

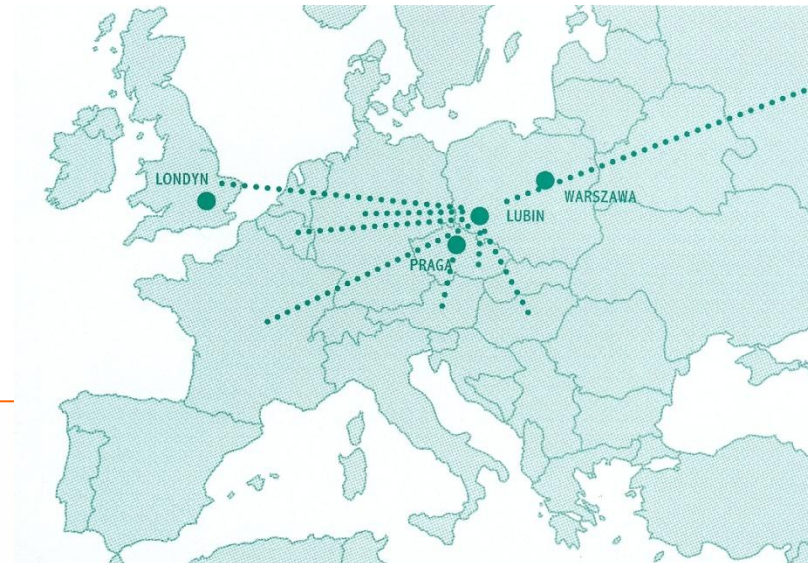


## Mine water and wastewaters management system in KGHM Polish Copper



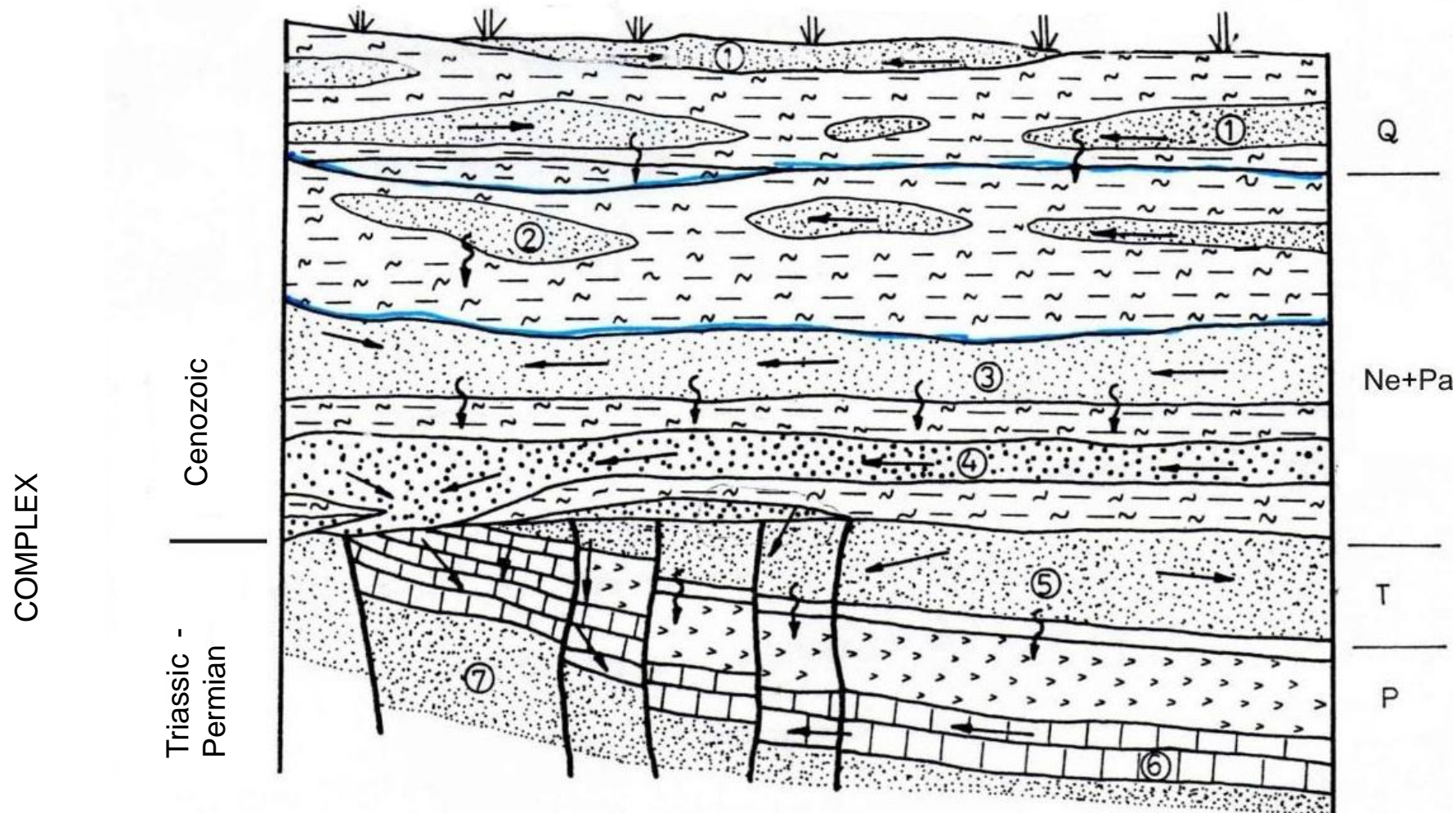
## ***KGHM Polish Copper in figures:***

- ✳ 9th-largest producer of copper and the 3rd-largest producer of silver in the world
- ✳ Production in 2011:
  - 550 thousand tones of electrolytic copper;
  - 1203 tones of silver
  - 400 kg of gold
- ✳ Employment 2011 - 18,600
- ✳ Turnover 2011 – 4 billion EUR
- ✳ Divisions: 3 Smelters, 3 Mines, 3 Concentrators
- ✳ Deposit area 400 km<sup>2</sup>, 27 shafts
- ✳ TMF – 15 km<sup>2</sup>
- ✳ Location SW Poland Lower Silesia Region (Legnica – Głogów District)

