



Nutrients Action Programme 2019-2022 Workbook

RECORDING YEAR:

FARM BUSINESS NO:

NAME:

Sustainability at the heart of a living, working, active landscape valued by everyone.



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk



Northern Ireland
**Environment
Agency**

www.daera-ni.gov.uk

**This document may be made available in alternative formats;
please contact us to discuss your requirements:**

CAFRE Greenmount Campus
45 Tirgracy Road,
Antrim
BT41 4PS

Telephone: 0300 200 7842
Email: enquiries@cafre.ac.uk

Northern Ireland Environment Agency
Water Management Unit
17 Antrim Road
Tonagh
Lisburn
Co Antrim
BT28 3AL

Telephone: 028 9262 3280 / 028 9263 3486
Email: agricultural.regulation@daera-ni.gov.uk

You can download this workbook from our websites.

Follow these links: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022 or
www.daera-ni.gov.uk/articles/nitrates-directive

Contents with hyperlinks

Topic	Page	When to use this section:
NAP Regulations record checklist	3	All farm businesses
Section 1 - Calculating livestock manure nitrogen (N) loading	9	If you keep livestock
Section 2 - Calculating livestock manure storage capacity	25	If you store organic manures
Section 3 - Calculating nitrogen (N) applications for grassland	43	If you grow grass
Section 4 - Calculating nitrogen (N) applications for arable crops (excluding N-max crops and grass)	47	If you grow crops apart from grass and winter or spring wheat, barley or oats
Section 5 - Calculating nitrogen (N) applications for N-max crops	51	If you grow winter or spring wheat, barley or oats
Section 6 - Planning phosphate (P_2O_5) applications for grassland and all other crops - Fertilisation Plan for non-derogated farms	55	If you use chemical phosphate, non-livestock manures, P-rich manures or anaerobic digestate
Section 7 - Calculating phosphate (P_2O_5) applications for grassland and all other crops	59	
Contact details	63	All farm businesses
Common conversions	65	All farm businesses
Typical Annual NAP and Phosphorus Regulations Calendar	67	All farm businesses

Please note:

It is not a requirement to calculate the various values for your farm (such as livestock manure nitrogen (N) loading, chemical N and phosphate application rates or the number of weeks storage capacity on farm) but without doing so, you may be unaware if you are above or below the various limits and so could be in breach of the Regulations.

For further information refer to the NAP 2019-2022 Guidance Booklet.

Frequently used terms:

Some frequently used terms and units in this workbook are defined below. For the definitions of other terms, please refer to the key definitions and glossary in the NAP 2019-2022 Guidance Booklet.

Fertilisation plan: is a record of the planned use of fertilisers and manure for the calendar year.

Freeboard is the term given to the unfilled depth (safety margin) at the top of a slurry tank or compound. Mandatory freeboard allowances are at least 750 mm for earth bank lagoons and 300 mm for all other slurry stores. This is not a legal requirement for facilities completed before 1 December 2003 (unless they have been substantially modified). However, it is considered best management practice to adhere to freeboard allowances in all stores.

N: means nitrogen.

N-max and N-max crops: for the purposes of the NAP, N-max is an upper limit of N that can be applied to crops of winter/spring wheat, barley and oats (see definition in the NAP 2019-2022 Guidance Booklet for more details).

P: means phosphorus.

P₂O₅: means phosphate.

P-rich manures: for the purposes of the NAP, organic manures which contain more than 0.25 kg of total phosphorus (P) per 1 kg of total N are considered to be P-rich manures. The proportion P to N of a number of common organic manures is set out in **Annex G** of NAP 2019-2022 Guidance Booklet. Examples of P-rich manures would include some anaerobic digestates and some pig slurries and manures.

Information required and recommended record sources <i>(Annexes referred to are annexes of the NAP 2019-2022 Guidance Booklet)</i>		
All farm businesses		
Eligible agricultural area		Copy of relevant SAF form.
	If claiming Basic Payment Scheme	Letter from DAERA stating the area deemed eligible to activate entitlements each scheme year and your latest DAERA map.
	If not claiming Basic Payment Scheme	If not claiming Basic Payment Scheme, evidence of the fields and the area that you are farming each year.
	Common land	Provide evidence of the rights of use and area of common land if applicable.
If you keep livestock		
Livestock numbers	All livestock types	Enterprise management software or numbers recorded in the NAP Guidance Workbook, which is available on-line at: www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022 Stock numbers should be taken at least on the first day of each alternative month. For example, 1 Feb, 1 Apr, 1 Jun, 1 Aug, 1 Oct, 1 Dec.
		Or
	Cattle	DAERA Herd Register for Bovine Animals or APHIS online records ¹ .
	Sheep	DAERA Flock Register or APHIS online records ^{*.1}
	Pigs	DAERA Herd Register for Pigs.
	Poultry	Company audit records or welfare legislation records or quality assurance records or egg marketing legislation records.

¹ Aphis online records can be accessed at: www.daera-ni.gov.uk/onlineservices

Information required and recommended record sources <i>(Annexes referred to are annexes of the NAP 2019-2022 Guidance Booklet)</i>		
If you keep livestock and store organic manures		
Livestock manure storage capacity	Storage capacity	<p>On farm confirmation of storage capacity, for example, dimensions of tanks, e.g. 25 m x 4 m x 1.8 m.</p> <p>Or</p> <p>Remember to include slurry collected from open yards, roof water (if allowed to flow onto dirty yards) and an allowance for silage effluent in your calculations.</p>
	Housing term	Numbers and length of time livestock housed during winter.
	Separated cattle/sheep slurry	Note of amount of cattle/sheep slurry separated.
	Rented storage facilities	Rental agreements containing details of any rented storage facilities or silage clamps or livestock contract rearing arrangements (NAP 2019-2022 Guidance Booklet, Annex L).
If you keep livestock and need a storage allowance		
Livestock manure storage capacity allowances (if applicable)	Out-wintered livestock	Numbers, type and length of time livestock out-wintered.
		Note on SAF form or DAERA farm map of area and location of land used to out-winter.
	Bedded livestock	Numbers, type and length of time livestock bedded.
	Poultry litter stored in a midden	Details of poultry litter which is stored in a midden.
	Poultry litter stored in a field heap	NIEA will check that notification has been sent for any poultry litter/ anaerobic digestate fibre field heaps.
	Slurry exported to processing facility	Valid contractual agreements with processing facilities or evidence of access to an approved treatment or recovery outlet (NAP 2019-2022 Guidance Booklet, Annex M).

Information required and recommended record sources (Annexes referred to are annexes of the NAP 2019-2022 Guidance Booklet)		
If you use chemical fertilisers		
Chemical nitrogen (N) and phosphate (P ₂ O ₅) usage	Annual chemical fertiliser stock balance	Record of fertiliser stock on 1 January - tonnage and N and P ₂ O ₅ content (NAP 2019-2022 Guidance Booklet, Annex O) .
		Record of fertiliser stock on 31 December - tonnage and N and P ₂ O ₅ content (NAP 2019-2022 Guidance Booklet, Annex O) .
	Annual chemical fertiliser movements	Dated fertiliser invoices or receipts or a list of purchases showing: - certified N and P ₂ O ₅ content of chemical fertiliser; and - tonnage bought/sold.
		The tonnage and N and P ₂ O ₅ content of fertiliser imported in and exported off the farm (other than bought/sold), if applicable (NAP 2019-2022 Guidance Booklet, Annex O) .
If you apply any organic manures apart from livestock manure to grassland		
Grassland fertiliser details	Total area of grassland	Grassland field areas from SAF form.
	Other organic manure fertiliser details (apart from livestock manure)	The type, amount and N content of organic manure applied to grassland area.
If you grow winter/spring wheat, barley or oats (N-max crops)		
N-max crop fertiliser details	Cropping regimes and their individual areas	Note the type of crops, for example, spring barley, winter wheat, and record on SAF form or DAERA farm map.
	N fertiliser application details	Type, amount and N content of all fertilisers containing N (chemical and organic including livestock manures) applied to each crop area.
	If N-max limits have been exceeded	Records of previous three years' total grain yield weights and total areas harvested for each crop type for which N-max limits have been exceeded.

Information required and recommended record sources <i>(Annexes referred to are annexes of the NAP 2019-2022 Guidance Booklet)</i>		
If you grow any other crops		
Other crops fertiliser details	Cropping regimes and their individual areas	Note the type of crops, for example, potatoes, maize, and record on SAF form or DAERA farm map.
		Previous crop grown.
	SNS index for other crops	If known, soil type. If soil type is unknown the tables in (NAP 2019-2022 Guidance Booklet, Annex H) may be used to establish SNS index.
	N fertiliser application details	Type, amount and N content of all fertilisers containing N (chemical and organic including livestock manures) applied to each crop area.
If you export or import organic manures		
Imported/exported organic manures	All organic manures	<p>Record of:</p> <ul style="list-style-type: none"> - Amount and type of each manure. - Date imported/exported. - Name and Business ID of importer/exporter. - Signature of exporter. - Name and address of transporter (if 3rd party). <p>See (NAP 2019-2022 Guidance Booklet, Annex N) for example import/export records. All manure exports must be submitted online to NIEA using DAERA online services by 31 January for the previous year.</p> <p>Where appropriate - waste transfer note and copy of exemption from waste management licensing.</p>

Information required and recommended record sources <i>(Annexes referred to are annexes of the NAP 2019-2022 Guidance Booklet)</i>		
Imported/exported organic manures	Anaerobic Digestate	Nutrient content analysis provided by the producer containing the percentage: - Dry matter - Total Nitrogen (N) - Total Phosphate (P ₂ O ₅) - Total Potash (K ₂ O) - Ammonia N or NH ₄ ⁺
	Organic manures other than livestock manures	N content of organic manures (apart from livestock manures and spent mushroom compost) provided by the producer in accordance with waste or sewage sludge regulations or Quality Protocol.
If you apply chemical phosphate (P₂O₅) fertiliser (from 2020) to grassland, P-rich ⁽²⁾ organic manures or (from 2020) anaerobic digestate to any land		
Phosphorus controls	Fertilisation Plan	CAFRE Crop Nutrient Calculator available at DAERA online services: www.daerani.gov.uk/online-services or the NAP Guidance Workbook which is available at: http://www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022 An electronic or paper format detailing: Size of each crop area, type of crop, results of soil P test, maximum phosphate recommendation, planned phosphate application details.
If you apply chemical phosphate (P₂O₅) fertiliser		
Phosphorus controls	Size and location of each field to which chemical P ₂ O ₅ fertiliser, P-rich manure or anaerobic digestate has been applied	Note the fields to which chemical phosphate fertiliser, P-rich manure or anaerobic digestate has been applied on SAF form or DAERA farm map.
	Type of crop sown	Type and date of crops grown in above fields noted on the SAF form or DAERA farm map.

