

Ben Meadows offers products to sample underground water both above and below the water table. Sampling systems offered fall into two basic types. These are lysimeters and piezometers. Both types are described in detail in our current catalog so this is intended as a general outline. Lysimeters are for sampling water in the vadose zone. This is the layer of unsaturated soil above the water table. Water in the vadose zone is contained between soil pores in an area where air is also present between pores.

Lysimeters work by using vacuum to pull water into the device, and pressure or vacuum to get the water to the surface for collection and analysis. The lysimeter uses a ceramic tip, similar to that used on a tensiometer. This porous ceramic tip allows water to flow into the sampler. The process can be quickened by using a hand pump to apply vacuum to one of the tubes while clamping or closing a valve on the other. The vacuum sucks water into the lysimeter.

To retrieve the sample, one of two methods can be used. Using the hand pump, pressure can be applied to the inlet tube, thus pushing water out through the outlet tubing. The other choice is to apply vacuum to the outlet tube to pull the water to a collection flask. When using vacuum to remove the sample, a flask with a two holed rubber stopper must be used to prevent liquid from reaching the hand pump and damaging it.

When using the ceramic cup lysimeter, #220690 & #220691, the lysimeter head assembly #220693 can be used. The head contains a pressure gauge and valves to open and close the inlet and outlet tubing. The head is suggested if installing as a permanent sampler as it protects the tubing and valves. If the head assembly is not used, some type of clamps or valves must be fitted to the two tubes for proper operation. This system uses PVC casing to surround the tubes above the lysimeter. In this respect, it is almost like a cased well. Silica flour can be mixed and applied around the ceramic cup to establish equilibrium between the soil and the porous tip.

The pressure vacuum water sampler, #220680, does not have the casing or head assembly option, but works the same as a lysimeter. With both of these systems, the deeper the installation, the more pressure is needed to bring the sample to the surface. For very deep applications, an air compressor may be needed to provide adequate pressure.

For ground water sampling (saturated soil below the water table), a piezometer is used. This is a long tube with a very fine screen or filter at the bottom to let the water enter the

unit. Piezometers are often used as alternatives to traditional monitoring wells for depths to 65 feet. A length of sampling tube is attached to the tip and run to the surface through a series of hollow extensions. The tubing exits the system at the bottom of the drive head. The drive head can be used with either a slide hammer or a portable rotary hammer, both of which pound the unit to the desired depth. A vacuum is then applied as with the lysimeters to pull the sample to the surface for collection.

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