

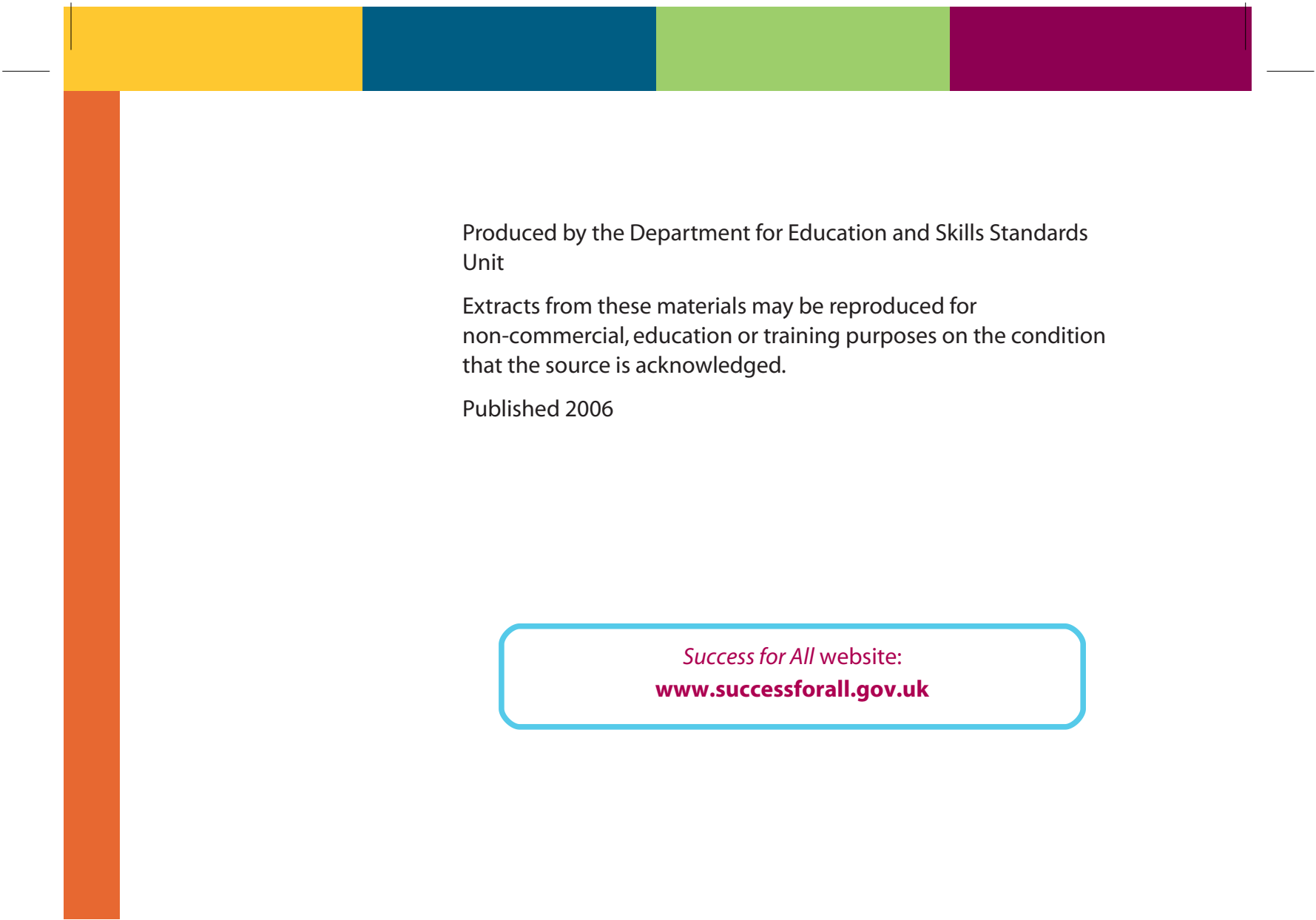


Standards Unit

Improving teaching, training and learning in construction

Construction, the environment and sustainability

Teacher and trainer guide



Produced by the Department for Education and Skills Standards Unit

Extracts from these materials may be reproduced for non-commercial, education or training purposes on the condition that the source is acknowledged.

Published 2006

Success for All website:
www.successforall.gov.uk

Disclaimer

It is understood that in using this material you agree to indemnify the Department for Education and Skills and not hold the Department for Education and Skills liable for the result foreseeable of any actions you may take based on the information contained herein.

Produced by the Standards Unit working with BDP Media Ltd.

These resources have been reviewed and checked for factual accuracy by Environmental and Engineering Consultancy (ENTEC).

Contents

Introducing the Standards Unit resource pack	5
Using the different elements in the resource pack	7
Illustrated Dictionary of Terms	8
Decision-making activity: greenfield and brownfield sites	10
Text-based learning materials to extend the learning of more able learners	13
Additional text-based learning resources with suggested solutions	14
Air quality and the ozone layer – fill the gaps handout	17
Air quality and the ozone layer – fill the gaps answer sheet	18
Air quality and the ozone layer – word search	19
Air quality and the ozone layer – word search answer sheet	20
Natural drainage and landscape – crossword	21
Natural drainage and landscape – crossword answers	22
Natural drainage and landscape – fill the gaps handout	23
Natural drainage and landscape – answer sheet	24
Acid rain and alternative energy – multiple-choice questions	25
Air quality and global warming – multiple-choice questions	27
Multiple choice questions – answers	29
Further information for teachers and trainers: sources of renewable energy	30
Species other than birds specially protected under The Wildlife and Countryside Act, 1981: Schedule 5 (Animals)	33
Species other than birds specially protected under The Wildlife and Countryside Act, 1981: Schedule 8 (Plants)	41
Is an environmental impact assessment (EIA) required?	49
The Government’s Standard Assessment Procedure (SAP) for Energy Rating of Dwellings	51



Introducing the Standards Unit resource pack

These teaching and learning resources will enable Level 2 learners progressing to Level 3 to understand important features about sustainability and the relationship between the natural and built environments. They will enable development of learners' knowledge and understanding of how activities by the construction and built environment sectors have an impact upon our surroundings. Learners will investigate the techniques, processes and procedures used to protect the natural environment. They will also explore the broad aims of sustainability and the advantages of adopting a sustainable approach to construction work.

Construction and the environment is a relatively new topic for many construction teachers, trainers and learners. It contains extensive new terminology and there is a lack of appropriate resources to support teaching and learning. Practising teachers and trainers developed the resources in this pack. Pilot centres across England have evaluated these resources and contributed to their development. Many useful websites are available that support this exciting topic and teachers and trainers should explore these to develop hyperlinking techniques to enhance the pedagogy and experience of learners.

This resource pack uses terms expressed in awarding body specifications for learners progressing from Level 2, but they do not necessarily cover all the required learning outcomes. If used for the BTEC National Diploma and Certificate in Construction, teachers or trainers should ensure the unit is covered to the appropriate breadth and depth to enable learners to achieve the qualification specification. The pack is also useful for Level 2 and 3 learners who are studying civil engineering and building services options or other syllabi that require investigation of environmental and sustainability issues, for example, the GCSE Construction and the Built Environment and other specialist diplomas.

"The resources were well received and colleagues felt they would provide a valuable resource in transforming teaching and learning and also provide useful tools in the reinforcement of learners' understanding. The resources contain many concepts for developing teaching and learning strategy with 'loads of ideas to build upon.'"

*Dave Pullin and
Jacqueline Pond,
Oaklands College*

Summary of learning outcomes identified by Edexcel

To achieve the BTEC unit Construction and the Environment a learner must be able to do the following:

1. Identify the important features of the natural environment that need to be protected.
2. Describe the various ways in which the activities of the construction and built environment sector may benefit or harm the natural environment.
3. Investigate the ways in which the natural environment may be protected.
4. Explore the advantages of sustainable construction techniques.

These resources provide opportunities to demonstrate key skills and learners should be encouraged to cross reference examples where appropriate.

Building a sustainable future

“A dynamic process which enables all people to realise their potential and improve their quality of life in ways which simultaneously protect and enhance the Earth’s life support systems.”

Forum for the Future

Using the different elements in the resource pack

General information

This resource pack has three main components:

- Illustrated dictionary of terms CD-ROM;
- Decision-making CD-ROM;
- text-based learning materials.

It provides teachers and trainers with a range of interactive teaching and learning resources that will enable them to provide appropriate support to a diverse range of learners including those studying at Level 2 and those progressing further.

