

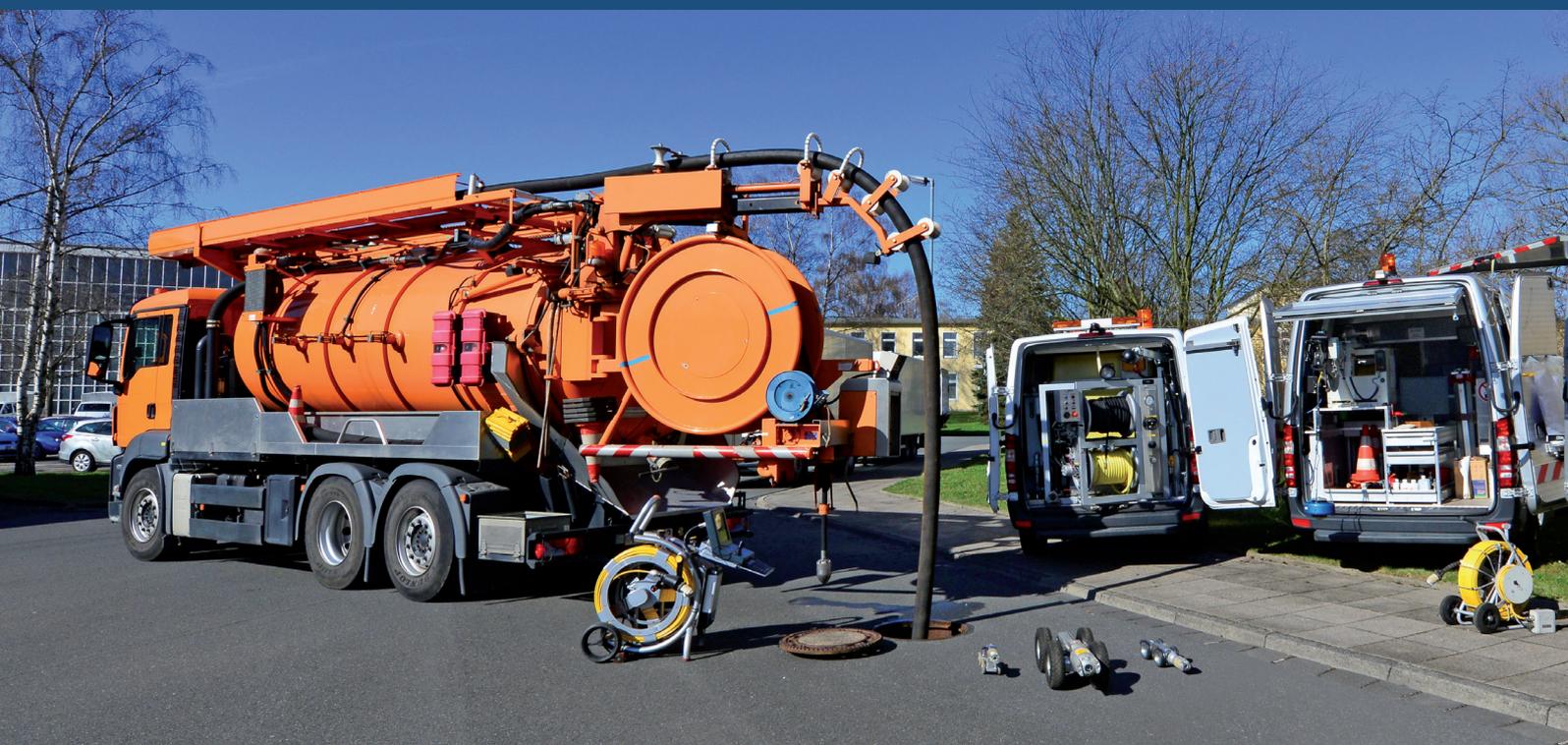


Federal Ministry
for Housing, Urban
Development and
Building

Federal Ministry
of Defence

Baufachliche Richtlinien Waste Water Guidelines

Summary of the Guidelines for planning, construction and
operation of waste water facilities in Federal Real Estate



1 Foreword

The Federal Republic of Germany is the owner of real estate used for both civilian and military purposes. An operable infrastructure is crucial to the designated usage of the real estate, requiring internal supply and disposal systems such as sewage networks. The sewer networks on the estate used by the armed forces alone are comparable in size to the sewage systems of Hamburg and Munich combined. The responsibility for the construction, maintenance and operation of the Federal estate, including all supply mains and disposal facilities, lies with the Construction Administration of the Federal States, the Federal Real Estate Agency and the Property Management Offices.

