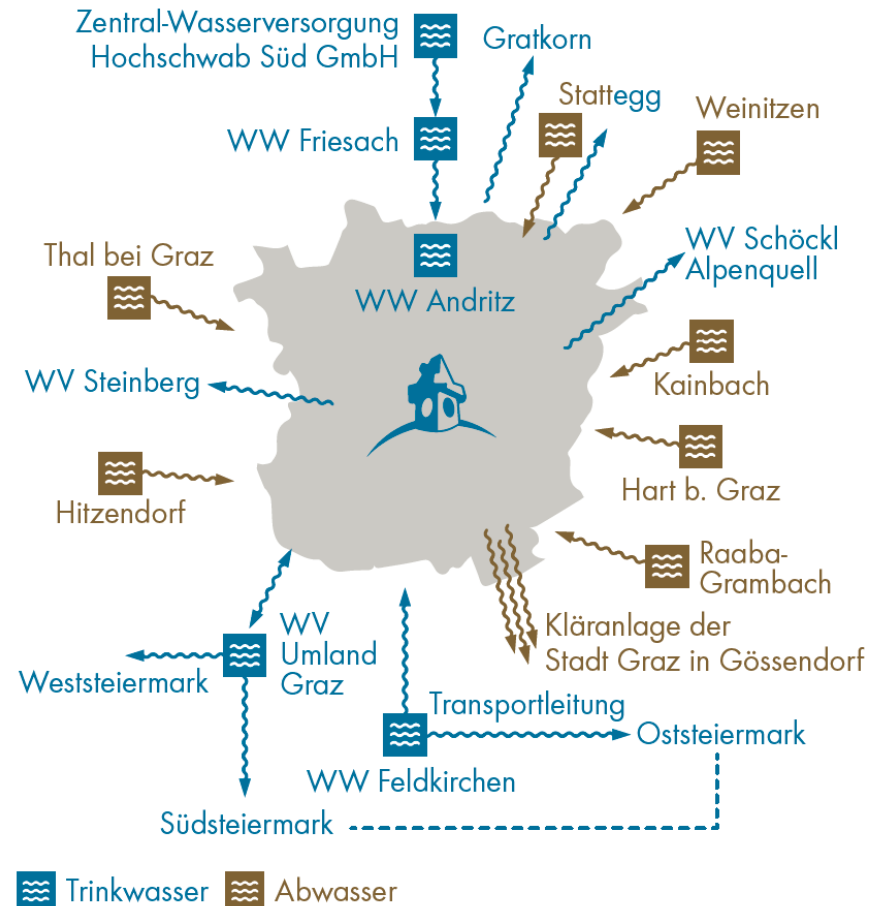




Central Storage Tunnel Graz (CST Graz)

