. • Open Air Maturation. **PINEBARK/SAWDUST** • Open Air Receival. • Open Turned Windrow. • Open Air Maturation

The composting of pine bark and sawdust will continue to be managed under current siting and management practices of open windrow composting .

Communication Engagement Objectives

- To inform residents and stakeholders of the upgraded compost facility.
- To retain resident's confidence in Pinegro Product's environmental performance.
- Provide proactive, clear information to residents and stakeholders.
- To capture feedback and concerns from residents and stakeholders.

To develop communication tools which will assist Pinegro with providing information on issues raised.

Key Messages

- Working with our community and keeping communications open.
- Minimal impact for neighbouring properties.
- Comply with EPA requirements.
- Comply with Town Planning requirements.
- Job Creation
- Manufacture of high quality products to be made available to new & existing markets.

4.1.2 Face to Face Engagement with Residents

Pinegro have proactively engaged with nearby rural neighbours. This included visiting face to face the properties within a 2.85 kilometre radius of the Monash Way site. As part of the engagement program Pinegro provided a letter with details on the proposed project. **See Below – Letter to Residents.**

Pinegro Products Pty. Ltd.
A.B.N. 72 005 531 546 A.C.N. 005 531 546
Head Office:
P.O. Box 237 Bacchus Marsh, Victoria 3340
Telephone (03) 5367 3222 Fax (03) 5367 5288
Web Address: http://www.pinegro.com.au

8th August, 2019

Dear Householder,

I write to inform you that Pinegro Products Pty Ltd, a local Morwell business for over 30 years, is proposing to amend our current EPA Composting Licence at our property situated at 300 Monash Way, Morwell. Please find attached a locality plan identifying our site and the approximate distance to your residence, which is between 1.85kms and 2.5kms away.

Pinegro is proposing to build and operate a State of the Art composting facility. The facility will compost up to 65,000 tonnes p.a. of Food and Garden organics utilising proven best practice technology, creating new jobs and infrastructure investment in the Latrobe Valley.

As part of our EPA Works Approval Application we are required to contact neighbours and advise you of our proposal. Pinegro representatives will be visiting local residences to outline our proposal and holding an information session at our Pinegro Products Pty Ltd site at 300 Monash Way, Morwell on Saturday 31st August, 2019 from 10.00 am to 12 pm. There will be a number of Pinegro staff at the session to outline what is proposed and to answer any questions you may have.

If you are unable to attend the information session and wish to discuss our proposal please ring me on the above telephone numbers or via email :- office@pinegro.com.au.

Yours Sincerely,

JOHN VAN MEEL
General Manager

See attached list of residents visited as part of the face to face engagement.

300 MONASH WAY, MORWELL

ENGAGEMENT RESIDENTS - LIVING WITHIN 2.5 KM'S OF FACILITY

VISITS CONDUCTED 9th **AUGUST, 2019**

PROPERTY ADDRESS	SUBURB	DISTANCE	OWNER/RESIDENT NAME	COMMENTS	VISITED (Y/N)	AT HOME (Y/N)
20 Mulga Drive	MORWELL	3.23			Y	N
25 Mulga Drive	MORWELL	3.07			Y	N
30 Mulga Drive	MORWELL	3.14			Y	N
50 Mulga Drive	MORWELL	3.05			Y	N
55 Mulga Drive	MORWELL	2.95			Y	N
70 Mulga Drive	MORWELL	2.91			Y	N
390 church Rd	MORWELL	5.27			Y	Y
360 Thampsons Rd	MORWELL	6.9			Y	Y
165 Church Rd.	MORWELL	3.11				
75 Mulga Drive	MORWELL	2.76				

300 MONASH WAY, MORWELL

ENGAGEMENT RESIDENTS - LIVING WITHIN 2.5 KM'S OF FACILITY

VISITS CONDUCTED 9th. **AUGUST, 2019**

PROPERTY ADDRESS	SUBURB	Km. DISTANCE	COMMENTS	VISITED (Y/N)	AT HOME (Y/N)
30 church Rd	MORWELL	1.75		Y	Y
65 church Rd	MORWELL	2.13.		Y	N
75 church Rd	MORWELL	2.14		Y	N
79 church Rd	MORWELL	2.23		Y	N
90 church Rd	MORWELL	2.3		Y	N
92 church Rd	MORWELL	2.34		Y	N
130 church Rd	MORWELL	2.9		Y	N
RMB 4921 Mulga Drive	MORWELL	3.37		Y	N
310 Tramway Rd	MORWELL	1.4	Industrial Site	Y	Y
270 Monash Way	MORWELL	.55	Industrial site	Y	Y

300 MONASH WAY, MORWELL

ENGAGEMENT RESIDENTS - LIVING WITHIN 2.5 KM'S OF FACILITY

VISITS CONDUCTED ___13TH___ AUGUST, 2019

PROPERTY ADDRESS	SUBURB	DISTANCE	OWNER/RESIDENT NAME	COMMENTS	VISITED (Y/N)	AT HOME (Y/N)
AS PART OF COMMUNITY ENGAGEMENT LETTERS WERE ALSO SENT TO ALL LATROBE CITY COUNCILLORS AS FOLLOWS:-						
MR. STEVEN PIASENTE - CEO	MORWELL					
CR. KELLIE O'CALLAGHAN	MORWELL					
CR. DAN CLANCEY	MORWELL					
CR. GRAEME MIDDLEMISS (MAYOR)	MORWELL					
CR. DALE HARRIMAN	MORWELL					
CR. ALAN MCFARLANE	MORWELL					
CR. DARREN WHITE OAM	MORWELL					
CR. BRADLEY LAW	MORWELL					
CR. SHARON GIBSON	MORWELL					

4.1.3 Communication with the Latrobe City Council

Pinegro has communicated our proposal directly with staff and members of the Latrobe City Council during the preparation of the Works Approval Application and also indirectly during the Town planning process via our representative Nicole Stow from Beveridge Williams.

As part of our Community Engagement we have sent personal invitations to the Mayor, and all current sitting councillors to our Community Information Session.

4.1.4 Meetings with EPA (Vic)

During the preparation of the Works Approval Application , Pinegro have met with Ben Carr and Quentin Cooke from the EPA to discuss the proposed licence amendment and application process. The EPA provided valuable feedback on issues to be addressed by Pinegro in preparing the works approval.

On 22nd November 2019, Pinegro met with Ben Carr and Kaitlyn Morris from the EPA on site at 300 Monash Way, Morwell to review our draft works approval, tour the site and view surrounding properties and land uses.

On the 26th February 2020 Pinegro met with Ben Carr from the EPA to review a second draft of our Works Approval Application. Ben provided valuable feedback and input to the Works Approval Application.

4.1.5 Meetings with Other Key Stakeholder Groups

Pinegro has provided an outline of the proposal to the Chief Executive Officer, Matt Peake, of the Gippsland Waste Resource Recovery Group (GWRRG).

The GWRRG were supportive of our proposal and recognised that resource recovery infrastructure in the region was vital to achieve recycling targets and reduce valuable resources going to landfill.

4.1.6 Community Information Session – 300 Monash Way, Morwell

On Saturday 31st August 2019 Pinegro held an information session from 9.00am-12.00pm at the site of the current composting facility. The information session was staffed by 3 Pinegro staff.

The session enabled a variety of information to be conveyed to the community providing details in the form of printed handouts of the proposed Invessel compost facility, poster maps of the site, locality maps and background information on Pinegro. The attendees were also given a tour of the current facility.

Below are images of attendees and Pinegro staff at the Community Information Session.

4.2 Community Feedback

The community information session was attended by 12 local residents and other interested parties. All the residents and stakeholders were supportive of Pinegro's Best Practice Invessel Compost Facility Proposal.

A copy of the information session handout and a list of attendees who signed our register are provided below. **– Pinegro Proposed Facility Handout and List of Attendees.**

PINEGRO PRODUCTS PTY LTD
PROPOSED COMPOSTING FACILITY
EXPANSION MORWELL

Establish an Environmentally Sustainable Composting Facility utilising Proven Best Practice Technology

Proposed Invessel Compost Facility – Morwell

PINEGRO PRODUCTS PTY LTD:

- ✓ Successful Morwell business with operations throughout Australia – Established in 1979.
- ✓ Core Business – manufacturer of composts and landscape products.
- ✓ Established OH&S systems and nationally accredited quality systems.
- ✓ Stable Management Team with over 50 years of industry experience.
- ✓ Experienced manufacturer – operating four composting sites producing over 150,000m3 of compost annually.

FEEDSTOCK:	*Current Licence*	*Proposed Licence*
✓ Municipal garden organics p.a.	25,000 tonnes	Nil
✓ Food & garden organics (FOGO) p.a.	Nil	55,000 tonnes
✓ Commercial Food Waste	Nil	5,000 tonnes
✓ Treated Biosolids p.a.	Nil	5,000 tonnes
✓ Pinebark & Sawdust p.a.	50,000 tonnes	30,000 tonnes

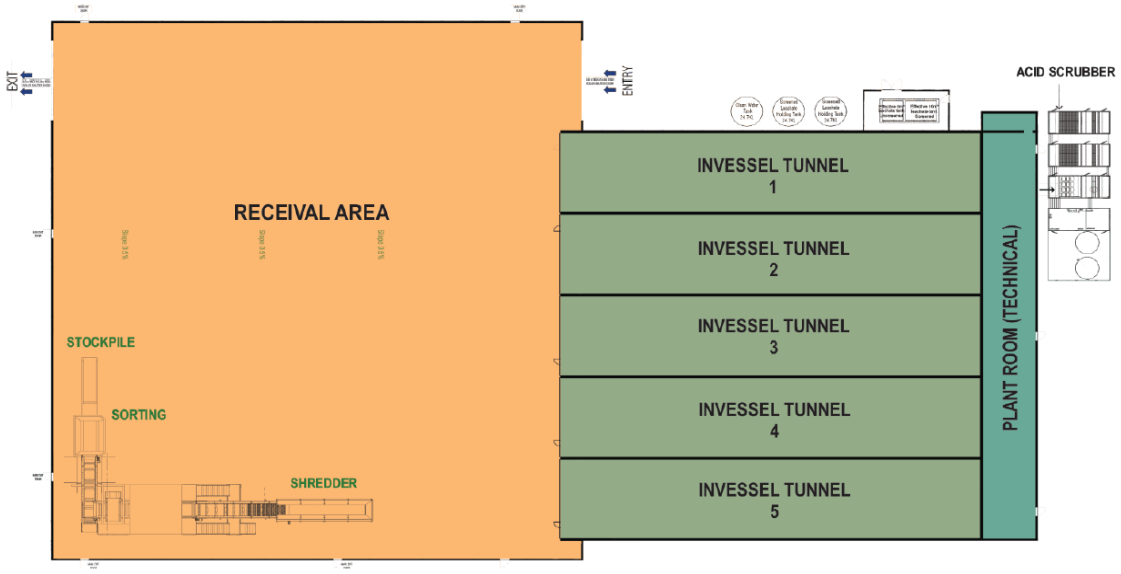
COMMUNITY BENEFITS:

- ✓ World's Best Practice Composting technology .
- ✓ New Jobs and Investment of between $10 - $15 Million for Gippsland.
- ✓ Alignment with key Council objectives to reduce environmental impact by directly reducing landfill volumes.

- ✓ Fully controlled compost process to eliminate all environmental impacts; and
- ✓ Proven manufacturer of high quality AS4454 composts with existing markets.

PROVEN TECHNOLOGY:

- ✓ Proven Best Practice technology in Europe with over 50 facilities operational.
- ✓ Two operational sites in Australia – Shellharbour, NSW and Yatala, QLD.
- ✓ Full compliance with EPA Victoria regulatory requirements.



Ground Floor Plan

ENVIRONMENTAL CONTROLS:

ODOUR: ✓ **No Odour impact to residents**

- ✓ Negatively Aerated Enclosed Receival & Compost Building.
- ✓ Highly Automated Aerobic Composting process.
- ✓ Acid Scrubber & Biofilter used to prevent odour emissions.
- ✓ Significant buffer zone to nearest resident
- ✓ 0km - 2.0 km - 1 resident
- ✓ 2.0km - 2.5km - 5 residents

NOISE: ✓ **No Noise impact to residents**

- ✓ All equipment used by Pinegro Products has low noise levels
- ✓ Operating hours – Monday – Friday 7.00am to 6.00pm
  Saturday 7.00am – 1 pm Sunday - Closed

WATER: ✓ **No impact on Waterways**

- ✓ An impermeable surface will be constructed together with a lined dam to ensure all water is contained and reused onsite.

TRAFFIC: ✓ **No Traffic impact to residents**

- ✓ Trucks will use Monash Way to arrive at site.
- ✓ Limited hours of operation

PINEGRO COMMUNITY INFORMATION DAY - 31ST AUGUST, 2019
300 MONASH WAY, MORWELL
ATTENDEES

NAME	ADDRESS	EMAIL/PHONE NO.	COMMENTS
Jamie Marsden	3A MINEX WAY MORWELL		EXCELLENT Proposal
Maryam Khadi	Latrobe city Council	odi au	Environmental officer
[illegible] Cr Sharon Smith	165 CHURCH RD HAZELWOOD NTH 3840		GOOD PROPOSAL
Emily Lindley	65 Church Rd Hazelwood Nth 3840		
Angela Leviston	79 Church Rd Hazelwood Nth 3840		
Peter LEVISTON	"	"	

PINEGRO COMMUNITY INFORMATION DAY - 31ST AUGUST, 2019
300 MONASH WAY, MORWELL
ATTENDEES

NAME	ADDRESS	EMAIL/PHONE NO.	COMMENTS
Wendy Farmer	Newborough.		
PETER GREAVES	HAZELWOOD NORTH		
Kerrie Gatt	Hazelwood North.		
DAN GREAVES	HAZEL WOOD NORTH		
JW. Oconner	Hazelwood		
Mich BURGESS	HAZELWOOD		

5 PROCESS AND INTEGRATED ENVIRONMENTAL ASSESSMENT

5.1 Existing Operation

The existing Pinegro Morwell compost facility is situated at 300 Monash Way, Morwell, EPA Premises Reference 72867 comprises 6.295 hectares and commenced operations in 1994.

5.1.1 Current Compost Facility

The facility infrastructure includes an outdoor hardstand organics receival area, outdoor hardstand active phase compost area and outdoor hardstand maturation area. There is a leachate capture dam surrounding the site.

Currently the facility processes;

• 25,000 tonnes p.a. of municipal source separated kerbside and transfer station garden organics.

• 50,000 tonnes p.a. of pine bark and sawdust.

5.1.2 Current Processing Technology

The Pinegro processing technology utilised is Open Windrow Composting and consists of:-

• Open Air Receival of Garden Organics

• Open Air Turned Windrow

• Open Air Maturation

See below – Table 3 – Current Composting Flowchart

Table 3 – Current Composting Flow Chart

MORWELL SITE
PRODUCTION OPERATING PROCEDURES
GREEN WASTE

COMPOSTING FLOW CHART

Pinegro – Morwell – Composting Process Flow Chart

RECEIVALS
BIN BASED – KERB SIDE
GREEN ORGANICS

DECONTAMINATION

DISPOSAL TO LANDFILL

SHREDDING

Shredded GO	Shredded GO	Shredded GO	Shredded GO	Shredded GO	Shredded GO

OPEN WINDROW
FORMATION & ACTIVE
PHASE COMPOSTING

MATURATION	MATURATION	MATURATION	MATURATION	MATURATION	MATURATION

TESTING

SCREENING PROCESS

MULCH

COMPOST

OVERSIZE – REPROCESS OR
DISPOSE TO REHAB
LANDFILLS

5.2 Description of Proposed Invessel Compost Facility

Objectives of the Proposed Invessel Compost Facility

Pinegro is proposing to Design, Finance, Construct and Operate a Best Practice State of the Art Invessel Compost facility at our company owned property situated at 300 Monash Way, Morwell. The new facility represents a significant technology upgrade and meets or exceeds current best practice technology in the Australian and International Compost industry.

5.2.1 Site Layout

The following site plan outlines the siting of the Invessel Compost Facility including organics receival building, compost tunnels, bio-filters, maturation pads, leachate capture dam and associated roadways.

The ground floor plan shows the design of the receival building, compost tunnels, chemical scrubber and associated computer control systems. The two elevation plans highlight the front, back and sides of the facility and the bio-filtration air handling systems.

See following: **Figure 6 - Full Site Layout;**
Figure 7 - Ground Floor Plan
Figure 8 - Elevations 1
Figure 9 - Elevations 2