Within the framework of environmental protection and on the basis of the Federal Water Act (Wasserhaushaltsgesetz) and subordinate State Laws, self-monitoring ordinances (Eigenkontrollverordnungen) and municipal by-laws, the responsibility lies with the Federal Real Estate Agency (BlmA). The BlmA has to inspect and keep records of the waste water facilities' condition within defined time intervals, maintain the facilities to the standard of state-of-the-art technology and have remedial works carried out as necessary. The person in charge of operating the facility is personally responsible for averting any danger to public safety or order that may be caused by waste water facilities.

In order to carry out construction and remedial works the BlmA has to commission the Construction Administration of the Federal States.

The Technical Waste Water Guidelines (BFR Waste Water) offer comprehensive help with the planning, construction and operation of waste water facilities on Federal real estate. It is published by the Federal Ministry for Housing, Urban Development and Building (BMWSB) and the Federal Ministry of Defence (BMVg).

Based on current technical standards and regulations, a quality management is defined in the BFR Waste Water Guidelines to enable sustainable and especially economical planning, construction and operation of waste water facilities on Federal real estate. At the same time, the BFR Waste Water Guidelines are the functional basis for the data handling tools that have been introduced in the Construction Administration.

2 General Information

The BFR Waste Water Guidelines apply to the planning and operation of waste water facilities on Federal real estate in accordance with the "Regulations for the Implementation of Federal Construction Projects" (RBBau).

As a rule, the regulations of the BFR Waste Water Guidelines must be complied with. They represent the requirements with respect to quality assurance in planning and structural and operational services, that must be met prior to, during and after the services have been rendered. They are also intended to guarantee a nation-wide, uniform and thus comparable procedure.

The BFR Waste Water Guidelines serve mainly to ensure compliance with the principles of economy and thriftiness set out in Art. 7 BHO (Federal Budget Regulations), while taking into account the constraints of the water authorities and the principles of sustainability (see also RBBau A (1), in conjunction with K 5, (1) ff.).

Since the introduction of the EU Water Framework Directive in December 2000, the idea of sustainability in planning, construction and operation of sewage facilities has increased in significance. In terms of sustainability, ecological and economical factors are to be taken into account in principle. With regard to technical waste water procedures, this includes the following objectives:

- ▶ Minimization of water consumption
- ▶ Minimization of stormwater run-off, if possible with decentralized stormwater management
- ▶ Prevention of ground and water contamination
- ▶ Separate management of dry weather flow and stormwater according to WHG
- ▶ Minimization of operating and maintenance costs
- ▶ Consideration of urban construction and landscape issues

Also, the special conditions with respect to Federal real estate are to be taken into account.

The 2nd edition of the BFR Waste Water Guidelines was introduced by decree

- ▶ dated June 01, 2001, by the Federal Ministry of Defence (BMVg) and
- ▶ dated December 11, 2001, by the Federal Ministry for Transport, Construction and Housing (BMVBW), today Federal Ministry for Housing, Urban Development and Building (BMWSB).

The BFR Waste Water Guidelines in their latest version are available on the internet:

www.bfr-abwasser.de

Scope of Application

Objectives

Ministerial Regulations

Distribution

3 How the procedure works

The steps in the procedure for planning and executing building measures at waste water facilities on Federal real estate are as follows:

- ▶ General planning (LAK)
- ▶ Object-related planning and construction
- ▶ Documentation
- ▶ Operation

Planning and construction of waste water facilities form the basis for operation. Operating instructions must be taken into account, therefore, in all planning phases. Conversely, valuable information can be gained from the planning stage pertaining to future operation.

General planning is carried out for Federal real estate in the form of the Estate Sewage Disposal Concept (LAK). Using the LAK an overall sewage disposal plan is developed based on the current inventory and condition data of the waste water facilities, operational experience and future use. In this phase the estate is regarded as a whole. With this approach it is achieved that both the effects of individual measures on the entire system and the primary structural requirements as a specification for the individual building measures are taken into consideration.

General estate-planning

As a first step, the technical condition of the drainage system is detected by a visual inspection on the basis of digital inventory data. Besides detecting the technical condition, the hydraulic capacity is also determined. For this, the discharge capacity of the waste water system is calculated with the help of hydraulic programmes on the basis of the digital inventory data. Afterwards, the technical and hydraulic conditions of the system are automatically evaluated. This provides not only a first summary of the existing systems' condition but also the possibility of a standardized comparison of estates, which can be used for control and steering tasks.

The second step is to develop a technical overall drainage plan or to update an existing one, taking into consideration operational experience and future use of the estate. The integrated analysis of the waste water system enables a facility-independent comparison of refurbishment options. On the basis of the overall concept, individual construction projects are at first defined, then planned and implemented in detail. Drawing up an LAK ensures that the principles of cost effectiveness are taken into account, the required hydraulic safety regulations are adhered to and also the quality in planning and in execution is maintained.

Requesting step one and step two are splitted in 2 different processes.

