



Government of **Western Australia**  
Department of **Environment Regulation**

**ENVIRONMENTAL  
STANDARD**

# **Environmental Standard: Assessing leachates from waste-derived materials**

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## 1. Introduction

Applicants proposing to apply solid waste-derived materials (WDMs) to land or to use them as soil amendment agents must demonstrate that the use of the WDM will not cause harm to public health or to the environment. The Department of Environment Regulation’s case-by-case assessment of applications for the use of WDMs requires leach testing of the materials to assess potentially harmful chemical constituents which can be leached from solid WDMs. This Environmental Standard (ES) identifies and outlines the leachate testing methods for WDMs when they are proposed to be applied to land or used as soil amendment agents.

### 1.1 Scope

This ES sets out the processes and testing methods that are required for assessing chemical constituents of environmental concern that may be leached from WDMs that are:

- disposed of on land surfaces; and/or
- used as soil amendment agents.

### 1.2 Out of scope

This ES does not apply to the testing of leachates from waste or waste-derived materials at prescribed premises.

### 1.3 Review

This ES will be reviewed by 1 July 2017.

## 2. Referenced documents

The following documents are referenced:

US EPA SW-846	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
US EPA Method 1313 October 2012	Liquid-Solid Partitioning (LSP) as a Function of Extract pH Using a Parallel Batch Extraction Procedure
US EPA Method 1314, January 2013	Percolation Column Liquid-Solid Partitioning (LSP) as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials Using an Up-flow Percolation Column Procedure
US EPA Method 1315, January 2013	Mass transfer rates of chemical constituents in leachate from monolithic and compacted granular materials (e.g. construction materials) using a semi-dynamic tank leaching procedure
US EPA Method 1316, October 2012	How liquid-solid partitioning varies with the liquid-to-solid ratio using a parallel batch extraction procedure

### 3. Application of test methods

US EPA SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, includes Test Method 1313, Test Method 1314, Test Method 1315 and Test Method 1316.

The Leaching Environment Assessment Framework (LEAF) is a collection of leaching tests, data management tools and leaching assessment approaches developed to identify detailed characteristic leaching behaviours of a wide range of solid materials (e.g. wastes, soils, construction products etc). Extensive laboratory work and field trials have been undertaken to validate LEAF test methods 1313, 1314, 1315 and 1316.

Test Method 1313 determines how liquid-solid partitioning varies with the pH of the leaching solution using a parallel batch extraction method. This test method applies a full range of pH conditions that WDMs may be exposed to in the environment, thereby providing a high level of confidence in predicting the likely concentrations of contaminants in leachates from these materials in various settings.

Test Method 1314 determines how liquid-solid partitioning varies with varying liquid to solid ratios using an up-flow percolation column procedure. This test method considers how the concentration of leachate will vary as the liquid to solid ratio changes.

Test Method 1315 determines mass transfer rates of chemical constituents in leachate from monolithic and compacted granular materials (e.g. construction materials) using a semi-dynamic tank leaching procedure.

Test Method 1316 determines how liquid-solid partitioning varies with the liquid-to-solid ratio using a parallel batch extraction procedure.

### 4. Sampling and sample preparation

All sampling and sample preparations must be undertaken in accordance with SW-846 - Chapter Three (Inorganic Analytes) and Chapter Four (Organic Analytes) for sample collection and preservation methods.

All samples must be collected using the techniques specified in LEAF test methods 1313, 1314, 1315 and 1316.

### 5. Analysis and reporting

All laboratory samples must be submitted to and tested by a laboratory with current NATA accreditation or equivalent for the parameters being measured.

### 6. Quality assurance/quality control (QA/QC)

All procedural, analytical and quality control criteria specified in LEAF test methods 1313, 1314, 1315 and 1316 must be adhered to when applying this ES.