Flood Protection and prevention in Cologne

StEB Köln – Stadtentwässerungsbetriebe Köln, AöR
(Municipal Drainage Operation Cologne, AöR)

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Summary

• Short overview StEB Köln

• What does flood protection on the river Rhine look like?

• Projectable flood protection on the river Rhine

• Public relations before and during a flood (river Rhine)

June 2021
StEB Köln and it’s duties today

» Wastewater drainage and treatment
» Flood protection and prevention
» Management and development of the smaller streams and ponds

June 2021
Foundation model of StEB Köln (Institution under public law)

It was established in May 2001 as a municipal company of the City of Cologne.

June 2021
Waste water disposal in Cologne

- 1 Mio. inhabitants
- 5 WWTP's
- 2.377 km sewers
- 148 pumping stations
- 94.643 road gullies

June 2021
Bodies of water in Cologne

• 15 smaller streams
• 59 km open surface bodies of water
• 15 km piped streams

June 2021
Ponds in the parks

- 15 ponds in Cologne
- 61 ha surface on water
- 0.4 – 3.0 m water depth

June 2021
Different between flood on large river and heavy rainfall

<table>
<thead>
<tr>
<th>Flood on a large river</th>
<th>Urban storm water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain in a long period of time in the hole catchment area</td>
<td>Short and heavy rainfalls</td>
</tr>
<tr>
<td>Long forecast time possible</td>
<td>Pretty Short forecast time</td>
</tr>
<tr>
<td>Main risks near the borderline or in correspondent deep areas</td>
<td>Risks for all areas, particularly in low grounds and hillsides</td>
</tr>
<tr>
<td>Structural protection (state initiative) mostly up to HQ_100 or HQ_200</td>
<td>Every owner is self-responsible</td>
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June 2021
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*June 2021*
Flood protection on the river Rhine in Cologne

- Through our work and our flood protection we try to prevent the catastrophe.
- We are not a civil protection authority, but the experts in water management.
- A great advantage with flood on a large river, we have time to implement the technical flood protection measures.
- We have an action plan so that the protective measures can be implemented depending on the water level.

June 2021
Catchment area of the river Rhine

Map of Germany

Cologne
The flood protection level was 10.00 m Cologne Gauge.

June 2021
What can be done by flood?

The Flood Protection Concept (1996)

- Basics of flood problems
- Preventive flood protection
- Structural flood protection
- Flood management
- Danger prevention und disaster control
- Public relations

June 2021
## What can the city protect?

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<tr>
<td>10,70 m KP</td>
<td>388</td>
<td>0,9</td>
<td>0,04</td>
</tr>
<tr>
<td>11,30 m KP</td>
<td>521</td>
<td>1,6</td>
<td>0,1</td>
</tr>
<tr>
<td>11,90 m KP</td>
<td>21.751</td>
<td>2,5</td>
<td>0,7</td>
</tr>
<tr>
<td>12,50 m KP</td>
<td>116.599</td>
<td>3,5</td>
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Technical flood protection on the river Rhine

- ca. 28 km – new flood protection walls
- ca. 27 km – renew of flood protection walls
- construction of 2 retention area in Cologne
- underground flood protection
  (pumping station and valves in the sewer system)
- improve flood management
- total cost: ca. 430 Mio. €
  (ca. 200 Mio € for the underground flood protection
   and ca. 230 Mio € for the surface flood protection
   and flood management)

June 2021
Protection levels

- 10.70 m Porz-Zündorf, Marktplatz
- 11.30 m on the left bank of the Rhine, Godorf bis Altstadt Nord, on the right bank of the Rhine, Porz-Langel bis Westhoven
- 11.90 m on the left bank of the Rhine, Riehl bis Worringen, on the right bank of the Rhine, Poll bis Flittard
Flood protection at the river Rhine

- 70 km border line
- 10.3 km mobile walls
- 9 storage areas for the mobile walls
- 34.5 Mio m³ retention area

Pictures: StEB Köln, Peter Jost
Flood protection at the river Rhine

- 24 flood – pumping station (capacity up to 10 m³/sec)
- 75 outlet canals into the River Rhine
- 827 flood protection valves

June 2021
Who has what responsibilities during a flood?

- StEB Köln (technical flood protection, water level forecast and coordination and monitoring of the flood stakeholders)
- City of Cologne, department of streets and traffic (road barrier)
- City of Cologne, department of public order (public safety)
- City of Cologne, fire department (Fire and rescue service)

It is important that everyone knows his duties!
How do we inform those involved in flood?

We are sending out a flood notice. It contains the water level forecast and the current discharge and weather situation in the Rhine Catchment area.
Risk analysis tool for administration (RAWAS = Risk Analysis Tool Water)
Public relations during a flood:

- Daily water level forecast for Cologne gauge
- Information for the public and media

Homepage: www.steb-koeln.de
Hotline: 0221-221-26161
Which areas of the city are at risk?

Flood risk map post in the internet since 2004:  www.steb-koeln.de
Which areas of the city are at risk?

Obligatory for the entire EU since 2013 due to the 2007 Flood Risk Management Directive.

Flood risk map post in the internet since 2004:  www.steb-koeln.de

June 2021
Public relations before a flood:

Examples:

- flyers, brochure
- guided tour
- event in combination with other organisation
- consulting of the City of Cologne, industry and citizen
- warning app, loudspeaker and siren by the fire bridge
Thank you for your attention.

Dr. Marlene Willkomm
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