² P-rich organic manures are those containing more than 0.25 kg of total P per 1 kg of total N.

Information required and recommended record sources <i>(Annexes referred to are annexes of the NAP 2019-2022 Guidance Booklet)</i>		
Phosphorus controls	Results of soil P test	DAERA farm map indicating fields sampled or soil sample results showing field identification details.
		Results of soil analysis with UK Accreditation (or National Equivalent) statement for the soil P test, relating sampling site to Olsen extractable P content and soil P index.
	Phosphate fertiliser application details	Type, amount and available phosphate content of all fertilisers containing phosphate (chemical and organic including livestock manures) applied to fields to which chemical P ₂ O ₅ fertiliser/P-rich manure/ anaerobic digestate has been applied.
		Dates of applications.

Please note:

- These are only recommended record sources. If you have another method of recording the required information which will allow NIEA to make an assessment of your farm business's compliance with the various measures then this is satisfactory.
- Remember to refer to the previous NAP and Phosphorus Guidance Booklet and Workbook, published in 2015, in relation to keeping records relating to the previous NAP period (2015 to 2018).
- For additional information, please refer to **Section 10** of the NAP 2019-2022 Guidance Booklet.

Section 1 - Calculating Livestock Manure Nitrogen (N) Loading

To calculate the livestock manure nitrogen loading for your farm using this workbook:

- Complete the relevant worksheets in Section 1.1 - Livestock Manure Nitrogen Loading Worksheets.
- Transfer the relevant figures from Section 1.1 to Section 1.2 as directed.
- Complete Section 1.2 - Nitrogen Loading Calculation.

Alternatively, you can access the 'Nitrogen Loading Calculator' at:

www.daera-ni.gov.uk/online-services

Refer to **Section 5.1.1** of the NAP 2019-2022 Guidance Booklet for additional information.

Note: The APHIS online report classifies cattle as either dairy or beef based on the typical use of the breed, e.g. Friesian is dairy and Aberdeen Angus is beef. However, the N loading calculation is based on the actual use of the breed, i.e. milked cows are classified as dairy and suckled cows as beef regardless of the breed.

Section 1.1 - Livestock manure nitrogen loading worksheets

Worksheet A - Livestock manure nitrogen (N) produced by dairy cattle

(Only complete this table if you keep these livestock).

An accurate record of cattle type and numbers kept each year can be obtained using the 'Nitrate Stock Count' function on APHIS Online which you can access from Online services at: www.daera-ni.gov.uk/online-services. See note on **page 9**.

Please ensure that for your farm any breeds that are traditionally beef, but are being milked are classified as dairy and breeds that are traditionally dairy, but are being suckled are classified as beef for the purposes of the N loading calculation.

1. Enter the average number of dairy livestock on the farm from 1 January to 31 December.
2. Multiply the average number by the N produced per head per year.
3. Total the N produced per year and insert in Box A. **Transfer your answer to Box A on page 23.**

Livestock type	Average number per year		N produced per head per year		N produced (kg N per year)
Dairy Cattle	No.	x	kg N	=	Answer
Dairy cows		x	100	=	
Dairy heifer (over 2 years)		x	45	=	
Dairy heifer (1-2 years)		x	39	=	
Breeding bull		x	52	=	
Dairy calves:					
to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
0-1 year		x	19	=	
OR					
6-12 months		x	12	=	
0-6 months		x	7	=	
Total livestock manure N produced by dairy cattle (kg N per year)					(A)

Worksheet B - Livestock manure nitrogen (N) produced by beef livestock (Only complete this table if you keep these livestock).

An accurate record of cattle type and numbers kept each year can be obtained using the 'Nitrate Stock Count' function on APHIS Online, which you can access from Online services at: www.daera-ni.gov.uk/online-services. See note on **page 9**.

1. Enter the average number of beef livestock on the farm from 1 January to 31 December.
2. Multiply the average number per year by the N produced per head per year.
3. Total the N produced per year and insert in Box B. **Transfer your answer to Box B on page 23.**

Livestock type	Average number per year		N produced per head per year		N produced (kg N per year)
Beef Cattle	No.	x	kg N	=	Answer
Suckler cows		x	52	=	
Cattle (over 2 years)		x	45	=	
Cattle (1-2 years)		x	39	=	
Breeding bull		x	52	=	
Beef calves: to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
0-1 year		x	19	=	
OR					
6-12 months		x	12	=	
0-6 months		x	7	=	
Bull beef calves: to prevent the same animal being counted twice use either "0-13.5 months" OR "0-6 months" and/or "6-13.5 months" categories					
0-13.5 months		x	30	=	
OR					
6-13.5 months		x	23	=	
0-6 months		x	7	=	
Total livestock manure N produced by beef livestock (kg N per year)					(B)

Worksheet C - Livestock manure nitrogen (N) produced by sheep

(Only complete this table if you keep these livestock).

1. Enter the average number of sheep on the farm from 1 January to 31 December.
2. Multiply the average number per year by the N produced per head per year.
3. Total the N produced per year and insert in Box B. **Transfer your answer to Box C on page 23.**

Livestock type	Average number per year ¹		N produced per head per year		N produced (kg N per year)
Sheep	No.	x	kg N	=	Answer
Ewe (over 1 year)		x	9.0	=	
Ram (over 1 year)		x	9.0	=	
Lambs: to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
Lambs ¹ 0-1 year		x	4.4	=	
OR					
Lambs 6-12 months		x	3.2	=	
Lambs 0-6 months		x	1.2	=	
Total livestock manure N produced by sheep (kg N per year)					(C)

¹ To calculate the average number of lambs use the table on page 66.

Worksheet D - Livestock manure nitrogen (N) produced by deer and goats

(Only complete this table if you keep these livestock).

1. Enter the average number of deer and/or goats on the farm.
2. Multiply the average number per year by the N produced per head per year.
3. Total the N produced per year and insert in Box D. **Transfer your answer to Box D on page 23.**

Livestock type	Average number per year		N produced per head per year		N produced (kg N per year)
Deer	No.	x	kg N	=	Answer
Deer (red) over 2 years		x	15	=	
Deer (red) 6 months-2 years		x	12	=	
Deer (fallow) over 2 years		x	13	=	
Deer (fallow) 6 months-2 years		x	7	=	
Deer (sika) over 2 years		x	10	=	
Deer (sika) 6 months-2 years		x	6	=	
Goats	No.	x	kg N	=	Answer
Milking goat		x	15	=	
Non-milking goat		x	9	=	
Kids:					
to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
0-1 year		x	4.4	=	
OR					
6-12 months		x	3.2	=	
0-6 months		x	1.2	=	
Total livestock manure N produced by deer and goats (kg N per year)					(D)

Worksheet E - Livestock manure nitrogen (N) produced by horses

(Only complete this table if you keep these livestock).

1. Enter the average number of horses on the farm.
2. Multiply the average number per year by the N produced per head per year.
3. Total the N produced per year and insert in Box E. **Transfer your answer to Box E on page 23.**

Livestock type	Average number per year		N produced per head per year		N produced (kg N per year)
Horses	No.	x	kg N	=	Answer
Horse > 3 years old		x	50	=	
Horse 2-3 years old		x	44	=	
Horse 1-2 years old		x	36	=	
Horse foal < 1 year old		x	25	=	
Donkey/small pony		x	30	=	
Total livestock manure N produced by horses (kg N per year)					(E)

Worksheet F - Livestock manure nitrogen (N) produced by breeding pigs per year

(Only complete this table if you keep these livestock).

1. Enter the number of pigs on the unit at any one time.
2. Enter the total number of pigs sold/transferred off the unit in the year for each weight range. You can select more than one weight.
3. Multiply the number on the unit and the number sold/transferred per year by the N produced per head per year.
Total the N produced per year and insert in Box F. **Transfer your answer to Box F on page 23.**

Livestock type	Number on unit per year ¹		N produced per head per year		Total N produced (kg N per year)
Pigs	No.	x	kg N	=	Answer
Boars ¹		x	18	=	
Maiden gilts ¹		x	11	=	
Lactating sows ² , dry sows, served gilts ¹		x	16	=	
Sale/transfer weight of pigs (kg)	Number sold/transferred per year	x	N produced per head per year		Total N produced (kg N per year)
	No.	x	kg N	=	Answer
18		x	0.09	=	
35		x	0.38	=	
105		x	2.38	=	
Total livestock manure N produced by breeding pigs (kg N per year)					(F)

¹ Average number on the unit at any one time and not the total number entering the herd.

