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Mobile centrifuge as a useful device for monitoring of suspended sediment contamination

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Polluted soil can be a source of suspended sediments contaminated by various persistent organic pollutants. Contamination enters a river system any time a rainfall occurs.

River suspended sediments represent soil conditions and state of soil pollution of an upstream catchment. Suspended sediments monitoring is a part of a standard monitoring of surface water quality in the Czech republic. An advanced technique of sampling has been introduced for suspended sediments. Due to prevailingly low concentrations of suspended sediments in rivers and high requirements on the amount of material (about 30g of wet material) for chemical analysis a mobile centrifuge unit has been used for regular sampling at 44 locations since 2001. The sampling unit consists of a centrifuge Alfa Laval WSB 203B – 34 (type cleaning of liquids from solid particles) with the maximal effective discharge 1500 l/hour and peristaltic pump Alfa Laval IP 200 with maximal vertical suction lift 9,5 m, horizontal 30 m and maximal discharge 1 700 l/hour. Whole sampling unit is mounted on a 4x4 vehicle and can be operated by one-man crew. The performance of this sampling unit is very good, a sampling time varies from 1 up to 8 hours depending on water turbidity (suspended sediment concentration). The frequency of sampling is 4 times a year. Samples are analyzed for heavy metals, organochlorine pesticides (OCPs), polychlorinated biphenyles (PCBs) and polycyclic aromatic hydrocarbons (PAHs), e.g. substances with low solubility in water and readily bound to solid particles. That makes suspended sediment very useful matrix (now relatively easy to sample), for POPs monitoring within a river system.