GLOSSARY OF TERMS

The terms used in the text are defined in this glossary, and apply only to this guidance. The authors gratefully acknowledge DETR’s consent to reproduce parts of the Glossary of Terms from “The Reclamation of Mineral Workings to Agriculture” ISBN 0 11 753095 6.

AFTERCARE PERIOD
Period (usually 5 years) following soil replacement during which drainage, cultivation, seeding, fertilising and establishment of after-use to the agreed standard takes place. Programme of aftercare works must be agreed with the Mineral Planning Authority.

AFTERCARE SCHEME
A scheme submitted by the operators and agreed with the Mineral Planning Authority setting out the proposed management of the land during the aftercare period. Alternatively, the steps required during the aftercare period may be set out as a series of planning conditions.

AFTER-USE
The final use of the site following restoration. For example, forestry, amenity, agriculture. An agricultural after-use may be, for example, permanent grass, arable crops, or a rotation including arable crops and grass.

AGRICULTURAL LAND CLASSIFICATION (ALC)
A methodology developed by the Ministry of Agriculture Fisheries and Food (MAFF) for assessing the quality of agricultural land. The system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The principle physical factors influencing agricultural production are climate, site and soil. These factors together with interactions between them form the basis for classifying land. The methodology has five grades (grade 1 the highest quality land and 5 the poorest) with grade 3 subdivided into two subgrades 3a and 3b. The grade or subgrade of land is determined by the most limiting factor present.

AMENDMENT
An organic or inorganic substance which is added to soil forming materials to improve their chemical and physical properties to
increase biological activity and facilitate plant growth.

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<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>ANAEROBIC</strong></td>
<td>Without oxygen. May be a problem with soil storage, where soil may become anaerobic due to compaction or waterlogging excluding air from within the soil, reducing its ability to support plant growth without remedial measures.</td>
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<tr>
<td><strong>ARABLE AGRICULTURE</strong></td>
<td>Production of crops which require cultivation and reseeding each year, such as cereals, root crops and oilseed rape.</td>
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<td><strong>BACKACTER</strong></td>
<td>Also known as a back-hoe hydraulic excavator. A machine with a reach of about 6 metres normally mounted on tracks, used for stripping and restoring soils, as well as for loading dumptrucks.</td>
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<tr>
<td><strong>BEST AND MOST VERSATILE AGRICULTURAL LAND</strong></td>
<td>MAFF Agricultural Land Classification grades 1, 2 and 3a agricultural land.</td>
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<td><strong>BIODEGRADABLE</strong></td>
<td>(Also putrescible) material which is capable of being decomposed by microorganisms into its elements or constituents.</td>
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<td><strong>BULKING FACTOR</strong></td>
<td>The % increase in volume of materials when excavated compared to their volume in an undisturbed state.</td>
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<td><strong>BUND</strong></td>
<td>Stack of stored material, usually soil, often used to screen working areas; or material placed in an engineering context to protect areas from flooding or spillage of fuel etc.</td>
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<tr>
<td><strong>CAP</strong></td>
<td>(Also capping layer) the cover placed over the landfill on completion of landfilling to exclude water or to ensure landfill gases can be effectively managed. Constructed of low permeability material.</td>
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<td><strong>COMPACTION</strong></td>
<td>Compression of soils normally by heavy machinery which damages soil structure, resulting in restrictions to plant rooting and poor drainage.</td>
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<td><strong>DIFFERENTIAL SETTLEMENT</strong></td>
<td>(See also Settlement) process whereby some parts of the site sink more than others, leading to an uneven gradient.</td>
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</table>
May lead to backfalls on drainage pipes resulting in wet areas within the site. May be a particular problem with sites filled with putrescible waste.

**DIRECT PLACEMENT**

Restoration of soils to their final location without a period of storage.

**DROUGHTINESS**

A lack of soil water which may affect the range of crops that can be grown, as well as their yield and sometimes quality. Droughtiness is included as one of the constraints within the agricultural land classification system.

**DUMPTRUCK**

Wheeled machine used to transport minerals and soils.

**ENVIRONMENTAL IMPACT ASSESSMENT**

The process whereby the environmental impact of proposals are assessed, normally as part of the planning application process.

**EROSION**

The movements of soil particles from the land surface, usually as a result of heavy rainfall or sometimes strong winds.

**FERTILISER**

Organic or inorganic materials added to the land to provide essential nutrients to promote the growth of plants.

**FIELD DRAINAGE**

See [Underdrainage](#).

**FRIABLE**

The condition of a soil when it readily crumbles under light pressure. Often referred to in planning conditions as “dry and friable”.

**HEADLAND**

Strip of land at the edge of a field where agricultural machinery turns back into work.

**HORIZON**

A specific part of the soil profile, e.g. the lower horizon may refer to the subsoil.