² Lactating sow figure includes suckling pigs to weaning.

Worksheet G - Livestock manure nitrogen (N) produced by growing/finishing pigs per year

(Only complete this table if you keep these livestock).

1. Enter the number of pigs sold or sent to slaughter in the year.
2. Multiply the number per year by the N produced per head per year.
- 3 Total the N produced per year and insert in Box G. **Transfer your answer to Box G on page 23.**

Livestock type	Number sold or sent to slaughter per year		N produced per head per year		Total N produced (kg N per year)
Growing/finishing Pigs	No.	x	N	=	Answer
7 kg-18 kg		x	0.09	=	
7 kg-35 kg		x	0.38	=	
7 kg-105 kg		x	2.38	=	
18 kg-35 kg		x	0.29	=	
18 kg-105 kg		x	2.30	=	
35 kg-105 kg		x	2.00	=	
Total livestock manure N produced by pigs (kg N per year)					(G)

Worksheet H - Livestock manure nitrogen (N) produced by poultry per year

(Only complete this table if you keep these livestock).

1. Select either Table H1 or Table H2, depending on your production system.
2. Enter either the number of birds produced on your farm per year, Table H1, or the unit capacity in Table H2.
3. If using Table H2 enter the number of weeks occupancy and multiply this by the unit capacity to give the number of birds produced per year.
4. Multiply the number of birds by the N produced per 1,000 birds.
5. Total the N produced per year and insert in Box H in Table H2. **Transfer your answer to Box H on page 23.**

Table H1

Livestock type	Number of birds produced per year		N produced per 1,000 birds		N produced (kg N per year)
Poultry	No.	x	kg N	=	Answer
Broilers conventional (1,000s)		x	40	=	
Broilers hot water heating systems (1,000s)		x	33.8	=	
Free range broilers (1,000s)		x	44.9	=	
Turkeys (0 - 6 weeks) (1,000s)		x	229	=	
Turkeys (6 weeks - kill) (1,000s)		x	305	=	
Turkeys (0 - kill) (1,000s)		x	534	=	
Fattening ducks (1,000s)		x	139	=	
Total N					

Table H2

Livestock type	Unit capacity (1,000s)		Number weeks occupancy		Planned number of birds produced		N produced per 1,000 birds per week		N produced (kg N per year)
Poultry	No.	x	No.	=	No.	x	N	=	Answer
Broiler breeder (1,000s) 0-18 weeks		x		=		x	2.9	=	
Broiler breeders (1,000s) 18-60 weeks		x		=		x	7.2	=	
Broiler breeder (1,000s) 0-60 weeks		x		=		x	5.9	=	
Pullets (1,000s)		x		=		x	4.7	=	
Layers (1,000s)		x		=		x	12	=	
Free range layers (1,000s)		x		=		x	5.4	=	
Total N from Table H2									
Total N from Table H1									
Total livestock manure N produced by poultry (kg N per year) (Table H1 & Table H2)									(H)

Section 1 - Calculating Livestock Manure Nitrogen (N) Loading

Worksheet I - Livestock manure nitrogen (N) from slurry and manure IMPORTED onto the farm (Only complete this table if you import slurry and manure onto your farm).

1. Select the type of slurry/manure and dry matter (DM) and insert the volume or tonnage. Typical DM is 6% for cattle slurry and 4% for pig slurry.
2. Total the N imported per year and insert in Box I. **Transfer your answer to Box I on page 23.**

Slurry type	Imported quantity (m ³)		N content (kg N per m ³)		N imported (kg N per year)
Cattle slurry - 2% DM		x	1.6	=	
Cattle slurry - 6% DM		x	2.6	=	
Cattle slurry - 10% DM		x	3.6	=	
Pig slurry - 2% DM		x	3	=	
Pig slurry - 4% DM		x	3.6	=	
Pig slurry - 6% DM		x	4.4	=	
Separated cattle slurry (liquid portion):					
- Strainer box		x	1.5	=	
- Weeping wall		x	2	=	
- Mechanical separator		x	3	=	
Separated pig slurry (liquid portion)		x	3.6	=	
Other (e.g. digestate)**		x		=	
Manure type	Imported quantity (t)		N content (kg N per t)		N imported (kg N per year)
Cattle FYM - 25% DM		x	6	=	
Sheep manure FYM - 25% DM		x	7	=	
Pig manure FYM - 25% DM		x	7	=	
Broiler litter conventional - 66% DM		x	33	=	
Broiler litter hot water system - 72% DM		x	33.8	=	
Free range broiler litter** - 57% DM		x	26.4	=	
Broiler breeder manure 0-18 weeks - 55% DM		x	17.5	=	
Broiler breeder manure 18-60 weeks - 60% DM 60% DM		x	20.7	=	
Broiler Breeder manure 0-60 weeks - 59% DM 59% DM		x	20.2	=	
Pullet manure - 72% DM		x	32.7	=	
Layer manure* - 30% DM		x	16	=	
Free range layer manure - 46% DM		x	18.8	=	

* Please note that the N content values for free range broiler litter, layer manure, turkey litter 0-6 weeks and duck manure may change if further research into the nutrient content of poultry manures is carried out.

Section 1 - Calculating Livestock Manure Nitrogen (N) Loading

Manure type	Imported quantity (t)		N content (kg N per t)		N imported (kg N per year)
Turkey litter 0-6 weeks* - 58% DM		x	24.8	=	
Turkey litter 6 weeks-kill - 58% DM		x	24.8	=	
Turkey litter 0-kill - 58% DM		x	24.8	=	
Duck manure* - 25% DM		x	6.5	=	
Horse manure FYM - 25% DM		x	5	=	
Goat manure FYM - 40% DM		x	9.5	=	
Spent mushroom compost		x	8	=	
Separated cattle slurry (solid portion)		x	4	=	
Separated pig slurry (solid portion)		x	5	=	
Other**		x		=	
Total livestock manure N from exported slurry and manure (kg N per year)				=	(l)

** See N content provided by producer or waste transfer note/copy of exemption from waste management licensing.

Section 1 - Calculating Livestock Manure Nitrogen (N) Loading

Worksheet J - Livestock manure nitrogen (N) from slurry and manure EXPORTED from the farm (Only complete this table if you export slurry and manure from your farm).

1. Select the type of slurry/manure and dry matter (DM) and insert the volume or tonnage. Typical DM is 6% for cattle slurry and 4% for pig slurry.
2. Total the N exported per year and insert in Box J. **Transfer your answer to Box J on page 23.**

Slurry type	Exported quantity (m ³)		N content (kg N per m ³)		N exported (kg N per year)
Cattle slurry - 2% DM		x	1.6	=	
Cattle slurry - 6% DM		x	2.6	=	
Cattle slurry - 10% DM		x	3.6	=	
Pig slurry - 2% DM		x	3	=	
Pig slurry - 4% DM		x	3.6	=	
Pig slurry - 6% DM		x	4.4	=	
Separated cattle slurry (liquid portion):					
- Strainer box		x	1.5	=	
- Weeping wall		x	2	=	
- Mechanical separator		x	3	=	
Separated pig slurry (liquid portion)		x	3.6	=	
Other (e.g. digestate)**		x		=	
Manure type	Exported quantity (t)		N content (kg N per t)		N exported (kg N per year)
Cattle FYM - 25% DM		x	6	=	
Sheep manure FYM - 25% DM		x	7	=	
Pig manure FYM - 25% DM		x	7	=	
Broiler litter conventional - 66% DM		x	33	=	
Broiler litter hot water system - 72% DM		x	33.8	=	
Free range broiler litter* - 57% DM		x	26.4	=	
Broiler breeder manure 0-18 weeks - 55% DM		x	17.5	=	
Broiler breeder manure 18-60 weeks - 60% DM		x	20.7	=	
Broiler Breeder manure 0-60 weeks - 59% DM		x	20.2	=	
Pullet manure - 72% DM		x	32.7	=	
Layer manure* - 30% DM		x	16	=	
Free range layer manure - 46% DM		x	18.8	=	

* Please note that the N content value for free range broiler litter, layer manure, turkey litter 0-6 weeks and duck manure may change if further research into the nutrient content of poultry manures is carried out.

Section 1 - Calculating Livestock Manure Nitrogen (N) Loading

Manure type	Exported quantity (t)		N content (kg N per t)		N exported (kg N per year)
Turkey litter* 0-6 weeks - 58% DM		x	24.8	=	
Turkey litter 0 - kill - 58% DM		x	24.8	=	
Duck manure* - 25% DM		x	6.5	=	
Horse manure FYM - 30% DM		x	7	=	
Goat manure FYM - 25% DM		x	9.5	=	
Spent mushroom compost		x	8	=	
Separated cattle slurry (solid portion)		x	4	=	
Separated pig slurry (solid portion)		x	5	=	
Other**		x		=	
Total livestock manure N from exported slurry and manure (kg N per year)				=	(J)

** See N content provided by producer or waste transfer note/copy of exemption from waste management licensing.

Section 1.2 - Livestock manure nitrogen loading calculation

Step 1: Calculate the nitrogen (N) from livestock manure

- Transfer the answers from the relevant worksheets to enter the amount of livestock manure N from each of the enterprises on your farm.
- Adjust for any slurry/manure imported or exported and add up to give the total livestock manure N on the farm.
- You must account for all livestock manure produced from any animal kept for use or profit.

