



## **Purearth Organic Composting Overview**

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## Introduction:

The Purearth composting facility is designed to safely and conveniently process greenwaste and manufacture soil additives. The composting facility is situated at 324 Horton Road, Woottating, within the Shire of Northam local government boundary. The facility has been operational since 2015 and operates under license from the Department of Water & Environment Regulation (DWER).

The types of raw material, utilised as feedstock for the composting process, include organic materials from domestic gardens, eg collected from FOGO (Food Organic Green Organic) systems operated by the City of Fremantle, Town of East Fremantle, City of Melville and materials deposited at local government facilities, including the Waste Transfer Facilities, operated by the Shire of Mundaring.

The technology is proven and energy efficient, turning a problem, ie greenwaste, into a solution, ie valuable nutrient-rich, compost products. With many years' hands on experience in the field, Purearth understands the needs of the land and manufactures products that enhance nutrient-depleted soils. The Purearth product is organic, natural and is set to play an important part in growing crops of greater nutritional value.



## The FOGO Journey, Thus Far

Purearth held the first contract awarded for the receipt and composting of FOGO materials arising within the Perth metropolitan area for many years. Purearth has been working with the Resource Recovery Group (RRG, previously known as SMRC) since October 2019, whereby the RRG aggregates the raw FOGO material and conducts a decontamination process at their Canning Vale facility. Nowadays, approximately 50% of the RRG's FOGO material is then delivered to Purearth who receive and process the material into FOGO derived compost products. The volume of FOGO arising across the SMRC member councils is currently approximately 30,000 tonnes per annum. These materials are subjected to further processing by Purearth and blended with other organic materials and made ready for sale as FOGO derived compost and other products, that comprise ~20-30% FOGO. Those finished products are available in bulk or can be supplied in bagged form.

## Our Processes

The Purearth composting facility processes a range of greenwaste materials and manufactures a range of organic Soil Mixes; Composts; and Mulches. These products play an important part in returning nutrition to our soils.

The Purearth process encompasses an “end-to-end” solution, spanning the receipt, processing, composting, remanufacturing and retail of quality organic soils, mulches and composts.

- Receipt of raw materials, greenwaste, etc;
- Primary processing;
- Blending;
- Composting & pasteurisation within a controlled environment;
- Maturation;
- Screening & grading;
- Quality control & process management; and
- Loadout of finished materials.

Importantly, the owners of the Purearth business have developed strong markets in the wholesale, retail and agricultural sectors, and also operate a sales and distribution business, Little Loads, and supply a network of landscaping & nursery outlets, where the products are available for purchase &/or delivery throughout metropolitan and regional WA.

## Our Products:

The Purearth process spans the receipt, processing, composting, manufacturing and distribution of quality products.

Our product range includes the following, as well as specified products for broad acre application:

**Soil Mixes:** Landscape mix; Premium garden mix; Native mix; Special lawn mix; Soil conditioner; Potting mix;

**Composts:** Fine compost; Premium fine compost; Organic compost;

**Mulches:** Organic tree chip mulch; Enviro mulch; Black mulch; Jungle mulch; Karri & peat mulch.

## Accreditation:

Purearth is certified to the Organic Farm Input standard with the National Association for Sustainable Agriculture (Australia) Limited (NASAA).

Purearth continues to meet the requirements of both NASAA and the Australian standards, with both the composting facility and the distribution operation subjected to annual audits.

## Existing & Emerging Markets:

Purearth’s existing markets include landscape gardeners; commercial gardeners; recreational gardeners; nursery suppliers; and the agricultural sector.

Purearth’s emerging markets include the Western Australian Local Government sector. Purearth has qualified as a member of various WA Local Government Association’s (WALGA) Preferred Supplier panels.

