

Water Stewardship

EWP Water Stewardship Milestone Event

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BASF at a glance



BASF – The Chemical Company

- The world's leading chemical company
- Offers intelligent system solutions and high-value products for almost all industries
- Sales 2009: €50.7 billion
- Income from operations (EBIT) 2009: €4.9 billion
- Employees: 105,000 employees
- Six Verbund sites and close to 385 production sites worldwide

BASF Segments



Chemicals



Plastics



Performance Products



Functional Solutions



Agricultural Solutions



Oil & Gas

Inorganics

Performance Polymers

Dispersions & Pigments

Catalysts

Crop Protection

Oil & Gas

Petro-chemicals

Poly-urethanes

Care Chemicals

Construction Chemicals

Inter-mediate

Paper Chemicals

Coatings

Performance Chemicals

Sustainable Water Management

- **BASF`s Contribution: Products and Services**
- The EWP pilot project
- The pilot site Ludwigshafen
- SWM at the Ludwigshafen site
- Benefits of the EWP pilot project

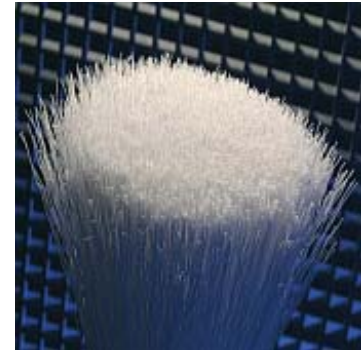
Sustainable Water Management

- **BASF is contributing to the sustainable use of water**
 - **Chemical products and chemical-based system solutions play a crucial role along the value chain from raw water to wastewater.**
- **BASF strives to be sustainable in its use of water**
 - **The sustainable use of water is an integral part of BASF's Values and Principles and is important for our company's future success.**

BASF's Contribution: Products

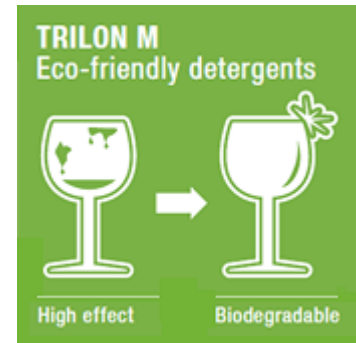
Products which are used in water production and improve water quality

- E.g. Ultrason[®] filter membranes
 - provide ultrafiltration
 - remove viruses as well as bacteria from dirty surface water
- Others: Water Treatment Chemicals, Larvicide ABATE[®], etc.



Products, which help save water and reduce emissions to water

- E.g. Chelating Agent Trilon[®] M dishwashing tab
 - improves the cleaning effect of detergents and cleaning agents
 - 80% less wastewater load compared with phosphate-based formulations
- Others: Color Fast Finish, Cyclanon[®] ECO, Lutensol[®] M



Products that improve the efficiency of water use in agriculture

- E.g. Superabsorbent Luquasorb[®]
 - Due to its high absorption capacity water can be absorbed very quickly in the soil. Water loss due to evaporation is minimized.
- Others: Drought resistant plants etc.



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The EWP Pilot Project

Objectives of pilot testing

EWP OBJECTIVES

- Define principles and criteria of SWM in a comprehensive and concrete way
- Create the basis for an objective reporting, certification and communication scheme
- Test the applicability of the developed system to define, monitor and assess SWM at operational level
- Receive feedback from future standard-users on the proposed assessment schemes and communication tools

BASF OBJECTIVES

- Identification of water-related risks at site level
- Incorporate the needs of the chemical industry into a European approach for sustainable water management
- Possibility to gain early experience in the implementation of the new Water Stewardship system.
- Assist communication towards investors and customers.

A pilot has started ...