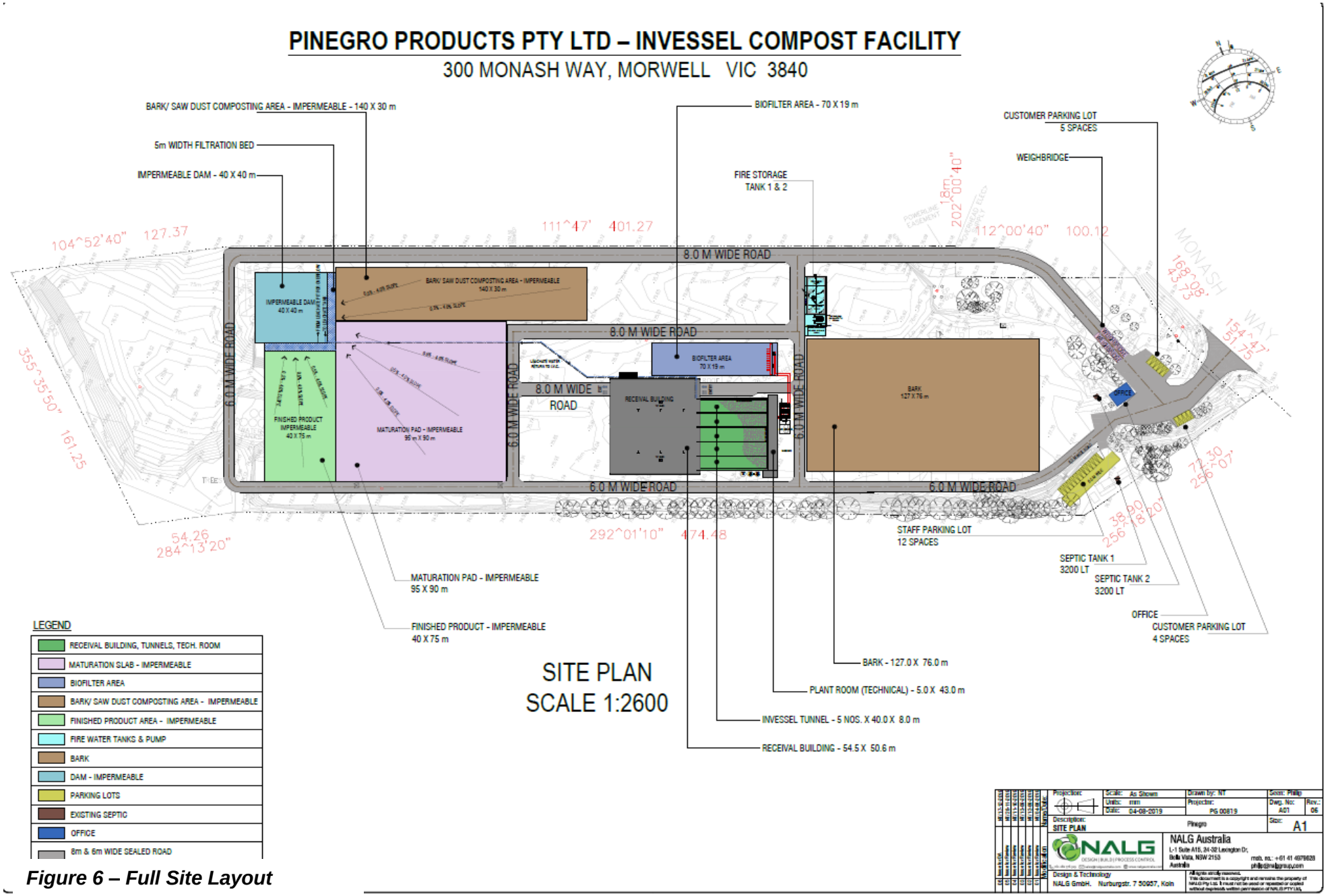


Figure 6 – Full Site Layout

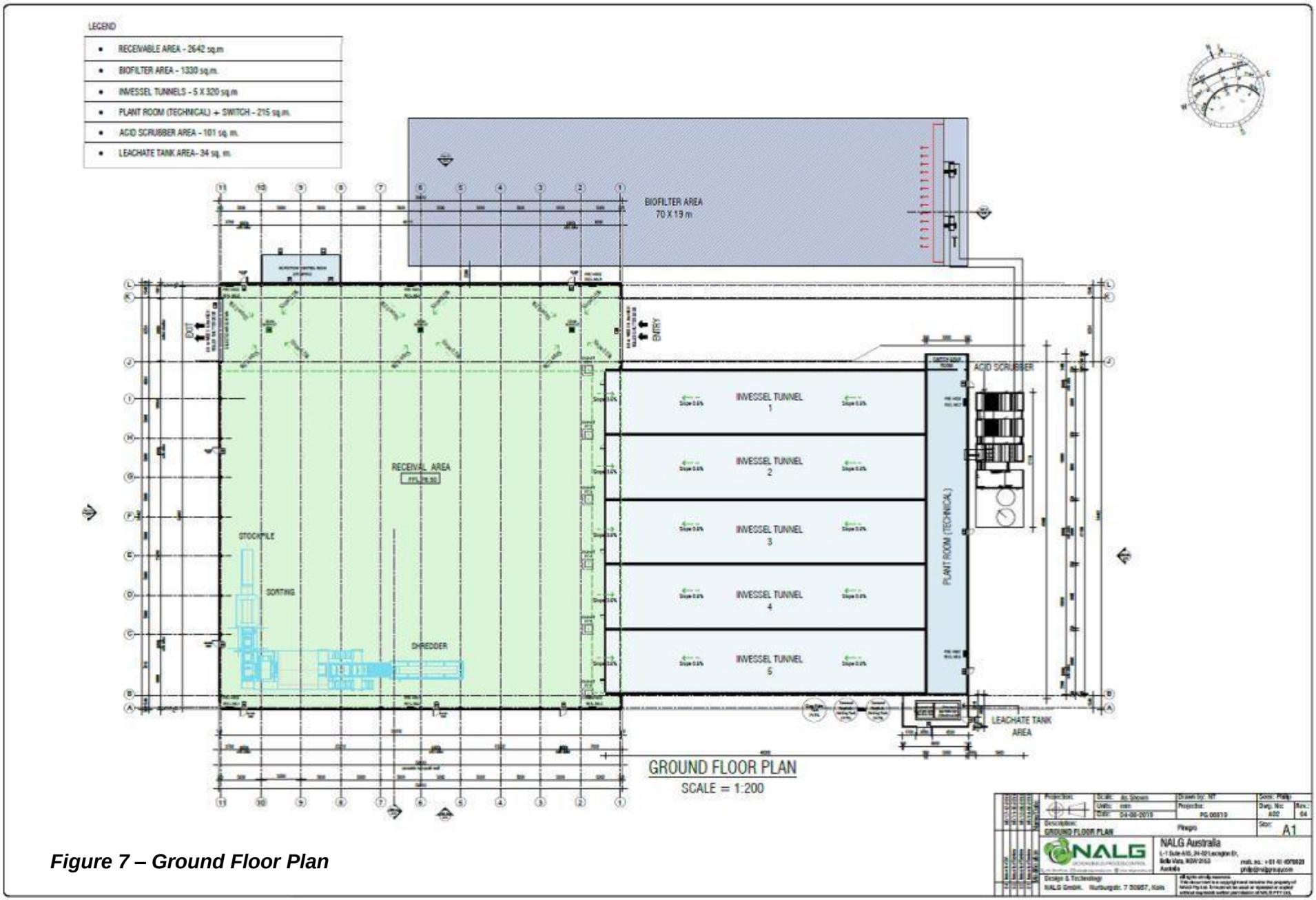


Figure 7 – Ground Floor Plan

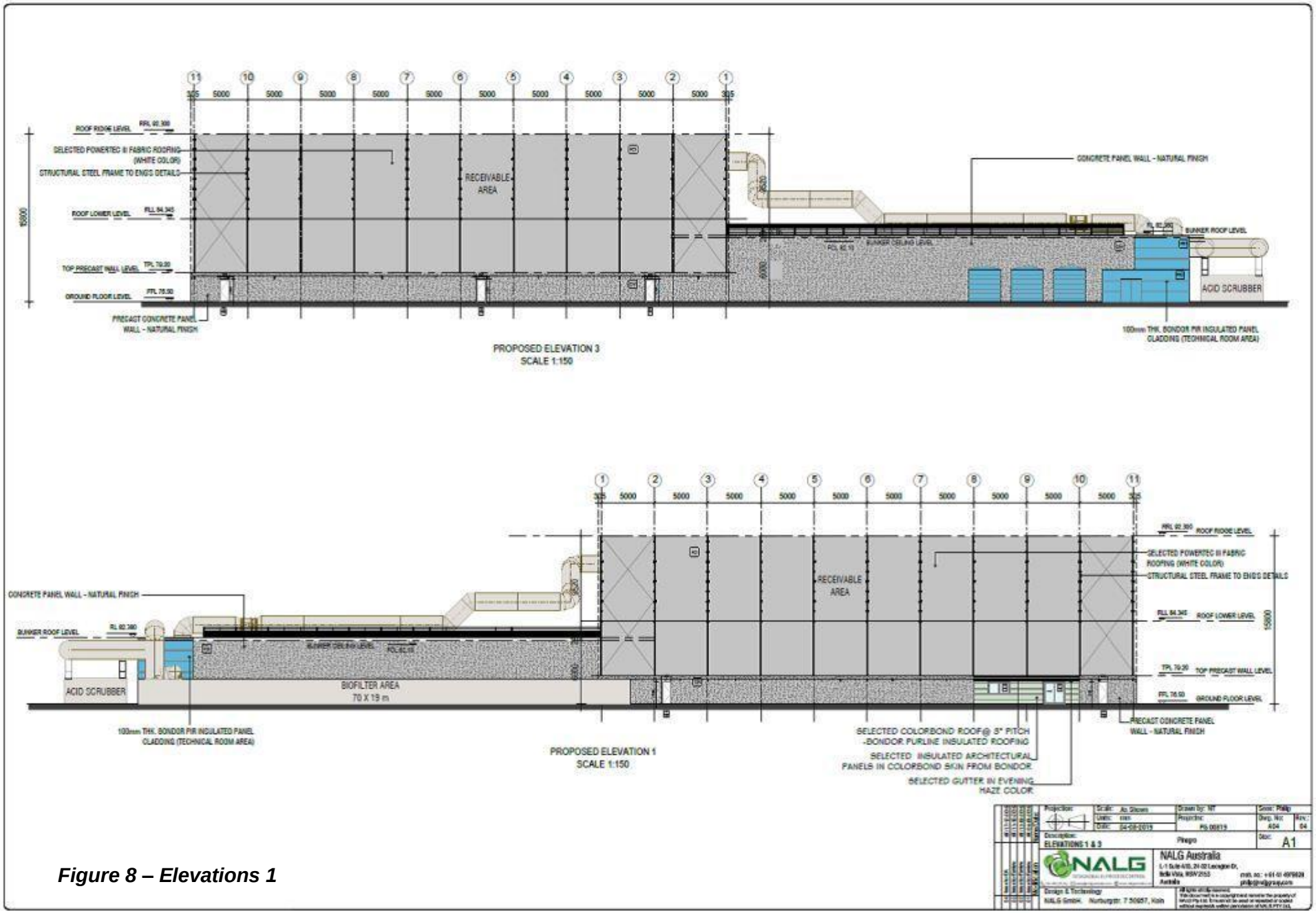


Figure 8 – Elevations 1

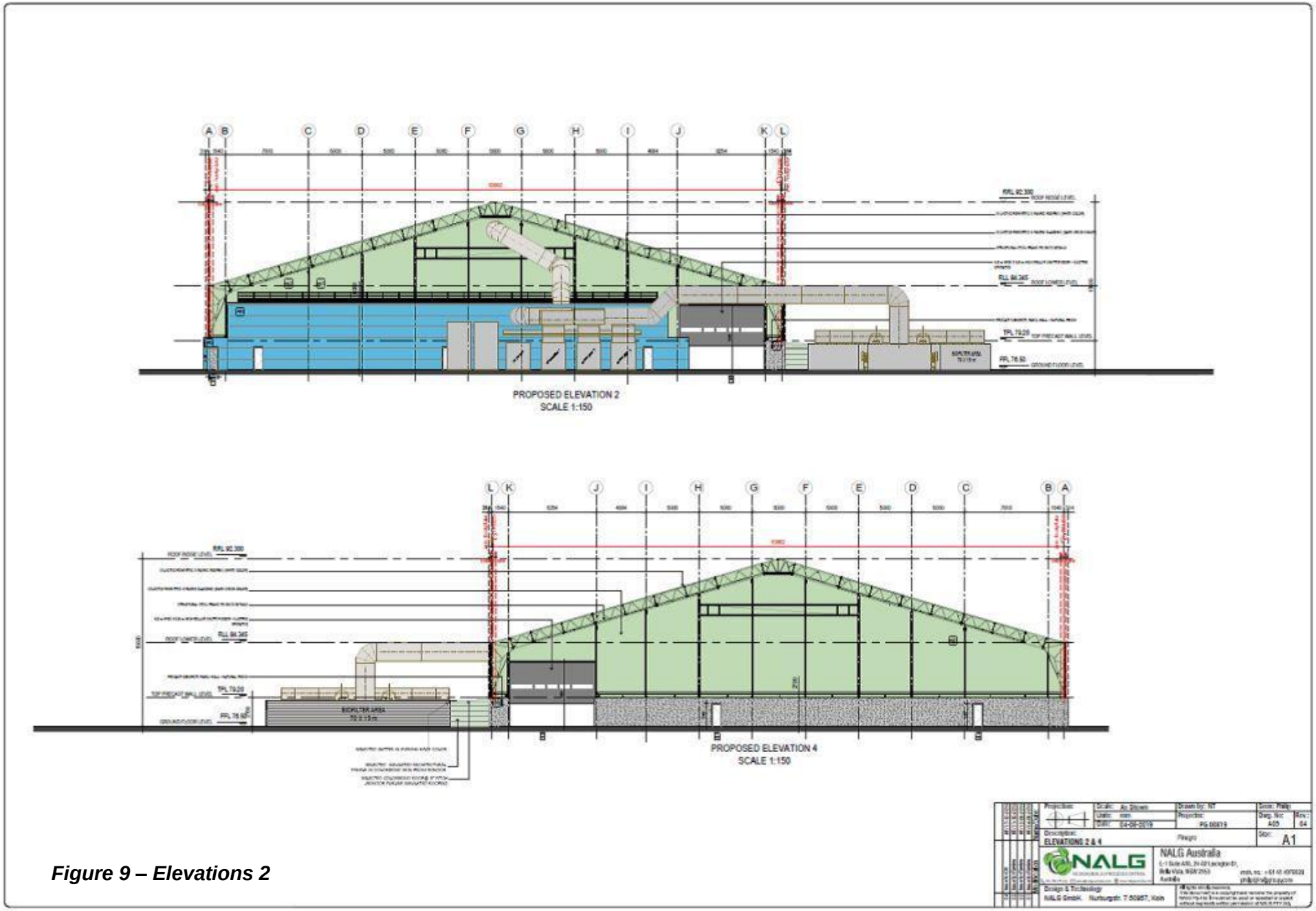


Figure 9 – Elevations 2

5.2.2 Best Practice Composting Facility

The proposed enclosed Invessel Compost Facility will process up to 55,000 tonnes p.a. of FOGO, 5,000 tonnes p.a. of Commercial Food Wastes and 5,000 tonnes p.a. of Biosolids derived from the Gippsland Region.

The infrastructure to be constructed for the Invessel processing facility will include:

(a) Enclosed receival building maintained under negative pressure with air capture and secondary odour treatment;
(b) Five Invessel composting tunnels with air capture and secondary odour treatment;
(c) Two Stage odour control - air pre-treatment tower and chemical scrubber and final treatment bio-filtration;
(d) Computer controlled processing and management system, and new or upgraded utilities and services where required, including electrical power, data and communications, town water, fire mains, wastewater, roadways and stormwater capture and reuse.

5.2.3 Gippsland Community Need

The Gippsland Waste Resource Recovery Group acts on behalf of the Bass Coast Shire, Baw Baw Shire, East Gippsland Shire, Latrobe City Shire, South Gippsland Shire and Wellington Shire. The GWRRG have put out a Request for Expressions of Interest for facilities that can process kerbside FOGO for all councils. It is estimated the processing of FOGO will reduce landfill volumes by 25,000 tonnes per year for the Gippsland Region.

The Kerbside FOGO collection and processing is a new service to ratepayers in the region. Our proposed Invessel Composting Facility would offer the local community the following benefits:-

✓ New State of the Art Infrastructure to process up to 55,000 tonnes p.a. of FOGO;

- ✓ New Jobs and Investment in the Gippsland Region;
- ✓ Strategic location for receival of FOGO;
- ✓ Flexibility to manage changes in volume and composition of organics;
- ✓ Focus on workplace Health and Safety;
- ✓ Experienced and local compost operators with the financial strength to deliver the solution;
- ✓ Fully controlled compost process to eliminate all environmental impacts; and
- ✓ Proven manufacturer of high quality AS4454 compost outputs with existing sales markets

5.2.4 Hours of Operation

The site hours of operation are:

- Monday to Thursday 6:00 am to 6:00 pm;
- Friday 6:00 am to 5:00 pm
- Saturday 7:00 am to 1:00 pm; and
- When essential maintenance is required.

5.2.5 Source of Raw Materials

The feedstocks to be processed include; FOGO, commercial food waste and biosolids and will be predominantly sourced from councils in the region including:- Latrobe City Council, Baw Baw Shire, South Gippsland Shire, East Gippsland Shire, Wellington Shire & Bass Coast Shire. There will also potentially be some overflow volume from the Melbourne region as well.

5.2.6 Expected Markets

A PRODUCT – NOT A WASTE

Pinegro is one of Australia's leading producers of compost and landscape products, with over 600,000m3 sold annually. These existing products are marketed and distributed through a variety of channels, from bulk sales direct from our processing facilities, through to the distribution of bagged product for sale through leading retailers, including Bunnings, Woolworths and Mitre 10. Pinegro have a close alignment with agricultural fertiliser spreading contractors including Gippsland Soil Solutions who are able to efficiently apply bulk Organics in agricultural applications. Our integrated team has experience processing a broad range of organic feedstocks, and a track record of developing sustainable market demand for our high-quality outputs.

End uses and Marketing

The key products and markets include:

Soil Amendment Products, there are large scale agricultural markets (including in the Gippsland region, and North West Victoria) actively re-establishing microbiology in soils through the addition of mature composted Organics, which can increase the productivity of

farmland that has been degraded through the long-term use of mineral fertilisers. We have undertaken successful trials of sub- surface application to increase soil benefits associated with compost in relation to re-establish the biology of agricultural soils.

Top Dressing, being the high -quality undersized (<8mm) compost blended with additional products (such as sand and manures) to meet specific end user requirements for high-end applications.

Garden Mix, being the mid -size (8-20mm) compost, which can be bagged and sold to household consumer (including residents of the Participant Councils) or distributed in bulk form for landscaping applications.

Mulch Mix, being the oversize (20-35mm) compost, to be distributed in bulk form for landscaping applications.

Stormwater Bio-filtration, a relatively new product line, which Pinegro has developed in conjunction with the Centre for Organic Research & Education (CORE) in order to provide an opportunity to filter stormwater runoff (especially from road ways in new property development) and remove hydrocarbon and heavy metal contamination.

Soil Erosion Media, being oversize material that is used to stop soil erosion on embankments.

Biomass Fuel, being up to 10% of feedstock that will generally be the oversize biomass and plastic contamination; manufacture of this product is subject to demand for biomass fuel in Victoria.

The proven Pinegro marketing strategy to create and grow long term sustainable end use markets relies on the production of consistent, quality products that consumers value.

5.3 Process and Technology

In order to determine whether the proposed feedstocks and compost technology to be used are appropriate we have classified the feedstock risk rating and, based on the rating, identified the EPA recommended technology.

5.3.1 Feedstock Categorisation

We have categorised the feedstocks we propose to accept in Table 4 in accordance with EPA Publication 1588.1 June 2017 *Designing, Constructing and Operating Composting Facilities;*

Table 4 – Feedstock Categories

Category	Risk Level	Waste Types	Definitions and examples
1.	Lowest	Garden and landscaping organics	Grass, leaves, plants, branches. tree trucks and tree stumps
		Untreated Timber	Sawdust, shavings, timber offcuts, crates, pallets, wood packaging

		Natural organic fibrous organics	Meat, seed hulls/husks, straw, bagasse and other natural organic fibrous organics
2.	Medium	Municipal source separated kerbside garden waste	Grass, leaves, branches, tree trunks and tree stumps
		Biosolids and aged manure	Biosolids that meet treatment grades T1 to T3. Aged manure that has a dry matter greater than 35%
3.	**Medium to High**	**Dewatered sewage sludge and fresh manures**	**Dewatered sewage sludge (does not meet the T1 to T3 standards), animal manure and mixtures of animal manure and animal bedding organics**
		Other natural or processed vegetable organics	**Vegetables, fruits and seeds and processing wastes, winery, brewery and distillery wastes, food organics excluding organics in category 4**
		Mixed source separated kerbside (Garden waste/food waste – FOGO)	**Grass, leaves, plants, branches, tree trunks and stumps, vegetables, fruit and meat**
		Grease interceptor trap wastes	**Grease trap waste with less than 10% solids**
4.	Highest	Liquid organic wastes (excluding grease interceptor trap waste with less than 10% solids)	Liquid food waste and liquid food processing wastes (including sludges), liquid animal wastes (blood) and paunch (sludge), grease trap with greater than 10% solids
		Meat, fish and fatty foods	Animal mortalities, parts of carcasses, bone, fish and fatty processing or food

Source: EPA Publication 1588.1 June 2017 – Designing, Construction and Operating Composting Facilities Pg. 10 Table 4

The feedstock categories we are proposing to process are classified as **medium to high** as highlighted in red in Table 4.

5.3.2 Recommended Technology Types

We have assessed our technology requirement in accordance with EPA Publication 1588.1 June 2017 *Designing, Constructing and Operating Composting Facilities* in Table 5 below;

Table 5 – Recommended Technology Requirements

	Recommended technology requirements		
Feedstock Category	**Open Environment**	**Enclosed or Covered Environment**	**Enclosed with Secondary Odour Control**
1: Lowest potential risk of harm to human health and the environment.	Yes	Yes	Yes
2: Medium potential risk of harm to human health and the environment.	Yes	Yes	Yes
3: Medium to high potential risk of harm to human health and the environment.	**No**	**Yes**	**Yes**
4: Highest potential risk of harm to human health and the environment.	No	No	Yes

Source: EPA Publication 1588.1 June 2017 – Designing, Construction and Operating Composting Facilities Pg. 11 Table 5

Based on the risk rating of medium to high for the feedstock, the recommended composting technology is enclosed receival with a secondary odour treatment system.

THIS IS THE TECHNOLOGY THAT PINEGRO PROPOSES TO USE

5.3.3 Technology that Pinegro Proposes to Use

Our proposal is the current best practice for the processing of FOGO, Biosolids and Commercial Food Waste in the Australian and International Composting Industry:-

- Totally enclosed process area for receival, picking, shredding and loading of material into the composting tunnel. The building is maintained under negative pressure to prevent odour escaping from the receival building. All captured air is either reused in the process or treated prior to release to the atmosphere.
- The Invessel system is SCADA computer controlled to ensure optimum conditions are maintained and strict processing parameters are met.
- Composting is undertaken in the vessels for a period of 14 days before the pasteurised compost is moved into open windrow maturation.
- We have a two-stage odour treatment system comprising of a tower chemical scrubber used to pre-treat odorous emissions and an engineered bio-filter.
- Open air maturation on an impermeable pad with contact water capture into a lined dam. The compost will meet AS4454 – Composts & Soil Conditioner requirements..

We will continue to process pine bark and sawdust under current siting and management practices to produce products that meet Australian Standard requirements including: AS 3743 – Potting Mixes, AS 4454 – Composts & Soil Conditioners, AS 4422 – Playground Surfacing Material, AS 4419 – Soils This will be at a reduced volume and will be undertaken

using existing technology of open windrow composting. No other feedstocks will be added to or composted using open windrow technology.

5.3.4 Site Design and Capacity

The Pinegro Morwell Compost Facility will be engineered and designed to maximise operational areas and reduce any potential offsite environmental impacts.

The facility will include the following key process controls:

Table 6 – Site Design - Key Process Controls

Area/Activity	Dimensions	Description
Receival Building for Incoming Feedstocks	50m x 55m Total Area: 2,750m2 Processing Capacity: 400 tonnes per day (tpd)	Fully Enclosed Negative Aeration Concrete Base 2 Stage Odour Control System 3 Drainage points directed toward the leachate management system SCADA Computer process air controls
Invessel Tunnels (5)	40m L x 8m W x 6m H Total Area: 320m2 per tunnel	Fully Enclosed Negative Aeration Concrete Base 2 Stage Odour Control System All vessels drain to leachate management system SCADA Computer process controls
Bio-filter Area	70m x 19m Total Area: 1,330 m2	Temperature, ammonia, moisture and back pressure controlled Engineered Design SCADA Computer process controls
Maturation Pad (Organics)	95m x 90m Total Area: 8,550m2	Impermeable Engineered Design Contoured Toward Leachate Dam
Compost Pad (Pinebark/Sawdust)	140m x 30m Total Area: 4,200m2	Impermeable Engineered Design Contoured Toward Leachate Dam
Screening/Finished Product Storage Pad	40m x 75 m Total Area: 3,000 m2	Impermeable Engineered Design Contoured Toward Leachate Dam

Leachate Dam	40m by 40m Total Area: 1600 m2 Depth: 2m Dam Capacity: 3.2 ML	Impermeable Engineered Design Aerated Overflow & reuse directed to Invessel Compost Facility

The site has been designed to minimise the potential for risk to the environment employing best available technology. The proposed composting infrastructure as a minimum meets and in many cases exceeds the best practise design as recommended in EPA Publication 1588.1 June 2017 – Designing, Constructing and Operating Composting Facilities. All receival is undertaken in an enclosed receival hall maintained under negative pressure with no untreated air venting directly to the atmosphere. Secondary controls consist of a two-stage approach Chemical scrubbing and bio filtration, with each capable of treating odorous emissions in isolation in the event of breakdown.

Mass Balance Calculation:

Tunnel Capacity

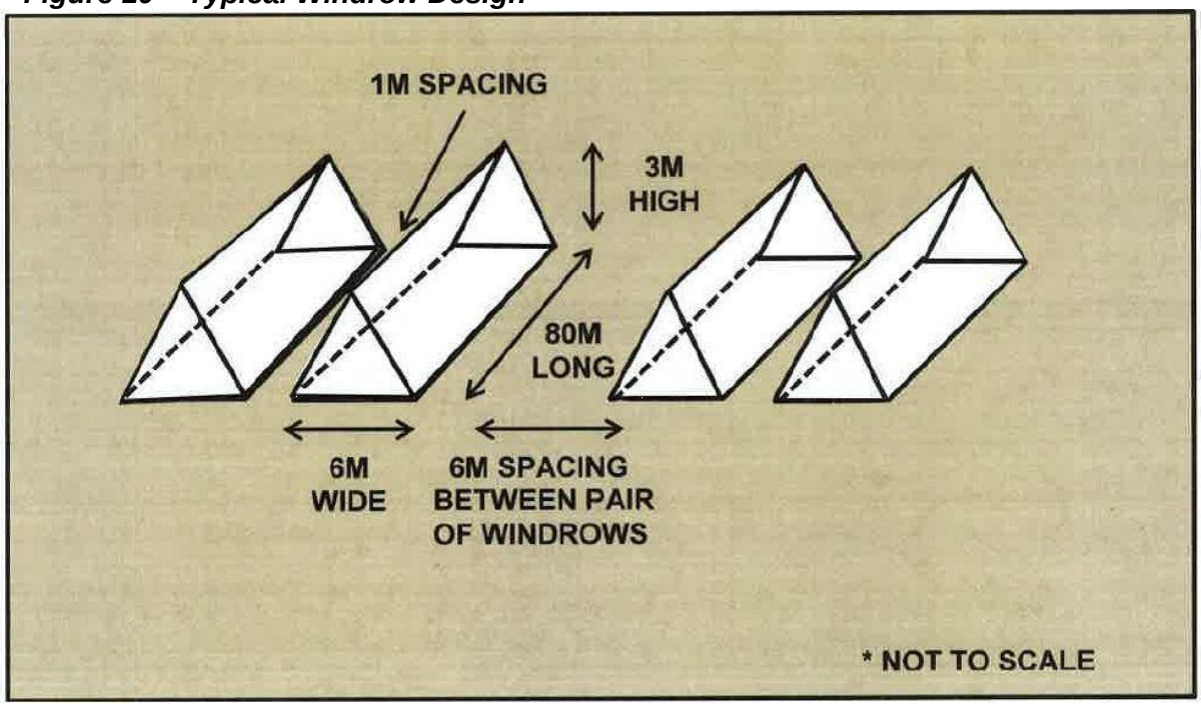
Table 7 – Mass Balance Calculation

Design of Each Tunnel	
Length	40 metres
Width	8 metres
Height	6 metres
Filling height	2.4 metres
Total Capacity of a Tunnel	760-800 tonnes
Maximum Capacity of 5 Tunnels - 5 tunnels @ 780 tonnes	3,900 tonnes
Based on a 14 day cycle time the tunnels can be utilised	26 weeks per year
Annual Total Vessel Capacity	101,400 tonnes
Allow 2 days per 26 week cycle for filling/unloading & maintenance of tunnels - 52/365 days Redundancy Time in Tunnel	14%
Annual Tunnel Capacity	87,204 tonnes
Spare Capacity in Tunnels	22,204 tonnes

Tunnel Output	
Assume Full Capacity	65,000 tonnes p.a.
Pre Wetting of FOGO 120% Weight Gain	78,000 tonnes p.a.
Tunnels Loaded Per Week (5 Tunnels) Conversion 1.4m^3 = 1 tonne	1,500 tonnes 2,100 m^3
Tunnels Output Per Week 35% Reduction Conversion 1.6m^3 = 1 tonne	975 tonnes 1,560m^3
Assume 5 week Maturation Period At Full Capacity	7,800m^3
Organics Maturation Pad	
Design 95 x 90 m2	8,550m2
Windrow Dimensions:-	
6m wide x 3.0m high x 80m long	1440m3
25% Reduction	(360m3)
	_____
Each Windrow Volume	1080m3
	_____
Maturation Pad Capacity:-	
90m long/ 6m wide windrow	15 Windrows 16,200m3
Allow 6m Row Gaps between two (pair of) windrows	(4) Windrows (4,320 m3)
Allow 1 m Gap between each windrow	(1) Windrow (1,080 m3)
	_____
Total Windrows Available For Maturation	
Volume:- 10 Windrows @ 1080 m3	10 10,800 m3
	_____
Windrow maturation area required for 5 week maturation period	(7,800m3)
Potential Additional Volume on Maturation Pad	3,000m3

The maturation windrow dimensions are designed to follow guidance in EPA Publication 1667.2 October 2018 *Management and Storage of Combustible Recyclable and Waste Materials*. The windrow dimensions are 6m wide by maximum of 3m high and 80m long. The windrows are laid in pairs side by side with a 1m gap. Each pair of windrows will have a 6m gap between them to allow for CFA access to each windrow. The maturation pad will be surrounded by road way access of at least 6m.

Figure 10 – Typical Windrow Design



The Invessel compost facility and maturation pad design provides sufficient additional capacity to allow for non routine conditions that may arise in the operations.

5.3.5 Key Processes and Technology

Morwell Invessel Composting Technology
Proven Best Practice Composting Technology

Pinegro and its proven technology provider NALG Australia, intend to establish and operate a FOGO Composting Facility with the annual capacity of 65,000 tonnes.

NALG Australia – Proven Technology and Design Provider

"ENVIRONMENTALLY SUSTAINABLE TAILORED SOLUTIONS IN WASTE PROCESSING, TREATMENT AND RESOURCE RECOVERY"

NALG Australia, including its European technology partners, has over 30 years' experience in waste processing and treatment. It specialises in developing tailored solutions for its clients including all design, engineering, construction and control systems to recover recyclables and produce compost products. A prominent demonstration of NALG Australia's success and commitment to building performing facilities is the fact that it has built two new Invessel Compost Australian facilities recently. It provides a compact solution with all operations under one roof.

NALG provides a highly skilled project development and construction team with a unique track record of completing turnkey projects. With a rigorous, streamlined turnkey project management process that is supported by worldwide expertise it has demonstrated its ability to complete projects cost effectively and in a timely manner.

Proven Best Practice Technology

- ✓ Proven Best practice technology in Europe with over 50 facilities operational.
- ✓ Two Australian operational sites in Shellharbour, NSW and Yatala, QLD.
- ✓ Full compliance with EPA regulatory requirements.
- ✓ Australian Standard AS4454 product compliance.
- ✓ Australian Standard AS4454 product compliance.

Detailed in Table 8 is a flow chart of the proposed Invessel composting process. Each stage of the process identified in table is then described in detail.

