



DHI SOLUTION

## LABORATORY SERVICES AND TESTING FACILITIES

Sampling • Testing • Analysis • Lab-/pilot-/field-scale • Tailor-made set-up

High quality and reliable material- and site-specific data are the foundation for important decisions and are fundamental to the success of any environmental investigation. Material-specific data are the basis for comparison with or setting of environmental quality criteria. Site-specific data serve as the basis for site-specific modelling or impact and risk assessment. We can perform sampling of specific material at relevant sites and perform adequate testing and analysis in tailor-made test set-ups.

### SAMPLING

All samples are taken for a specific purpose, and the data resulting from sampling, testing and analysis lead to a decision that has consequences. If a sample taken as part of a site investigation shows that environmental quality criteria are exceeded, the consequence could be that the site has to undergo a cost-intensive clean-up. To plan and perform sampling correctly may be a challenge, especially when dealing with a rather heterogeneous material such as waste. There are several principles of good sampling that can be followed and which significantly improve the quality of sampling.

With our expertise, we can help you identify the most adequate sampling method and equipment for your specific needs, plan the sampling process, and even carry out sampling for you.



### LEACHING TESTS

When it comes to choosing the correct leaching test, it's imperative to choose an appropriate test method for the issue in question. One test method can't answer all the pertinent questions and it might be necessary to perform a number of different

### SUMMARY

#### CLIENT

- Industry
- Waste treatment and disposal facilities
- Consultants and contractors
- Public sector

#### CHALLENGE

- Lack of material-specific data or only inadequate data available
- Inadequate or unreliable site-specific data available

#### SOLUTION

- Sampling of specific material at relevant sites
- Performance of adequate testing and analysis
- Tailor-made test set-up in lab, pilot and field scale
- Monitoring

#### VALUE

- High quality material and site-specific data
- Reduced risk of unqualified decisions
- Possible cost savings by compliance with target values
- Sound basis for impact and risk assessment

tests to obtain the requisite data. Moreover, not all tests are suitable for all kinds of material and certain leaching tests are used to describe the influence of specific factors (such as the pH or redox potential) on the leaching. We have the facilities and expertise to perform:

- batch leaching tests
- up-flow percolation tests
- pH dependence tests
- tank tests
- leaching tests for organic parameters

In Denmark, performing these tests often requires accreditation, which we possess for the majority of the tests. For example, we are accredited to test waste to determine whether it meets leaching-based acceptance criteria for waste to be landfilled.



*We can perform numerous leaching tests and for a large number of different materials, such as waste, residues, soil, sediments, aggregates, construction products*



### BIOACCESSIBILITY TESTING

Most soil quality criteria and clean-up levels for soil contaminants are based on toxicity studies. When polluted soil is ingested, the contaminants may be less accessible than in seen in toxicity studies. Bioaccessibility tests can be used to simulate how much of a contaminant may be accessible to the human body. You can use these tests as a tool in risk assessments to determine what level of pollution may be acceptable.

### FIELD-SCALE TESTS

We have experience with field-scale leaching tests and can assist you with setting up and conducting these types of experiments. At the field scale, leaching tests can be run in lysimeters – large columns that are filled with the material to be tested. The purpose of these lysimeter leaching tests is to provide new information about how the environment might be impacted by leaching of inorganic and organic substances from the material to be disposed of or recovered. We use this knowledge both to minimise environmental impact in the short and long term and in future discussions of legislation



*Lysimeter leaching tests in Copenhagen*

regarding disposal and recovery of waste. Our experience from lysimeter tests with shredder waste shows that if shredder waste is landfilled in the future, it may be

necessary to adjust design and operation of landfills (including pre-treatment). Similarly landfill legislation has to be adjusted in order to reduce the aftercare period and achieve final storage quality within a reasonable timeframe.

### TEST FACILITIES

We can provide you with expert advice when it comes to planning tailor-made experiments, whether this is at lab or pilot scale or in the field. We have facilities that enable us to set up and carry out specific experiments for your needs.



*Hydrogeological sampling at gypsum stack prior to testing of gypsum material, Landskrona, Sweden*

### DATABASE

In conjunction with collaborative partners, we've developed a database structure — Leaching eXpert System (LeachXS). LeachXS is both a database and expert Decision Support Systems (DSS) for characterisation and assessment of environmental impact. LeachXS estimates contaminant release as derived from leaching tests. Using LeachXS, we can assist you with

interpretation of the results of various leaching tests and estimation of long-term release of substances of interest.

Applicable materials include:

- industrial and hazardous waste
- stabilised waste
- construction materials
- municipal waste
- soil/contaminated soil
- mining wastes
- sediments

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