For process optimization the above described two steps are combined and reduced on necessary demands for small LAKs with less than 1.000 m drainage system length. Additionally the request and execution of refurbishment measures are aimed to be part of the process.

Based on the integral approach in the LAK individual projects can be planned and executed sectorally. The object-related planning is performed in the planning phases of the HOAI (Official Scale of Fees for Services by Architects and Engineers).

Notes on planning and execution of refurbishment measures can be found in the appendix Refurbishment Procedures of the BFR Waste Water Guidelines.

The planning, constructing and operating of waste water facilities are carried out on the basis of digital data. It is indispensable that the documentation is consistent and reliable. Only in such a way can data from different specialty areas be permanently filed and maintained in one system.

The relevant surveying regulations (BFR Verm) define a consistent standard for detection and digital documentation of all facilities on Federal real estate, whether they are used by the military or by civilians. This ensures the quality consistency of recorded data nationwide and facilitates the exchange, the comparability and the usability of the data. As-built documentation in accordance with BFR Verm serves as the geometrical basis for data in the "Estate Information System for External Facilities" (LISA ®).

Different specialty areas can profit from consistent as-built documentation, and inter-disciplinary information can be used as required. The digital data exchange formats are part of the BFR Waste Water Guidelines. They ensure faultless data transmission between customer and contractor and therefore provide quality assurance.

When a project is handed over, the operator receives the up-to-date as-built documentation and all the documents required for operation. These must also be used by the operator for controlling and optimising the waste water facilities. The BFR Waste Water Guidelines stipulate fundamental regulations for this.

In support of the operational organization, the BFR Waste Water Guidelines offer documents and examples, such as operation logs with test reports on carrying out a general inspection. Unusual occurrences during day-to-day operations should be documented and provided to the planner as necessary. They are a valuable basis for the planner and enable better solutions which are adapted to the local conditions. The requirements for the economic operation of the facility must be taken into account in all planning phases. This procedure ensures lasting continuance in the operation of the facility and optimised operational procedures. The procedure of planning, construction and operation of waste water facilities has thus come full circle.

Object-related planning and construction

Documentation

Operation

4 Content

The origin of the BFR Waste Water Guidelines goes back to 1991 when the "ISYBAU-oriented action concept" was initiated for Federal and Land real estate. In January 1996 this action concept was replaced by the 1st edition of the BFR Waste Water Guidelines. After fundamental revision and amendment, the 2nd edition of the BFR Waste Water Guidelines in the current form was published in June 2001. This 2nd edition is continually being revised and extended.

4.1 Main Part

After a general introduction the main part of this Guide includes fundamental, technical and procedural regulations. The regulations presented in the main part are explained in detail in the technical part of the Appendices, including procedures and implementation.

The following regulations (most recent version) are listed in the Chapter "Legal and Technical Basis" in the main part as well as in the respective appendices:

- ▶ EU Directives, Federal statutory provisions,
- ▶ Decrees, regulations and guidelines from the Federal Ministries of Construction and Defence (BMUB and BMVg), and
- ▶ Standards and technical regulations

The Chapter "Planning and Implementation of Construction Projects" includes regulations for all project phases during the construction of waste water systems. General planning for the Federal real estate (Chapter 3.1) is carried out in the form of an "Estate Sewage Disposal Concept (LAK)". Taking this approach, the estate is considered as an entirety and an overall concept with regard to drainage engineering is developed, in analogy to a master drainage plan. Finally - if required - construction projects are defined on the basis of the overall concept. The LAK regulations serve as

Legal and Technical Basis

Planning and Implementation of Construction Projects

the engineering regulations for the waste water section of the "Decision Document - Construction" (Entscheidungsunterlage - Bau) (ES - Bau). They have a dominating influence on total costs (see Fig. 4-2).

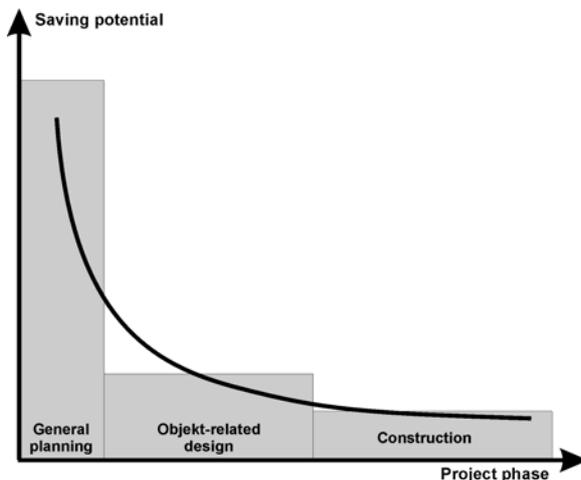


Fig. 4 - 1 Possible cost influencing factors (diagram from BFR Waste Water)

The object-related design (Chapter 3.2) refers to the construction tasks defined within the framework of the general planning and forms the basis for the preparation of the "Design Document - Construction" (Entwurfsunterlage - Bau) (EW - Bau). The object-related design, which ends with the construction planning, is followed by the construction (Chapter 3.3).