The resource pack provides teachers and trainers with a wide range of environmental and sustainability information in a convenient format. It also encourages teachers and trainers to adopt a wider range of teaching methods and the embedding of blended learning techniques into the construction curriculum.

The pack encourages learners to take more responsibility for managing their own learning and extending their knowledge. It also provides learners with opportunities to extend their learning and has the potential to record evidence of any competencies gained.

This guide contains additional reference materials to assist teachers and trainers with definitions and meanings of words.

For the resources to be used most effectively, the following points should be considered:

- Teachers and trainers using these resources should adequately prepare for lessons by familiarising themselves with these resources.
- The resources should be incorporated in lessons, not used in isolation.
- The reason for using the resources should be determined in advance – initial teaching materials, checking understanding or consolidation of learning – this will affect how and when they are incorporated in sessions and any additional materials needed to accompany the resources.
- The materials are best used in small group activities (ideally two or three people).
- When used in whole-class activities the size of the detail on the screens can be enlarged by following the accessibility procedures contained on the CD-ROM and the notes included in this guide.

Illustrated dictionary of terms

This interactive CD-ROM enables teachers and trainers to explore with learners the standard terminology used. It also covers aspects of construction activity that might contribute to problems for the natural environment. It will help learners to develop knowledge and understanding of:

- important features of the natural environment;
- ways in which the activities of the construction and built environment sector may benefit or harm the natural environment;
- ways in which the natural environment may be protected;
- other features of sustainable development.

Content of the CD

This component enables teachers and trainers to define the following terms and learners to extend their knowledge of:

- acid rain
- air quality
- air-quality assessment
- alternative energy sources
- atmospheric environmental issues
- biodiversity
- contaminated land
- deforestation
- enhancement of the natural environment
- environmental impact assessments (EIAs)
- global warming
- green belt
- greenhouse gases
- heritage
- innovative design
- land use
- landscape
- Legionella
- loss of natural habitat
- low humidity
- natural amenities
- natural drainage
- ozone layer
- radon
- reducing energy costs
- renewable materials
- sick building syndrome (SBS)
- Sites of Specific Scientific Interest (SSSI)
- soil quality
- solar power
- standard assessment procedures (SAPs)
- sustainable communities
- sustainability
- volatile organic compounds (VOCs)
- water quality
- water resources
- wave and tidal power
- wildlife
- wood (biomass)

The CD contains illustrated presentations, which are also available in a printable format to provide text-based materials. Teachers and trainers can use this dictionary of terms to introduce common words and phrases used in the BTEC unit descriptor to extend and develop teaching and learning to meet the individual needs of all learners.

Planning points

- The CD contains prompts and tips on each screen; be familiar with these to support your learners.
- To enlarge the size of font on screen for use as a whole-class activity, refer to the accessibility guidance provided.
- If there are insufficient numbers of computers for individual learners to undertake these activities, print off the terms from the dictionary to support group discussion.

“Learners were divided into small groups and the teacher gave each group a term to research. They were encouraged to use a variety of research media, including exploring websites, professional journals and other articles, in addition to the dictionary of terms. After about 45 minutes each group presented their findings to the rest of the class.

The more able learners were asked to prepare questions on the other topics so that all learners were challenged.”

Neil Dunn, Stockport College

- extension activities – such as preparing a crossword, a word search or a gapped handout – based on past topics could be developed to reinforce learning.

“This is an excellent resource for use throughout the course. I am proposing to place it on our construction intranet site, which will give access to the dictionary of terms by all construction-based learners. The dictionary of terms is useful to all students, in many different modules of their course, and also as a resource in its own right across all Level 2 and 3 programmes.”

Tim Richardson, Colchester Institute

Decision-making activity: greenfield and brownfield sites

This interactive CD-ROM enables teachers and trainers to develop, extend and reinforce learners' knowledge and understanding of the environmental and sustainability issues relating to greenfield and brownfield sites. Topics include:

- choice of site
- appropriate noise and site barriers
- listed buildings, heritage and planning restriction
- local authority priorities
- safeguarding protected species
- safeguards relating to radon
- water pollution
- tree preservation orders
- energy conservation
- contaminated land
- removal and recycling of rubbish

"The CD-ROM of supporting materials has enabled learners to have a colour booklet of these resources as a permanent record. There are good opportunities for developing these terms into a 'domino' card or crossword activity."

*Anton Jung,
Southampton City*

This resource offers learners 'real life' scenarios relating to construction developments that impact on the natural environment. Learners must make decisions and use the knowledge gained from the previous components of their course.

Extended-learning resource suggestions have been included in this pack to reinforce important issues.

The sites are based on actual developments but the possible outcomes and solutions to situations are based on preferred environmental decisions regardless of cost and other outside influences that might otherwise impact on the final choice. Such additional constraints may be added by the teacher or trainer to extend the learners' skills.

Planning points

- For the CD-ROM to be played to a group, speakers will be required for the sound-track to be adequately heard.
- With this resource teachers and trainers can differentiate and manage the learning to suit individuals or groups. For example, you may use the interactive presentations to introduce learners to specific elements of the BTEC Construction and the Environment unit. More able learners could be encouraged to

“During the pilot phase, a learner, who has transferred to us for his second year of study, linked the information on the CD-ROM with one of his assignments. He came to me a week later to borrow the pack to help him complete his work. The final portfolio demonstrated a clearer understanding of the environmental issues involved in the development and sustainability of modern-day construction.”

*Tim Richardson,
Colchester Institute*

manage their own learning by using the same presentations, following the instructions contained on the CD-ROM, and encouraged to research additional learning resources. Learners' decisions will be influenced by their application of the knowledge they gained through effective use of the resources. This approach will enable teachers and trainers to differentiate between their learners more effectively.

- It is important that teachers and trainers check individual learner's progress and question their reasons for making choices before being allowed to progress through these resources. The whole group should participate in an open forum, explaining reasons behind their decisions, with learning points being summarised and recorded by the teacher or trainer.
- This decision making activity could be serialised. Each 'decision' could be made after each element has been developed by the teacher or trainer, using the 'dictionary of terms' and other research materials.

“One method of delivery used by a teacher was to split the class into two groups. One group was tasked to address the issues related to Johnstown, the greenfield site, and the other half to consider the issues related to Petersville, the brownfield site.

Each half of the group was further split into three smaller groups. Each sub-group was allocated one of the recommendation options, given on the CD-ROM. They were required to devise and present their reasoning for the allocated option to the whole class on why their choice is the best solution and why the alternative options are inappropriate.

This activity generated considerable motivation and discussion within the class and the teacher summarised the main options to reinforce learning and stressed that in many cases there is no one finite answer.”

Observation by Regional Subject Lead

“The video clips on the CD-ROMs were the key contributors to the learner's interest being maintained as they brought the subject 'alive.'”

Anton Jung, Southampton City College

"I used other examples of good environmental practice to reinforce learning and to make the topic transferable to other types of site. I introduced noise restriction and working hours constraints within the learners assignments. The learners also considered the impact of sustainability in other locations such as the local shopping centre and primary school."

Tim Richardson, Colchester Institute

Case study

With reference to the greenfield Site A, the teacher identified the issue of shielding houses from the noise of traffic and the use of different types of noise barriers.

The learners were divided into groups and instructed to consider and report back on their allocated method of dampening the noise, whilst being environmentally friendly.

The following options were being considered:

1. An artificial embankment of imported earth.
2. Rigid fencing with hedges.
3. Mature fast growing trees.

One group defended their decision to construct 'a mound of earth' whilst demonstrating that the other two options were inappropriate. They said that by having the mound of earth constructed around the site transport costs could be saved through using the naturally occurring materials from excavations. At the same time it would provide a natural habitat for wildlife.

Another group argued that importing the materials to produce an artificial embankment is not only costly but adds to poor air quality and noise pollution generated by the mechanical equipment. Whereas, planting trees is a better option and although slow to be established, it will provide an effective environmental solution.

And so on...

In conclusion the teacher summarised the main issues.

Neil Dunn, Stockport College

Text-based learning materials to extend the learning of more able learners

The learning materials contained in this guide are suggestions to add range and variety to the pedagogy used in the classroom. They are presented as templates that teachers and trainers will wish to adapt and develop to cover the full range of the learners' programme of study.

Teachers and trainers are encouraged to produce additional learning activities to provide further support to extend the knowledge and skills of individual learners.

The different models and templates are presented to reinforce learners' understanding and knowledge.

There are many websites available which specialise in this topic and the underlying pedagogy. Teachers and trainers should consult them as part of their continuous professional development to ensure that the learners experience and understanding is both current and exciting.

