

## EXECUTIVE NOTE

### THE ACTION PROGRAMME FOR NITRATE VULNERABLE ZONES (SCOTLAND) REGULATIONS 2008 (S.S.I. 2008/298)

#### Introduction

1. The instrument was made using the powers conferred by section 2(2) of the European Communities Act 1972<sup>1</sup>. The instrument is subject to negative resolution procedure.

#### Policy Objectives

2. The purpose of the instrument is to establish a revised action programme for the nitrate vulnerable zones which were designated in Scotland by regulation 3 of the Designation of Nitrate Vulnerable Zones (Scotland) Regulations 2002 (S.S.I. 2002/276) and regulation 3 of the Designation of Nitrate Vulnerable Zones (No. 2) (Scotland) Regulations 2002 (S.S.I. 2002/546) (“the 2002 Regulations”). The aim of the action programme is to prevent or minimise the losses of nitrate from agricultural sources to the water environment (surface waters and groundwater).

3. The instrument gives further effect in Scots law to the Nitrates Directive (91/676/EEC)<sup>2</sup> which requires Member States to designate land as a nitrate vulnerable zone (NVZ) where, as a result of agricultural activity, nitrate concentrations have reached 50 milligrams per litre of water or could do so if preventive action is not taken. Member States are required to introduce in such NVZs action programmes to reduce the losses of nitrate to the water environment, to review and if necessary revise such action programmes at least every four years; and to report on the implementation of the measures. The action programme must contain rules relating to periods when land application of nitrogen fertilisers is prohibited, storage of livestock manure, and the limitation of land application of fertilisers consistent with good agricultural practice.

4. Regulation 5 of the instrument requires the occupier of a farm to prepare or have prepared each year a fertiliser and manure management plan for the farm, and provides that no nitrogen fertiliser is to be applied until such a plan has been prepared. Regulations 6 to 11 require farmers to have sufficient storage capacity for manures and slurry, in particular that they must have 26 weeks’ capacity for pig slurry or poultry manure and 22 weeks’ capacity for cattle slurry. Temporary storage of solid manure in field heaps is permitted subject to certain conditions.

5. Regulation 12 requires farmers to calculate the nitrogen fertiliser needs of crops to be grown on the farm and not to exceed the requirement for any crop. Under regulation 13 they must take account of the quantity of nitrogen expected to be taken up by the crop from any livestock manure.

6. Regulation 14 limits the amount of nitrogen in livestock manure to be applied on the farm, whether deposited directly by the animals or by spreading, to 170 kilograms per hectare

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<sup>1</sup> 1972 c.68.

<sup>2</sup> Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources. This may be viewed at: [http://eur-lex.europa.eu/smartapi/cgi/sga\\_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31991L0676&model=quichett](http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31991L0676&model=quichett)

in a year. Regulation 15 restricts the amount of nitrogen in organic manure, excluding that deposited by the animals whilst grazing, that may be applied to any field to 250 kg per hectare per year.

7. Regulations 16 to 24 govern the application of fertilisers to farm land in accordance with good agricultural practice. In particular, organic or chemical (manufactured) fertilisers may not be applied to land in the closed periods specified of autumn and early winter.

8. Regulations 25 to 29 require records to be prepared and to be kept available for inspection, and provide for notices to be served on the occupier. Regulations 30 to 31 provide for offences.

9. The Schedules set out technical detail that must be used in complying with the action programme.

### **Financial Effects**

10. There will be costs to the farming industry as a result of the revised action programme. A Partial Regulatory Impact Assessment, which was issued with the formal consultation paper, identified that the intensive livestock farming sector was most likely to be affected by the measures concerning slurry storage, although all would be affected to some extent by the revised and more prescriptive requirements on record keeping. This is reiterated in the final Regulatory Impact Assessment which accompanies these Regulations.

### **Consultation**

11. These Regulations follow a series of consultations as the proposals were developed and refined. The process began with meetings with farmers in each of the NVZs to outline the proposed changes. Then a formal consultation was issued in November 2006 to all farmers within the NVZs, to organisations representing the agricultural sectors, environmental bodies and interested parties. Responses to the consultation were analysed and a report of the analysis was placed on the Government website (as was the consultation document) and an advisory letter sent to all respondents. Following this, modifications to the proposals were discussed with DEFRA and the European Commission and at stakeholder group meetings with organisations representing both the agricultural and environmental sectors. The Regulations embody several changes from the version of the programme consulted upon, but are no more onerous; no further formal consultation has been necessary. The consultation process, as described above, has complied with regulation 6A of the Protection of Water Against Agricultural Nitrate Pollution (Scotland) Regulations 1996 (S.I. 1996/1564) as inserted by regulation 2(3) of the Nitrate (Public Participation etc.) (Scotland) Regulations 2005 (S.S.I. 2005/305).

Scottish Government  
September 2008

# Regulatory Impact Assessment of revised Action Programme proposed for Nitrate Vulnerable Zones in Scotland

## Regulatory Impact Assessment (no 2005/56)

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## **Title of proposal:**

### **Regulatory Impact Assessment (no 2005/56) for revised Action Programme proposed for Nitrate Vulnerable Zones in Scotland: Nitrate Vulnerable Zones (Scotland) Regulations 2008**

1. This Regulatory Impact Assessment (RIA) is based on the Partial Regulatory Impact Assessment that formed part of the consultation on the proposed revision of the Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2003 (“the current Regulations”). It has been published to accompany the laying of the Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008 (“the 2008 Regulations”) before Parliament.