The following fundamental decisions on operational processes are made in the Chapter "Management of Waste Water Technical Systems":

- ▶ "Operational Instructions for Planning and Construction",
- ▶ "Planning Instructions for Operation", and
- ▶ "Operation"

Management

In addition to this, it is pointed out again and again that the operator's notes and the requirements of the user have to be included in any planning or construction phase. The operator is requested to compile operational notes on planning and design, and to submit these data already during the phase of general planning. Subsequent to general planning and following construction, the operator shall be given all documents necessary for a uniform as-built documentation in accordance with the relevant surveying regulations (BFR Verm) as well as those pertinent to the operation of the new or refurbished waste water facilities in compliance with the RBBau, subparagraph H. Furthermore, the planner is requested to pro-

vide the operator with information which is important for the operation, The "Checklistenmaster" can be used to determine the required amount of documents.

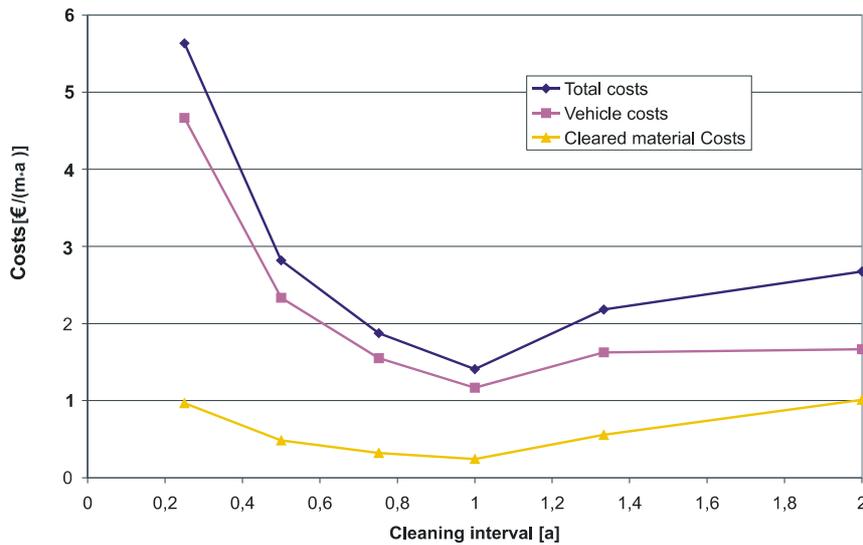


Fig. 4 - 2 Cleaning costs as a function of the cleaning interval

To minimize the operating costs, there is an urgent need to take every operational aspect into account right from the planning stage, and use of EDP support based on a digital as-built documentation is indispensable.

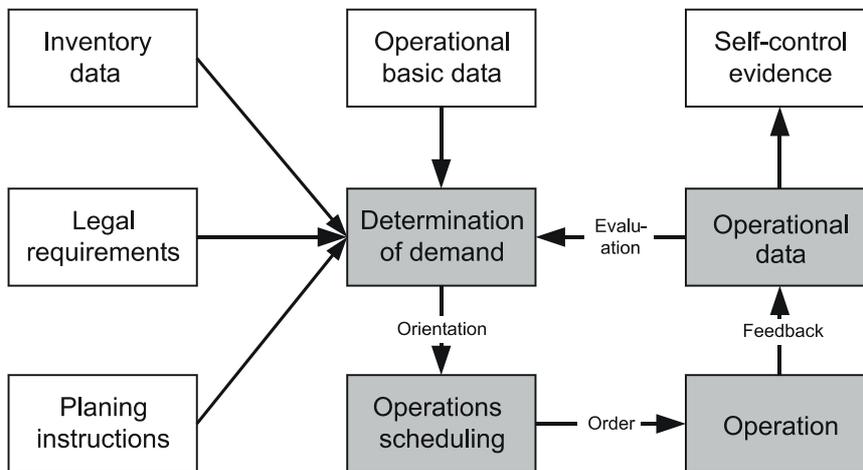


Fig. 4 - 3 Operational optimization

Important information on how to optimise the operation of the facility is included. The objective of optimisation in the sense of facility management is to manage and control waste water facilities so that the legal requirements are observed, the functional capacity is continuously maintained and any harmful environmental impact is minimised.

The Chapter 5 „Documentation“ contains procedural guidelines for the systematic recording and permanent storage of technical wastewater data with the help of the Wastewater Information System (FIS). The primary record-keeping system component is the „Estate Information System for External Facilities“ (LISA ®). Within the documentation process, all structural changes to the actual on-site inventory, such as remedial actions are digitally recorded and documented (data continuation).



