

IEG Multi-Level Sampling Well™

for Simultaneous Sampling of Soil Vapour and Groundwater

As a fundamental objective of detailed geoenvironmental investigations, **IEG Multi-level Sampling Well™** systems allow a very detailed three-dimensional soil and groundwater contamination profile to be developed. The system is capable of recovering multiple, high-quality samples of both soil vapour and groundwater simultaneously from numerous packer-isolated horizons in a single standard borehole.

Since many fewer boreholes are required to obtain more coverage of a site at depth, and because well purging and sampling time on site is considerably reduced, this makes the IEG MLSW™ a very cost effective means of site characterisation and monitoring.

The IEG MLSW™ can identify areas of point source contamination, or pinpoint plume boundaries whilst simultaneously facilitating the accurate determination of contamination levels in the unsaturated and saturated zone, as well as the capillary fringe. The system is used to readily and accurately delineate multi-phase contamination in three dimensions, which is vital for the design, installation, monitoring and validation of in-situ process-based soil and groundwater remediation schemes. The patented, modular system can be customised for the needs of each project during the course of a site investigation, or alternatively can be based on predetermined depths of interest.

Advantages and Benefits

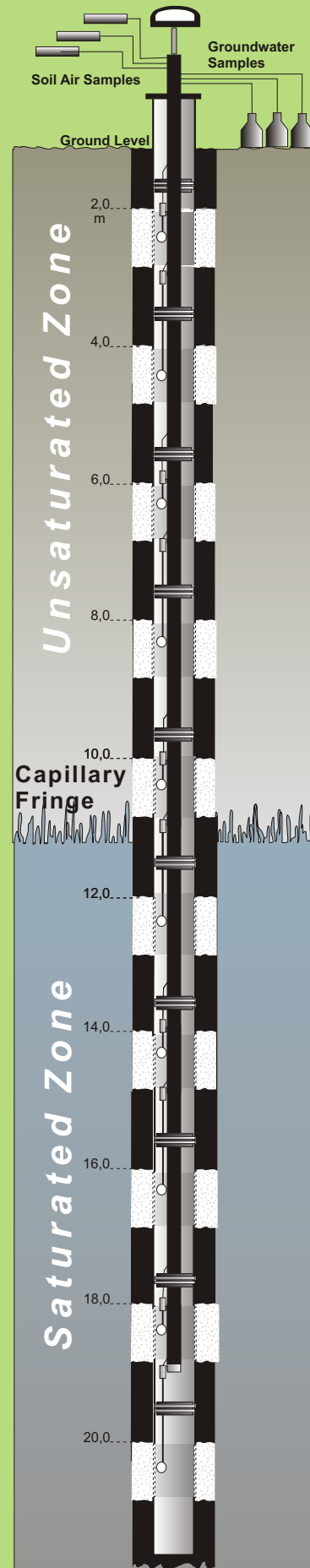
The system offers many technical advantages over conventional single or multiple fully-screened monitoring wells, combined with **significant time and cost savings** which will **reduce the overall cost** of a site investigation, monitoring and validation programme.

Perhaps most importantly, the MLSW™ allows very **high quality** data to be generated in order to facilitate **accurate** detailed quantitative risk assessments based on zone-specific, undiluted and undistorted results, unlike those obtained using fully-screened monitoring wells.

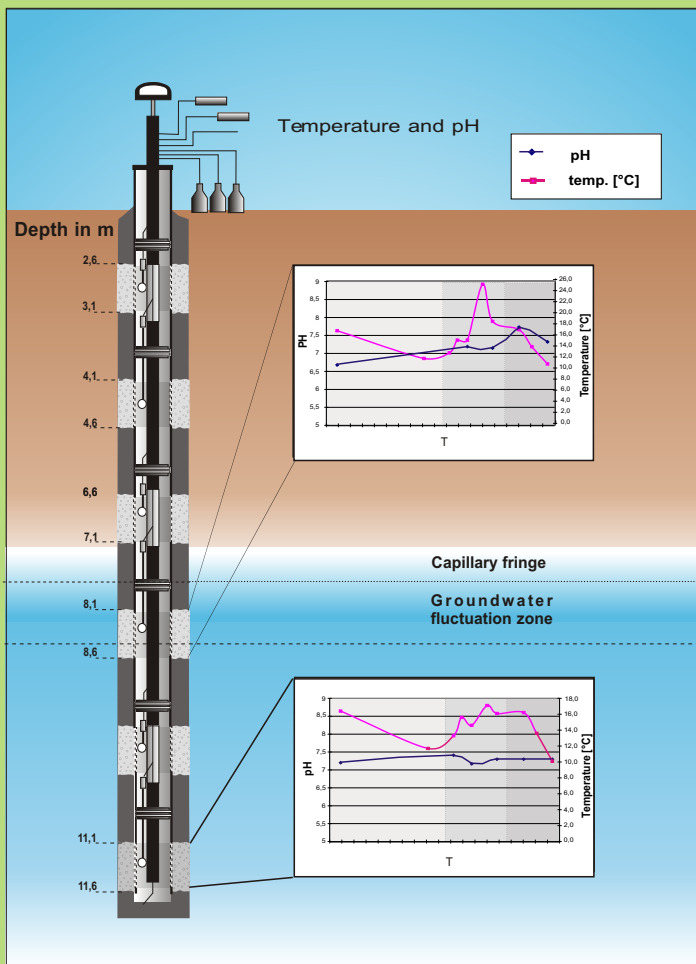
In the era of MCERTS for contaminated soil and groundwater analysis, sampling error is dramatically reduced using the IEG MLSW™ to recover samples from sealed installations at discrete and precisely known depths rendering expensive analytical data much more **reliable** and **cost effective**. By using the IEG MLSW™ to develop an accurate contamination profile, therefore, remediation system design can be realistically determined, appropriately sized and performance criteria set with confidence, **reducing uncertainty and risk**.