The owners of Purearth also own and operate the Little Loads business, providing sales and distribution of quality garden and landscaping products and organic solutions to both existing and developing markets. The Little Loads business has been operated by the Curtis family for over 35 years and specialises in the supply and distribution of the Purearth range of products. Purearth products are also distributed through approximately 15 nursery outlets across the Perth metropolitan area.

## Safety and the Environment:

Safety is of paramount importance onsite and various safety plans have been developed to meet the requirements of various agencies, including the Shire of Northam and the DWER. The Biofilter, which utilises approximately 500 cubic metres of organic filtration media, is subject to twice-yearly odour modelling, as part of the DWER license compliance process. There are 3 groundwater monitoring bores onsite, which are also monitored on a programmed basis, as part of the DWER license compliance process.

There is a range of infrastructure onsite, dedicated to safety and the environment, including mobile firefighting units, along with physical and operating systems guarding against the spread of dieback.

Based on average rainfall patterns, from the Bureau of Meteorology's Baker's Hill weather reporting station, the site might typically receive approximately 600mm of rainfall per annum. Purpose built dams have been constructed and lined, to manage leachate and surface runoff, so as to contain and manage these materials within the site boundaries. In the event that excess leachate &/or water arises, there are systems in place to utilise excess water onsite in the overall process. Dust suppression activities are conducted during dry weather, as appropriate.

## Sustainability and the Circular Economy

There are a range of benefits arising from the Purearth business model, which include the following:

- The creation of jobs and employment is converting waste materials into valuable products;
- The recovery of valuable resources and the diversion of waste from landfill, along with the associated reduction in greenhouse gas emissions from landfill;
- Stimulating the circular flow of organic materials, where wastes are converted into soil improvement products, which stimulate the production of high quality plant-based products, where the residual materials from the processing of those products, is returned to the organic composting process for further processing and conversion to valuable products; and
- The support of growing regenerative farming sector in the WA agricultural regions.

## The Overall Composting Process in Summary:

The Purearth process is considered 'best practice' in Australia, where composting occurs in windrows placed on sealed concrete hardstands, before being fully covered to ensure a controlled environment. Each batch is made of select blended organics and processed green waste, to balance Carbon and Nitrogen ratios, ie C:N ratios.

Air is forced through the medium (from pipes embedded in the slabs) for the duration of the process, ie around 6 weeks. Extraction piping is placed on top of the windrow, under the cover, to extract VOC's (volatile organic compounds) and these are directed to the bio filter, which scrubs the air to remove odour.

Probes are located within the windrow, to monitor oxygen, temperature, moisture (humidity) and pressure to ensure the air is getting through. The probes send information through to a process logic controller (PLC) which sends the data through to the office computer, where the information is stored and available for the appropriate personnel to monitor and adjust, if necessary. Oxygen is set to a percentile, whereby if the windrow oxygen drops below the set minimum, the PLC will start the aeration fan to raise oxygen in the windrow and, in turn, do likewise with the temperature. If the temperature goes above a set maximum, the PLC will start the fan to cool the windrow down, which is imperative to stop it self-combusting and cause a fire. The windrow is held above 60 degrees for more than a week to ensure pasteurisation.

The process is designed to mimic nature, by keeping the microbes (bugs) at an optimal level to allow the material to break down. A measured portion of pasteurised compost (loaded with the right microbes) is added to each batch, to assist in kick starting the composting process. Organic activators can also be added to assist with the process.

On completion of the pasteurisation process, the batch is then removed and stored for maturation, screening and testing, before being loaded onto trucks for delivery to Purearth's Perth operations for blending and distribution via Purearth's sales outlets.

Individual steps within the overall process, include the following:

## Receival of Raw Materials:

Incoming Greenwaste feedstock is delivered by trucks to the Greenwaste Receival Area, to the south of the site, where it is stockpiled, ready for further processing. The Greenwaste is then moved to the Raw Material Storage Area, ready for blending. Importantly, the smaller fraction, measuring less than 25mm, typically comprising "fines" and sand, are extracted during this stage, so that they can be stored separately, reducing the risk of fire from spontaneous combustion during storage.