## **Purpose and intended effect of the measures**

### **(i) Objectives**

2. The proposed legislation will establish a revised Action Programme in place of that in the Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2003. This will provide greater protection of the water environment from nitrate from agricultural activities. The measures will:

- limit the quantities of fertilisers applied,
- increase the efficiency of manure usage,
- increase the length of the periods when organic manure other than farmyard manure may not be applied to land, and
- require certain minimum volumes of slurry storage capacity.

The 2008 Regulations will also make a range of advisory good farming practice measures mandatory. While versions of some of these measures already exist in the current Regulations, the changes proposed are intended to improve their effectiveness, especially in avoiding use of nitrogen fertiliser in excess of crop requirement or in adverse weather or soil conditions.

### **(ii) Background**

3. The current Regulations put into domestic law the provisions in the [Nitrates Directive 91/676/EEC](#) (“the Directive”) concerning action programme measures. To prevent nitrate from polluting the water environment or to reduce the effects, the Directive requires that where waters have high concentrations of nitrate from agricultural sources the area of land that drains into such waters must be identified and designated as an NVZ. Thereafter, it requires an action programme of mandatory management measures to be established which are designed to reduce the losses of nitrate from the agricultural practices within the zone.

4. In Scotland, 14% of the land area is designated as NVZs. These are located in Aberdeenshire, Moray, Banff & Buchan; Strathmore and Fife; Lothian and the Borders; and Lower Nithsdale. The current Regulations are supplemented by general and technical information provided in the ‘Guidelines for farmers in nitrate vulnerable zones’. The NVZ maps and documents may be viewed at:

<http://www.scotland.gov.uk/library5/environment/wgap-02.asp>,

<http://www.scotland.gov.uk/Topics/Agriculture/Environment/NVZintro/NVZlegislation> and

<http://www.scotland.gov.uk/Topics/Agriculture/Environment/NVZintro/NVZguidance>

5. This RIA considers the impact, in terms of costs and benefits, of the action programme measures in the 2008 Regulations.

### **(iii) Rationale for Government intervention**

6. In the past 50 years intensive farming methods, such as using high-yield crop varieties supported by nitrogen-based fertiliser and more intensive livestock production methods, have produced large yield increases of all major crops and supported higher livestock densities. These changes, as well as imported fuel and technological advances in machinery, have ensured greater security of food supply and, historically, greater profitability for UK agriculture. However, in common with intensive farming systems throughout Europe, they have also led to greater releases of nitrogen, mainly in the form of nitrate, but also as ammonium from livestock, into the water environment.

7. Nitrate pollution is of concern because it can make water unfit for drinking and can damage the aquatic environment. The legislation to protect water against nitrate pollution from agricultural sources was therefore established, partly in order to protect water supply sources; it could avoid the need for additional pre-treatment to reduce levels of nitrate below the limit set by the Drinking Water Directive. Additionally, there is concern for the quality of small individual private water supplies, which in a number of samples taken from Scottish private water supply sources (mainly springs, wells and boreholes) have been shown to have nitrate concentration levels above the Drinking Water Directive guide level of 25mg/l and maximum allowable concentration of 50 mg/l.

8. Elevated nitrate concentrations in groundwaters may occur in catchments where groundwater makes a significant contribution to river base flow i.e. throughout much of Scotland during the summer months. Nitrate transported to the surface freshwater environment in this way, and from surface run-off, contributes to deterioration in water quality. This, together with phosphate, contributes to nutrient enrichment which may in turn result in eutrophication, an undesirable disturbance of the aquatic environment. Some species are unable to tolerate this; the effects of this may also impact higher up the food chain and reduce biodiversity. It is particularly important to avoid damage to important sites such as SSSIs. Harmful effects on watercourses can also reduce tourism revenues and curtail recreational pursuits such as rambling, boating, swimming, fishing, and bird watching.

9. The microbiological contamination of some designated bathing waters may be exacerbated by manure and slurry spreading in the NVZs. More generally, nitrates from agricultural land that are washed into rivers will eventually contribute to the levels of nutrients from various sources in estuaries and coastal waters. Nitrogen is the nutrient most likely to determine plant growth in coastal waters and estuaries,

and so elevated concentrations in these waters are of particular concern. These nutrients, including nitrate, can result in abnormal growth of aquatic plants such as algae and seaweed. Filter-feeding shellfish may accumulate algal toxins by feeding on the toxic algae, sometimes at levels potentially lethal to humans. The cause and effects of nutrients, including nitrate, in both fresh and sea water are therefore the subject of research.

10. The negative effects of the losses of nitrate from agricultural land do not have a significant direct effect on farmers. The farmer just does not have the benefit of the positive advantages that the nutrients could have had on the land. The negative impacts are thus an external cost, which is not taken into account by farmers in their production and land management decisions. In economic terms this is a 'market failure', and it justifies some degree of Government intervention to bring into account the externality.

11. The Nitrates Directive requires the Action Programme to be reviewed periodically. A report to the European Commission considered the risk of nitrogen losses (nitrates, but also other nitrogen forms) by both run-off and leaching, and the measures to control these in the Action Programmes, for each of the Member States. Further research carried out by the Scottish Agricultural College (SAC) and on a Great Britain basis has shown that there is a significant risk of run-off or leaching of nitrates in the winter months and that the risks are substantial for agricultural soils generally. The current Regulations are therefore insufficient. Additionally, in reviewing the current Regulations, it became apparent that at least one of the provisions is in breach of the Directive. The Scottish Government therefore runs the risk of prosecution and of significant daily fines being levied by the European Court of Justice if it judges that Scotland's current Regulations are non-compliant.

