BS ISO 28901:2011

BSI Standards Publication

Soil quality — Guidance for burial of animal carcasses to prevent epidemics

bsi.

...making excellence a habit.™

Document Sharing Hub

Full document details: BS ISO 28901:2011

National foreword

This British Standard is the UK implementation of ISO 28901:2011.

The UK participation in its preparation was entrusted to Technical Committee EH/4, Soil quality.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© BSI 2011

ISBN 978 0 580 66855 5

ICS 13.080.99

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2011.

Amendments issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS ISO 28901:2011

INTERNATIONAL STANDARD

ISO 28901

First edition
2011-09-15

Soil quality — Guidance for burial of animal carcasses to prevent epidemics

Qualité du sol — Lignes directrices pour l'enfouissement des carcasses d'animaux pour éviter une épidémie

Reference number
ISO 28901:2011(E)

Documents
Document Sharing Hub
© ISO 2011

Full document details: BS ISO 28901:2011

COPYRIGHT PROTECTED DOCUMENT

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO 2011 – All rights reserved

Documents
Document Sharing Hub

Full document details: BS ISO 28901:2011

Contents

Page

Foreword ... iv

Introduction ... v

1 Scope ... 1

2 Normative references ... 1

3 Terms and definitions ... 1

4 Objectives and constraints ... 2

5 Planning of burial programme ... 3
5.1 Time of burial ... 3
5.2 Consideration of diseases and kind of animal carcasses infected ... 3
5.3 Selection of burial site ... 4

6 Construction of burial pit ... 9
6.1 Preparation of the site ... 9
6.2 Excavation of the burial site ... 10
6.3 Placement of lining materials and discharge pipes ... 10
6.4 Placing of carcasses in the burial pit ... 11
6.5 Coverage of burial pit after finalization of placement of carcasses ... 11

7 Maintenance after burial ... 12
7.1 Safety measures ... 12
7.2 Odour treatment ... 12
7.3 Gas discharge ... 12
7.4 Leachate treatment ... 12
7.5 Surface regrading ... 12

8 Monitoring ... 12

9 Reuse of burial sites ... 12

10 Report and record keeping ... 13

Annex A (informative) **Examples of national specifications regarding burial of animal carcasses** ... 14

Annex B (informative) **Diseases listed by the World Organisation for Animal Health (OIE)** ... 22

Annex C (informative) **Examples of the design of protection layers for perforated drainage pipes** ... 26

Bibliography ... 27

© ISO 2011 – All rights reserved

Documents
Document Sharing Hub

Full document details: BS ISO 28901:2011

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 28901 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 7, *Soil and site assessment*.

© ISO 2011 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 28901:2011

Introduction

The incidence of livestock epidemics such as bovine spongiform encephalopathy (BSE), swine fever, foot and mouth disease (FMD), Newcastle disease and avian influenza (AI) are becoming increasingly more frequent and geographically widespread. These epidemics spread quickly across country borders due to rapid exchange of people, animals and products between countries. Epidemics threaten the welfare of human beings through secondary infection on other livestock, economic loss and public health. Preventing the spread of epidemics to other areas where livestock are raised is the priority. However, when this fails and the epidemic has spread, rapid and effective action should be taken to prevent the further spread of infection. Slaughter followed by disposal of infected livestock is an essential means of preventing the spread of the epidemic.

Disposal methods for slaughtered livestock include: incineration, rendering, composting and burial. Burial is a method that has long been used, as it is relatively economical and does not require specialized techniques or equipment. However, it does have the potential to contaminate the receiving environment. Leachate from the buried animal carcass can pollute the soil and the surrounding waters (groundwater and surface water), and the gas caused by the decomposition of the carcass produces foul. Despite such drawbacks, burial continues to be used widely, because it can limit the spread of an epidemic when massive amount of carcasses must be disposed rapidly. The objectives of this International Standard are to curtail the spread of the disease, to destroy the causative agents, and to dispose of the carcasses by burial.

© ISO 2011 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 28901:2011

Documents
Document Sharing Hub

INTERNATIONAL STANDARD ISO 28901:2011(E)

Soil quality — Guidance for burial of animal carcasses to prevent epidemics

1 Scope

This International Standard provides guidance on environment-friendly burial methods of animal carcasses to prevent epidemics, to curtail the spread of the disease, to destroy the causative agents, and to dispose of the carcasses.

This International Standard does not apply to the burial of animal carcasses resulting from natural death or by accident.

Other methods of disposal are outside the scope of this International Standard.

NOTE In some countries, infected animals or parts of animals cannot be buried on farms due to legislation but are subject to handling by licensed commercial landfills or incinerations.

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 10390, *Soil quality — Determination of pH*

ISO 10694, *Soil quality — Determination of organic and total carbon after dry combustion (elementary analysis)*

ISO 11260, *Soil quality — Determination of effective cation exchange capacity and base saturation level using barium chloride solution*

ISO 11272, *Soil quality — Determination of dry bulk density*

ISO 11277, *Soil quality — Determination of particle size distribution in mineral soil material — Method by sieving and sedimentation*

ISO 13536, *Soil quality — Determination of the potential cation exchange capacity and exchangeable cations using barium chloride solution buffered at pH = 8,1*

ISO 14688-2:2004, *Geotechnical investigation and testing — Identification and classification of soil — Part 2: Principles for a classification*

ISO 25177, *Soil quality — Field soil description*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
affected animal
animal which has been infectious or is at present infectious or is suspected of soon becoming infectious and which is to be killed to prevent epidemics

3.2
animal carcass
dead body of an animal or parts thereof, or products of animal origin

NOTE Animal excreta are included in this definition.