Additional text-based learning resources with suggested solutions

Dictionary of terms

The summary below provides teachers and trainers with additional suggestions for questions to challenge learners and to extend their learning. These can be offered during learning sessions or as written questions to encourage self-managed learning, with learners researching appropriate websites to develop knowledge and understanding.

Topic	Question	Answer
Air quality	What are the latest ratings for air pollution in the North West and South East of England, and the Highlands of Scotland?	Will depend on when the site is accessed.
	How many automatic air pollution monitoring sites are there across the UK?	100
Ozone layer	In which year did the hole in the ozone layer over Antarctica reach the size of the USA?	October 1987
Soil quality	In terms of soil quality, what is the British Standard for analysis and assessment (to Voelker Standard)?	BS 3882 (1994)
	How can heavy soils be made to drain better?	By adding humus, organic matter and sharp sand.
Landscape	What alternatives are there to replacing 'sound absorptive barriers'?	Angle the barrier away from the road.
Natural amenities	What do the initials SSSI stand for?	Site of Specific Scientific Interest
Land use	Since 1997, how many hectares of land have been designated or proposed as greenbelt?	30,000 (as of March 2004)

Topic	Question	Answer
Green belt	What was number of the Government circular inviting local planning authorities to consider establishing green belts?	42/55 (1955)
Greenhouse gases (Energy saving-cavity wall fact sheet)	During which period were cavity walls constructed but not filled with insulation?	Early 1930s–mid 1980s
Local authorities	How many local authorities are there in the East Midlands?	8 (or choose your own county)
Water quality	What percentage of fresh water is stored underground as groundwater?	0.6%
Wildlife	What are the scientific names for these endangered species: common frog; common toad; adder?	<i>Rana temporana</i> ; <i>Bufo bufo</i> ; <i>Vipera berus</i>
Biodiversity	When did the E120 experiment start?	1994
SAPs	What do the initials NHER stand for?	National Home Energy Rating
Acid rain	What percentage of sulphur is deposited in Sweden from neighbouring countries?	90%
Deforestation	Western Europe has lost what percentage of its primary forest?	99%
Loss of natural habitat	What gas aids photosynthesis?	CO ₂
VOCs	Which household products contain VOCs?	Stains and varnishes; nail polish remover; adhesives; furniture polish; hair spray and paint thinners.

Topic	Question	Answer
Contaminated land	What contaminants can be found in an area used for wood processing?	Coal tar-creosote; chlorinated hydrocarbons: pentachlorophenol; metalloids/metals: arsenic, copper, chromium.
Sick building syndrome (SBS)	Which type 1 symptoms are connected with SBS?	Lethargy and tiredness; headache; dry blocked nose; sore eyes; sore throat; dry skin and/or skin rashes.
Low humidity	What does the acronym CIBSE stand for?	Chartered Institute of Building Services Engineers
Legionella	When was the first Legionella outbreak discovered?	July 1976
Radon	Which region of the UK is greatly affected by radon?	Cornwall
Enhancement of the natural environment	At Manchester Airport's Terminal 2, what ratio of new trees to dislodged trees have been planted as part of their Environmental Mitigation Package?	6:1
EIAs	Which type of schedule relates to the development of an airport?	Schedule 1
Reduction of energy costs	How much money could you save each year if you replaced 10 ordinary light bulbs with energy saving equivalents?	£70 (£7 each bulb)
Alternative energy systems	Approximately how many operational wind turbines are there in the UK?	35,000

Air quality and the ozone layer – fill the gaps handout

Choose the most appropriate words from the list below to complete the sentences.

Air quality

The quality of air depends on the _____ of _____ in the atmosphere. The standards for air quality are based on an _____ of the effects of each pollutant on _____ health, including the effects on sensitive groups.

Air-quality assessment

An air-quality assessment assesses the impact of all _____ of sources and developments on _____ air quality. This includes an initial survey of background air quality, inventory, _____, dispersion modelling, and _____ assessment.

Ozone layer

Ozone is a _____ in the _____ which protects the Earth from the harmful effects of _____ radiation from space. Besides CFCs, which are now used far less frequently in _____ and the developed world, two other 'greenhouse' gases have a bad effect on ozone. These are nitrous oxide and _____. Nitrous _____ breaks down and destroys ozone as it goes, and methane actually creates more _____, but in the wrong part of the _____.

ambient

assessment

atmosphere

concentration

construction

emissions

human

impact

layer

manner

methane

oxide

ozone

pollutants

stratosphere

ultra-violet

Air quality and the ozone layer – fill the gaps answer sheet

Air quality

The quality of air depends on the **concentration** of **pollutants** in the atmosphere. The standards for air quality are based on an **assessment** of the effects of each pollutant on **human** health, including the effects on sensitive groups

Air-quality assessment

An air-quality assessment assesses the impact of all **manner** of sources and developments on **ambient** air quality. This includes an initial survey of background air quality, inventory, **emissions**, dispersion modelling, and **impact** assessment.

Ozone layer

Ozone is a **layer** in the **stratosphere** which protects the Earth from the harmful effects of **ultra-violet** radiation from space. Besides CFCs, which are now used far less frequently in **construction** and the developed world, two other 'greenhouse' gases have a bad effect on ozone. These are nitrous oxide and **methane**. Nitrous **oxide** breaks down and destroys ozone as it goes, and methane actually creates more **ozone**, but in the wrong part of the **atmosphere**.

Air quality and the ozone layer – word search

Y I H S I U F J X X X T Q A K P E G N E
O W V P N Z S Z A K W D S M J X M T O F
S S I Y I O K T N T L V E P Y O I O I C
K Q G P P D I S M F M R O W F B S K T Q
K N D Q R L Q T C V E O T M O T S O C L
D O E B E Q O G A H S S S F H A I Z U O
P S K N N X J X P R N H Q P M O O O R Q
U K V N N H T S I A T O Z B H G N N T G
C N H F A K O E M D K N I M O E S E S G
U Q G B M T U U L R E E E J J T R A N A
T Q L R A G H A U E N H L C D P V E O V
G T L R L A Y E R T P H Y H N B C E C Y
L I T N T N B X J T C Y E V Q O A Z K F
Q S E W V C Y D U G P Q C U U X C B B S
G B F Y E N A H T E M P W H M A B X P G
S Z J Z L D D P A L Y K S F L V W X I P
P O U C V F C N M O I G D U L Q Q L J N
N S B B B N I I L I J K V X D Y Z M P F
H S X N Y W D A S S E S S M E N T B Z C
N Q E F S A L F D K R U X Z L F U B E F

Find these terms in the word search puzzle:

AMBIENT

EMISSIONS

MANNER

STRATOSPHERE

ASSESSMENT

HUMAN

METHANE

CONCENTRATIONS

IMPACT

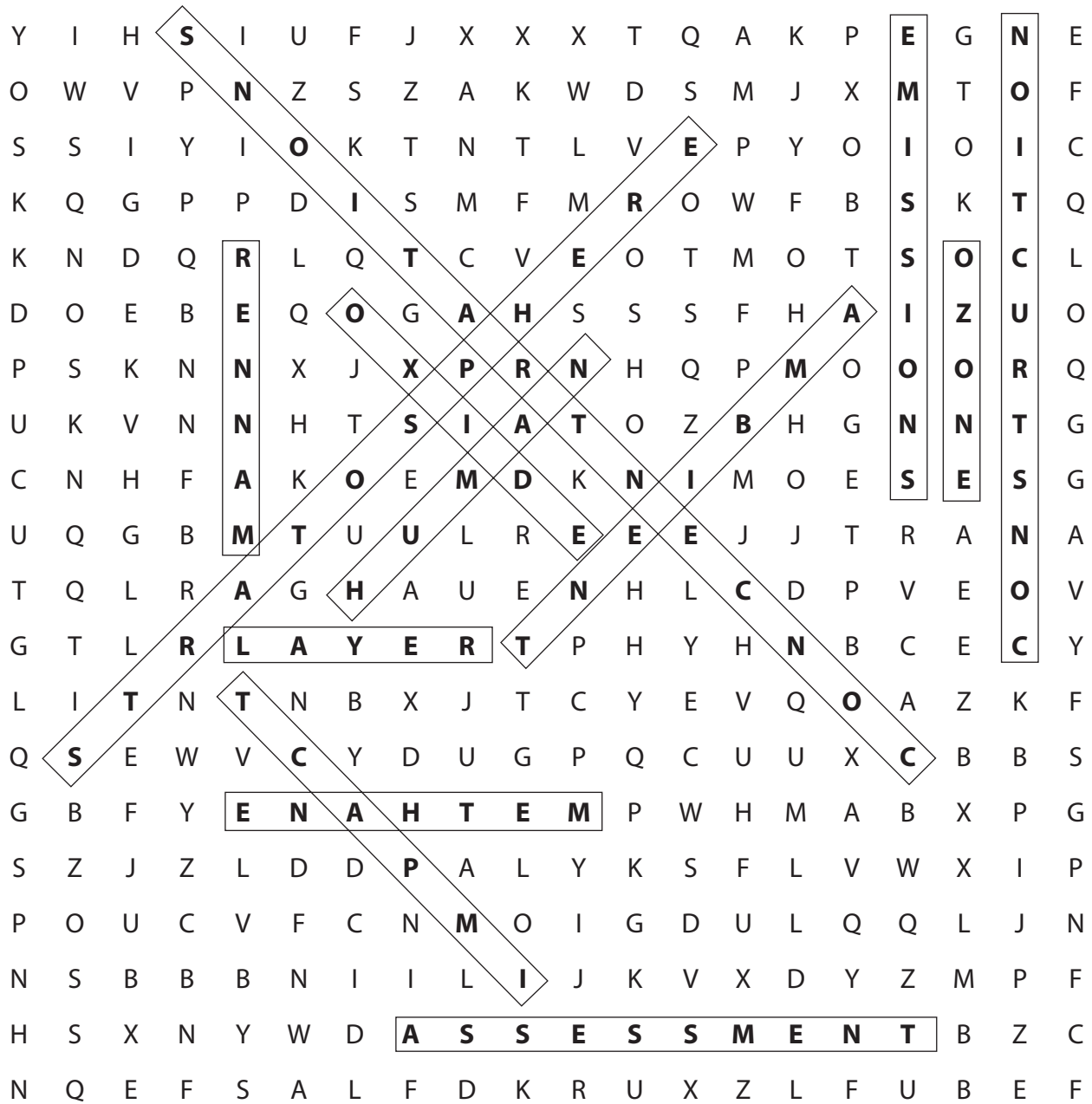
OXIDE

CONSTRUCTION

LAYER

OZONE

Air quality and the ozone layer – word search answer sheet



AMBIENT

EMISSIONS

MANNER

STRATOSPHERE

ASSESSMENT

HUMAN

METHANE

CONCENTRATIONS

IMPACT

OXIDE

CONSTRUCTION

LAYER

OZONE

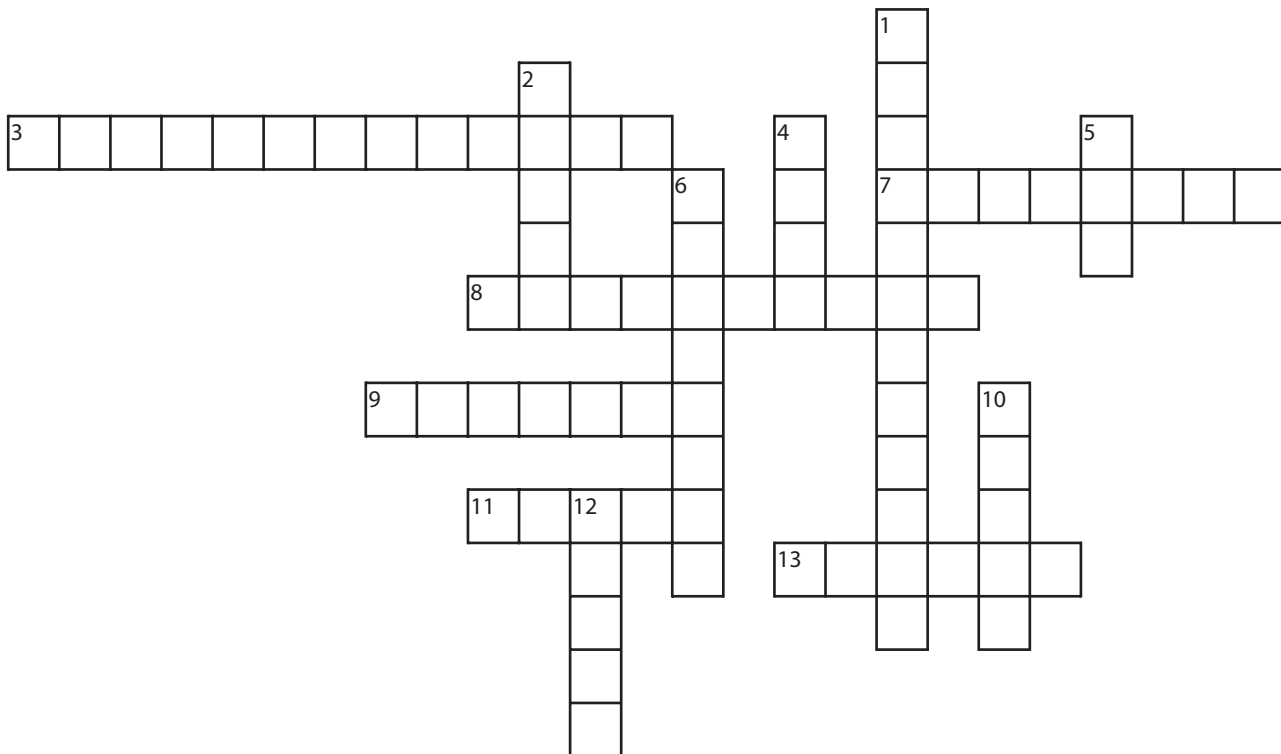
Natural drainage and landscape – crossword

Across

- 3 Go together
- 7 To stop something you ... it?
- 8 You can cut it with a knife
- 9 Not level
- 11 It often has chairs around it
- 13 An increase in size

Down

- 1 The industry you are in
- 2 This is not heavy
- 4 You do this to keep clean
- 5 Not wet
- 6 An architect did that
- 10 Like Pete but ends in 'Y'
- 12 Not above



Natural drainage and landscape – crossword answers

Across

- 3 Complementing
- 7 Suppress
- 8 Atmosphere
- 9 Sloping
- 11 Table
- 13 Growth

Down

- 1 Construction
- 2 Light
- 4 Wash
- 5 Dry
- 6 Designed
- 10 Peaty
- 12 Below

Note: the answers are similar to those needed to complete the 'fill the gaps' handout for natural drainage and landscape.

Natural drainage and landscape – fill the gaps handout

Choose the most appropriate words from the list below to complete the sentences.

Natural drainage

Natural drainage occurs when the soil is made up of _____ chalky, stony clay loam or very _____ soils, or a combination of the above, and generally where the site is _____.

_____ heath occurs where the soils are free draining and where the water _____ always remains _____ the surface.

Rain on soils which are naturally draining can _____ away any minerals that serve as a base for the soil. These are needed for plant _____, and _____ the hydrogen, carbon, oxygen and nitrogen in the _____.

Landscape

Landscape is our surrounding environment. It can be natural, such as mountains and forests, or designed, such as roads or parks.

Some landscapes are _____ to suit the environment including the _____ of land banks or barriers to help _____ noise from busy motorways and roads.

atmosphere

below

complement

construction

designed

dry

growth

light

peaty

sloping

suppress

table

wash

Natural drainage and landscape – answer sheet

Natural drainage

Natural drainage occurs when the soil is made up of **light** chalky, stony clay loam or very **peaty** soils, or a combination of the above, and generally where the site is sloping.

Dry heath occurs where the soils are free draining and where the water **table** always remains **below** the surface.

Rain on soils which are naturally draining can **wash** away any minerals that serve as a base for the soil. These are needed for plant **growth** and **complement** the hydrogen, carbon, oxygen and nitrogen in the **atmosphere**.

Landscape

Landscape is our surrounding environment. It can be natural, such as mountains and forests, or designed, such as roads or parks.

All landscapes are **designed** to suit the environment including the **construction** of land banks or barriers to help **suppress** noise from busy motorways and roads.

