

Biosolids

Land Application of Biosolids

24 May 2011

Q What are biosolids?

A Biosolids are a by-product of the wastewater treatment process. Treated appropriately they can be safely and beneficially used.

Q What are biosolids used for?

A Biosolids have high nutrient value and can be used as a soil conditioner on farms. They can also be reprocessed to produce a compost product.

Q How long has Sydney Water provided biosolids for beneficial land use?

A Sydney Water commenced its biosolids land application program in 1989.

Q Does Sydney Water test biosolids before they are used?

A Yes. The Environmental Guidelines: Use and Disposal of biosolids products (NSW EPA 1997) lists the requirements for biosolids beneficial use. The guidelines include testing biosolids for a range of heavy metal and organic compounds and nutrients; and pathogen and odour controls. Sydney Water provides summary information reports on the amount of biosolids used and its grading to the NSW Office of Environment and Heritage (formerly EPA) on an annual basis. About 800 samples are tested for a range of parameters each year.

Q How are Sydney Water biosolids made safe from pathogens for beneficial land use?

A Sydney Water treats its biosolids to remove pathogens (Grade A) or reduce them to low levels so that by following the Guidelines they are safe to use (Grade B).

Q What crops are grown using biosolids?

A Generally dewatered biosolids (Grade B) are applied to large broad-acre farms that grow canola, wheat, oats, barley and pastures. The biosolids are spread and incorporated into the soil prior to sowing. The harvested components of these crops don't come into contact with the soil/biosolids mixture. These crops are also mostly reprocessed eg. into flour. Dewatered biosolids are not applied to vegetables or root crops. Around 20 NSW farms per year use biosolids provided by Sydney Water. Composted biosolids are treated to a high level and tested to ensure that they are suitable to be used in the same way as any other composted product.

Q What portion of Sydney Water’s biosolids is beneficially used each year?

A Sydney Water has beneficially used 100% of its biosolids every year since 2003.

Q Are biosolids used in other countries?

A Biosolids are beneficially used in many countries around the world. In the UK, US and Canada the majority of the biosolids are applied to agricultural farms. Some countries use biosolids as a fuel source and others incinerate.

In Australia research has been undertaken to determine a safe framework for biosolids use and Sydney Water follows this framework to ensure public safety. Other countries such as the UK and US follow a similar framework for biosolids use.

Q Who monitors what Sydney Water does with biosolids?

A The Environmental Guidelines: Use and Disposal of biosolids products (NSW EPA 1997) were prepared and are regulated by the Office of Environment and Heritage (formerly EPA). These guidelines were developed with the assistance of a Biosolids Subcommittee, which included representatives from Government Departments (including Health and Agriculture), Water Utilities (including Sydney Water) and other related industries.

These guidelines provide a multi-barrier approach to risk management including managing the risk of pathogens in biosolids. The guidelines stipulate the permissible end use applications based on the level of treatment. Sydney Water requires its contractors to meet these guidelines and provides information to the Office of Environment and Heritage annually.

Q Based on international findings eg the US, how do we know that biosolids application is safe in Australia?

A International studies have shown that biosolids, when treated and managed in accordance with guidelines such as we have in NSW, are safe. In 2002 the US National Research Council reviewed that country’s experience with biosolids use, current science and the US EPA’s biosolids regulation, called the 40CFR Part 503 rule, and concluded that ‘There is no documented scientific evidence that the Part 503 rule has failed to protect public health’.

Sydney Water has been managing biosolids for over 20 years and are unaware of any illnesses caused to its staff from biosolids, or the general public from biosolids land application.

Q What are Blastocystis hominis, Dientamoeba fragilis and Salmonella?

A *Blastocystis hominis* and *Dientamoeba fragilis* are parasites. Some subtypes of these parasites can cause gastrointestinal illness. Dr Damien Stark of St Vincent’s Hospital and Professor John Ellis of the University of Technology Sydney who are experts on these organisms, advised that there is no scientific evidence linking properly managed biosolids to the transmission of these parasites to people. Current best knowledge is that these parasites are transmitted by the faecal-oral route from person to person. This means personal hygiene such as food and hand washing is paramount to preventing transmission. These are not Third World parasites and have been reported to be circulating at a low level in the population of Sydney for at least 30 years.

A Salmonella is a group of bacteria that includes types that are pathogens. Some types cause gastroenteritis and some can cause blood poisoning.

Q **What test results were referred to in the media?**

A *Dientamoeba fragilis*

Reference was made to the St Vincent's Hospital team currently in the early stages of researching methods for detecting *Dientamoeba fragilis* in wastewater. They requested that Sydney Water assist the research by supplying wastewater samples. Five samples were provided, three untreated wastewaters, one primary treated and one secondary treated sample. *Dientamoeba fragilis* was detected in only one of the untreated wastewater samples and not detected in either of the treated wastewater samples.

A *Blastocystis hominis*

Reference was made to finding of *Blastocystis hominis* in type B biosolids by a Brisbane laboratory. There is no standardised, accredited method for the detection of *Blastocystis* in biosolids. However, it is not unexpected that low levels of this organism would be detected in Grade B biosolids. There are different types of *Blastocystis hominis*. Only one type is a known pathogen. Expert molecular biological testing is required to confirm the presence of this type.

A Salmonella

Reference was made in the media that Salmonella was detected in Grade B biosolids. While there is an accredited method for testing for the Salmonella group in biosolids, not all Salmonella are pathogens and further testing is required to confirm that those found are pathogens. That said, it is not unexpected that low levels of any type of Salmonella might be found in Grade B biosolids. The important fact is that the processes used to produce Grade B biosolids reduce the levels of Salmonella to levels safe for the specified uses.

Q **How are Sydney Water's biosolids managed?**

A Sydney Water currently provides biosolids to two contractors for beneficial use in accordance with the Environmental Guidelines: Use and Disposal of biosolids products (NSW EPA 1997). Sydney Water manages and monitors these contracts. Sydney Water conduct regular audits of these contactors to ensure compliance with environmental and safety requirements.

Sydney Water assesses the quality of its biosolids and provides the quality data to the contractors. Regular reports are provided to Sydney Water on the Contractor's operations, which include quality data for composted biosolids including pathogen data.

Q **Is it safe to handle biosolids?**

A When working with biosolids or any soil or potting mix product, appropriate personal protective equipment such as gloves should be used. When any handling processes associated with biosolids are completed good personal hygiene practice should be followed such as hand washing. Exposure to dust can be reduced if required by wetting down the biosolids (if dry) and wearing a P2 mask.

Q What information is available about biosolids?

A Sydney Water has information on its website
<http://www.sydneywater.com.au/Sustainability/Biosolids/index.cfm>

For specific information on biosolids email inquiry BioSoil@sydneywater.com.au

A The Australia & New Zealand Biosolids Partnership supports public engagement in sustainable management of biosolids in Australia, supports the Australian and New Zealand water industry on technical and regulatory components of biosolids management, and is part of a global network on the sustainable management of biosolids.

More information is available on its website <http://www.biosolids.com.au/>