

INFO NIGHT FOR INTERESTED END USERS

- Get further info and see product sample -

 Thursday 30th July, Moriac Community Centre

Newling Reserve, Hendy Main Road, Moriac

7:15 for 7:30 pm start. Call 02 4234 4444 to register

**Organics &
Remediation Division**

Technical Expertise

Intensive Monitoring

Beneficial Use

Yielding Results
Transpacific / L.V. Rawlinson & Associates (LVRA)
WHAT ARE BIOSOLIDS?

Biosolids are the solid organic product that results from sewage treatment processes, which have been classified by the EPA as suitable for beneficial use. Biosolids contain nutrients and organic matter and when applied to land they can improve soil chemical and physical properties and enhance plant growth. Biosolids are used for a wide range of beneficial uses including agriculture, forestry, land rehabilitation and landscaping.

ARE BIOSOLIDS USED IN AUSTRALIA?

Most Australian states have well established beneficial use programs, which involve recycling biosolids into agricultural, landscaping and other markets. In NSW, Sydney Water recycles 100% of biosolids, equivalent to approximately 150,000 tonnes of biosolids per year into agricultural markets and 30,000 tonnes into the landscaping market. Queensland, Western Australia and South Australia all have large beneficial use programs. Biosolids recycling is also becoming increasingly common in Victoria.

BARWON WATER'S BIOSOLIDS BENEFICIAL USE PROGRAM

Barwon Water's biosolids are currently air dried at a temporary Barwon Water facility established at Melbourne Water's Western Treatment Plant at Werribee. However this drying operation is not considered to be sustainable in the long term.

The biosolids are land applied by LVRA/Transpacific in broad acre agriculture north of Geelong in the Werribee Plains area as a beneficial soil conditioner and fertiliser to grow a range of crops including canola, wheat and barley (see Figure 1). This program is conducted under the management controls of the Victorian EPA biosolids guidelines and began in 2004. To date, over 78,000 tonnes of biosolids have been beneficially used on over 10 farms.

With the construction of a Biosolids Treatment Facility at the Black Rock Water Reclamation Plant (BRWRP), Barwon Water will soon produce a pelletised biosolids product classified as T1 under the Victorian EPA classification system. T1 is the highest possible treatment quality which will be suited to a wider range of beneficial uses including agricultural and non-agricultural uses.

The Biosolids Treatment Facility will be operated by Plenary Environment (Barwon) Pty Ltd and is adjacent to the BRWRP, located approximately 18 km south east of Geelong. The new Biosolids Treatment Facility will treat sewage sludge from Barwon Water's water reclamation plants.

HOW ARE PELLETISED BIOSOLIDS PRODUCED?

The biosolids will be processed using the Keppel Seghers HARD Pelletiser, which relies on indirect, gas-powered heating to dry the biosolids, reliably reduce a wide range of pathogens to low levels and form stable granulated pellets. This process is currently used in Europe and North America.

The Pelletiser will thermally treat the incoming dewatered sludge to produce a consistent T1 treatment grade biosolids pellets that have a dry solids content of over 90%. T1 is the highest quality treatment grade for biosolids under the Victorian EPA classification system.

The Barwon Water Pelletised Biosolids are a granulated, small, dry, brown ball or pellet as shown in Figure 2. Pellets predominantly range in size from 1.2 mm to 4.0 mm in diameter and have a bulk density of approximately 800 kg/m³. The biosolids pellets are easy to handle, available on a year round basis, can be stored and can be readily transported for beneficial use.

HOW CAN BARWON WATER PELLETTISED BIOSOLIDS BE USED?

Barwon Water Pelletised Biosolids are classified as treatment grade T1, contaminant grade C2 and may be beneficially used in a range of agricultural and non-agricultural end uses. Beneficial use sites must meet a range of site selection criteria and adopt environmental management controls prior to receiving biosolids.

Agricultural end uses include: vegetables, pasture, cereal crops and non food crops such as turf, woodlots and flowers (see Figures 1 and 3).

Non-agricultural end uses include: landscaping of public use land (public parks, sportsgrounds), forestry and site rehabilitation.



Figure 1. Canola grown using air-dried Barwon Water Biosolids in the Werribee Plains area north of Geelong.

WHAT ARE THE BENEFITS OF USING BIOSOLIDS?

Biosolids can be applied to land as a complete or partial substitute for conventional fertilisers. The application of biosolids can benefit soils through the addition of organic matter and slow release nutrients, and through increased moisture holding potential. Biosolids application also helps to promote cleaner waterways by safely recycling nutrients and organic matter that have been removed from wastewater.