Acid rain and alternative energy – multiple-choice questions

- 1 What is one of the main causes of acid rain?
A Sultun trioxide **B** Sulphur dioxide
C Raisin toxide **D** Current monoxide
- 2 How much of its primary forest has Western Europe lost?
A None of it **B** 79%
C 99% **D** All of it
- 3 Which of the following materials is considered to contain volatile organic compounds (VOCs)?
A Oil-based paints **B** Wool insulation
C Natural timber **D** Water
- 4 What are contaminated sites usually considered to be?
A Brownfield **B** Dangerous
C Untouchable **D** Greenfield
- 5 What do the initials SBS stand for?
A Stable building substance **B** Sick building syndrome
C Standard buying services **D** Soft brick system
- 6 What is a key way of avoiding sick building syndrome?
A Open all windows **B** Don't work there
C Wash regularly **D** Good building design
- 7 What are the humidity levels in an office recommended by CIBSE?
A 50–75% **B** 20–40%
C 40–70% **D** 70–100%

8 At what temperature should hot water be stored in order to prevent the Legionella bacterium from growing?

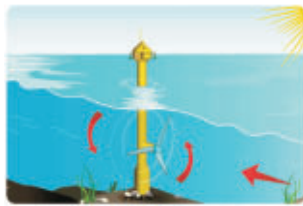
- A** 25°C **B** 50°C
C 60°C **D** 26°C

9 Radon is present in all soils and rocks. It is formed from the decay of...?

- A** Radium **B** Radium
C Radium **D** Radium

10 What type of alternative energy system is shown in the picture?

- A** Solar power
B Wind power
C Sea/tidal power
D Biomass



11 Which of the following would normally require EIAs?

- A** Hedge pruning **B** House extension
C Development <0.5 hectare **D** Asbestos extraction

12 Which part of the Building Regulations ensure that designers are incorporating energy-saving solutions?

- A** Part M **B** Part K
C Part J **D** Part L

13 An area of sea roughly the size of London would be enough to provide how much of the UK's electricity needs?

- A** 10% **B** 12%
C 20% **D** 15%

Air quality and global warming – multiple-choice questions

- 1 What is normally found in our stratosphere?
A Ezone layer **B** Ozone layer
C Troposphere **D** Cloud layer
- 2 Apart from nitrous oxides, which other gas helps to create the 'greenhouse' effect?
A Mythane **B** Themthane
C Methane **D** Uthane
- 3 Which type of system can be affected by global warming?
A Eco **B** Perco
C Reco **D** Meso
- 4 In which year was the planning policy for the countryside published?
A 1988 **B** 1901
C 1888 **D** 1785
- 5 What is contaminated land automatically classed as?
A Dangerous **B** Brownfield
C Greenfield **D** Greenbelt
- 6 A high wooden fence constructed alongside a motorway primarily prevents the passage of what?
A Weeds **B** Animals
C People **D** Noise
- 7 What does SSSI stand for: Site of Special...?
A Strip Interest **B** Stroat Interest
C Scientific Interest **D** Scenic Interest

- 8** Land can be used for a number of reasons and is generally categorised as Leisure, Commercial, Residential, or...?
- A** Car parking **B** Greenbelt
C Industrial **D** Brownfield
- 9** Greenhouse gases are gases in the atmosphere including carbon dioxide, methane and nitrous oxide into the atmosphere. Approximately what percentage is carbon dioxide?
- A** 45% **B** 50%
C 55% **D** 56%
- 10** Who issues 'Abstraction Licences' for water?
- A** Water Authority **B** Local Authority
C Environment Agency **D** Rivers Commission
- 11** Which of the following is not a protected species?
- A** Great crested newt **B** Common frog
C Northern brown argus **D** Single spot lusa
- 12** The Building Regulations 2000 require a SAP rating on every new home. What rating is considered to be an energy efficient home?
- A** 60 **B** 70
C 75 **D** 80
- 13** Global warming is partly caused by emissions that are released into the atmosphere from mainly burning fossil fuels. What type of emission is released from burning them?
- A** DO₂ **B** FO₂
C HO₂ **D** CO₂
- 14** In which ways can we reduce the impact of construction and its functions on the atmosphere? By being:
- A** Energy efficient **B** Considerate to wildlife
C Restrictive on our **D** Using other fuel sources
heritage

Multiple choice questions – answers

Acid rain and alternative energies

- | | | | | | |
|---|---|----|---|----|---|
| 1 | b | 6 | d | 11 | d |
| 2 | c | 7 | c | 12 | d |
| 3 | a | 8 | c | 13 | a |
| 4 | a | 9 | d | | |
| 5 | b | 10 | c | | |

Air quality and global warming

- | | | | | | |
|---|---|----|---|----|-----|
| 1 | b | 6 | d | 11 | d |
| 2 | c | 7 | c | 12 | d |
| 3 | a | 8 | c | 13 | d |
| 4 | a | 9 | b | 14 | all |
| 5 | b | 10 | c | | |

Further information for teachers and trainers: sources of renewable energy

Renewable energy is energy produced without depleting resources. Renewable energy sources include:

- solar;
- wind;
- water (hydro);
- bio-energy;
- earth and geothermal energy.

Solar energy

In buildings, solar energy can be used for electrical power generation or displacement and for thermal energy (space and water heating) production.

Solar electrical power generation

Sunlight can be converted to electricity using photovoltaic panels. Panels would typically be rack mounted or integrated into building façades. Both options require power transformation and management systems for the electricity to be used directly in the building or to be fed to the grid.

Electrical power displacement through daylighting

Installing lighting controls that take advantage of natural light in the perimeter spaces of buildings allows for significant electric lighting energy savings. While natural light from the north side is the easiest to use, daylighting from the other cardinal directions requires shading measures and controls to avoid visual discomfort and maximize the use of daylight availability.

Solar thermal energy

Space heating

Passive solar heating displaces fossil-fuel-based energy sources in a building by providing space heating through building design and placement. These gains are made through high-performance fenestration, skylights and curtain wall systems, enhanced by heat accumulation in the building. The potential drawbacks are overheating and visual discomfort in directly lit spaces. The key to optimising solar space heating is a refinement of the design through whole-building energy performance simulation.

Domestic hot water heating

Solar collectors preheat water, typically domestic hot water used for taps and showers. Excess energy is stored in water tanks, with a second system bringing water temperature up to the required levels.

Wind energy

Wind energy converts the energy present in wind into various forms including mechanical energy, for operations such as pumping water. Mechanical energy can run generators that convert it into electrical energy. This electrical energy can then be fed into a power grid or used to augment stand-alone generators in off-grid communities. The power and energy output from a wind turbine increases in proportion to increases in wind speed.

Hydroelectric energy

The hydrologic cycle of water provides a renewable energy source called hydroelectric energy. Canada is the world leader in the production of hydroelectric energy. It provides nearly two-thirds of Canada's electricity needs with the majority of hydroelectricity production used by large utility companies.

Hydroelectric energy is generated from the flow of water, which may be natural due to the topography of the land or may require a dam to be built to contain large volumes of water. Water flowing from this change in elevation turns turbines that drive the generators that in turn produce electricity.

There has been a greater focus on the development of small-scale hydroelectric facilities (micro-hydro) that can provide on-site electricity demands. A micro-hydro facility requires a sizable flow of water and can be developed at existing dams or designed in conjunction with water-level controls.



Bio-energy

Bio-energy is produced through the release of stored chemical energy (solar energy) contained in biomass. Biomass is present in many waste products such as agricultural waste, forest material, municipal and food-processing waste. The combustion of these biomass sources produces bio-energy.

Bio-energy can be used to make cleaner-burning ethanol fuels for vehicles or for combustion to heat residential, industrial and commercial properties.

Earth energy

Earth energy harnesses the temperatures found in the earth or ground water to cool or heat air and water for buildings. Earth energy heating and cooling systems (ground-source or geothermal



heat pumps) can be used to move heat from one location to another through a direct heat transfer process thereby providing the heating and cooling requirements for facilities.

Geothermal energy

Geothermal energy uses steam or hot water in the earth's crust for several purposes: powering turbines, heating buildings and heating water. Geothermal facilities can produce energy where there are the right geographical features and the water temperature is high enough to power a turbine (more than 100°C). With the appropriate geographical features, hot water directly from the earth is used for heating buildings.