- Test the applicability of the draft standard for Sustainable Water Management on-site
- Pilot site Ludwigshafen
- Kick off meeting with EWP 12th of March 2010 in Ludwigshafen
 - BASF's management and technical experts, sustainability experts and the EWP Water Stewardship team.
- BASF pilot project team
 - 4 water / sustainability experts
 - coordination Sustainability Center
 - team meetings all 3 weeks

The EWP Pilot Project Time schedule

BASF INTERNAL

Regular Working Group Meetings every 3 weeks

March 2010

July 2010

Sept 2010

Kick-off
BASF and
EWP

Half-time
meeting
with EWP

Final meeting
and reporting
of results

COURSE OF ACTION with EWP

Water Stewardship

- Course of action

HOW THE STANDARD WORKS

- a general outline of principles and criteria of Sustainable Water Management
- a table of potential indicators which may be used by reporting organizations to evaluate and certify the degree of compliance with the referring criteria
- a glossary with definitions

DEFINITIONS

- **Principle:** Basic goal for achieving SWM.
- **Criteria:** Element contributing to SWM for a given principle.
- **Indicator:** Measurable parameter for assessing the criteria.
- **Target value:** Value of indicator, indicating SWM.

Principle 1.1 Inflow: Evaluate water abstraction from all sources

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Indicator 1	Water stress-sensitivity classification of sources	- Number and description of all sources used and outlining those that are a) Significantly under water stress b) Significantly affected by the water abstraction
Indicator 2	Water source abstraction impact	- Water abstraction volume per source (total & net) a) Sources significantly under water stress b) No resource consents available

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The pilot site Ludwigshafen

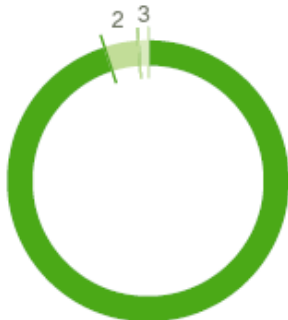
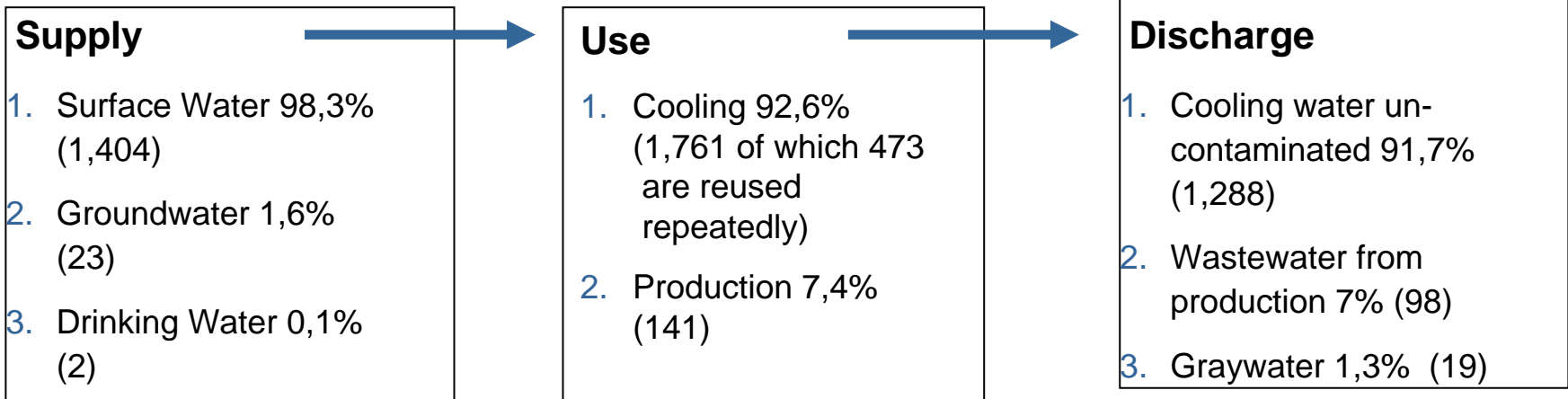


SWM at the Ludwigshafen site

Water Balance in 2008

million cubic meters per year

- BASF used 1,429 million cubic meters of water at the BASF Ludwigshafen site
- 98 % was drawn from rivers / lakes, 1,6% from groundwater, 0,1% was drinking water
- The vast majority of the water is used for cooling.

