

REVISED EDITION





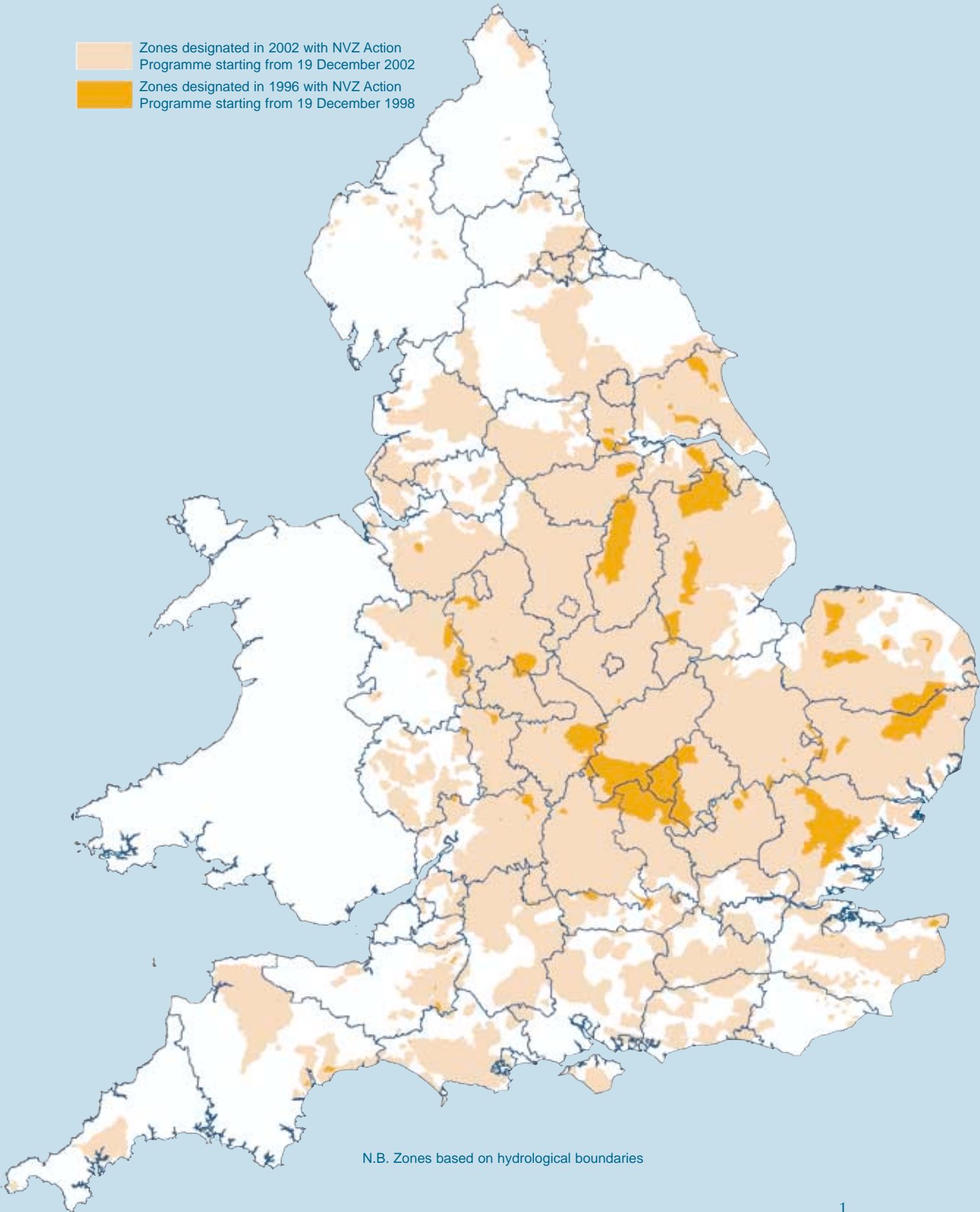
GUIDELINES for FARMERS in NVZs – England

DEFRA
Department for
Environment,
Food & Rural Affairs

*Nitrate
Vulnerable
Zones*

NITRATE VULNERABLE ZONES IN ENGLAND

-  Zones designated in 2002 with NVZ Action Programme starting from 19 December 2002
-  Zones designated in 1996 with NVZ Action Programme starting from 19 December 1998



N.B. Zones based on hydrological boundaries

SUMMARY OF NVZ RULES

<i>Closed Periods</i>	<i>Arable</i>	<i>Grassland</i>
Manufactured Nitrogen Fertiliser (on all soil types)	1 Sept – 1 Feb	15 Sept – 1 Feb
Organic Manures (with high available N on sandy and shallow soils only e.g. slurry and poultry manure)	1 Aug – 1 Nov (arable land <i>with no</i> autumn sown crop)	1 Sept – 1 Nov (including arable land with autumn sown crop)

<i>Nitrogen Limits</i>	<i>Arable</i>	<i>Grassland</i>
Fertiliser Nitrogen	do <i>not</i> exceed crop requirement	do <i>not</i> exceed crop requirement
Organic Manures: (i) whole farm within NVZ (including grazing deposition)	210 kg/ha ¹ total N	250 kg/ha total N
(ii) field limit ² (excluding grazing deposition)	250 kg/ha total N	250 kg/ha total N

¹ reduces to 170 kg/ha after the first four years of Action Programme in NVZ

² NB available N from organic manures must not exceed crop requirement

Spreading Controls

- Do not apply nitrogen fertiliser or organic manures when the soil is:
 - waterlogged; or flooded; or frozen hard; or snow covered.
 - Do not apply nitrogen fertiliser or organic manures to steeply sloping fields.
 - Spread nitrogen fertiliser and organic manures evenly and accurately.
 - Do not apply nitrogen fertiliser in a way that contaminates water courses.
 - Do not apply organic manures within 10 metres of water courses.
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Slurry Storage

There must be sufficient storage to meet the autumn closed period for spreading slurry.

All new or substantially enlarged/reconstructed storage facilities must comply with the relevant regulations.

Record Keeping

Adequate farm records must be kept for at least five years covering cropping, livestock numbers, and the use of nitrogen fertilisers and organic manures.

Please note this is only a summary – you should refer to the main text for full details of the rules.

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GUIDELINES FOR FARMERS

NITRATE VULNERABLE ZONES – ENGLAND

INTRODUCTION

1 Nitrate from agricultural land is the main source of nitrate in rivers and aquifers in Western Europe. High levels of nitrate in certain waters have given rise to environmental and health concerns and these have been reflected in the EC Nitrates Directive (91/676/EEC), which is aimed at reducing nitrate pollution from agriculture. The Directive requires that nitrate pollution in all surface and ground waters is tackled. About 70% of nitrates in English waters come from agricultural land. No single farmer is responsible for this – it is the cumulative impact of all the farming on land draining into polluted waters. The Directive requires Nitrate Vulnerable Zones to be established in polluted catchments where nitrate from agricultural land is causing pollution of water sources and for Action Programme measures to be implemented in those zones to reduce nitrate pollution.