Fig. 4 - 4 Estate Information System for External Facilities LISA ®

The recording of the wastewater technical installations in Federal estates is carried out in accordance with the specifications of the relevant surveying regulations (BFR Verm) and the BFR Wastewater.

The software-related basis for the uniform, unambiguous and cross-subject documentation of the digital data of all External facilities in LISA is the real estate inventory model, which is included in the BFR Property Inventory Documentation (BFR LBestand). The BFR LBestand also contain the signature catalogue for the plan representation.

The exchange of data between the recording components at the building level and the primary verifying system component LISA is carried out with the exchange formats GML in the form of of LgBestMod and ISYBAU XML Wastewater..

The interdisciplinary management of digital data in the primary record enables multiple use of the collected technical data, which improves the quality of the planning and construction services to be provided; long-term investment and operating costs can be saved.

4.2 Appendices

The Appendices are based on the regulations in the main part. They describe in detail the procedures for implementation.

The Appendix "Definitions" contains regulations governing the clear coding scheme for drainage systems. This includes, for example, consistent assignment of codes for manholes and reaches.

A-1 Definitions

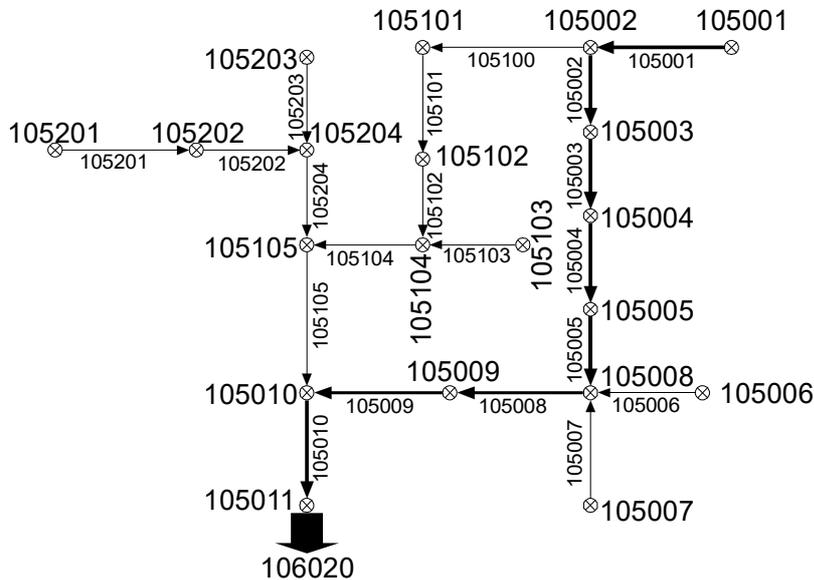


Fig. 4 - 5 Example of the classification system of a sewer network section

The Appendix 2 "Cleaning and Inspection" contains detailed instructions on carrying out preparatory cleaning activities for the inspection of sewer systems and standards for the implementation and documentation of optical inspections of reaches, small pipes, manholes, inspection chambers and special structures of the sewer system. The specifications also include regulations on the measurement of the course of connecting lines by means of sensor technology. Furthermore, specifications and documentation of physical leak tests are included.

A-2 Cleaning and Inspection



Fig. 4 - 6 Inspection van with inspection cameras

The documentation of the inspections is done on the basis of the visual inspection coding system of DIN EN 13508-2 "Investigation and assessment of drain and sewer systems outside buildings - Part 2: Visual inspection coding system" in combination with worksheet DWA-M 149-2: 2013. The mandatory rules describe the inspection codes and the recording of damages in reaches, small pipes, manholes and inspection chambers as well as in refurbished sections of reaches, small pipes and manholes. The visual inspection coding system of the DIN EN 13508-2 is not to be used for special structures of the sewer system. In this case, the condition is to be described in words.

The Appendix "Classification and Evaluation of Condition" contains a description of the procedures for the structural evaluation of reaches/small pipes and manholes/inspection chambers as well as the hydraulic evaluation of manholes and reaches.

The Classification and Evaluation of Condition are based on the descriptions of the condition of reaches/small pipes and manholes/inspection chambers determined by visual inspection. The evaluation is done automatically, thus ensuring process efficiency.

The purpose of the hydraulic evaluation is to get an overview of the hydraulic capacity of a drainage network in order to be able to estimate whether remedial work is required.

A-3 Classification and Evaluation of Condition



Fig. 4 - 7 Damage in a stormwater sewer with immediate action required

The Appendix "Hydraulic Calculations" was adjusted to comply with DWA Worksheet A 118, and to consider the specific features of Federal real estate. For calculation purposes, sewer systems are first classified along specific criteria into different levels of complexity, i.e. single reaches or simple or complex sewer systems. The precipitation load, the calculation

A-4 Hydraulic Calculations

procedure and the target variable is specified for each of these types of system. A checklist facilitates the implementation and verification of hydraulic calculations as well as the evaluation of the results.