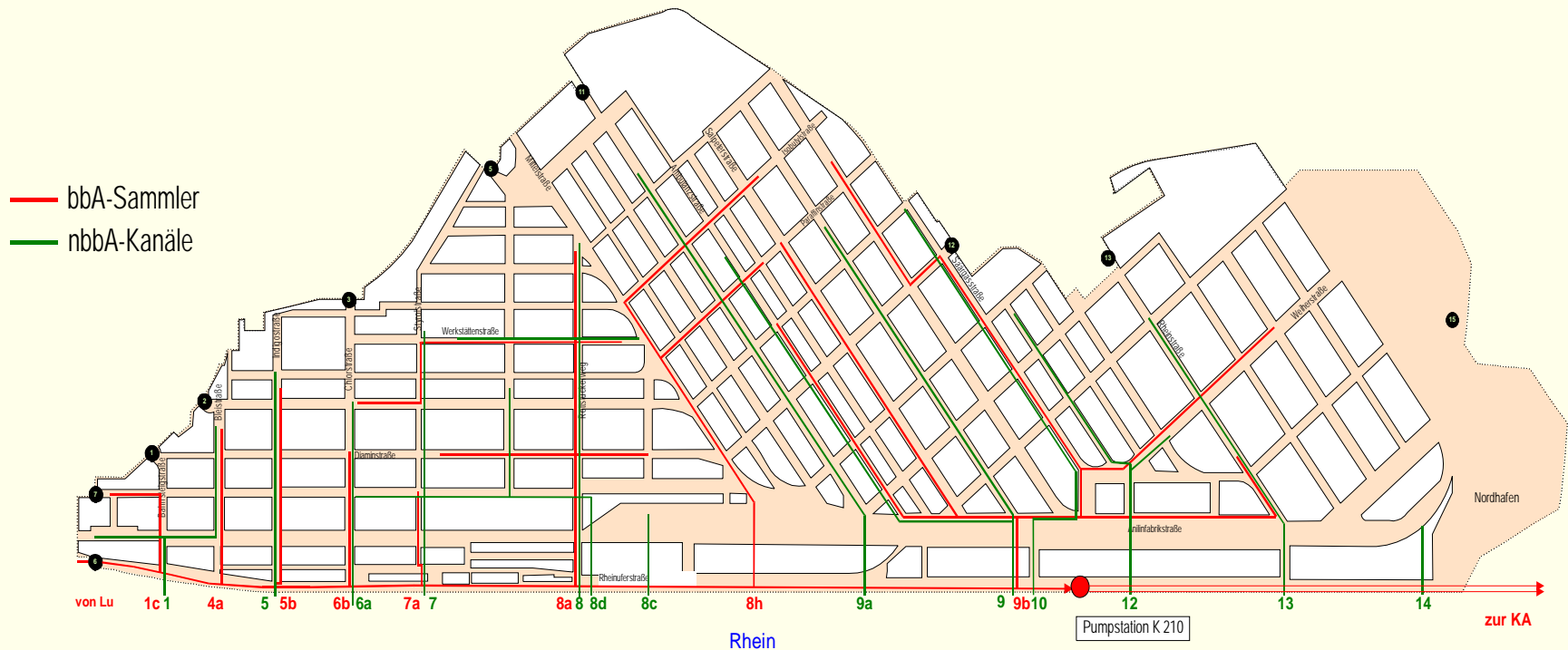


The pilot site Ludwigshafen

Waste water concept

■ 2 sewer systems

- „nbbA“ = cooling water (green); ~50 km
- „bbA“ = contaminated waste water (red); ~35 km