Table 8 – Invessel Composting Flow Chart

MORWELL SITE
PRODUCTION OPERATING PROCEDURES
FOOD ORGANICS GREEN ORGANICS (FOGO)

INVESSEL COMPOSTING FLOW CHART

Pinegro – Invessel – Composting Process Flow Chart

RECEIVALS
FOGO – ENCLOSED AERATED RECEIVAL BUILDING

DECONTAMINATION- (plastic,glass, metal, other inorganic materials) AIM <1% Contamination by Weight

DISPOSAL TO LANDFILL

SHREDDING - INSIDE RECEIVAL BUILDING

Shredded FOGO	Shredded FOGO	Shredded FOGO	Shredded FOGO	Shredded FOGO	Shredded FOGO

ACTIVE PHASE COMPOSTING ENCLOSED AERATED TUNNEL

MATURATION	MATURATION	MATURATION	MATURATION	MATURATION	MATURATION

TESTING

SCREENING PROCESS

MULCH

COMPOST

OVERSIZE – REPROCESS OR DISPOSE TO REHAB LANDFILLS

5.3.5.1 Receival of FOGO, Commercial Foodwaste and Biosolids

The feedstock is received in the enclosed Receival Building maintained under negative pressure with no untreated air emissions. All floors are impermeable (concrete) with liquid draining to a leachate sump. The total area of floor space is 2,750 m^2.

The airtight enclosure is engineered and designed in Germany ensuring there are no untreated emissions venting directly to the atmosphere. This is achieved by capturing all emissions whilst maintaining the building under negative pressure and treating all emissions with secondary controls.

Figure 11 - Receival Building- Shell Harbour NSW Invessel Compost Facility

The building is equipped with two rapid action roller doors with one on each side of the building, to minimise pressure loss whilst trucks enter, with air removal programmed to achieve 4 air exchanges per hour.

Each door consists of an internal and external door. The external steel structural roller door protects against prevailing wind conditions and prevents air from escaping outside the building when closed. The external door usually remains open during receival.

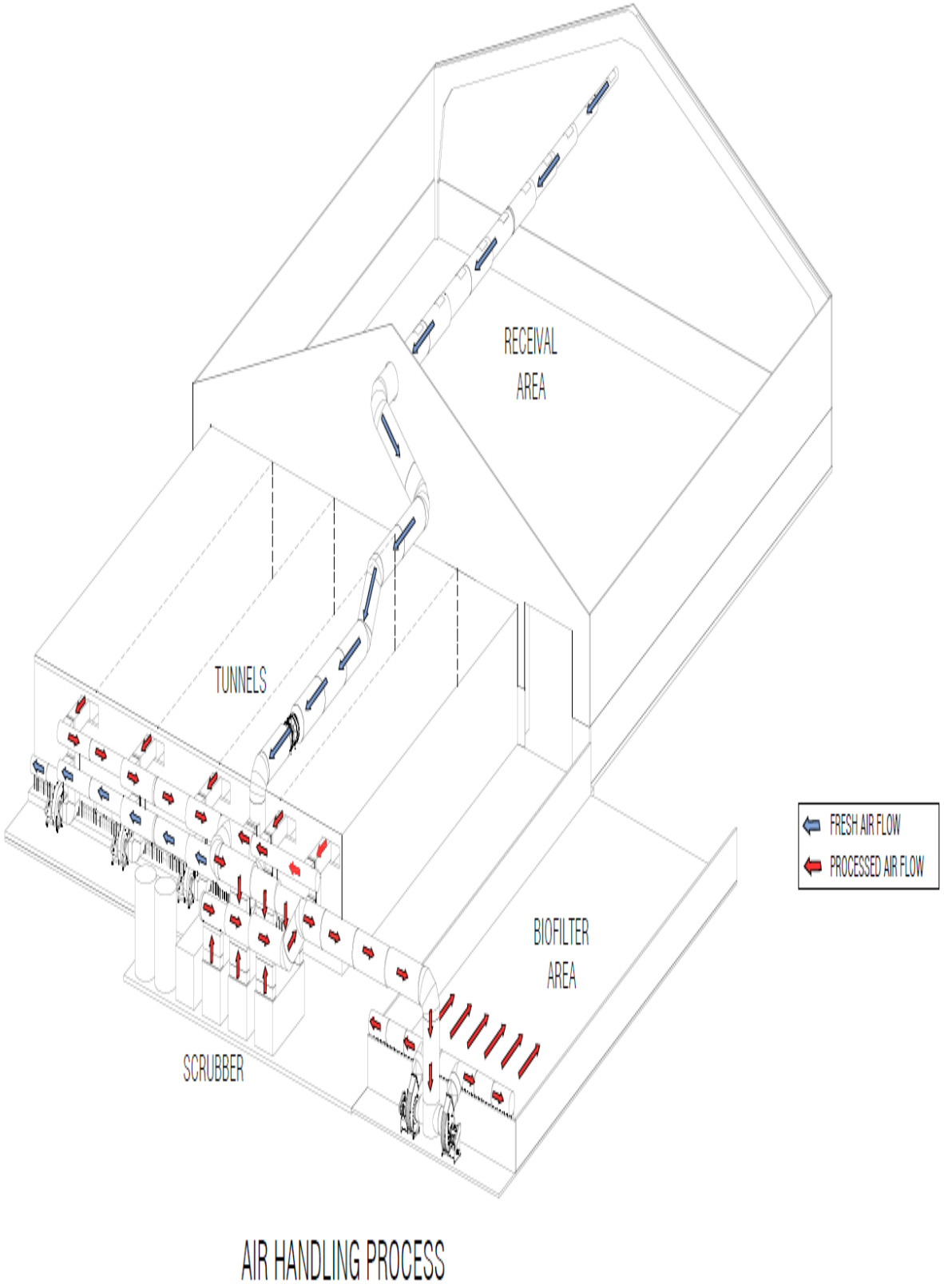
The internal rapid action door is designed to open & close quickly (30 seconds) as trucks enter and exit the building and prevents air from escaping from the building. An air curtain is designed around the roller door to regulate airflow in the building. The SCADA control system automatically increases/decreases fan speeds as doors open and close, to maintain negative air pressure.

Figure 12 - Roller Doors-Yatala QLD. Invessel Compost Facility

The building air removal system is SCADA controlled to automatically maintain the required oxygen and negative pressure requirements. There are 4 pressure sensors and 1 oxygen sensor located within the building. The pressure sensors are located - 2 near the rollers doors, one inside the air removal duct work and 1 at the Receival area. There is also 1 oxygen sensor located inside the top of the building ensuring that the oxygen levels and negative pressures are maintained. Building air is extracted by a 15Kw centrifugal fan via ducting located along the top of the building as pictured in Figure 13. This extracted air is then reused on demand to the invessel tunnels with all surplus diverted to the air treatment system. This reduces the load on the odour control system.

Figure 13 - Inside Receival Building with Air handling Ducts-
Shell Harbour NSW Invessel Compost Facility

Figure 14 – Air Handling System



5.3.5.2 Decontamination

All organics received are unloaded on the receival floor then transported to a Feed Hopper by a front end loader or excavator. The waste is then sorted through a picking station which is housed within the building. The picking station consists of a sizing screen, magnetic separator, hopper and shredder. There is a manual sorting cabin connected to the picking station where staff manually pick waste. This has a designated air management system. The fresh air intake and air conditioning ensures a pleasant and safe environment for the employees in this area. At the picking station contaminants that have passed the primary screening are removed and either recycled or sent to landfill. These typically consist of metals, inert materials, plastic, glass etc.

Figure 15 - Decontamination Area - Shell Harbour NSW Invessel Compost Facility

5.3.5.3 Shredding

Once all contaminates have been removed the conveyor belt transports the material to the shredder. It is then mechanically shredded to reduce the size of the material to a size of <120mm, optimum for composting. The shredded and screened material are then loaded into the aeration tunnels. Moisture is added in the tunnels to precondition the material. Pinegro can also add the oversize compost at this stage to increase the air fill porosity and carbon nitrogen ratio of the blend if required. All material is processed and loaded into the vessels within 24 hours of Receival.

5.3.5.4 Active Phase Composting – Enclosed Aerated Tunnels

The active phase of the composting process is the most difficult stage to manage and control, it is also when the highest odour emissions are produced. To mitigate the odour risk, this stage is strictly controlled and the process conditions are monitored and controlled. Key performance parameters such as moisture, temperature and oxygen levels are monitored, and adjusted by the SCADA control system to achieve the pre-programmed requirements.

All air emissions from this process are treated with primary and secondary controls. The proposal is for five tunnels. Each tunnel is 8 metres wide, 6 metres high and 40 metres long. The tunnels consist of an aerated floor with Christy nozzles and leachate collection which is diverted to the leachate management system.

The tunnels are equipped with sprayers for leachate water reuse and freshwater addition when required. The tunnels are maintained under constant negative pressure. They are a totally sealed system with the entry door made of stainless-steel panels with rubber seals to prevent any possibility of pressure loss.

The tunnels are equipped with four temperature monitoring probes within each tunnel. This allows for point source monitoring. A temperature, moisture and oxygen probe is also located in the extracted air duct this ensures that the average temperature is reflective of the point source (in vessel) measurements. These parameters are monitored and regulated by the SCADA control system ensuring that optimal conditions for composting are maintained.

Although temperature is critical to pasteurisation, we are not solely reliant on these measurements, monitoring and assessment of pathogens is undertaken by periodically sampling finished product to meet AS4454-2003 requirements.

Figure 16 - Aeration Tunnel Floor Air Pattern Design - Yatala QLD. Invessel Compost Facility

Figure 17 – Finished Aeration Tunnel Floor with Leachate Collection Pipes- Yatala QLD. Invessel Compost Facility

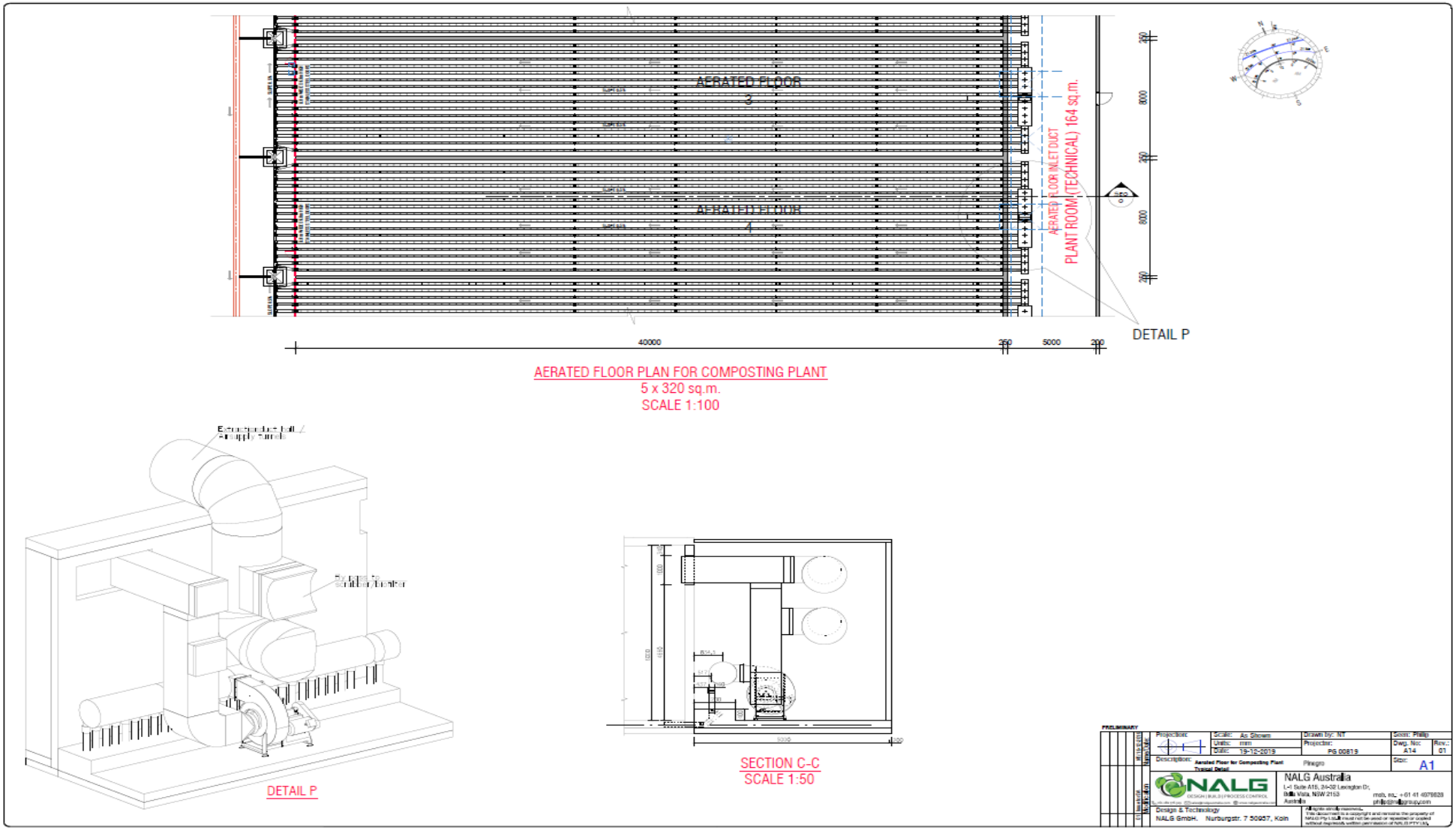


Figure 18 – Aerated Floor Technical Detail

The Active Compost Phase process for the Invessel system involves the following stages;

1. Filling of the Tunnels
2. Equalisation /Warming up of Compost
3. Pasteurisation of Compost
4. Cool-down of Compost
5. Conditioning of Compost
6. Cool-down before Emptying Tunnel

1. Filling of Tunnels - 1 Day

The decontaminated shredded material is loaded into the tunnels via a front end loader. To optimise the composting process Pinegro will implement quality control procedures for homogeneity, porosity and weight of the material, the volume filled and the method of filling.

The filling of the tunnel will usually take about one day with the blower fan and return ducts running at a predetermined rate. This will treat the odorous air. Leachate water or storm water will be added at this stage. See Figure 19 below Tunnel Filling.

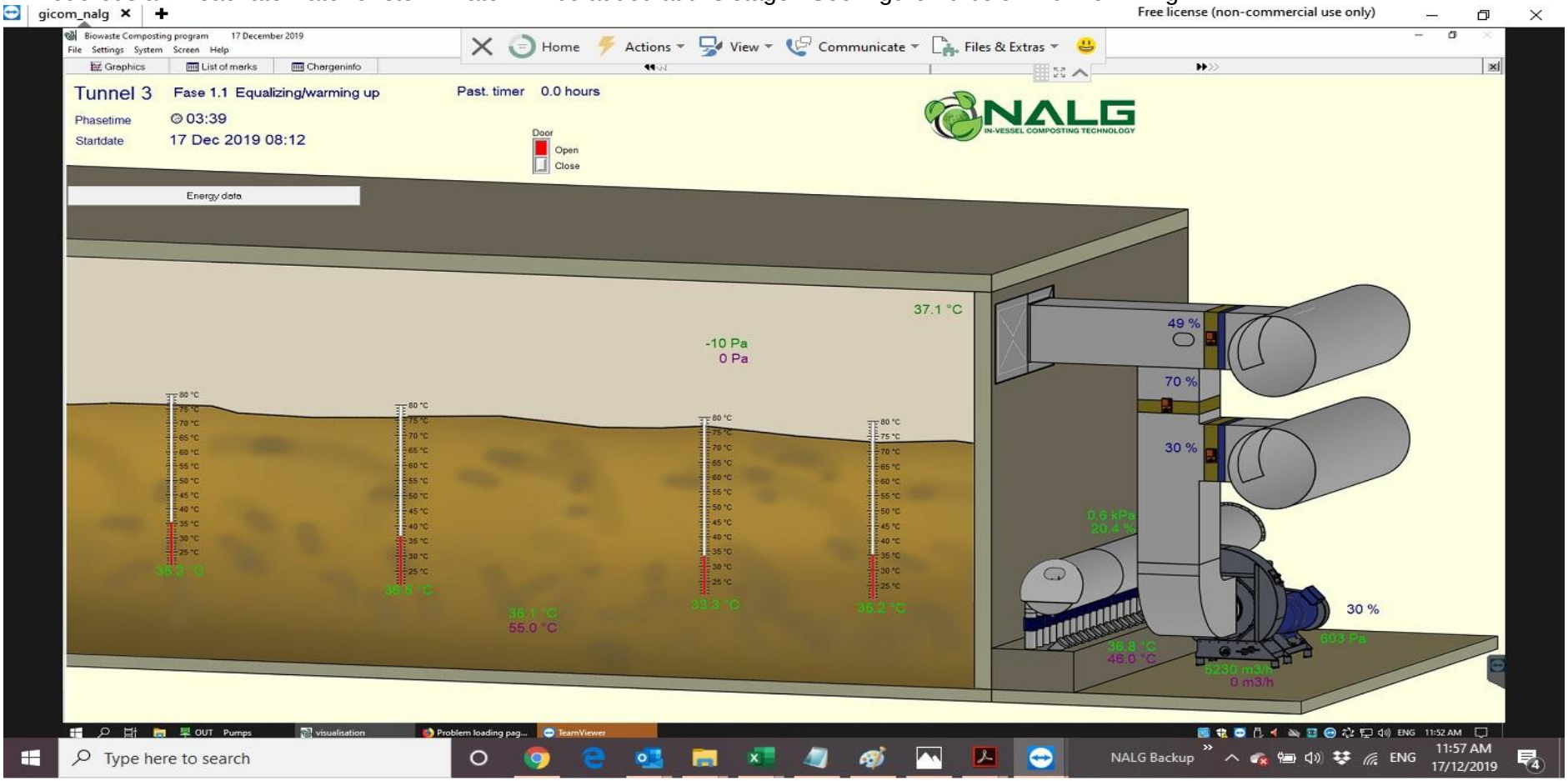


Figure 19 - Tunnel Filling

2. Equalisation/Warming Up of Compost – 1 Day

This stage is designed to equalise the temperatures of the compost and increase them in a controlled manner. Leachate water or storm water will be added at this stage. This is a vital component of the process, which is designed to create a homogeneous compost.

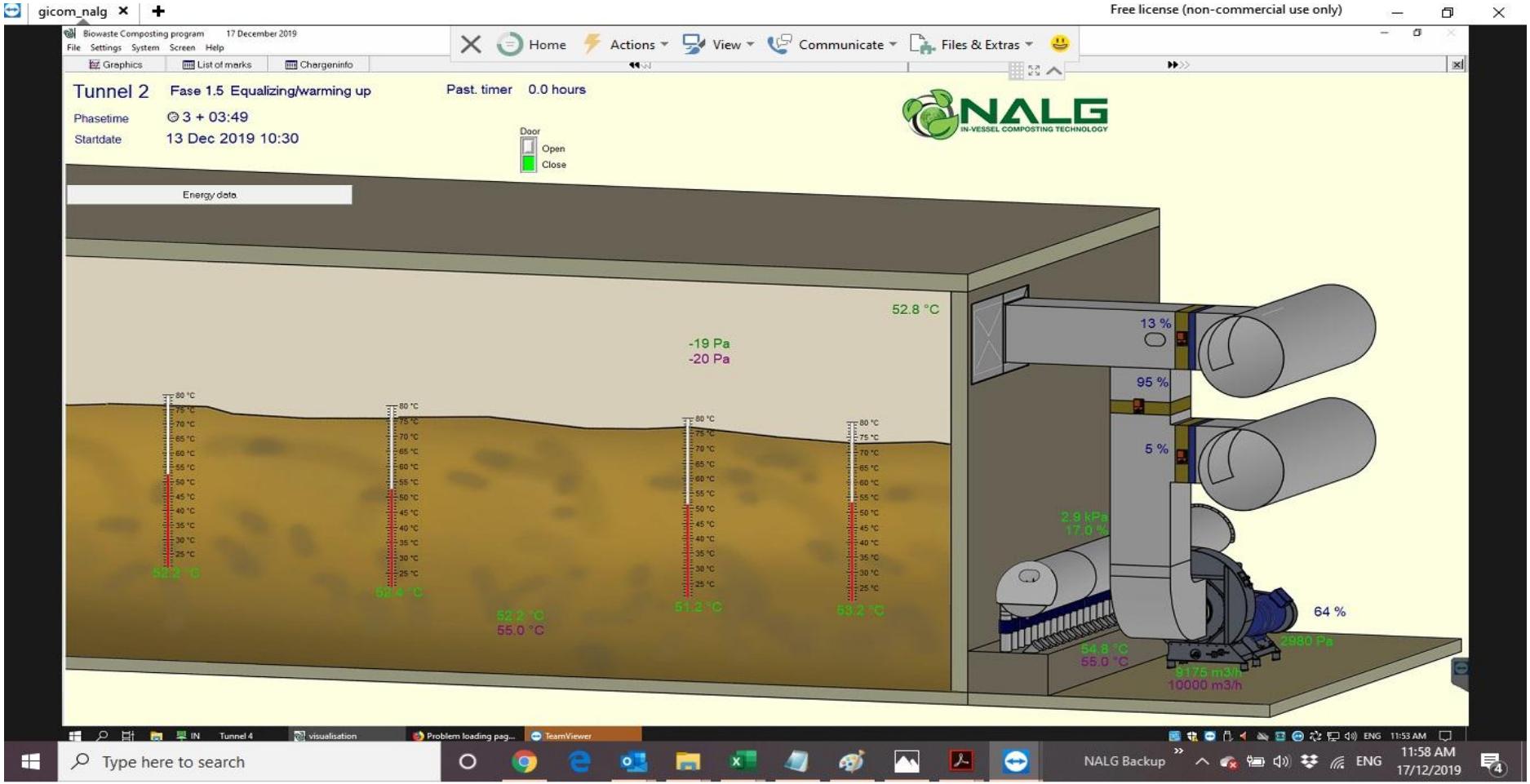


Figure 20 - Equalisation/Warming of Compost in Tunnel

3. Pasteurisation – 3 Days

The objective of this phase is for pathogen and weed seed destruction. The compost temperatures are elevated to > 55°C for at least 72 hours by setting a high airflow rate and higher minimum inlet temperatures. This process is managed by the SCADA control system to ensure the whole mass reaches >55°C.

The compost temperatures are maintained at >55°C to ≤ 60°C. Above this temperature, the thermophilic micro-organisms suffer too much, with the unavoidable result being an increase in composting time and the overall process being inhibited. Secondly, the protein breakdown is dramatically increased, possibly resulting in ammonium toxicity.

The minimum level for oxygen supply is set at 10%, to ensure oxygen levels maintain aerobic conditions. The system has a backup for oxygen control which is a manual override system where a minimum damper set point of 5 – 15% may be put in place. Clean water can be added through this phase as required. See Figure 21 - Pasteurisation below.

The Invessel Compost System allows Pinegro significant flexibility in setting temperature, oxygen and moisture levels and the length of time in the active phase.

