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Soil quality - Guidance on the determination of background values

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# Soil quality — Guidance on the determination of background values

*Qualité du sol — Guide pour la détermination des valeurs de bruit de fond*

Reference number
ISO 19258:2005(E)

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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 19258 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 7, *Soil and site assessment*.

# Soil quality — Guidance on the determination of background values

## 1 Scope

This International Standard provides guidance on the principles and main methods for the determination of pedo-geochemical background values and background values for inorganic and organic substances in soils.

This International Standard gives guidance on strategies for sampling and data processing and identifies methods for sampling and analysis.

This International Standard does not give guidance on the determination of background values for groundwater and sediments.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10381-1, *Soil quality — Sampling — Part 1: Guidance on the design of sampling programmes*

ISO 10381-5, *Soil quality — Sampling — Part 5: Guidance on the procedure for the investigation of urban and industrial sites with regard to soil contamination*

ISO 11074:2005, *Soil quality — Vocabulary*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11074 and the following apply.

**3.1**
**background content**
content of a substance in a soil resulting from both natural geological and pedological processes and including diffuse source inputs

**3.2**
**background value**
statistical characteristic (3.8) of the background content

**3.3**
**contaminant**
substance or agent present in the soil as a result of human activity

NOTE There is no assumption in this definition that harm results from the presence of the contaminant.

**3.4**
**diffuse source input**
input of a substance emitted from moving sources, from sources with a large area or from many sources

NOTE 1 The sources can be cars, application of substances through agricultural practices, emissions from town or region, deposition through flooding of a river.

NOTE 2 Diffuse source input usually leads to sites that are relatively uniformly contaminated. At some sites, the input conditions may nevertheless cause a higher local input such as near the source or where atmospheric deposition/rain is increased.

[ISO 11074:2005]

**3.5**
**pedo-geochemical content**
content of a substance in a soil resulting from natural geological and pedological processes, excluding any addition of human origin

NOTE It may be hardly possible to determine the precise pedo-geochemical content of certain substances in a soil due to anthropogenic diffuse contamination.

**3.6**
**pedo-geochemical background value**
statistical characteristic (3.8) of the pedo-geochemical content

NOTE Any estimate of pedo-geochemical background value will be prone to a certain amount of error given the uncertainty associated with determining the pedo-geochemical content.

**3.7**
**soil**
upper layer of the Earth's crust composed of mineral parts, organic substance, water, air and living organisms

[ISO 11074:2005]

**3.8**
**statistical characteristic**
numerical value calculated from a variate of a chosen parameter of the population

EXAMPLE Examples of the statistical characteristics are the mean, the median, the standard deviation or the percentiles of the ordered frequency distribution.

**3.9**
**study area**
three-dimensional definition of the area where samples are to be obtained from and thus for which the background value(s) are to be estimated

**3.10**
**support**
size, shape and orientation of a soil sample

NOTE For the purpose of analysing spatial variation in soils geostatistically (by estimation of the variogram of a soil property), the support should be the same at each sampling site.

**3.11**
**variate**
set of observed values of a variable

EXAMPLE A variate could for instance be the series of numbers of the concentration of a substance in soil or numerous, individual soil samples.