SAP4

States of Jersey

Department of the Environment

Farm Manure Plan

A step by step guide for farmers

Farm Reg:-
Name:-
Address:-
Date:-

Do I need to complete a Farm Manure Plan?

In order to determine whether you need to complete a Farm Manure Plan please answer the following questions:-

1. Do you have livestock?
2. Do you import organic manures or composts onto your farm?
3. Do you use sewage sludge?
4. Do you allow other farmers /growers to apply organic wastes to the land you farm?
5. Have your fields changed since your last Farm Manure Plan, if so your FMP needs updating.

If the answer to any of the above is 'yes' you need to complete a Farm Manure Plan (FMP) for this year unless you completed an FMP in 2012 and the land area you farm is **unchanged**. If the fields you are farming are unchanged from last year please advise us by completing the tick box below.

I completed a Farm Manure Plan in 2012 and my fields are unchanged? ☐

Signature of Applicant…….
Please return signed sheet only if it is applicable to you.

Introduction

These guidelines have been designed to help you produce a plan in order to spread manure, slurries and other organic wastes on your farm with the minimum risk of causing water pollution. The background to the plan is described in the Code of Good Agricultural Practice for the Protection of Water (The Water Code) Jersey which is available free of charge from the Environment Department : Telephone 441600. The Water Code also gives advice on the handling and storage of manures and slurries. In the current Water Code, published in June 2009, the application of organic manures and dirty water to agricultural land is subject to a **3 month closed period** (the dates of the closed period are from the 1st October to 31st December each year) it is therefore important that this closed period is taken into account when producing your Farm Manure Plan and calculating your future storage requirements. (Definitions for slurry and dirty water can be seen at Annex 3, page 20.)

Please remember that this **Farm Manure Plan** is only part of your **Farm Manure and Waste Management Plan** as other materials used on farms such as pesticides, fuel oil, polythene and fertilisers can also cause pollution. Information on how to include the above in your Farm Manure and Waste Management Plan can be found in The Water Code.

The guidelines have been divided into five easy steps

The first four steps enable you to complete a map of your farm showing where manures can safely be spread. Step five is designed to assist in calculating the amount of storage, if any, you require.

- **Step 1** helps you identify how much land you have for spreading manures and where manures should not be spread;
- **Step 2** helps you identify any restrictions on manure spreading;
- **Step 3** helps you work out the minimum area of land you need for spreading;
- **Step 4** gives you guidance on applying sewage sludge and other organic wastes;
- **Step 5** helps you work out whether you need extra storage for slurry and dirty water;

The guidance given in this document may not cover every circumstance on your farm
Please discuss any problems with officers at the Environment Division (441600).

Reducing the risk of pollution from land spreading

Complete the steps in the following pages to produce your Farm Manure Plan (FMP). By carrying out the recommendations you will minimize the risk of causing water pollution from spreading animal manures and organic wastes on your farm

To complete your FMP you will need to do some calculations and these are explained in each of the following steps.

To draw up the plan you will need:

1. **Your total farm area in vergées** (To calculate your total farm area go to Annex 5 (page 21) and complete columns 1&2).

2. **A map of the farm** that clearly shows:

   - every field and watercourse (including all ditches);
   - field areas in vergées;
   - any boreholes, springs or wells that supply water for farm dairies or human consumption including any on neighbouring land near to your boundary. You should take all reasonable steps to ascertain the position of the above water sources, including private water supplies.

If these features are not marked on your map, please draw them in.

Note: Please use a map showing your farm with a minimum scale of 1:10,000

3. **Stock details**:

   - The average number of each type of stock housed on the farm over the whole year, (e.g. pigs and poultry) and/or over the winter period only, (e.g. dairy cattle);
   - The average time for which each type is housed.

4. **Coloured pens or pencils** - red, yellow, orange and green.

5. **A calculator**.

In the following pages we outline the necessary steps to draw up a successful plan.
As you complete the steps you will notice letters beside some boxes. These letters are used to identify figures which recur throughout the document. They are a guide to help you when transferring figures from one box to another in certain calculations.