2 The Nitrates Directive defines polluted waters as:

- Surface freshwaters which contain or could contain, if preventative action is not taken, nitrate concentrations greater than 50mg/litre.
- Ground waters which contain or could contain, if preventative action is not taken, nitrate concentrations greater than 50mg/litre.
- Natural freshwater lakes, or other freshwater bodies, estuaries, coastal waters and marine waters which are eutrophic¹ or may become so in the near future if protective action is not taken.

The Environment Agency regularly monitors surface and ground waters through a network of monitoring points and boreholes which enables the assessment of water quality against the above criteria. All land draining into these polluted waters must be designated as NVZs.

3 Following extensive consultation, 66 Nitrate Vulnerable Zones (NVZs) were designated in England in 1996, covering about 8% of the country. The NVZ Action Programme came into force in those zones on 19 December 1998. Following further consultation in 2001/2002, additional NVZs covering about 47% of the country are being designated in 2002. The NVZ Action Programme comes into force in the new zones on 19 December 2002. **The NVZ Action Programme applies to all land within designated NVZs.**

4 These Guidelines have been prepared by the Department for Environment, Food and Rural Affairs in consultation with the Environment Agency. They summarise the rules that you, as a farmer, will have to follow when farming within a designated NVZ, and provides additional guidance to help you understand what is required and how to comply. This revised edition of the

¹ 'Eutrophication' is the process whereby excessive nutrients, especially nitrogen and phosphorus compounds, cause an accelerated growth of algae and plants, which affects the balance of organisms, including fish, and water quality.

NVZ Farmer Guidelines provides advice to farmers in *all* NVZs i.e. those designated in both 1996 and 2002. Further, more detailed, guidance on the use of organic manures is provided in the DEFRA booklet NVZ 5 ‘Manure Planning in NVZs – England’ (PB 5504 Revised July 2002) (see paragraph 48 for more details). The ‘Action Programme’ rules have been produced by the Government and are set out in regulations. The Environment Agency is responsible for the enforcement of these regulations.

- 5 An indicative map showing the location of all the NVZs in England can be found on page 1 of these Guidelines. This map is based on hydrological (‘soft’) boundaries and should only be used as a general guide to the location of the NVZs. If you are located near a boundary you will need more detailed maps to establish whether any of your farm will be within an NVZ. Detailed maps for the 2002 designations will be available over the summer 2002 and final precise field boundaries will be available from September 2002. The maps are also available as a fully interactive web-based service on the DEFRA nitrate webpage. See paragraph 47 for details.

THE ACTION PROGRAMME RULES

- 6 The Nitrates Directive requires that a set of rules is put in place in NVZs to reduce existing nitrate pollution from agricultural land and to prevent further pollution from arising. The rules are known as the *Action Programme* rules or measures. Compliance with the rules is a legal requirement within those areas designated by the Government as NVZs.

Who is responsible for complying with the rules?

- 7 The legal obligation to comply with the Action Programme rules rests with the *occupier* of each *farm*, or livestock unit, with land in an NVZ. This reflects the fact that some rules apply to individual fields, or similar areas of land, whereas others apply on the basis of the whole farm, or that part which lies within the NVZ. It also reflects the need for a coherent set of records to be maintained in respect of NVZ land. In most cases, it will be quite clear as to who ‘the occupier’ is: it may be an owner-occupier, or it may be a tenant with a full agricultural tenancy – a tenancy normally with life-time security. But, because agricultural land can be occupied and farmed under a variety of different circumstances, it is not possible to lay down hard and fast definitions for either ‘occupier’ or ‘farm’. Accordingly, assessments for the purpose of checking compliance with the rules will have to be made on the basis of the circumstances applying in each individual case. If you require further advice on your circumstances you should contact the Environment Agency (see Annex 1).
- 8 Nevertheless, the following guidance on how it is intended that the rules should apply may be helpful. For these purposes, a ‘farm’ is taken to mean an area or areas of land and its buildings, which is used for the growing of crops or rearing of livestock, and includes livestock units and any outlying fields all of which form part of an individual farm business. The occupier is taken to be the person, or persons, in occupation of the land and engaged in the management and farming of the land. If you fall into any of the following categories, you will usually be the occupier and will have the responsibility for complying with

the Action Programme rules:

- Owner-occupier.
- Tenant with a full agricultural tenancy – a tenancy agreement normally with lifetime security and subject to the provisions of the Agricultural Holdings Act 1986, including statutory succession tenancies.
- Tenant with a Farm Business Tenancy – a tenancy agreement taken up on or after 1 September 1995 under the provisions of the Agricultural Tenancies Act 1995.

9 If more than one person is involved in the management and farming of the land – such as partnerships and share farming agreements – they are each responsible and should make effective arrangements between themselves to ensure that all the NVZ requirements are complied with.

10 Because the rules apply to the farm (i.e. all the land on the farm which lies within the NVZ), the occupier of the farm remains responsible for compliance with the rules in respect of the whole of the farm in the NVZ, including any land that may be used by other producers under short-term agreements. For example, if the occupier of an arable farm rents a field to a specialist vegetable grower for a period of a year, the arable farmer continues to retain overall responsibility for the land, and will be treated as the occupier of the whole farm, including that rented to the vegetable grower, for the purposes of compliance with the Action Programme rules. Given the potential variety of land-use agreements, it has not been possible to define what constitutes a ‘short-term agreement’ but, for the purposes of guidance, it is expected that any agreement of two years or less is likely to be regarded as short-term.

11 Longer term arrangements in respect of fields or other blocks of land, which do not constitute a farm in their own right, are likely to be taken into account in assessing what constitutes an occupier’s ‘farm’. For example, if a farmer rents grazing land from a neighbour under a five year agreement, then that land will normally be treated as effectively forming part of the farm to which it is being added, rather than relating to the farm or unit from which it is being rented. Under these circumstances, the farmer who is using the additional land will be treated as the occupier and will be responsible for compliance with the NVZ rules on that land.

General information on the rules

12 The following rules apply to all NVZs designated in England. If some or all of the land that you farm is in an NVZ, the following rules must, by law, be observed from the dates specified in these guidelines (see paragraph 3). Details of where you can obtain further advice and help on how to comply with the NVZ Action Programme rules can be found in paragraphs 46 to 54.

13 For each rule, the legal obligation is described in **bold type**. This is followed, in ordinary type, by non-statutory guidance on how the rule should be interpreted. Additional text in *italics* represents advice which will further reduce nitrate losses; this further advice does not form part of your legal obligations.

USE OF NITROGEN FERTILISERS

14 This section applies to all nitrogen fertilisers, which for the purposes of the NVZ Action Programme rules includes:

- all industrially manufactured nitrogen-containing fertilisers and organic fertilisers, defined under the Fertiliser Regulations 1991 (as amended) (paragraphs 14-21 apply);
- other nitrogen-containing materials, which are neither organic manures, nor manufactured nitrogen fertilisers (paragraphs 16-21 apply). (Organic manures are covered in paragraphs 22-35.)