**HOLISTIC**

Consideration of a system in its entirety rather than in its individual components.

**HYDRO-GEOLOGY**

The influence of geology upon the earth’s water.

**HYDROLOGY**

All the earth’s water, both surface and
underground.

IMPERMEABILITY
Refers to the inability of water, air and roots to penetrate a material such as soil.

INFRASTRUCTURE
All wells, pipes, pumps, chambers and engineering hardware or utilities which are used in either the landfill gas or the leachate control systems. May also refer to mineral processing plant, site offices etc, or agricultural water supplies, access tracks, fences and gates etc.

INTERIM RESTORATION
See Restoration.

LANDFILL GAS
By-product of the biological decomposition of putrescible matter in waste, chiefly comprising methane and carbon dioxide.

LANDFORM
The profile of the restored land surface of the site.

LANDRAISING
A waste disposal site which is above the height of the surrounding land.

LEACHATE
Water that has seeped through a landfill and has thus extracted and become contaminated with substances from within the deposited wastes and their products of decomposition.

LEACHING
The downward removal of materials in solution from the root zone by water percolating through the soil e.g. nitrate which may pollute aquifers in certain circumstances.

LIMING
Use of material containing the carbonates, oxides and/or hydroxides of calcium and/or magnesium used to neutralise soil acidity.

LOOSE TIPPING
Refers to the placement of soils in a bed system using backacters and dumptrucks whereby none of the replaced soils are trafficked by machinery.

LOW LEVEL RECLAMATION
The restoration of land to a level below that which it was pre-working. Restorations may require a pumped drainage system.

LOWER PLASTIC LIMIT
The water content of the soil at which it changes from being brittle to plastic. For
cohesive soil this can be assessed by rolling the soil with the palm of the hand to form a thread 0.3cm thick. If this is impossible due to the thread breaking up it is considered to be drier than its lower plastic limit and thus in a suitable state for movement. Cohesionless soil (coarse grained, sandy) has no plastic limit.

**MOLE DRAINAGE**

Installation of drains by use of a mole plough. The base of the plough blade is bullet-shaped to form the “mole” and varies in diameter from 5-10cm. This method of drain installation is most suitable for stoneless clay soils which do not have widely fluctuating water tables. This is a temporary drainage system and may require re-moling every 5-6 years.

**MOTOR-SCRAPER**

A wheeled machine which can strip soils using an angled blade, as well as transport and replace them. The machine has its own driven wheels.

**NUTRIENTS**

Mineral elements essential for plant growth, obtained from the soil. The most commonly considered are N, P and K (Nitrogen, Phosphorous and Potassium).

**ORGANIC MATTER**

The organic fraction of soil, which is made up of plant and animal residues, and is important for maintaining good soil structure, fertility, ease of working, and for the prevention of erosion.

**OVERBURDEN**

Material underlying the soil profile (i.e. normally below 1.2 metres) and above the mineral to be worked.

**PERMEABILITY**

The ability of air and water to penetrate the soil.

**pH**

A measure of acidity or alkalinity where a pH of less than 7 is acid and greater than 7 is alkaline.

**PHASED WORKING**

A method of sequential working of the mineral resource, which divides the site into a number of phases allowing for progressive reclamation of the land. Once the site is opened up for working, soils can be used to restore the land progressively.
PLOUGH PAN
Smearing and compaction of soil, generally caused by ploughing at the same depth, often in wet conditions.

PONDING
Areas of accumulated water on the land surface. May be associated with localised drainage problems and/or periods of heavy rainfall.

PRE-SETTLEMENT LEVELS (CONTOURS)
The calculated levels (contours) to which tipping is carried out such that, when settlement is completed, the final consent levels are achieved (also called surcharge levels or contours).

PROGRESSIVE RECLAMATION
See Phased Working.

RECLAMATION
The process of returning the land to the agreed after-use and standard which includes both the restoration and the aftercare periods.

RESTORATION
1. Mineral planning definition: Process of soil replacement to prepare the site for aftercare works (cultivation and seeding).

2. Landfill industry definition: The process which will return the completed landfill to a condition suitable for its proposed after-use, includes design, initial landscaping works, soil spreading and aftercare.

Interim restoration is the establishment of vegetation such as grass following replacement of part of the subsoil layer. This safeguards the remainder of the soil resource from damage that may be caused by remedial works required by the landfill gas and leachate control infrastructure. Interim restoration may normally be for a period of up to 5 years during which the worst of any settlement normally occurs.

3(1) RESTORATION STANDARD
Defined in the Town and Country Planning Act 1990 Schedule 5 paragraph 3 (1): “the land is brought to the required standard when its physical characteristics are restored, so far as it is practicable to do

without storage.
so, to what they were when it was last used for agriculture”.