Species other than birds specially protected under The Wildlife and Countryside Act, 1981: Schedule 5 (Animals)

Source: www.english-nature.org.uk

Mammals			
Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Arvicola terrestris</i>	Water Vole	Damage/destruction of place of shelter/ protection S.9(4)(a) and disturbance while in a place of shelter S.9(4)(b) only	1998
<i>Cetacea</i>	All Dolphins, Porpoises, Whales		<i>Tursiops truncatus</i> and <i>Delphinus delphis</i> 1981; rest 1988
<i>Felis silvestris</i>	Wildcat		1988
<i>Lutra lutra</i>	Otter		1981
<i>Martes martes</i>	Pine Marten		1988
<i>Muscardinus avellanarius</i>	Dormouse		1988
<i>Odobenus rosmarus</i>	Walrus		1988
<i>Sciurus vulgaris</i>	Red Squirrel		1981
<i>Vespertilionidae</i> and <i>Rhinolophidae</i>	All Bats		1981

Reptiles

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Anguis fragilis</i>	Slow Worm	Killing and injuring S.9(1) (part); sale S.9(5)	S.9(5) 1981; S.9(1) 1988
<i>Cheloniidae</i> and <i>Dermochelyidae</i>	All Turtles		1988
<i>Coronella austriaca</i>	Smooth Snake		1981
<i>Lacerta agilis</i>	Sand Lizard		1981
<i>Lacerta vivipara</i>	Viviparous Lizard	Killing and injuring S.9(1) (part); sale S.9(5)	S.9(5) 1981; S.9(1) 1988
<i>Natrix natrix</i>	Grass Snake	Killing and injuring S.9(1) (part); sale S.9(5)	S.9(5) 1981; S.9(1) 1988
<i>Vipera berus</i>	Adder	Killing and injuring S.9(1) (part); sale S.9(5)	S.9(5) 1981; S.9(1) 1991

Amphibians

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Bufo bufo</i>	Common Toad	Sale only S.9(5)	1981
<i>Bufo calamita</i>	Natterjack Toad		1981
<i>Rana temporaria</i>	Common Frog	Sale only S.9(5)	1981
<i>Triturus cristatus</i>	Warty (Great Crested) Newt		1981
<i>Triturus helveticus</i>	Palmate Newt	Sale only S.9(5)	1981
<i>Triturus vulgaris</i>	Smooth Newt	Sale only S.9(5)	1981

Fish			
Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Acipenser sturio</i>	Sturgeon		1992
<i>Alosa alosa</i>	Allis Shad	Killing, injuring & taking S.9(1),(4)(a)	S.9(1) 1991, S.9(4)(a) 1998
<i>Alosa fallax</i>	Twaite Shad	Damage/destruction of place of shelter/ protection S.9(4)(a) only	1998
<i>Cetorhinus maximus</i>	Basking Shark		1998
<i>Coregonus albula</i>	Vendace		1988
<i>Coregonus lavaretus</i>	Whitefish		1988
<i>Gobius cobitis</i>	Giant Goby		1998
<i>Gobius couchii</i>	Couch's Goby		1998
<i>Lota lota</i>	Burbot		1981

Moths			
Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Acosmetia caliginosa</i>	Reddish Buff		1981
<i>Bembecia chrysidiformis</i>	Fiery Clearwing		1998
<i>Gortyna borelii</i>	Fisher's Estuarine Moth		1998
<i>Hadena irregularis</i>	Viper's Bugloss	Removed, believed extinct	1988 1998
<i>Pareulype berberata</i>	Barberry Carpet		1981
<i>Siona lineata</i>	Black-Veined		1981
<i>Thalera fimbrialis</i>	Sussex Emerald		1992
<i>Thetidia smaragdaria</i>	Essex Emerald		1981
<i>Zygaena viciae</i>	New Forest Burnet		1981

Butterflies			
Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Apatura iris</i>	Purple Emperor	Sale only S.9(5)	1989
<i>Argynnis adippe</i>	High Brown Fritillary		1992 (previously sale only)
<i>Aricia artaxerxes</i>	Northern Brown Argus	Sale only S.9(5)	1989
<i>Boloria euphrosyne</i>	Pearl-Bordered Fritillary	Sale only S.9(5)	1989
<i>Carterocephalus palaemon</i>	Checkered Skipper	Sale only S.9(5)	1989
<i>Coenonympha tullia</i>	Large Heath	Sale only S.9(5)	1989
<i>Cupido minimus</i>	Small Blue	Sale only S.9(5)	1989
<i>Erebia epiphron</i>	Mountain Ringlet	Sale only S.9(5)	1989
<i>Eurodryas aurinia</i>	Marsh Fritillary	Sale only S.9(5) Full protection	S.9(5) 1989 1998
<i>Hamearis lucina</i>	Duke of Burgundy Fritillary	Sale only S.9(5)	1989
<i>Hesperia comma</i>	Silver-Spotted Skipper	Sale only S.9(5)	1989
<i>Leptidea sinapis</i>	Wood White	Sale only S.9(5)	1989
<i>Lycaena dispar</i>	Large Copper	Sale only S.9(5) Full protection	S.9(5) 1989 1998
<i>Lysandra bellargus</i>	Adonis Blue	Sale only S.9(5)	1989
<i>Lysandra coridon</i>	Chalkhill Blue	Sale only S.9(5)	1989
<i>Maculinea arion</i>	Large Blue		1981
<i>Melitaea cinxia</i>	Glanville Fritillary	Sale only S.9(5)	1989
<i>Mellicta athalia (Melitaea athalia)</i>	Heath Fritillary		1981
<i>Nymphalis polychloros</i>	Large Tortoiseshell	Sale only S.9(5)	1989
<i>Papilio machaon</i>	Swallowtail		1981
<i>Plebejus argus</i>	Silver-Studded Blue	Sale only S.9(5)	1989
<i>Strymonidia pruni</i>	Black Hairstreak	Sale only S.9(5)	1989
<i>Strymonidia w-album</i>	White-Letter Hairstreak	Sale only S.9(5)	1989
<i>Thecla betulae</i>	Brown Hairstreak	Sale only S.9(5)	1989
<i>Thymelicus action</i>	Lulworth Skipper	Sale only S.9(5)	1989

Beetles

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Chrysolina cerealis</i>	Rainbow Leaf Beetle		1981
<i>Curimopsis nigrita</i>	Mire Pill Beetle	Damage/destruction of place of shelter/ protection S.9(4)(a) only	1992
<i>Graphoderus zonatus</i>	Water Beetle		1992
<i>Hydrochara caraboides</i>	Lesser Silver Water Beetle		1992
<i>Hypebaeus flavipes</i>	Beetle		1992
<i>Limoniscus violaceus</i>	Violet Click Beetle		1988
<i>Lucanus cervus</i>	Stag Beetle	Sale only S.9(5)	1998
<i>Paracymus aeneus</i>	Water Beetle		1992

Hemipteran bugs

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Cicadetta montana</i>	New Forest Cicada		1988

Crickets

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Decticus verrucivorus</i>	Wart-Biter		1981
<i>Gryllotalpa gryllotalpa</i>	Mole Cricket		1981
<i>Gryllus campestris</i>	Field Cricket		1981

Dragonflies

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Aeshna isosceles</i>	Norfolk Aeshna		1981
<i>Coenagrion mercuriale</i>	Southern Damselfly		1998

Spiders

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Dolomedes plantarius</i>	Fen Raft Spider		1981
<i>Eresus niger (cinaberinus)</i>	Ladybird Spider		1981

Crustaceans

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Austropotamobius pallipes</i>	Atlantic Stream (White-Clawed) Crayfish	Taking S.9(1) (part); sale S.9(5)	1988
<i>Chirocephalus diaphanus</i>	Fairy Shrimp		1988
<i>Gammarus insensibilis</i>	Lagoon Sand Shrimp		1988
<i>Triops cancriformis</i>	Apus		1988

Sea-mats

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Victorella pavida</i>	Trembling Sea-Mat		1988

Molluscs

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Atrina fragilis</i>	Fan Mussel	Killing and injuring S.9(1); possession S9(2); sale S.9(5)	1998
<i>Caecum armoricum</i>	De Folin's Lagoon Snail		1992
<i>Catinella arenaria</i>	Sandbowl Snail		1981
<i>Margaritifera margaritifera</i>	Pearl Mussel	Killing and injuring S.9(1) (part) Full protection	S.9(1) 1991 1998
<i>Monacha cartusiana</i>	Carthusian Snail	Removed from Schedule 5	1981 1988
<i>Myxas glutinosa</i>	Glutinous Snail		1981
<i>Paludinella littorina</i>	Lagoon Snail		1992
<i>Tenellia adspersa</i>	Lagoon Sea Slug		1992
<i>Thyasira gouldi</i>	Northern Hatchet-Shell		1992

Annelid worms

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Alkmaria romijni</i>	Tentacled Lagoon-Worm		1992
<i>Armandia cirrhosa</i>	Lagoon Sandworm		1988
<i>Hirudo medicinalis</i>	Medicinal Leech		1988

Sea anemones and allies

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
<i>Clavopsella navis</i>	Marine Hydroid		1998
<i>Edwardsia ivelli</i>	Ivell's Sea Anemone		1988
<i>Eunicella verrucosa</i>	Pink Sea-Fan	Killing, injuring and taking S.9(1); possession S9(2); sale S.9(5)	1992
<i>Nematostella vectensis</i>	Starlet Sea Anemone		1988

