# ANZBP Factsheet on COVID-19 and Biosolids

**8 April 2020**

The mission of the Australian and New Zealand Biosolids Partnership (ANZBP) is to support sustainable biosolids management. The ANZBP creates resources so that the opportunities and risks associated with biosolids can be identified, assessed, and managed, and so that biosolids managers can respond effectively to the changing social and regulatory environment.

Throughout this pandemic, the ANZBP is staying informed of the most up-to-date research via a network of national and international experts. This factsheet aims to answer a few questions that you may have regarding risks of biosolids land application programs in this time of uncertainty.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the official name of the virus that causes the disease known as COVID-19. This is a 'novel' virus that belongs to a large family of coronaviruses that also includes SARS coronavirus (SARS-CoV) and Middle East respiratory syndrome (MERS). First reported in December 2019, research on SARS-CoV-2 is rapidly emerging, however, there has been much research on previously discovered coronaviruses, which are genetically similar and appear to behave/react predictably.

## Can SARS-CoV-2 enter the wastewater system?

Despite COVID-19 being a respiratory illness, some infected people also develop gastro-enteric symptoms. Recent research has shown that genetic material from the SARS-CoV-2 has been detected in stool samples of COVID-19 cases, and gene fragments have also been detected in wastewater treatment plants in Europe. However, even though gene fragments have been detected, this does not mean that the virus is in an infectious and 'viable' state. Advice from the World Health Organisation (WHO) states that there is no evidence of transmission of COVID-19 via sewerage systems (1).

In the coming months, testing of wastewater for evidence of SARS-CoV-2 gene fragments, which is often referred to as "wastewater-based epidemiology", is likely to be initiated by Water Research Australia to help monitor for virus presence and persistence in the Australian population (3). Results could help health authorities and water utilities to monitor the overall occurrence of the virus amongst the community, however, the mere presence should not be mistaken for an indication that the virus is viable or infectious.

## Can SARS-CoV-2 be found in biosolids?

There have been no detections of SARS-CoV-2 in biosolids. A key piece of research into the survival of coronavirus and poliovirus concluded that 'Coronaviruses die off very rapidly in wastewater, with a 99.9% reduction in 2–3 days' (2). The researchers cultured the viruses in the laboratory and spiked them into primary and secondary wastewater samples (held at room temperature) and found that coronaviruses were below the limit of detection after just 3 days (2).

After flowing down toilets and drains, sewage makes its way through a series of underground pipes and pump stations before arriving at wastewater treatment plants (which often takes hours to days). If SARS-CoV-2 arrives at the treatment plant in a viable

state (this has not been demonstrated), it would then be subject to several physical, biological and chemical treatment steps. By design, these treatment processes ensure that risks on the human and environmental health from chemical and biological contaminants are reduced (this includes reduction of potential pathogens). There are many different treatment processes that are designed to achieve the required level of pathogen inactivation, but typically activated sludge is recycled in the treatment plant for a number of days or weeks, prior to a further digestion step (usually detention of another few weeks).

Biosolids are subject to stringent State and Federal guidelines that are designed to reduce the likelihood of pathogen survival including bacteria, viruses' protozoa and helminths. SARS-CoV-2 is what is called an 'enveloped' virus, with a fragile outer lipid membrane which is unstable in the environment, meaning it is likely to become inactivated significantly faster than non-enveloped and more resistant viruses such as Adenovirus that are suitably managed by existing biosolids treatment processes and guidelines.

**We are all in this together.**

The ANZBP realises the growing concern as Australian and New Zealand COVID-19 cases continue to climb. Fortunately, we are confident that SARS-CoV-2 is unlikely to have any impact on the high quality of biosolids currently produced, as health risks to biosolids producers, transporters, applicators and farmers is managed by the rigorous treatment processes already used to meet the relevant biosolids guidelines.

ANZBP will continue to maintain vigilant surveillance of local and international research being conducted. In these times, it is important to find some positives and this pandemic has enhanced the relationships with biosolids producers and users around the globe with the sharing of resources, information, and expertise from countries further ahead in the struggle against COVID-19.

All peak public health and water associations including WHO, United States Environmental Protection Agency, Water Environment Federation, Water Services Association Australia (4), Water Research Australia (3), Australian Water Association and the Global Water Research Coalition (5) state that the current water and wastewater treatment steps are adequate to manage SARS-CoV-2 virus.

It is important to continue to practice hand hygiene and avoid touching eyes, nose, and mouth with unwashed hands when using biosolids (and other soil amendment products).

**References**

1. https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19
2. Gundy, P.M., Gerba, C.P. & Pepper, I.L. Survival of Coronaviruses in Water and Wastewater. *Food Environ Virol* **1**, 10 (2009). https://doi.org/10.1007/s12560-008-9001-6
3. https://www.waterra.com.au/_r9550/media/system/attrib/file/2200/WaterRA_FS_Coronavirus_V11.pdf)
4. https://www.wsaa.asn.au/sites/default/files/publication/download/COVID-19%20Fact%20Sheet%2010032020.pdf
5. http://www.globalwaterresearchcoalition.net/_r4150/media/system/attrib/file/820/GWRC_Factsheet_COVID-19%20Virus%2010%20March%202020.pdf