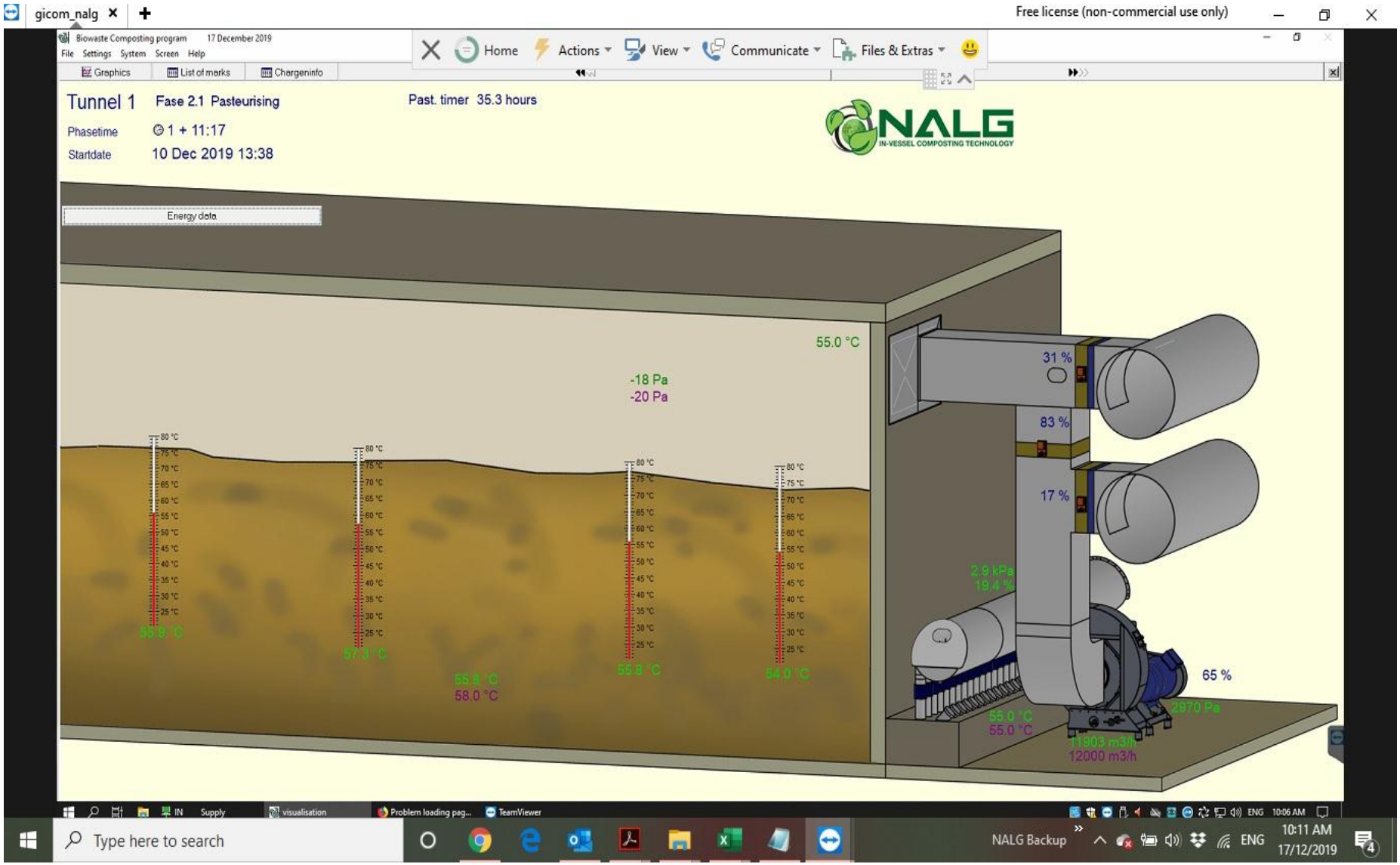


Figure 21 - Pasteurisation Phase

4. Cool-Down for Conditioning – 1 Day

After the conclusion of the pasteurisation process the SCADA Control System automatically switches through to the cool-down phase. The system also has the capability of undertaking this activity manually if required. In this phase the temperature is decreased to the optimal composting temperature using the ventilator and fresh air damper. The first portion of the cool-down (to 55°C) may occur relatively quickly (in two to three hours) the second portion of the cool-down (55°C to 50°C) may be slower, from 0.5 to 1.5°C per hour.

5. Conditioning Phase – 5-7 Days

This composting phase attracts the highest level of microbes. Microbes are essential in the break down of organic matter and the production of carbon dioxide, water and heat during the compost process. At this stage we maintain the compost temperature between 45°C and 55°C with an optimum of 48-52°C. Lower temperatures slow down the process. Clean water can be added if required.

Toward the end of the conditioning phase there will be a reduction in microbiological activity (less heat being produced) indicating that the compost has completed its active compost phase. Another very good indicator is the rapid decrease in the ammonia concentration. At the end of this process, the C:N ratio will decrease.

The SCADA Control System monitors compost temperatures and oxygen levels and adjusts them to maintain the set processing parameters.

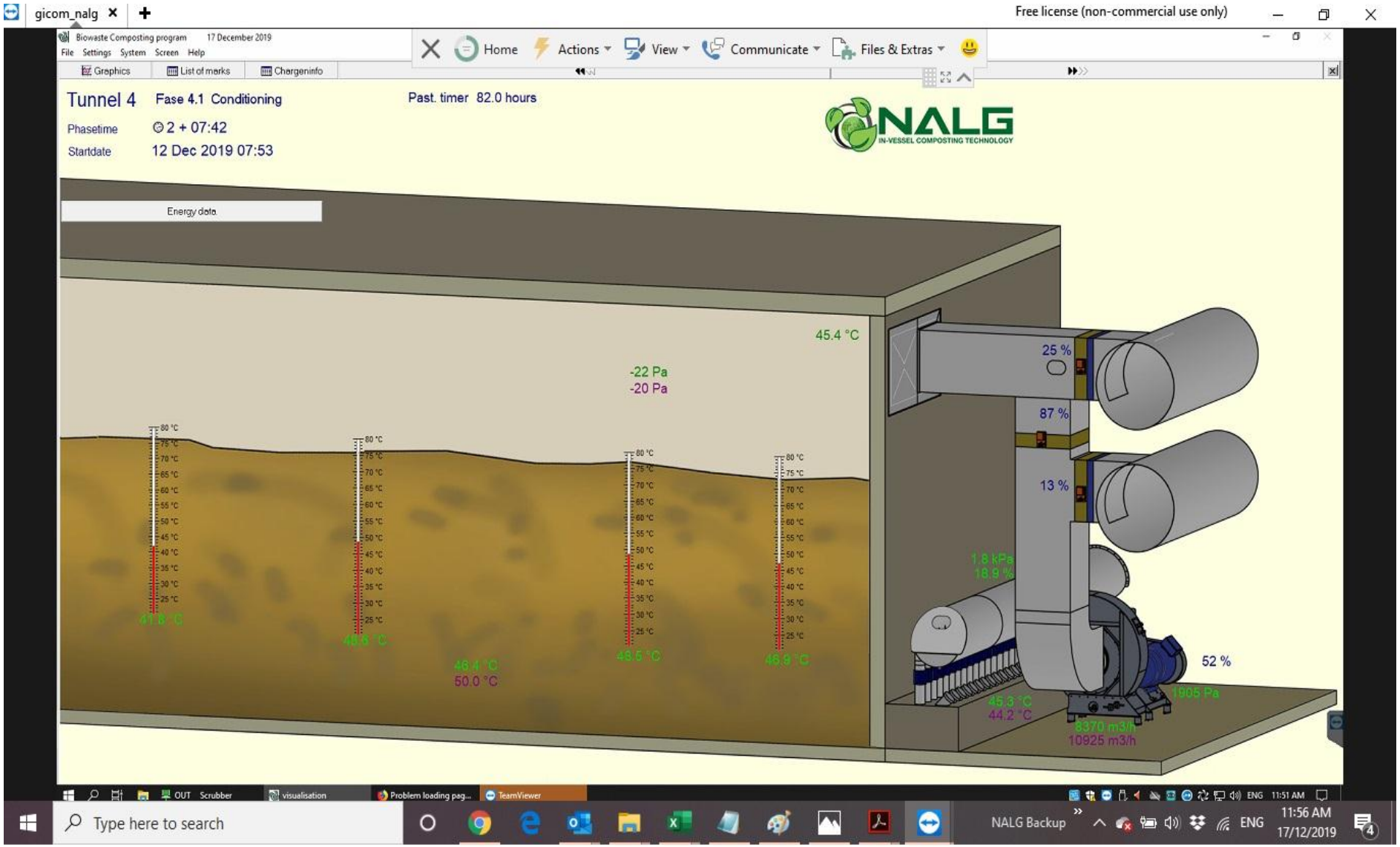


Figure 22 - Conditioning Phase

6. Cool-Down Before Emptying Tunnel – 1 Day

The composts are cooled down to between 30°C and 40°C prior to emptying the tunnel. This stage is designed to regulate the compost temperature, oxygen content and moisture levels prior to being transported to the maturation pad.

Figure 23 -FOGO after active phase composting - Shell Harbour NSW Invessel Compost Facility

5.3.6 Two Stage Odour Control System

All process air and dust particles in the receival building and composting tunnels will be captured and treated prior to venting to the atmosphere. In order to reduce the volume of odorous air to be treated, the receival building extracted air is diverted into the compost tunnels. The SCADA computer control system monitors and directs the air flow within the receival building and compost tunnels. It also monitors and diverts the air to the air treatment system. The proposal is for a two stage air treatment system.

The first stage will be a proprietary chemical scrubber. This will remove dust particles and pre-treat odorous air prior to secondary stage treatment, bio-filtration. The advantage of this system is that odorous air is treated to reduce the odour concentration, remove the ammonia component which bio-filters have difficulty in managing, and the air is presented to the bio-filter free of dust, saturated and less than 40°C. In the second stage the air is transported via an exhaust duct to the specially engineered bio-filter.

5.3.6.1 Stage 1 Chemical Scrubber

Stage 1 –Chemical Scrubber

Pinegro proposes to use proven Dutch technology supplied by Inno-plus for the supply and installation of the Chemical scrubber. The chemical scrubber is used as an air pre-treatment system that can also be operated independently of the primary control bio-filter.

Bio-filters traditionally have difficulty in processing hot air and ammonia and particulate laden air streams. The chemical scrubber is designed such that it reduces the load on the bio-filter. It removes particle, saturates the air stream and removes ammonia. In doing so it also reduces the odour concentration.

Scrubbers operate by having a large surface area that comes into contact with the contaminated air stream. The design of the proposed system is such that a constant mist of water is passed over the process air. The air scrubber is a scrubber pack with a honeycomb structure with a very large specific surface area. This large surface area is needed to give the ammonia present in the air sufficient time to dissolve in water.

The process water is collected in a water reservoir. The pH value of the process water is determined by continuously monitoring the acid content (pH value). If the pH value is too high, an acid pump automatically adds acid from the acid storage tank to the process water. In addition, the concentration of acid in the process water is also continuously measured. If the acid concentration of the process water has reached a pre-set level, the process water is automatically discharged to the drainage basin.

Treated air from the scrubber is directed to the bio-filter for final treatment.

See Figure 24 - Chemical Scrubber Design.

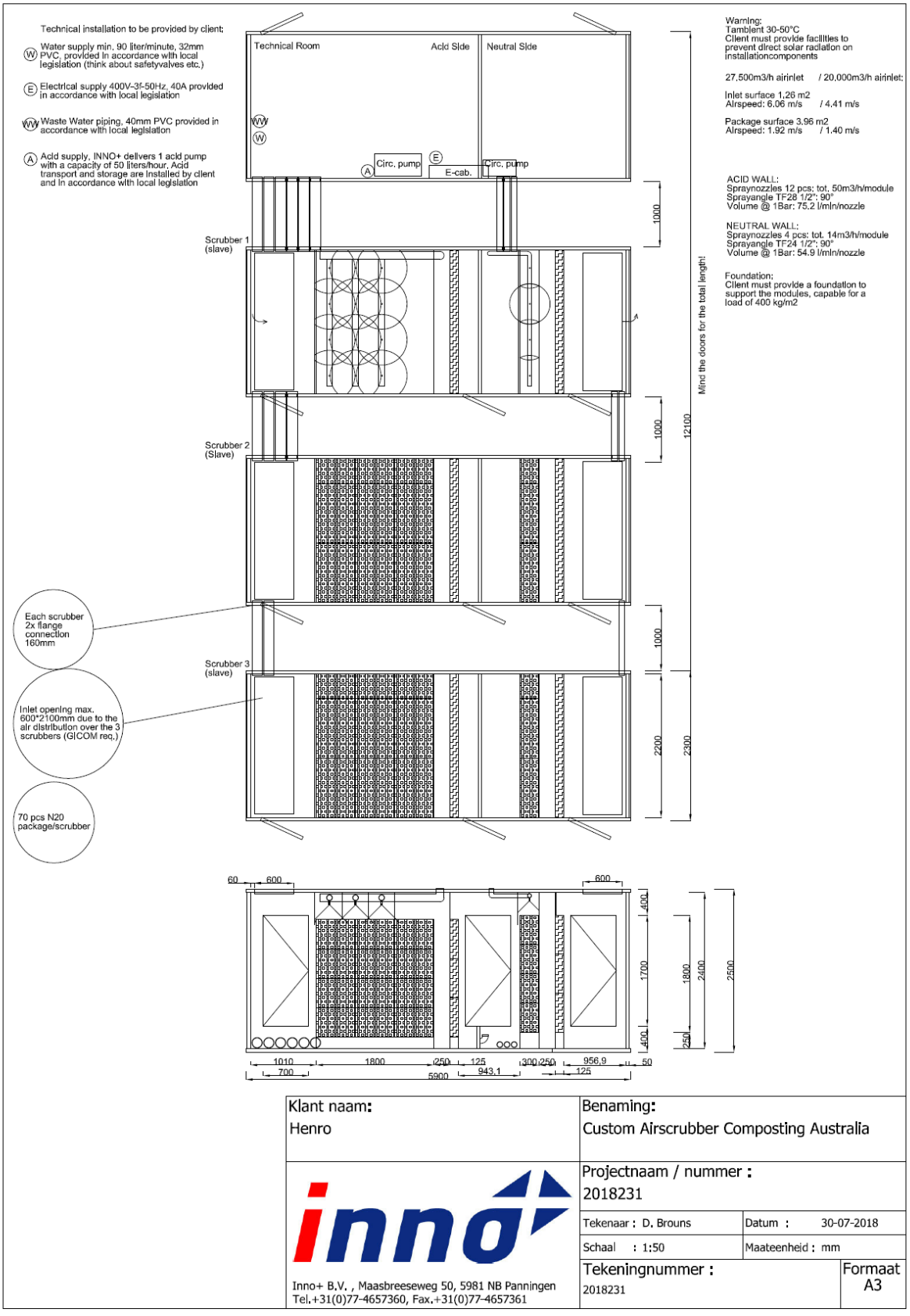


Figure 24 – Chemical Scrubber Design

Figure 25 - Chemical Scrubber - Yatala QLD. Invessel Compost Facility

The purified air leaves the scrubber at the top or rear without ammonia, and without the majority of odours and dust particles.

The process water is collected in a water reservoir. The pH value of the process water is determined by continuously monitoring the acid content (pH value). If the pH value is too high, an acid pump automatically adds acid from the acid storage tank to the process water. In addition, the concentration of acid in the process water is also continuously measured. If the acid concentration of the process water has reached a pre-set level, the process water is automatically discharged to the drainage basin

.

5.3.6.2 Humidifier

The humidifier is located within the scrubber. The air temperature probes located within the air stream and the SCADA control system measures the temperature of exhaust air. If the air temperature is higher than 40°C or not in line with the set temperature, the sprayers are activated and this conditions the air to a cooler temperature. The cooler air provides optimal conditions for the microbes in the bio-filter. The humidifier is also activated if the bio-filter moisture levels are detected to be dry and lower than what is specified. The humidification process is conducted by clean water supplied from a rainwater or freshwater tank from town supplies and this process is also PLC programmed to work with the SCADA system and outside weather conditions.

5.3.6.3 Particulate removal

The process air from the tunnels and Receival building can contain dust particles with organic debris. This air is transported via duct work to the bio-filter pre-treatment scrubber. This dust is removed from the air stream by contact with the liquid within the scrubber via perforated grills. These grills increase the contact surface area and provide an efficient particulate removal sytem. The contaminated liquid is then collected in tanks for reuse in the wetting of the active compost phase.

5.3.6.4 Stage 2 Bio-filtration

The Bio-filter is a 2 compartment design. Each of the compartments is supplied with an individual 55kW fan.

The bio-filter is designed with a floor system that has 250mm-300mm pipes with nozzles every 150mm. The air from the scrubber is transported by the ducts and pushed into the medium via two suction fans at low pressure. The air is retained in the bio-filter medium space for between 35-41 seconds. This provides sufficient retention time for odour removal.

The total bio-filter medium depth is 2000mm comprising of three layers.

The bottom layer of the bio-filter comprises of 250mm shredded wood, with a sizing of >100mm which prevents the blocking of the air nozzles.

The middle section comprises 1500mm of pinebark/shredded tree roots, with a sizing of up to 80mm.

The top layer of the bio-filter comprises 250mm of fine pine bark, which is spread evenly on the surface of the bio-filter. This ensures a homogeneous spread of air with a large surface area.

5.3.6.5 Bio-filter Management and Controls

To ensure optimal operating conditions the biofilter is equipped with return air pressure sensors, moisture sensors and 4 temperature sensors in the bio-filter medium.

The bio-filter is also equipped with sprayers in the event the medium starts to dry off or in hot windy conditions. The leachate from the floor of the bio-filter is collected in a tank and used during the active composting phase.

Figure 26 - Bio-filter - Shell Harbour NSW Invessel Compost Facility

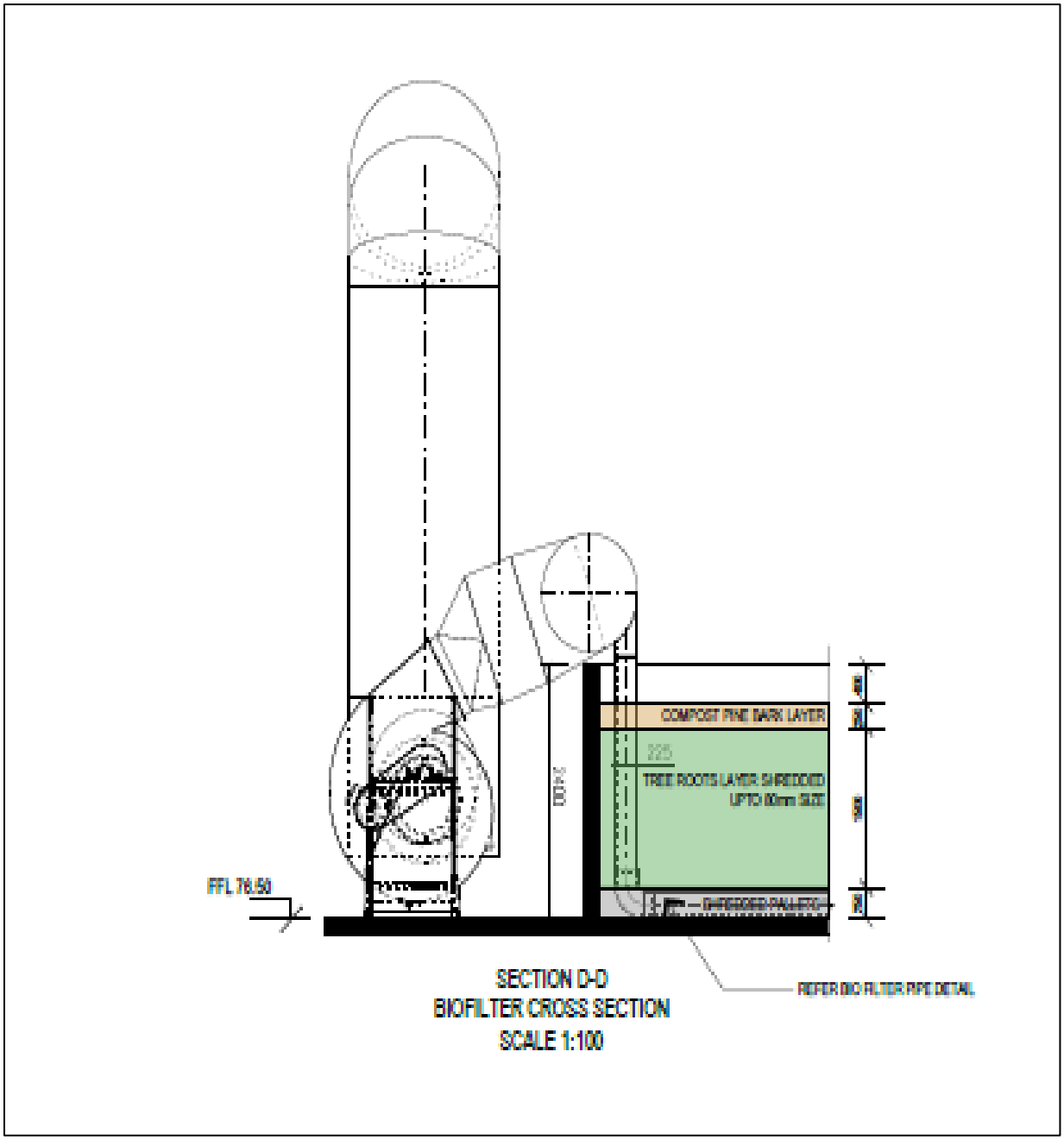


Figure 27 - Biofilter Cross Section

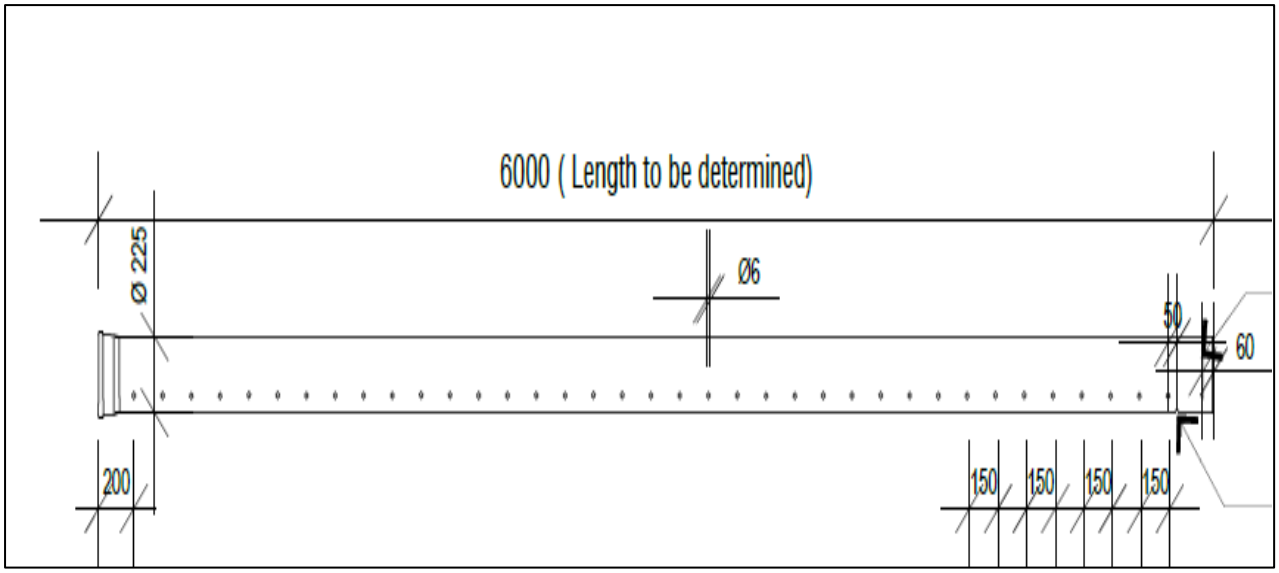


Figure 28 - Hole Pattern – Bio-filter Pipes

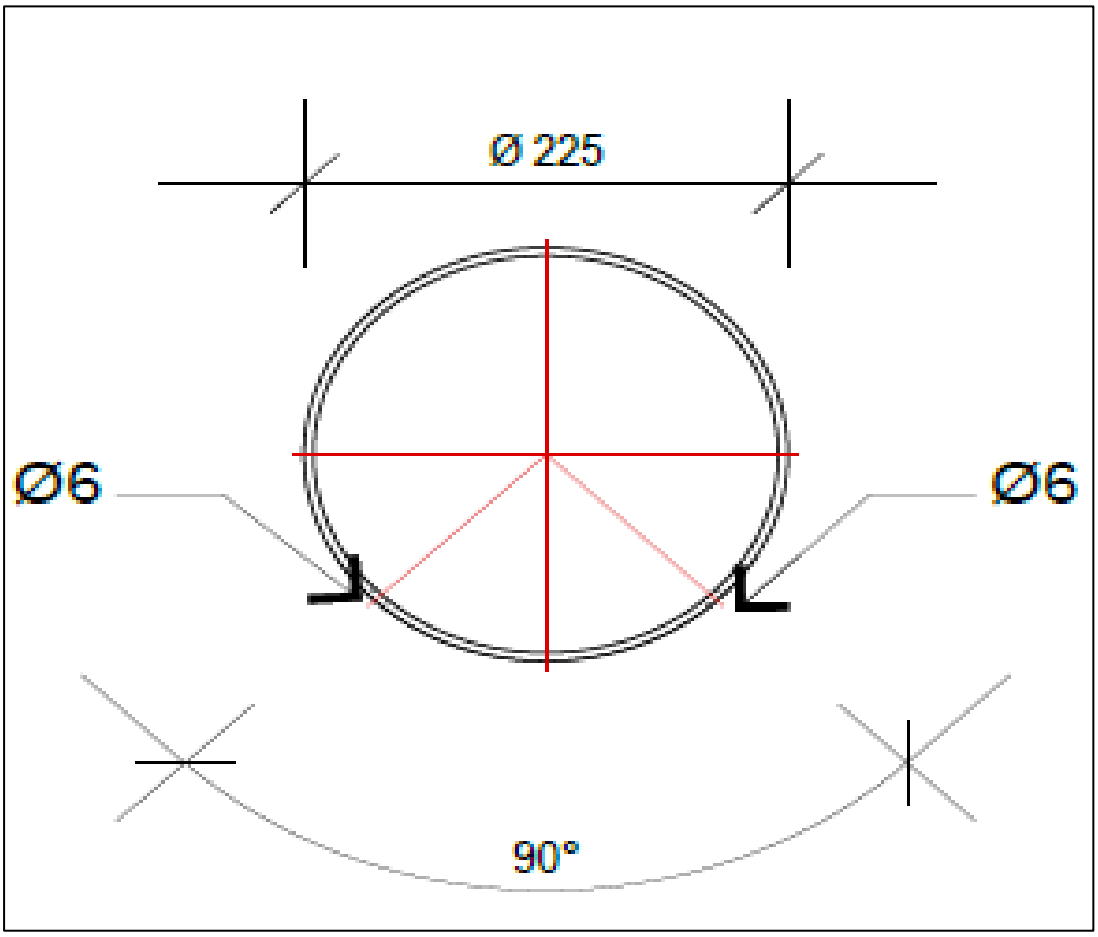


Figure 29 - Detailed Hole Pattern

Figure 30 - Bio-filter blower

Bio-filter Blower: (2 fans)
Power: 55 KW
Speed: 1167 RPM
Air Volume: 16.6 Cubic Metre Per Second

