The taming of brackish seepage

Smits, Frank; Olsthoorn, T.; Smulders, L.; van Wielink, I.

The taming of brackish seepage

Frank Smits[1], Theo Olsthoorn[2], Lucas Smulders[3] and Iris van Wielink[4]
[1] Waternet, Amsterdam and Technical University Delft, the Netherlands
[2] as [1], but retired
[3] Waternet, Amsterdam, the Netherlands
[4] Vrije Universiteit Amsterdam and Waternet, Amsterdam, the Netherlands

ABSTRACT
In the area that is managed by the waterboard Amstel, Gooi and Vecht, some deep polders are located. Most of them attract large amounts of brackish seepage. This seepage not only contains salt, but also nutriënts.

Without hydrological intervention, the waterquality in the area would suffer significantly from the brackish seepage. To prevent this, each year about 140 million cubic meter of water from the lake Markermeer, which equals a column of 20 cm, is let in at the river Vecht. This water is used to dilute the brackish water and flush it as soon as possible to the bigger parts of the watersystem like the Amsterdam-Rijncanal. However, this supply of a huge volume of water from the Markermeer is the reason that the water quality objectives, as set in the European Water Framework Directive, are not met in the area around the northern part of the river Vecht. Ecologically, this area needs local, fresh seepage from the hills of the Utrechtse Heuvelrug and not the foreign water from the Markermeer, which contains a lot of sulphate. Furthermore, the available amount of fresh water in the Markermeer is expected to become less due to the predicted climate change and the involved waterboards have agreed to reduce the intake from the Markermeer.

Waternet is the merged organisation of:
1) the Waterboard Amstel, Gooi and Vecht,
2) the Surface Water and Sewerage Management of the City of Amsterdam,
3) the Amsterdam Water Supply.

Because Waternet, as a governmental organisation, covers the complete watercycle, innovative solutions for the classic problems with brackish seepage can be thought of...

Currently Waternet works on the following research questions: Can the brackish groundwater be extracted by wells, to prevent the brackish seepage to reach the surface water system of the deep polder? Does this save fresh water from the Markermeer? Can this brackish groundwater be used as a new source for the drinking water supply for the city of Amsterdam? And if so, how can the concentrate be disposed that is created with the purification of the brackish groundwater by the process of reverse osmosis? What are the benefits, the costs and the risks of such a system?

We would like to present a concise but colorful introduction of the current system with the brackish seepage from the polder Horstermeer, and the ideas for using it as a new source for drinking water.

Contact Information: Frank Smits, Waternet, Production Plant Leiduin, Vogelenzangseweg 21, 2114 BA, Vogelenzang, the Netherlands, Mobile Phone: +31 6 532 714 39, Phone: +31 20 608 7546, Email: frank.smits@waternet.nl