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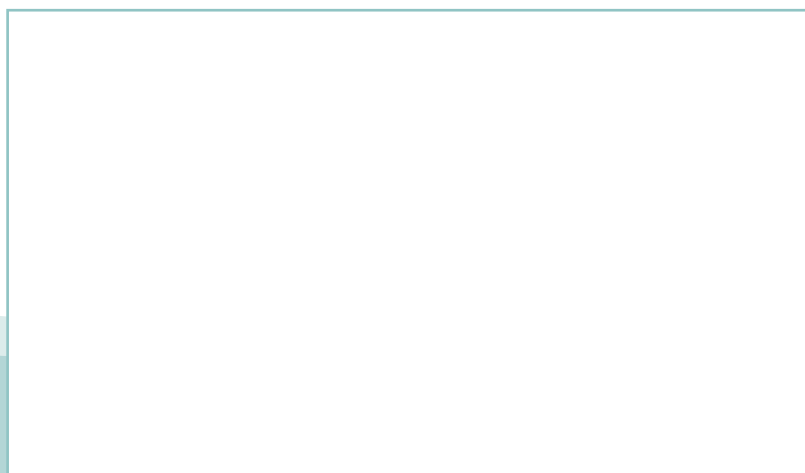
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Markundersökning – Vägledning vid bestämning av bakgrundsvärden (ISO 19258:2018)

Soil quality – Guidance on the determination of background values (ISO 19258:2018)



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Denna standard ersätter SS-EN ISO 19258:2011, utgåva 1

The European Standard EN ISO 19258:2018 has the status of a Swedish Standard. This document contains the official version of EN ISO 19258:2018.

This standard supersedes the SS-EN ISO 19258:2011, edition 1

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EUROPEAN STANDARD

EN ISO 19258

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2018

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Supersedes EN ISO 19258:2011

English Version

Soil quality - Guidance on the determination of background values (ISO 19258:2018)

Qualité du sol - Lignes directrices
pour la détermination des valeurs de
bruit de fond (ISO 19258:2018)

Bodenbeschaffenheit - Leitfaden zur Bestimmung
von Hintergrundwerte(ISO 19258:2018)

This European Standard was approved by CEN on 3 August 2018.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 19258:2018) has been prepared by Technical Committee ISO/TC 190 "Soil quality" in collaboration with Technical Committee CEN/TC 345 "Characterization of soils" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

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Endorsement notice

The text of ISO 19258:2018 has been approved by CEN as EN ISO 19258:2018 without any modification.

Soil quality — Guidance on the determination of background values

1 Scope

This document gives guidelines for the principles and main methods for the determination of background values for inorganic and organic substances in soils at a local/regional scale. The site scale is excluded.

It gives guidelines for sampling and data processing strategies. It identifies methods for sampling and analysis.

This document does not apply to the determination of background values for groundwater and sediments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 11074, *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.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

background concentration

concentration of an element or a substance characteristic of a soil type in an area or region arising from both natural sources and anthropogenic diffuse sources such as atmospheric deposition

[SOURCE: ISO 11074:2015, 3.5.1, modified — In the definition, “an element or” has been introduced before “a substance” and “anthropogenic” has replaced “non-natural”. Note 1 to entry has been removed.]

3.2

background value

statistical characteristics (3.8) of the total (natural pedo-geochemical and anthropogenic) content of a substances in soil

Note 1 to entry: Commonly expressed in terms of average, typical, median, mode, a range of values or a background value.

[SOURCE: ISO 11074:2015, 3.5.2, modified — Note 1 to entry has been added from ISO 11075:2014, 3.5.1.]

3.3

diffuse source input

input of a substance emitted from moving sources, from sources with a large area or from many sources

Note 1 to entry: In practice, two situations are commonly recognized: rural areas with diffuse source inputs typically from land spreading and aerial deposition; and urban areas where the diffuse source inputs come typically from traffic and industrial activities.

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Note 2 to entry: Diffuse source input usually leads to sites that are relatively uniformly contaminated. At some sites, the input conditions can nevertheless cause a higher local input, such as near the source or where atmospheric deposition/rain is increased. Two types of main diffuse source input can be considered: one in rural areas (e.g. atmospheric deposits, spreading); and one in urban areas (e.g. traffic, industries).