© ISO 2011 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 28901:2011

3.3
burial
act of burying an animal carcass

3.4
discharge
action of releasing a substance such as a liquid or gas; a substance that is expelled from a defined area or location

3.5
disposal
collective noun for any operation to remove and discard waste

3.6
epidemic
large number of cases of a particular disease, usually infectious, occurring at the same time in a particular community

3.7
infectious waste
substance containing viable microorganisms or their toxins which is known or reliably believed to cause disease in man or other living organisms

[EN 13965-1:2004]

3.8
leachate
liquid percolated through a soil and containing substances in solution or suspension

3.9
livestock
domesticated animals, usually kept on a farm

EXAMPLES Cattle, sheep, horses, pigs, chickens.

3.10
permeability
measure of the ease with which gases, liquids, or plant roots penetrate or pass through a bulk mass of soil

3.11
quicklime
liming material consisting mainly of calcium oxide or a mixture of calcium oxide and possibly magnesium oxide, produced by the calcination of limestone, magnesian limestone or dolomitic limestone

[EN 12944-3:2001]

3.12
soil texture
relative proportions of the various particle size fractions (i.e. sand, silt, clay) in a soil according to a soil classification system

3.13
wildlife animal
all non-domesticated animals

EXAMPLES Deer, wild boar, rodents.

4 Objectives and constraints

In the event of an epidemic in which an infectious disease either kills animals directly or causes them to be killed, urgent action is required to

— curtail the spread of the disease,

© ISO 2011 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 28901:2011

— destroy the causative agents,

— rehabilitate those persons affected by the epidemic,

— return the land to profitable agriculture or other use,

— dispose of the carcasses, and

— dispose of excreta and other obnoxious material.

Four factors will constrain the work:

a) The need for urgency arises because there will be a multiplicity of pathways by which the causative agents can be transmitted from live or dead animals within the area affected to animals in remote locations. The causative agent can be spread by birds, other wildlife, or transported by wind or wind-blown dust, and water. All of these mechanisms are difficult to control.

b) In an attempt to arrest some of these pathways, the site shall be quarantined, with movements of people and other animals onsite and offsite being minimized, controlled and disinfected.

c) As a consequence, the work shall be constrained by what is in hand or can readily be obtained.

d) Further adaptation should be made to suit local ground conditions.

The number of animals involved shall also be considered.

NOTE For example, in one small outbreak in 2007, over 350 cattle were slaughtered on one day, and 800 pigs and 50 more cattle were slaughtered on the following day.

5 Planning of burial programme

5.1 Time of burial

Carcasses should be buried as soon as possible after their death. However, it should be noted that postmortem livestock will gas up and increase volume by up to half. Therefore, if they are placed in a burial pit too soon and covered over, the carcasses will subsequently rapidly degas, causing large voids to form and causing cracking of cover material. Therefore, either the stock should not be covered immediately or the carcasses should be pierced to prevent them gassing up.

Once buried, decomposition and degradation processes will intensify after 24 h to 72 h (depending on the ambient temperature), which will pose additional threats to health and the environment.

Each country may have a specified time frame within which carcasses shall be buried.

5.2 Consideration of diseases and kind of animal carcasses infected

When livestock are sufficiently believed to be infected by an epidemic, owners of livestock in the area where the epidemic has spread or may spread can be ordered to immediately eradicate the livestock. Livestock eradication requirements can differ on a national scale, depending on the form of the epidemic. Diseases listed by the World Organisation for Animal Health (OIE) are given in Annex B.

5.2.1 Consideration of volume of carcasses to be buried

It might be necessary to bury the following:

a) carcasses and parts thereof;

b) excreta, including: urine, dung, sweat, saliva, snot (nasal mucus), tears, earwax, milk, semen, “afterbirth”;

c) miscellaneous droppings, for example: hair, scurf, skin, blood;

© ISO 2011 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 28901:2011

d) infected straw, bedding mixed with dung, farmyard manure (if infected), etc.

Depending on the disease, some or perhaps all of these can transmit viable causative agents.

Burial volume is generally determined by the livestock's species and size. If the burial volume is uncertain, it should be assumed that no more than 300 kg of carcass per 1 m^3 will be permitted. Table 1 gives an indication of average livestock weight.

Table 1 — Average livestock weight

Type	Kind of animal	Weight kg
Beef cattle	Cows and bulls	550
	Feeder cattle	450
	Replacement heifers	360
	Calves	135
Dairy cattle	Cows and bulls	600
	Replacement heifers	450
	Calves	135
Hog	Boars or sows	150
	Feeder pigs	100
	Weanling pigs	16
Poultry	Hens, cockerels, capons	1,8
	Chicks, broilers	1,5
	Hen turkeys, geese, ducks	8
Sheep		50

5.3 Selection of burial site

5.3.1 Deciding between onsite or offsite burial

In general, to avoid further spreading of the disease due to transport and handling, the infected livestock should be buried at the site where they are found.

The principal advantages of burial over incineration are that burial tools are simple, and movements off the site where infected animal carcasses occur are minimized.

When a suitable location for burial is not available on the farm, burial would have to be off the farm.

If the carcasses are buried on the farm, continuing maintenance and monitoring of the burial area are required (in relation to an existing national specification, if available); see also Clause 8. This area should be taken out of production.

NOTE The presence of the pit, even if landscaped, can reduce the value of the land.

5.3.2 Methods of burial

The following methods of burial are distinguished.

Simple burial: The carcasses are laid into a pit and soil is placed directly on top of them, perhaps with the addition of some quicklime. In this method, earth-dwelling worms, insects, and bacteria have direct access to the carcasses and assist in their disintegration. However, large volumes of obnoxious effluent are to be expected, and the causative agents are likely to escape with the effluent, meaning that complete disposal of

© ISO 2011 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 28901:2011