## **Consultation**

### **(i) Within Government**

12. The Water, Air, Soils and Flooding Division, which is responsible for producing this RIA, has consulted with other policy Divisions within the Environment Quality Directorate, the Scottish Government Legal Directorate, and Divisions dealing with agricultural policy and agricultural practice within the Rural Directorate, with the Scottish Agricultural College (SAC) who analysed data and the information for the Partial Regulatory Impact Assessment, and with other UK Administrations - the Department for Environment, Food and Rural Affairs, the Welsh Assembly Government and the Department of Environment Northern Ireland.

### **(ii) Public consultation**

13. The public consultation, which concerned various options and amendment to the current Regulations, was issued in November 2006<sup>3</sup>. It included a draft of the revised Action Programme and a Partial Regulatory Impact Assessment on it. Copies of the consultation paper were sent to representative bodies for farming

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<sup>3</sup> Protection of Scotland's Water Environment: Action Programme for Nitrate Vulnerable Zones: Proposed amendments - <http://www.scotland.gov.uk/Publications/2006/11/16095031/4>

businesses and environmental interests, and a shorter version (some 14,000 copies) was sent to all farm holdings within or partly within the NVZs and to other interested parties. The full version was made available on the Scottish Government's website and from its area offices on request. There was a total of 313 responses to the consultation. Copies of individual responses are available from the Scottish Government's library services and an analysis of the responses to the consultation has been published on the Scottish Government's website<sup>4</sup>.

14. In response to the consultation, the farming sector was supportive of the need to protect the environment and generally considered many of the changes understandable but felt that other proposals had been made without due weight having been given to the cost to farmers. Similarly, the environmental sector respondents were generally supportive of measures that were tighter than present ones where they considered there would be benefit to the environment and would ensure a smoother transition to future requirements under the terms of the Water Framework Directive. While there was disagreement on points of detail, many respondents suggested modifications to the proposals or alternative approaches to the management of nitrogen from manure and fertilisers that would protect Scottish waters from nitrate from agricultural sources.

15. The responses have been fully considered in the review process. The Scottish Government is sympathetic, in particular, to issues of financial concerns raised by and on behalf of the farming sector. It has modified the draft Regulations to ensure that they are proportionate, making the minimum requirements to give effect to the requirements of the Directive and to promote real and lasting improvements to the water environment. The Government has convened a Nitrates Directive Stakeholder Group, including the National Farmers Union of Scotland and the Scottish Agricultural College, to discuss issues relating to the Action Programme with particular reference to designing guidance that will help farmers in complying.

## Options

16. In order to provide an appropriate framework within which to set the RIA, three policy options were identified and their potential impacts assessed:

- **Option 1:** to retain the current Regulations unchanged (the 'do nothing' option)
- **Option 2A:** to introduce a limited number of changes to the current Regulations to correct provisions considered to be in breach of the Directive and to take account of good farming practice measures, scientific field research and modelling on losses of nitrate, and
- **Option 2B:** as option 2A but with a longer period where fertiliser could not be spread to land, leading to a 'blanket' 6-month slurry storage requirement. This measure would be to ensure that there is minimal risk from fertiliser running off land during adverse weather conditions which may persist to the end of January.

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<sup>4</sup> Action Programme for Nitrate Vulnerable Zones Proposed Amendments. Analysis of consultation responses received - <http://www.scotland.gov.uk/Publications/2007/09/05093759/0>

17. In order to allow time for compliance, transitional periods would apply to the date when the revised legislation comes into effect for both Option 2A and 2B. These periods will enable farmers to have time to take action where measures have particular cost implications, eg. to construct or replace storage facilities.

## Costs and benefits

- **Sectors and groups affected**

18. The main revisions to the Action Programme, slurry storage and the increase in the length of the period when organic fertilisers may not be applied, are most likely to affect farms that produce and/or use large quantities of slurry. Additionally, the proposal to apply the closed period to all soil types means that the impact is likely to be greatest on farms located on medium and heavier textured soils. The following categories of farm have been identified as being most likely to be affected by these proposed changes:-

- Mixed livestock
- Specialist pig farms
- Cropping and sheep
- Cattle and sheep
- Cropping and intensive livestock
- Specialist poultry
- Cropping and dairy, and
- Dairy farms

19. Many are likely to need to construct new, or additional, storage facilities to allow for the extended period when the application of slurry and other organic fertilisers is not permitted. Under [The Control of Pollution \(Silage, Slurry and Agricultural Fuel Oil\) \(Scotland\) Regulations 2003](#) (amended in 2006 and 2008), there is an expectation that there should be capacity to store six months' slurry production unless a need for less can be demonstrated. Whilst stores built since 2003 should have complied with this at the time of their construction, stores built prior to that date or farms where stock numbers have increased since the store was built may have insufficient storage capacity.

20. On some farms there may be more cost-effective and practical alternatives to constructing new storage facilities in order to achieve compliance with these proposed changes to the Action Programme Regulations. These options may include, for example:-

- a. separating clean and dirty water systems (this reduces the total volume of stored liquid which increases the effective storage capacity of the system and reduces overall spreading costs);
- b. keeping livestock outdoors (e.g. two weeks) longer in the autumn;
- c. moving to straw-based systems (e.g. for young stock); and
- d. contract rearing of young stock on neighbouring farms.