Colour coding of pollution risk areas

Your plan will contain some or all of the following coloured areas:

- **Red areas** must never be used for spreading.
- **Yellow areas** are not normally used for operational reasons but may be brought into use in the future.
- **Orange areas** cannot be used when certain conditions apply, but they will usually be available some times of the year. For example fields which cannot be used when they are at field capacity may be used in the spring or summer when the water level has fallen.
- **Green areas** may be used for spreading at most times of the year (excluding the closed period).

Whilst this guide does not specifically deal with air pollution you should be aware of the potential odour risk when manures are spread near to houses taking into account the prevailing winds and alternative methods of application. You may wish to mark fields on your Farm Manure and Waste Management Plan which could be vulnerable to the above problem.

Step 1 **Calculating the area of arable and grassland available for spreading animal manures**

(a) Areas where animal manures should never be spread. (RED)

These areas are described below. Pick out those areas which occur on your farm, and colour them on your map in **red**. Where an area is an unusual shape, for example circular areas around wells mark off a square or 'practical' shaped area of the field.

Areas on which manures and slurry should never be spread are:

Ditches and watercourses

- Within at least 10 metres (11 yards) of either side of any watercourse including wet ditches, dry ditches and piped ditches. This will avoid direct spreading into the watercourse and also reduce the risk of run-off reaching the watercourse. Do not forget to include watercourses that form the boundary to your farm.

Other non-spreading (red) areas

- Within at least 50 metres (55 yards) of any spring, well, borehole or reservoir that supplies water for human consumption or farm dairies.
- Steep slopes where run-off is a high risk throughout the year. See Annex 1b (page 17) for definitions**.**
- Any areas where you may not be allowed to spread for reasons such as a tenancy or management agreement.

After colouring in these areas on your map, use Table 1 (Page 6), to help you calculate the total number of vergée's where you should never spread animal manures (These areas should also be marked in **Annex 5**, column 3, page 21).

(b) Other areas where you would not normally spread animal manures. (YELLOW)

We suggest that you leave these areas **yellow** on your map. Enter these areas into Table 1 (they should also be marked in **Annex 5**, column 4, page 21).

Areas where you would not normally spread animal manures include:

- non farmed areas - buildings, roads, tracks;
- particular land use such as orchards, woodlands etc;
- location e.g. they are too far from the farm;
- the surface is rocky or uneven so that your equipment cannot be used effectively or safely;

Table 1 - Calculating the area not available for spreading

List **only** your fields which have red or yellow areas in this table. Remember ditches and watercourses have two sides therefore enter twice if it runs through a field.

Field Number	**Whole field area in vergée's (vg)**	**Ditches & watercourses**		***2 Other Red areas (vg)**	**Yellow areas (vg)**
		Total length in metres (m)	Metres ÷ 180*1 = vg		
Areas not available for spreading		**Totals**	*x*	*Y*	*Z*

**1 This calculation is derived from ditches x 10m (red area) ÷ 1800 to give vergée's.*
(If you do not multiply by the 10m first, you only need to divide by 180)

Total farm area (Annex 5, page 21, column 2)	***A =***	**vg**
Total area not available for spreading: (x + y + z)	***B =***	**vg**
Total area available for spreading (A - B)	***C =***	**vg**

*2 If you have a well in the middle of a fence line the minimum area to include in the red zone, using the no spread distance of 50 metres, will be 2.2 vergées.

Note: - The area of each field designated red or yellow should also be marked in **Annex 5**, columns 3 & 4, page 21.

Step 2

Identifying areas where manures should not be spread under certain conditions

Some areas of the farm will be unsuitable for spreading at certain times of the year (other than the envisaged closed period). These circumstances can vary from year to year. The following are only guidelines as each field should be assessed annually according to prevailing circumstances and your own experience.

Table 2 - Identifying high risk areas. (ORANGE).

These areas should be marked on your map and in **Annex 5,** column 5 (page21).