Livestock manure N	(kg N per year)	How do I calculate this figure?
Dairy cattle	A	Worksheet A, page 10.
	+	
Beef cattle	B	Worksheet B, page 11.
	+	
Sheep	C	Worksheet C, page 12.
	+	
Deer and goats	D	Worksheet D, page 13.
	+	
Horses	E	Worksheet E, page 14.
	+	
Breeding pigs	F	Worksheet F, page 15.
	+	
Growing and finishing pigs	G	Worksheet G, page 16.
	+	
Poultry	H	Worksheet H, page 17/18.
	+	
Imported slurry/manure	I	Worksheet I, page 20.
	-	
Exported slurry/manure	J	Worksheet J, page 22.
	=	
Total livestock manure N (A+B+C+D+E+F+G+H+I-J)	K	

Section 1 - Calculating Livestock Manure Nitrogen (N) Loading

Step 2: Calculate the eligible agricultural area

Calculate the total area (ha) which you control. Further information about this can be found in the NAP 2019-2022 Regulations Guidance Booklet, **Section 1.3**.

Eligible agricultural area (ha)	L	
---------------------------------	---	--

Step 3: Calculate the livestock manure nitrogen (N) loading

Calculate the annual livestock manure N loading for your farm by dividing the total livestock manure N by the eligible agricultural area.

Total livestock manure N (kg)	K	
	÷	÷

← Transfer answer from Step 1 on **page 23**.

Eligible agricultural area (ha)	L	
	=	=

← Transfer answer from Step 2 above.

Livestock manure N loading (kg per ha per year) (K÷L)	M	
--	---	--

← Is your figure below 170 kg N per ha per year?

If your loading is above the 170 kg N per ha per year limit, your options are to apply for a Nitrates Derogation, consider taking additional eligible land, export livestock manure or reduce livestock numbers.

Operating under an approved derogation will allow you to farm above 170 kg N per ha per year to a limit of 250 kg N per ha per year from grazing livestock manure, subject to your farm meeting certain key criteria. You may wish to consider this for future years. Application for derogation must be made to NIEA on or before 1 March each year. Farms operating under derogation must adopt additional nutrient management and record keeping measures to ensure that operating at a higher grazing livestock manure limit does not adversely impact on water quality. Further information about the NAP Derogation can be found in the NAP 2019-2022 Regulations Guidance Booklet, **Section 5.1.4** and in the NAP Derogation Guidance Booklet 2019-2022.

Section 2 - Calculating Livestock Manure Storage Capacity

To calculate the manure storage capacity for your farm using this workbook:

- Only complete Section 2.1 if you intend to use of storage allowances for out-wintering or bedding livestock.
- Complete Section 2.2 and Section 2.3.
- Transfer the relevant figures from Section 2.2 to Section 2.3 as directed.
- Only complete Section 2.4 if you produce poultry litter on your farm.

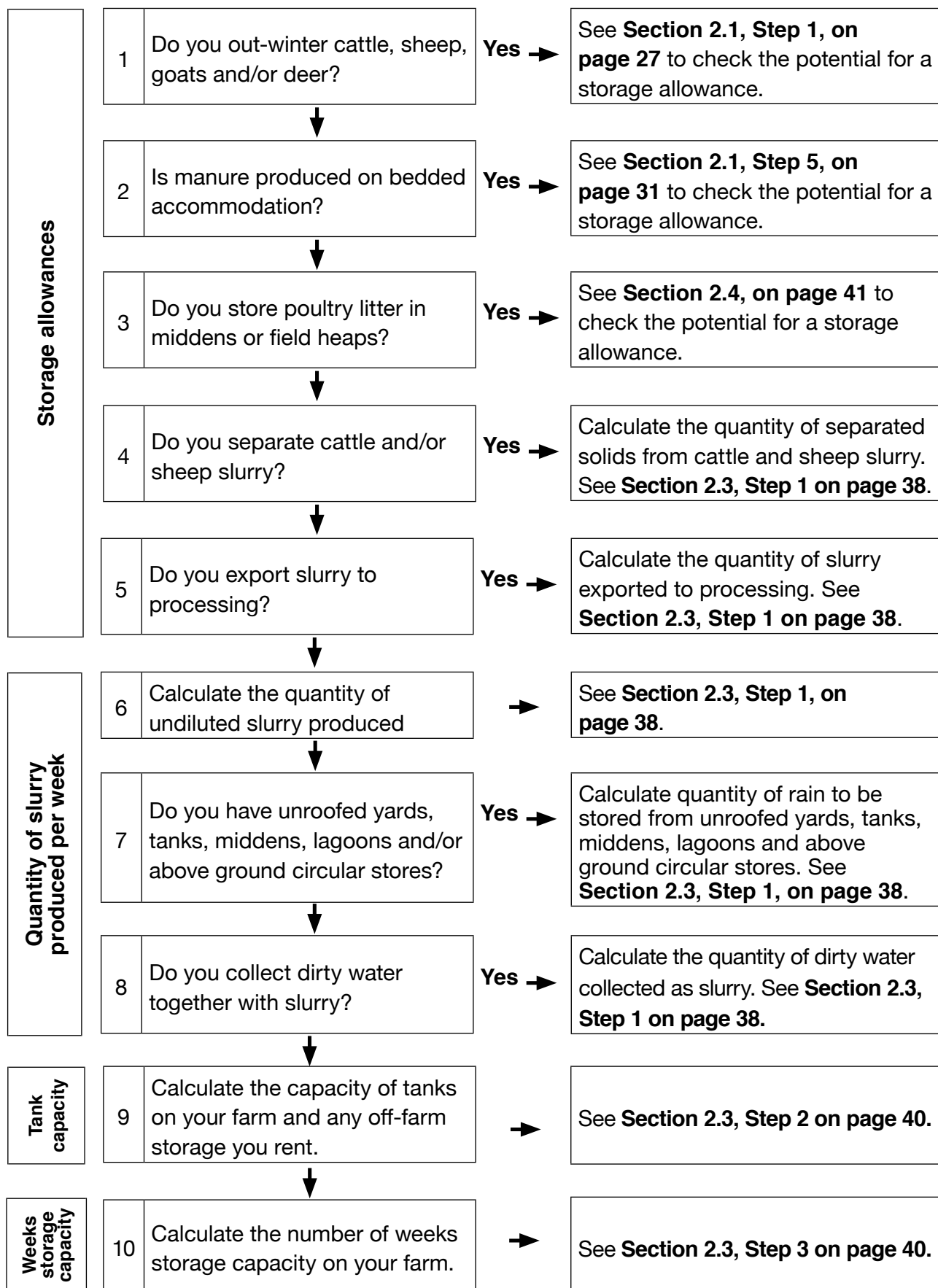
Alternatively, you can access the 'Manure Storage Calculator' at:

www.daera-ni.gov.uk/online-services

Section 2 - Calculating Livestock Manure Storage Capacity

Refer to Section 8 of the NAP 2019-2022 Regulations Guidance Booklet for additional information.

The process to calculate the livestock manure storage on your farm is outlined below.



Section 2.1 - Allowances when calculating storage requirements

Allowances may be made for manure produced from animals which:

- are out-wintered (Steps 1-4); or
- on bedded accommodation (Step 5).

Refer to Section 8.1 of NAP 2019-2022 Regulation Guidance Booklet for additional information.

Step 1: Allowances for out-wintered livestock

1. Check potential to make a storage allowance for out-wintered livestock in Table 1 below. Refer to your nitrogen (N) loading calculation for your annual loading kg N per ha per year (stocking rate).

Table 1

Livestock type	Annual stocking rate (kg N per ha per year)
Sheep, deer and goats	Must be below 170 kg
Cattle only (excluding dairy cows)	Must be below 140 kg
Cattle and sheep, deer and goats	Must be below 140 kg

If you do not meet the annual stocking rate limit, you cannot avail of storage allowances for out-wintered livestock and these livestock must be included when calculating storage requirements.

If you meet the annual stocking rate limit, continue by completing Worksheets A and B.

Section 2 - Calculating Livestock Manure Storage Capacity

Step 2: Calculate the stocking rate on the out-wintered area by completing Worksheets A and B

Worksheet A

(Only complete this table if you keep these livestock).

An accurate record of cattle type and numbers kept each year can be obtained using the 'Nitrate Stock Count' function on APHIS Online, which you can access at:

www.daera-ni.gov.uk/online-services

1. Enter the average number of cattle (excluding dairy cows) and/or sheep on the farm over the winter period (Feb, Oct, Dec).
2. Multiply the average number over the winter by the N produced per head per year.
3. Total the N produced and insert in Box A. **Transfer your answer to Box A on page 30.**

Livestock type	Average over winter		N produced per head per year		N produced (kg N)
Cattle	No.	x	kg N	=	Answer
Suckler cows		x	52	=	
Cattle (over 2 years)		x	45	=	
Cattle (1-2 years)		x	39	=	
Breeding bull		x	52	=	
Beef calves:					
to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
0-1 year		x	19	=	
OR					
6-12 months		x	12	=	
0-6 months		x	7	=	
Sheep	No.	x	kg N	=	Answer
Ewe (over 1 year)		x	9	=	
Ram (over 1 year)		x	9	=	
Lambs:					
to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
0-1 year		x	4.4	=	
OR					
6-12 months		x	3.2	=	
0-6 months		x	1.2	=	
Total livestock manure N produced by out-wintered cattle and sheep				=	(A)

Worksheet B

(Only complete this table if you keep these livestock).