## Storage of Processed Raw Materials:

Raw materials are stockpiled in this area, ready for batching and blending in the Blending Hall, as production demands require.

## Blending:

Material is then moved to the Blending Hall, where it is blended with liquid waste and other organic materials, in readiness for placement on one of eight 500 square metre concrete slabs in the Covered Static Pile Forced Aeration Area.



## Pasteurisation:

The Covered Static Pile Forced Aeration stage comprises a controlled environment, where the levels of oxygen, moisture and temperature are maintained at approximately 65 degrees centigrade for 2 weeks to enable pasteurisation to occur. During this time, fresh air is fed into the material, while used air is extracted from the system, before being directed to the Biofilter, where any odour or volatile elements are neutralised using naturally occurring microbes to break down particles and cleanse the air, which then returns to the environment.



## Composting:

Pasteurised material is then directed to the Compost Storage Area, where it remains for up to 2-3 months, during which time it is turned periodically, which aids the ongoing aeration process, allowing the compost to fully mature. Testing is conducted on the material to ensure that it meets AS 4454 for Composts, Soil Conditioners and Mulches, prior to final screening and grading.



## Screening & Grading:

Mature Compost is then directed to the Screening & Grading Area, where it is screened and graded according to size, ie material that measures 8mm and below is graded as premium compost, suitable for a range of Purearth products, such as Fine Compost and Premium Fine Compost; material that measures between 8mm and 50mm is marketed as Mulch; while oversized materials can be reprocessed into smaller sized material or used as aeration bedding material in the construction of Covered Static Pile Forced Aeration windrows.





## Finished Material Storage:

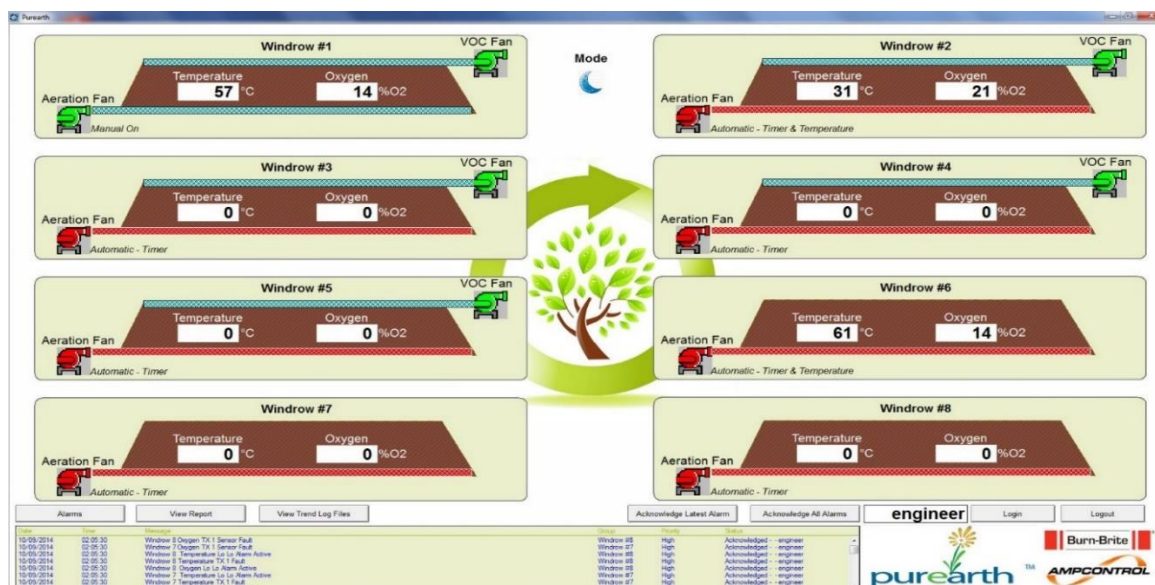
Finished material is then moved into the Finished Material Storage Area, where it is stockpiled, ready for transportation offsite and distribution to the market.