Key	Conditions leading to high risk areas	Colour Map
•	Fields or part fields next to a watercourse, spring or borehole when the surface is severely compacted[*1] or waterlogged.	Orange
•	Fields or part fields that are likely to flood.	Orange
•	Field or part fields next to a watercourse, spring or borehole when the soil is at field capacity[*2].	Orange
•	Field or part fields which are strongly sloping. See Annex 1b (page 17) for definitions.	Orange
•	Field or part fields which are moderately sloping and have a slowly permeable soil (i.e. one through which water passes only slowly - example. clay loam)	Orange
•	Fields or part fields with shallow soils over granite, shale or other rock formation. See Annex 1b (page 17) for definitions.	Orange
•	All fields or part fields[*3] with effective pipe or mole drains.	Orange
•	All fields, following the harvest of maize (or other crops), which are either left bare or fallow and /or are compacted	Orange

Notes

*1 Severely compacted is when rain stays on the surface after rainfall

*2 Field Capacity is when the soil becomes fully wetted and more rain would cause water loss by drainage. This normally happens in autumn and lasts until the spring.

*3 Fields or part fields which in the last 12 months have been pipe drained, mole drained or subsoiled over drains should not be used for spreading in late Autumn and early Spring.

Drained fields should not be used in summer if they are cracked down to the drains or backfill.

Step 3

Calculating the minimum area of land needed for spreading animal manures

This calculation ensures that for:

Grassland
No more than 45 kg/vergée (90units/vergée) of total nitrogen from animal manures is applied in any one year to grassland or long term crops. (Crops occupying land for 12 months or more).

Arable
No more than 30 kg/vergée (60units/vergée) of total nitrogen from animal manures is applied in any one year to land under arable cropping. (Crops occupying land for less than 12 months).

(These are the maximum amounts allowed to comply with The Water Code, 2004).

Follow these steps in **Table 3 (page 9)**

- Fill in your stock numbers in column **I**
- Enter the number of months cattle are housed in column **II**
- Carry out the multiplication using the figures in columns **I, II and III** and record the result in column **IV**
- Finally add up the column **IV** to get the total area needed

Area requirements for other classes and weights of stock are given in Annex 1 (page 16).

Importing animal manures onto your farm

All farms that import organic manures (including farms with no livestock of their own) should have a **Farm Manure Plan** that ensures that the organic manures that are spread on their fields contain NO MORE than 45 kg N per vergée (90units/vergée) on grassland or 30 kg N vergée (60units/vergée) arable land in any 12 month period. Field records should be kept showing the date and amounts organic manures applied, the nutrients contained in the organic manures should be taken into account when calculating the amount of inorganic fertilizers required by the following crop (see DEFRA booklet RB209).

If you spread slurry/manure from other livestock farms on your land, you can include their livestock numbers with your own. Alternatively, you may find it easier to calculate spreading area needed from your knowledge of the number of spreader loads received during the year (go to **Annex 4**, page 20).

Sewage sludge and other organic wastes

If you spread sewage sludge or other organic wastes, see **Step 4 (page 10)**.

Table 3 - Calculating the minimum area of land needed

* The following vergée's per stock unit refer to grassland i.e. (45 kg total Nitrogen); see **F**&**G** below for arable.

Stock Unit	**I** Number of stock units		**II** Months housed	**III** vg per stock unit per month	**IV** Total area needed (**vg**)
Dairy Cow		X		X 0.13 =	
Follower / Young Stock (13months to calving)		X		X 0.08 =	
Follower / Young Stock (Birth to 12 months)		X		X 0.04 =	
Horses		x		X 0.06 =	
	Livestock housed all year			vg per annum	
Breeding Sow Place, including piglets to 4 weeks				X 0.44 =	
Weaner Place				X 0.07 =	
Grower Pig Place				X 0.13 =	
Light Cutter Pig Place (35/85 kg)				X 0.21 =	
Bacon Pig Place (35-105 kg)				X 0.23 =	
1000 Laying Hens(housed)				X 14.0 =	
1000 free range laying hens				X 7.0 =	
Imported animal manures (if any)	Value from Box W1 (Annex 4, page 20) =				

Minimum grassland area needed (Total column **IV**)	***D***	**vg**
Grassland available for spreading manure (Transfer the total of columns 5 & 6 from **Annex 5**, page 21)	***E***	**vg**
If E is bigger than D then your Grassland area is sufficient for your manures. If D is bigger than E continue below.	***F = E - D***	**vg**
Arable area required for spreading, (F x 1.5)[*1]	***G***	**vg**
Arable area available for spreading (Transfer the total of columns 5 & 6 from **Annex 5**, page 21)	***H***	**vg**
If H is bigger than G then your arable area is sufficient for your manures. If G is bigger than H see the following notes.	***I = H - G***	**vg**

***1 The grassland maximum 45 kg N divided by the arable maximum 30 kg N = 1.5. (Therefore you will need 1.5 times more arable land than grassland for the same amount of organic manures)**

If the area of grass and arable land available is smaller than the area required to spread all the animal manures on your farm, the following should be considered.