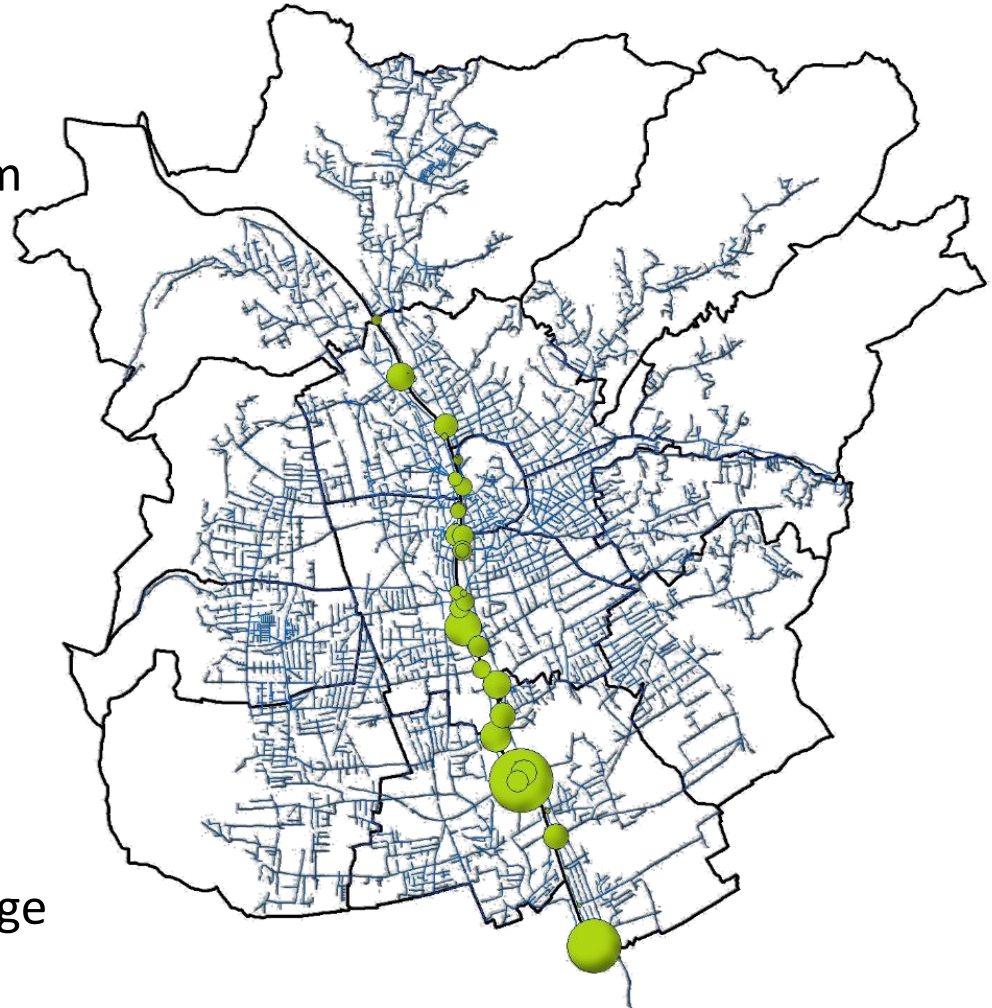
Graz Water Management

- 200 employees
- Water supply
 - 17 M m³ drinking water
 - ~ 1 380 km water system
- Wastewater drainage & treatment
 - 30 M m³ wastewater
 - ~ 860 km wastewater system



Sewage system of Graz

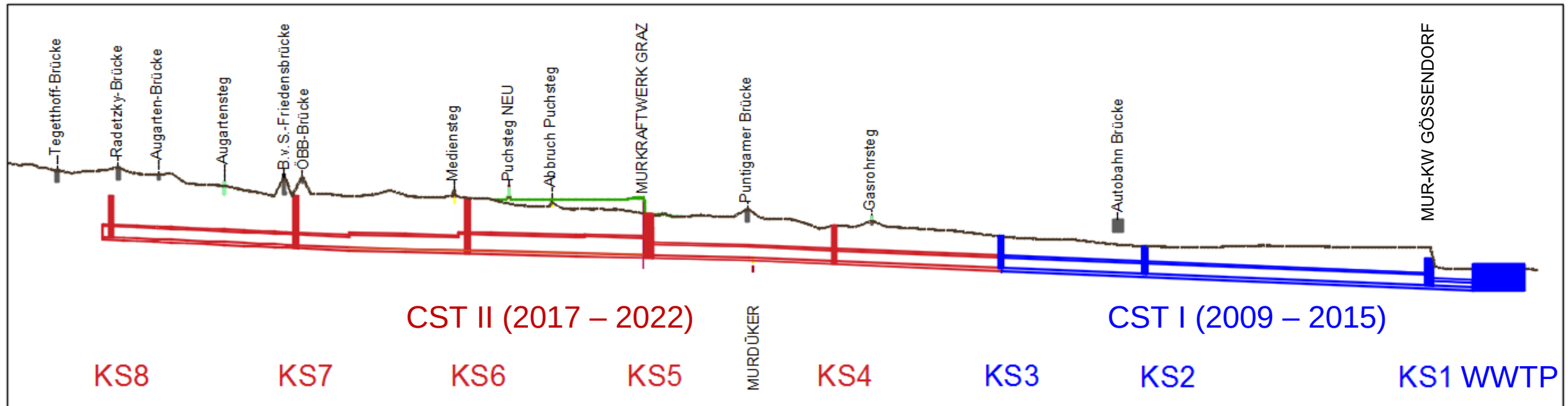
- 860 km sewers
70% combined sewer system
- 1 WWTP for
500 000 PE => 815 000 PE
- 37 000 m³ storage volume
- 35 CSOs to the Mur
with 660 t BOD per year
(approx. 28 000 PE)
- 100 000 m³ additional storage
needed