1. Enter the average number of deer and goats on the farm over the winter period (Feb, Oct and Dec).
2. Multiply the average number over the winter by the N produced per head per year.
3. Total the N produced and insert in Box B. **Transfer your answer to Box B on page 30.**

Livestock type	Average over winter		N produced per head per year		N produced (kg N)
Deer	No.	x	kg N	=	Answer
Deer (red) over 2 years		x	15	=	
Deer (red) 6 months-2 years		x	12	=	
Deer (fallow) over 2 years		x	13	=	
Deer (fallow) 6 months-2 years		x	7	=	
Deer (sika) over 2 years		x	10	=	
Deer (sika) 6 months-2 years		x	6	=	
Goats	No.	x	kg N	=	Answer
Milking goat		x	15	=	
Non-milking goat		x	9	=	
Kids: to prevent the same animal being counted twice use either "0-1 year" OR "0-6 months" and/or "6-12 months" categories.					
0-1 year		x	4.4	=	
OR					
6-12 months		x	3.2	=	
0-6 months		x	1.2	=	
Total livestock manure N produced by out-wintered deer and goats (kg N)				=	(B)

Section 2 - Calculating Livestock Manure Storage Capacity

Step 3: - Transfer the answers from the relevant tables as directed below

Livestock manure N from out-wintered cattle and sheep (kg N)	A		Complete Worksheet A on page 28 to calculate this figure.
	+	+	
Livestock manure N from out-wintered deer and goats (kg N)	B		Complete Worksheet B on page 29 to calculate this figure.
	=	=	
Total livestock manure N from out-wintered cattle, sheep and deer and goats (kg N) (A + B)	C		Total the N produced by out-wintered cattle, sheep, deer and goats.
	÷	÷	
Out-wintered eligible land area (ha)	D		Enter the eligible area of land used for out-wintering cattle, sheep, deer and goats.
	=	=	
Stocking rate on out-wintered area (kg N per ha) (C ÷ D)	E		Divide the total N produced by out-wintered livestock (C) by the area of land used (D). See Table 4 below to check if you can avail of storage allowances for out-wintered livestock.

Step 4: Can I avail of the out-wintering allowance?

Livestock type	Stocking rate limit on out-wintered area (kg N per ha)
Sheep, deer and goats	Must be below 130 kg N per ha
Cattle only	Must below 85 kg N per ha
Cattle, sheep, deer and goats	If N from cattle is more than N from sheep/deer and goats the stocking rate must be below 85 kg N per ha
Cattle, sheep, deer and goats	If N from cattle is less than N from sheep/deer and goats the stocking rate must be below 130 kg N per ha

If you are below the out-wintered stocking rate limit(s) you can avail of storage allowances for out-wintered livestock and these livestock can be excluded when calculating storage requirements.

If you do not meet the out-wintered stocking rate limit(s) you cannot avail of storage allowances for out-wintered livestock and these livestock must be included when calculating storage requirements.

Step 5: Allowances for livestock on bedded accommodation

The quantity of slurry produced from animals housed in bedded accommodation and collected as farmyard manure, for the 22-week period, does not need to be taken into account when calculating a farm's slurry storage capacity provided that the conditions outlined in **Section 8.1** of the Nutrients Action Programme 2019-2022 Guidance Booklet are met.

Complete Worksheet F if you wish to discount manure produced by livestock in bedded accommodation from the calculation of your farm's storage requirements:

Worksheet F

1. Enter the average number of livestock to be bedded on the farm over the winter period.

Livestock type	Average over winter
Cattle	No.
Dairy cow	
Suckler cow	
Cattle over 2 years	
Cattle 1-2 years	
Calves 6 months - 1 year	
Calves 0 - 6 months	
Sheep	
Ewe/ram (over 1 year)	
Lamb (6-12 months)	
Lamb (0-6 months)	
Deer	No.
Deer (red) over 2 years	
Deer (red) 6 months - 2 years	
Deer (fallow) over 2 years	
Deer (fallow) 6 months - 2 years	
Deer (sika) over 2 years	
Deer (sika) 6 months - 2 years	
Goats	No.
Goat	
Kid	
Pigs	No.
Pigs	

Section 2.2 - Manure storage worksheets

Worksheets G and H: Calculate quantity of undiluted slurry produced per week

1. Enter the average number of livestock kept on the farm over the winter period (Feb, Oct & Dec). Exclude livestock numbers if they meet the out-wintering and/or bedded eligibility (to calculate the allowances refer to **Section 2.1 which begins on page 27**). For pigs and poultry, enter the average number on the unit.
2. Multiply the average number over the winter period by the quantity of slurry produced per animal per week.
3. Total the quantity of slurry produced by cattle and sheep insert in Box G.
Transfer your answer to Section 2.3, Box G on page 38.
4. Total the quantity of slurry produced by pigs and poultry and insert in Box H.
Transfer your answer to Section 2.3, Box H on page 38.

Livestock type	Average over winter		Slurry per animal per week		Slurry produced per week (m ³ per week)
Cattle	No.		m³		Answer
Dairy cow		x	0.37	=	
Suckler cow		x	0.23	=	
Cattle over 2 years		x	0.23	=	
Cattle 1-2 years		x	0.18	=	
Calves 6 months - 1 year		x	0.09	=	
Calves 0-6 months		x	0.05	=	
Sheep	No.	x	m³	=	Answer
Adult ewe/ram		x	0.03	=	
Fattening lamb		x	0.01	=	
Total quantity undiluted cattle and sheep slurry per week (m³ per week)				=	(G)

Section 2 - Calculating Livestock Manure Storage Capacity

Livestock type ¹	Average number on unit ³		Slurry per animal per week		Slurry produced per week (m ³ per week)
Pig	No.	x	m³	=	Answer
Maiden gilt		x	0.05	=	
Dry/lactating sows ² /served gilts		x	0.08	=	
Weaners (stage 1) 7-18 kg		x	0.01	=	
Grower (stage 2) 18-35 kg		x	0.02	=	
Finisher dry fed (stage 3) 35-105 kg		x	0.03	=	
Finisher liquid fed (stage 3) 35-105 kg		x	0.05	=	
Poultry	No.	x	m³	=	Answer
1,000 laying hens		x	0.81	=	
1,000 ducks		x	0.81	=	
Total quantity undiluted pig and poultry slurry per week (m³ per week)				=	(H)

¹ The standard figure for slurry production does not include water for cleaning buildings.

² Lactating sow figure includes suckling pigs.

³ Average number on the unit at any one time.

Section 2 - Calculating Livestock Manure Storage Capacity

Worksheet I: Calculate quantity of rainfall falling on yards where slurry is produced plus the quantity of rainfall entering unroofed tanks per week

1. Enter the dimensions of the yards and/or tanks and multiply them by the rainfall per week.
2. Total the quantity of rainfall mixed with slurry produced by cattle and sheep and insert in Box I. Transfer your answer to **Section 2.3, Box I on page 38**.
3. Total the quantity of rainfall mixed with slurry produced by pigs and poultry and insert in Box J. Transfer your answer to **Section 2.3, Box J on page 38**.

Rainfall falling on unroofed yards where slurry is produced						
Area	Description	Length (m)	Breadth (m)	Rainfall per week ¹ (m)	Quantity (cattle & sheep) (m ³)	Quantity (pigs & poultry) (m ³)
		l	b	R	l x b x R	l x b x R
1				0.025		
2				0.025		
3				0.025		
4				0.025		
5				0.025		
6				0.025		
7				0.025		
8				0.025		

Rainfall entering unroofed rectangular tanks, unroofed middens and earth bank lagoons						
Area	Description	Length (m)	Breadth (m)	Rainfall per week ¹ (m)	Quantity (cattle & sheep) (m ³)	Quantity (pigs & poultry) (m ³)
		l	b	R	l x b x R	l x b x R
1				0.025		
2				0.025		
3				0.025		
4				0.025		
5				0.025		

Rainfall entering unroofed above ground circular stores						
Area	Description	Radius (m)	Rainfall per week ¹ (m)	Quantity (cattle & sheep) (m ³)	Quantity (pigs & poultry) (m ³)	
		r	R	(r x r x 3.14 x R)	(r x r x 3.14 x R)	
1			0.025			
2			0.025			
3			0.025			
4			0.025			

Total quantity of rainfall collected as slurry per week (m³)				(I)	(J)
--	--	--	--	------------	------------

¹ Rainfall per week is the Northern Ireland average over the winter months (October-March).

Worksheet K: Calculate the total quantity of clean and dirty water collected with slurry per week

1. Enter the dimensions of clean yards and/or roofs where rainfall drains to slurry tanks and multiply them by the rainfall per week (Table K1).
2. Enter the dimensions of areas where dirty water is produced and multiply them by the rainfall per week (Table K2).
3. Total the quantity of clean and dirty water collected with slurry produced by cattle and sheep and insert in Box K (Table K3). Transfer your answer to **Section 2.3, Box K on page 38**.
4. Total the quantity of clean and dirty water collected with slurry produced by pigs and poultry and insert in Box L (Table K3). Transfer your answer to **Section 2.3, Box L on page 38**.

Table K1 - Water from clean yards and roofs entering tanks						
Area	Description	Length (m)	Breadth (m)	Rainfall per week ¹ (m)	Quantity (cattle & sheep) (m ³)	Quantity (pigs & poultry) (m ³)
		l	b	R	l x b x R	l x b x R
1				0.025		
2				0.025		
3				0.025		
4				0.025		
Table K1 - Total						

Table K2 - Surface run-off from open silos/other areas producing dirty water						
Area	Description	Length (m)	Breadth (m)	Rainfall per week ¹ (m)	Quantity (cattle & sheep) (m ³)	Quantity (pigs & poultry) (m ³)
		l	b	R	l x b x R	l x b x R
1				0.025		
2				0.025		
3				0.025		
4				0.025		
5				0.025		
Table K2 - Total						

Section 2 - Calculating Livestock Manure Storage Capacity

Table K3 - Washings (dirty water)					
				Volume (cattle & sheep) (m ³)	Volume (pigs & poultry) (m ³)
Dairy parlour washings ² (m ³)	No. of cows -----	x	0.13		n/a
Building washings - cattle ⁵ (excludes parlour washings)	Insert actual quantity of water used per week.				n/a
Building washings - poultry ³	No. of batches ----- X Floor area ----- m ²	x	0.007	n/a	
Building washings - pigs ⁴	No. of pigs moved out of pens/week -----	x	0.002	n/a	
Table K3 - Total					
Total from Table K1 (clean water entering tanks)					
Total from Table K2 (dirty water entering tanks)					
Total quantity of clean and dirty water collected with slurry per week (m³) (Table K1 + Table K2 + Table K3)				(K)	(L)

¹ Rainfall per week is the Northern Ireland average over the winter months (October-March).