Notes:

- You may wish to consider if some of the yellow areas on your map which are used for cropping could be safely used for spreading to make good the difference.
- Alternatively you should make arrangements to spread the excess manures on other farms. You should always follow the advice given in The Water Code.
- You should reconsider the decision to import animal manures on to your farm.

Step 4 — Guidelines for spreading dried sewage sludge or other organic wastes

You only need to complete this page if you spread dried sewage sludge pellets or bring other organic wastes onto your farm.

The **Farm Manure Plan** you have drawn up should also be used as a guide you when spreading sewage sludge or other organic wastes i.e.; green waste compost or seaweed. The risk of causing pollution is very similar to the risk that occurs from spreading animal manures.

The recommended annual limit, of 45 kg N /vergée (90units/vergée) for grassland and 30kg N /vergée (60units/vergée) arable, is the total organic nitrogen that can be applied to agricultural land during the year from all sources. Therefore you should only spread sewage sludge and other waste if you have more land suitable for spreading than you need for your own animal manures.

Before deciding whether you wish to spread these materials you will need to make sure there will be some land available for spreading after you have spread all your animal manures. The amount of land remaining will be seen by transferring any remaining arable or grassland areas from table 3, page 9 into the boxes below.

Grassland area available for spreading sewage sludge and other organic manures (45 kg N/vergée)

Box F (page 9) = _____ **vg**

Arable area available for spreading sewage sludge and other organic manures (30 kg N/vergée)

Box I (page 9) = _____ **vg**

The simplest way to avoid applying excess nitrogen is to avoid spreading dried sewage sludge etc on fields where you plan to spread animal manures. To help you avoid applying more than 45 kg N/vergée on grassland and 30kg N/vergée on arable land, the rates of application for organic manures should not be more than those given below in any 12 month period. However, sludge and other manures from a particular source may contain more or less nitrogen than the average analyses on which these figures are based. The supplier should provide you with an analysis and interpretation.

Type of organic manure	**Maximum rate of application per annum**	
	Grassland	Arable
Dried Sewage Sludge Pellets*[1]	0.98 tonnes/vergée	0.65 tonnes/vergée
Compost*[2]	9.0 t/vergée	6.0 t/vergée
Vraic*[3]	6.4 t/vergée	4.3 t/vergée

Notes:
*1 The average nitrogen content of dried sewage sludge pellets is approximately 46 kg per tonne
*2 The average nitrogen content of green waste compost (available from PSD) is 5 kg / tonne
*3 The average nitrogen content of vraic (Seaweed) is 7 kg / tonne (sea lettuce is not suitable for spreading on farm land)

All organic wastes should be spread at rates which take account of their nitrogen content and polluting potential.

Reducing the risk of pollution from land spreading

Using this plan — These pages help you use your plan to avoid pollution

Red areas

These areas should never be used for spreading manure as it would cause water pollution, damage natural habitats or in some cases break agreements with land owners.

Yellow areas

You have judged these unsuitable for various reasons. It may be possible to spread manure safely at some time in the future. You should use the guidance given in Table 2, page 7 to make this decision.

Maximum annual applications to Orange and Green areas

- The amount of animal manure applied to grassland or long term crops (crops in ground more than 12 months) in a 12 month period should not contain more than 45 kg/vergée total N (90 units/vergée).

- The amount of animal manure applied to arable land (crops in ground for less than 12 months) in a 12 month period should not contain more than 30 kg/vergée total N (60 units/vergée).