Species other than birds specially protected under The Wildlife and Countryside Act, 1981: Schedule 8 (Plants)

Vascular plants		
Scientific name	English name	Year scheduled
<i>Ajuga chamaepitys</i>	Ground Pine	1992
<i>Alisma gramineum</i>	Ribbon-Leaved Water-Plantain	1981
<i>Allium sphaerocephalon</i>	Round-Headed Leek	1981
<i>Althaea hirsuta</i>	Rough Marsh-Mallow	1981
<i>Alyssum alyssoides</i>	Small Alison	1981
<i>Apium repens</i>	Creeping Marshwort	1988
<i>Arabis alpina</i>	Alpine Rock-Cress	1988
<i>Arabis scabra (stricta)</i>	Bristol Rock-Cress	1988
<i>Arenaria norvegica</i>	Norwegian Sandwort	1981
<i>Artemisia campestris</i>	Field Wormwood	1981
<i>Atriplex pedunculata</i> (<i>Halimione pedunculata</i>)	Stalked Orache	1992
<i>Bupleurum baldense</i>	Small Hare's-Ear	1981
<i>Bupleurum falcatum</i>	Sickle-Leaved Hare's-Ear	1981
<i>Carex depauperata</i>	Starved Wood-Sedge	1981
<i>Centaurium tenuiflorum</i>	Slender Centaury	1992
<i>Cephalanthera rubra</i>	Red Helleborine	1981
<i>Chenopodium vulvaria</i>	Stinking Goosefoot	1988
<i>Cicerbita alpina</i>	Alpine Sow-Thistle	1981

Vascular plants

<i>Clinopodium menthifolium</i> (<i>Calamintha sylvatica</i>)	Wood Calamint	1981
<i>Coincya wrightii</i> (<i>Rhynchosinapis wrightii</i>)	Lundy Cabbage	1988
<i>Corrigiola litoralis</i>	Strapwort	1988
<i>Cotoneaster integerrimus</i> (<i>Cotoneaster cambrica</i>)	Wild Cotoneaster	1981
<i>Crassula aquatica</i>	Pigmyweed	1988
<i>Crepis foetida</i>	Stinking Hawk's-Beard	1988
<i>Cynoglossum germanicum</i>	Green Hound's-Tongue	1988
<i>Cyperus fuscus</i>	Brown Galingale	1981
<i>Cypripedium calceolus</i>	Lady's-Slipper	1981
<i>Cystopteris dickieana</i>	Dickie's Bladder Fern	1981
<i>Dactylorhiza lapponica</i>	Lapland Marsh-Orchid	1992
<i>Damasonium alisma</i>	Starfruit	1981
<i>Dianthus armeria</i>	Deptford Pink	1998 England and Wales only
<i>Dianthus gratianopolitanus</i>	Cheddar Pink	1981
<i>Diapensia lapponica</i>	Diapensia	1981
<i>Eleocharis parvula</i>	Dwarf Spike-Rush	
<i>Epipactis youngiana</i>	Young's Helleborine	1988
<i>Epipogium aphyllum</i>	Ghost Orchid	1981
<i>Equisetum ramosissimum</i>	Branched Horsetail	1988
<i>Erigeron borealis</i>	Alpine Fleabane	1988
<i>Eriophorum gracile</i>	Slender Cottongrass	1988
<i>Euphorbia peplis</i>	Purple Spurge	1981 Removed 1992
<i>Eryngium campestre</i>	Field Eryngo	1981
<i>Filago lutescens</i>	Red-Tipped Cudweed	1988
<i>Filago pyramidata</i>	Broad-Leaved Cudweed	1992

Vascular plants		
<i>Fumaria reuteri (martinii)</i>	Martin's Ramping-Fumitory	1988
<i>Gagea bohemica</i>	Early Star of Bethlehem	1988
<i>Gentiana nivalis</i>	Alpine Gentian	1981
<i>Gentiana verna</i>	Spring Gentian	1981
<i>Gentianella anglica</i>	Early Gentian	1992
<i>Gentianella ciliata</i>	Fringed Gentian	1988
<i>Gentianella uliginosa</i>	Dune Gentian	1992
<i>Gladiolus illyricus</i>	Wild Gladiolus	1981
<i>Gnaphalium luteoalbum</i>	Jersey Cudweed	1981
<i>Hieracium attenuatifolium</i>	Weak-Leaved Hawkweed	1992
<i>Hieracium northroense</i>	Northroe Hawkweed	1992
<i>Hieracium zetlandicum</i>	Shetland Hawkweed	1992
<i>Himantoglossum hircinum</i>	Lizard Orchid	1981
<i>Homogyne alpina</i>	Purple Colt's-Foot	1988
<i>Hyacinthoides non-scripta</i>	Bluebell	1998 S.13(2) sale only
<i>Lactuca saligna</i>	Least Lettuce	1981
<i>Leersia oryzoides</i>	Cut-Grass	1998
<i>Limonium paradoxum</i>	St David's Sea Lavender	1981 Removed 1992
<i>Limonium recervum</i>	Recurved Sea Lavender	1981 Removed 1992
<i>Limosella australis</i>	Welsh Mudwort	1992
<i>Liparis loeselii</i>	Fen Orchid	1981
<i>Lloydia serotina</i>	Snowdon Lily	1981
<i>Luronium natans</i>	Floating Water-Plantain	1992
<i>Lychnis alpina</i>	Alpine Catchfly	1981
<i>Lythrum hyssopifolia</i>	Grass-Poly	1988
<i>Melampyrum arvense</i>	Field Cow-Wheat	1981

Vascular plants

<i>Mentha pulegium</i>	Pennyroyal	1988
<i>Minuartia stricta</i>	Teesdale Sandwort	1981
<i>Najas flexilis</i>	Slender Naiad	1992
<i>Najas marina</i>	Holly-Leaved Naiad	1988
<i>Ononis reclinata</i>	Small Restharrow	1988
<i>Ophioglossum lusitanicum</i>	Least Adder's-Tongue	1988
<i>Ophrys fuciflora</i>	Late Spider-Orchid	1981
<i>Ophrys sphegodes</i>	Early Spider-Orchid	1981
<i>Orchis militaris</i>	Military Orchid	1981
<i>Orchis simia</i>	Monkey Orchid	1981
<i>Orobanche artemisiae-campestris</i> (<i>Orobanche loricata</i>) (<i>Orobanche picridis</i>)	Oxtongue Broomrape	1981
<i>Orobanche caryophyllacea</i>	Bedstraw Broomrape	1981
<i>Orobanche reticulata</i>	Thistle Broomrape	1981
<i>Petrorhagia nanteuilii</i>	Childing Pink	1981
<i>Phyllodoce caerulea</i>	Blue Heath	1981
<i>Phyteuma spicatum</i>	Spiked Rampion	1992
<i>Polygonatum verticillatum</i>	Whorled Solomon's-Seal	1981
<i>Polygonum maritimum</i>	Sea Knotgrass	1981
<i>Potentilla rupestris</i>	Rock Cinquefoil	1981
<i>Pulicaria vulgaris</i>	Small Fleabane	1988
<i>Pyrus cordata</i>	Plymouth Pear	1981
<i>Ranunculus ophioglossifolius</i>	Adder's-Tongue Spearwort	1981
<i>Rhinanthus serotinus</i>	Greater Yellow-Rattle	1981
<i>Romulea columnae</i>	Sand Crocus	1988
<i>Rumex rupestris</i>	Shore Dock	1992
<i>Salvia pratensis</i>	Meadow Clary	1992
<i>Saxifraga cernua</i>	Drooping Saxifrage	1981
<i>Saxifraga cespitosa</i>	Tufted Saxifrage	1981

Vascular plants

<i>Saxifraga hirculus</i>	Yellow Marsh-Saxifrage	1992
<i>Scirpus triqueter</i> (<i>Scirpus triquetrus</i>)	Triangular Club-Rush	1981
<i>Scleranthus perennis</i>	Perennial Knawel	1981
<i>Scorzonera humilis</i>	Viper's-Grass	1988
<i>Selinum carvifolia</i>	Cambridge Milk-Parsley	1988
<i>Senecio paludosus</i>	Fen Ragwort	1988
<i>Stachys alpina</i>	Limestone Woundwort	1981
<i>Stachys germanica</i>	Downy Woundwort	1981
<i>Tephrosieris integrifolia</i> subspecies <i>maritima</i>	South Stack Fleawort	1998
<i>Teucrium botrys</i>	Cut-Leaved Germander	1988
<i>Teucrium scordium</i>	Water Germander	1981
<i>Thlaspi perfoliatum</i>	Perfoliate Penny-Cress	1992
<i>Trichomanes speciosum</i>	Killarney Fern	1981
<i>Veronica spicata</i>	Spiked Speedwell	1981
<i>Veronica triphyllos</i>	Fingered Speedwell	1988
<i>Viola persicifolia</i>	Fen Violet	1981
<i>Woodsia alpina</i>	Alpine Woodsia	1981
<i>Woodsia ilvensis</i>	Oblong Woodsia	1981