5.3.7 Maturation Phase – 3 to 6 Weeks

Our proposal is to continue to manage the maturation phase with current management procedures. The maturation phase will be conducted outdoors on a specially designed and engineered impermeable hardstand area. The pad size will be 95 x 90 m^2 creating an 8,550 m^2 maturation area that is contoured toward an impermeable leachate dam. **See Figure 31 following - Maturation Pad Layout.**

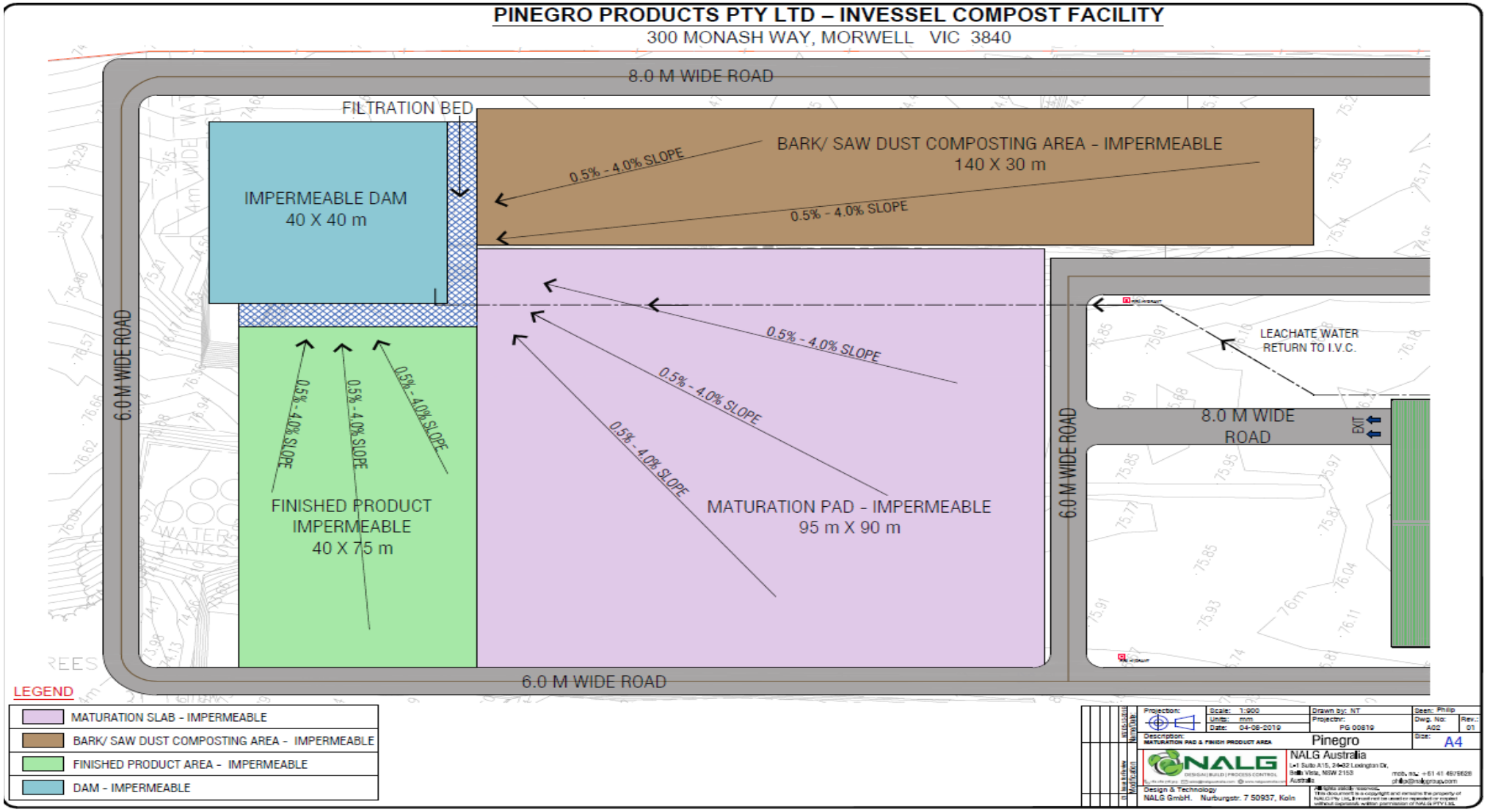


Figure 31 - Maturation Pad

Prior to formation of the maturation windrow the material removed from the vessels will be assessed for moisture and porosity. The C:N ratio and moisture levels will be analysed and amendments made to meet C:N ratio of between 25:1 and 35:1 and bulk density parameters of 400 - 600 kg/m^3. This material may then be combined with screened 14 – 50 mm compost during formation to ensure a high C:N ratio and high porosity therefore further minimising risk of odour generation during this stage.

The Maturation stage is intended to stabilise the composted material. During the Maturation phase the piles (windrows) are matured for a further three to six weeks. The windrows are turned weekly, and kept below a height of three metres with water added as required. Pinegro will utilise one of either front end loader or tracked excavator to turn the windrows. Smaller windrows of 1.5m in height will be turned with a windrow.

The temperature and moisture content is monitored weekly. The desired temperature range is between 30°C - 45°C and moisture content <30%. Temperature is monitored using a manual temperature probe with 4 measurements undertaken across the windrow to determine an average windrow temperature. If at any point temperature exceeds 55°C the windrow will be turned immediately. This is a preventative measure to maintain aerobic conditions as well as the desired decomposition rate minimising odour generation. Moisture level determination is undertaken by squeeze test. If temperatures have decreased within the windrows there may be need for the addition of water during the early stages of pasteurisation. If required, clean water is applied by sprinkler for 30 minutes and reassessed.

All composts are batch coded to trace their compost history for quality control.

Table 9 includes draft maturation composting procedure and monitoring plan.

Table 9 – Maturation Process & Monitoring Guidelines

MORWELL

MATURATION OF COMPOSTS

AIM To ensure safe and effective operation of the Maturation Phase of composting and maintain accurate records of the Maturation phase of composting.

OBJECTIVES: Establishment of work procedures, staff training, safe and efficient operation of machinery used for forming and turning of Maturation windrows.

PROCEDURE: All processing through the Maturation phase of composting is batch processed. Each batch will have unique batch number derived from the Invessel Compost Batch and recorded on Batch Sheet. The batch number is maintained during the maturation stage.

MATURATION STAGE COMPOSTING – 3 TO 6 WEEK PROCESS

- Select location/position for Maturation windrow. Refer to site map for location identification, record batch number and location on the Temperature & Turning Form.
- The moving of material to Maturation is to be undertaken in suitable weather condition at the direction of the Area Supervisor or the Site Manager.
- Temperature readings are taken on a weekly basis as a minimum or as directed by the Area Supervisor, these are recorded on the Temperature & Turning Form.
- The Maturation windrows require turning on a weekly basis, turning is performed by front end loader or excavator. Turning process is undertaken in suitable weather condition at the direction of the Area Supervisor or the Site Manager.
- The Area Supervisor, after reviewing data from the Temperature, Recording & Release Form, will approve the windrow ready for testing. (Every TENTH batch is tested for compliance to Australian Standard AS4454.

Personnel protective equipment must be worn as appropriate with the handling of composts and in accordance with machinery manufacturers operating manuals.

- ***Eye protection***
- ***Safety clothing, i.e. hi-vis safety clothing***
- **Safety boots**

	MONASH WAY PRODUCTION OPERATING PROCEDURES MATURATION MONITORING

TEMPERATURE, RECORDING & RELEASE FORM

Batch No_____ Start Date_____

MATURATION BATCH

WEEK START						NO. OF TURNS	MOISTURE ADDED	COMMENTS
	T1	T2	T3	T4	AVG			

MATURATION COMPOSTING

WEEK STAR T		TEMPERATURE READINGS				NO. OF TURNS	COMMENTS
	T1	T2	T3	T4	AVG		

APPROVED FOR RELEASE	NAME	SIGNATURE	DATE
Site Manager/Area Supervisor			

Document Control:	Prepared by: Pinegro Products Pty Ltd		
First Issue: Draft Feb 2020	Revised Dates:	Next Revision:	Page: 1 of 1
Reference: Monash Way Production Operating Procedures			Maturation / Rev 0

5.3.8 Screening and Sampling of Product

The material is screened after the maturation process after the release forms have been approved. The compost is screened on an impermeable hardstand pad in accordance with the customer needs. The screening activity will be undertaken at the furthest point on site from the nearest resident. This will add a further 200 metres distance to the nearest sensitive receptor. The screen will be covered to prevent dust emissions.

Following the completion of the Active and Maturation composting stages, batch testing is undertaken. Batch samples are controlled through a combination of internal and external laboratory testing. The product will be tested to confirm that it meets AS 4454 to ensure product quality. Pinegro have well established compost quality systems and test regimens.

Following is an example of our Batch Sampling process and quality control.

SAMPLING AND TESTING

AIM To ensure the quality objectives of the composting process are achieved in compliance with Australian Standards and or Pinegro Release specifications.

OBJECTIVES: Establishment of work procedures and staff training.
Consistent and representative sampling methods.
Maintaining adequate records of testing results.

A. "REGULAR" SAMPLE COLLECTION

At the beginning of each week, obtain the list of current batches. Each of these batches will require sampling.

Use clear polyethylene bags (about 340 mm deep x 255 mm wide) as sample bags. They should hold approximately 2 litres of material after sealing to air-tightness with a rubber band .

Take samples of the required materials using either a hand scoop or the specially developed sampling auger. The sampling tube is preferred as it will easily reach the centre of a windrow and take a more representative "core" sample of material from it.

B. SAMPLING USING A HAND SCOOP

"Place sample into bag.....being done":	It is much easier and more realistic to fill a sample bag with material, rather than work out in advance what tests are going to be performed on a particular material.
"Place tag, with.....Date the tag."	Tagging is best done in the controlled environment of the laboratory. Use of consecutive tags is more assured this way.
Additional clause	"Using a marking pen, mark every sample bag with both - • Batch Number • Date Sampled"

C. SAMPLING FOR "STANDARDSMARK" TYPE TESTING

Follow normal sampling procedures as stated above but comply with the following additional requirements.

Collect two 10-litre samples of each batch to be audited or type tested.

Empty the contents of both bags on to a clean surface and mix thoroughly using a shovel.

Mixing is best achieved by piling the material into a new conical heap to the side of the existing heap, by taking small shovelfuls in sequence from around the bottom edge of the existing heap and carefully allowing each stream of material to fall exactly on to the one spot (from a ½-1 metre height). The new cone which so develops, mechanically distributes the falling particles as evenly as possible around the edge and sides of the new conical heap. This effectively mixes the material.

Perform this step a total of four times.

Divide the total material into two and place in separate bags. Seal the bags, giving one to the SAQAS representative and tag the other for retention in the laboratory.

D. SAMPLE REGISTRATION

ALL samples received in the laboratory must be tagged using preprinted tags consecutively numbered with 4-digit numbers. Attach the tags with a rubber band and once attached, the tag must stay with the sample at all times.

The sample number, batch number and date sampled must be registered on the laboratory log-sheet, BFT01, *"Sample Register"* together with a forward slash (/) to indicate which tests are to be performed on the sample.

On the sample tag, circle (O) the same test "boxes" as shown on the BFT01, *"Sample Register"* sheet.

E. MONITORING SAMPLE TESTING SCHEDULE

When the tests scheduled for the sample is being physically set up, mark with a back slash (\) the particular tests on BFT01, "Sample Register" sheet and with a tick (3) on the sample tag. This will give an "X" on BFT01, "Sample Register" sheet for those samples whose particular tests have been physically set up. This ensures that no test is overlooked by providing a double check between BFT01, "Sample Register" sheet and sample tags. It can also be determined at a glance which tests are up to date by viewing the checks (X) against the particular tests for each sample on the BFT01, "Sample Register" sheet.

F. EXTERNAL TESTING

Samples of Certified Products will be tested externally at a frequency as determined by the licence holder(s), but generally based on sales volume and agreed by the SAI Client Manager.

Samples are collected, sent to an approved NATA accredited lab.

Copies of lab reports will be sent to the license holder and SAI Global on receipt. The report will be viewed by internal lab as soon as possible and signed off by Lab Assistant.

Non-conforming results will be dealt with according to the Non-Conforming product process

Personnel protective equipment must be worn as appropriate with the handling of biosolids.

- ***Eye protection***
- ***Safety clothing, i.e. hi-vis safety clothing***
- ***Safety boots***
- ***Dust mask when preparing samples***

Pinegro AS4454 Certification is shown below.

STANDARDSMARK LICENCE

SAI Global hereby grants:

PINEGRO Products Pty Ltd

137 Main Street, Bacchus Marsh, VIC 3340, Australia

And

615 Monash Way, Morwell, VIC 3480, Australia

StandardsMark Licence

Manufactured to:

AS 4454-2003 - Composts, soil conditioners and mulches

"the StandardsMark Licensee" the right to use the STANDARDSMARK as shown below only in respect of the goods described and detailed in the Schedule which are produced by the Licensee or on behalf of the Licensee* and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.

Licence No: SMK1700

Issued : 18 May 2017
Expires : 2 September 2022

Originally Certified : 3 September 1997
Current Certification : 18 May 2017

Nicole Grantham
General Manager SAI Global Certification Services

Certified Product
Australian Standard

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5.4 Technology Assessment and Case Studies

Prior to undertaking a review of best practice technology Pinegro strived to design a plant that meets with all relevant EPA policies and guidelines and not cause any environmental impacts. Review of EPA Publication1588.1 June 17 Designing, Constructing and Operating Composting Facilities provided guidance for the selection of technology based on the category of product being processed

Table 10 – Recommended Technology Requirements

	Recommended technology requirements		
Feedstock Category	**Open Environment**	**Enclosed or Covered Environment**	**Enclosed with Secondary Odour Control**
1: Lowest potential risk of harm to human health and the environment.	Yes	Yes	Yes
2: Medium potential risk of harm to human health and the environment.	Yes	Yes	Yes
3: Medium to high potential risk of harm to human health and the environment.	**No**	**Yes**	**Yes**
4: Highest potential risk of harm to human health and the environment.	No	No	Yes

Source: EPA Publication 1588.1 June 2017 – Designing, Construction and Operating Composting Facilities Pg. 11 Table 5

Based on the recommended technology Pinegro have adopted an enclosed Receival and active phase compost phase with secondary odour controls.

Our odour risk assessment of the proposed activities identified the highest risks are associated with the receival of material, the active phase of composting and the treatment of odorous emissions. Therefore we required a system that would;

(a) receive waste in an enclosed environment with no untreated emissions venting directly to the atmosphere.
(b) active phase undertaken in an enclosed controlled environment, SCADA controlled with secondary control of emissions and,
(c) two stage secondary odour controls that can be operated independently of each other.

Our proposal applies the best practice principles of EPA publication 1517.1 Demonstrating Best Practice, in that it identifies high risk activities and implements beyond meeting minimum requirements such as design ground level criteria and minimum controls.

Pinegro undertook a comprehensive assessment of technology available both in Australia and overseas. They assessed over 25 Invessel Compost Facilities in Australia and Internationally as part of that decision-making process. The decision to adopt the NALG Australia design was based on best practice, their willingness to adapt contingency controls for high risk air emissions and proven environmental performance.

Table 11 below provides a list of some of the operational NALG Invessel Compost facilities that utilise similar technologies and feedstocks.

Table 11 – Reference Facilities

Operator	Year of Comm-ission	Site Address	Capacity	Process Technology	Waste Type	Distance to Sensitive Receptor
Regroup Pty Ltd & ShellHarbour City Council **REFERENCE FACILITY**	2017	Dunmore, NSW, Australia	32,000 TPA	Enclosed Receival and 3 compost tunnels with Air Capture & Secondary Odour Treatment Open Air Maturation	FOGO	400m to Residents
Phoenix Power Recyclers Pty Ltd & JJ Richards & Sons Pty Ltd	2019	Yatala, QLD, Australia	50,000 TPA (Phase-I)	Enclosed Receival with Air Capture & Secondary Odour Treatment Open Air Maturation	FOGO/ Grease Trap Waste	70m to Industry 150m to Residents
Envar Limited	2017	Woodhurst, St.Ives Cambridgeshire, UK	70,000 TPA	Enclosed Receival with Air Capture & Secondary Odour Treatment Open Air Maturation	MSW and Greenwaste	300m Residential
Van Vliet Recycling	2012	Nieuw Oranjekanaal 45 3151 XL Hoek van Holland The Netherlands	200,000 TPA	Enclosed Receival with Air Capture & Secondary Odour Treatment Enclosed Maturation	FOGO/ Commercial Food Waste	200m to industry 1km to Residents
Stonegrave Aggregates Ltd. / John Wade Group	2009	Darlingtonn,UK	50,000 TPA	Enclosed Receival with Air Capture & Secondary Odour Treatment Open Air Maturation.	MSW and Greenwaste	400m to Residents
City of Hamilton/ Aim Environmental	2006	71 Main Street West Hamilton, ON L8P 4Y5 Canada	60,000 TPA	Enclosed Receival with Air Capture & Secondary Odour Treatment Open Air Maturation.	FOGO	500m Residents

5.4.1 Benchmarking

With consideration to EPA publication 1517.1 Demonstrating Best Practice
Benchmarking provides a tool for analysing relevant performance indicators at your site and comparing them to the same indicators for:

- similar sites or businesses in Australia or internationally, with consideration given to overall scale;
- theoretical 'ideal' performance;
- original design specifications, and
- known 'best practice' sites or businesses.

By establishing your performance relative to one or more of these and highlighting where possible weaknesses exist, the best practice design process can lead to an improvement in performance. Benchmarking can help a business achieve better performance by learning from best practice businesses.

Pinegro in their assessment identified the benchmark site as very similar in operation to what is proposed. Pinegro have opted for a larger scale system with a high performance output and capable of operating independently in the case of a breakdown. Odorous emissions are primarily treated by a chemical scrubber and then emissions are further treated through bio-filtration.

We have chosen the Regroup Shellharbour Invessel Compost Facility (Shell Harbour) as our reference facility to benchmark. This is a relatively new facility operating under best available technology and producing product that meets AS4454.

This facility most closely aligns to the feedstocks, infrastructure and control processes that our proposed facility will have. The Shellharbour facility is located within an operational landfill with a new large-scale residential development and golf course situated approximately 400 metres away.

5.4.2 Comparison Shell Harbour against Pinegro Proposal

Table 12 – Benchmarking Shell Harbour against Pinegro Proposal

	Shell Harbour	Pinegro
Volume and type of Feed Stock	32,000 tonnes p.a. of FOGO/Commercial Food Waste	65,000 tonnes p.a. FOGO 55,000 T Biosolids 5,000 T Commercial Food Waste 5,000 T
Receival	Total area 1,400 m2 Maintained under negative pressure with 4 air exchanges per hour Indoor shredding and decontamination. No untreated air vented directly into the environment.	Total area 2,700m2 Maintained under negative pressure with 4 air exchanges per hour Indoor shredding and decontamination. No untreated air vented directly into the environment.
Active composting	Invessel SCADA controls regulating temperature, moisture oxygen content. 3 tunnels 30mx6mx6m. Maximum capacity 450 tonnes 4 temperature probes invessel Temperature oxygen and moisture probe exhaust air. Leachate capture and reuse 14 day in vessel cycle	Invessel SCADA controls regulating temperature, moisture oxygen content. 5 tunnels 40mx8mx6m. Maximum capacity 760-780 tonnes 4 temperature probes in vessel Temperature oxygen and moisture probe exhaust air. Leachate capture and reuse 14 day in vessel cycle
Maturation	Open windrow Maturation pad total area 6000m2 Front-end loaders	Open windrow Maturation pad 95mx90m total 8550m2 Windrow turners and front-end loaders Windrow dimensions 80m long x 3m high 6m wide. 10 windrows.

Leachate Management	Receival hall, active phase full capture & reuse. No discharge to environment. Maturation Area impermeable hardstand surface contoured toward the impermeable leachate dam. Reuse of leachate waters in the vessels.	Receival hall, active phase full capture & reuse. No discharge to environment. Maturation Area impermeable hardstand surface contoured toward the impermeable leachate dam. Reuse of leachate waters in the vessels.
Odour control	Pre-treatment, Chemical Scrubber, final treatment bio-filtration Dimension details for biofilter Scrubber process capacity 36K m^3 of air per hour Bio-filter designed to manage output air from scrubber	Pre-treatment, Chemical Scrubber, final treatment bio-filtration Dimension details for biofilter Scrubber process capacity 89K-100K m^3 of air per hour Bio-filter designed to manage output air from scrubber
Nearest receptor	400m	1.85km
Finished product	AS 4454	AS 4454

5.5 Choice of Process and Technology

With consideration of EPA Publication 1588.1 recommendations for best practice design and operation for the proposed feedstocks to be processed, the guide recommends enclosed receival and enclosed aerobic composting with a secondary odour capture and treatment system. Open air maturation is considered acceptable.

The Pinegro proposal is based on the design of the Shell Harbour facility which incorporates enclosed receival enclosed aerobic composting with secondary controls and open air maturation.

This facility, operational since 2017 employed best available technology and is now producing product that meets AS4454 requirements. In the planning phase the proposal had significant challenges meeting NSW EPA requirements as it was situated within 400 m of a high-density residential zone. Their design was approved by EPA NSW, is operational and has proven environmental performance. Although Pinegro has a significantly larger separation distance we have designed an odour management system to give us greater control.

The Shell Harbour facility is designed to processes 32,000 tonnes of waste per annum comprising of FOGO and Commercial Food.

Our facility is designed to process 65,000 tonnes of waste comprising of 55,000 tonnes of FOGO, 5,000 tonnes and 5,000 tonnes of Commercial Food Waste.

In order to accommodate the increase in proposed processing volume we have incorporated 5 tunnels 40mx8mx6m with a maximum capacity 760-780 tonnes per tunnel. The Shell harbour facility has 3 tunnels 30mx6mx6m with a maximum capacity 450 tonnes per tunnel.

We have designed our facility such that the receival hall, invessel composting system, SCADA controls, leachate management and odour control are the same, with the exception that our facility has scaled up for additional volume.

We have employed best available technology such that, we pre-treat the emissions by chemical scrubbing and final treatment is undertaken by bio-filtration. This gives us greater

flexibility with odour management, as the control systems has a lower loading and can operate independently of each other in case of breakdown, or maintenance.

The advantages of this composting system are;

- Excellent infrastructure to control the compost process;
- Excellent odour control equipment;
- Operational Flexibility for change in waste stream and volumes;
- No wastewater discharge;
- Fully automated control process; and
- O, H & S Compliance for our staff.

Pinegro have extensively researched and used alternate composting systems, and based on our experience, believe Invessel Compost Systems are the best option to process the proposed feedstocks.

6 ENVIRONMENTAL INFORMATION

6.1 Energy Use and Greenhouse Gas Emissions

Energy Consumption

We have modelled our energy use based on diesel fuel and electricity consumption of the following equipment listed in Table 13.