The maximum annual application rates for slurries and manures

Slurry or Manure	Grassland (per vergée)	Arable (per vergée)
Cow slurry (6% dry matter)	15m^3 or 3,300 gallons	10m^3 or 2,200 gallons
Dirty Water(<1% dry matter)	150 m^3 or 33,000 gallons	10 m^3 or 22,000 gallons
Pig slurry (3% dry matter)	18m^3 or 3,960gallons	12m^3 or 2,640 gallons
Fresh cattle or pig manure	7.5 tonnes	5.0 tonnes
Manure from laying hens	3.0 tonnes	2.0 tonnes
Horses (15% dry matter)	11.2 tonnes	7.5 tonnes

- All applications of animal manure should follow the plan, take account of soil and weather conditions, and be subject to frequent checks to ensure odour and pollution problems do not occur.

Remember:

- Slurry and manure should never be spread on any areas which are frozen hard;

- Risks can be reduced by applying manures at lower rates than those recommended above;

- Do not spread manures when the soil is so wet that tractor-drawn machinery will damage the soil;

- The maximum annual application rates, N contained in organic manures, applies to all agricultural land.

Using orange areas - (These are areas of land that are less suitable for spreading organic manures)
Do not apply organic manures to these areas when severely compacted or if the soil is cracked over shallow rock.
Provided your machinery does not damage the soil these areas can be used for spreading at other times of the year (excluding the closed period).
When the soil is at field capacity you should follow the guidelines below:

Do not	apply more than 9m^3/vergée (2000 gallons/vergée) of slurry or other effluent at any one time;
Do not	apply more than 9m^3/vergée by travelling irrigators at any one time;
Do not	apply more than 5mm/hour (0.2 inches) of dirty water with sprinklers;
Do	move sprinklers regularly to suit conditions taking particular care that polluting material does not pass into a watercourse;
Do	leave an interval of at least 3 weeks between applications.

These guidelines also apply to drained and shallow soils throughout the year (excluding the closed period).

- Risks can be reduced further by applying waste at lower rates than those recommended above.

Using green areas

Provided your machinery does not damage the soil these areas can, other than in the closed period, be used for spreading at any time due to the lower risk of causing pollution. Low dry matter slurries or other dilute effluents may be applied at more than 9m^3/vergée at any one time, but always taking care that run off does not occur.

Shallow or Drained soils

You should not use any drained or shallow soil fields when they are cracked in summer, within 12 months of subsoiling or following the installation of mole or pipe drains. Outfalls of drainage systems should be checked following the application of organic manures to ensure pollution has not occurred.

Silage effluent

The amount of effluent produced will vary from year to year according to the moisture content of the grass when it is ensiled. Silage effluent is highly polluting and should be diluted with the same amount of water before application to land. Do not apply more than 9m^3/vergée (2000 gallons/vergée) of diluted effluent. Avoid shallow soil or drained land wherever possible to reduce the risk further. .

Using manures

Use your map together with your cropping plan and grazing schedule to decide when to apply to a particular field. The fertiliser value of manures should be maximized by applying according to crop needs and to complement your inorganic fertiliser applications. DEFRA booklet RB209, Fertiliser Recommendations for Agricultural and Horticultural Crops gives further guidance.

Step 5

Assessing whether extra storage is needed for slurry and dirty water

You will need this step by step guide to help you assess your storage need.

Using the assessment of spreading risks made in steps 1 to 4, **step 5** will enable you to estimate whether extra storage of slurry and dirty water will be needed to minimize the risk of causing pollution.

It is assumed that solid manures will remain in buildings or be stored at a suitable outside location prior to spreading in the spring or summer.

Complete the boxes below with your best estimate of existing slurry and dirty water storage capacity. (Earth banked stores or unlined excavated pits are considered unsuitable and should be upgraded to BS5502 standards).

