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Soil quality — Vocabulary

Qualité du sol — Vocabulaire

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 444, *Environmental characterization of solid matrices*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 11074:2015), which has been technically revised. It also incorporates the Amendment ISO 11074:2015/Amd 1:2020.

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The main changes are as follows:

- terminological entries have been reorganised with all the terms and definitions placed in [Clause 3](#) in alphabetical order;
- terms that have different definitions depending on the context have been grouped, and the domain field has been added in angle brackets to differentiate them.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document defines soil quality terms. The previous editions (ISO 11074:2015 and ISO 11074/Amd 1:2020) presented terms and definitions in separate clauses to differentiate the terms about e.g. sampling, remediation. This became more and more artificial, since soil quality experts with different expertise need to work closely together and there is a greater need for one term list instead of multiple ones, where experts first need to find out in which clause a specific term is located. In this edition, all the terms are included in [Clause 3](#).

For some terms, there are different definitions, depending on the context. These terms are presented after each other, with the differentiating domains between brackets: <context>. Often these are a general domain and a specific domain, resulting in different definitions.

Though the terms apply to all other ISO/TC 190 soil quality standards, this document does not cover all the terms used in ISO/TC 190 soil quality standards.

New and revised standards are published continuously though time. The revision periods of soil quality standards differ. That means that definitions of the same terms can be different in specific soil quality standard and in this document.

NOTE For general terms relating to quality, see ISO 9000.

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Soil quality — Vocabulary

1 Scope

This document defines terms used in the field of soil quality.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

3.1

abandoned hazardous site

hazardous site (3.201) left by the owner or other responsible party in unmanaged condition

3.2

abandoned industrial site

industrial site (3.443) left by the owner or other responsible party in unmanaged condition

3.3

abandoned potentially hazardous site

site (3.443), left by the owner or other responsible party in unmanaged condition, whose history leads to a suspicion that it can be hazardous

3.4

abandoned waste disposal site

waste disposal site (3.443) left by the owner or other responsible party in unmanaged condition

3.5

abiotic decomposition

decomposition (3.113) by physical and/or chemical processes (e.g. photolysis, *hydrolysis* (3.211), *oxidation* (3.305), and *reduction* (3.373))

3.6

abiotic degradation

degradation (3.116) by physical and/or chemical processes

3.7

above-ground sampling

process of taking *samples* (3.398) from material that has been deposited on the ground surface

EXAMPLE Samples are taken from a *stockpile* (3.496) (including *bulk volumes* (3.64) of *excavated soils* (3.154)), deposit of waste or embankment (see ISO 18400-104:2018).

3.8

accumulation

increase of the *concentration* (3.86) of a substance in soil due to the fact that the *substance input* (3.508) is larger than the *substance output* (3.509)

Note 1 to entry: Substance output includes material which is degraded.

3.9

active protective measure

process designed, for example, to control *groundwater* (3.191) or *gas migration* (3.178)

EXAMPLE Pumped water extraction or gas extraction system.

3.10

active soil gas sampling

sampling (3.410) by extracting a certain volume of *soil gas* (3.454)

3.11

actual increment size

amount of material that is present in an *increment* (3.218)

3.12

actual sample size

amount of material that is present in the *sample* (3.398)

3.13

aerobic

descriptive of a condition with molecular oxygen available

3.14

aerobic biological treatment

biological treatment (3.46) in the presence of oxygen

3.15

aftercare management

measures applied on completion of remedial works or as an integral part of a *containment* (3.90) strategy to ensure continued *effectiveness* (3.142) over the long term

3.16

aggressive soil conditions

soil conditions potentially damaging to buildings and construction materials

3.17

air-sparging

introduction of air under pressure into the *groundwater* (3.191)

3.18

aliphatic hydrocarbon

acyclic or cyclic, saturated or unsaturated carbon compound, excluding aromatic compounds

3.19

aliquot

known amount of a *homogeneous* (3.204) material, assumed to be taken with negligible *sampling error* (3.413)

Note 1 to entry: The term is usually applied to fluids.

3.20

ammonification

microbial *degradation* (3.116) of organic nitrogen to ammonia

3.21

amplicon

DNA or RNA fragment obtained by *polymerase chain reaction (PCR)* (3.330) from a template

3.22

anaerobic

descriptive of a condition in which molecular oxygen is not available

3.23

anaerobic biological treatment

biological treatment (3.46) in the absence of gaseous or soluble oxygen

3.24

anaerobic transformation

reaction occurring under exclusion of oxygen (*reducing* (3.372) condition)

Note 1 to entry: These generally occur when the redox potential (Eh) is less than 200 mV.

3.25

analytical and testing strategy

plan comprising the *samples* (3.398) to be analysed or tested, the parameters to be measured, sample preparation methods, and the analytical or testing methods to be employed

Note 1 to entry: There should be associated quality assurance methods.

3.26

analytical sample

portion of material, resulting from the original *sample* (3.398) or *composite sample* (3.83) (3.84) by means of an appropriate method of *sample pretreatment* (3.402) and having the size (volume/mass) necessary for the desired testing or analysis

3.27

anisotropy

property of a soil or other volume of material to have different spatial variation structures depending on direction and distance

Note 1 to entry: Usually illustrated in a *variogram* (3.566).

