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UMH IV Workshop Summary

Workshop “Passive Groundwater and Mine Water Treatment”

A total of 9 delegates attended the “Passive Groundwater and Mine Water Treatment” workshop at the UMH IV meeting in Freiberg/Sachsen. All the delegates already have experiences in water treatment and were interested in gaining further insights into the current status of research and potential future initiatives.

After a fruitful discussion the delegates came to the following conclusions, which they deem necessary for future improvements of passive treatment options:

More interdisciplinary understanding is needed

Many researchers in the passive treatment field have only a very specialised background knowledge. It is necessary that all aspects involved in remediation are investigated, such as microbiology, hydrogeology, geochemistry, or hydrology.

“Passive” Systems have to be maintained and need active interference

Authorities and other end users still think that passive treatment systems are maintenance free. It is necessary to disseminate the information among stakeholders / the parties involved outside the “passive remediation community” that passive systems are, in fact, not maintenance free and that failure to regularly maintain such systems can their rapid demise.

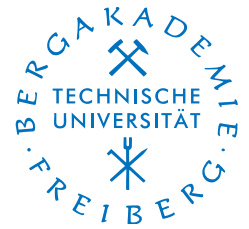
Besides the active maintenance that is needed for passive systems, the end user must also understand that passive systems possibly need interference in case the system loses its ability to treat the water. Therefore, regulators and authorities must understand, that the processes involved are very often natural and that some processes could be improved by actively interfering with the system (e.g. periodical feeding of the organisms).

How can we reduce the maintenance and sampling frequency

Only minor research has up to date been done on reducing the maintenance of passive treatment systems. Future research should focus on optimising passive systems in such a way that either less maintenance or at least a lower sampling frequency would be necessary. This would significantly reduce the costs of such systems and would help to increase their acceptance.

Cheap and reliable systems for developing countries are needed

In poor countries the pollution of surface and ground water directly affects / threatens the health of many people if not of the whole population as these countries cannot afford sophisticated drinking water treatment systems. Therefore cheap, reliable, and easy to use treatment techniques are necessary. This is, for example, the case in India, Bangladesh, and Chile where high arsenic concentrations naturally occur in the ground water.



More work has to be done on treatment systems, that could be used in these countries.

Longevity prediction of passive systems

Currently the knowledge and especially the methods of how to calculate the longevity of a passive treatment system are not sufficient. During the past months the first European passive mine water treatment system ceased to treat the mine water discharged into the system. The reason was probably the exhaustion of metabolisable organic material. Further research is necessary to calculate the lifetime of such systems and to find an applicable approach to predict the time at which the reactive material has to be replaced.

“Selective” microbiological research needed

Though we understand the role of microorganisms in passive water treatment and we know the most important microbial groups acting in such systems, we are still not able to select the important strains out of all organisms. To improve the reaction rates, we must identify the helpful strains and we must learn how to encourage activity of those microbes that are important to the remediation process.

Regulatory agency support

Finally, the delegates came to the conclusion, that already too many laboratory experiments have been conducted as a result of the lack of regulatory support. Even in the UK, which has a lot of experience with passive treatment systems, it is still complicated to get permits for field-scale experiments on passive remediation systems. Regulators usually ask for reliable discharge values (e.g. Fe, Mn, As). Instead, regulators should understand that a small improvement of the current situation should be favoured over doing nothing.

Therefore, the delegates stated, that “we need more demonstration and field systems and not only laboratory studies”.