## Quality Control:

In addition to testing against AS4454, site personnel are trained to scrutinise the material as they are handling it throughout the process, eg as it is being unloaded in the Receive Area and loaded into various processes from there forward. As such, they remain constantly vigilant in an effort to detect foreign objects, such as plastics, metal, etc, and removing these as they are identified, so that they can be removed in a timely manner. Various other mechanical interventions are designed into the process, including the use of magnets in the machinery used during the initial processing phase, to remove metallic items, along with a forced-air system being used in the screening process to remove residual items, such as light plastics.

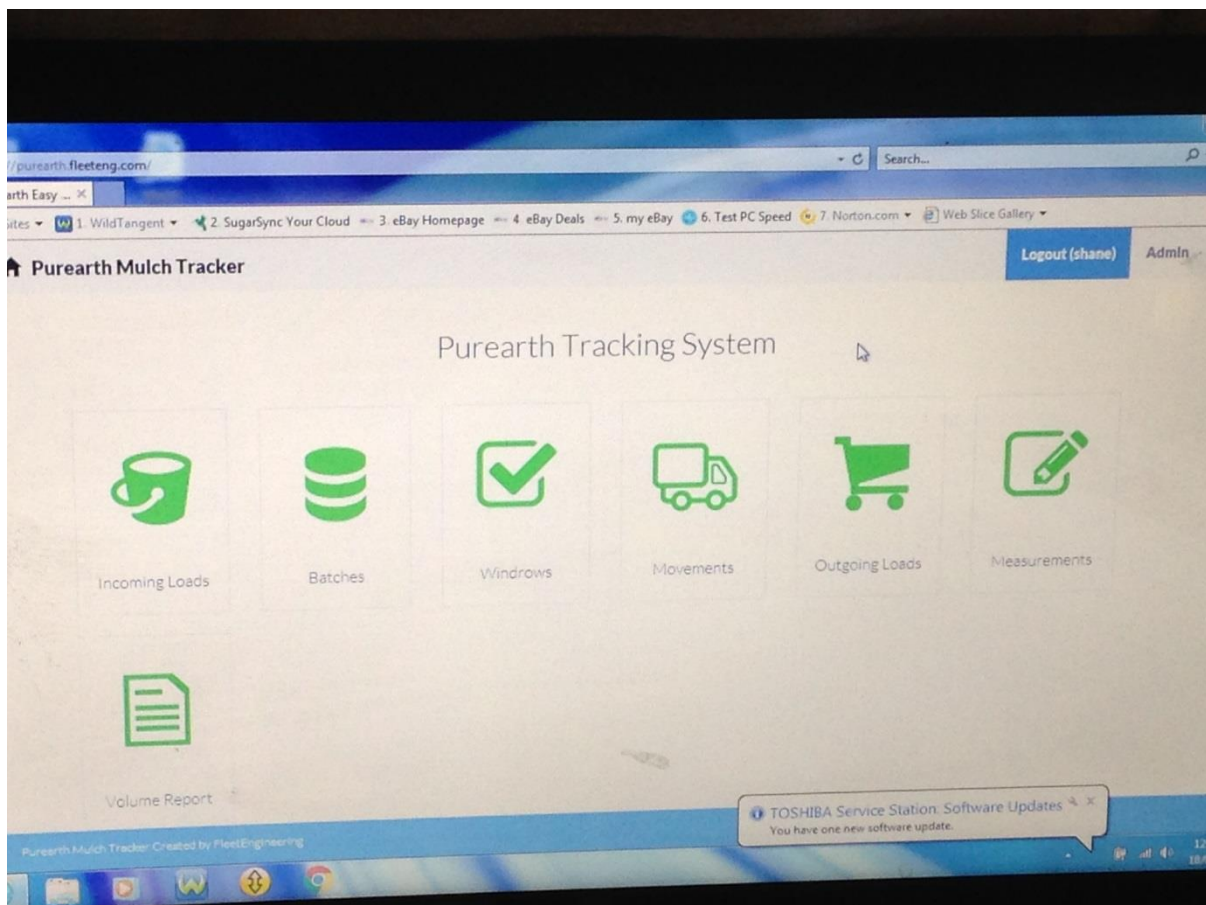
The monitoring and management of the composting process relies upon data transferred from monitoring probes that are inserted into the windrows, to monitor oxygen, moisture and temperature levels on a real time basis. Data from the probes is collected by the Program Logic Control (PLC) system and directed to desktop computers in the site office. This critical system can also be monitored and operated remotely from smart phones.