Closed periods (paragraph 15)

Do not apply manufactured nitrogen fertiliser between 15 September and 1 February for fields in grass, or 1 September and 1 February for fields not in grass, unless there is a specific crop requirement during that time.

15 Manufactured nitrogen fertiliser applied during this closed period is not generally required by crops and, if applied, is poorly utilised and at greater risk of leaching. Hence the basic rule is to ban applications during this period. However, a few crops e.g. over-wintered cauliflower and crops under polythene, can have an agronomic justification for a small amount of nitrogen fertiliser to be applied during this period. This is allowed under the rules without requiring specific permission. However, you should keep a record of the agronomic justification for any nitrogen fertiliser applications made during the closed periods. The agronomic justification should be developed as part of a systematic approach to fertiliser planning which takes full account of nitrogen available from soil organic matter, previous crop residues and organic manures.

Non-spreading conditions (paragraph 16)

To reduce the risk of run-off do not apply nitrogen fertiliser when the soil is

- **waterlogged; or**
- **flooded; or**
- **frozen hard; or**
- **snow covered**

16 Normal common-sense definitions of waterlogged, flooded and snow covered will apply. 'Frozen hard' is when the soil surface is frozen for 12 hours or longer in the preceding 24 hours. Application is allowed on days when early morning frost thaws during the day.

Steeply sloping fields (paragraph 17)

Do not apply nitrogen fertiliser to steeply sloping fields.

- 17** The risk of run-off increases with slope. No specific angle of slope is given in the NVZ legislation due to the complexity of landscape features in practice and the influence of other factors, such as soil condition, ground cover and rainfall after application upon the risk of run-off. However, fields in the steeply sloping category are unlikely to be cultivated. Proximity to watercourses should also be taken into account when assessing the risk of run-off from sloping land causing water pollution.

Before spreading nitrogen fertiliser onto sloping land take care to assess the risk of causing run-off and water pollution.

Crop requirement limitation (paragraphs 18-19)

Do not exceed crop requirement for the quantity of fertiliser nitrogen applied to each field each year, taking account of crop uptake and soil supply from soil organic matter, crop residues and organic manures.

- 18** This rule requires that an assessment is made of the amount of fertiliser nitrogen required by each crop on each field each year (see Annex 2). A systematic approach to fertiliser planning will help you achieve this. When doing this you should take account of the expected crop uptake and make full allowance for the nitrogen available from soil organic matter, previous crop residues and from applications of organic manures. Where appropriate, you should also allow for the influence of soil type, rainfall and irrigation. Where the crop requirement for nitrogen is influenced by expected yield, the yield estimate should be realistic and based upon average yield levels previously obtained in the field. Most fertiliser recommendation systems take account of these factors. DEFRA 'Fertiliser Recommendations for Agricultural and Horticultural Crops' (RB209) (2000) Seventh edition, is one authoritative source (see paragraph 53) but not the only information source that you can use if you need further guidance. You should be able to explain which system you have used or how you have arrived at the crop requirement for fertiliser nitrogen.

In situations of high soil nitrogen supply, such as land receiving regular applications of organic manures or recently ploughed from intensively managed grass, soil analysis for soil mineral nitrogen can be used to provide more precise guidance to the soil nitrogen supply and fertiliser requirement. Analysis for soil mineral nitrogen can also improve precision in intensive vegetable rotations, particularly when a second crop is grown in the same year.

19 The amount of nitrogen available to crops from organic manures depends upon the type of manure, the timing and method of application. Guidance on how to calculate the available nitrogen contribution from organic manures is given in the DEFRA booklet ‘Manure Planning in NVZs – England’. The MANNER Computerised Decision Support System is recommended for detailed field specific guidance – for further details see paragraph 51. Annex 2 contains a worked example of crop requirement for fertiliser nitrogen, taking into account previous crop, soil type and use of organic manures.

Avoiding pollution of surface waters (paragraph 20)

Do not apply nitrogen fertiliser in such a way that makes it likely that it will enter directly into surface water.

20 Nitrogen fertiliser must be spread accurately on the cropped area without any direct contamination of surface water. Care must be taken to avoid direct contamination when spreading fertiliser alongside streams, ditches, lakes etc. which contain free water. Direct application to temporarily dry ditches and blind ditches must also be avoided. Full width machines should present few problems. Spinning disc and oscillating spout machines need careful operation. If appropriate, they should be fitted with headland deflector plates.

Fertiliser application (paragraph 21)

Nitrogen fertiliser should be spread as uniformly and accurately as is practically possible to the cropped area.

21 Nitrogen fertiliser should be spread accurately, at the right rate, and without applying it to uncropped areas, hedges and ditches. Adjust fertiliser spreaders carefully, following manufacturers’ instructions, to apply the amount you want. You should use only fertiliser of a quality that you can spread accurately and evenly.

All machines should be tested regularly for accuracy of spreading and calibrated for the application rate required.

Nitrogen fertiliser use and nitrate leaching – remember that:

- *Current recommendation systems aim to predict the economic optimum rate for nitrogen fertiliser use.*
- *This gives the best economic return.*
- *There is only a small increase in nitrate leaching as nitrogen fertiliser rates increase up to the economic optimum.*
- *At rates above the optimum nitrogen is used less efficiently by the crop and the risk of nitrate leaching increases substantially.*
- *Thus, using no more nitrogen fertiliser than the crop requires is in the best interests of both the farm business and the environment.*

ORGANIC MANURE USE

Farm-based limits (paragraphs 22-27)

Organic manure loadings shall not exceed 250 kg/ha of total nitrogen each year averaged over the area of grass on the farm, and 210 kg/ha of total nitrogen each year averaged over the area of the farm not in grass. These rules apply to all farms using organic manures, whether producing or receiving them.

- 22** These limits apply to all organic manures, INCLUDING that deposited by animals whilst grazing, and to all the agricultural land on the farm within the NVZ boundaries. They include all other nitrogen-containing organic materials such as sewage sludge. Derived from the EC Nitrate Directive, the year is defined as running from 19 December until 18 December in the following year. These limits do not include manufactured fertilisers containing nitrogen. You should note that the limits on the use of organic manures are based upon the area of agricultural land on the farm, within the NVZ. Areas of woodland, roads and hardstanding are excluded from the calculation of land available for manure spreading. Annex 3 shows an example calculation of spreading area and manure capacity.
- 23** The higher limit of 250 kg/ha for grassland is justified by the longer growing season and lower leaching risk on grassland. Agreement with the EC is required for this higher limit for grassland. In line with the Directive's requirements, for land in agricultural crops other than grass the 210 kg/ha limit will be reduced to 170 kg/ha after the first four years of the Action Programme, i.e. from:
- 19 DECEMBER 2002 for designations with the NVZ Action Programme beginning on 19 December 1998; and
 - 19 DECEMBER 2006 for designations with the NVZ Action Programme beginning on 19 December 2002.
- 24** In order to simplify compliance with these limits, standard figures representing typical nitrogen excreta rates for different types of livestock, together with the animal numbers per hectare that equate with these limits, are given in Annex 4. Some worked examples are shown in Annex 5. In practice, the actual number of animals equating to the limit on a particular farm may vary depending on diet and other details of the production system. These factors may be taken into account when calculating the actual land area needed for an individual livestock farm. However, if you decide to use excreta rates which differ from the standard figures in Annex 4 you should keep adequate records, for example on slurry analyses and details of diets in support of your actions.