Volume (m^3) = Length (m) x width (m) x depth (m)

Storage capacity available - slurry	**J 1**	**m^3**
Storage capacity available - dirty water	**J 2**	**m^3**

Therefore total storage (J1 + J2)	**=**	**J 3**	**m^3**

Minimum Storage Capacity

Given the imposition of a closed period during the winter, for the application of organic manures to agricultural land, each farm will need to have sufficient slurry and dirty water storage to meet this requirement. In addition to take account of ground and weather conditions that could be unsuitable for spreading and to avoid all farmers having to spread on the first day after the closed period ends it is **recommended** that dairy and other livestock units have a minimum of **4 months storage capacity for slurry and dirty water.**

Calculating the monthly volume of slurries

To calculate the monthly volume of slurries produced complete **Table 4** as follows;

- Enter the number of stock on slurry based systems (Column **I**).
- If some of the excreta is collected as solid manure and stored separately estimate the proportion handled as slurry (Column **II**) e.g. 50% = 0.5, 100% = 1

Where cows are housed on straw the proportion of any excreta collected as slurry from passage ways, feed areas, collecting yards and parlours is not likely to be more than 50% (0.5).

- Multiply together columns **I, II,** and **III,** and record the total in column **IV**.
- Add the figures in column **IV** to obtain the required monthly volume of storage **K**.
- Multiple **K** by 4 to calculate recommended 4 months storage capacity.

Table 4 - Slurry production

	I	II	III	IV
Stock Unit	Number on slurry or part slurry-based system	Proportion of waste collected as slurry	Volume per unit per month (m^3)	Total Volume produced (m^3)
1 Dairy Cow	x	x	1.35 =	
1 Follower (13 months to calving)	x	x	0.75 =	
1 Follower (Weaning to 1 year)	x	x	0.37 =	
Other	x	X	=	
1 Breeding sow place including piglets to 4 weeks	x	X	0.20 =	
1 Weaner place	x	X	0.04 =	
I pig (20 - 90 kg) meal fed	x	X	0.12 =	
1 pig (20- 90 kg) liquid fed	x	X	0.21 =	
Other	x	X	=	
Horses (stabled using dry bedding)	Nil x	Nil x	Nil =	

The monthly outputs for other types of stock are given in Annex 2 (page 17).

Total monthly volume of slurries (total column iv)	**= K**	**m^3**
4 months recommended storage (K x 4)	**= L**	**m^3**

With reference to the amount of storage capacity available (boxes J1, 2 & 3, *Page 13*) assess the need for extra slurry storage on your farm. You may need to take professional advice. Telephone 866200 for further information.

Dirty Water Storage

Calculating dirty water production (for a monthly winter period)

To estimate likely production of dirty water you will need:

1. A rough plan of the open yards and silage clamps with dimensions to enable calculation of the total dirty yard area from which run-off is collected.

2. A calculator.

Use your plan of open yards to work out the total dirty area in square metres. Exclude covered areas if rain falling on these roofs is collected and discharged to a clean drain. If rainfall onto roofs or clean concrete also mixes with dirty water then include this roof or yard area. Also **include** the area of uncovered silage clamps and slurry and weeping wall stores if the liquid drains to the dirty water store. In the calculations below, parlour washings are based on a standard figure of 18 litres (4½ gallons) per cow per day. If you know the total amount of parlour washings (litres) on a daily basis multiply by 0.03*[1] and enter directly into box **N**.

For **pig units**, make use of box **M** and box **O** only.

Surface area of yards (m^2) = Length (m) X Width (m)*[2]

Table 5 - Dirty water production

	Total yard area		Jersey rainfall Oct-Jan 1894-2004*[3]			
Run-off:	m^2	X	**150** mm	÷ 1000*[4]=	***M***	**m^3**
			Number of cows			
Parlour washings: (Unless you have a discharge license for this liquid to enter the foul sewer)				x 0.54*[5]=	***N***	**m^3**
Estimate any other foul run-off on a monthly basis e.g. use of hose-pipe or pressure washer:					***O***	**m^3**

Total winter monthly volume of dirty water	**M + N + O** =	***P***	**m^3**

Total dirty water over 4 month winter period	**P x 4** =	**Q**	**m^3**

See Annex 3, page 19, for land area required for spreading dirty water produced over winter

*1 Square yard = 0.84 m^2, 1 inch = 25.4 mm, 220 gallons = 1m^3
*2 Multiplying by 0.03 converts litres per day into cubic metres per month
*3 The maximum 4 month total rainfall in 110 years (1894 to 2004) was 686.8mm between Oct 2000 and January 2001.
*4 Dividing by 1000 converts rainfall from millimetres into metres
*5 Multiplying by 0.54 gives the volume of parlour washings per month

Total volume of storage

The total volume of storage required to contain **4 months** slurry and dirty water on your farm can be calculated by completing the following boxes.