3(2) RESTORATION STANDARD

Defined in the Town and Country Planning Act 1990 Schedule 5 paragraph 3 (2): “In any other case where the use specified in an aftercare condition is a use for agriculture, the land is brought to the required standard when it is reasonably fit for that use”.

RIPPING

See Subsoiling.

ROOT ZONE

The part of the soil profile exploited by plant roots.

ROTATION

A sequence of cropping designed to limit a build up of pests and diseases, as well as facilitating good crop husbandry and the maintenance of soil condition and fertility.

SATURATED LEVEL

The level within the soil profile below which the soils are saturated (see also Water Table).

SETTLEMENT

The amount by which a landfill surface sinks below its original tipped level due to compaction by its own weight and degradation of the waste. May also affect restored mineral sites which have not been landfilled to a lesser extent. (see also Differential Settlement and Pre-settlement Levels).

SMEARING

Normally the result of a mechanical action such as ploughing, rotavating or wheel slippage, resulting in a soil layer which is relatively impermeable. Particularly a problem with wet clayey soils.

SOIL FORMING MATERIAL

Materials such as overburden or silt pond dredgings, which may be treated by the addition of organic matter to enhance their soil like properties for use in land restoration.

SOIL PROFILE

Cross section through the soil usually comprising a layer of topsoil, which overlies the subsoil; often includes the weathering parent material from which the subsoil is formed.
SOIL STRUCTURE

The combination or arrangement of primary soil particles into secondary particles, units or peds. These peds may be arranged in the profile in such a manner as to give a distinctive characteristic pattern. The peds are characterised and classified on the basis of size, shape and degree of distinctness into classes, types, and grades. Structural units include:

**Blocky:** Cube-like blocks of soil up to 10cm, in size sometimes angular with well defined planar faces, sometimes with curved surfaces and corners (subangular blocky).

**Columnar:** Vertically oriented pillars, often six sided up to 15cm in diameter with rounded tops.

**Granular:** Rounded aggregates, generally not much larger than 2cm in diameter often found in loose conditions in the topsoil horizon. Where particularly porous, such units are called crumbs.

**Platy:** Horizontally layered, thin and flat aggregates resembling wafers. Such structures occur, for example in recently deposited clay soils.

**Prismatic:** Vertically oriented pillars, often six-sided, up to 15cm in diameter, with flat tops to the pillars; common in the subsoil horizon of clayey soils in semi-arid regions.

STATEMENT OF PHYSICAL CHARACTERISTICS REPORT

A report normally produced in conjunction with an agricultural land classification survey, which describes the different soil profiles in detail, allowing the restoration of the site to be judged against this benchmark.

SUBSOIL

The subsoil horizons of soils with distinct profiles. In soils with weak profile development, the subsoil is below the topsoil (or its equivalent of surface soil) in which roots normally grow. Although generally lower in organic matter, it is an important source of available water for plants.

SUBSOIL SUBSTITUTE

Material such as overburden or silt pond dredgings which are used as a substitute for subsoil in land restoration.
**SUBSOILING**

Disturbance of the subsoil/subsoil substitute within the soil profile using a rigid-tined subsoiler, often with wing attachments, such that soil compaction is broken up improving the permeability of the soil to air, water and penetration by plant roots.

**SURCHARGE**

1. Additional material which may cause or encourage settlement.
2. To fill a landfill above final contours to allow for subsequent settlement (see also [Pre-settlement Levels](#)).

**SURFACE WATER RUN OFF**

Excess water which does not infiltrate the soil and runs off the surface. This can be a significant problem in the initial years after reclamation, due to compaction and lack of vegetation cover. Additional measures in the form of ditches and drains may be required to conduct water safely downslope and prevent sheet and gully erosion.

**TEXTURE (SOIL)**

Soil texture is the relative proportions of clay, silt and sand within the soil.

**THATCH**

Build up of dead matted grass at the base of the plants on the soil surface.

**TILLERING**

The production of shoots from the base of a plant.

**TILTH**

Tilth generally refers to the size of the topsoil particles in a seedbed.

**TOPSOIL**

The uppermost or cultivated layer of soil, often of relatively dark colour. A specified depth of soil from the natural surface.

**TOWED SCRAPER**

A wheeled machine which can strip soils using an angled blade as well as transport and replace them. The machine is pulled by a tracked bulldozer.

**UNDERDRAINAGE**

A system of clay or perforated plastic drainage pipes installed within the subsoil to carry excess water from the soil profile to the ditch system.

**WATER TABLE**

The level within the soil profile where the
saturated layer is positioned.

**WHEEL COMPACTION**

The compression-induced decrease in volume of an unsaturated soil by wheeled equipment. Wheel track compaction effects are proportional to axle load, contact area, and loading frequency.