

WATER KNOWS NO BOUNDS

This sentence has had a special meaning for the three federal states Baden-Wuerttemberg, Hesse and Rhineland-Palatinate in the border triangle of the Rhine-Neckar metropolitan area for many decades already. We know that we cannot protect the River Rhine as an area of unspoiled nature nor for the manifold ways of use by Man unless we act jointly to keep an eye on the quality of its water. It is our goal to recognize potential impairment quickly and to overcome the consequences of potential pollution together.

The Rhinewater Control Station Worms is a visible sign of this intensive cooperation in the protection of water bodies. As a common installation of the three federal states, it has acquired an important international reputation since 1995 being an important site for water quality monitoring, but also as an institution for environmental education for guests from all over the world. The three federal states have concluded an agreement to secure the financing and operation of the Rhinewater Control Station also in the future, and to strengthen it in order to overcome new challenges.

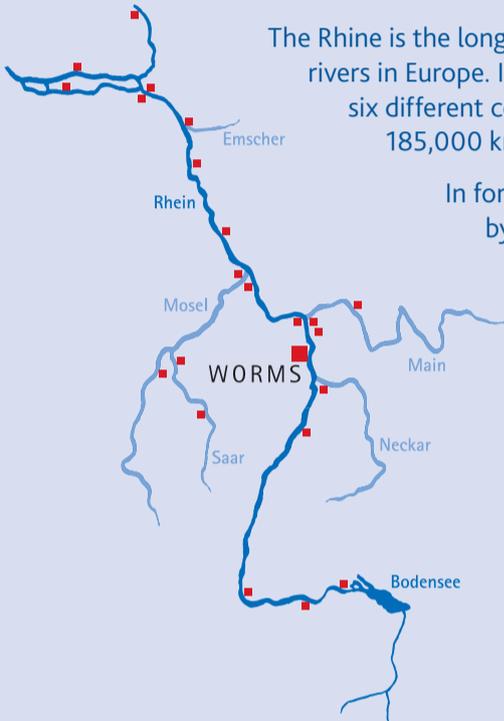
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WHY ARE WE MONITORING THE RHINE AROUND THE CLOCK?



The Rhine is the longest river in Germany and one of the major rivers in Europe. Its course of 1,230 km takes it through six different countries. The entire catchment area of 185,000 km² is home to approx. 58 million people.

In former times, the riverside was characterized by fishermen's huts and barges. Today these have given way to cities, industry and cargo vessels. 50 % of all Europe's chemical industry is located on the Rhine. The Rhine is a source of retreated drinking water for approx. 20 million people.

The intensive use of the river almost led to its biological death. In the mid-1970s certain sections were considered highly polluted, but various efforts helped it to recover by and large. Today it is the habitat of many different forms of life.

A particular strain on water quality stems from industrial companies and the high level of shipping activity. Industrial incidents or shipping accidents can lead to spills of substances that are harmful to the water.

A chain of monitoring stations was installed in order to monitor water quality, reaching from Lake Constance to the Rhine estuary on the North Sea coast.

If the contamination is detected at an early stage, the alarm can be triggered and measures taken in order to protect the drinking water supply and the ecosystem of the Rhine.

THE RHINEWATER CONTROL STATION

After the major chemical incident in Basel in 1986, the German States of Baden-Wuerttemberg, Hessen and Rheinland-Pfalz agreed in 1990 to establish and operate a joint Rhinewater Control Station in Worms.



The objective was to close the gap in the monitoring network for the Rhine-Neckar conurbation.

Construction began in 1993. Trial operation was launched in 1994 and 17 May 1995 marked the official start of operation one year later.

From 1998 until 2011 the Rhinewater Control Station also acted as the "Rhinewater Quality Management Bureau" for the major monitoring stations in the German catchment area of the Rhine below Lake Constance. Since 2012, the station hosts the secretariat of the German Rhine River Basin Community (FGG Rhein).

FUNCTIONS:

1. **Trend Monitoring**
 - Measuring and rating water quality according to internationally agreed programmes (EU Water Framework Directive: surveillance monitoring)
2. **Alarm Monitoring**
 - Early detection of unusual pollutions
3. **Environmental Education**
 - Lectures and guided tours
 - Out-of-school education for class levels 7-10

LOCATION AND ARCHITECTURE



Nibelung Bridge allows us to extract water from across the entire river on a continuous basis and in a safe and technically convenient way.

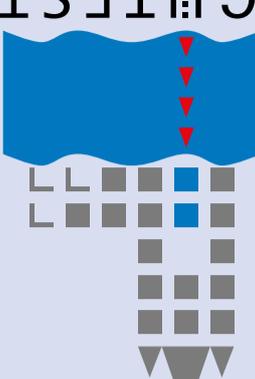


Parts of the vaults of the 115 year-old Nibelung Tower were renovated and fitted with automatic measuring and sampling equipment. A new building accommodates our laboratories and offices.

To be protected from flooding, the new structure is built on piles. It mirrors the outline of the bridge and sits comfortably next to architecture of the monument.



RHEINGÜTESTATION WORMS




TECHNICAL DATA



SAMPLING:

- 4 measuring sites across the Rhine with 4 submersible pumps (discharge capacity approx. 0.7 M litres per day)
- 4 routine and 4 event samplers
- in addition 1 alarm sampler and automatic enrichment to enable screening for organic microcompounds

LOCATION: Rhine km 443.3

CONTINUOUS MEASUREMENT:
water temperature, oxygen, pH, electric conductivity, turbidity, UV extinction

CONTINUOUS BIOTESTS:
2 Daphnia Toximeters
1 Algae Toximeter

LABORATORY EQUIPMENT:
3 laboratory rooms with GC/MS system, algae and daphnia cultures

COMPUTER SYSTEMS:
SPS and PC network for process control and visualization, data analysis and remote data transfer, network for office communication

ENVIRONMENTAL EDUCATION:

- display with presentation of tasks and current values
- 5 learning points for out-of-school education



TRACKING DOWN HARMFUL SUBSTANCES

BIOTESTS:

Not all dissolved matters can be analysed shortly. Small living organisms such as water fleas and algae, however, are very fast in detecting harmful substances. This is why we use them in biotests.

Daphnia (water fleas)



Their movements tell us about the quality of the water. The water fleas placed within the measuring chambers of the toximeter are monitored

by a video system. Unusual movements will release an alarm.

Algae



The fluorescence of algae in a Rhinewater sample is compared in 30-minute intervals with a control sample of algae in drinking water. Any significant difference

between the two fluorescence curves is an indication of an increased concentration of substances toxic to algae, for example herbicides.

SCREENING:



Hundreds of organic microcompounds are measured every day. Unusual findings are reported to the authorities at once under a multi-tier alarm system and

notified through the international Warning and Alarm Plan for the Rhine, whenever required.

IF YOU ARE INTERESTED

WE CAN OFFER:

- a public information terminal at Nibelung Bridge (Nibelungenbrücke)
- a modern conference room for discussion forums and presentations about current issues of water body protection
- guided tours for up to 15 people for school classes and experts by appointment



The Rhinewater Control Station Worms is operated by the State Environment Agency Rheinland-Pfalz, mandated by the 3 Federal States.

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IMPRESSUM

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