VAN WALT
monitoring your needs

Passive Sampling Survey Results

Questions:	Yes	No			
Are you familiar with taking groundwater samples using passive or 'no-purge' samplers?	80%	20%			
Have you ever used a passive sampling technique?	40%	60%			
	High Flow	Low Flow	Passive		
What is your usual/preferred method of groundwater sampling?	17%	80%	3%		
	Determined by Regulator	History of this method	Familiar with this method	Already have Equipment	Client/ Contaminant requirement
What was the reason for choosing your current sampling technique?	8%	24%	24%	17%	27%
	Less 1 Year	1 Year	2 Years	3 Years	5 Years or More
What is the average duration of your typical groundwater monitoring project?	15%	26%	22%	7%	30%
	Repetitive	One-Off			
In your projects, are your sampling events repetitive or one-off?	90%	10%			
	Average %				
What percentage of your sampling events are repetitive?	73%				
	3 Months	6 Months	12 Months		
If your sampling events are repetitive, what is the typical frequency?	56%	29%	15%		
	Yes	No			
Are you experiencing any unexplained variability between your sampling results?	20%	80%			
Do you believe your results are obtained efficiently and show consistency?	87%	13%			
	Grab	Diffusion	Integrative		
If you are using a passive sampling method, which type are you using?	67%	33%	0%		
	No	Insufficient Sample Size	Artificial Turbidity	Initial Hardware cost	Inability to Compare data
Have you encountered any restrictions or objections when using this method?	43%	36%	0%	7%	14%
	2" and Larger				
What is the most common internal diameter of the wells that you are monitoring?	100%				

	40ml-350ml	500ml-1L	1L -2L	2L - 3L	4L +
What sample volume does your regular laboratory require you to supply?	11%	43%	29%	14%	4%
	0 - 20m	21 - 40m	41 - 60m	61 - 80m	81 m +
What is the deepest well you are required to sample regularly?	27%	20%	23%	17%	13%
	Yes	No			
Do you have problems obtaining samples from wells which have very low recharge?	53%	47%			
	Average %				
On average what proportion of your overall budget comprises of the sampling costs?	33%				

Van Walt Survey Conclusions & Opinions

Environmental professionals in the UK, Spain and New Zealand participated in a passive sampling survey, to help us develop an understanding of the knowledge and perception of this sampling method in the groundwater sector.

The passive sampling survey concluded that the majority of participants at 80%, are aware of, and familiar with passive sampling techniques. However, 60% have not used this method of groundwater sampling themselves. Most specified their preferred method of groundwater sampling to be low-flow purging, specifically 80% opt for low-flow, which was also ground breaking technology when it was initially commercialized. Now, it seems to be the favoured approach by environmental monitoring professionals although 53% of those surveyed cite low-recharge wells to be problematic.

20% of survey responders admitted they experience unexplained variability between sampling results which can cause problems by possibly delaying the process of identifying trends in data and potentially putting a strain on project budgets. On average, survey participants said 33% of their overall budget comprises of sampling costs alone.

For those not using passive sampling techniques, avoidable expenses such as; onsite power source, disposing of waste water and extended man hours on site, could account for large additional costs as the frequency of sampling and project duration increase. The most common project duration (32%) is 5 years or longer. With 74% of total sampling events being repetitive and a sample collection frequency of 3 months, ways to manage or reduce costs becomes more imperative.

Only 9% from the survey specified that their method of sampling was determined by the regulator. The majority said they continue with their current monitoring technique due to sampling history at the site, familiarity with their device or they already have the equipment. The minority claim the sampling method chosen is down to the client/contaminant requirements. Just 14% acknowledged that their results are not obtained efficiently or consistently.

For those who had used passive sampling, 75% adopted the ‘grab’ technique. Grab Sampling obtains samples at a specific depth and time by effectively taking a ‘snapshot’ of the groundwater condition at the time of collection. Of these the majority found the only restrictive factor to be sample volumes as 85% of sampling events require a sample size of 500ml - 3Litres.

We believe that the findings might be showing that passive sampling techniques show advantages compared to more traditional sampling methods. Van Walt supports the passive ‘grab’ sampler, the Snap Sampler because, we believe by using this type of passive sampler the results show less variability between sampling events because samples are sealed ‘in-situ’; the sampler is deployed at a discrete depth at each deployment for consistency of results and therefore are not user dependent. The Snap Sampler has been proven to reduce data variability by as much as 50%. For the 21% of the participants who experience unexplained variability between sampling results, we believe using a passive sampling method could greatly reduce the variability seen.

For 50% who are finding low-recharge wells to be problematic, utilising this approach to groundwater sampling would see data collected without the hassle of waiting for water levels to rise after purging. Passive samplers are deployed prior to sample collection to reduce elevated levels of turbidity, achieving minimal to no disturbance to the well water. Less sampling events would be required because data is collected efficiently, only taking approximately 15 minutes, and with consistency because the technique is not user dependent. Trends would be more visually apparent.

Determined by the average project duration of 5+ years, repetitive nature and frequency of sampling, a minimum of 20 groundwater samples would be collected over the course of an average project timespan. Low-flow sampling is generally cheaper than high flow purging costs and can be used in a wider range of circumstances, passive sampling is generally inexpensive compared to even low-flow methods and is ideal for remote or challenging sites. By applying passive sampling techniques to appropriate sites, the survey participants who said 34% of their overall budget comprises of sampling costs, could see substantial cost savings.

In our opinion, the findings from the survey are showing that the only thing preventing wider use of passive sampling techniques is the environmental community itself and any uncertainty towards this once “mysterious sample collection device” has been replaced by knowledge and extensive studies. “Practitioners along with regulators who have accepted and become accustomed to the sample collection procedures and the representativeness of the analytical data. …Passive samplers are quickly replacing volume purge sampling as the better sampling method worldwide.” (Protocol for Use of Five Passive Samplers to Sample for a Variety of Contaminants in Groundwater; Diffusion/Passive Sampler team; December 2008; Team Leaders: Kim Ward / George Nicholas)