The pilot site Ludwigshafen

Waste water concept – The main sewer



The pilot site Ludwigshafen

Waste water treatment plant



- Capacity: 6 million population equivalent
- Waste water from BASF and the municipal waste water from Ludwigshafen, Frankenthal and Bobenheim-Roxheim

Allocation Volume 2008:	BASF SE	83,4 %
	Municipal	16,2 %
	Externe	0,4 %

Sustainable Water Management

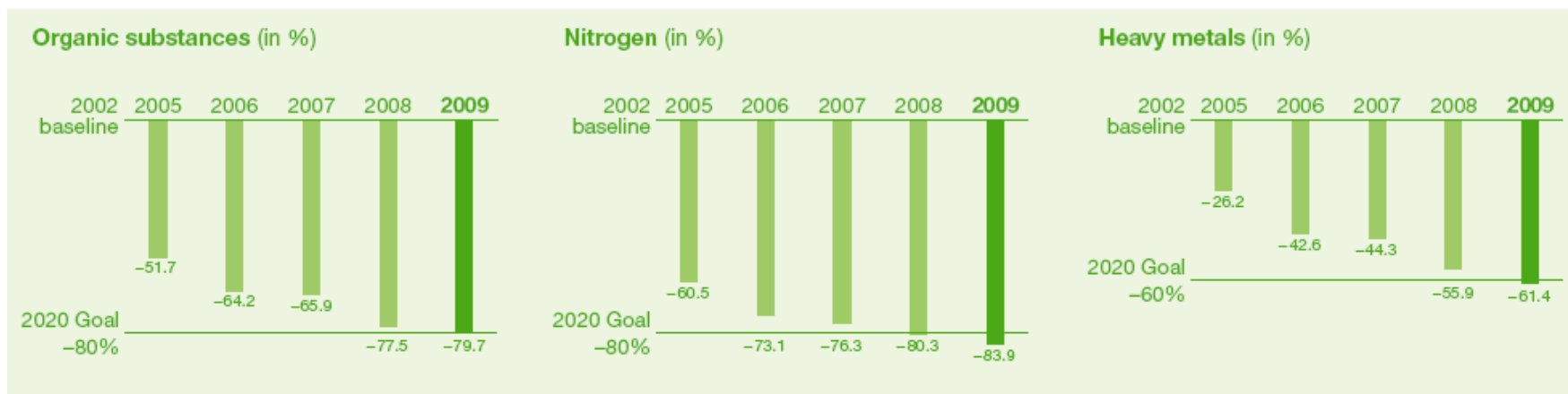
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SWM at the Ludwigshafen site

Emissions Reductions Goals (BASF Group)

- We are continually working on reducing emissions to water from production processes and have set ourselves ambitious goals.
- We reduced emissions of organic substances (COD) to water by 80% from 2002 to 2009.
- Emissions to water of nitrogen were reduced by 84%.
- We cut heavy metal emissions by 61%.