Mosses

Scientific name	English name	Year scheduled
<i>Acaulon triquetrum</i>	Triangular Pygmy-Moss	1992
<i>Anomodon longifolius</i>	Long-Leaved Anomodon	1998
<i>Bartramia stricta</i>	Rigid Apple-Moss	1992
<i>Bryum mamillatum</i>	Dune Thread-Moss	1992
<i>Bryum neodamense</i>	Long-Leaved Threadmoss	1998
<i>Bryum schleicheri</i>	Schleicher's Thread-Moss	1992
<i>Buxbaumia viridis</i>	Green Shield-Moss	1992

Mosses

<i>Cryphaea lamyana</i>	Multi-Fruited River-Moss	1992
<i>Cyclodictyon laetevirens</i>	Bright-Green Cave-Moss	1992
<i>Desmatodon cernuus</i>	Flamingo Moss	1998
<i>Didymodon cordatus</i> (<i>Barbula cordata</i>)	Cordate Beard-Moss	1992
<i>Didymodon glaucus</i> (<i>Barbula glauca</i>)	Glaucous Beard-Moss	1992
<i>Ditrichum cornubicum</i>	Cornish Path-Moss	1992
<i>Grimmia unicolor</i>	Blunt-Leaved Grimmia	1992
<i>Hamatocaulis</i> (<i>Drepanocladus</i>) <i>vernicosus</i>	Slender Green Feather-Moss	1992
<i>Hygrohypnum polare</i>	Polar Feather-Moss	1998
<i>Hypnum vaucheri</i>	Vaucher's Feather-Moss	1992
<i>Micromitrium tenerum</i>	Millimetre Moss	1992
<i>Mielichhoferia mielichhoferi</i>	Alpine Copper-Moss	1992
<i>Orthotrichum obtusifolium</i>	Blunt-Leaved Bristle-Moss	1992
<i>Plagiothecium piliferum</i>	Hair Silk-Moss	1992
<i>Rhynchostegium rotundifolium</i>	Round-Leaved Feather-Moss	1992
<i>Saelania glaucescens</i>	Blue Dew-Moss	1992
<i>Scorpidium turgescens</i>	Large Yellow Feather-Moss	1992
<i>Sphagnum balticum</i>	Baltic Bog-Moss	1992
<i>Thamnobryum angustifolium</i>	Derbyshire Feather-Moss	1992
<i>Zygodon forsteri</i>	Knothole Moss	1992
<i>Zygodon gracilis</i>	Nowell's Limestone-Moss	1992

Liverworts

Scientific name	English name	Year scheduled
<i>Adelanthus lindenbergianus</i>	Lindenberg's Leafy Liverwort	1992
<i>Geocalyx graveolens</i>	Turpswort	1992
<i>Gymnomitrium apiculatum</i>	Pointed Frostwort	1992
<i>Jamesoniella undulifolia</i>	Marsh Earwort	1992

Liverworts

<i>Lophozia (Leiocolea) rutheana</i>	Norfolk Flapwort	1992
<i>Marsupella profunda</i>	Western Rustwort	1992
<i>Petalophyllum ralfsii</i>	Petalwort	1992
<i>Riccia bifurca</i>	Lizard Crystalwort	1992
<i>Southbya nigrella</i>	Blackwort	1992

Fungi

Scientific name	English name	Year scheduled
<i>Battarraea phalloides</i>	Sandy Stilt Puffball	1998
<i>Boletus regius</i>	Royal Bolete	1998
<i>Buglossoporus pulvinus</i>	Oak Polypore	1998
<i>Hericinum erinaceum</i>	Hedgehog Fungus	1998

Lichens

Scientific name	English name	Year scheduled
<i>Alectoria ochroleuca</i>	Alpine Sulphur-Tresses	1998
<i>Bryoria furcellata</i>	Forked Hair-Lichen	1992
<i>Buellia asterella</i>	Starry Breck-Lichen	1992
<i>Caloplaca luteoalba</i>	Orange-Fruited Elm-Lichen	1992
<i>Caloplaca nivalis</i>	Snow Caloplaca	1992
<i>Catapyrenium psoromoides</i>	Tree Catapyrenium	1992
<i>Catillaria laureri</i>	Laurer's Catillaria	1992
<i>Catolechia wahlenbergii</i>	Goblin Lights	1998
<i>Cladonia convoluta</i>	Convolute Cladonia	1998
<i>Cladonia stricta</i>	Upright Mountain-Cladonia	1992
<i>Collema dichotomum</i>	River Jelly-Lichen	1992
<i>Enterographa elaborata</i>	New Forest Beech-Lichen	1998
<i>Gyalecta ulmi</i>	Elm Gyalecta	1992

Fungi

<i>Heterodermia leucomelos</i>	Ciliate Strap-Lichen	1992
<i>Heterodermia propagulifera</i>	Coralloid Rosette-Lichen	1992
<i>Lecanactis hemisphaerica</i>	Churchyard Lecanactis	1992
<i>Lecanora achariana</i>	Tarn Lecanora	1992
<i>Lecidea inops</i>	Copper Lecidea	1992
<i>Nephroma arcticum</i>	Arctic Kidney-Lichen	1992
<i>Pannaria ignobilis</i>	Caledonian Pannaria	1992
<i>Parmelia minarum</i>	New Forest Parmelia	1992
<i>Parmentaria chilensis</i>	Oil-Stain Parmentaria	1992
<i>Peltigera lepidophora</i>	Ear-Lobed Dog-Lichen	1992
<i>Pertusaria bryontha</i>	Alpine Moss-Pertusaria	1992
<i>Physcia tribacioides</i>	Southern Grey Physcia	1992
<i>Pseudocyphellaria lacerata</i>	Ragged Pseudocyphellaria	1992
<i>Psora rubiformis</i>	Rusty Alpine Psora	1992
<i>Solenopsora liparina</i>	Serpentine Solenopsora	1992
<i>Squamarina lentigera</i>	Scaly Breck-Lichen	1992
<i>Teloschistes flavicans</i>	Golden Hair-Lichen	1992

Stoneworts

Scientific name	English name	Year scheduled
<i>Chara canescens</i>	Bearded Stonewort	1992
<i>Lamprothamnium papulosum</i>	Foxtail Stonewort	1988

Is an environmental impact assessment (EIA) required?

Generally it will be decided by the Local Planning Authority (LPA) whether a proposed development requires EIA. Proposals will normally fall into two broad categories:

Schedule 1


EIA is always required for the following developments:

Oil refineries; thermal and nuclear power stations; nuclear fuel reprocessing plants; iron and steel smelting plants; asbestos extraction installations; industrial chemical installations; major railway lines, motorways and airports; inland waterways and ports; waste disposal and water transfer or treatment plants; petroleum and natural gas extraction; dams; pipelines; intensive poultry and pig installations; industrial timber and paper plants; quarries and opencast mining; petroleum or chemical storage.

Schedule 2

Developments that may require an EIA include proposals under these subcategories:

1. agriculture and aquaculture;
2. extractive industry;
3. energy industry;
4. production and processing of metals;
5. mineral industry;
6. chemical industry (unless included in Schedule 1);
7. food industry;
8. textile, leather, wood and paper industries;
9. rubber industry;
10. infrastructure projects;
11. other projects;
12. tourism and leisure;

- 
13. any change or extension to a Schedule 1 development;
 14. agriculture and aquaculture;
 15. extractive industry;
 16. energy industry;
 17. production and processing of metals;
 18. mineral industry;
 19. chemical industry (unless included in Schedule 1);
 20. food industry;
 21. textile, leather, wood and paper industries;
 22. rubber industry;
 23. infrastructure projects;
 24. other projects;
 25. tourism and leisure;
 26. any change or extension to a Schedule 1 development.



The Government's Standard Assessment Procedure (SAP) for Energy Rating of Dwellings

This substantial document is available to download from the Building Research Establishment: www.bre.co.uk/sap2001

All SAP assessments must meet the requirements of The Building Regulations Approved Document Part L – Conservation of fuel and energy.