² For quantity of dairy parlour washings use 0.13 m³ per cow per week. If your milking plant is significantly different use the actual amount.

³ For poultry house washings use 6.8 litres (0.007 m³) per m² per batch. If your washing system is significantly different use your own actual figures.

⁴ For pig house washings, use 1.8 litres (0.002 m³) per pig moved out of pens. If your washing system is significantly different use your own actual figures.

⁵ For cattle and sheep house washings, use your own actual figures.

Worksheet M: Calculate the total quantity of separated solids from slurry per week
(Only complete this table if you separate cattle or sheep slurry).

1. Enter the type of slurry separated (cattle and sheep only).
2. Enter the quantity of this slurry type produced per week. (Refer to **Worksheet G, page 32** for the relevant figure).
3. Multiply the quantity by the % reduction figure. The maximum volume reduction allowed is 20%.
4. Total quantity of separated slurry per week and insert in Box M. **Transfer your answer to Section 2.3, Box M on page 38.**

Slurry Type	Quantity of slurry separated per week		% reduction by separation		Reduction in volume
	m ³	x	%	=	m ³
		x		=	
		x		=	
		x		=	
		x		=	
Total quantity of separated solids per week (m ³)				=	(M)

Worksheet N: Calculate the total volume of slurry exported to processing per week

1. Enter the type of slurry exported to processing.
2. Enter the quantity of slurry produced and exported over the winter period. Divide by 22 for cattle and sheep slurry, and 26 for pig and poultry slurry, to calculate the quantity exported per week.
3. Total the quantity produced by cattle and sheep and insert in Box N.
Transfer your answer to **Section 2.3, Box N on page 38.**
4. Total the quantity produced by pigs and poultry and insert in Box O.
Transfer your answer to **Section 2.3, Box O on page 38.**

Slurry Type	Quantity of slurry exported	÷22 or ÷ 26		Quantity of cattle & sheep slurry exported per week	Quantity of pig & poultry slurry exported per week
	m ³		=	m ³	m ³
		÷ 22 or ÷ 26	=		
		÷ 22 or ÷ 26	=		
		÷ 22 or ÷ 26	=		
		÷ 22 or ÷ 26	=		
		÷ 22 or ÷ 26	=		
Total quantity of slurry exported to processing per week (m ³)				(N)	(O)

Section 2.3 - Manure storage capacity calculation

Step 1: Volume of slurry produced per week

Enter the quantity of slurry and dirty water collected as slurry produced on the farm in the relevant boxes.

Quantity produced per week (m ³)	Cattle & sheep	Pigs & poultry
--	----------------	----------------

Undiluted slurry produced*	G	H
	+	+

Complete Section 2.2, Worksheets G and H on **pages 32 and 33** to calculate figure.

Rain on yards where slurry is produced and rain entering open tanks	I	J
	+	+

Complete Section 2.2, Worksheet I on **page 34** to calculate figure.

Clean and dirty water collected with slurry	K	L
	-	-

Complete Section 2.2, Worksheet K on **pages 35 and 36** to calculate figure.

Reduction in volume from cattle and sheep slurry	M
	-

Complete Section 2.2, Worksheet M on **page 37** to calculate figure.

Slurry exported to processing	N	O
	=	=

Complete Section 2.2, Worksheet N on **page 37** to calculate figure.

Total quantity of slurry produced per week (m ³)	P	Q
--	---	---

* Remember you may be able to make allowances for slurry/manure produced from animals which are:

- out-wintered; and/or
- on bedded accommodation.

See **Section 2.1, page 27** for additional information.

Worksheet R: Calculate the storage capacity of rectangular tanks, earth bank lagoons and above ground stores

1. Enter the dimensions of tanks, lagoons and above ground stores and multiply them to determine the capacity. Include any off-farm storage you rent and keep a written record of your rental agreement.
2. Total the capacity for cattle and sheep and insert in Box R. Transfer your answer to **Section 2.3, Step 2, Box R on page 40.**
3. Total the capacity for pigs and poultry and insert in Box S. Transfer your answer to **Section 2.3, Step 2, Box S on page 40.**

Storage capacity of rectangular tanks, and concrete lagoons						
Area	Description	Length (m)	Breadth (m)	Adjusted depth (depth-freeboard)* (m)	Capacity - cattle & sheep (m ³)	Capacity - pigs & poultry (m ³)
		l	b	h	l x b x h	l x b x h
1						
2						
3						
4						
5						
6						
7						
8						
Storage capacity of earth bank lagoons						
1						
2						
3						
4						
Storage capacity of above ground circular stores						
Area	Description	Radius (m)	Adjusted depth (depth-freeboard)* (m)	Capacity - cattle & sheep (m ³)	Capacity - pigs & poultry (m ³)	
		r	h	r x r x 3.14 x h	r x r x 3.14 x h	
1						
2						
3						
4						
Total capacity of tanks, lagoons and stores (m³)				(R)	(S)	

* Mandatory freeboard allowances are at least 750 mm for earth bank lagoons and 300 mm for all other slurry stores. This is not a legal requirement for facilities completed before 1 December 2003 (unless they have been substantially modified).

Section 2 - Calculating Livestock Manure Storage Capacity

Step 2: Tank capacity

To calculate the information required for Step 2, complete **worksheet R on page 36** and transfer your answer to the relevant box(es) below.

	Cattle & sheep	Pigs & poultry
Storage capacity of tanks, stores and lagoons on the farm (m ³)	R	S

Transfer answer from Worksheet R, on **page 39**.

Step 3: Weeks storage Capacity

Divide the total storage capacity of tanks, stores and lagoons by the quantity of slurry and dirty water to be collected per week.

	Cattle & sheep	Pigs & poultry
Storage capacity of tanks, stores and lagoons on the farm	R	S

Transfer answer, from Step 2 above.

Total quantity of slurry and dirty water to be collected per week (m ³)	P	Q

Transfer answer, from Step 1 on **page 38**

Weeks storage capacity	T	U

Do you have enough storage? See table below.

Do you have enough storage?

Livestock Type		Weeks storage required
Cattle and sheep		22
Pigs	- less than 10 breeding sow places or 150 finishing pig places	22
	- more than 10 breeding sow places or 150 finishing pigs places	26
Poultry - more than 500 poultry places		26
Mixed enterprise - pig/poultry and other livestock		22 (other livestock) 26 (pigs/poultry)

Section 2.4 - Poultry litter production and storage worksheet and calculation

The quantity of poultry litter produced which is stored in a midden or field heap does not need to be taken into account when calculating a farm's slurry storage capacity provided that the conditions outlined in **Section 8.3** of the Nutrients Action Programme 2019-2022 Guidance Booklet are met.

Complete the following if you wish to calculate how much storage capacity you require for poultry litter.

Worksheet V: Quantity of poultry litter produced per week

1. Enter the average number of birds on the unit at any one time.
2. Multiply the average number by the quantity of manure produced per 1,000 birds per week.
3. Total the quantity of litter produced and insert in Box V. Transfer your answer to **Table 2 Box V on page 42.**

Livestock Type	Average number on the unit		Quantity of litter produced per week		Total quantity of litter produced per week
	No.	x	t	=	t
1,000 broilers conventional and litter		x	0.17	=	
1,000 broilers hot water heating and litter		x	0.14	=	
1,000 free range broilers		x	0.24	=	
1,000 broiler breeders 0-18 weeks		x	0.16	=	
1,000 broiler breeders 18-60 weeks		x	0.33	=	
1,000 broiler breeders 0-60 weeks		x	0.28	=	
1,000 replacement pullets		x	0.13	=	
1,000 layers		x	0.73	=	
1,000 free range layers		x	0.28	=	
1,000 turkeys (0-6 weeks) and litter		x	1.38	=	
1,000 turkeys (6 weeks-kill) and litter		x	1.38	=	
1,000 turkeys (0-kill) and litter		x	1.38	=	
1,000 ducks		x	2.02	=	
Total quantity of poultry litter produced per week (t)				=	(V)

Section 2 - Calculating Livestock Manure Storage Capacity

Worksheet W: Calculate the total quantity of poultry litter exported to processing per week

1. Enter the type of poultry litter exported to processing.
2. Enter the quantity of poultry litter produced and exported over the winter period and divide by 26 to calculate the quantity exported per week.
3. Total the quantity exported and insert in Box W. **Transfer your answer to Table 2 Box W below.**

Manure Type	Quantity of litter exported over the winter period			Total quantity of poultry litter exported per week
	No.	÷ 26	=	t
		÷ 26	=	
		÷ 26	=	
		÷ 26	=	
Total quantity of poultry litter exported to processing per week (t)			=	(W)

Table 2: Calculate the quantity of poultry litter requiring storage

Total quantity of poultry litter produced per week (t)	V	
--	---	--

- -

Transfer answer from, Worksheet V, **page 41**.

Total quantity of poultry litter exported to process per week (t)	W	
---	---	--

= =

Transfer answer from, Worksheet W, above.