3.28

anthropogenic change

influence on soil properties caused by human activities

3.29

anthropogenic concentration

concentration (3.86) of a substance in a soil resulting from anthropogenic origin

Note 1 to entry: See ISO 19204:2017.

3.30

anthropogenic ground

deposits which have accumulated through human activity

Note 1 to entry: These can consist of natural materials placed/replaced by man (e.g. clay) or man-made materials (e.g. refuse).

Note 2 to entry: See ISO 18400-104:2018.

3.31

aromatic hydrocarbon

hydrocarbon (3.210) of which the molecular structure incorporates one or more planar sets of six carbon atoms that are connected by delocalized electrons, numbering the same as if they consisted of alternating single and double covalent bonds

3.32

assessment criteria

criteria set up to help decide if a *site* (3.443) requires further investigation or other action (e.g. *remediation* (3.380))

Note 1 to entry: The assessment criteria aid in interpreting the results of a quantitative *risk* (3.393) or other assessment.

Note 2 to entry: For *risk assessments* (3.395), assessment criteria are often *threshold* (3.534) values for *doses* (3.131) or *media concentrations* (3.86), such as tolerable daily intake, tolerable air, water, and soil concentrations set by international, national, or local authorities.

3.33

available water capacity

soil water (3.479) content usable by plants based on the effective root penetration depth

Note 1 to entry: The usable *field capacity* (3.166) in the effective root zone is expressed in millimetres of water column.

Note 2 to entry: The available water capacity (AWC) is generally taken to be the water content between field capacity (FC) and the permanent *wilting point* (3.572) (PWP) or 10 kPa to 1 500 kPa.

3.34

avoidance behaviour

tendency (of an organism) to avoid the test soil while preferring the *control soil* (3.95)

3.35

background concentration

concentration (3.86) of an element or a substance *characteristic* (3.70) of a soil type in an area or region arising from both natural sources and anthropogenic diffuse sources such as atmospheric deposition

3.36

background value

statistical characteristics (3.495) of the total (natural pedo-geochemical and anthropogenic) content of substances in soil

3.37

basal respiration

microbial soil respiration without addition of substrate

3.38

basal respiration rate

R_B
constant mass of CO₂ released or mass of O₂ consumed per unit mass of soil per unit time without substrate addition

3.39

bedrock

in situ naturally consolidated rock either underlying drift deposits such as glacial till or exposed by past or current erosion processes

3.40

bioaccessibility

fraction (3.172) of a substance in soil or *soil material* (3.459) that is liberated in (human) gastrointestinal juices and thus available for absorption

3.41

bioavailability

<general> degree to which chemicals present in the soil can be absorbed or metabolised by a human or ecological *receptor* (3.370) or are available for interaction with biological systems

3.42

bioavailability

<human health> *fraction* (3.172) of a substance present in ingested soil that reaches the systemic circulation (blood stream)

3.43

bioconcentration factor

BCF

ratio of the *concentration* (3.86) of a substance in an organism to that in the soil

3.44

biodegradation

molecular *degradation* (3.116) of an organic substance resulting from the complex actions of living organisms

3.45

biodiversity

variability among living organisms on the earth, including the variability within and between species, and within and between ecosystems

Note 1 to entry: This is also often used to refer to the number and variety of organisms found within a specified geographic region.

[SOURCE: ISO 14050:2020, 3.8.22, modified —Note 1 to entry has been added.]

3.46

biological treatment

methods using the natural activities of plants or *microorganisms* (3.266), such as bacteria and fungi, to transform, destroy, fix or immobilise *contaminants* (3.91)

3.47

biomass

<general> total mass of living organisms or parts of them

Note 1 to entry: Biomass is expressed as fresh or dry mass of test organism or fresh or dry mass per test unit.

3.48

biomass

<fauna> total mass of test organisms or parts of them expressed as dry mass or fresh mass of test organism or dry mass or fresh mass per test unit

3.49

biomass

<plants> total mass of shoots, flowers and seed pods

Note 1 to entry: Biomass is expressed as dry mass per plant or, if needed, as dry mass per pot. During the test period, some of the test plants can reach different *growth* (3.194) stages and their water content can differ when the plants are harvested. Thus, the dry mass better represents the biomass produced during the growth period.

3.50

bioreactor

equipment in which biotreatment is applied to a solid, liquid, or slurry

3.51

bioremediation

use of *biological treatment* (3.46) methods to decontaminate soil or *groundwater* (3.191)

3.52

biosolid

organic product applied to soil

EXAMPLE Sewage sludge, compost, manure, industrial products.

Note 1 to entry: Without giving a specific context, biosolid is often regarded as a component of sewage sludge.

3.53

**biotreatment bed
treatment bed**

above-ground bed of soil designed to enhance *biodegradation* (3.44) processes, usually incorporating means of collecting leachate and often means of maintaining oxygen (in aerobic processes) and nutrient levels

Note 1 to entry: It can also include means of capturing released volatiles or means of maintaining *anaerobic* (3.22) conditions.