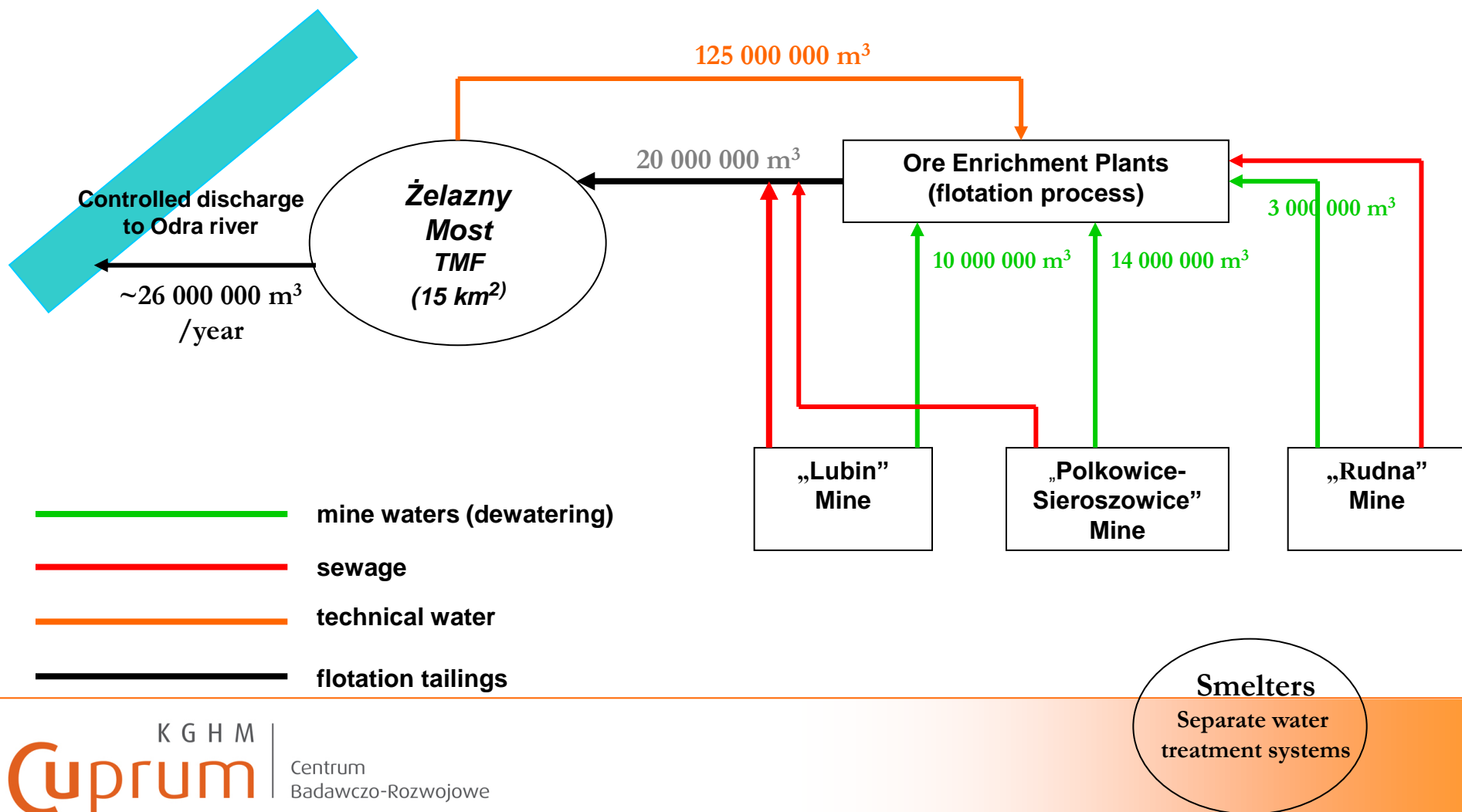


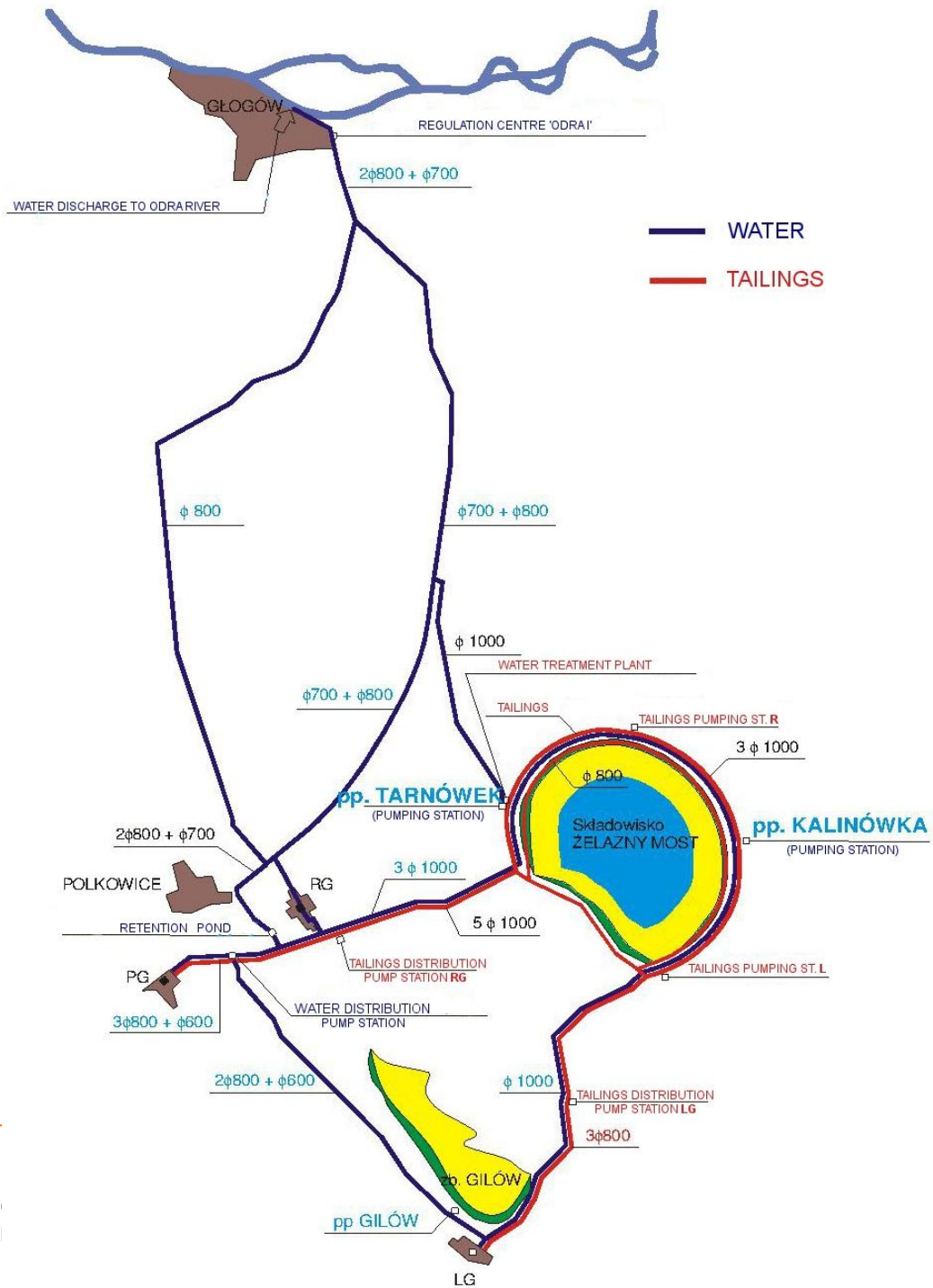


## Hydrogeology – simplified scheme



# Mine water and wastewaters management from Mining Divisions, Ore Enrichment Plants and TMF ŻELAZNY MOST (main water streams)