- 25 Fuller guidelines on how to calculate whether you have sufficient land for spreading manures, and therefore comply with the requirements of the NVZ rules, can be found in the DEFRA booklet ‘Manure Planning in NVZs – England’ and the NVZ Decision Support System ‘Your Farm and NVZs – Do you comply?’ (see paragraphs 48 and 49 for more details).
- 26 Where there is insufficient land on the farm to spread organic manures within the set nitrogen limits, either the number of livestock should be reduced or, where possible, arrangements will need to be made to transport the excess to another farm or farms. Alternatively, some poultry litters can be used as raw materials for energy production at certain power stations. Once manures are transported to another farm, the responsibility for their subsequent management and land application pass to the receiving farm. If the receiving farm lies within an NVZ, the land application must comply with the Action Programme rules. If the farm lies outside NVZ boundaries, the land application should comply with the Codes of Good Agricultural Practice (see paragraph 54 for further details). The original farm producing the manure must keep records identifying the receiving farm, the type and quantity of exported manure and the date it was moved off the farm (see paragraph 38).
See paragraph 41 for information on biosecurity where manures are exported.
- 27 Long-term planning to take account of these rules should be based on the assumption that the 210 kg/ha limit reduces to 170 kg/ha after the first four years of the Action Programme (see paragraph 23). For the purposes of planning, farmers with grassland should bear in mind that the 250 kg/ha limit is subject to EC agreement being reached.

Field-based limit (paragraph 28)

Organic manure shall not be applied to any field at a rate which would result in the total nitrogen supplied in the manure exceeding 250 kg/ha in any 12 month period.

- 28 The amount of organic manure applied should be in accordance with the Code of Good Agricultural Practice for the Protection of Water. This requires that applications of organic manure to individual fields must not exceed 250 kg/ha per year of total nitrogen, EXCLUDING any deposited by animals whilst occupying the field. The area of the field used to calculate the 250 kg/ha limit should exclude any areas where manures must not be spread, such as the 10 metre buffer zone around surface waters (see paragraph 34). This PER FIELD LIMIT applies in addition to, and in conjunction with, the overall FARM LIMIT, as set out in paragraphs 22-27 above.

Crop requirement limitation (paragraph 29)

Do not apply more available nitrogen in organic manure than the amount required by the particular crop being grown.

29 Guidance on how to calculate the available nitrogen contributed by organic manures is provided in the DEFRA booklet ‘Manure Planning in NVZs – England’ (also see paragraph 48).

If you are a livestock farmer you are encouraged to develop a Farm Waste Management Plan which will help you decide when, where, and at what rate, to spread organic manures on your farm. This is not mandatory within NVZs but will reduce the risk of causing water pollution from the storage and spreading of organic manures. Guidance on Farm Waste Management Plans is given in the Code of Practice for the Protection of Water and can also be obtained from DEFRA. You can get independent, professional advice, for a fee, from a member of the National Farm Waste Management Register. A list of members of the Register may be obtained by telephoning 01884 234852.

Closed periods (paragraphs 30-31)

On sandy or shallow soils do not apply slurry, poultry manures or liquid digested sewage sludge

- between 1 September and 1 November to fields in grass, or to be sown with an autumn sown crop, or
- between 1 August and 1 November to fields not in grass, nor to be sown with an autumn sown crop.

30 These types of organic manure contain a higher proportion of available nitrogen; hence their use entails a greater risk of nitrate leaching. The months when application is banned are the most crucial ones for risk of nitrate leaching. August application on grassland allows time for nitrate to be taken up by the growing crop but other crops are less effective at taking up nitrate at this time. Applications after 1 November will result in very limited conversion to nitrate in most winters.

31 You should note that SLURRY is defined as excreta produced by livestock while in a yard or building, including mixtures with bedding, rainwater and washings, that have a consistency that allows them to be pumped or discharged by gravity at any stage of the handling process. Very dilute wastes such as parlour washings on dairy farms and run-off from lightly fouled yards are excluded as long as they do not include liquid effluent from silage or stored slurry, for example effluent from a weeping wall store.

POULTRY MANURES include all poultry-produced manures and litters.

LIQUID DIGESTED SEWAGE SLUDGE is the residue after processing raw sewage at a treatment works that has undergone anaerobic digestion but has not been dewatered.

FARMYARD MANURE These closed periods do not apply to farmyard manure (i.e. straw-based manures).

SANDY SOILS (also known as light sand soils) are defined as soils which are sand, loamy sand or sandy loam texture to 40 cm depth and sand or loamy sand to 80 cm. The topsoil will contain less than 8.5% organic matter (5% organic carbon).

SHALLOW SOILS are defined as soils of 40 cm or less depth over rock which is commonly chalk, limestone or sandstone in NVZs.

It is your responsibility to determine whether any of your land falls under the definition of sandy/shallow soils.

AUTUMN SOWN CROPS are defined as:

- a cover crop sown before 1 October and not removed (by mechanical cultivation, herbicide or grazing) before 1 December of the same year.
- a crop, other than a cover crop, sown between 1 August and 1 November in any year.

Cover crops can be very effective at reducing nitrate leaching at the most critical time of the year. When the cover crop is destroyed during the winter the nitrogen will be slowly released from the crop residues. Catch crops for grazing can also be effective in reducing nitrate loss when used late in the year. Consider sowing catch crops or cover crops in fields that would otherwise be bare over the autumn and winter.

Non-spreading conditions (paragraph 32)

To reduce the risk of run-off, do not apply organic manures when the soil is

- **waterlogged; or**
- **flooded; or**
- **frozen hard; or**
- **snow covered.**

32 Normal common-sense definitions of waterlogged, flooded and snow covered will apply. 'Frozen hard' is when the soil surface is frozen for 12 hours or longer in the preceding 24 hours. Application is allowed on days when early morning frost thaws during the day.

The risk of run-off is greater on bare arable soil than on cropped land. This risk can be reduced by incorporating the manure by cultivation. Additionally, incorporation within 24 hours will reduce the loss of ammonia and increase the amount of nitrogen available to the crop. For slurries and other liquid manures injection into the ground can reduce the risk of run-off, providing the application rate suits site conditions. Situations where slurry can be injected successfully can often be limited by the condition of the soil and the crop.

Steeply sloping fields (paragraph 33)

Do not apply organic manures to steeply sloping fields.

- 33** The risk of run-off increases with slope. No specific angle of slope is given in the NVZ legislation due to the complexity of landscape features in practice and the influence of other factors, such as soil condition, ground cover and rainfall after application, upon the risk of run-off. However, fields in the steeply sloping category are unlikely to be cultivated. Proximity to watercourses should also be taken into account when assessing the risk of run-off from sloping land causing water pollution.

