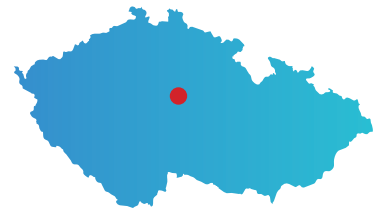




VRCHLICE RESERVOIR

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Country: Czech Republic

Name of the site: Vrchlice Reservoir

Area (ha/km²): 93,5/0,935

Ecosystem type: Deep (stratified)
temperate lake

SITE DESCRIPTION

The Vrchlice Reservoir is a eutrophic water body in Central Bohemia, Czech Republic, with a surface area of 0.94 km², a maximum depth of 32 m, and an average depth of 9 m. Its 97 km² catchment is dominated by agriculture, and the reservoir retains water for about half a year. Constructed in 1974, it supplies drinking water to around 80,000 people in the Kutná Hora and Čáslav regions, and also serves for flow maintenance, flood protection, hydropower, and local irrigation. In recent decades, internal phosphorus release has contributed to high phytoplankton biomass, raising concerns about water quality. The main purpose of the Vrchlice reservoir is to store water for drinking water supply. Other purposes include maintaining augmented flow below the dam, utilising the outflow for hydropower generation, supplying water for the golf resort, and mitigating floods in the downstream area. A multi-level intake structure allows water to be taken from three different heights in the reservoir. The water is transported to the drinking water treatment plant in Kutná Hora.



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CHALLENGES

It is expected to build and operate a solar-driven pump for pumping hypolimnion anoxic water with elevated phosphorus content, use the sorption material to reduce the amount of phosphorus, and return the filtered water to the deep layers to avoid disturbing thermal stratification.

CURRENTLY USED RESTORATION MEASURES

Currently, phosphorus removal from sediment or hypolimnetic water is not part of the reservoir's management strategy, meaning that internally stored phosphorus remains within the system and may continue to be released under favourable environmental conditions. Within FERRO, this challenge is addressed through a solar-powered pump that transfers phosphorus-rich hypolimnetic water from the deepest part of the reservoir to the surface, where it passes through a filtration system that removes phosphorus before the treated water is returned below the thermocline. The filter



material is periodically replaced and exploited for phosphorus recovery, with the potential for reuse in agriculture, linking water quality improvement with circular nutrient management. In addition, upstream pre-dams and ponds, including Hamerský, Roztěž, and Lázně, trap sediments and nutrients from inflows, while wastewater treatment plants have improved phosphorus removal efficiency. Together, these measures reduce internal phosphorus loading, improve water quality, suppress algal blooms, and contribute to safeguarding the reservoir's drinking water supply.

STAKEHOLDERS

Elbe River Authority, state enterprise – takes care of the Vrchlice reservoir

Municipality Kutná Hora – the main user of drinking water produced from Vrchlice reservoir

Water Management Company Vrchlice – Maleč, a.s. – operator of the water treatment plant using water from the reservoir