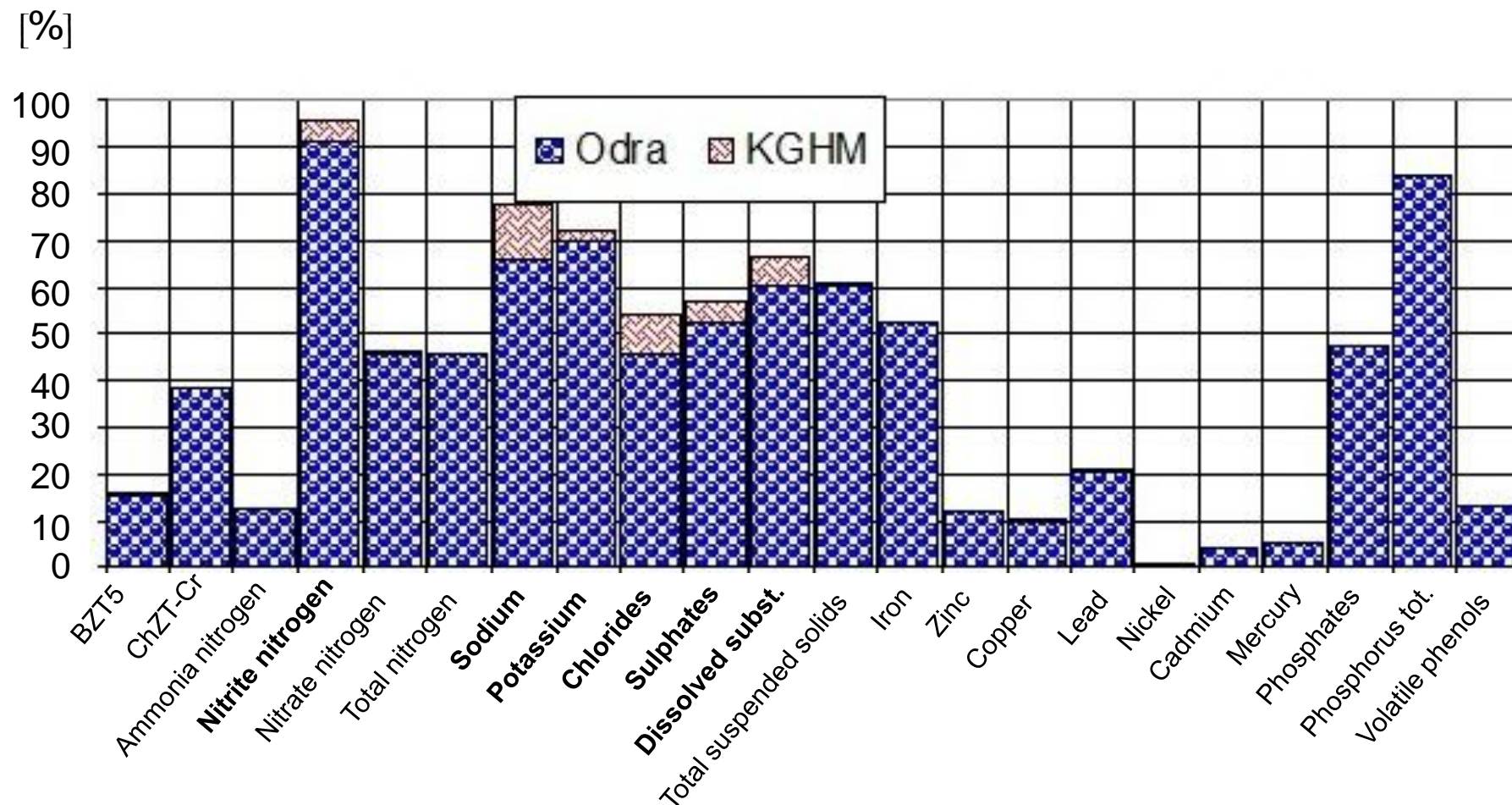




## *Average volumes and parameters of mine water from KGHM Mines*

MINE	Volumes of mine water [m <sup>3</sup> ]	Main constituents:		
		Dissolved mineral Matter [mg/dm <sup>3</sup> ]	Chlorides Cl <sup>-</sup> [mg/dm <sup>3</sup> ]	Sulphides SO <sub>4</sub> <sup>2-</sup> [mg/dm <sup>3</sup> ]
LUBIN	10 000 000	3 128	567	1 333
POLKOWICE -SIEROSZOWICE	14 000 000	13 900	6 600 Up to 95 000	1 900
RUDNA	3 000 000	373 138	210 458	6 967
TOTAL annually	27 000 000			

## *The usage of absorption capacity of the Odra river*





## *Main water issues:*

- Volumes of waters discharged to natural watercourses
- Quality of discharged waters ('preclarified' in TMF ŹELAZNY MOST), 'high salinity' results on:
  - quality of natural waters
  - blocking other possibilities of water usage
- Seasonal disturbances in nitrogen compounds of water discharge
- Local underground water pollution ('high salinity' zones) and surface waters
- Depression cone area with potential influence on water intakes
- Closing in on to end of life of TMF – expected change of storage technology creates a challenge for current system



# Thank you!