Box L (Table 4)		**Box Q** (Table 5)		**Required 4 months Storage Capacity**
m^3	+	m^3	=	m^3

If your required 4 months storage is greater than J3, page 13, then you require additional slurry and dirty water storage.

Reducing the need for dirty water storage

The amount of dirty water storage can be reduced by:-

1. Roofing existing dirty yard areas*.
2. Diverting roof water away from dirty water yard areas.
3. Minimizing the area of yards contaminated by animal manures.

*If the amount of dirty water produced on your farm can be reduced then the size and cost of the required storage would also be reduced.

Annex 1a

Vergées needed per stock unit for other classes and weights of stock

Stock Unit	Table 3 Column III Vergées needed per stock unit
Mature bull	0.1 per month
Young bull or beef animals (6 to 18 months)	0.073 per month
1 mature sheep	0.017 per month
1 fattening lamb	0.006 per month
1 pig place (20-65 kg) dry meal fed	0.2 per year
1 pig place (20-65 kg) liquid fed	0.2 per year
1 pig place (35-105 kg) dry meal fed	0.233 per year
1 pig place (35-105 kg) liquid fed	0.233 per year
1000 turkeys (male)	30.9 per year
1000 turkeys (female)	14.5 per year
1 horse (> 400kg)	0.7 per year
1 horse (400kg <)	0.6 per year

Annex 1b

Definitions of land and soil characteristics

Sloping Land

Sloping land can be a problem when spreading slurries and dirty water, the greater the slope the greater the danger of run-off especially when the land is saturated or compacted.

A) **Steep –** More than 25% slope **(This condition is a serious limiting factor)**
B) **Strongly Sloping –** 10 to 25% slope **(This condition is a limiting factor)**
C) **Moderately sloping –** 3 to 9% slope **(This condition is a minor limiting factor)**
D) **Nearly level- Less than 3% slope** (This condition is **not** a limiting factor)

Soil Depth

Soil depth is defined as the depth of soil over the underlying bed rock. The shallower the soil is the greater the danger of applied slurries and dirty water finding their way into the underlying water table.

A) **Very Shallow Soils-** soils which are less than 10” deep**(This is serious a limiting factor)**
B) **Shallow Soils-** 10 to 19 inches deep **(This is a limiting factor)**
C) **Moderately Deep Soils**- 20 to 35 inches deep **(This is a minor limiting factor)**
D) **Deep Soils-** more than 36 inches deep (This is **not** considered a limiting factor)

Annex 2 Estimating minimum areas needed for spreading slurry

Area needed for spreading slurry

For a typical month when all livestock are housed calculate the area needed to spread the slurry that is produced that month.

Table 6 - Calculating the areas needed to spread slurry during months when all livestock are housed

Stock Unit on Slurry based system	**I** No. on slurry or part slurry based system	**II** Proportion collected as slurry e.g. *Half = 0.5* *All = 1.0*	**III** Vergées needed per stock unit per month	**IV** Area needed for month (**vg**)
1 Dairy Cow	X	X	0.13	=
1 Follower / Young Stock (13 months to calving)	X	X	0.08	=
1Follower / young stock (1 month to 1 year)	30 X	X	0.04	=
1 Breeding Sow Place, including piglets to 4 weeks	X	X	0.037	=
1 Weaner Place	X	X	0.006	=
1 Light Cutter Pig Place (35-85kg) dry meal fed	X	X	0.018	=
1 Bacon pig place(35-105kg)	X	X	0.020	=
Other	X	X		=
Other	X	X		=
	Total grass area needed per month = (Total of column IV)		***R***	**vg**
	(R x1.5 = S) *[1]			
	Total arable area needed per month =		***S***	**vg**

*1 Grassland maximum 45 kg N/ vergée divided by arable maximum 30 kg N / vergée = 1.5

Annex 3 — Estimating minimum areas needed to spread dirty water

Table 7 - Minimum area needed for spreading dirty water in winter

	Six month (winter) volume of dirty water (transfer **P** from **Table 5, page 15**)		Minimum area needed for spreading dirty water in winter
P = m^3	**x 6 =**	m^3	**÷ by 150*** **T1** vg

* divided by 150 because up to 150 m^3 of dirty water may be applied to a vergée of **grassland** without applying more that 45 kg N/ vergée. Dirty water contains 0.3 kg N/m^3 (on average), 45 ÷ 0.3 = 150.

