

Provisional SOP for sampling river surface waters and sediments

All samples using the method below should be done to provide triplicate samples for each location.

Water Samples

For the microplastics water sampling a special filtration setup is required (Figure 1A). The sampler must be flushed and conditioned with river water sample before the real sample is taken. The waste pipe is attached to the red bypass tap, the black outlet tap is closed and 2.5 L of river water is pumped to flush out and condition the system, exiting through the bypass.

For sampling, the idea is to pass 50 L spot sample over to collect ~200 µg of solids on the filter for analysis. The flow rate is monitored throughout sampling and recorded at 1-minute intervals for the duration so that the changing flow rate over the duration of each sample can be compared.

Once the sample volume has been confirmed using the inline flow meter, the sampler can be stopped, valves closed and removed from the auto sampler hose. The valve ends of the filter cartridges must be covered with foil to limit dirt ingress. Three samplers will run in parallel and capturing sample from the exact same location within the water column (Figure 1B). Sample hoses will be tied together to allow this to happen.

The opening of the inlet pipe should be approximately 50 cm below the surface of the water where possible. The inlet pipe can be marked at 50 cm as a guide. The inlet hose should be 6 mm internal diameter if sampling from height is required. This has been tested to 7 m vertical lift for bridge sampling.

All water after filtration will be pumped back into the river downstream or away from collection point.

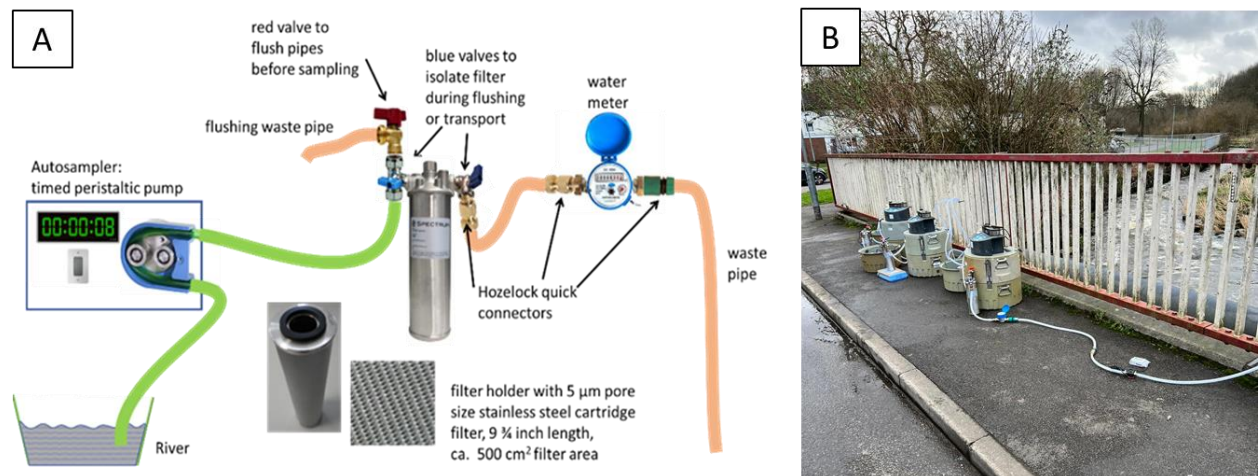


Figure 1: A) Schematic of the pumped filter sampler design used to sample river surface waters. B) an example of triplicate auto-samplers in the field collecting simultaneous replicate samples

Sediment Samples

Sediment samples will be taken from selected locations using a claw sediment sampler, lowered using a tripod and winch Figure 2 or lowered via rope, should it be identified in the RAMS appropriate to do so.

When the sediment sampler is approximately 50 cm from the water surface, the winch locking pin should be released allowing the sampler to fall and penetrate the riverbed sufficiently. When the claw hits the riverbed, the securing pin on the sampler will release, this will then allow the jaws of the sampler to close upon retrieval. Care should be taken when bringing in the sampler as it can weigh more than 20kg (Figure 2B).

The sediment samples will be then decanted by opening the jaws into a stainless-steel bucket (rinsed with a small volume of filtered DI water), allowed to settle and the supernatant poured gently away leaving a small amount of water behind with the sediment (Figure 2D). The sediment that remains should be decanted with a little river water in to a Kilner jar, filtered water will also be used to rinse off any remaining sediment into the jar. The desired sediment should fill the Kilner jar 70%. Should a small

amount of sediment be captured; repeated sampling should take place until it is deemed enough sample has been taken.

This should then be repeated to provide 3 samples per location.

For the third replicate at each site, the supernatant poured off from the settled sediment in the bucket will be captured in a 1L glass Duran for analysis.

Once all samples are taken the filters and sediment samples are to be driven or couriered to the laboratory and stored at 4°C until processed. Processing of the filter cartridges take place within 5 days of sampling. If sediments require storage longer than 5 days prior to processing, these should be frozen at -20°C.



Figure 2: Images demonstrating safe use of the clam shell sediment grab sampler in the field from a height when bridge sampling from the central channel. Due to the weight of the full sampler on return, a tripod and winch may be necessary as demonstrated here. For lower height sampling a rope will suffice. A) shows the grab sampler and winch assembly, B) demonstrates adequate sampling location for bridge sampling the centre of the channel, C) the grab sampler is opened manually and D) the captured sediment is decanted into the cleaned steel bucket. As the grab sampler can capture both the solid sediment and some of the overlying water, it is allowed to settle before the majority of the supernatant is decanted and the sediment solids taken for sampling.