3.54

bioventing

in situ process in which vapour extraction or air infiltration rates, or both, are adjusted to optimize *biodegradation* (3.44) reactions

3.55

boiling point

BP
point at which the vapour pressure of a liquid equals the external pressure acting on the surface of liquid

Note 1 to entry: It is expressed in degrees Celsius.

3.56

**boring
borehole
bore**

hole of any predetermined diameter and length formed in any soil, geological formation, or man-made material by *drilling* (3.134)

3.57

bottom barrier system

in-ground (largely) horizontal barrier used to isolate or contain a *site* (3.443), or both

3.58

**bound residues
non-extractable residues**

chemical species in plants and soils, that cannot be extracted without significantly changing the chemical nature of these residues

EXAMPLE Chemical species originating from organic molecules.

Note 1 to entry: These non-extractable residues are considered to exclude fragments recycled through metabolic pathways leading to natural products.

3.59

break layer

stratum of high permeability granular material within a *cover system* (3.102)

Note 1 to entry: Its purpose is to stop upward capillary movement of soluble *contaminants* (3.91).

3.60

brownfield

<general> land affected by former uses

3.61

brownfield

<sustainable remediation> *site* (3.443) which:

- has been affected by former uses of the site or surrounding land;
- is derelict or underused;
- is mainly in fully developed or partly developed urban areas;

- requires intervention to bring it back to beneficial use; and/or
- can have real or perceived *contamination* (3.93) problems

3.62

bulk density

ratio of the mass of a quantity of material (or one phase) and the total volume occupied by this material (including other phases)

Note 1 to entry: This is typically a volumetric mass, but it is commonly named as “density”. The numerical values are identical or divided by the volumetric mass of water ($1 \text{ t} \cdot \text{m}^{-3}$) at 4 °C.

3.63

bulk sample

sample (3.398) resulting from the planned aggregation or the combination of sample units

[SOURCE: Reference [27]]

3.64

bulk volume

volume, including the solids and pores, of an arbitrary soil mass

3.65

capillary water

water held on soil particles due to unbalanced inter-molecular attraction at the liquid boundary

EXAMPLE The rise or depression of liquids in narrow tubes, the formation of films, drops, bubbles, etc.

3.66

carcinogen

substance that causes the development of malignant cells in animals or humans

3.67

certified reference material

CRM

reference material (3.374), one or more of whose property values are certified by a technically valid procedure accompanied by a certificate or any document allowing the identification of the origin of the certificate

3.68

chain-of-custody procedure

procedure to ensure *sample* (3.398) integrity (e.g. when transferred between the field and laboratory and within a laboratory) and to ensure that the sample will provide legally and technically defensible data

Note 1 to entry: See ISO 5667-3:2024, 3.2 for a definition of integrity.

3.69

channel sample

sample (3.398) obtained by removal of material in a channel-like shape from the soil using suitable equipment

3.70

characteristic

property or attribute of a material that is measured, compared, or observed

3.71

chemical treatment

treatment of contaminated soil, *sediment* (3.433), water, or other material in which the principal mechanism for *degradation* (3.116) or conversion to a less environmentally harmful form is a chemical reaction or combination of reactions

3.72

chemico-physical treatment

process-based treatment relying on combination of physical and chemical processes

3.73

classification system

ranking system

formalized system to perform a *preliminary assessment* ([3.341](#))

Note 1 to entry: Formalized procedures can also aid in interpreting results of the *preliminary investigation* ([3.342](#)).

3.74

clay content

proportion of soil particles with a particle size < 2 µm

3.75

cloning vector

a small piece of DNA that can be stably maintained in an organism, and into which a foreign DNA fragment can be inserted for cloning purposes

3.76

cluster sample

composite sample ([3.83](#)) ([3.84](#)) for which the *increments* ([3.218](#)) are taken over a small area around a predefined *sampling point* ([3.418](#))

Note 1 to entry: Sampled area is typically about 0,5 m² to 1,0 m².

Note 2 to entry: Material sampled is taken from within the same stratum or from material with the same *characteristics* ([3.70](#)).

3.77

community relations

processes involved in informing and consulting the local community affected by a *hazardous site* ([3.201](#)) and activities to investigate or remediate it

3.78

community relations plan

formal statement of measures to be taken to inform and consult the local community

3.79

competent authority

<contaminated sites> authority that assesses investigation results and takes decisions about the severity and urgency of the soil *contamination* ([3.93](#)) found, and that also assesses proposals for *remediation* ([3.380](#)) or *protective measures* ([3.354](#))

Note 1 to entry: Depending on the *site* ([3.443](#)) and the country, the competent authority can be very different.

3.80

compliance control

performance control

investigation or programme of ongoing inspection, testing, or *monitoring* ([3.276](#)) to confirm that a *remediation strategy* ([3.383](#)) has been properly implemented (e.g. all contaminated materials have been removed) and/or when a *containment* ([3.90](#)) approach has been adopted, that this continues to perform to the specified level

3.81

compliance point

location (e.g. soil or *groundwater* ([3.191](#))) where the *assessment criteria* ([3.32](#)) is measured to check if the criteria are met