- **Analysis of costs and benefits**

21. SAC carried out a cost and benefit analysis of the proposed amendment of the Regulations<sup>5</sup>. Their report in 2006 considered the implications of:-

- a limit of manure deposition of 170 kg N/ha,
- 'blanket' extensions of 5 and 6 months of the closed period (when manure must not be applied to land),
- storage requirements as a result of the extended closed period,
- the limitation of land application of fertilisers, and
- the completion of a manure and fertiliser management plan

The table at the end of this report provides a summary analysis of the likely costs and benefits of these measures, which form the basis of options 2A and 2B considered by this report. To quantify the costs and benefits more accurately would require a detailed investigation of impacts on individual farms following the collection of primary data.

- **Benefits**

22. The main benefits of the options stem from reducing inputs of nitrate to surface and ground waters within the NVZs. For the reasons given in paragraphs 6 to 9 above, this is an undoubted benefit to the environment and thus to society, but cannot easily be quantified in monetary terms. Table 1 below, from the SAC report, estimates for options 2A and 2 B the potential savings from nitrate leaching over the autumn and early winter when little or no nitrate is taken up by plants.

*Table 1 - Calculated saving in N leaching for different closed periods (kg N per hectare agricultural land; and t N)*

Closed period:		Sept-Jan	Oct-Jan	Oct-Dec
Land use	Manure source	kg N saved per ha		
Grass	Dairy	0.036	0.018	0.018
Grass	Beef	0.058	0.028	0.028
	(Sheep)	0.000	0.000	0.000
Arable	Pigs	0.071	0.043	0.042
Arable	Poultry	0.331	0.188	0.185
	<b>Total</b>	<b>0.496</b>	<b>0.277</b>	<b>0.273</b>
NVZ area (ha)	1,191,242			
<b>Total N saved (t)</b>		<b>591</b>	<b>330</b>	<b>326</b>

23. In general, the environmental benefits of the new requirements may help biodiversity, species and habitat conservation, and tourist dependent economies. The [Scottish Environment Protection Agency's State Of Scotland's Environment 2006](#) estimated that 206,000 tonnes of chemical nitrogen fertiliser were applied to

<sup>5</sup> Assessment of the Benefits and Costs of changes to the Nitrate Vulnerable Zones Action Programme in Scotland - <http://www.scotland.gov.uk/Topics/Agriculture/Environment/NVZintro/NVZactprog>

farmland in Scotland in 2005. It comments that much more needs to be done to match the input of nutrients to soil storage capacity and plant growth capacity. The amendments proposed in the consultation will lead to the more efficient use of organic fertilisers, which will reduce the need to buy nitrogen fertiliser, with consequential savings for farmers. Based on the total saving of leached nitrate in Table 1, SAC estimated in Table 2 the savings from using organic fertiliser stored over the closed period rather than purchasing chemical fertilisers.

*Table 2 - Estimated Benefits from Storage of N*

<i>Closed period</i>	<b>Sept - Jan</b>	<b>Oct - Jan</b>	<b>Oct - Dec</b>
Total N saved (t)	<b>591</b>	<b>330</b>	<b>326</b>
Value of fertiliser £0.43/ kg N	£254,130	£141,900	£140,180

Since fertiliser prices have increased significantly (ammonium nitrate is now quoted at about £400 a tonne), these figures should be increased by some 150% to reflect the current value of the savings. The savings from storage in slurry of N alone are thus of the order of £350,000 a year for the farmers, estimated at 300, expanding their slurry storage. In addition there will be savings in other nutrients, available in slurry, notably phosphates, which have also increased in cost.

24. Modelling of weather, soil and growing conditions predicts that, with moderate rainfall conditions, very little manure-derived nitrate will leach from applications made after the end of December and especially after mid-January. Run-off, especially from sloping ground, may still be significant in January. When the manure is applied in spring, or indeed from late January onwards, more of the nitrogen is available for uptake by the growing crop. Extending the closed period from December to the end of January would increase the benefit in N saving in the NVZs by 4 tonnes, little over 1 per cent of the N saving expected under option 2A. This may understate the benefit of increasing the slurry storage requirement, since greater storage capacity gives farmers more flexibility in when they apply it to the land; in other words, there could be prolonged wet or very cold weather at the end of the closed period. Even so, the benefits of option 2B over option 2 A appear only marginal.

25. For the revised Action Programme, environmental benefit is derived from the more inclusive requirements of the fertiliser and manure management plan, which is to include a risk assessment map of the farm at field level. This will help both to reduce the risk of applications of manure in unsuitable conditions and to ensure that the required calculations of fertiliser needs are carried out. The updating of fertiliser and manure management plans will be of benefit to farmers in that it will reduce the risk of breach of the regulations through lack of planning. It will also increase transparency, in terms of compliance checking, to demonstrate that the requirements of the Action Programme have been taken into account.

26. Adoption of the SAC Recommendations for crop N, taking account of residual values from previous crops, of soil type and where appropriate of well-established high yields, is expected to lead to reductions in N losses to the water environment. Restrictions in applying fertilisers close to water courses benefit surface waters; monitoring shows that there have been some improvements in N concentrations in

surface waters in the Scottish NVZs vis-à-vis surface waters outwith the NVZs. Based on experimental data, SAC also concluded that improved compliance with the detailed fertiliser recommendations would be economically beneficial to farmers by either reducing costs or increasing the yields or the quality of the crop.