Table 13 Energy consumption summary

Source of Energy Consumption	Weekly Diesel Consumption (Litres)	Annual Diesel Consumption (48 Weeks) (Litres)
Loaders:		
1 x John Deere 724K	310	14,880
1 x John Deere 624J	280	13,440
Windrow Turner: Komptec Topturn X53	50	2,400
Mobile Screens: 1 x Terex/Finlay	150	7,200
Grinder: Van Gelder	650	31,200
Total Diesel Consumption	**1,440**	**69,120**
Source of Energy Consumption	**Weekly Power Consumption (kWh) @ 73% use ***	**Annual Power Consumption (52 Weeks) (kWh) @ 73% use**
Invessel Compost Facility		
Fan Inlet Air Tunnel x 5	26,978 7,914	1,402,859 411,505

Fan Air Scrubber x 2 Pump Leachate Pit x 2 Pump Spraying Biofilter x 1 Pump Spraying Tunnels x 1 Fan Fresh Air Duct	791 540 540 1,583	41,151 28,057 28,057 82,301
Mixed Plant Trommel Screen/Bark Shaker screen	472	24,551
Total Power Consumption	38,818	**2,018,481**

***See Table 14 – Energy Consumption Invessel Compost Facility.**

Table 14 – Energy Consumption Invessel Compost Facility

	Pinegro Products Morwell			

EQUIPMENT LIST

S.No.	Equipment	Power kWh		
		Installed	De-rating	Diversity
			10.0%	65%
1	Fan Inlet Air Tunnel 01	75	67.5	43.875
2	Fan Inlet Air Tunnel 02	75	67.5	43.875
3	Fan Inlet Air Tunnel 03	75	67.5	43.875
4	Fan Inlet Air Tunnel 04	75	67.5	43.875
5	Fan Inlet Air Tunnel 05	75	67.5	43.875
6	Fan Air Scrubber 01	55	49.5	32.175
7	Fan Air Scrubber 02	55	49.5	32.175
8	Pump Leachate Pit 02	5.5	4.95	3.2175
9	Pump Leachate Pit 01	5.5	4.95	3.2175
10	Pump Spraying Biofilter	7.5	6.75	4.3875
11	Pump Spraying Tunnels (01-04)	7.5	6.75	4.3875
12	Fan Fresh Air Duct	22	19.8	12.87
	="Average Instantaneous Power"			312
	Average Daily Energy Use		7483	kWh

THE PINEGRO INVESSEL COMPOST FACILITY WILL USE <10TJ/YEAR OF ENERGY

6.2 Greenhouse Gas Emissions

Composting offers an environmentally superior alternative to disposing of organic material in landfill because composting reduces methane production while providing a series of economic and environmental co-benefits.

Composting is an aerobic process that reduces or prevents the release of methane during organic matter breakdown. Methane is 26 times more potent than carbon dioxide as a greenhouse gas and is a significant contributor to global greenhouse gas emissions. Decomposing organic material in anaerobic conditions – by microbes in the absence of oxygen – releases methane into the atmosphere. Anaerobic fermentation is common in landfill.

Each tonne of organic waste disposed of as landfill and broken down by anaerobic fermentation releases about one tonne of carbon dioxide equivalents (CO_2-e) of greenhouse gases, mostly in the form of methane. However, the aerobic process of composting does not produce methane because methane-producing microbes are not active in the present of oxygen. (**Ref : Department of Primary Industries and Regional Development – Govt. of Western Australia – Composting to Avoid Methane Production) (link: www.agric.wa.gov.au/print/node/5706)**

Composting practices that minimise anaerobic conditions and maximise aerobic conditions will be the most effective at reducing greenhouse gas emissions. The Pinegro Invessel Compost Facility will compost under aerobic conditions.

The Pinegro Invessel Compost Facility will deliver a net reduction in Greenhouse Gases emitted to the environment based on the following:

Table 15 Greenhouse Gas Emissions

Activity	Tonnes CO_2-e Emitted / (Saved)
Emissions Generated	
Diesel Consumption (see Figure 32)*	188
Power Consumption (see Figure 32)*	2,160
Emission Reduction	
Landfill Diversion Benefit 65,000 tonnes of organic waste (1 tonne organic waste diverted from Landfill = 1 tonne CO_2 –e)	(65,000)
NET CO_2-E BENEFIT	(62,652)

See Figure 32 – Facility Energy & Emissions Calculation

Australian Government
Clean Energy Regulator

NATIONAL GREENHOUSE AND ENERGY REPORTING

FACILITY ENERGY & EMISSIONS CALCULATOR

Facility name (optional)	Pinegro Morwell Invessel Facility		Operational Control	Full year	365

TRANSPORT FUEL COMBUSTION

Select fuels below	Amount Enter amount below	Unit	Greenhouse gasses CO_2	CH_4	N_2O	Total scope 1 emissions (t CO_2-e)	Total energy (GJ) (Gigajoules)
Diesel oil (post-2004 vehicles)	69.120	kL	186	0	2	188	2,668
-		-					
-		-					
-		-					
-		-					
-		-					
-		-					
Total Scope 1 transport emissions (t CO_2-e) and energy consumed (GJ)						188	2,668

NON-TRANSPORT FUEL COMBUSTION

Select fuels below	Amount Enter amount below	Unit	Greenhouse gasses CO_2	CH_4	N_2O	Total scope 1 emissions (t CO_2-e)	Total energy (GJ) (Gigajoules)
-		-					
-		-					
-		-					
-		-					
-		-					
-		-					
-		-					
Total Scope 1 non-transport emissions (t CO_2-e) and energy consumed (GJ)						0	0

PURCHASED ELECTRICITY

Select state/territory below	Amount Enter amount below	Unit	Emission factor EF	Total scope 2 emissions (t CO_2-e)	Total energy (GJ) (Gigajoules)
Victoria	2018481.000	kWh	1.070	2,160	7,267
-		kWh			
Total Scope 2 emissions (t CO_2-e) and energy consumed (GJ)				2,160	7,267

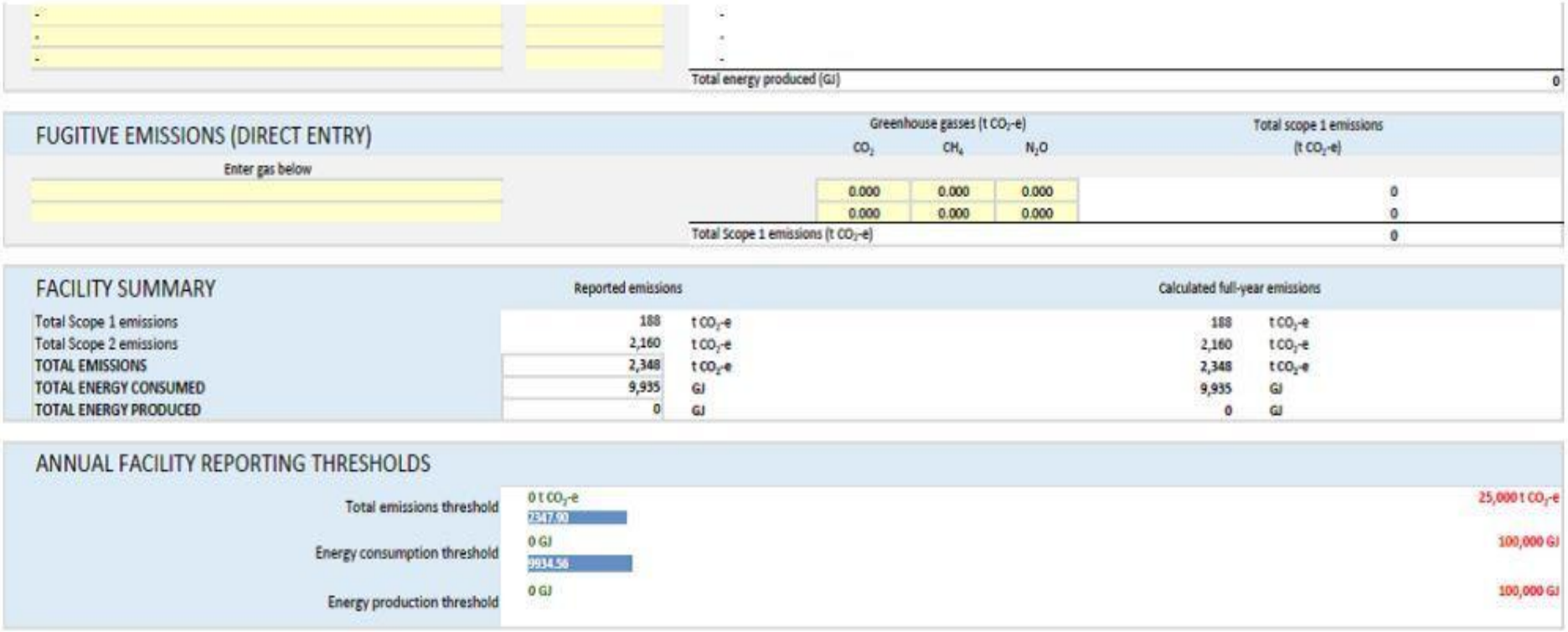
CONSUMED WITHOUT COMBUSTION

Select energy source below	Amount Enter amount below	Unit	Total energy (GJ) (Gigajoules)
-		-	
-		-	
-		-	
Total energy consumed (GJ)			0

ELECTRICITY/ENERGY PRODUCED

Select energy product below	Amount Enter amount below	Unit	Total energy (GJ) (Gigajoules)

Facility Energy & Emissions Calculation – continued.



-		-
-		-
-		-
Total energy produced (GJ)		0

FUGITIVE EMISSIONS (DIRECT ENTRY)

Enter gas below	Greenhouse gasses (t CO_2-e) CO_2	CH_4	N_2O	Total scope 1 emissions (t CO_2-e)
	0.000	0.000	0.000	0
	0.000	0.000	0.000	0
Total Scope 1 emissions (t CO_2-e)				0

FACILITY SUMMARY

	Reported emissions		Calculated full-year emissions	
Total Scope 1 emissions	188	t CO_2-e	188	t CO_2-e
Total Scope 2 emissions	2,160	t CO_2-e	2,160	t CO_2-e
TOTAL EMISSIONS	2,348	t CO_2-e	2,348	t CO_2-e
TOTAL ENERGY CONSUMED	9,935	GJ	9,935	GJ
TOTAL ENERGY PRODUCED	0	GJ	0	GJ

ANNUAL FACILITY REPORTING THRESHOLDS

Total emissions threshold	0 t CO_2-e	25,000 t CO_2-e
Energy consumption threshold	0 GJ	100,000 GJ
Energy production threshold	0 GJ	100,000 GJ

Figure 32 – Facility Energy & Emission s Calculation

The equipment Pinegro will use is state of the art using best practice technology to reduce our energy consumption. Conventional open windrow composting requires significantly more movement of materials during the composting process and uses significantly more diesel.

7 AIR EMISSIONS

7.1 Air Emissions Assessment

The two State Environmental Protection Policies (SEPP) are relevant to air emissions, and they include:

- State Environment Protection Policy (Air Quality Management) (SEPP AQM)
- State Environment Protection Policy (Ambient Air Quality Management) (SEPP AAQ)

The SEPP AQM provides the framework for management of the air environment so that the beneficial uses of the environment are protected. It requires the generator of air emissions to implement continuous improvement. It also required the generator to determine the level of impact from air emissions and the requirement to achieve the relevant design criteria. EPA Victoria recommend undertaking computer modelling of the transportation and dispersion of the generated odour.

Modelling is a predictive tool and relies on accurate odour emission rate inputs.
Most models are based on modelling point source emissions such as stacks with well defined flow and concentration parameters. The odour sampling methods for area sources such as composting windrows with passive odour emissions are not well defined. There are significant difficulties in determining flow rates and concentrations from these sources given the lack of mechanical airflow and the variation in their feedstocks over time. Odour modelling prediction methods have difficulties with accuracy when assessing large area source emissions such as composting. Discrepancies have been reported between modelling predictions and field observations. ***Reference: Establishing the extent of odour plumes and buffers for waste handling facilities Chris Bydder, Jim Demetriou***

Rather than undertake modelling of the emissions to predict impacts, we rely on case studies, as well as the implementation of best proactive design and management to provide a greater level of understanding of the likely odour impacts to beneficial use. In doing so we have chosen the Shell Harbour facility as our reference facility.

7.1.1 Air Emission Sources and Key Performance Parameters

In order to benchmark against a reference facility, we must have a clear understanding of the odour emission being generated and how they are controlled. In the Shell Harbour Facility, engineered controls have been implemented for the highest risk activities, that being, receival of organics and active stage composting.

We identified that odour emissions from the invessel treatment system and the receival hall are dependent on the odour control performance. If we can ensure that our odour controls are as effective as those employed by Shell Harbour then the odour emission rate will effectively be the same, independent of the processing volumes.

The bio-filter performance at the Shell Harbour Facility was assessed by the Odour Unit with it reducing the odour emissions significantly. See **Attachment 2 – Shell Harbour Bio-filter Odour Assessment.**

7.1.1.1 Odour Control (Biofilter)

The Shell Harbour Facility bio-filter comprises of single cell 15m wide by 30m long 1.8 m high. It has a three stage bio-medium course, medium and fine. It has an empty bed air residence time of 31 to 41 seconds and can process 36,000 m^3 of air per hour. It has 2 bio-filter temperature probes, 2 moisture probes, 1 back pressure sensor and a sprinkler system to regulate temperature and moisture levels. The bio-filter has been designed for 3 compost tunnels.

The Pinegro bio-filter comprises of 2 independent cells, 19m wide by 70m long 2.2 m high. It has a three stage bio-medium course, medium and fine. It has an empty bed residence time of 31 to 41 seconds and can process 89,000-100,000m^3 of air per hour. The bio-filter has 2 fans running independently, 4 bio-filter temperature probes, 2 moisture probes, 2 back pressure sensors and a sprinkler system to regulate temperature and moisture levels.

To ensure that we will meet or exceed the performance of the Shell Harbour Odour Control System we have included additional chemical scrubber capacity to pre-treat odour prior to bio-filtration. This is a proven system and has been employed successfully at many modern composting facilities.

Performance of all odour controls will be validated during commissioning phase with the performance of the bio-filter being independently assessed 3 months after installation. This is undertaken to fine tune the system with repeat testing undertaken if required. The testing is undertaken to assess against performance requirements that being less than 1000 odour units with a neutral/compost characteristic.

By ensuring that the odour management system employed meets or exceeds the performance of the Shell Harbour Facility we can be assured that the emissions from the highest risk activity are comparable.

7.1.1.2 Other Sources of Odour Emissions.

Windrow maturing area.

The organic material that has been processed through the invessel system will be further processed or matured on the maturation pad.

This has a significantly lower risk of odour impact as the material has been pasteurised and completed the active compost phase. The maturation phase is the stage at which the material is curing.

The Shell Harbour Facility processes 32,000 tonnes p.a. of material on their maturation pad.

When comparing against the Shell Harbour Facility although the processing volume is 65,000 tonnes p.a. compared to 32,000 tonnes p.a. we feel that this will result in a minor increase in odour emission yet little impact on the overall emissions from the site.

7.1.2 Air Emissions Odour Management Best Practice

Pinegro has adopted best practice principles via a risk-based approach for the management of potential environmental impacts. This risk-based approach has identified the key selection requirements in the facility design and compost technology.

The key components of the design approach demonstrating application of best practice for A07 ORGANIC WASTE PROCESSING include:-

- Site selection – Separation distance to sensitive receptors, locality and zoning, meteorology and potential for residential encroachment.

- Best Practice Compost Infrastructure & Technology – To manage air quality, noise, prevention of discharge waters, prevention of ground water contamination, litter, fire, dust and human health;

- Process Controls – Flexibility in design to manage environmental impacts in non-routine conditions; and

- Experienced Operators – trained and supported by compost technology experts.

In Table 16 we have assessed our infrastructure controls and their effectiveness in controlling high risk odour activities.

Table 16 - Pinegro Infrastructure Odour Controls

EPA Best Practice Design- Odour	Pinegro Infrastructure Control	Best Practice Achieved Yes/No	Reason for choice of technology
Continuous Odour Sources • Receival of Organics	Enclosed Receival Building with Air Capture and Secondary Odour Treatment.	Yes	No Odour impact to Environment. Computer controlled air treatment with a number of safety warnings for equipment malfunction.
Continuous Odour Sources • Active Phase Composting	Enclosed Invessel Aerobic Composting tunnels with Air Capture and Secondary Odour Treatment.	Yes	No Odour impact to Environment. Computer controlled air treatment with a number of safety warnings for equipment malfunction.
Continuous Odour Sources • Biofilter	Engineered 2 compartment biofilter with sprinkler system for water addition. Humidified process air to cool down air temperature and scrub ammonia prior to release to bio-filter.	Yes	No Odour impact to Environment. Computer controlled with a number of safety warnings for equipment malfunction.

Continuous Odour Sources • Stock Piling of Organics	There will be no stock piling of the receival organics as they will be processed within 24 hrs. Organics stored in Receival Building. In maturation the organics will be windrowed and kept below 3 metres in height.	Yes	No Odour impact to Environment. Process Controls to eliminate offsite impact.
Continuous Odour Sources • Leachate Waters - Anaerobic	Operate aerator in leachate dam to maintain aerobic conditions Periodic removal of organic solid material at the bottom of the dam Filter water through a sediment trap removing organics	Yes	Reuse of leachate waters in Active Compost Phase. Leachate waters pumped to tanks to regulate volume.
Discontinuous Odour Sources • Machinery	The highest risk of machinery being a source of odour is in the receival building and in the invessel compost area. Machinery used in these areas will be confined to this space. The machinery is located within an enclosed building where we have air capture and secondary odour treatment.	Yes	No Odour impact to Environment. Modern well maintained. equipment used. Regular Cleaning of Machinery.
Discontinuous Odour Sources • Turning & Aeration	In the initial active compost phase all turning and aeration will be conducted in an Enclosed environment with Air Capture and Secondary Odour Treatment. In the maturation phase the pasteurised organics will be turned and aerated weekly to ensure they do not become anaerobic. Refer Table 13 - Pinegro Compost Process Controls	Yes	No Odour impact to Environment. Computer controlled air treatment with a number of safety warnings for equipment malfunction. Minimal odour in maturation with established process controls in place.
Discontinuous Odour Sources • Screening and Movement of Compost	Reduce screening if there are high winds. Implementation of process controls to ensure only matured compost is screened. Screening equipment will be located at the furthest point to the sensitive receptors.	Yes	Established screening procedures in place. Screen covered.

In Table 17 we have assessed our process controls and their effectiveness in controlling high risk activities.

Table 17 - Pinegro Compost Process Controls

Processing parameters for pasteurisation	Ideal range or ratio	Pinegro Systems & Quality Assurance Program	Best Practice Achieved Yes/No
Nutrient Balance (Carbon to Nitrogen Ratio)	25:1 and 35:1	The feedstock used by Pinegro is FOGO, commercial food and biosolids. Pinegro will formulate the ideal blend to meet a carbon to nitrogen ratio of 25:1 and 35:1	Yes
Total Moisture	OPTIMUM LEVEL 45-60%	The moisture content of the initial compost blend we are aiming for in the active phase is between 45% and 60%. Using the invessel compost facility we can add water through the spraying systems inside the tunnel or dry the material out through the aeration floors, through the SCADA computer control systems.	Yes
Oxygen Content	>5 %	Pinegro have full control and total flexibility to adjust the oxygen content levels to achieve the appropriate levels. The SCADA computer control system automatically senses oxygen content within the vessels and adjusts to the range set.	Yes
pH	Between 6.0 AND 8.5	Based on the feedstock Pinegro are able to achieve pH levels of between 6.0 and 8.5. Pinegro test the pH levels periodically to ensure the desired levels are achieved.	Yes
Porosity and Bulk Density	400-600 kg/m^3	During the shredding of FOGO process Pinegro aim for a bulk density in the shredded FOGO of 300-400 kg/m^3. This is achieved by using a coarse screen in the shredder. The addition of a coarse woody fraction can assist us in achieving the desired compost blend bulk density to 400-600kg/m^3.	Yes
Temperature	55^{o}C – 75^{o}C	The Pinegro invessel compost facility process and its series of controls allow it to obtain an homogenous temperature distribution during pasteurisation. The SCADA control system constantly monitors temperatures and will adjust oxygen and moisture levels automatically.	Yes

7.1.2.1 Maturation Stage

The maturation windrows will be managed in accordance with current site practices which are consistent with the provisions of EPA guideline 1588.1, AS 4454 and Guide to Best Practice Organics.

Pinegro have a proven performance with well-established management practices for open windrow composting. We have effectively managed the maturation phase at this site with the proposed management system for over 30 years.

Detailed below are the process controls in place to manage the maturation phase.

Table 18 – Pinegro Maturation Phase Process Controls

Processing parameters for pasteurisation	Ideal range or ratio	Pinegro Systems & Quality Assurance Program	Best Practice Achieved Yes/No
Nutrient Balance (Carbon to Nitrogen Ratio)	20:1 and 40:1	The pasteurised compost will have a C:N ratio of between 20:1 to 40:1 to assist the maturation process.	Yes
Total Moisture	OPTIMUM LEVEL 25-40%	The moisture content of the pasteurised compost we are aiming for is between 25% and 40%. Using the invessel compost facility we can add water through the spraying systems inside the tunnel or dry the material out, prior to dispatch to the maturation pad.	Yes
Oxygen Content	>5 %	Pinegro will regularly aerate the maturation windrows to maintain aerobic conditions in the windrows.	Yes
Windrow Heights and Porosity	300-700 kg/m3	During the shredding of FOGO process Maturation windrows will be <3m in height and at a build density of 300 – 700kg/m^3	Yes
Temperature	≤ 45°C	Pinegro will regularly temperature probe the maturation piles and maintain windrows at ≤45°C.	Yes

7.1.2.2 Shell Harbour Performance

This Facility faced significant challenges to manage their odour impacts, as the nearest sensitive receptors are located within 400m of the facility. After commencement of full operations Regroup commissioned the Odour Unit, Air emission Consultants, to prepare an independent report on the Bio-filter Condition and Performance at the Shellharbour Invessel Compost Facility.

The odour unit finding was that the bio-filter odour removal performance was 95.6% and it was working well. The odour characteristics at the bio-filter were described as earthy and detectable at very low limits. There was no detectable offsite odour impact.

Regroup were also able to demonstrate compliance with AS 4454 for product quality achieving the elemental, physical and destruction of pathogens required under the standard. **See Attachment 3 – Shell Harbour Australia Standard 4454 Test Results.**

This site is relatively new, operational since 2017 and is meeting all the NSW EPA environmental requirements. This site has had no odour reports during its operations.

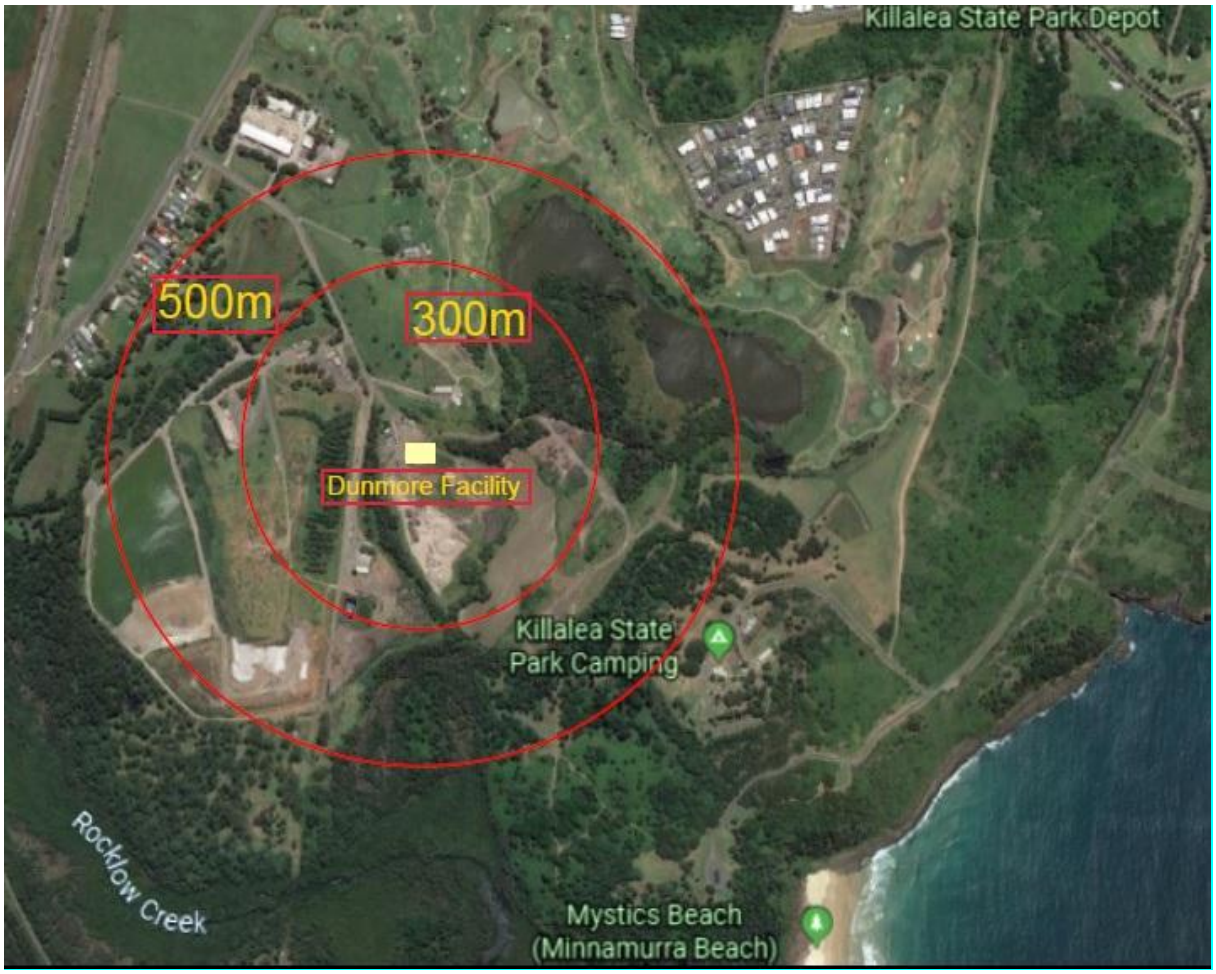


Figure 33 – Shell Harbour Distance to Nearest Sensitive Receptor

7.3 Impact Assessment

Pinegro's nearest sensitive receptors are low density rural housing with the nearest sensitive receptor located 1,850 metres from the activity boundary. This provides a significantly greater buffer distance than the Shell Harbour Facility.