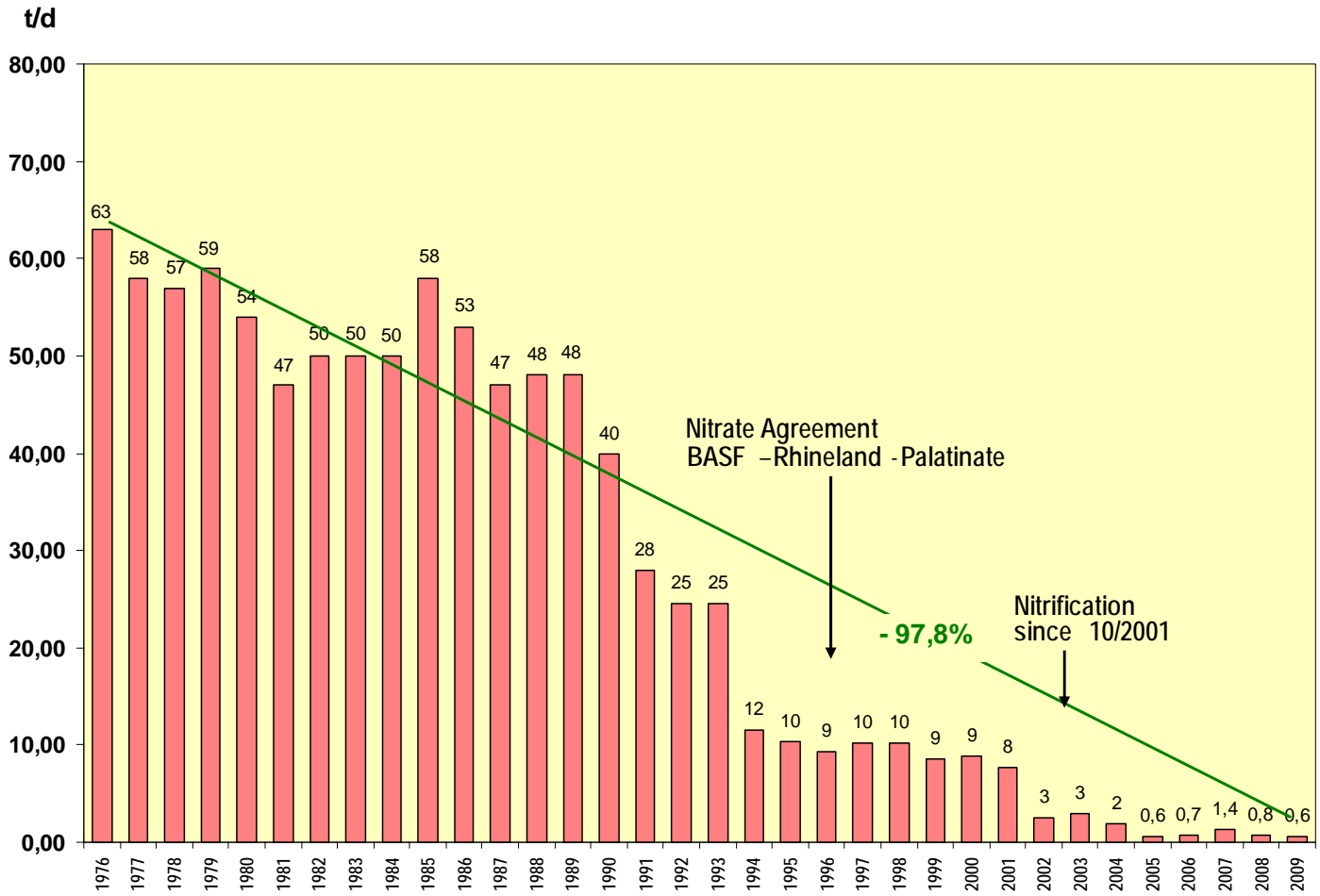
Emissions to water ¹



SWM at the Ludwigshafen site

Ammonium emissions into the Rhine

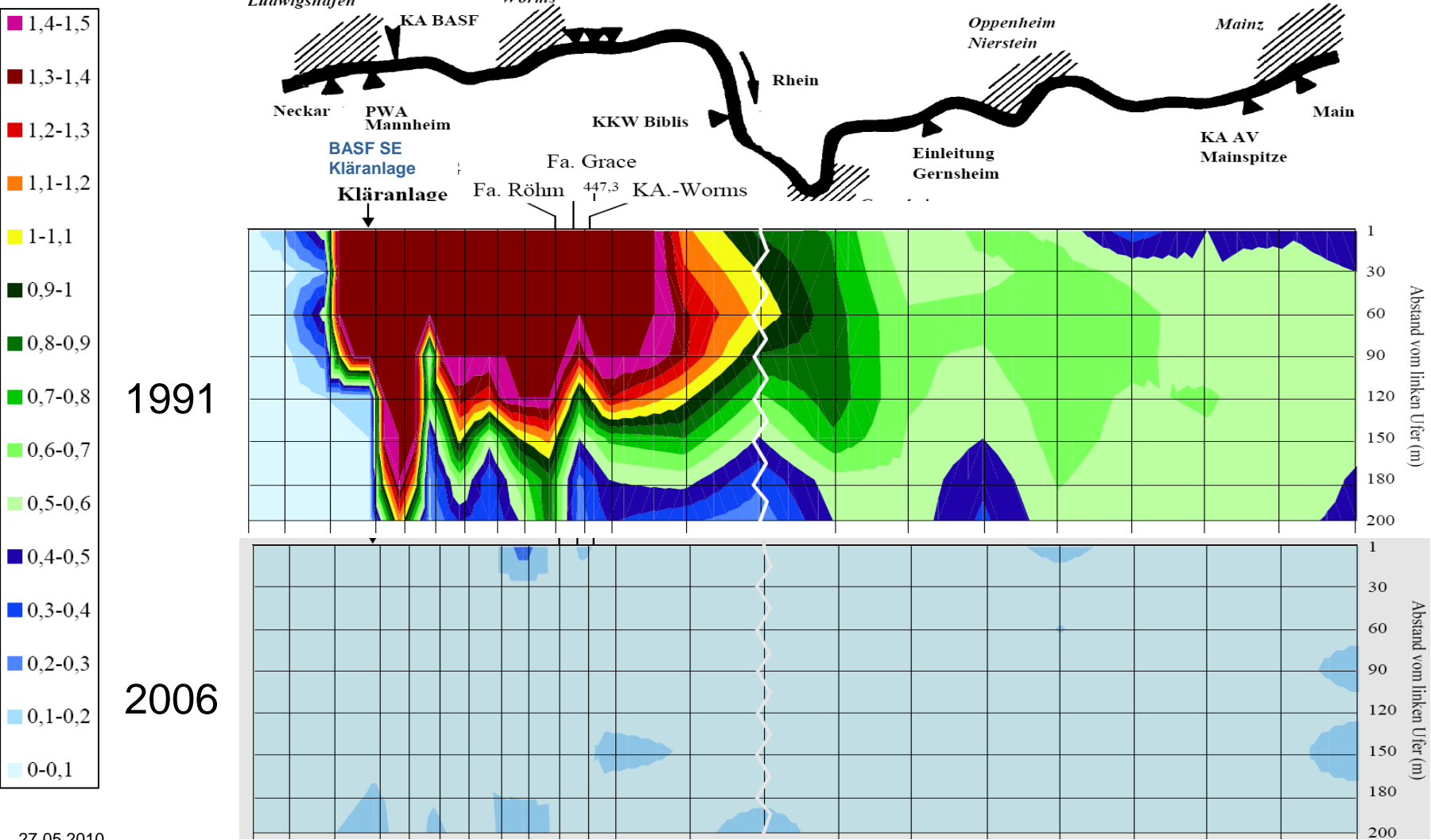
Discharge sewage plant (1976–2009)



SWM at the Ludwigshafen site

Ammonium load of the Rhine

1991 vs. 2006 (mg/l)



SWM at the Ludwigshafen site

Water management

- Umweltzentrale (24 hour attendance, remote transmission of check values)
- Online-Monitoring of cooling water/effluent discharge into the Rhine
- In-plant protection concepts for cooling water and effluents
- Safety basin of the waste water treatment plant
- Examination of technical problems, elimination of the underlying cause



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Benefits of the EWP pilot project

- Raise internal awareness of SWM.
- Build internal expert networks and make contact persons visible.
- Identify external sources of information (ministries, Rhine measurement stations).
- Analyze and condense data in compliance with the EWP draft standard.
- Gain experience in the implementation of standards for SWM.
- Review SWM on-site.