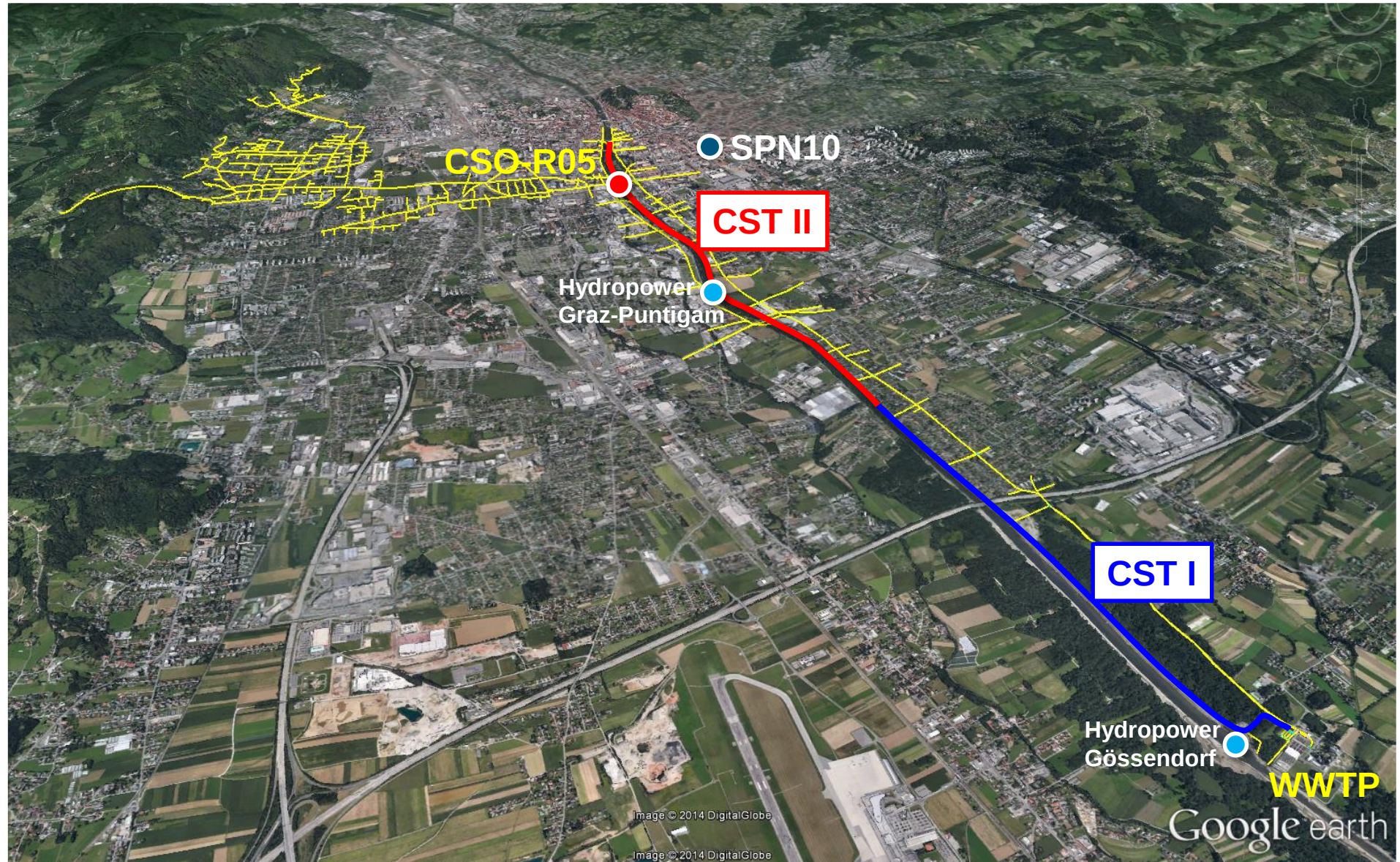
Central Storage Tunnel Graz (CST Graz)

- Total length: 8,4 km (3,2 km + 5,2 km); inclination: 1,6 ‰
- 21 of 35 CSOs along the river Mur are connected to the CST
- Total storage volume that can be activated in the CST: 94 000 m³ (25 000 m³ + 69 000 m³)
- 7 storage cascades were constructed to activate this volume with 10 submersible weirs
- Total costs approx. € 81,1 Mio., approx. 863 €/m³

