Mapping and modelling of the transboundary thermal groundwater system – supraregional to local scale

A newly proposed transboundary thermal groundwater body „Mura – Zala“ between Hungary and Slovenia

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MAPPING AND MODELLING

Supra-regional model 1: 500 000 and local models 1: 100 000, 1: 200 000

Geothermal model - Depth contour map of the 150 °C isotherm

Databases and viewer

Significant shallow depths (3,000 m) of the 150 °C isotherm are in the Mura-Zala and Styrian basins.

Calculated infiltration to thermal Upper Pannonian sandy aquifer: 1.02 mm/year in natural conditions.

Actual abstraction of thermal water: 0.49 mm/year (48%).

INCENTIVES AND MEASURES

Transboundary thermal groundwater body (TTGWB) „Mura – Zala“

Energy policy 2009/28/EC - incentives

Objective:
- 3.7 times higher energy use (2008 – 2020).

Water policy 2000/60/EC – measures

Objective:
- long term positive water balance,
- unchanged groundwater flow direction,
- not affected neighbouring wells,
- not deteriorated conditions for exploitation in the future.

Special recommendations for transboundary management of „Mura-Zala“:

Abstraction - should not be increased more than 3.5 times.

Water rights - should be granted depending on the trend of water level, taking into account the critical level point and critical point of abstraction.

Critical level point - is recommended not to be more than 30 meters below the original level before any exploitation.

Thermal water balance and critical level point - have to be updated at least every 6 years, regarding the monitoring data.

Thermal efficiency - has to be increased from 30 % to 70 %.

Information has to be regularly exchanged - of intended abstraction increment and intended drilling activities on the 20 km border area.

SUSTAINABILITY OF MANAGEMENT

Maximum depression at the border line is 6-8 m, reflecting all the joint effects of the cold and thermal water production of both countries.

Three immediate priorities:
- yearly reports of monitoring results - submitted by user and approved by granting authority,
- definition of critical level points for abstraction wells - defined at least from other available data or locations,
- free accessible info to the public – above all: quality of discharged waste water and overexploitation indications.