LVRA have carried out many successful beneficial use projects in Victoria and other states including Barwon Water's current land application program.

QUALITY?

Preliminary analysis indicates that the Barwon Water Pelletised Biosolids has the following total N:P:K:S ratio: 7 : 2 : 1 : 1.

Biosolids contain high levels of organic matter, nitrogen, phosphorus and other nutrients essential for plant and crop growth. Biosolids also contribute to improved soil properties such as structure, moisture retention and cation exchange capacity.

Granulated biosolids pellets contain slow release nutrients which will not burn vegetation and become available over time providing long term benefits.

As the pellets revitalise and build the soil, plants will benefit from:

- essential plant nutrients and micronutrients;
- residual nitrogen available in future years;
- slow release of nutrients;
- high organic matter;
- stronger root development; and
- increased water retention and reduced potential for leaching.

BIOSOLIDS QUALITY CONTROL

Biosolids quality is assessed according to the Victorian Environment Protection Authority guidelines requirements. The guidelines set minimum standards for pathogen removal and heavy metal and pesticide concentrations and sampling requirements. The standards are set to ensure protection of the environment and human and animal health. Biosolids that do not meet minimum standards are not beneficially used or applied to land.

APPLICATION TO AGRICULTURAL LAND

Barwon Water Pelletised Biosolids are a pellet of a consistent size which allows them to be easily handled like other granulated soil conditioners or fertilisers.

Biosolids application rates are calculated to meet crop nutrient requirements. Due to their organic nature, nutrients are released slowly and application rates are typically higher than for conventional fertilisers in order to provide the same nutrient benefit. The biosolids guidelines recommend that T1C2 biosolids are incorporated into the soil.

WHAT ARE THE RISKS OF USING BIOSOLIDS?

In general, biosolids may contain contaminants such as heavy metals and pesticides. Safe contaminant concentrations in the biosolids are met through restrictions on what is allowed to enter the sewerage network as well as monitoring of the biosolids. Biosolids may be treated via a range of treatment processes with varying degrees of bacteria and pathogen control. Some biosolids may also exhibit odour.

Barwon Water Pelletised Biosolids are treated to the highest treatment grade, T1, via a process that has demonstrated that it is capable of reliably reducing a wide range of pathogens to low levels. Contaminant levels are monitored and meet contaminant grade C2 criteria.

The dried pellets have little or no odour.

WHO CONTROLS THE USE OF BIOSOLIDS?

The beneficial use of biosolids is regulated by government legislation and biosolids guidelines published by the Victorian EPA. These provide a framework for sustainable use of biosolids while protecting environmental systems and human health. Before land application projects commence, approval is obtained from the relevant regulatory authority (eg. Victorian EPA). The approvals process includes assessment of the proposed application site and development of management procedures that meet guideline requirements.



Figure 2. Barwon Water Pelletised Biosolids.

WILL THERE BE LONG TERM IMPACTS?

As with other fertilisers, the use of biosolids should not result in adverse impacts when managed appropriately. The main long term effects will be improved soil structure, water holding capacity and nutrient status.

SAFE HANDLING

General health and safety controls are required for the handling of Barwon Water Pelletised Biosolids similar to fertilisers or compost material such as avoiding breathing dust, wearing gloves and washing hands immediately after use.

SITE ASSESSMENT

An environmental site assessment is undertaken to assess the suitability of the potential application site to receive biosolids. The environmental review takes into account climate, topography, geology, soil, water, flora and fauna, heritage and proximity to sensitive areas. Potential impacts are assessed and management practices are developed to ensure the application does not affect the surrounding environment.

The biosolids guidelines identify sensitive areas in which application is not permitted. Buffer zones are placed around these areas to protect land uses such as drinking water catchments, national parks, residential areas, occupied dwellings, groundwater bores and surface waters.

BENEFICIAL USE AGREEMENT

End users (e.g. landholders) and suppliers sign a beneficial use agreement that sets out each party's responsibilities. Responsibilities include the supply and application of biosolids, timing of the application, maintenance of buffer zones and incorporation requirements.

QUESTIONS, ISSUES AND ENQUIRIES

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Further information about biosolids or biosolids application is available in relevant state biosolids guidelines.

The EPA Victoria *Guidelines for Environmental Management: Biosolids Land Application* (2004) is available from the EPA website at:

www.epa.vic.gov.au Publication Number 543

Beneficial use enquiries can be directed to:

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Figure 3. Barley grown biosolids in the Werribee Plains area north of Geelong.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (May 2009). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date. End users should check currency of the information with the appropriate officer of LVRA or the user's independent adviser.