[SOURCE: ISO 11074:2015, 3.3.9, modified — Note 1 to entry has been replaced with new text. The last sentence in Note 2 to entry has been added.]

3.4 pedo-geochemical concentration

concentration of a substance in a soil resulting from natural geological and pedological processes, excluding any addition of anthropogenic origin

Note 1 to entry: It is difficult to determine the precise pedo-geochemical concentration of certain substances in soil due to the presence of anthropogenic diffuse contamination.

3.5 pedo-geochemical background value

statistical characteristic (3.8) of the *pedo-geochemical concentration* (3.4)

Note 1 to entry: Any estimate of pedo-geochemical background value is prone to certain errors given the uncertainty associated with determining the pedo-geochemical concentration.

[SOURCE: ISO 11074:2015, 3.5.9, modified — In the definition, “concentration” has replaced “content”.]

3.6 anthropogenic concentration

concentration of a substance in a soil resulting from anthropogenic origin

3.7 anthropogenic background value

statistical characteristic (3.8) of the *anthropogenic background concentration* (3.1) of a substance in soils

3.8 statistical characteristic

numerical value calculated from a *variate* (3.10) of a selected parameter of the population

EXAMPLE Mean, median, standard deviation, standard error, percentiles of the ordered frequency distribution.

[SOURCE: ISO 11074:2015, 3.5.11, modified — “selected” has replaced “chosen” and “standard error” has been added in the example.]

3.9 study area

three-dimensional definition of the area where samples are to be obtained from and, thus, for which the *background values* (3.2) are to be determined

[SOURCE: ISO 11074:2015, 5.2.29]

3.10 variate

set of observed values of a variable

EXAMPLE Series of numbers of the concentration of a substance in soil; numerous, individual soil samples.

4 General

Soils retain the evidence of their past history, including impacts due to natural events or human activities. Chemical impacts related to human activities can be detected in soils all over the world, even in regions far from any source of contamination. For this reason, the determination of background values of inorganic and organic substances in soils consists of a pedo-geochemical fraction and an

anthropogenic fraction. The ratio of these fractions varies widely depending on the type of substances, the type of soil and land use, and the kind and extent of external impacts.

For many inorganic substances, the background concentration is dominated by the pedo-geochemical concentration and, consequently, by the mineralogical composition of the soils' parent material. Pedogenetic processes can lead to a redistribution (enrichment/impoverishment) and, consequently, to a horizon-specific differentiation of the substances within a soil profile. Persistent organic substances in soils originate more often from non-natural sources. Therefore, the background concentration of soils is governed by the kind and extent of diffuse contamination from non-soil sources.

In practice, it is often difficult to distinguish clearly between the pedo-geochemical and the anthropogenic fraction of the background concentration of soils. Nonetheless, a detailed knowledge of the background concentration and its natural fraction for the substances of concern is essential for any evaluation of the current status of soils for environmental or land use related aspects, as well as for scientific purposes within the scope of pedology or geochemistry. To this end, so-called background values in terms of the statistical characteristics of both the pedo-geochemical and the anthropogenic fraction should be determined.

A variety of different objectives can be identified for the determination of background values of inorganic and/or organic substances in soils. The objectives themselves provide insufficient information to define the technical programme that will produce the desired background values. Thus, a number of technical approaches should be defined, which together form the basis of the technical programme.

This guidance identifies:

- essential requirements of sampling strategies and procedures;
- minimum requirements regarding the necessary steps and ways of sample pretreatment;
- analytical methods;
- statistical evaluation procedures for determining sound and comparable background values.

Guidance is given on:

- a) evaluating existing data from different data sources;
- b) setting up investigation programmes to compile background values for a clearly defined three-dimensional picture of the soil.

These situations represent the two extreme starting positions for the process of compiling background values. In practice, there is also a third intermediate situation in which additional data are collected because the quantity or quality of the existing data are insufficient.

5 Procedures

5.1 General

The procedures to determine background values encompass aspects of sampling (e.g. strategy, procedure), soil analysis (e.g. pretreatment, extraction, measurement), data processing and presentation. In general, two starting positions can be distinguished, namely:

- a) the evaluation of existing data, mostly from different data sources;
- b) the collection of new data based on an appropriate investigation strategy.