Before spreading organic manures onto sloping land take care to assess the risk of causing run-off and water pollution.

Buffer strip for surface waters (paragraph 34)

Do not apply organic manures within 10 metres of surface water.

- 34** Surface waters includes lakes, rivers, streams and ditches which contain free water and also temporarily dry ditches and blind ditches. Manure must not be applied to this 10 metre buffer strip.

To help protect the quality of ground water, organic manures should not be applied within 50 metres of a spring, well or borehole that supplies water for human consumption, or is to be used in farm dairies.

Spreading organic manures (paragraph 35)

Organic manures should be spread as accurately and uniformly as is practically possible.

- 35** Application equipment should be suitable for the type of manure being spread and should be capable of producing a reasonably uniform spreading pattern over the appropriate range of application rates.

STORAGE OF SLURRY AND SILAGE

Legal requirements (paragraph 36)

All new, substantially reconstructed, or substantially enlarged installations for the containment of slurry and silage must conform with The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 (amended 1997).

- 36** The Environment Agency already has powers under these Regulations to require changes to facilities if they pose a significant risk of pollution. You must notify the Environment Agency in writing about a new, or substantially enlarged, or substantially reconstructed installation at least 14 days before you use it.

Minimum storage requirements (paragraph 37)

The storage capacity available for those animal manures which cannot be applied during the autumn closed periods must be sufficient to cover these periods unless other environmentally acceptable means of disposal are available.

- 37** The practical minimum storage period to enable the autumn spreading ban on slurry to be met is three or four months depending on cropping. This assumes that slurry is being produced throughout the months when spreading is banned, is not being exported outside the Zone and that winter application is both practicable and environmentally acceptable (i.e. complies with the Code of Good Agricultural Practice for the Protection of Water). It is expected that the latter criteria will be met on most, if not all, sandy or shallow soil fields in NVZs. Guidelines on estimating the minimum storage requirements needed to comply with the closed periods for spreading slurries are provided in the DEFRA booklet 'Manure Planning in NVZs – England'. The NVZ Decision Support System 'Your Farm and NVZs – do you comply?' also calculates the monthly storage requirements for slurry. If the Action Programme requires you to make changes to, or increase, your storage facilities you may be eligible for a grant under the NVZ Farm Waste Grant Scheme (see paragraph 40).

Solid manure (i.e. manure that contains enough bedding material or is dry enough to be stacked) should only be put into temporary field heaps if you can put it where there is no risk of pollution from run-off. Manure heaps should not be located within 10 metres of a watercourse or field drain, or within 50 metres of a spring, well or borehole, that supplies water for human consumption or is to be used in farm dairies.

RECORDS

(paragraphs 38-39)

All farms must keep adequate records relating to livestock numbers and the use of nitrogen fertiliser and organic manures.

- 38** These records are essential to monitor compliance with the NVZ rules; it is therefore a legal requirement that you maintain an acceptable recording system which must be available for inspection by Environment Agency staff at all reasonable times. These records will need to include details of the following:
- the area of the farm and its individual fields, excluding areas of woodland, roads and hardstanding;
 - the cropping of each field, including sowing dates;
 - applications of nitrogen fertiliser, including quantities and application dates;
 - any applications of organic manures, including type, quantity and application dates;
 - any livestock kept on the farm, including type and length of time kept (i.e. normal stocking cycles);
 - any livestock manure moved off the farm, including quantities, dates and details of the recipient.

- 39** **You must keep these records for at least five years.** The record form shown at Annex 6 may be used if you do not already have a field recording system which includes the information required, or it may be used as a model of what is required. You may use photocopies of the example at Annex 6 or obtain copies from DEFRA Publications (tel 08459 556000). A copy can also be downloaded from the DEFRA nitrate website (see paragraph 47). A further example of the record form showing some sample entries can be found at Annex 7. These entries are only a guide to show you how the form might be completed. An example of a form for recording movements of livestock manures off the farm is provided in the DEFRA Manure Planning Booklet. The DEFRA Manure Planning Booklet also contains a form for recording livestock numbers. The NVZ Decision Support System ‘Your Farm and NVZs – Do you comply?’ contains a section which allows you to record the farm and field details required within NVZs.

GRANTS FOR FARM WASTE FACILITIES

- 40** DEFRA grants are available to farmers with land in existing NVZs who need to invest in new or improved farm waste facilities. For NVZs designated in 2002, grant will be available after the Zones have been formally designated. Only expenditure committed after the formal designations for the new NVZs have come into force can be eligible for grant. You should check that the new regulations (anticipated in September) have come fully into force before committing any expenditure you wish to claim grant for. You may do this via the

DEFRA NVZ web pages or by contacting the East Midlands Rural Development Service as below. Advice is also available from the DEFRA Rural Development Service (RDS) to assist you in making decisions about waste storage facilities. Details of the scheme are given in DEFRA Publication PB 2529, 'Farm Waste Grant Scheme: Nitrate Vulnerable Zones'. Contact the DEFRA RDS Office at Nottingham (tel 01159 291191) for a copy of the scheme literature and advice if needed. You should also contact your local Environment Agency office as early as possible about any plans for waste storage facilities and must notify it prior to bringing the facilities into use, to ensure that they meet the requirements of the Silage, Slurry and Agricultural Fuel Oil Regulations. Details of Environment Agency offices are given at Annex 1.

BIOSECURITY

- 41** The risk of spreading animal disease while transporting manures to other farms is reduced by providing secure containment, *cleaning the exterior of the vehicle used for transport before leaving the originating premises*, and spreading on arable land or on grassland used for forage conservation. Advice on applying manures to grazing land is contained in booklet No 2, 'Making better use of livestock manures on grassland' – see paragraph 52 for further details.

ENFORCEMENT

- 42** You are required by law to meet the obligations in bold text described above. The legislation does not allow for exceptions to be made. Enforcement of this legislation will be carried out by staff of the Environment Agency and after the Action Programme comes into effect any queries on the legal interpretation of the rules should be addressed to them. Details of Environment Agency contact points are contained in Annex 1.

PENALTIES

- 43** Failure to comply with the measures set out in the NVZ Action Programme may result in prosecution. The Environment Agency may also serve a notice requiring action to be taken, or any other relevant steps which it considers necessary, to ensure that there is no continuation or repetition of the activity to which the notice relates. The period for compliance stated in the notice will be sufficient to allow steps to be taken or measures to be implemented to rectify the contravention and will not be less than 28 days. The Environment Agency may, at any time, withdraw the notice, extend the period for compliance with the requirements of the notice, or modify the requirements of the notice, but only with the consent of the person on whom the notice is served.
- 44** If action is not taken to remedy the situation within the timeframe stipulated by the Environment Agency, the case may be brought to court, and if found guilty, the individual concerned may be liable, on summary conviction, to a fine not exceeding the statutory maximum of £20,000.

