

Treatment of heavy metals (Zn, Pb, Ni...) water pollution and water pH correction





Context

On a historical production site still in activity, working in particular metals (metal parts, tools, cables...), a problem of acidity ($\text{pH} < 4$) which causes the dissolution of heavy metals (Zn, Pb, Ni, Cr, Cd, Cu) and create as a consequence a contamination of the groundwater. This groundwater pollution presents a proven risk of dispersion and therefor a risk of contamination of the little river situated next to the site. It was agreed to act urgently.

Traditional techniques were rejected (according to BATNEEC principles) for example, the technic Pump&Treat was rejected after unsatisfactory results in terms of pumping efficiency and low hydraulic permeability. In situ treatment was chosen, injection tests were conclusive and proved to be much faster and very efficient for a rentable price.

Reagents

After laboratory tests and the pilot test, NaOH was selected to be injected in full-scale in the saturated zone. Indeed, besides the obvious correction of the pH that it will cause, NaOH allows the neutralization of heavy metals present in significant quantities by precipitation.

Application

The area was treated by injections in grid application over an area of about 2000 m², i.e. a total of 70 injections. The injections were carried out in a regular grid whose radius of influence after pilot testing was defined at 2,5 m. The reagents (NaOH) have been injected between 1.5 and 4.5m-ss (i.e. a treated volume of approximately 3000 m³) with a dosage of 100L/m; i.e. 300L/pt).



Location:	Flanders, BE
Geology:	Silt
Pollutant(s):	min. pH min. = 1,98 / cc (mg/L): Zn=431; Pb= 56; Ni:1,8; Cr tot.= 1,2
Reaction:	pH adjustment and immobilization by precipitation
Reagent(s):	NaOH
Application type:	Grid application
Surface/length:	2000 m ²
Number of points:	70
Depth interval:	1,5 – 4,5 m-bgl
Dosage:	200 l/m

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