Optimised waste water disposal in a specific river basin

... a river manager introduces itself
The Emscher and Lippe Region
## Key Figures – Performance Data
(30.12.2004)

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watercourses</td>
<td>733 km</td>
</tr>
<tr>
<td>Sewers</td>
<td>263 km</td>
</tr>
<tr>
<td>Pumping stations</td>
<td>212</td>
</tr>
<tr>
<td>Polder Areas</td>
<td>842 km²</td>
</tr>
<tr>
<td>Wastewater Treatment Plants</td>
<td>59</td>
</tr>
<tr>
<td>Facilities Size</td>
<td>6,7 mil. PE</td>
</tr>
<tr>
<td>Sewage Discharge</td>
<td>1 bil. m³/a</td>
</tr>
<tr>
<td>Rainwater Treatment</td>
<td></td>
</tr>
<tr>
<td>- Sites</td>
<td>106</td>
</tr>
<tr>
<td>- Volume</td>
<td>265,000 m³</td>
</tr>
<tr>
<td>Flood Protection</td>
<td></td>
</tr>
<tr>
<td>- Retention Volume</td>
<td>3,1 mil. m³</td>
</tr>
<tr>
<td>- Dikes</td>
<td>216 km</td>
</tr>
</tbody>
</table>
### Key Figures – Financial Data
(31.12.2005)

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>299 mil. EUR</td>
</tr>
<tr>
<td>Investments</td>
<td>224 mil. EUR</td>
</tr>
<tr>
<td>Balance Sheet Total</td>
<td>2.5 bil. EUR</td>
</tr>
<tr>
<td>Assets</td>
<td>2.4 bil. EUR</td>
</tr>
<tr>
<td>Cash-flow</td>
<td>52 mil. EUR</td>
</tr>
<tr>
<td>Profit</td>
<td>non profit</td>
</tr>
<tr>
<td>employees</td>
<td>1,492</td>
</tr>
</tbody>
</table>
Members / Clients

- **Industrial Companies**: 23 members, 117.0 mio. Euro p.a.
- **Municipalities**: 13 members, 34.3 mio. Euro p.a.
- **Mining Companies**: 120 members, 33.6 mio. Euro p.a.
Where we are working

<table>
<thead>
<tr>
<th></th>
<th>Emscher-genossenschaft</th>
<th>Lippe-verband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (km²)</td>
<td>865</td>
<td>3,280</td>
</tr>
<tr>
<td>Inhabitants (mil.)</td>
<td>2.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Inhabitants / km²</td>
<td>2,775</td>
<td>427</td>
</tr>
</tbody>
</table>

Brussels capital reg. 161 km²
Inhabitants 1 million
Communes 19
Duties of the Emschergenossenschaft

River Management
of the Emscher and its tributaries

Management of Surface Waters

Flood Protection

Rainwater Management

Groundwater Management

Wastewater Disposal
- wastewater discharge
- wastewater treatment
- sewage sludge treatment and utilisation

Readjustment of the Emscher system
(Supplying Drinking and Industrial Water)
Politically Regulatory EU framework
Overview about the pending procedures in this area

Water Sector
- Services of General Interest
- State Aid Rules
- Public-Private-Partnership
- Public Procurement Rules
Environmental EU framework
Overview about the pending legislative procedures in this area

Water Sector
- Waste
- Environmental Quality Standards
- Sewage Sludge
- REACH
- Pesticides
- Flood Management
- Groundwater
- Plant Protection Products
Environmental EU framework
Overview about the pending legislative procedures in this area

Further Initiatives:

- Soil Protection Strategy
- Water Sector
- Climate Change Policy
The Emschert before the 20th century
Mining influence on drainage and flow regimes since the 19th century.
The Emscher today – open sewers
The Emscher with open sewers and its geographical constraints
- canal
- highway
- residential areas
The aim – sustainable water management
Emscher – Remodelling
Project spanning over generations

15-20 years for infrastructure

1992

25-30 years for ecological development
Measures already carried out or to be realized by the Emschergenossenschaft
Requirement for Remodelling
Emscher Wastewater Treatment Plants
Where do diffuse discharges come from?

PRECIPITATION

SEWER

RAINWATER TREATMENT

WASTE WATER TREATMENT

WATERBODIES (ex. rivers, lakes)
From the Immission‘s Angle

Analysis of the quality of the waterbody through measure programmes (Emscher-plus, …)
→ Quality of the waterbody at specific points (ex. mouth)

Balance: „Sum of discharged load (quality*Q_{discharge})
plus load from natural drain (quality*Q_{natural})
compared with the overall load (quality*Q_{overall})“

Example: PAK of the Hüller beck with 96 companies and specific inputs from running water
Potentially contaminated areas around the river Emscher
Area-wide – rain-water management

WWTP = waste water treatment plant