APPEALS AGAINST STATUTORY NOTICES

45 If you are served with a statutory notice, you may appeal to the Secretary of State for Environment, Food, and Rural Affairs against the notice. You should normally appeal within 28 days from the date the notice is served. A notice of appeal must contain, or be accompanied by, a statement of the grounds of the appeal. The Secretary of State has powers which include being able to require withdrawal of the notice, modify any of its requirements or to dismiss the appeal. You may wish to consider taking legal advice before making an appeal.

FURTHER ADVICE

General and technical queries

- 46** If you have a query or require further clarification on what being in an NVZ means to you, help is available from a number of sources.
- For **general queries**, you can telephone the central DEFRA helpline tel 08459 335577. All up-to-date information on NVZs is available via the DEFRA nitrate webpage (see paragraph 47 below).
 - If you require help in clarifying how to interpret the rules on your farm, you can telephone the **NVZ technical advice helpline** (which is likely to run until March 2003) – tel 0845 6023864. Lines are open from between 9am and 5pm, Monday to Friday. The helpline is run by ADAS on behalf of DEFRA. Alternatively, for the new zones you can also call your local Environment Agency after 19 December 2002 when the measures in the new NVZs come into force (see Annex 1 for a list of regional Environment Agency offices).
 - E-mail queries should be sent to helpline@defra.gsi.gov.uk

DEFRA Website

47 The DEFRA **nitrate webpage** www.defra.gov.uk/environment/water/quality/nitrate contains a wide range of up-to-date information on the Nitrates Directive and how it is being implemented in England. It also contains fully interactive NVZ field boundary maps and links to other relevant websites e.g. the Environment Agency. It also contains a publications library of the relevant literature.

Manure Planning in NVZs – England

- 48** The booklet ‘**Manure Planning in NVZs – England**’ is supplementary to these guidelines and has been prepared to help livestock farmers and those arable farmers importing organic manures comply with the requirements of the Action Programme measures. It provides a step by step guide on how to calculate:
- If there is enough land available for spreading manure;
 - If there is enough storage for slurry; and
 - How much manure applications will reduce the requirement for fertiliser N.
- Copies of this booklet are available from DEFRA publications, Admail 6000, London SW1A 2XX (tel: 08459 556000) by quoting PB 5504 or it can be viewed and downloaded from the DEFRA Website: www.defra.gov.uk/environment/water/quality/nitrate

NVZ Decision Support System

49 A NVZ Decision Support System (DSS) ‘Your Farm and NVZs – Do you comply?’ has been designed to provide a simple, user-friendly system to help you assess if your farm complies with the NVZ Action Programme rules. The software is an alternative to the Manure Planning booklet and will carry out all the necessary calculations for a farm and assess if the farm complies with the NVZ Action Programme rules. The DSS will give a hard copy output of the NVZ compliance assessment information for your farm and also contains a record keeping facility. As part of the package a laminated ‘Soil Assessment Guide’ is also available to help you determine soil types on your land.

50 The NVZ Decision Support System is available on CD-ROM *free of charge*. If you would like a copy, telephone the NVZ technical advice helpline on **0845 6023864**. The DSS can also be downloaded from the DEFRA nitrate webpage (see paragraph 47 above).

MANNER software tool

51 The Manure Nitrogen Evaluation Routine (MANNER) Decision Support System is available to help farmers accurately predict the fertiliser nitrogen value of organic manures on a field specific basis. The MANNER software tool needs only some basic information to run and is available *free of charge* on disk or CD-ROM. For a copy, telephone the NVZ technical advice helpline specifying if you would like MANNER on CD or disk.

Managing Livestock Manure Booklets

52 Further guidance on how to integrate manure and inorganic fertiliser use to best advantage is provided in the following booklets:

- *Making better use of livestock manures on arable land*
Managing Livestock Manures Booklet 1 (revised 2001)
- *Making better use of livestock manures on grassland*
Managing Livestock Manures Booklet 2 (revised 2001)
- *Spreading systems for slurries and solid manures*
Managing Livestock Manures Booklet 3 (revised 2001)

These are available *free of charge* from the NVZ technical advice helpline – call **0845 6023864**. They are also available on the DEFRA nitrate webpage (see paragraph 47 above).

Fertiliser Recommendations for Agricultural and Horticultural Crops

53 More detailed advice on fertiliser use is published in **Fertiliser Recommendations for Agricultural and Horticultural Crops**, DEFRA Reference Book 209, 7th Edition, 2000 (ISBN 0 11 243058 9). This publication (priced £15) is available from Stationery Office bookshops or direct from The Stationery Office Tel: 0870 600 5522. It can also be viewed and printed from the DEFRA nitrate webpage (see paragraph 47 above).

Water, Air and Soil Codes

54 The Water, Air and Soil Codes are designed to provide practical guidance to help farmers and growers avoid causing pollution and to protect soil as their most valuable resource. The Codes describe the main risks of causing pollution from different agricultural and horticultural sources. You can obtain all these Codes *free of charge* from DEFRA publications (tel: 08459 556000). They can also be viewed and printed on the DEFRA website.

ENVIRONMENT AGENCY HEAD AND REGIONAL OFFICES

Head Office

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD
Tel: 01454 624400
Fax: 01454 624409
Environment Agency General Enquiry Line: 08459 333 111
Environment Agency Emergency Hotline (for pollution incidents): 0800 80 70 60

Southern

Guildbourne House, Chatsworth Road, Worthing, West Sussex BN11 1LD
Tel: 01903 832000
Fax: 01903 821832

South West

Manley House, Kestrel Way, Exeter EX2 7LQ
Tel: 01392 444000
Fax: 01392 444238

North East

Rivers House, 21 Park Square South, Leeds LS1 2QG
Tel: 0113 244 0191
Fax: 0113 246 1889

North West

Richard Fairclough House, Knutsford Road, Warrington WA4 1HG
Tel: 01925 653999
Fax: 01925 415961

Midlands

Sapphire East, 550 Streetsbrook Road, Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

Anglian

Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough PE2 5ZR
Tel: 01733 371811
Fax: 01733 231840

Thames

Kings Meadow House, Kings Meadow Road, Reading, Berkshire RG1 8DQ
Tel: 01189 535000
Fax: 01189 500388

EXAMPLES OF ASSESSMENT OF CROP REQUIREMENT FOR FERTILISER NITROGEN

(i) Allowing for the available nitrogen in organic manures applied before first cut silage