### Process Management:

The overall process, from incoming loads of raw materials, to outgoing loads of finished materials, is monitored and recorded on the Purearth Tracking System. This system has been tailor made to suit the requirements of the Woottating Composting Facility, providing information along the following lines:

- **Incoming loads:** the source of each load is logged, along with the volumetric data and the name of the client;
- **Batches:** records of each individual batch are recorded, including the date, types and volumes of materials utilised;
- **Windrows:** details of the specific windrow and their locations are logged as they are constructed;
- **Movements:** details of movements of materials from one stage to another onsite are recorded;
- **Outgoing loads:** the destination of each load is logged, along with volumetric data and the name of the customer;
- **Measurements:** testing and analysis, along with monitoring data are recorded for future reference; and
- **Volume Report:** various reports can be generated from the system, eg to suit regular and ad-hoc reporting requirements.



## Further Information:

Purearth would welcome those interested, who might wish to visit our site for a firsthand introduction to our systems and operations. Please contact Paul Curtis, on 0411 156 666, or Bill Marchbank, on 0415 095 956, for further information &/or to arrange a site visit.

## Appendices:

Purearth has incorporated additional information, related to the formulae and blending procedures, in the Compost Site Overview document in response to suggestions made during the 2020 NCO audit process.

The following summary overview provides an outline in relation to current bulk product storage, blending and retail sales practices at the Little Loads Sales & Distribution facility, located at 325 Dundas Road, High Wycombe.

As such, this Facility Overview can be used to supplement and support Purearth's Organic Handling Plan, as it relates to our NASAA NCO certified organic accreditation.

### **Product Range:**

The range of products held at the Little Loads sales & distribution outlet at 325 Dundas Road, High Wycombe, includes the following, with some of the materials being used as inputs to a blending process to manufacture additional products:

- Calcite granules;
- Garden supplies;
- Manures, both cow & sheep;
- Minerals;
- Mulches;
- Quarried products;
- Sands, both bulk & bagged; and
- Soils of various types.

These products are largely supplied from Purearth's Composting Facility, having been tested prior to transportation to High Wycombe.

### **Product storage:**

Some of the range of products outlined above can be made available for sale, as they are, or as inputs to a range of other finished products, that can be manufactured onsite at the Little Loads sales and distribution facility.

Large volume materials, such as composts and mulches are stored in stockpiles on suitably designed and constructed hardstand areas, ready to be sold in bulk &/or used as inputs to other finished products, see next section for a list of some of those finished products.

These stockpiles are maintained at a level, judged as suitable to provide the required volumes to meet projected sales requirements and are topped up, as required.

## **Product Blending Process:**

Generally speaking, the blending process utilises an operator and a Front End Loader, to mobilise component parts of the blend being manufactured, in the appropriate measure, to create one of the following finished products:

- Premium Vegie/Garden mix;
- Landscape mix;
- Special lawn mix;
- Native mix;
- Potting mix; and
- Soil conditioner.

The mixing and blending of the ingredients occur on a paved hardstand area, before the finished products are moved to holding bunkers, ready for sale.

Purearth's soil mix composition, ingredients and blending data can be made available, where appropriate.