- **Costs**

27. The impact of the measures will vary from farm to farm depending on such factors as farming practices and availability of land for the application of organic manures and slurries. The main costs will arise from drawing up of fertiliser and manure management plans, the spreading restrictions for organic manures, the storage requirements for organic manures, and record keeping.

28. Taking no action, but retaining the current Regulations, would continue the present actions to protect, to a certain degree, waters from agricultural nitrate in some parts of the NVZs, notably in areas where the soil types are shallow and sandy and for a short period during the late autumn. However, doing nothing would mean that the Government is in breach of the terms of Article 5.5 of the Directive for not taking account of all relevant research findings which demonstrate that the current Regulations need to be made more stringent and because at least one of the provisions in the current Regulations is at odds with the requirements set out in that Directive. We do not consider that this option is defensible since it runs the high risk of proceedings being taken in the European Court of Justice against Scotland for failure to comply with the Directive. Compliance with the provisions of the Directive as appropriate is a part of cross-compliance for individual farmers, and at national level compliance is expected for the Scotland Rural Development Programme.

29. There will be some costs from the requirement for the fertiliser and manure management plan to be more detailed than is required under the current Action Programme. It involves drawing up a risk assessment map of the farm at field level. SAC estimated a total cost of between £5.3m and £5.9m for these plans to be produced by consultants for all the holdings in the NVZs. This was on the basis of consultancy per holding ranging from 1 hour to 20 hours at a cost of £60 per hour. The table at the end of this report provides a summary of the costs estimated for each farm type for the completion of the plan by a consultant. However, since then the requirements have been simplified; it is expected that many farmers will be able to carry out the necessary work themselves. Many farmers will already have substantive plans. The additional cost, therefore, should be considerably less than SAC's estimate for some 15,000 holdings having a new plan drawn up by consultants (in practice many businesses comprise more than one holding). We estimate that the cost, allowing for farmers' time and for a possible increase in consultancy rates, could be £2.8m a year, including record-keeping, in the first 3 years. The future years' costs are expected to be offset by the benefits from the more effective use of fertilisers.

30. The largest cost of the Action Programme is expected to be the capital cost of bringing slurry storage up to the requirements. SAC estimated the cost of slurry storage, especially for dairy farms and pig farms, including mixed farms, on various

assumptions. Thus, if 70% of those farmers had to construct 6 months' capacity, the capital cost would have been £14.8m, and if 100% had to construct new storage the cost would have been £21.2m. These figures do not involve any realistic assessment of how many would actually need to construct new slurry storage. We estimate that the number of farms in the NVZs requiring new or substantially expanded slurry storage to comply with the Regulations, taking account of the exemptions, is not more than 300. At 2008 prices it is estimated that the cost of additional slurry storage capacity in the NVZs will average £50,000 per farm; and those farms would be eligible for 40% funding (see paragraph 32 below).

31. Since option 2A corresponded to 5 months storage capacity, there could be a substantial difference between 2A and 2B. The unavoidable difference between 2A and 2B is that a dairy farmer with 5 months storage capacity could be compliant under 2A but would have to incur substantial additional costs under 2B. Option 2A with a modification to comply with the 6 months requirement for pig units is thus preferable. The Regulations provide that, unless exemptions apply, farmers will have to have 26 weeks storage for pig slurry or poultry manure and 22 weeks for cattle slurry. This reflects a difference in risk. Dairy farmers may well choose 6 months, which will give additional flexibility for relatively little additional cost.

32. Slurry storage capacity is particularly needed for pig farms and dairy farms. The 6 months' storage requirement applies already for large pig and poultry units under PPC rules. Some other farms already have 6 months' storage capacity or in the case of dairy farms at least 5 months. Others make arrangements for the 'export' of slurry or can make adjustments such as excluding excessive rain water. The Scottish Government expects farmers to take action promptly to bring their storage capacity into line with requirements, but in practice the costs will spread over the three years of the transitional period. The cost, taking account of increases in the price of steel, is estimated as £5 million a year for the 3 years of the transition. In the SRDP farmers are eligible for funding of up to 40% of the cost of manure or slurry storage facilities. Thus £6m of the £5m per year could be met from SRDP funds. Defra estimate the cost of additional slurry storage to be provided as a result of their Regulations to be between £12.8 m and £16.5m per year annualised over 20 years, a net present value of over £150m. Since the English NVZ area will be 5 times (70%) that of Scotland as a proportion of territory, and includes many more dairy farms, our estimate of £5m a year for 3 years appears consistent and realistic.

33. For specialist pig farms that generally have limited ground on which to apply the slurry and manure that is produced, it is likely that the surplus will need to be transported to another farm or for onward processing, as often occurs at present. In these circumstances additional transport costs are likely to be incurred in order to comply with the 170 kg N/ha limit on grassland. SAC estimated this cost to be a total of £339,000 per year; this could be updated by a third to £0.5m. SAC estimated an annual cost of maintenance (5%) and depreciation (4%) on the capital expenditure. (They also included 'finance charges on capital loan', but we have assumed that the capital expenditure is all incurred in the year of expenditure.) The annual cost to farmers of adjusting to the new rules on manure and slurry applications, including the 170 kg limit on grassland, is estimated at £1.8m.

