



Portuguese Association of Water and Wastewater Services
Avenida de Berlim, 15 - 1800-031 Lisboa - Portugal
+351 218551359
geral@apda.pt
www.apda.pt

Leaflet Brochure: COVID-19

Severe acute respiratory syndrome - coronavirus 2, in sewage and sludge systems

Preamble

Due to the present state of emergency in Portugal, due to the pandemic caused by the new coronavirus, which causes the disease called COVID-19, APDA's CEAR prepared this document, which was primarily intended for the technicians and decision-makers of the Management Entities, as well as the consumers and the public in general, in view of the legitimate concerns about the presence of this virus in wastewater and, consequently, the potential danger to public health of the collection, intersection, pumping and wastewater treatment plants (WWTP).

Given that the overwhelming majority of Portuguese Management Entities are already managing sludge from WWTP, based on a circular economy, namely through agricultural recycling, it is also important to highlight the preventive measures that may eventually be implemented in the management of this by-product.

This document was prepared based on the technical information available at the beginning of April 2020, and will be updated in the near future, according to the new scientific knowledge that may occur.

Can COVID-19 be transmitted through wastewater and sludge from WWTP?

All studies and scientific data available to date indicate that the **SARS-CoV-2 virus, responsible for the disease called COVID-19, does not remain active in wastewater. There is no evidence that this new coronavirus has been transmitted by sanitation systems, with or without wastewater treatment.**

In the case of WWTP sludge, given the result from successive treatment processes in the liquid and solid lines (of the WWTP), **and based on the fact that the virus does not remain active in the wastewater, it is expected that there is also no virus in the active form in the treatment by-products.**

SARS, a similar coronavirus, was detected in untreated wastewater for 2 to 14 days in the 2003 SARS outbreak. There was documented transmission associated with wastewater aerosols. The data suggest that common practices for disinfecting wastewater treatment systems may be sufficient to deactivate coronaviruses, as long as the Management Entities properly monitor this treatment step.

Employees of sanitation systems and wastewater treatment plants must follow standard practices, apply basic hygiene precautions and wear Personal Protective Equipment (PPE) as prescribed for current work tasks.

Justification: The structure of SARS-CoV-2 is very similar to other coronaviruses, already studied, based on an envelope lipid, forming a fragile outer membrane. Generally, enveloped viruses are less stable in the environment, mainly outside a host.

On the other hand, the sequence of the operation processes that make up the WWTP, associated with the morphological and chemical characteristics of SARSCoV-2 should be sufficient to eliminate the possibility of the virus remaining active.

Indications for Management Entities: It is recommended to disclose scientifically supported information, directed employees and the general public, in order to demystify the rumors and incorrect information spread by social networks, internet and other media. It is suggested:

<https://kwr.webinargeek.com/webinar/replay/vSPL8xegamo/>

Can coronavirus be found in untreated feces and wastewater?

The SARS-CoV-2 virus has been detected in the feces of some patients diagnosed with COVID-19, as well as in wastewater (not subject to treatment). **However, all data indicate that the virus in feces is no longer infectious,** based on data from previous outbreaks of other coronaviruses, such as SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome). There are no reports of fecal - oral transmission of COVID-19 so far.

The virus has already been detected in hospital wastewater, especially during periods of high concentration of infected patients and low ambient temperatures, however, no live SARS-CoV-2 was detected with the ability to be an infectious agent.

Hospital wastewater must be specifically monitored, treated and eventually disinfected, not only by this virus, but also by possibility of contamination by other pathogens (already widely known).

Justification: Despite the fragile structure, SARS-CoV-2 can survive 14 days at 4 °C and 2 days at 20 °C under conditions laboratories, and all the data available so far indicate that it will not have an infectious character, given the susceptibility of the virus to environmental conditions, namely temperature and disinfectant action.

Indications for Management Entities: Despite the existing information regarding the difficulty of the virus transmission via water untreated wastewater, it is suggested to make disinfectant dispensers available near water handling sites wastewater, as well as reinforcement in the use of the usual protection measures in sanitation.

Wastewater system workers should take extra precautions to protect themselves from coronavirus?