Separation distances are addressed in EPA Publication 1518, Section 4 and 1588. The guideline specifies separation distances based on feed stock risk factor, process volumes, and best practice management and controls.

Based on the guidance provided in Table 2 of EPA publication 1588, Pinegro require a separation distance of **greater than 1,400 metres**. The distance to the nearest sensitive receptor is **1,850** metres.

When we compare actual performance, we expect our performance to meet that of the reference facility, in that we will have no impact at distances up to 400m. The risk of impact to the sensitive receptors is very low.

8 NOISE EMISSIONS

Noise conditions are addressed in SEPP N1. When designing the plant consideration was given to clause Cl.19 Replacing or installing new equipment with the requirement being;
Use the quietest equipment available when replacing or installing new equipment

8.1 History of No Noise Impact

Pinegro have operated very similar activities on the current site in an open environment for over 20 years without any noise impact to the surrounding environment. We have not received any noise complaints during that time.

Based on Table 19 and our assessment of the proposed noise sources Pinegro will believe there will be an **overall reduction in the noise** levels generated from our facility.

8.2 Noise Impact Assessment

Noise emissions from the compost facility at Morwell will be subject to the provisions of the EPA Guidelines Publication 1411 *Noise from Industry in Regional Victoria*. As outlined in the Publication 1411, the Pinegro compost facility is situated within a rural location outside of a major urban area.

The SEPP -1 Area Map below confirms the Pinegro Morwell facility is located outside the metropolitan zone defined in red and also falls outside the Morwell major urban area hence the **rural classification**. Both the generating zone (being the compost facility) and the 'receiving zone' being the nearest rural resident are considered to be classified in the rural zone.

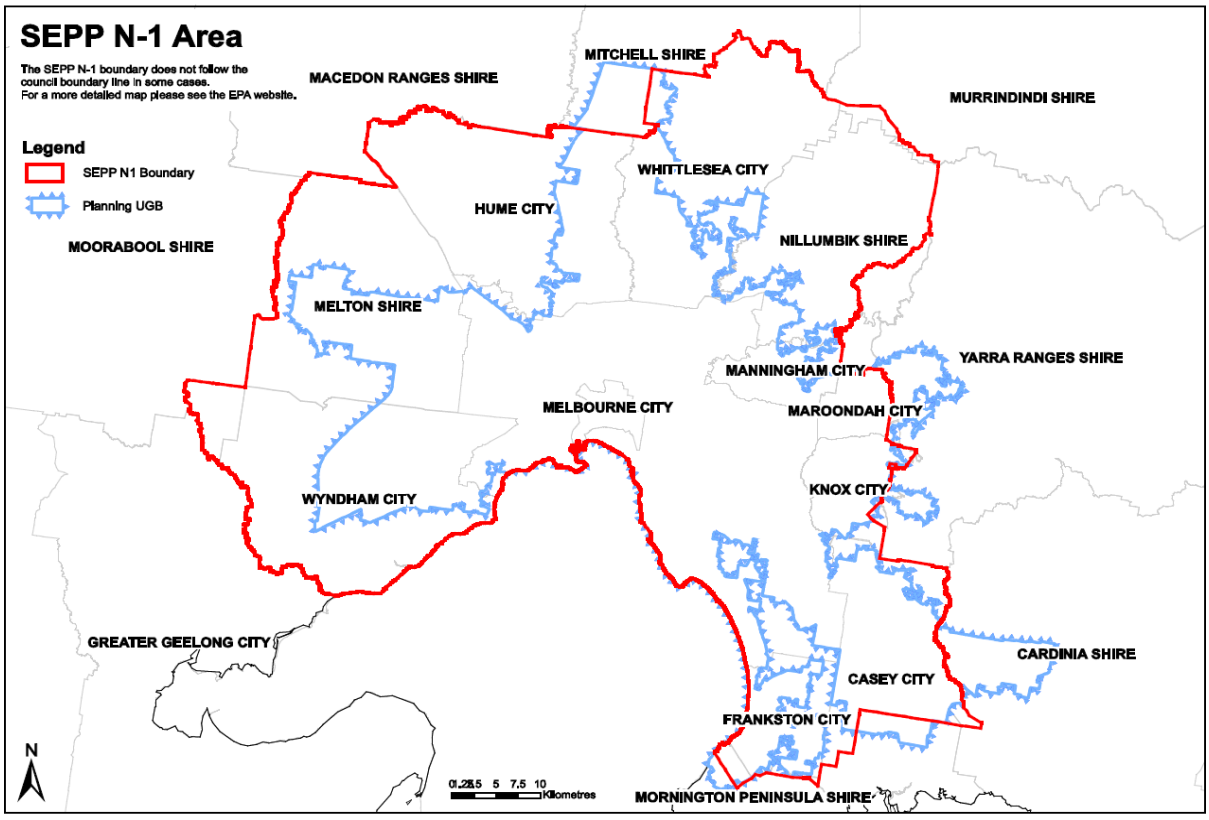


Figure 34 – SEPP N-1 Area

Table 19 provides a summary of potential noise sources and their impact that may emanate from the Morwell compost operation.

Table 19 Compost operation noise sources

Noise Source	Nature of Activity	Hours of Activity	Impact additional to existing operation
Trucks	Vehicle movements in delivery of feedstock , and in the dispatch of composted product	Day	The feedstock volume increase will add an additional 3 trucks per day (from 10 to 13 trucks daily) **No major noise increase**
Invessel Compost Facility Fan Inlet Air Tunnel x 5 Fan Air Scrubber x 2 Pumps –Various x 4	The pumps and fans operate intermittently and not consecutively over a 24 hour period.	Day/Evening/ Night	Fans and pumps are all additional to existing operation. All fans, motors and pumps are enclosed.
Front-end Loader (John Deere 724K ; John Deere 624J)	Movement of feedstock in the receival building, on maturation pad & bark processing area - 3 loaders	Day	**Reduction in noise** impact due to the use of 2 loaders instead of 4. Further noise reduction as 1 loader will operate within an enclosed building
Windrow Turner (Komptech Topturn X53)	Turning of mature compost in Windrows – Operational for approx. 8 hours per week	Day	**No change.**
Grinder – (Van Gelder)	Grinding of organics	Day	**Major reduction in noise** as the grinding activity will be undertaken in an enclosed building. Previously this activity was done outdoors.
Mixed Plant Trommel Screen/Bark shaker screen	Screening and grading bark	Day	**No change.**
Screen Terex /Finlay	Screen/grade of mature compost	Day	**No change**

8.3 Hours of operation

The current facility hours of operation are:

- Monday to Thursday 6:00 am to 6.00:pm;
- Friday 6:00 am to 5:00 pm;
- Saturday 7:00 am to 1:00 pm; and
- When essential maintenance is required.

8.4 Noise Impact

Noise from Pinegro may arise from their operations of both mobile and fixed machinery.

There have been no reports from the current activities and it is expected that the overall noise from the site will decrease. Due to the separation distances provided the noise from the facility is not expected to be audible at the nearest rural residence (1.85 km).

8.5 Best Practice

In accordance with EPA publication 1588.1 the following measures will be considered to minimise noise;

- grinding activity will be undertaken in an enclosed building;
- reducing the number of operational loaders from 4 to 2 and one of those will further reduce noise emission due to operation within enclosed building, and
- all fans, motors and pumps are enclosed.

9 WATER MANAGEMENT

Management of waters will be subject to the *State Environment Protection Policy Waters* (SEPPW).

The SEPPW requires that any discharge of wastewater to surface water be managed in accordance with the waste hierarchy.

Stormwater management is a key consideration with the site being designed such that there is no discharge off site and all surface water is directed to leachate management pond.

9.1 Storm Water Management

Section 6.1 of EPA Guideline 1588.1 requires stormwater that comes into contact with compost material not be discharged offsite. All open area is maintained under the conditions of the existing licence. That is:

- Sealed surfaces
- Bunding and falls to leachate dam
- Silt traps
- Aerated Leachate ponds.

The upgraded infrastructure works, receival and invessel composting building are non-contact areas. The storm water derived from the roof is a valued input in the composting process.

Stormwater tanks will be installed with sufficient capacity to capture all storm water from the receival building roof and reused in the composting process.

The existing infrastructure is governed by Pinegro's licence which EPA audit annually and have found to be satisfactory. The stormwater storage structure has been designed such that it meets the requirements as outlined in EPA Guideline 1588.1 Designing, Constructing & Operating Composting Facilities Section 6.1.1

- Be sufficient in capacity to accommodate run-off from the total process area resulting in a one in 20 years storm event.
- Have built in redundant capacity to accommodate contact water during periods of persistent rainfall, and when process needs are low.
- Be lined to provide hydraulic conductivity less 1x 10^{-9} m/s.
- Maintain minimum free board depth to protect against overtopping.
- Be maintained in an aerobic state.
- Reuse of leachate waters in compost process.

9.1.1 Open Air Contact Water Upgrade

Pinegro proposes to contain and store all contact water from the compost maturation pads, roadways and screening pad for re-use back into the invessel compost facility.

The invessel compost facility has a highwater requirement during the active phase of composting.

Water from the leachate dam waters will be pumped to five 45,000 litre, above ground, enclosed water storage tanks, then pumped to the compost tunnels for prewetting of the compost.

All areas containing compost material, maturation pad (Area 95m x 90m), finished product/screening pad (Area 40m x 75m), bark maturation pad (Area 140m x 30m) and contact roadways will be graded and sealed with compacted clay to achieve hydraulic conductivity of less than 1 x 10^{-9} m/s as per Australian Standard (AS) 1289.6.7.1 2001 Methods of Testing Soils for Engineering purposes.

These areas will be graded with a fall of between 0.5 – 4% to ensure all surface water run-off is carried toward the leachate dam. All contact waters will be diverted to a pre-treatment filtration bed designed to reduce organic load by filtering larger organic particles prior to the waters entering the leachate dam.

The leachate dam will be lined with compacted clay to achieve a hydraulic conductivity of less than 1 x 10^{-9} m/s as per Australian Standard (AS) 1289.6.7.1 2001 Methods of Testing Soils for engineering purposes to protect ground waters. The leachate dam will be maintained under aerobic conditions to minimise the risk of odour generation. This will be achieved by installing a permanent aeration system.

Pinegro will engage suitably qualified Civil and Environmental Consultants to prepare the technical specifications required, to meet all Works Approval conditions regarding pad and leachate dam construction.

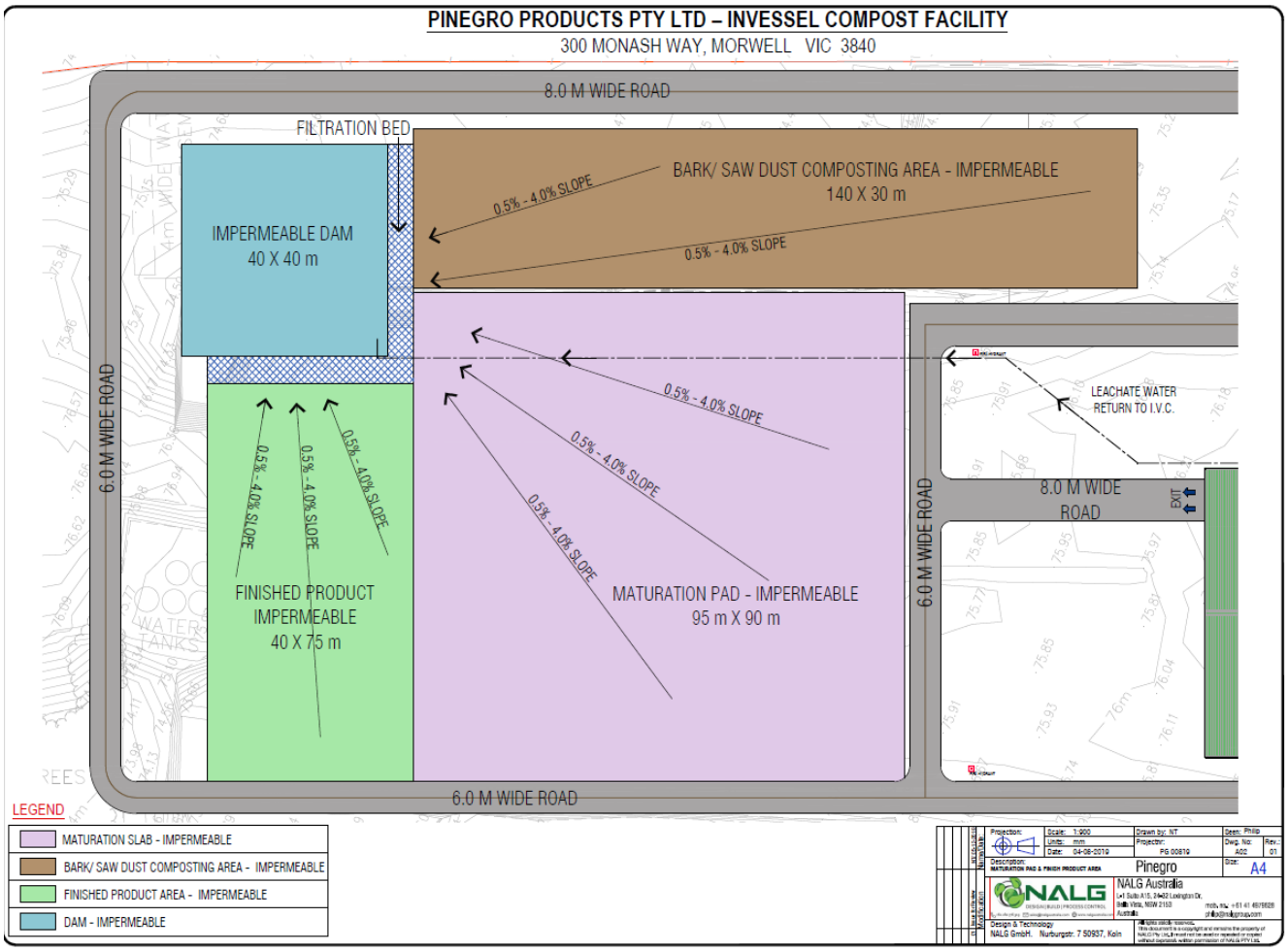


Figure 35 - Stormwater contact areas Design

9.1.2 Leachate dam

The leachate dam has been designed to meet all EPA Publication 1588.1 June 2017 Designing and Constructing & Operating Compost Facilities guidelines.

Pinegro has modelled stormwater interception, collection and the storage system adequate to the proposed operations and all requirements to store sufficient run-off waters.

Detailed estimations of the run-off containment on the premises are provided in **Attachment 4 - Leachate Dam Capacity Calculation**

The model inputs include rainfall data from the Latrobe Valley Airport Morwell (closest rainfall data to the Monash Way site) and considers water requirements for composting, stormwater holding capacity of windrows and filtration screening bed.

The model estimates the dam capacity required to contain all surface water run-off to avoid off-site discharges in a one-in-20-year storm event. The run-off collection system and the storage dam will be inspected after heavy rain events to ensure adequate dam capacity.

The calculated dam capacity provides 48% greater dam storage capacity than required to capture and contain all surface water run-off.

9.1.3 Leachate Dam Design

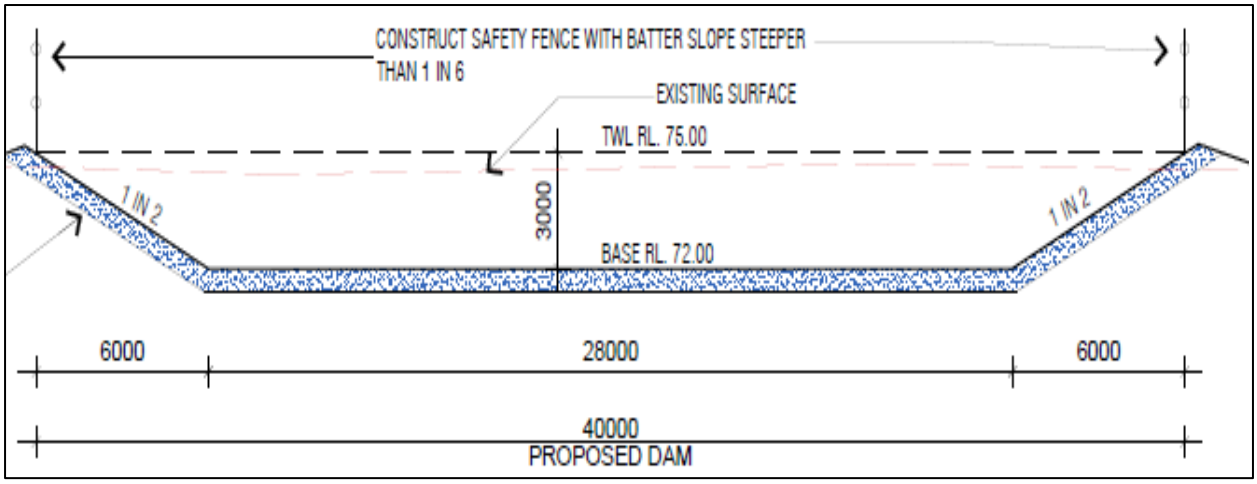


Figure 36 - Leachate Dam Side View

The draft dam design is 40m long by 40m wide at a depth of between 2 to 3 metres with a sloped embankment and particle filtration bed. The dam will hold a minimum of 3.2 mL of leachate waters, be aerated and will have a recirculation pump back to the unfiltered leachate tank. The ability to recirculate and store leachate waters through the invessel compost facility provides a safe guard in the event of high rainfall events.

The leachate dam capacity calculation concludes that the proposed leachate dam has;

- Sufficient capacity to accommodate run-off from the total process area resulting from a one-in-20-year event;
- Sufficient built in redundant capacity to store contact water run-off during periods of persistent rainfall, and when the process needs are low;
- Sufficient capacity to maintain a minimum freeboard depth of 150mm to protect against overtopping.

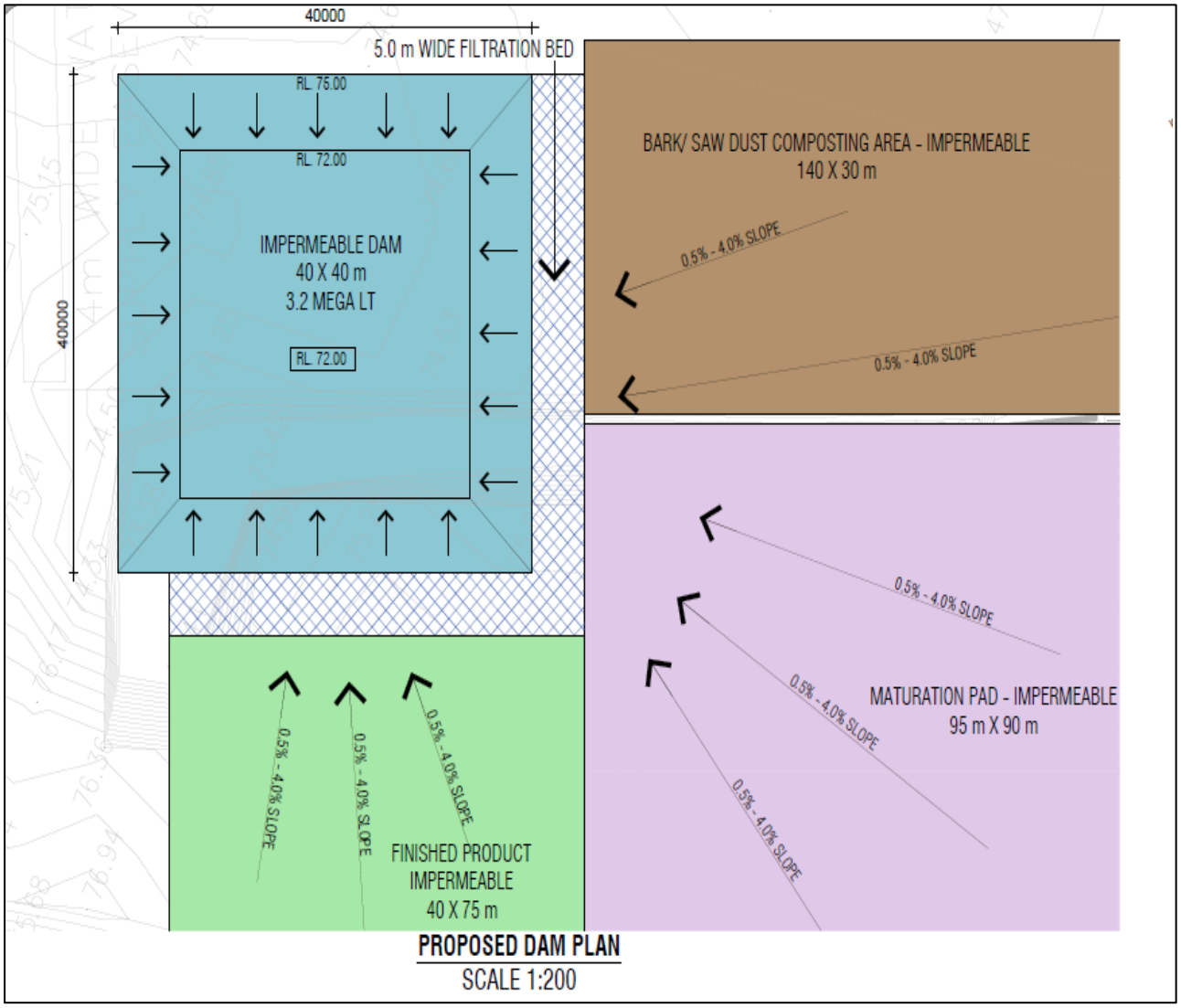


Figure 37 - Leachate Dam – Aerial View

9.1.4 Best Practice Management

Section 6.1 of EPA guideline 1588.1 June 2017 Design & Construction of Compost Facilities provides guidance for achieving best practice in Stormwater Management. Table 20 below summarises how Pinegro achieves compliance with the relevant requirements.

Table 20 – Best Practice Design & Operation

EPA Best Practice Design & Operation 6.1	Pinegro Control	Comments
Sealed surfaces for feedstock 106inebark, mixing and processing.	Receival & Active Phase Composting – Enclosed on concrete floor with full leachate capture and reuse system.	Leachate waters cannot contaminate surface water or groundwater. No offsite water discharges.
Bunding around the perimeter of the process and storage areas.	No bunding required in receival or active phase composting areas as they are enclosed on concrete floor with full leachate capture and reuse system. There will be a low bund surrounding the maturation, composting and screening pads to avoid run off.	Leachate waters cannot contaminate surface water or groundwater. No offsite water discharges.
Sealed surfaces for product maturation, 106inebark/sawdust composting, screening & finished product pads.	Maturation, bark/sawdust composting and finished product pads are all sealed with an impermeable clay layer with hydraulic conductivity of less than 1×10^{-9} m/s. Pads are contoured to enable leachate water to flow to the fully lined impermeable leachate dam.	All surface water captured. No groundwater impact due to impermeable liner.
Internal Roads in contact with organics.	Impermeable clay layer with hydraulic conductivity of less than 1×10^{-9} m/s. All contact waters will flow to a fully lined impermeable leachate dam.	All contact water captured. No groundwater impact due to impermeable liner.
Leachate Dam – Sufficient Capacity, Engineered Liner and maintained in an aerobic state.	Leachate Dam – Engineered clay liner with a hydraulic conductivity of less than 1 x 10-9 m/s. Aeration system to maintain aerobic conditions in the dam. Sufficient redundant capacity to accommodate high rainfall periods.	Leachate dam has capacity to contain persistent rainfall events and a one-in-20-year storm event.
Re-Use of Leachate Waters. **(no EPA requirement)**	Leachate Dam waters will be pumped to the unfiltered leachate tank to be reused in the initial wetting up of the compost in the active compost phase.	Preventative measure to stop dam overflow.
Storm Water Capture and Storage – From Receival Building Roof.	All storm water from the receival building will be captured and reused in the invessel compost facility & firefighting purposes. Contact waters will be collected and stored separately from the storm water.	Installation of water tanks for stormwater capture.

9.2 Leachate Management System

9.2.1 Receival Building and Invessel Composting Tunnels

Leachate is generated in the receival and processing areas. The receival area consists of a contained concrete floor so that all leachate is diverted to an internal drainage system serviced by an unfiltered leachate tank. Leachate generated in the tunnel system during processing and cleaning drains to an air lock pit and then transported to the unfiltered leachate tank.