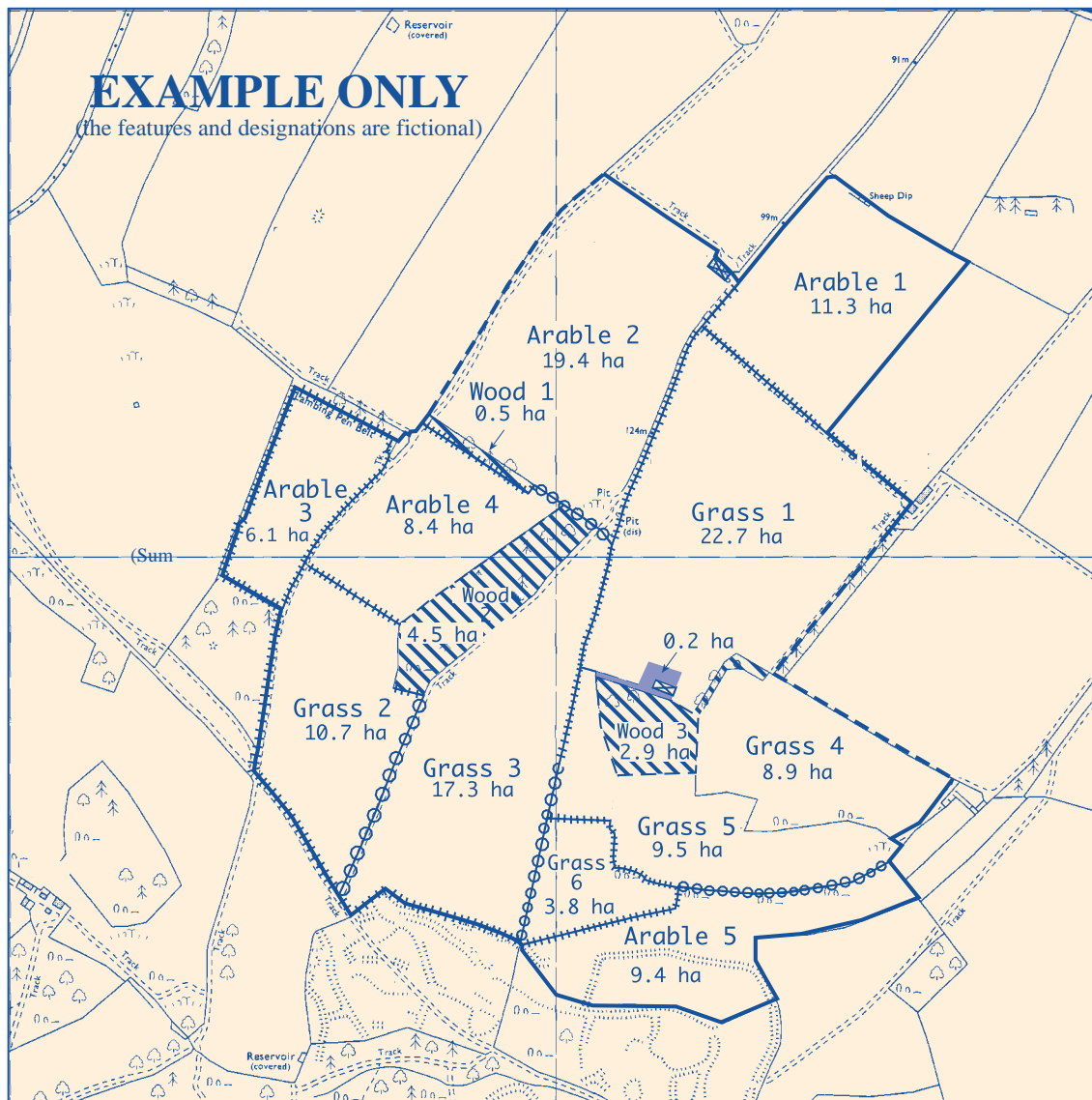
Recommendation for first cut silage (68-70 D) at low soil nitrogen supply	150 kg/ha N
Available nitrogen from cow slurry applied at 50m ³ /ha in March	50 kg/ha N
Net crop requirement for fertiliser nitrogen	100 kg/ha N

(ii) Allowing for the available nitrogen in broiler litter applied before sugar beet

Recommendation for sugar beet following a cereal crop on a loamy sand soil	120 kg/ha N
Available nitrogen from fresh broiler litter: <ul style="list-style-type: none"> – applied at 6 t/ha in March – soil incorporated within 24 hours 	80 kg/ha N
Net crop requirement for fertiliser nitrogen	40 kg/ha N

For fuller details see DEFRA Fertiliser Recommendations for Agricultural and Horticultural Crops (RB209) from which these examples are derived.

NVZ FARM MAP



- | | |
|---|---|
|  Farm boundary |  Hedge |
|  Woodland |  Fence |
|  Wall |  Farm building |
| |  Hardstanding |

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NVZ FARM MAP

Notes to Annex 3

To calculate the area available for the spreading of organic manure:

$$\begin{aligned}\text{Area of grass} &= (\text{Sum of area of grass fields}) - (\text{area of any ponds/lakes/hardstanding within fields}) \\ &= (22.7 + 10.7 + 17.3 + 8.9 + 9.5 + 3.8) - (0.2) \\ &= 72.7 \text{ ha}\end{aligned}$$

$$\begin{aligned}\text{Area of arable} &= (\text{Sum of area of arable fields}) - (\text{area of any ponds/lakes/hardstanding within fields}) \\ &= (11.3 + 19.4 + 6.1 + 8.4 + 9.4) \\ &= 54.6 \text{ ha}\end{aligned}$$

To calculate the manure N capacity of the farm:

$$\begin{aligned}\text{Manure N capacity} &= [\text{Area}] \times [\text{Manure N limit}] \\ \text{Manure N capacity of grass} &= (72.7 \text{ ha} \times 250 \text{ kg}) \\ &= 18,175 \text{ kg N per year} \\ \text{Manure N capacity of arable} &= (54.6 \text{ ha} \times 210 \text{ kg}^*) \\ &= 11,446 \text{ kg N per year} \\ \text{Manure N capacity of farm} &= 18,175 + 11,446 \\ &= 29,641 \text{ kg N per year}\end{aligned}$$

NB

* the allowance on arable land will reduce to 170 kg/ha N after the first four years of the Action Programme (see paragraph 23).

Standard total nitrogen production as livestock excreta and maximum NVZ stocking rates ANNEX 4

Livestock Unit	Age Range or Average	Body Weight kg	Occupancy per cent of year	Annual excreta production m ³ or t	Annual N production kg	Animal number per ha to comply with maximum N loadings		
						170 kg/ha N	210 kg/ha N	250 kg/ha N
Cattle								
Dairy cow		650	100	23.2	116	1.5	1.8	2.2
Dairy cow		550	100	19.2	96	1.8	2.2	2.6
Dairy cow		450	100	15.3	76	2.2	2.8	3.3
Dairy heifer replacement	>2 years	500	100	11.7	58	2.9	3.6	4.3
Beef suckler cow ⁹	>2 years	500	100	11.7	58	2.9	3.6	4.3
Bull beef	6-13.5 months	300	60	4.8	23	7.4	9.1	10.9
Grower fattener	>2 years	500	100 ⁷	11.7	58	2.9	3.6	4.3
Grower fattener	12-24 months	400	100 ⁷	9.4	47	3.6	4.5	5.3
Grower fattener	6-12 months	180	50 ⁷	2.4	12	14	17.5	21
Calf	0-6 months	100	50 ⁷	1.3	7	24	30	36
Pigs								
Maiden gilts ¹		90-130	100	2.6	13.0	13	16	19
Boars		130-250	100	3.2	16	11	13	16
1 sow place, including litters ²	Progeny to 7 kg	130-225	100	4.0	19.5	9	11	13
Weaners ⁸	3-7.5 weeks	7-18	90	0.4	3.0	57	70	83
Growers, dry meal ⁸	7.5-11 weeks	18-35	90	0.9	6.1	28	34	41
Light cutter, meal fed ⁸	11-20 weeks	35-85	90	1.4	9.4	18	22	27
Baconers, dry meal fed ⁸	11-23 weeks	35-105	90	1.5	10.5	16	20	24
Baconers, liquid fed (@ 4:1) ⁸	11-23 weeks	35-105	90	2.4	10.5	16	20	24