The Management Entities for sanitation services must ensure that workers follow routine practices to alleviate exposure to wastewater. This includes safe work practices and Personal Protective Equipment (PPE) normally necessary to carry out the tasks associated with wastewater handling. Protections are not recommended specific measures for COVID-19, however, increasing the frequency of proper hand hygiene is one of the most that can be used to prevent infection with the virus.

Justification: There are two main routes of transmission of the virus that causes COVID-19: respiratory and contact. The respiratory transmission occurs when respiratory droplets generated when an infected person coughs, or sneezes, and are inhaled directly by another person. Contact transmission occurs when the droplets expelled by an infected person are deposited on surfaces where the virus can remain viable.

Indications for Management Entities: The World Health Organization (WHO) guidelines on the safe management of drinking water and sanitation services apply to the COVID-19 outbreak, with no specific measures required. It is emphasized that the introduction of enhanced hand hygiene, including disinfection, will contribute to the prevention of contamination, so that the Management Entities may place alcohol dispensers together with the collection points of residual water samples as a precautionary measure. For more details see:

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>

Basic hygiene practices for wastewater and sludge system workers

- Wash your hands with soap and water immediately after handling wastewater.
- Avoid touching the face, mouth, eyes, nose, open wounds and cuts when handling wastewater.
- After handling wastewater, wash your hands with soap and water before eating or drinking.
- After handling wastewater, wash your hands with soap and water before and after using the bathroom.
- Before eating, remove dirty work clothes and eat only in designated areas, away from places with wastewater.
- Do not smoke when handling wastewater.
- Keep wounds and cuts covered with clean, dry bandages.
- Wash your eyes thoroughly with drinking water if residual water comes in contact with your eyes.
- Wear impervious gloves to avoid cuts and contact with wastewater.
- Wear rubber boots in the workplace and whenever in contact with wastewater.
- Remove rubber boots and work clothes before leaving the workplace.
- Clean contaminated work clothes daily with 0.05% chlorine solution (1 part commercial bleach for 100 parts of water).

Indications for Management Entities: It is suggested wide dissemination of this type of information among its employees, especially in the operational and maintenance ones that deal with wastewater, sludge and related equipment.

Personal protective equipment suggested

Operationally all the technical personnel of the sanitation systems, including unblocking of ducts, pumping systems, WWTP and personnel related to sludge recycling, who have direct and indirect contact with wastewater and / or sludge, have to be properly equipped, with appropriate uniform and PPE, continuous training on its use and easily accessible facilities for wash hands. These aspects are always important, but in the current phase of the global pandemic, they are still of greater relevance.

Workers should wash their hands with soap and water immediately after removing PPE. The following PPE is recommended:

- Safety glasses: to protect the eyes from droplets or aerosols from wastewater.
- Aerosol-proof face mask or shield: to protect the nose and mouth.
- Liquid-repellent coveralls: so that the residual water does not come into contact with the worker's clothes.
- Impervious gloves: to avoid exposing your hands to residual water.
- Rubber boots.

Indications for Management Entities: As in the previous point, it is suggested wide dissemination of this type of information with its employees, especially in the operational ones that deal with wastewater and sludge.

Preventive measures that can be adopted by the Management Entities

In the management of wastewater systems, the main concern is focused on the health of technical personnel assigned to operation/ exploration and maintenance of sanitation systems, including sludge recycling process operators.

Operationally, all technical personnel of the sanitation systems must be properly equipped, with uniform and respective PPE. These aspects are always important, but in the current phase of the global pandemic, they are still of greater relevance.

It is important to ensure that the Contingency Plan developed for the sanitation systems has defined the operations indispensable for the continuity of operation of the main drainage, pumping, transport, intersection and wastewater treatment, as well as for the sludge produced in the WWTP. Based on this information, the minimum number of employees per function, obligatorily active to fulfil the minimum tasks. Depending on available human resources, consideration should be given to implementing a preventive or teleworking

regime for employees to reduce contact between employees as much as possible and decrease the likelihood of infection in a given period.

At the mentioned Contingency Plan, it is also relevant to foresee the possibility of an interruption in the supply of reagents, spare parts and other equipment. So, it is recommended not only greater control of its dosing/ use, if possible, reserve storage, as well as contacting alternative suppliers, to ensure the continued operation facilities. The same strategy should be used for equipment and the respective repair (e.g. motor winding, replacement of quick-wear parts, etc.).