The two sources of dirty water are then mixed and sprayed on an elbow screen which removes any solid particles. The filtered leachate water is then stored in an underground filtered leachate tank ready for spraying into the tunnels. Any remaining water is then stored in an above ground buffer tank and aerated.

All leachate waters from inside the receival building and the compost tunnels are fully captured and recycled back into the initial wetting up stage of the composting process. The entire leachate management system is SCADA Computer controlled and incorporates a warning system in the event of mechanical or process failures.

The invessel compost process makes use of all leachate water to optimise the moisture levels of the organics.

The following diagrams show how the leachate is captured and directed toward the leachate management system.

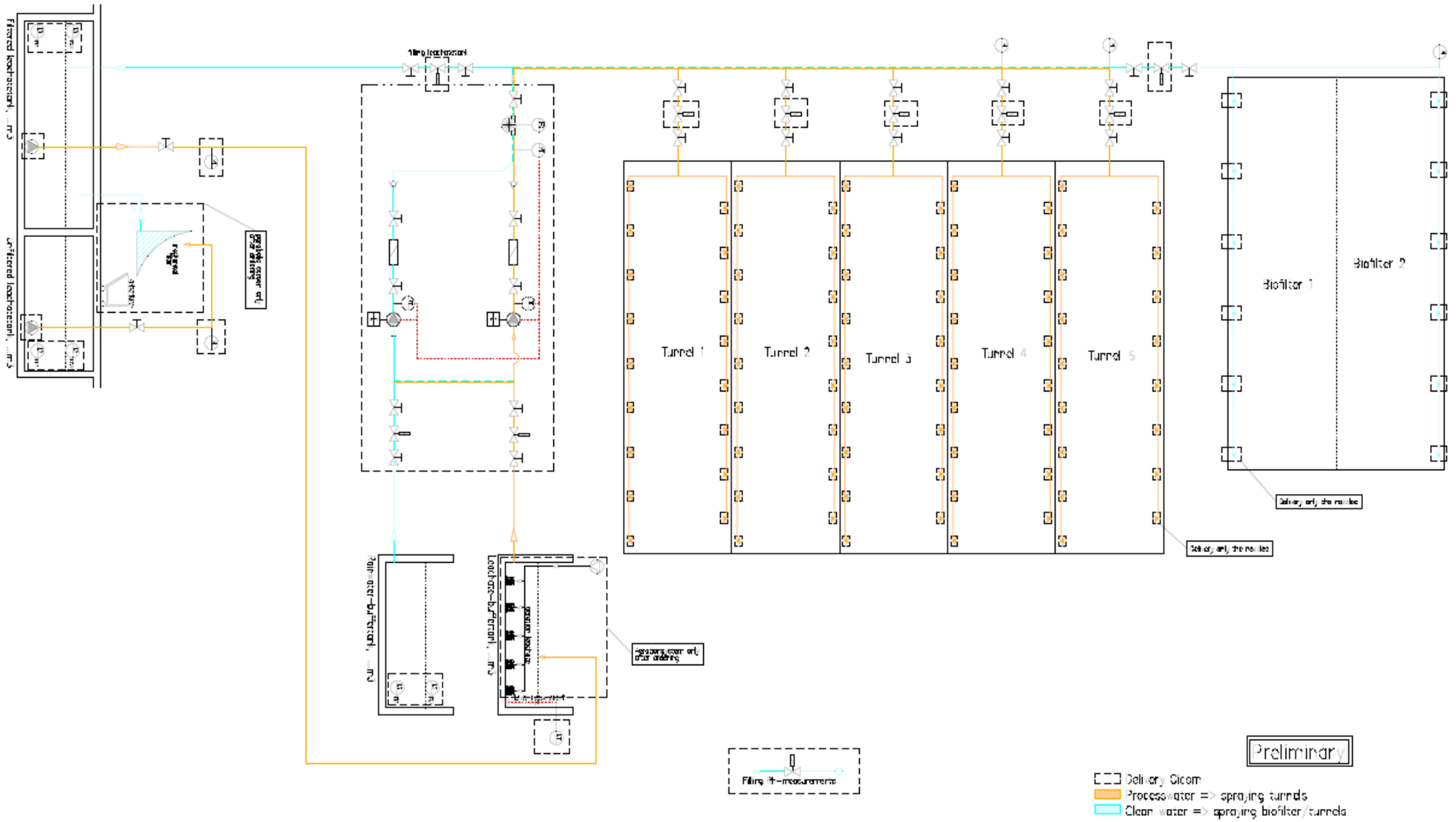


Figure 38 - Leachate Water Flow Diagram

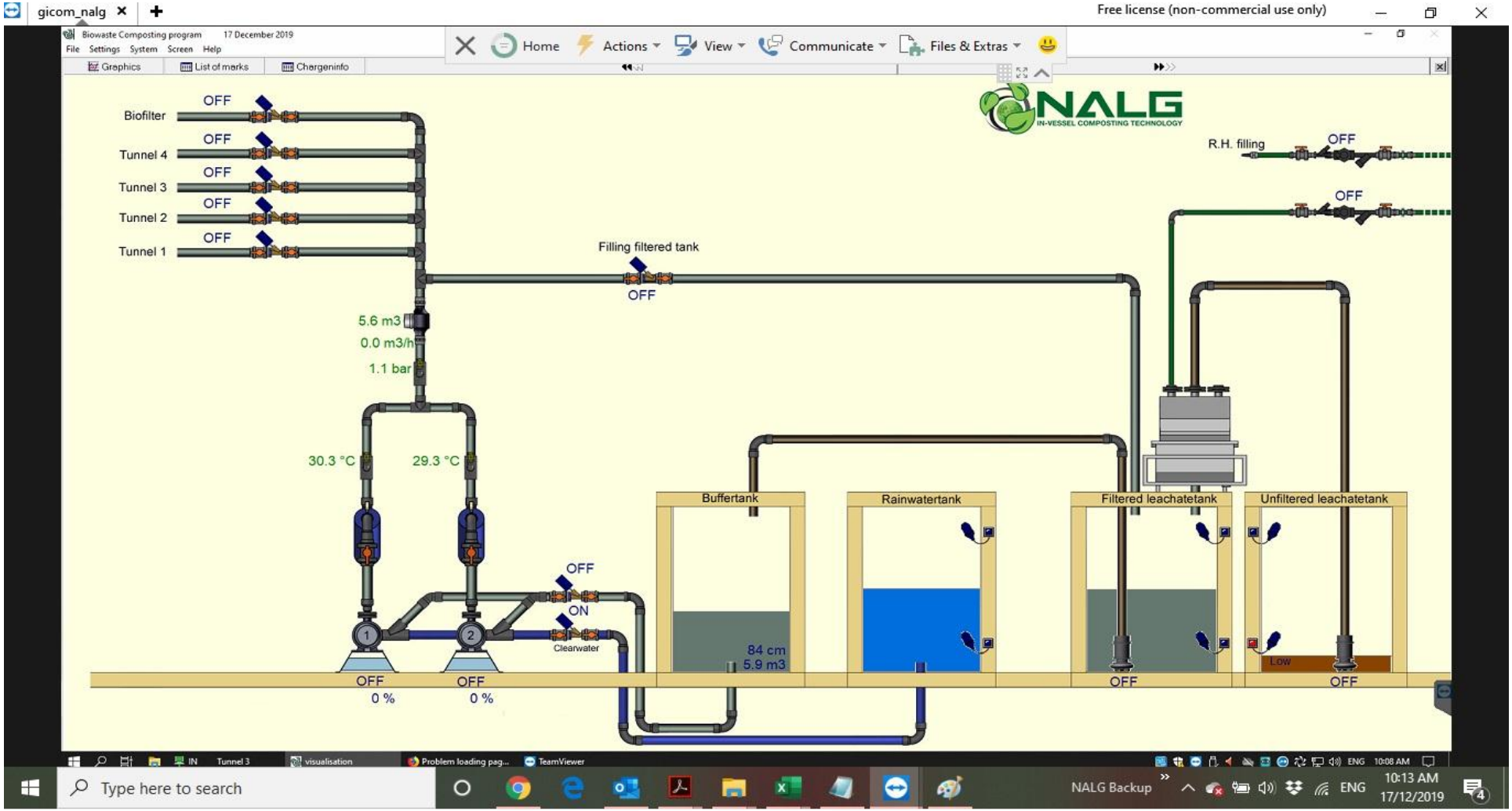


Figure 39 - Invessel Compost Facility Leachate Management System

Leachate spraying will commence at the start of the compost process and will only be used to initially wet up the organic material. No leachate waters will be used after this stage.

The leachate spraying process can be adjusted by a timer or by the SCADA control system to ensure no leachate waters are used after the initial wetting up of the compost. The leachate spraying is followed by a fresh water spraying during each spraying cycle to ensure the pipes are clean at all times and doesn't contaminate the pasteurised product by human error.

The leachate pump room is under constant negative pressure and the tanks underground are also constantly aerated.

Figure 40 - Leachate Re-Use Pump Room – Shell Harbour, NSW

9.2.2 Best Practice Leachate Management

The leachate management system is consistent with the requirements of EPA Guideline 1588.1 requiring preventative infrastructure appropriately engineered. The leachate management system goes beyond recommendations in 1588.1. Pinegro identified that the receival and active composting are the highest risk areas and as such designed a system that eliminate the risk of contamination to the ground water and surface water environment.

The management system has been designed such that this risk is appropriately mitigated. The leachate management system is appropriately engineered to ensure all leachate generated is captured and re-used. The SCADA system is controlled with alarms and, if required preventative actions are automatically undertaken. The systems outlined above demonstrate best practice design and operation of a compost facility.

10 DUST AND BIOAEROSOLS

The dust and bioaerosols management system is consistent with the requirements of EPA Guideline 1588.1 Section 6.3.

The site layout should be designed to minimise generation and spread of dust.
Recommended design and operational measures:

- Covering dusty material or applying light water spray;
- Enclosing fixed mechanical equipment used to process the raw material and finished material;
- Suction sweeping machines to maintain dust free environment, and
- Applying light water spray before or during turning.

Pinegro identified all high risk activities generating dust that could be undertaken in the receival building including the receival and shredding of organics and active composting phase. These activities are undertaken in a building maintained under negative pressure therefore eliminating the risk of dust becoming mobile and discharging to the environment. Any dust contained in the extraction air is filtered out through the water scrubber. The filter in the water scrubber is regularly maintained to ensure optimum dust extraction.

This represents best practice design in managing dust and bioaerosols in the receival and active composting phase.

The activities undertaken in the open environment with potential to generate dust are the turning and screening of the compost in the maturation area.

The following actions will be undertaken by Pinegro to avoid or minimise dust emissions associated with operation of the compost facility at Morwell:

- The maturation windrows will be kept at a moisture level of between 30 – 60%, reducing dust emissions coming from the turning and screening process.
- Pinegro will apply a light water spray before and during, turning and screening if required.
- An onsite water truck will be used to spray the work area and roadways should it be required.
- In high wind conditions coming from an easterly direction Pinegro will cease turning and screening if there are any dust emissions beyond the site boundary.
- The 1.85 km buffer zone to the nearest resident will ensure no offsite dust impacts to surrounding residents.
- Pinegro will locate the screen at the furthest point of the site. This will add a further 200 metres to the existing buffer zone.
- Bitumen the site entry area to eliminate dust issues. Pinegro have not had any dust complaints since 1994, and the infrastructure upgrades will further reduce emissions of dust and bioaerosols.

10.1 Biosecurity

The AS 4454 and EPA publication 1588.1 specifically address animal and human health. To reduce risk of pathogen transmission, facility operators should ensure that:

- Every part of the material is effectively pasteurised
- The product does not become re-contaminated
- Appropriate quality assurance is conducted and required standards met.

10.1.1 Biosecurity Practices

The high-risk activities Receival, shredding and active stage composting are undertaken within an enclosed building maintained under negative pressure. The only use of leachate waters is in the initial wetting up of the compost in the vessel at Day 1 of the active compost phase. No leachate waters are used in other part of the process.

The Invessel Compost Facility offers the highest level of process controls to demonstrate pasteurisation. The feedstocks achieve the temperature requirements for pathogen destruction in a highly controlled consistent system.

Pasteurisation is undertaken under controlled in vessel conditions ensuring that all of the material is effectively pasteurised. Final product is regularly tested for compliance with AS4454 to verify pathogen destruction.

11 ANIMAL AND HUMAN HEALTH

As with biosecurity Animal and Human health Section 6.4 of Publication 1588.1 provided guidance for achieving best practice. The highest risks to animal and human health occur in the receival of the organics and active compost phase.

The incoming organics will be received in an enclosed building which safeguards against birds, flies, rats and other vermin residing in the organics from the outside environment. The organics will be sorted and shredded within 24 hours and loaded into the tunnels for composting. This ensures that there is very little opportunity for the organics to be infested with vermin and no contact with the outside environment to avoid the escape of pathogens or weed seeds. Pinegro will implement environmental controls within the receival building as part of our environmental management plan.

The unpasteurised organics loaded into the tunnels will be composted at an average temperature of >55°C for up to 14 days. The Invessel Compost Facility has a series of process controls that ensure an homogeneous pasteurised compost is produced.

Pasteurisation is an important part of the active composting phase during which the number of plant and animal pathogens (organisms responsible for diseases) and plant pests and propagules (viable regenerative plant materials or seeds) are significantly reduced.

The pasteurised compost is then moved to the maturation pad for curing. Maturation of the composts is typically where the microbial activity slows and the compost begins to stabilise to an extent that it can be safely used on land and to come into contact with plants and people without any significant harmful effects.

The Pinegro Invessel Compost Facility process is best practice design for control of pathogens and plant propagules and minimises potential risks to animal and human health.

12 COMPOSTING STANDARD PRODUCT

Pinegro has in place a strict control and testing regime to ensure that the compost is produced to Australian Standards AS 4454 – 2012 Composts, Soil Conditioners and Mulches and Publication 1588.1 Tables 8,9 and 10.

12.1 Demonstrating Pasteurisation and Chemical Contamination

The invessel system is computer controlled such that every part of the material is maintained at a temperature greater than 55^{o}C for minimum of 3 consecutive days, ensuring effective pasteurisation.

Pinegro will implement an intensive monitoring program to test parameters as listed in AS4454 for pasteurisation and chemical contamination at commissioning. Once consistent results are achieved monitoring will be scaled back to the frequency as listed in the monitoring program.

To achieve Australian Standard certified product, Pinegro will comply with the following pathogen and elemental requirements;

Table 22 - Pathogen and Plant propagules standard for pasteurisation

Parameter	Standard
Enteric Viruses	<1 PFU per 10 grams total (dry weight
Helminth ova (Ascaris sp. And Taenia sp.)	<1 per 4 grams total dry solids
E. coli	<100 MPN per gram (dry weight)
Faecal coliforms	<1,000 MPN per gram (dry weight)
Salmonella spp.	Absent in 50 grams of final product (dry weight)
Destruction of noxious weeds (viable plant materials and propagules)	Nil (germination) after 21 days incubation

MPN = Most probably number, PFU = plaque-forming unit

Table 23 - Chemical contaminants limits for unrestricted use

Contaminant	Unrestricted used upper limited Dry weight basis (mg/kg)	Contaminant	Unrestricted used upper limited Dry weight basis (mg/kg)
Arsenic	20	DDT/DDD/DDE	0.5
Cadmium	1	Aldrin	0.02
Boron	100	Deildren	0.02
Chromium	100	Chlordane	0.02
Copper	150	Heptachlor	0.02
Lead	150	HCB	0.02
Mercury	1	Lindane	0.02
Nickel	60	BHC	0.02
Selenium	5	PCBs	Not detectable
Zinc	300		

Table 24 Physical Contamination

Physical Contamination	Percentage of Dry Matter w/w
Glass, metal and rigid plastic	<0.5
Plastics- Light and flexible or firm	<0.05

Pinegro will ensure that the human resources are available to undertake this labour intensive task. Pinegro have three quality assurance staff that over see our current quality systems.

Our staff will amend our Quality Assurance systems to incorporate the new feedstocks and processes proposed. Pinegro has held Australian Standard product Certification for over 25 years and have a strong understanding of the requirements.

13 LITTER

The main source of litter occurs in the receival of FOGO and commercial food waste loads when they are delivered onto the site.

The incoming feedstocks are delivered by truck inside the Pinegro enclosed negatively aerated receival building. The loads are discharged onto a concrete surface and spread out by front end loader. The feedstocks are then loaded into a feed bin and conveyed to a screen and manual picking station for decontamination. Manual pickers will sort most of the plastics, glass, etc. All of the decontaminated waste is disposed of to landfill as they generally cannot be recycled. No litter can escape to the outside environment during this process. The organics are then processed through the Invessel Compost Facility. We estimate that 80-90% of the contamination will be removed in the initial sort.

The screening of the matured compost may cause any remaining litter to scatter onsite. Generally the litter is contained in the oversize fraction of the compost (particles >25mm).
The oversize material will be returned to the receival building for further decontamination through the picking station. Pinegro will implement an environmental procedure for the periodic onsite and offsite picking of litter to eliminate any litter issues if required.

14 FIRE

Composting operations always need to be vigilant in the risk of fire and having a controlled composting process, adequate firefighting systems and site management practices to reduce the opportunity for fire.

Pinegro currently have in place an Emergency Fire Management Plan at the site to minimise the risk of fire on site**. See Attachment 5 – Emergency Management Plan – Fire**. Pinegro proposes to continue to utilise this plan in the open windrow composting of pinebark and sawdust and the maturation process for the organics.

Pinegro have consulted with the CFA and requested their response regarding our Proposed Amendment to our Planning Permit for our composting facility. As part of the consultation the CFA reviewed the following documentation:-

- EPA Draft Works Approval Application (September, 2019)
- Emergency Management Plan – Fire
- NALG Risk Assessment Plan – Invessel Composting Facility

The CFA have based their comments and conditions around the requirements of the EPA Publication 1667.2 October, 2018 *Management and Storage of Combustible Recyclable and Waste Materials.* **See Attachment 6 - CFA Response Letter.** Pinegro have engaged a Fire Engineer to assist with design and implementation of a CFA approved fire management plan. The fire consultant will be preparing a fire risk assessment that addresses the needs of EPA Publication 1667 and this and the fire management plan will be completed and submitted to EPA/CFA for approval prior to works being completed.

15 RISK ASSESSMENT OF OPERATION

The Environment Protection Act 1970 (EP Act) and various State Environment Protection Policies (SEPPs) set out guidance to protect Victoria's environment. Sources of emission or discharges to the environment must be managed in accordance with 'best practice'. SEPP Air Quality Management (SEPP AQM) provides the following definition of best practice:

"The best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of a generator of emissions in that industry sector or activity".

A number of SEPP's reference the requirement to demonstrate best practice in relation to the segment of the environment that the SEPP administers. EPA Publication 1517.1 October 2017 *Demonstrating Best Practice – Guideline* provides examples of best practice for the relevant SEPP, as described in Table 25 below.

Table 25 - State Environment Protection Policies (SEPPs) and best practice examples (from EPA Publication 1517.1 October 2017 - Demonstrating Best Practice – Guideline).

SEPP	Clause	Emitter/Industry requirement
SEPP (Noise) N-1	Cl. 19 (Replacing or Installing New Equipment)	Use the quietest equipment available when replacing or installing new equipment.
SEPP (Waters of Victoria)	Cl. 3 (in definition of 'best practice' and 'minimise') Cl. 28(3)(c) (new wastewater discharges)	New discharges require best practice.
SEPP Groundwater's of Victoria	Cl. 12 (prevention of groundwater pollution)	Undertake all practicable measures to prevent pollution of groundwater.
SEPP (Air Quality Management)	Cl. 18 (general requirements) Cl. 19 (management of new sources of emissions)	Apply best practice and continuous improvement for all relevant indicators; reduce to maximum extent achievable for Class 3' indicators

15.1 Best Practice Technology

Table 26 - Best Practice Invessel Compost Technology Risk Analysis

Common operational activities	Potential environmental impacts	Pinegro in-vessel compost facility Infrastructure & Process controls Refer - EPA Publication 1588.1 June 2017 – Designing, Constructing and Operating Composting Facilities for best practise controls
• Waste acceptance, and pre-treatment storage • Pre-processing, decontamination, chipping • Mixing and preparation • Pasteurisation, treatment • Maturation, curing • Batching, loading • Leachate management • Fire management	**Air** • offensive odour emissions from raw organic materials, composting process, product, contact water, machinery and turning/aeration • air emissions from: aerobic treatment: carbon dioxide • dust emissions from storage, grinding, mixing, screening and transport of composting materials • emissions from fire caused by unintended combustion of composting material **Noise** • Noise emissions from mobile and fixed machinery and transport vehicles.	**Separation Distance** • Significant separation distance, appropriate for large composting facilities (over 36,000 tonnes per year). • Our nearest sensitive receptor is 1,850 metres from the activity boundary. • Site is located in a sparsely populated area. 6 rural residents reside within 1,850 to 2,460 metres, • Site zoning of IN1Z-Industrial Zone ensures no residential encroachment. **Air** • All air emissions from the receival building and active composting phase air from the tunnels are captured and treated using secondary control equipment. The exhaust airs are initially treated through a chemical scrubber system and then through a specially engineered bio filter. • Installation of silt traps prior to the leachate dam. The leachate dam will be aerated to ensure aerobic conditions are maintained. • Pinegro have established compost process controls to create a homogenous compost recipe incorporating best practise parameters listed in table 3.2 Guide to Best Practice at Resource Recovery Centres • Pinegro holds Australian Standard Certification AS4454 for product quality standards. **Noise** • Pinegro have restricted hours of operation. Monday to Friday - 0600-1800, Saturday - 0700-1300, Sunday and Public Holidays – closed. • The fans and blowers for the invessel compost facility are enclosed.

	Water • generating contact water (excessive moisture in feedstock) during waste acceptance and pre-treatment storage • generating contaminated stormwater and leachate during decay of material, through flow after rain events **Land and groundwater** • contaminating groundwater with leachate (nitrates and phosphates) during batching and loading • spreading **Waste** • litter from vehicles, screening, shredding, chipping and unloading • carrying waste, weeds or pathogens offsite through vermin, birds and wind	• The grinder and loader will operate in an enclosed building. **Water** • All leachate waters collected in the receival building and composting tunnels will be captured and re-used in the invessel compost facility. No offsite discharge. • Leachate run off from the maturation pad will be collected in an engineered leachate dam with sufficient capacity to cope with run off during a 1 in 20 year storm event. • Silt traps will be installed prior to the inlet of the leachate collection dam. • The dam leachate water will be pumped back to the Invessel Compost Facility and re-used. **Land and groundwater** • The maturation pad and leachate dam will be constructed with an impermeable clay lining with low-permeability (1 x 10-9m/s). • Maturation pad will be sloped toward the leachate dam with appropriate Bunding to avoid surface water run-off. **Waste** • The Pinegro facility design will include a manual sorting picking station, pre-screen and shredding of waste prior to the active compost phase. • All odorous feedstocks will be processed within 24 hours of receival. • All feedstock will be stored on concrete hardstand. **Fire** • Installation of Firefighting systems in consultation with CFA. • Windrow dimensions in compliance with EPA Publication 1667.2 **Other** • As the receival and active compost phase activities are conducted in an enclosed building, there will be no bird and rodent issues. • The pasteurised compost on the maturation pad is unlikely to attract vermin. • Pinegro will implement pest controls should vermin become an issue

Pinegro has an existing Environmental Management Plan for our Compost facility. It is our intention to upgrade the plan to incorporate the new feedstocks and processes involved for the Invessel Compost Facility.

Our revised draft Environmental Risk Management Plan will contain risk assessments and mitigation measures for non-routine operations and upset conditions. This plan considers the major environmental risks in the operation of the proposed compost facility.

See Attachment 7 – Draft Environmental Risk Management Plan

16 INTEGRATED ENVIRONMENTAL ASSESSMENT

As part of our process for selecting processing technology, our aim was to implement best available technology and management practices. Our proposal incorporates current best available infrastructure and process technology for the proposed feedstock. It incorporates best practice compost technologies and process controls that limit most environmental impacts and produces a marketable end use product meeting the AS4454.

Our proposal provides diversion from landfill and the greenhouse abatement value of organics kept out of landfills to produce products that provide benefit to the environment.

We believe that our application for works approval is in the interest of the local and regional economy, waste generators, regulatory resource recovery objectives and the sequestration of carbon in soil and the agronomic benefits of the composts for soil health and productivity.

17 COMMISSIONING PLAN

The existing site will continue operations under the current EPA Licence during the construction of the Invessel Compost Facility and associated infrastructure. Arrangements during this transitional period will require flexibility to ensure both activities occur simultaneously and unimpeded to prevent delays in construction and also to ensure the site continues to operate efficiently and within licence requirements.

18 APPLICANT STATEMENT

I declare that to the best of my knowledge the information in this application is true and correct, that I have made all the necessary enquiries and that no matters of significance have been withheld from EPA

.

Signed Chief Executive Officer