Total quantity of poultry litter requiring storage per week (t) (V - W)	X	
---	---	--

Note: NIEA must be notified if poultry litter is to be stored in a field heap. NIEA can be informed by emailing: agricultural.regulation@daera-ni.gov.uk

Section 3 - Calculating nitrogen (N) applications for grassland

Only complete this table if you have grassland. In contrast to other crops, N from livestock manures does not need to be taken into consideration (an allowance for their use is already made in the calculation). N from any other organic manures used must be included.

If total chemical N applied to the whole grassland area is less than 60 kg N per ha this indicates extensively managed grassland. Further explanation of extensively managed grassland can be found in Section 7 of the NAP Guidance Booklet 2019-22

Column (A)	Enter the total area of grassland.
Column (B)	Enter the maximum N limit for your grassland area.
Column (C)	Enter the type(s) of organic manure, not including livestock manure , to be applied.
Column (D)	Enter in the amount of this organic manure to be applied to the grassland area.
Column (E)	Enter the available N content of these organic manures (per m ³ or tonne of manure) by calculating 40% of the total N content (i.e. multiplying by 0.4) (Annex G of the NAP 2019-2022 Regulations Guidance Booklet; total N content should be provided by producer or waste transfer note/copy of exemption from waste management licensing). For example, sewage sludge with a total N content of 3 kg N per m ³ has 1.2 kg available N per m ³ .
Column (F)	Multiply columns (D) and (E) to give total amount of available N to be applied in organic manures.
Column (G)	Enter the type(s) of chemical fertiliser to be applied on grassland during the year.
Column (H)	Enter the total amount of chemical fertiliser product to be applied for each fertiliser type.
Column (I)	Calculate the amount of N to be applied for all types of chemical fertiliser. For example if 25,000 kg of 27:0:0 is to be applied, kg of N to be applied = $27 \times 25,000 \div 100 = 6,750$ kg of N.
Column (J)	Divide total in (I) by whole area of grassland (A). Application less than 60 kg N indicates extensively managed grassland.
Column (K)	Add column (F) and (I) to give total N to be applied.
Column (L)	Divide total in (K) by whole area of grassland (A). Application to be less than requirement in column (B).

Nitrogen (N) application to grassland worksheet											
Crop details		Organic manure excluding livestock manures (for example sewage sludge)				Chemical N fertiliser			Total Chemical N fertiliser to be applied per ha (kg) Total (I) ÷ (A)	Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Area of grassland on the farm (ha)	N limit for grassland (kg per ha)	Type of manure	Total amount of manure to be applied to whole area of grass (m³ or t)	Amount of available N (kg per m³ or t) Annex G*	Total amount of available N to be applied to whole area of grass (kg) (D) x (E)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to whole area (kg)	Total amount of N from fertiliser to be applied to whole area (kg)		Total amount of N to be applied to whole area (kg) (F) + (I)	Total (K) ÷ (A)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)**	(K)	(L)
	Dairy: 272										
	Other livestock: 222										
	(If chemical N less than 60 extensively managed)										
							Total				

* Refers to **Annex G** in the NAP 2019-2022 Guidance Booklet.

** Grassland receiving less than 60 kg N per ha per year as chemical nitrogen fertiliser applied to the entire grassland area or with a manure N loading of less than 120 kg N per ha year is defined as extensively managed grassland, further detail is provided in the NAP 2019-2022 Guidance Booklet.

Nitrogen (N) application to grassland worksheet											
Crop details		Organic manure excluding livestock manures (for example sewage sludge)				Chemical N fertiliser			Total Chemical N fertiliser to be applied per ha (kg) Total (I) ÷ (A)	Organic and chemical N fertiliser	Total N to be applied per ha (kg) Total (K) ÷ (A)
Area of grassland on the farm (ha)	N limit for grassland (kg per ha)	Type of manure	Total amount of manure to be applied to whole area of grass (m³ or t)	Amount of available N (kg per m³ or t) Annex G*	Total amount of available N to be applied to whole area of grass (kg) (D) x (E)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to whole area (kg)	Total amount of N from fertiliser to be applied to whole area (kg)		Total amount of N to be applied to whole area (kg) (F) + (I)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)**	(K)	(L)
	Dairy: 272										
	Other livestock: 222										
	(If chemical N less than 60 extensively managed)										
							Total				

* Refers to **Annex G** in the NAP 2019-2022 Guidance Booklet.

** Grassland receiving less than 60 kg N per ha per year as chemical nitrogen fertiliser applied to the entire grassland area or with a manure N loading of less than 120 kg N per ha year is defined as extensively managed grassland, further detail is provided in the NAP 2019-2022 Guidance Booklet.

Nitrogen (N) application to grassland worksheet											
Crop details		Organic manure excluding livestock manures (for example sewage sludge)				Chemical N fertiliser			Total Chemical N fertiliser to be applied per ha (kg) Total (I) ÷ (A)	Organic and chemical N fertiliser	Total N to be applied per ha (kg) Total (K) ÷ (A)
Area of grassland on the farm (ha)	N limit for grassland (kg per ha)	Type of manure	Total amount of manure to be applied to whole area of grass (m ³ or t)	Amount of available N (kg per m ³ or t) Annex G*	Total amount of available N to be applied to whole area of grass (kg) (D) x (E)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to whole area (kg)	Total amount of N from fertiliser to be applied to whole area (kg)		Total amount of N to be applied to whole area (kg) (F) + (I)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)**	(K)	(L)
	Dairy: 272										
	Other livestock: 222										
	(If chemical N less than 60 extensively managed)										
							Total				

* Refers to **Annex G** in the NAP 2019-2022 Guidance Booklet.

** Grassland receiving less than 60 kg N per ha per year as chemical nitrogen fertiliser applied to the entire grassland area or with a manure N loading of less than 120 kg N per ha year is defined as extensively managed grassland, further detail is provided in the NAP 2019-2022 Guidance Booklet.

Section 4 - Calculating nitrogen (N) applications for arable crops (excluding N-max crops and grass)

Only complete this table if you grow crops other than grass or winter/spring wheat, barley or oats. In contrast to grassland all organic manures must be taken into consideration, including livestock manures.

Column (A)	Enter crop type from Annex H of the NAP 2019-2022 Guidance Booklet.
Column (B)	For each crop area on the farm with the same cropping history enter the soil nitrogen supply (SNS) index as determined in Annex H of the NAP 2019-2022 Guidance Booklet.
Column (C)	Enter the area to be grown for each crop type with the same cropping history.
Column (D)	Enter the maximum N limit for each crop area (Annex H of the NAP 2019-2022 Guidance Booklet) taking into consideration the SNS index stated in column B.
Column (E)	Enter the type(s) of organic manure, including livestock manure , to be applied.
Column (F)	Enter in the amount of manure to be applied.
Column (G)	Enter the available N content (per m ³ or tonne of manure) of the manure to be applied (Annex G of the NAP 2019-2022 Regulations Guidance Booklet).
Column (H)	Multiply columns (E) and (F) to give total amount of available N to be applied in organic manures.
Column (I)	Enter the type(s) of chemical fertiliser to be applied.
Column (J)	Enter the total amount of chemical fertiliser product to be applied for each fertiliser type.
Column (K)	Total up the amount of N to be applied for all types of chemical fertiliser applied. For example, if the type of fertiliser to be applied was 27:0:0, this contains 27% N. If 1,600 kg is to be applied per ha, then the amount of N would be $27 \times 1,600 \div 100 = 432$ kg of N.
Column (L)	Add column (H) and (K) to give total N to be applied to the area.
Column (M)	Divide total in (L) by area of crop (C). Application to be less than requirement in column (D).

Nitrogen (N) applications to arable crops (excluding N-max crops and grass) worksheet												
Crop details				Organic manure including livestock manures				Chemical N fertiliser			Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Crop	SNS	Total area of crop (ha)	Crop N require- ment (kg per ha) Annex H*	Type of manure	Total amount of manure to be applied to field(s) (m ³ or t)	Amount of available N (kg per m ³ or t) Annex G*	Total amount of available N to be applied to field(s) (kg) (F) x (G)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to field(s) (kg)	Total amount of N from fertiliser to be applied to field(s) (kg)	Total amount of N to be applied to field(s) (kg) (H) + (K)	Total (L) ÷ (C)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)

* Refers to **Annexes H and G** in the NAP 2019-2022 Guidance Booklet.

Nitrogen (N) applications to arable crops (excluding N-max crops and grass) worksheet												
Crop details				Organic manure including livestock manures				Chemical N fertiliser			Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Crop	SNS	Total area of crop (ha)	Crop N require- ment (kg per ha) Annex H*	Type of manure	Total amount of manure to be applied to field(s) (m ³ or t)	Amount of available N (kg per m ³ or t) Annex G*	Total amount of available N to be applied to field(s) (kg) (F) x (G)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to field(s) (kg)	Total amount of N from fertiliser to be applied to field(s) (kg)	Total amount of N to be applied to field(s) (kg) (H) + (K)	Total (L) ÷ (C)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)

* Refers to **Annexes H and G** in the NAP 2019-2022 Guidance Booklet.

Nitrogen (N) applications to arable crops (excluding N-max crops and grass) worksheet												
Crop details				Organic manure including livestock manures				Chemical N fertiliser			Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Crop	SNS	Total area of crop (ha)	Crop N require- ment (kg per ha) Annex H*	Type of manure	Total amount of manure to be applied to field(s) (m ³ or t)	Amount of available N (kg per m ³ or t) Annex G*	Total amount of available N to be applied to field(s) (kg) (F) x (G)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to field(s) (kg)	Total amount of N from fertiliser to be applied to field(s) (kg)	Total amount of N to be applied to field(s) (kg) (H) + (K)	Total (L) ÷ (C)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)

* Refers to **Annexes H and G** in the NAP 2019-2022 Guidance Booklet.