With remediation of sites on fixed budgets and programmes being a commercial reality, can you afford to continue to rely on potentially erroneous soil vapour and groundwater quality data obtained using inferior systems?

To discuss your in situ soil and groundwater remediation requirements, or for a free remediation concept and quotation, please contact us



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Principle of Operation

The IEG MLSW™ system consists of a standard HPDE ground-water sampling well (I.D. 100mm) with screened intervals at 500-1000 mm in length. On completion of drilling and logging, standard HDPE well screen and casing is inserted into the borehole as would be done for a conventional system, with screen sections positioned at specific depths in the saturated and unsaturated zones, dependent on field visual and olfactory assessments made during drilling.

The annulus around the screened intervals is then carefully filled with clean silica sand filter pack, whilst the annulus around the cased pipe sections between the screened sections is sealed with bentonite. These seals prevent vertical flow of soil gas and/or groundwater during the sampling, thereby eliminating cross-contamination between sampling horizons.

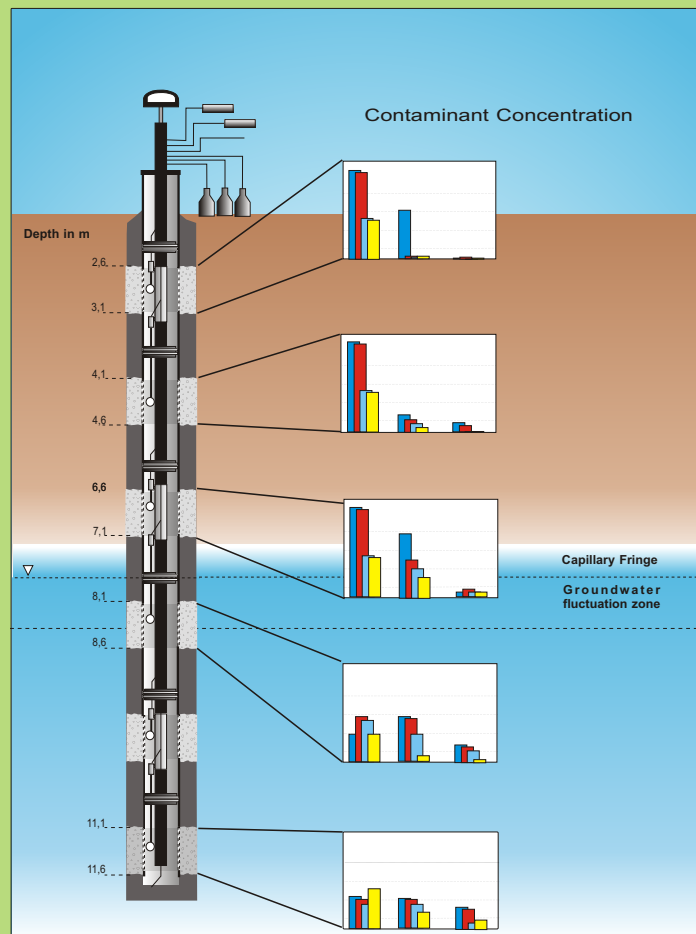
The MLSW™ consists of a manually-operated single piston drive, to which is attached pre-assembled double lip-packers positioned midway between the desired horizontal sampling horizons. Stainless-steel sampling chambers consisting of a piston operating inside a cylinder, are positioned between the sealed sampling areas.

The depths and lengths of the screened monitoring intervals are noted for each monitoring installation and the MLSW™ will be manufactured and delivered to site as ordered. Installation of the MLSW™ is simple and quick and can be accomplished in a matter of minutes by just one technician.

- **Patented design - proven engineering**
- **Easy to install and operate in the field**
- **Cost effective, time and labour saving**
- **Quality samples fast - repeatedly**

Sampling

Soil vapour and/or groundwater samples are then capable of being withdrawn into pre-determined sample vessels via the dedicated and discrete stainless-steel sampling ports. A simple up and downward motion of the piston head causes each of the sample cylinder chambers to fill with soil air or groundwater, depending on the particular depth of the sample intake. A strategically placed check valve controls the in- and outflow for an individual cylinder. The discrete samples can be brought to the surface without creating negative pressure, a situation frequently leading to distorted analysis results.



Advantages

- The number of monitoring boreholes required to obtain variable depth data is less than conventional techniques.
- Less drilling means less disruption to ongoing site activities.
- Material and personnel cost for this method are by far lower than conventional sampling with piezometers or nested wells, since only one person is needed to operate the hand pump, activating all sampling horizons at the same time the number of sampling horizons installed in the saturated and unsaturated zones is practically unlimited.
- Since the samples are removed without lowering the groundwater table or creating a cone of depression, the natural flow conditions of the aquifer remain undisturbed.
- Vertical flow in the sampling area, which results in distorted analytical results, is almost entirely prevented.
- Sampling procedure can be reproduced, repeatedly, providing consistent, accurate samples for analysis.
- No distorted analysis results caused by "relocating" of contaminants during sampling, since all components making contact with groundwater or soil air are firmly contained within the sealed system.