Livestock Unit	Age Range or Average	Body Weight kg	Occupancy per cent of year	Annual excreta production m ³ or t	Annual N production kg	Animal number per ha to comply with maximum N loadings		
						170 kg/ha N	210 kg/ha N	250 kg/ha N
Poultry								
1000 Laying hens		2200	98	41.0	660	260	320	380
1000 Broiler places ⁴	42 days	2200	76	16.5	495	340	420	510
1000 Broiler breeders		3400	77	61.0	975	170	220	260
1000 Replacement pullets ³	17 weeks	1600	38	7.8	125	1360	1680	2000
1000 Turkeys (male) ⁵	140 days	13500	80	46.4	1390	120	150	180
1000 Turkeys (female) ⁵	120 days	6500	80	21.7	650	260	320	380
1000 Ducks	50 days	3400	85	90	900	190	230	280
Sheep								
Adult ewes	>1 year	50-70	100	1.5	9	19	23	28
Lambs ⁶	0-6 months	4-40	50	0.2	1.2	140	175	210
Lambs ⁶	6-12 months	30-50	50	0.5	3.2	53	66	78

Notes to Annex 4:

1. Maiden gilts, assuming all year round accommodation.
2. Sows based on 2.3 lactations, covering 23 per cent of year and dry period 77 per cent of year. Combined output 19.5 kg N/sow/year.
3. Replacement pullets, output per 20 week cycle. Where there is more than one cycle per year adjust the output figures proportionately.
4. Broilers, output per 6.6 crops/year, 42 day cycle (76 per cent occupancy).
5. Turkeys, assuming 2.1 or 2.4 crops per year, male and female birds.
6. Lambs, on average, kept for 6 months.
7. 'Occupancy' for growing/fattening cattle variable on farms and should be assessed on individual units.
8. Data presented per pig place, assuming 90% occupancy. The Manure Planning Booklet and NVZ Decision Support System use a different system based on number of pigs finished.
9. Use beef suckler cow data for beef and dairy bulls.

WORKED EXAMPLES OF ORGANIC MANURE LIMIT

Dairy farm

At the time of calculation this all grass farm had the following:

- 100 cows @ 550 kg
- 20 dairy heifer replacements
- 30 calves

The area of grassland needed to meet the 250 kg/ha N organic manure limit are:

$$\text{Cows} \quad \frac{100}{2.6} = 38.5 \text{ ha}$$

$$\text{Dairy heifer replacements} \quad \frac{20}{4.3} = 4.7 \text{ ha}$$

$$\text{Calves} \quad \frac{30}{36} = 0.8 \text{ ha}$$

Total land area needed

$$38.5 + 4.7 + 0.8 = 44 \text{ ha}$$

$$\text{or } 44 \times 2.471 = 109 \text{ acres}$$

Pig unit

At the time of calculation this pig unit had the following number of sows and fattening places:

- 100 sows and litters
- 800 baconers
- 300 growers

The area of arable land needed to meet the 210 kg/ha N organic manure limit is:

$$\text{Sows} \quad \frac{100}{11} = 9.1 \text{ ha}$$

$$\text{Baconers} \quad \frac{800}{20} = 40 \text{ ha}$$

$$\text{Growers} \quad \frac{300}{34} = 8.8 \text{ ha}$$

Total land area needed

$$9.1 + 40 + 8.8 = 57.9 \text{ ha}$$

$$\text{or } 57.9 \times 2.471 = 143 \text{ acres}$$

Pig unit with part of land area within NVZ

At the time of calculation this pig unit had the following numbers of sows and fattening places:

- 200 sows and litters
- 2000 baconers
- 400 growers

The land area on the farm was 200 ha of arable land of which 80 ha was within and 120 ha outside the NVZ.

The 80 ha arable land can receive up to a total of $80 \times 210 = 16800$ kg N as pig slurry/manure.

The pigs will produce the following amounts of excreta and nitrogen:

	<i>Annual excreta volume (m³)</i>	<i>Annual N excretion (kg)</i>
Sows $200 \times 4.0 =$	800	$200 \times 19.5 =$ 3900
Baconers $2000 \times 1.5 =$	3000	$2000 \times 10.5 =$ 21000
Growers $400 \times 0.9 =$	352	$400 \times 6.1 =$ 2440
TOTAL	4152	27340

The manure N capacity for the 80 ha of arable land equates to 61 per cent of the annual N excretion from the pigs.

Thus the 80 ha within the NVZ can receive up to 61 per cent (equivalent to 2551 m^3 of excreta volume) of the slurry/manure produced by the pig unit.

Nitrate Vulnerable Zones Field Record Sheet

Diary of fertiliser nitrogen and organic manure applications

- It is a requirement of the Nitrate Vulnerable Zones Action Programme that you keep records of nitrogen fertiliser and manure applications.
- If your own records do not provide this information, please complete this form in respect of all land on your farm within the NVZ (one form per field).
- Fill in the information as soon as possible after each application of fertiliser and manure.
- If you are unsure about the action programme measures, consult the explanatory booklet "Guidelines for Farmers in NVZs – England" obtainable from DEFRA.
- This record sheet must be retained for five years from the date of the last entry it contains.

Field name or number Field area Start of NVZ Action Programme 1998 2002 Soil type

CROPPING DETAILS		DATE OF FERTILISER/ MANURE APPLICATION	NITROGEN FERTILISER Quantity applied (✓ as appropriate) <input checked="" type="checkbox"/> kg/ha N <input type="checkbox"/> units/acre N	ORGANIC MANURE APPLICATIONS			ADDITIONAL COMMENTS
Crop	Date sown			Manure type (e.g. pig slurry)	Analysis of nitrogen content (if available)	Quantity applied per ha (✓ as appropriate) <input type="checkbox"/> tonnes <input type="checkbox"/> M ³	
S. Barley	15.3.99	10.3.99		Pig slurry	/	50 m ³	3% I
Potatoes	6.4.00	30.3.00	50	Broiler manure	/	8 t	/
W. Wheat	8.10.00	5.4.00	130				
		16.4.01	70				
		8.5.01	70				

NVZ 3 (2002)

DEFRA

Department for
**Environment,
Food & Rural Affairs**

Produced by the Department for Environment, Food and Rural Affairs

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NVZ4

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Printed on recycled material. Text paper contains 100% post consumer waste.

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