Holding Graz Wasserwirtschaft ©



Overview

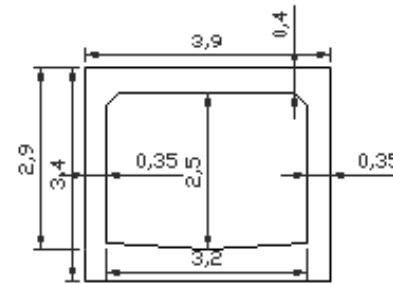


Main functions of the Central Storage Tunnel Graz

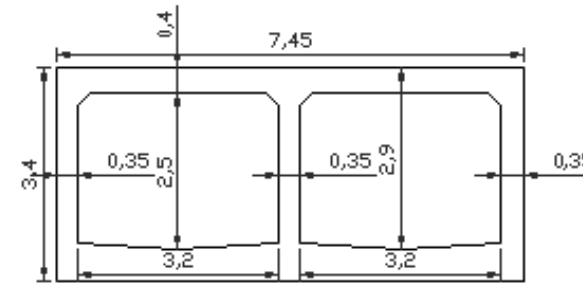
- **Ensuring drainage in the long term despite the two hydropower plants:**
Up to 80 m³/s can be discharged into the river Mur during a 100-year precipitation event from the connected CSOs upstream the hydropower plant Graz-Puntigam.
- **Pollution load reduction** into the river Mur by intermediate storage of the 21 connected CSOs and subsequent purification in the WWTP Graz.
- **Temporary redundancy** for rehabilitation work in the two main collectors along the River Mur.

Cross sections

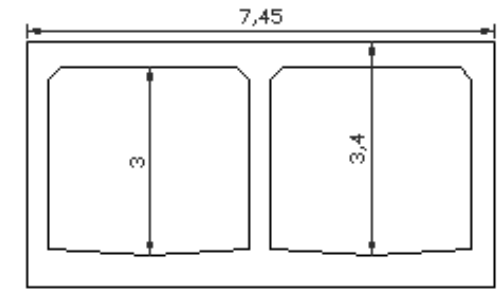
Standard: 1 x 3,2 m x 2,5 m



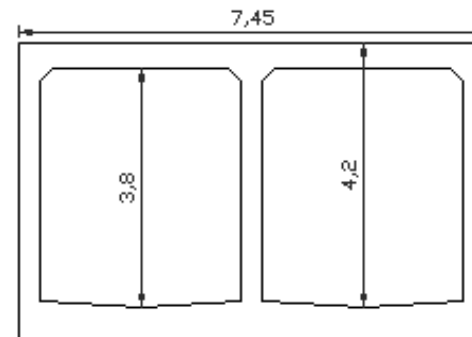
ZSK Standard
 $A = 7,8 \text{ m}^2$



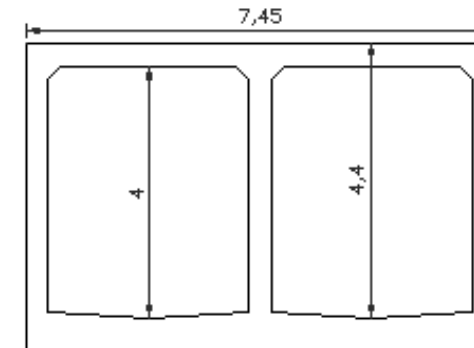
ZSK 2*2,5
 $A = 16,6 \text{ m}^2 (2*7,8)$



ZSK 2*3,0
 $A = 18,8 \text{ m}^2 (2*9,4)$



ZSK 2*3,8
 $A = 23,9 \text{ m}^2 (2*11,95)$



ZSK 2*4
 $A = 25,2 \text{ m}^2 (2*12,6)$

Holding Graz Wasserwirtschaft ©

Up to 2 x 3,2 m x 4,0 m

Hydraulically designed for up to
80 m³/s here in the area of KS05

Construction – Driving the sheet piles and excavation (Open Construction Method)



TDC Ziviltechniker GmbH ©

Construction – Securing excavation



TDC Ziviltechniker GmbH ©

Construction – Reinforcing the base plate



TDC Ziviltechniker GmbH ©

Construction – Formwork Carriage and Concreting I (42,50 m/week)



TDC Ziviltechniker GmbH ©

Construction – Formwork Carriage and Concreting II



G. GRUBER ©