- **Mitigation measures**

34. It is recognised that it takes time to plan and construct additional storage capacity. The 2008 Regulations therefore allow up to 3 years for farmers to bring their slurry storage capacity into line with the requirement under the terms of the Directive. Farmers who do not have sufficient storage will be expected to take action to become compliant, aided by appropriate funding in the early years of the SRDP.

35. In relation to livestock and the farm limit for livestock manure (170 kg/ha of nitrogen), the Directive allows Member States to seek a grassland derogation. The Government is committed to seeking a derogation from the 170kg N/ha/yr farm limit for grassland, which would be for a 4 year period. If approved, this could reduce the cost to the livestock industry, especially dairy farming, in the NVZs with effect from the year 2009, the first year of the new Action Programme.

36. Advice and support will be offered to farmers, for example on how to minimise the amount of additional manure and slurry storage they need. This could include actions such as:

- switching to straw-based systems;
- making arrangements to transfer manure and/or slurry to tillage land;
- the development of anaerobic digestion systems; and
- clusters of neighbouring farms to construct a joint-use slurry storage facility.

37. A series of workshops for farmers, advisers and regulatory staff will be run by the Scottish Agricultural College (SAC), starting in the autumn of 2008, to explain the provisions of the revised Action Programme and to advise on how farmers can most effectively adapt to the rules.

38. Within the Scotland Rural Development Programme, farmers are eligible for funding for manure and slurry storage to provide up to 40% of the capital cost (50% for young farmers or those in Less Favoured Areas). Priority is to be given to farmers in the NVZs in the early years of the SRDP.

### **Small/Micro Firms Impact Test**

39. The 2008 Regulations will affect businesses mainly in the intensive livestock sector. For small and micro businesses (eg holdings with less than 2 hectares and with few stock), it is expected that the 2008 Regulations will have little impact. In particular, those livestock farmers who use straw-based systems, as many in the NVZs do, will be much less affected as this farmyard manure is not caught by the closed period or storage requirements. Farmyard manure is much less of a risk to the water environment than slurry or poultry manure (without bedding material).

40. The Scottish Government actively sought responses from such businesses and their representatives, including the Federation of Small Businesses, NFU Scotland and the Scottish Rural Property and Business Association. Their views have been taken into account in finalising the 2008 Regulations and ensuring that they are proportionate, imposing the minimum costs to achieve the environmental benefits that the Regulations will deliver. The costs incurred by the industry should be recognised as proportionate to the actual nitrate problem in Scotland.

## **Legal Aid Impact Test**

41. The 2008 Regulations do not alter the enforcement and sanction provisions in the current Regulations. The changes made to the measures in the current Regulation do not create any new procedure or right of appeal to a court or tribunal, or any change in such a procedure or right of appeal. Therefore the 2008 Regulations are not expected to have any impact on the current level of use that an individual makes to access to justice through legal aid, or on the possible expenditure from the legal aid fund.

## **“Test Run” of Business Forms**

42. Forms to assist farmers in completing fertiliser and manure plans and records of fertiliser usage in terms of the requirements in the current Regulations are provided in ‘Guidelines for farmers in nitrate vulnerable zones’ (referred to in paragraph 4 above). These are currently being revised and expanded to include more detailed help in the calculation of crop requirement. SAC and NFU Scotland have agreed to conduct test runs with selected farmers before the revised guidelines are published and the regulations come into force. These will also be test-run as part of the training for Scottish Government Inspection Staff. Additionally SAC will conduct a number of workshops to explain the new rules and procedures.

## **Competition Assessment**

43. The consultation sought comments on the impact on competition. While there were concerns that the current and the proposed Regulations would affect competition with farming parts of Scotland outside the NVZs, the Regulations are necessary to protect the water environment and to be in accordance with the Directive. The scale of costs identified in the paragraphs above may, in the short term, be expected to affect a farm’s competitive advantage compared to farms not in an NVZ. More generally, similar restrictions are being introduced in NVZs in the other countries of the UK and in the Republic of Ireland, as well as in other European Union countries. The restrictions will have similar cost implications for them.

## **Enforcement, Sanctions and Monitoring**

44. The 2008 Regulations do not affect the monitoring, enforcement and sanctions measures that are set out in the current Regulations. These will continue to apply as indicated below.

45. The Scottish Government is the competent authority responsible for enforcing and checking farmer compliance with the Action Programme measures. Scottish Government inspectors have a knowledge of the NVZ requirements and procedures. In addition, the Scottish Government is the enforcement authority for the purposes of cross-compliance.

### Compliance assessment and monitoring programme

46. The aim of the compliance assessment and monitoring programme is to simplify and minimise the administrative burden for farmers whilst maintaining an effective level of assessment of compliance inspections under the Directive. These will therefore be integrated, to the maximum extent possible, with other inspections under the Single Farm Payment Scheme.

47. The Scottish Government is responsible for carrying out compliance checks on holdings each year. At least 5% of farms within the NVZs are inspected annually. Initially farms have been selected to include a wide range of areas and farm types, but as more experience is gained, the selection of holdings for compliance checking will be based on risk analysis which will take account of water bodies identified as being “at risk” from agricultural pollution and will also take account of the type of farm sector and other factors which may contribute to the potential severity of the pollution risk.