In the case of operations in sanitation systems, which the risk requires the simultaneous presence of two operators, under no circumstances reduce the safety conditions of operators. Two options that can be implemented, depending on the alert state existing in the country - which conditions the risk assumed in the operation of the sanitation systems.

- a) The carrying out of this type of procedures continues, but with the addition of extra security measures to reduce the possibility of contagion between technical personnel, such as maintaining a distance of at least 1 meter between operators whenever possible, as well as the use of masks, gloves and other PPE, even when there is no direct contact with residual waters;
- b) This type of task is postponed, as it is no longer possible to have two operators simultaneously, subdivided the teams to ensure that at least there is a reserve team at home, in the case of contamination of the service team.

All normal operations in the different treatment systems existing in the WWTP, which involve direct or indirect contact through wastewater aerosols can be maintained, provided that the technical personnel involved have access to PPE and changing rooms where you can take a shower and change clothes. In addition, alcoholic gel dispenser's and/or soap and water must be installed near places where wastewater handling is mandatory (e.g. sample collection, gates/ valves, cleaning of treatment systems in the WWTP, etc.).

Maintenance operations must be carried out after cleaning and washing equipment that has been in contact with water wastewater, followed by proper hygiene - now more reinforced, as a supplementary safety measure.

It also emphasizes the importance of cleaning the tools used, as well as avoiding their sharing between employees, as a way of safeguarding against possible contamination of personnel involved in maintenance - there are some indications that the virus responsible for COVID-19 can survive up to 4 hours if deposited in metallic and/or other materials, tools and other material can be contaminated by an already infected employee.

The sharing of tools, materials and other equipment related to individual operation and maintenance activities of the sewage systems and sewage sludge management should be avoided, without having previously been subject to convenient processes of cleaning and disinfection with anti-COVID-19 products.

In the case of WWTPs that have disinfection systems with a seasonal operation (usual in the summer season, in facilities close to bathing areas), they must be activated continuously and checked for full functioning, in order to guarantee disinfection of the final effluent from the WWTP.

Last but not least, sludge management at WWTPs should not be interrupted, so as not to compromise the operation of the entire treatment system. However, some additional aspects are advised, namely:

- a) Ensuring effective sludge hygienization, by lime or another method, regardless of the sludge's final destination;
- b) The mandatory use of gloves and the rest of the PPE, for personnel operating directly with the WWTP sludge;
- c) Enhance the temporary storage of sludge for 2 weeks, following the rules and legislation existing in each country, whenever possible and if there are areas available and properly prepared for this purpose;
- d) In cases of agricultural sludge recycling, ensure that the personnel involved are properly protected, including farmers;
- e) Still in the case of the processes of agricultural valorization of sludge (recycling), ensure, in this phase of the global pandemic, that good safety practices and measures in the agricultural use of sludge are ensured, namely by preventing sludge contact directly the with products intended for direct human consumption.

Final Considerations

As explained in this document, all available information indicates that it is unlikely that the new coronavirus remains active in wastewater or sludge sent for agricultural recovery.

This does not invalidate the preventive measures implemented or revised by the Management Entities responsible for sanitation systems, as a way of minimizing potential risks to Public Health and workers.

This document was prepared according to the indications of the "WHO Guidance 2020", as well as the diverse documentation made available by EurEau Commission II (Wastewater) - European Federation of National Associations of Water Services, at which APDA participates through CEAR.

The importance of updating this document is emphasized whenever new scientific data both from the presence of the new coronavirus in wastewater and from its infection and transmission in humans.

APDA

APDA is an organization that represents and defends the interests of the Portuguese entities responsible for water supply and wastewater services, as well as all stakeholders in this field. At the same time, encourages the treatment, research and development of issues related to the quantity and quality of water supply, drainage and the final destination of wastewater, providing a forum for professionals and experts from different backgrounds. The Specialized Committee for Wastewater Services (CEAR, in Portuguese) develops its activity with a focus on issues related to drainage, sanitation systems, treatment and reuse of wastewater and sludge from Wastewater Treatment Plant (WWTP).

CEAR

Comissão Especializada de Águas Residuais (Specialized Committee for Wastewater Services)