Arable land 100 m^3 of dirty water may be applied without applying more than 30 Kg N/vergée. (Multiply T1 x 1.5 = T2) **T2** vg

The nitrogen concentration of dirty water is increased if you add to it the liquid that drains from weeping-wall stores or strainer boxes. If this is the case you will need to increase the grassland area for spreading.
To do this multiply the figure from **T1 & T2** by **4** and enter into box **U1 & U2**.

Grassland T1 x 4 =	**U1**	vg
Arable land T2 x 4 =	**U2**	vg

The minimum area is related to nitrogen content and spreading on green areas. The area will need to be increased when spreading on orange areas where the maximum applications at anyone time is limited (see page 12).

Definitions of slurry and dirty water

Slurry and dirty water

Slurry is defined as excreta produced by livestock while in a yard or building, including mixture with bedding, rainwater and washings that have a consistency that allow them to be pumped or discharged by gravity at any stage of the handling process.

Dirty water

Dirty water is any water emanating from buildings and yards used for housing and feeding livestock that has been contaminated with excreta, effluent from manure stores and/or silage effluent, and would cause pollution unless stored and applied to land correctly.

Note: - Water samples can be taken where there is doubt if yard run off is either clean or dirty and arrangements can be made with the Department.

Annex 4

Estimating minimum areas needed for spreading imported animal manure and slurry

Minimum area needed for spreading imported farmyard manure and slurry

This calculation allows you to estimate the minimum spreading area using your knowledge of the number of spreader loads received during the year.

Follow the steps in **Table 8**

- For each type of manure/slurry, fill in a typical spreader capacity in column **I**.
- Enter the number of loads per year in column **II**.
- Carry out the multiplication using the figures in columns **I**, **II** and **III** and record the result in column **IV**.
- Finally add up the column **IV** to get the total minimum area needed **W**.

Table 8 - Calculating the minimum areas needed for spreading imported manure and slurry

Type of manure or slurry	**I** Typical spreader capacity (m^3)	**II** Number of loads per year	**III** Factor to limit nitrogen loading	**IV** Total area needed (**vg**)
Farmyard manure				
Cattle (25% dry matter)	X	X	0.133	=
Pig (25% dry matter)	X	X	0.156	=
Laying hen (30% dry matter)	X	X	0.330	=
Horses (15% DM)	X	X	0.084	=
Slurry				
Cattle (6% dry matter)	X	X	0.067	=
Pig (3% dry matter)	X	X	0.056	=

Grassland area needed (Total column IV)	**W1**	**vg**

Arable area needed (W1 x 1.5)*[1]	**W2**	**vg**

*1 Grassland maximum Nitrogen 45kg N/ vergée divided by the arable 30 kg N/ vergée = 1.5

Typical spreader capacities: 4.5 m^3 spreader (1 000 gallons)
6.8 m^3 spreader (1 500 gallons)
9.1 m^3 spreader (2 000 gallons)

Annex 5

Total Farm Area

Table 9: G = Grassland, A = Arable land

1. Identification (Examples)	2. Total Area (vg)	3. Red (vg)	4. Yellow (vg)	5. Orange (vg)		6. Green (vg)	
				G	A	G	A
Farmyard (name)	7.5	-	7.5	-	-		
G123	4.6	-	-	-	4.6		
G124	5.3	2.2 (well)		3.1			
G125	8.2		1.0 (track)				7.2
Actual data	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Page Total							
Total Farm Area							

Total Farm Area

Table 8 continued: G = Grassland, A= Arable land

1. Identification	2. Total Area (vg)	3. Red (vg)	4. Yellow (vg)	5. Orange (vg)		6. Green (vg)	
data				***G***	***A***	***G***	***A***
Page Total							
Previous page totals							
Total Farm Area							