48. Inspections comprise a comprehensive review of the extent of compliance with relevant aspects of the Action Programme measures for each selected agricultural business. This includes a check of all field and livestock records which make up the fertiliser and manure plan, including an assessment of compliance with farm and field based limits. Follow up action will also be implemented where inspectors observe obvious breaches during the course of their other work on farms

49. The Scottish Environment Protection Agency is the competent authority for the protection of water quality under the Water Framework Directive. It will work with the Scottish Government in any links between the implementation and enforcement of the Directive and checks and assessment for the River Basin Districts Management Plans.

### Sanctions for Non-Compliance

50. The following paragraphs deal with compliance with the 2008 Regulations and not with any other legislation that might apply under cross-compliance rules.

51. The occupier of any farm must ensure that the Action Programme is implemented in relation to the land on the farm in the nitrate vulnerable zone. Where livestock manures are moved from one farm to another, the owner/occupier of the farm receiving the manures will be the party responsible for ensuring that the manures are managed in accordance with the 2008 Regulations. Where the farm receiving manures is located outside an NVZ then the Action Programme rules will not apply there.

52. Failure to comply with the measures set out in the 2008 Regulations may result in prosecution. If the Action Programme measures have not been fully implemented, the farmer is advised of the remedial action required. The Scottish Government 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

Scottish Government 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 upon whom the notice is served.

53. If action is not taken to remedy the situation within the time frame stipulated in the notice, the case may be referred to the Procurator Fiscal. Under the Regulations, an individual may be liable, on summary conviction, to a fine not exceeding the statutory maximum of £5,000 in the Sheriff Court, or £2,500 in the District Court. Failure to allow access for monitoring purposes could lead to a fine on summary conviction not exceeding level 3 on the standard scale in the Sheriff Court.

54. Any individual served with a statutory notice has the right of appeal to the Scottish Land Court against the notice. The appeal must be placed within 28 days from the date the notice is served. A notice of appeal must be made on the grounds that:-

- the contravention did not occur;
- any requirement imposed is inadequately specified in the notice;
- any requirement imposed is not required to remedy or to prevent the continuation or repetition of the contravention; or
- any requirement imposed is inappropriate to achieve compliance with the action programme and the appellant contends that any such requirement should be modified.

55. The Scottish Land Court has powers which include being able to require withdrawal of the notice, modification of any of its requirements, or dismissal of the appeal.

## **Implementation and delivery plan**

56. Implementation and delivery of the new and amended measures in the Action Programme will be similar to those used for the current regulations. Prior to the 2008 Regulations coming into force – planned for 1 January 2009 – guidance and publicity will be provided in several ways. A guidance pack similar to the one produced for the current Regulations will be sent to all farmers and representative organisations. This will include illustrative forms on how to complete the planning and recording of the relevant farming activities, in particular the calculation of capacity required for manure storage facilities and calculation of the complex assessment of nitrogen fertiliser requirement of crops and grassland. The 2008 Regulations and the guidance will be put on the Scottish Government website (see 3<sup>rd</sup> link in paragraph 4 above).

57. Guidance and training will be provided for Scottish Government inspectors, and workshops will be provided by SAC for farmers, contractors and representatives of relevant organisations. Scottish Government Area Offices will continue as at present to provide advice, in the first instance, to any queries about the new and amended measures. Additionally, articles and information will be provided about the 2008 Regulations in the farming press.

58. Once the regulations come into force, then in addition to the measures described in paragraph 57 above, the inspection and enforcement regime described in paragraphs 47-49 (compliance inspections) and 51-53 (sanctions for non-compliance) will come into play.

## **Post-implementation review**

59. Under the terms of the Directive, reviews of both the need for NVZ areas and of the monitoring of water quality and action programme measures are required every 4 years. Reports on these reviews are sent to the European Commission and are made available on the Scottish Government website. Member States are required to revise their implementing regulations in the light of these reviews.

60. Given the financial implications for farmers of the 2008 Regulations the Scottish Government will undertake a review of this RIA within 10 years of the commencement of the Regulations. This Review RIA will take the final RIA as its starting point and update the assessment made in the light of the implementation of the regulation. The Review RIA will consequently be able to provide a more reliable assessment of the impact, rather than an estimate.

## **Summary and recommendation**

61. Of the options set out in paragraph 16 above, it is recommended that a modified option 2A is adopted. This provides a balance between the need to protect the water environment and the continuing livelihood of all sectors of the farming business. The 2008 Regulations, based on that option, provide the measures needed to reduce the impact of nitrate from agriculture on the water environment in Scotland and to meet the obligations to comply with the Directive.

62. Farmers in the NVZs will have to have more detailed fertiliser and manure management plans than is currently required. The cost is estimated at £2.8m in the first 3 years. Any further costs should be balanced and may well be exceeded by benefits to the farm business. The estimated cost of slurry storage capacity as a result of the revised Action Programme is estimated at £5m per year for the first 3 years, of which up to £6m could be met from the SRDP. The other additional costs from the revised Action Programme, including the 170 kg N/ha grassland limit, are estimated at some £1.8 million per year. The rules are based on good agricultural practice, and several measures, including financial support for increased manure and slurry storage facilities, have been introduced to assist farmers.

63. The revised Action Programme will result in substantial reductions in nitrate, and to some extent phosphate, being lost to the water environment. This will make possible substantial savings every year to farmers, and it will help to protect the quality of surface waters and of groundwater in Scotland, and reduce the loading of nitrate to coastal waters. There will as a result be benefits to water ecosystems and biodiversity, and the improvements to achieve good water quality required under the Water Framework Directive will be materially assisted.