The Appendix "Stormwater Management" contains detailed regulations for the close-to-nature handling of stormwater (e.g. above ground infiltration ponds), based on the specifications from DWA-A 102, part 1 and 2 and DWA-A 138. Due to mainly high availability of areas on Federal real estate, stormwater management is of great importance for the hydraulic remedial action of the existing drainage systems and has a high potential for the restoration of the natural water cycle.

A-5 Stormwater Management



Fig. 4 - 8 Infiltration pond with surface inlets

In the Appendix "Remedial Procedures" there are remedial procedures for reaches, small pipes and manholes described in detail, as well as assessment matrices for narrowing down the choice of remedial procedures.

A-6 Remedial Procedures



Fig. 4 - 9 Repair and refurbishment of a reach (section of sewer)

Remedial procedures are described on standardised data sheets as follows:

- ▶ Procedures
- ▶ Scope of application
- ▶ Technical requirements and constraints
- ▶ Advantages
- ▶ Disadvantages
- ▶ Environmental and legal requirements
- ▶ Duration of construction
- ▶ Additional technical contractual terms for quality assurance
- ▶ Description of services
- ▶ Construction supervision
- ▶ Quality certificates

Furthermore, Appendix A-6 contains information and documents for refurbishing separator systems for light liquids and grease separators.

In the Appendix "ISYBAU Exchange Formats for Waste Water (XML)" the content of the ISYBAU exchange formats and the fields of application are described in detail. They are used for the standardised digital data exchange between the employing authority and the contractor and others involved in the project. XML (EXTensible Markup Language) format is used throughout.

A-7 ISYBAU Exchange Formats for Waste Water (XML)

In general, the XML-ISYBAU Exchange Format consists of five different data sections:

- ▶ metadata
- ▶ primary data
- ▶ condition data
- ▶ hydraulic data
- ▶ operational data
- ▶ presentational data

Metadata are administrative data and information about an estate. At the same time, they form the header of the ISYBAU Exchange Format.

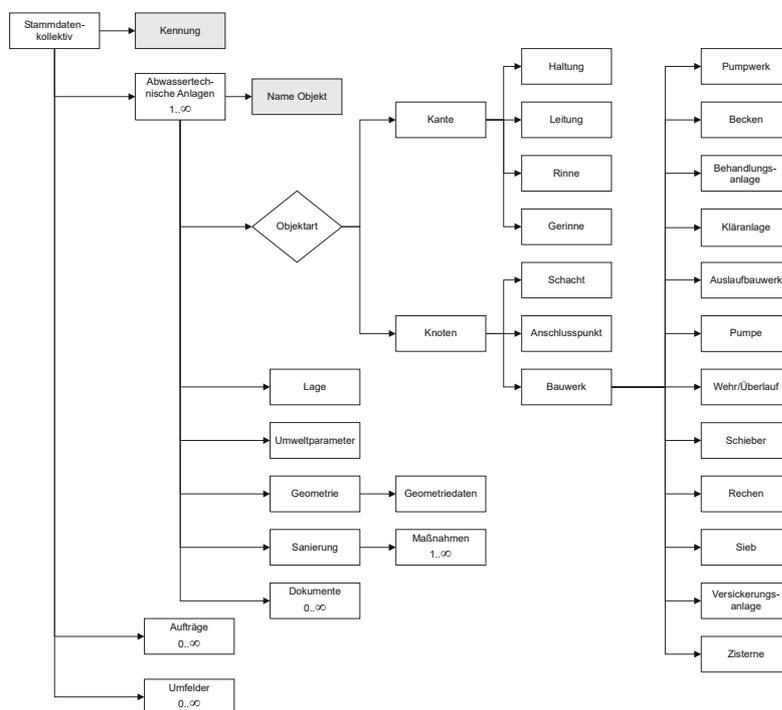


Fig. 4 - 10 The ISYBAU exchange formats ensure a consistent exchange of waste water-related technical data for planning and design.

The primary data of wastewater facilities are differentiated by type (e.g. reaches, small pipes, manholes and special structures). Facilities for decentralized stormwater management and the corresponding surrounding data are also integrated. Special structures are further divided into distinctive types. For all defined types it is possible to exchange geometric data and substance data (e.g. material). For reaches, small pipes and manholes it is also possible to exchange data on contract-related remedial work.

The section for condition data includes information on the visual inspection, water-tightness tests and the film records of the inspection.

The hydraulic data section of the ISYBAU Exchange Formats makes it possible to store complete hydrological/hydraulic data taking into account the requirements of DIN-EN 752.

The operating data section includes observations containing information about the location of the groundwater monitoring wells and soil properties.

The presentation data section comprises a data collective for transferring the design of plans with regard to text and symbol placement.

