

Technical Guide Part 3 on SARS-CoV-2 Wastewater Surveillance - Sample Logistics and Data Submission

This Technical Guideline is part of four working documents. The working documents are closely related from a technical point of view and should be considered together:

- Technical Guideline Part 1 for SARS-CoV-2 Wastewater Surveillance
 - Sampling Wastewater
- Technical Guideline Part 2 for SARS-CoV-2 Wastewater Surveillance
 - Molecular Biological Analysis
- Technical Guideline Part 3 for SARS-CoV-2 Wastewater Surveillance
 - Sample Logistics and Data Submission
- Technical Guideline Part 4 for SARS-CoV-2 Wastewater Surveillance
 - Data Processing

This guideline provides the basic principles for the transport of raw wastewater samples for subsequent analysis by PCR for SARS-CoV-2, as well as the electronic submission of the generated data.

The guide also explains how the data recorded by the wastewater treatment plants, the laboratories and the monitoring data are submitted electronically.

This guide describes the following areas:

- 1. Sample logistics**
- 2. Data submission**
- 3. Responsibilities**

1. Sample logistics

The sample containers / bottles (polyethylene with screw cap) are supplied with a sticker label containing the following information and sent to the PCR analysis laboratory:

- Name of the wastewater treatment plant
- Wastewater treatment plant sample identification number
- Date and time of sampling

The sample must be transported refrigerated/tempered; a temperature stability of $5^{\circ}\text{C} \pm 3^{\circ}\text{C}$ must be ensured; especially on very cold and very hot days.

The sample must reach the laboratory no later than 24 hours after being provided by the wastewater treatment plant. It is planned to reduce this transport time, ideally so that an analysis result of the sample can be submitted to the database of the Federal Environment Agency (Umweltbundesamt/UBA) within 48 hours to 60 hours.

The sample containers (polyethylene bottle, insulation, ice packs) are provided by the laboratory

and sent to the wastewater treatment plants. They can be cleaned and reused. It must then be ensured that the containers can still be tightly closed.

2. Data submission

The database for the SARS-CoV-2 data is available via an interface (web application). Monitoring data can be imported into the database via the web application. Ready-made, site-specific Excel templates from the UBA for data submission are sent to the wastewater treatment plants/laboratories/federal state authorities in advance. The data formats are defined in the data template. The structure and functionality of the Excel templates must not be changed, as an initial plausibility check of the data is carried out during the data submission. Some of the data to be submitted are mandatory fields, others are optional fields to be filled in. An explanation of this and the parameters of the plausibility check are stored in the templates.

There are three different templates:

Wastewater treatment plant master data sheet (Appendix 1): This contains the unchangeable parameters of the wastewater treatment plant. This includes:

- EU identification code of the wastewater treatment plant (DEPT key according to UWWTD (urban wastewater treatment directive) reporting, pre-filled by UBA)
- Full contact details for wastewater treatment plant
- Size, connected population
- Wastewater composition (total, indirect dischargers, proportion of extraneous water)
- Information on sampling point, sampler
- Volume of the individual sample

The template is sent to the UBA once at the start of wastewater monitoring, or if the technical data change significantly. The data will be stored in the database.

Laboratory master data sheet (Appendix 2): This contains the constant parameters of the laboratory. This includes:

- Laboratory identification code (provided by UBA)
- Full laboratory contact details
- PCR method used, gene sequences analyzed, limits of quantification
- Number of replicates and controls, standards
- Concentration method used
- Volume of waste water used
- Volume of RNA/nucleic acid extract used

The template must be sent to the UBA once at the beginning of wastewater monitoring, and in addition if the laboratory process of the analysis changes significantly, or if the laboratory carrying out the analysis changes.

Monitoring data sheet (Appendix 3): This sheet contains the changing data sets of the continuous wastewater monitoring (wastewater treatment plant data, laboratory data), as well as data for quality control of working processes. This includes sampling data:

- Wastewater treatment plant location (DEPT key, name)
- Day/time of sampling (begin and end of the sampling period*), sample volume
- Average volumetric inflow rate at the plant during the sampling period
- pH value, conductivity, temperature

This includes laboratory analysis data:

- Laboratory, Sample ID
- Temperature upon arrival at the laboratory/ at the start of sample preparation
- SARS-CoV-2 gene copies detected
- Gene copies of surrogate viruses (PMMoV, CrAssphage) detected

* The sampling date is the date at the end of the sampling period.

The monitoring data must be clearly assigned to the location of the related wastewater treatment plant and the laboratory performing the analysis. When importing data, the monitoring data sheet can only contain data from a single measuring point. However, it can be extended. It is also possible to import data from different wastewater treatment plants and from multiple samplings or sampling times simultaneously.

3. Responsibilities

Depending on the procedure in a federal state (German: Bundesland), the responsibility for data submission may lie directly with the state authority's central office or at the individual wastewater treatment plants/laboratories (decentralized solution).

In the case of central responsibility of a state office, the state's authority can decide in which form it receives the data from the wastewater treatment plant(s) and laboratory(s) and then import them into the UBA database using the templates provided.



In the case of a decentralized solution, the relevant wastewater treatment plants/laboratories must be contacted in advance to clarify who enters the data into the templates provided and into the UBA database.

If the wastewater treatment plant participates in the Federal Analysis, the wastewater treatment plant submits its data to the Federal Analytics Laboratory. The laboratory is responsible for submitting the monitoring data to the UBA database.

Institutions/persons can view their own data at any time and without restrictions for their own purposes.

The access data to the UBA database (PiA monitor) and the specific templates will be provided by the UBA on request. An instruction for using the database will also be provided.

The data must be submitted regularly. If no data is submitted for three months, the contact may be terminated. If more than 80% of the data are incomplete after 12 weeks or if no data entries are made within 2 weeks, an automated reminder will be sent, followed by a personal reminder after a further week (see appendix: Flowchart for communication of missing sample data).

Contact	Umweltbundesamt, sarscov2@uba.de Robert Koch-Institut, abwassersurveillance@rki.de	
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Further literature	<ul style="list-style-type: none"> • Handout analytical guidelines (German: "Handreichung zur Analytik"), ESI-CorA document • Appendix: Flowchart for communication of missing sample data • Standard ISO/WD 7014:2022 "SARS-CoV-2 in wastewater" 	