## Summary costs and benefits table

Option	Total benefit per annum: economic, environmental, social	Total cost per annum: - economic, environmental, social - policy and administrative
1	<p>-Maintains the <i>status quo</i>.</p> <p>-Some benefits to water environment from reduced input of nitrate into the water environment from agricultural sources.</p>	<p>-In breach of the Directive.</p> <p>-Risk of heavy fines for failure to comply with the Directive and requirement to amend the current Regulations. Threat to the SRDP.</p> <p>-Will not reduce damage to the water environment where there are no controls on the land (eg soils that are not shallow and sandy).</p>
2A	<p>-Benefit to the water environment from more effective measures to reduce input of nitrate into the water environment from agricultural sources, including savings from greater slurry storage estimated at 326 tonnes N (£0.35m) per year,</p> <p>-greater benefit to aquatic life and for recreational enjoyment of the water environment,</p> <p>-organic manure used for agricultural benefit, not “waste”,</p> <p>-reduction in reliance on chemical fertiliser,</p> <p>-better crop management and record keeping.</p>	<p>Financial cost to farmers from more detailed planning, additional slurry storage capacity, longer spreading restrictions, and better record-keeping:</p> <ul style="list-style-type: none"> <li>- estimated cost of £2.8m in the first 3 years for better fertiliser and manure management plans,</li> <li>- construction of slurry storage estimated capital cost of £5m per year for 3 years, of which £6m may be funded from the SRDP,</li> <li>- estimated costs of £1.8m per year for restrictions on land application and/or additional transport costs for intensive livestock farms (may be reduced by grassland derogation).</li> </ul>
2B	<p>Benefit to water environment from more effective measures to reduce input of nitrate into the water environment from agricultural sources.</p> <p>Similar to 2A, but slightly greater benefit, savings from greater slurry storage capacity estimated at 330 tonnes N per year.</p>	<p>Financial cost to farmers from longer spreading restrictions, greater storage requirements and better record-keeping.</p> <p>Similar to 2A, but some farmers with 5 months slurry storage might have been required to make a costly investment in additional capacity.</p>

## Contact

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### **Ministerial Statement**

I have read the Regulatory Impact Assessment and I am satisfied that the benefits justify the costs.

Richard Lochhead  
Cabinet Secretary for Rural Affairs and the Environment  
September 2008

Table 3. Compliance cost-benefits across all NVZs of each of the key measures in option 2A and 2B

All sectors	expected costs	expected benefits
<b>Completion of a Manure Management Plan</b>	£ 5,34 – 5,94 m	No costs for non-compliance with NVZ. No penalties being applied to Single Farm Payment and Rural Development Regulation payments

Limitation of 170 kg/ha/year organic N application	Case of “blanket” 5-months storage requirement	Case of 6-months storage requirement	Case of “blanket” 5-months storage requirement	Case of 6-months storage requirement
<b>One-off cost:</b> New slurry storage	£0.950 – 1.356 m	£1.01 – 1.44 m	Protection of environment. No costs for non-compliance with NVZ.  No penalties being applied to Single Farm Payment and Rural Development Regulation payments.	Protection of environment. No costs for non-compliance with NVZ.  No penalties being applied to Single Farm Payment and Rural Development Regulation payments.
<b>Annual costs:</b> Maintenance of capital items 5% and depreciation 4% and 20%	£0.130 - 0.185 m	£0.135 – 0.192 m		
Finance charges on capital loan	£0.116 – 0.166 m	£0.122 – 0.176 m		
Additional transporting costs for specialist businesses with limited land for spreading	£0.338m	£0.338m		

Extension of closed periods	Case of “blanket” 5-months storage requirement	Case of 6-months storage requirement	Case of “blanket” 5-months storage requirement	Case of 6-months storage requirement
<b>One-off cost:</b> New slurry storage	£12.69 – 18.13 m	£14.8 - 21.16 m	Protection of environment. No costs for non-compliance with NVZ.	Protection of environment. No costs for non-compliance with NVZ.

<b>Annual costs:</b> Maintenance of capital items 5% and depreciation 4% and 20%	£1.26 – 1.81 m	£1.46 - 2.08 m	No penalties being applied to Single Farm Payment and Rural Development Regulation payments.	No penalties being applied to Single Farm Payment and Rural Development Regulation payments.
Finance charges on capital loan	£1.55 – 2.22 m	£1.81 - 2.59 m		

<b>Limitation of land application of fertilisers</b>	N/A	Increased Efficiencies in N usage
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*Table 4. Estimated costs for preparation of manure and fertiliser plans, preparation classified by farm type*

<b>Main Farm Type</b>	<b>Hours</b>	<b>Cost (£)</b>
Cereals & General Cropping*	2	120
Specialist Fruit, Grass & Other Horticulture	1	60
Specialist Pigs	20	1,200
Specialist Poultry	14	840
Mixed Pigs and Poultry	20	1,200
Dairy (LFA & Low ground)	20	1,200
Cattle & Sheep	11	660
Cropping & Dairy	20	1,200
Cropping, Cattle & Sheep	11	660
Cropping & Intensive Livestock	14	840
Cropping & Mixed Livestock	11	660
Mixed Livestock	11	660
Specialist Grass & Forage	6	360
Specialist Horses	4	240

\* Assumes no livestock present on farm