The Appendix "LAK" contains information on the implementation of Estate Sewage Disposal Concepts (LAK).

A-8 LAK (Estate Sewage Disposal Concepts)

In the LAK, for reasons of process optimisation depending on the size of the existing drainage system, the LAK is divided into Part A (basic assessment) and Part B (remediation planning) for large properties and the LAK for small civil properties. As a guideline is a drainage system length of 1,000 m. Regardless of the procedure, the same technical requirements for achieving the protection goals apply: Stability, operational safety and tightness of the drainage system.

For definition of service items required for implementation of Estate Sewage Disposal Concepts (LAK) an internet based software application is provided (Materialien/Anwendungen). A set of quotation specifications constitutes the basis for selection of relevant service items depending on the existing waterwater system in real estates. In addition a sample contract and technical specifications for implementation of Estate Sewage Disposal Concepts (LAK) are provided.

In this way uniform regulations are provided in order to prepare master drainage concepts for drainage systems on Federal real estate including basic data for implementation. The process of the LAK with the technical tasks and responsibilities is described in detail with the help of project flow lists.

When working on Estate Sewage Disposal Concepts, the following operational aspects must also be taken into account:

- ▶ Prior to the preparation of the LAK, the operator must compile and evaluate from an operational perspective any administrative and estate/structure-related operational data for planning and design.
- ▶ The information flow between operator, planner, user, and, if required, the approving authority is to be ensured by discussions about the LAK. In this way any unnecessary work, such as the multiple collections of data, can be avoided.

The comparison of several remedial alternatives must be accomplished by a cost comparison and, if necessary, with an economic feasibility study. Therefore, a standardized procedure based on "Leitlinien zur Durchfüh-

zung dynamischer Kostenvergleichsrechnungen" [DWA, DVGW, 8th edition 2012], as proposed by the "Länderarbeitsgemeinschaft Wasser", has been laid down in Appendix 8 "LAK" of the BFR Waste Water Guidelines.

The Appendix "Plans" contains the requirements with regard to the content of plans and the kind of representation of technical plans (e.g. scales, regulations in according with BFR Verm).

A-9 Plans

The Appendix "Management and Operation" contains time limits for maintenance work as required by statutory regulations and decrees as well as examples of

A-10 Management and Operation

- ▶ operating instructions,
- ▶ alarm schedules,
- ▶ operational data for the LAK and
- ▶ operational logs and inspection reports for separator systems.

The Appendix "Laws and Regulations" contains lists of Federal and Land laws and regulations and those of technical associations/federations and professional organisations for waste water facilities.

A-11 Laws and Regulations

4.3 Materials

A-4.3.1 Tracked changes

The BFR Waste Water Guidelines are continually being updated. For comparison's sake, the changes are documented under "materials" in the section "tracked changes".

A-4.3.2 Information

This section contains informative documents which elucidate relevant or complex issues of the BFR WasteWater. This includes the following topics:

- ▶ Planning and construction of wastewater system as part of building construction measures
- ▶ LAK for small civil properties
- ▶ Heavy rainfall - objekt protection and structural precautions in federal civil federal real estate
- ▶ Notes on the course of the project for the implementation of LAKs and on the implementation of construction measures in small civilian federal real estate
- ▶ Hydraulic condition classification
- ▶ Sketches for modelling of wastewater systems within the as-build documentation
- ▶ Notes on the preparation and verification of data and documents of a LAK Part A

- ▶ Notes on data transfer from LAK Part A to the LISA as-build documentation
- ▶ Notes on asset valuation

A-4.3.3 Software Applications

The "Applications" section provides the user with interactive applications.

The selection of service items for inquiries about fees for Estate Sewage Disposal Concepts (LAK) for planning consultancies is supported by the internet application "Inquiry about fees for LAK". Different dialogues assist the user in setting administrative details, defining setting values and pre-selecting quotation specifications depending on the existing wastewater system of the real estate involved. Based on the preselected quotation specifications the user may select relevant service items and may specify quantities and options. The selected service items are checked for plausibility. The service items are plotted in a structured document which is used for inquiries about fees to potential contractors for implementation of Estate Sewage Disposal Concepts (LAK). In addition, a consistent specification of required digital data that the contractor has to provide for the waste water system of each real estate is defined by the application. The data specification is based on the description of the "ISYBAU Exchange Formats for Waste Water (XML)" in Appendix 8.

Inquiry about fees for LAK



Abb. 4 - 11 Inquiry about fees for LAK

The decision support for selecting remedial procedures is based on the contents of Appendix 6 "Remedial Procedures" of the BFR Waste Water Guidelines.

