

## Important recommendations when Low Flow Purging

The following list is not exhaustive but highlights some do's and don'ts when 'Low Flow Purging':

1. If you're sampling for VOC's: from a theoretical viewpoint you shouldn't use a peristaltic pump which uses an under-pressure to operate and therefore will volatilise compounds more quickly. A bladder pump offers the best possible VOC recovery. Similarly most impeller pumps create heat and can increase volatilisation.

Please note that there may be practical reasons for using either type of pump (for example because they give great repeatability, they're easy to use and decontamination is never an issue with peristaltic pumps) but understatement of VOC's may likely result. Any pump or sampling device which agitates the water within the well should not be used in low-flow purging. This includes inertial pumps and bailers.

2. In low yield wells consider using dedicated pumps to maximise stabilisation times. Any pump or device which is lowered through stagnant water layers will ultimately destabilise your sample which may become unrepresentative.

3. Calibrate your multiparameter meter daily; either in the lab or on site. Often a lab calibration can be more effective since the temperature sensor is very stable. Start with calibration for EC, followed by pH, Redox and DO.

4. Check the meter's barometric pressure for accuracy at least monthly and re-calibrate as necessary. Also most parameters will use temperature in their calculations so check that the temperature sensor is recording a sensible value or check against a reference.

5. By all means use a "confidence" solution for a post-calibration check but these should never be used for calibration. You can of course also use the calibration standards for this purpose.

6. A minimum of 3 parameter readings should be taken prior to sampling to make sure stabilisation has been achieved. These measurements should be taken when you are certain that the flow cell has been refreshed. This depends on flow rate and flow cell size (eg. if a flow cell has a volume of 500ml and you're pumping at 250 ml/min wait at least 2 minutes between readings).

7. At the end of each sampling day, check that the meter is still reading within spec and where possible, such as with the YSI Pro, print the GLP file as a record for the future in case the sample results are ever questioned.

8. Familiarise yourself with the DO options and use the correct polarographic membrane for the flow-rate and circumstances. Errors in excess of 55 percent can result from using the incorrect membrane. Make sure you're using the correct membrane or use an optical DO sensor.

9. Make sure that you are aware of which contaminants are present and choose your equipment with care. Some compounds will react negatively with the equipment and could damage it.

10. Choose the size of flow-through cell to match the well purge volume.

11. When using a flow-through cell make sure that the temperature remains stable. Don't leave it exposed to direct sunlight and also make sure that the length of tubing to the cell from the well is as short as possible. For best practice submerge your cell in a bucket which contains well water.

12. When sampling or low-flow purging use a dip meter to ensure that the water level does not drop by more than 10cm.

13. Make sure the samples are taken before they enter the flow-through cell.

14. Turbidity measurements are often a good indicator of well stabilisation. Measure turbidity before and after purging; stability is within 10%

15. Spending time in the office planning your sampling schedule will save you more time in the field.

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