

Geo & Hydro

Geo & Hydro is specialised in contaminated land management. Advanced remediation advice and design is one of our expertise areas in which we cooperate with other consultants (civil or more general engineering) and contractors to provide optimal solutions to our clients.

In situ or on-site remediation of organic contaminants is possible by biological breakdown of the molecules of the contaminant. This can be a fuel like petrol or diesel, a solvent like trichloroethylene or a pesticide like DDT or Dieldrin.

Why carry out a BioTest™?

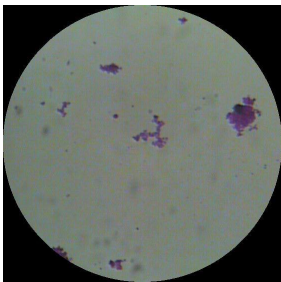
A Biotest™ is carried out to find the optimal conditions for those bacteria or fungi to breakdown the contaminants. These bacteria /fungi can occur naturally or can be added.

Some of the bacteria which breakdown contaminants are:

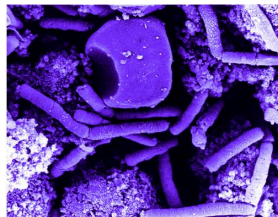
Spirillum



Coccus



Pseudomonas



Spirochete



Purpose of a BioTest™

The biological breakdown of contaminants is a long process and full scale remediation projects may take many years. Therefore it is important to know in advance if the method will be successful and what the final (residual) concentration is likely to be.

A BioTest™ is designed to answer such questions. A variety of options can be tested, from almost only natural attenuation to full stimulation of the biological process.

A BioTest™ is the basis of the remedial design and should be included in the planning stage of any remediation using biological breakdown (incl. MNA)

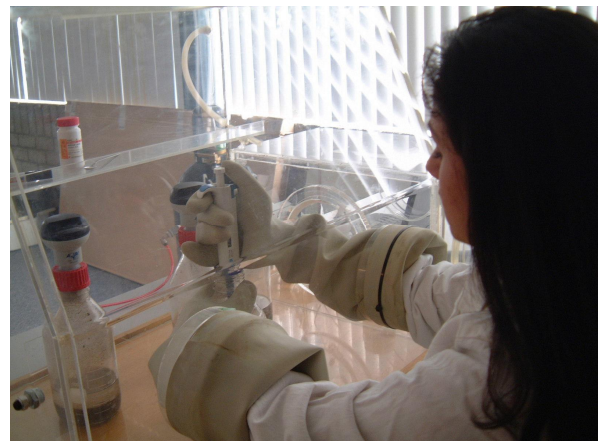
How do we do it?

The expected condition in the soil during remediation will be reproduced during the test such as:

- anaerobic or aerobic conditions;
- addition of oxygen or;
- addition of nutrients or carbon sources.

The breakdown is monitored by measuring several important parameters and by regular analysis by a certified laboratory.

Several BioTests™ are carried out for one project when different site conditions are expected at different depths or in various areas.



Advanced BioTests™

Advanced Biotests™ are carried out to compare different remediation techniques. Options include:

- Determining the influence of temperature or soil moisture;
- Comparing various carbon sources or mixtures (chlorinated solvents / pesticides);
- Determining the degree of stimulation to complete the project in a certain timeframe.

Which contaminants?

Biotests™ are available for most organic contaminants

- Aromatics;
- Mineral oil;
- Chlorinated solvents;
- Carbon acids;
- Esthers;
- Phenols

In some cases a literature study will be essential the contaminant is rather uncommon.

Accurate results

Accuracy and reproducibility are important. BioTest™ are therefor carried out according to internationally recognised protocols such as DIN 19737. The laboratory analysis are carried out t ILAT or NATA certified laboratory.

What is the cost of a BioTest™?

The cost depends on the test and the number of parallel tests. Due to the significant number of lab analysis per test and considerable work involved in the set-up and interpretation even relative simple tests cost a few thousand dollars. However an unsuccessful remediation project of several years may cost a lot more to correct. Whether a BioTest™ would be useful depends on site conditions and the aim of the remediation.

Based on an site assessment report an advice on the type of test and cost can be provided for \$ 350.-. excl. GST.

Any further questions?

Contact us by e-mail: ben@benkeet.com

BioTest™ Report

In a Biotest™ report the biological breakdown, expected breakdown intermediates, nutrient and other requirement are all concisely reported. Special attention is given to:

- Is natural attenuation possible?
- Which is to lowest possible final concentration?
- What is the expected breakdown rate?

Recommendations are made regarding requirements of the remedial system, which design factors will be critical and if filed pilot testing is recommended.