Remedial Procedures for Selection

Declaring input variables such as

- ▶ nature of damage (e. g. corrosion caused surface damage)

- ▶ requirements for a remedial procedure (e. g. increase in the static carrying capacity)
- ▶ boundary conditions for a remediation procedure (e. g. rebuilding of inflow branches)

form the basis for the selection of certain procedures, which are categorized as follows:

- ▶ for limited application only
- ▶ suitable or
- ▶ recommended.

The Appendix "Remedial Procedures" contains direct access to detailed descriptions of the procedures selected.

Fig. 4 - 12 Selection of remedial procedures

A-4.3.4 Examples

To support the Construction Agencies and to ensure quality management when setting up Estate Sewage Disposal Concepts (LAK), an example LAK with reports, data sheets and plans is provided.

Example LAK

The content of the example project meets the requirements of the BFR Waste Water Guidelines. Exceptional features with regard to contents and procedures are discussed in the report.

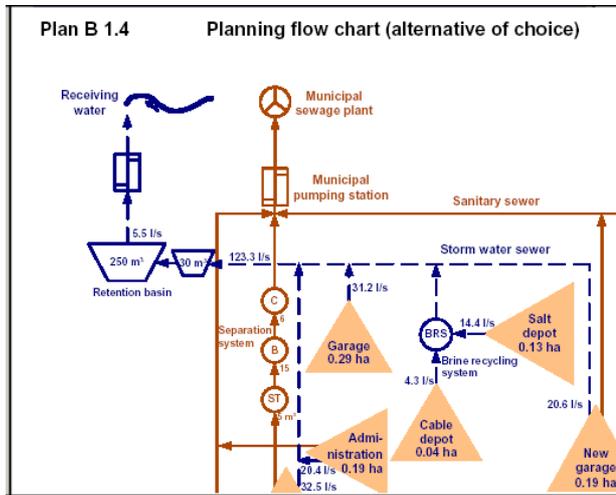


Fig. 4 - 13 Example LAK

Appropriate example data are provided to clarify the specifications of the required data size within the framework of the inventory and condition data detection of waste water facilities and for a standardized data interchange with the ISYBAU Exchange Formats for Waste Water (XML).

Example data

A-4.3.5 Plans

Examples of plans contained in the BFR Waste Water Guidelines are also available on the internet. Plans can be looked at on the display and plotted using the familiar functions from CAD programs, such as 'Zoom', 'Pan', 'Layer on/off'.

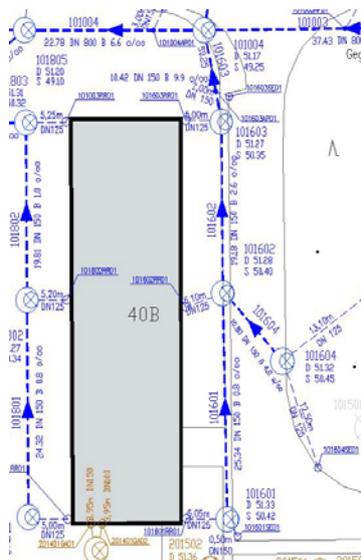


Fig. 4 - 14 Inventory plan on the internet

A-4.3.6 Templates

The section "Templates" provides the user with templates and example documents.

This includes templates for general planning, operation und remedial procedures which can be used immediately for project execution and work:

- ▶ LAK-handling, Part A and Part B
 - ◆ Contract sample
 - ◆ Technical specifications
 - ◆ Example of Part II of the "Decision Document - Construction" (ES - Bau)

- ▶ Management and operation
 - ◆ Examples of operating and work instruction for waste water facilities
 - ◆ Examples of alarm schedules for water pollutant accidents
 - ◆ Examples of operational logs and inspection reports for separator systems
 - ◆ Examples of operational data for the LAK
 - ◆ Example for the appointment of a water protection executive

- ▶ Remedial procedures
 - ◆ Evaluating matrices to pre-select remedial procedures of reaches, small pipes and manholes
 - ◆ Cost schedules for non-accessible reaches and small pipes
 - ◆ Example service catalogues for separator systems

- ▶ Leakage tests
 - ◆ Example of inspection reports for water pressure tests
 - ◆ Example of inspection reports for over- and under-pressure air tests

A-4.3.7 Decrees

Furthermore, the "Documents" section contains relevant decrees issued by the Federal Ministries. Construction and Defence Agencies are allowed access to the decrees by means of a password.

5 User assistance

In addition to the provision and maintenance of the BFR Waste Water Guidelines the Federal Competence Centre for Sewage Technology (Leitstelle des Bundes für Abwassertechnik) provides user assistance by means of

- ▶ information on current and future developments
- ▶ information on the "Information System Waste Water" (FIS Abwasser) and the software applications that belong to it
- ▶ the provision of the current and previous editions of the BFR Waste Water Guidelines including example documents.

The Federal Competence Centre for Sewage Technology provides its information material on the internet at

www.leitstelle-des-bundes.de/awt.

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