Section 5 - Calculating nitrogen (N) applications for N-max crops

Refer to Section 6.2 of the NAP 2019-2022 Guidance Booklet for additional information

Only complete this table if you grow winter/spring wheat, barley or oats. In contrast to grassland all organic manures must be taken into consideration including livestock manures.

Column (A)	Enter crop type - either winter/spring wheat, barley and/or oats.
Column (B)	Enter the total area for each crop type to be grown.
Column (C)	Enter the maximum N limit for each crop area as per the N-max limit for crop requirement (Annex I of the NAP 2019-2022 Guidance Booklet) including any adjustment for yield.
Column (D)	Enter the type(s) of organic manure, including livestock manure , to be applied.
Column (E)	Enter in the amount of manure to be applied.
Column (F)	Enter the available N content (per m ³ or tonne of manure) of the manure to be applied (Annex G of the NAP 2019-2022 Guidance Booklet).
Column (G)	Multiply columns (E) and (F) to give total amount of available N to be applied in organic manures.
Column (H)	Enter the type(s) of chemical fertiliser to be applied.
Column (I)	Enter the total amount of chemical fertiliser product to be applied for each fertiliser type(s).
Column (J)	Total up the amount of N to be applied for all type(s) of chemical fertiliser applied. For example if 1,600 kg of 27:0:0 is to be applied, kg of N to be applied = $27 \times 1,600 \div 100 = 432$ kg of N.
Column (K)	Add column (G) and (J) to give total N to be applied to the area.
Column (L)	Divide total in (K) by area of crop (B). Application to be less than requirement in column (C).

Nitrogen (N) applications to N-max crops worksheet											
Crop details			Organic manure including livestock manures				Chemical N fertiliser			Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Crop	Total area of crop (ha)	Crop N-max require- ment (kg per ha)	Type of manure	Total amount of manure to be applied to field(s) (m ³ or t)	Amount of available N (kg per m ³ or t)	Total amount of available N to be applied to field(s) (kg)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to field(s) (kg)	Total amount of N from fertiliser to be applied to field(s) (kg)	Total amount of N to be applied to field(s) (kg)	Total (K) ÷ (B)
		Annex I*			Annex G*	(E) x (F)				(G) + (J)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes I and G** in the NAP 2019-2022 Guidance Booklet.

Nitrogen (N) applications to N-max crops worksheet											
Crop details			Organic manure including livestock manures				Chemical N fertiliser			Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Crop	Total area of crop (ha)	Crop N-max require- ment (kg per ha) Annex I*	Type of manure	Total amount of manure to be applied to field(s) (m ³ or t)	Amount of available N (kg per m ³ or t) Annex G*	Total amount of available N to be applied to field(s) (kg) (E) x (F)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to field(s) (kg)	Total amount of N from fertiliser to be applied to field(s) (kg)	Total amount of N to be applied to field(s) (kg) (G) + (J)	Total (K) ÷ (B)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes I and G** in the NAP 2019-2022 Guidance Booklet.

Nitrogen (N) applications to N-max crops worksheet											
Crop details			Organic manure including livestock manures				Chemical N fertiliser			Organic and chemical N fertiliser	Total N to be applied per ha (kg)
Crop	Total area of crop (ha)	Crop N-max require- ment (kg per ha)	Type of manure	Total amount of manure to be applied to field(s) (m ³ or t)	Amount of available N (kg per m ³ or t)	Total amount of available N to be applied to field(s) (kg)	Type of N fertiliser to be applied	Total amount of fertiliser product to be applied to field(s) (kg)	Total amount of N from fertiliser to be applied to field(s) (kg)	Total amount of N to be applied to field(s) (kg)	Total (K) ÷ (B)
		Annex I*			Annex G*	(E) x (F)				(G) + (J)	
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes I and G** in the NAP 2019-2022 Guidance Booklet.

Section 6 - Calculating phosphate (P₂O₅) applications for grassland and all other crops

Only complete this table if you plan to apply chemical phosphate (P₂O₅) fertiliser, sewage sludge, organic manures applied to land under a Waste Management licence or exemption (e.g. abattoir waste), from 2017 P-rich manures or, from 2020 anaerobic digestate.

1. All organic manures, **including livestock manures**, must be taken into consideration.
2. The values for available P₂O₅ content of organic manures vary depending on soil phosphorus (P) index and crop type.
3. The P₂O₅ content of chemical fertilisers is taken to be 100% available.
4. You will require a current soil analysis and if applying anaerobic digestate a nutrient content analysis.
5. When applying nutrients to grass or crops remember to consider all nutrients such as potash and sulphur.

Column (A)	Enter the crop to be grown. A list of the main crops and their requirements are listed in Annex J of the NAP 2019-2022 Guidance Booklet.
Column (B)	Enter area of field.
Column (C)	Enter soil P index from soil analysis if available. (If not available then assume an index of 2+ for grass or 2 for all other crops).
Column (D)	According to the soil P index from soil analysis results enter the P ₂ O ₅ requirement for the crop in kg per ha from Annex J of the NAP 2019-2022 Guidance Booklet.
Column (E)	Enter the type(s) of organic manure, including livestock manure , to be applied.
Column (F)	Enter in the amount of manure to be applied in m ³ or tonnes.
Column (G)	Enter the available P ₂ O ₅ content (per m ³ or tonne of manure) of the manure to be applied (Annex G of the NAP 2019-2022 Regulations Guidance Booklet).
Column (H)	Multiply columns (F) and (G) to give total amount of available P ₂ O ₅ to be applied in organic manures.
Column (I)	Enter the type of chemical fertiliser to be applied.
Column (J)	Enter the amount of chemical fertiliser to be applied per ha.
Column (K)	Enter the amount of chemical P ₂ O ₅ to be applied. For example type of fertiliser to be applied was 27:6:12, this contains 6% P ₂ O ₅ . If 300 kg is to be applied per ha then the amount of P ₂ O ₅ would be $6 \times 300 \div 100 = 18$ kg per ha.
Column (L)	Add column (H) and (K) to give total amount of available P ₂ O ₅ to be applied per ha and divide by the area of the field (B) to calculate the application rate per ha. Application to be less than requirement in column (D).

If you are applying **chemical phosphorus fertiliser to grassland, P-rich manures or anaerobic digestate to any land you must complete a Fertilisation plan.**

Fertilisation Plan for non-derogated farms Phosphate (P ₂ O ₅) plan worksheet												
Grass/crop details					Organic manure including livestock manures				Chemical (P ₂ O ₅) fertiliser			Total P ₂ O ₅ to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P ₂ O ₅ requirement for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m ³ or t)	Available P ₂ O ₅ content of organic manure to be applied (kg per m ³ or t) Annex G*	Total amount of available P ₂ O ₅ supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P ₂ O ₅ from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes J and G** in the NAP 2019-2022 Guidance Booklet.

Fertilisation Plan for non-derogated farms Phosphate (P ₂ O ₅) plan worksheet												
Grass/crop details					Organic manure including livestock manures				Chemical (P ₂ O ₅) fertiliser			Total P ₂ O ₅ to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P ₂ O ₅ requirement for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m ³ or t)	Available P ₂ O ₅ content of organic manure to be applied (kg per m ³ or t) Annex G*	Total amount of available P ₂ O ₅ supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P ₂ O ₅ from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes J and G** in the NAP 2019-2022 Guidance Booklet.

Fertilisation Plan for non-derogated farms Phosphate (P_2O_5) plan worksheet												
Grass/crop details					Organic manure including livestock manures				Chemical (P_2O_5) fertiliser			Total P_2O_5 to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P_2O_5 requirement for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m ³ or t)	Available P_2O_5 content of organic manure to be applied (kg per m ³ or t) Annex G*	Total amount of available P_2O_5 supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P_2O_5 from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes J and G** in the NAP 2019-2022 Guidance Booklet.

Section 7 - Calculating phosphate (P₂O₅) applications for grassland and all other crops

Only complete this table if you are applying chemical phosphate (P₂O₅) fertiliser, sewage sludge, organic manures applied to land under a Waste Management licence or exemption (e.g. abattoir waste), from 2017 P-rich manures or, from 2020 anaerobic digestate.

1. All organic manures, including livestock manures, must be taken into consideration.
2. The values for available P₂O₅ content of organic manures vary depending on soil phosphorus (P) index and crop type.
3. The P₂O₅ content of chemical fertilisers is taken to be 100% available.
4. You will require a current soil analysis and if applying anaerobic digestate a nutrient content analysis.
5. When applying nutrients to grass or crops remember to consider all nutrients such as potash and sulphur.

Column (A)	Enter the crop to be grown. A list of the main crops and their requirements are listed in Annex J of the NAP 2019-2022 Guidance Booklet.
Column (B)	Enter area of field.
Column (C)	Enter soil P index from soil analysis if available. (If not available then assume an index of 2+ for grass or 2 for all other crops).
Column (D)	According to the soil P index from soil analysis results enter the P ₂ O ₅ requirement for the crop in kg per ha from Annex J of the NAP 2019-2022 Guidance Booklet.
Column (E)	Enter the type(s) of organic manure, including livestock manure , to be applied.
Column (F)	Enter in the amount of manure to be applied in m ³ or tonnes.
Column (G)	Enter the available P ₂ O ₅ content (per m ³ or tonne of manure) of the manure to be applied (Annex G of the NAP 2019-2022 Regulations Guidance Booklet).
Column (H)	Multiply columns (F) and (G) to give total amount of available P ₂ O ₅ to be applied in organic manures.
Column (I)	Enter the type of chemical fertiliser to be applied.
Column (J)	Enter the amount of chemical fertiliser to be applied per ha.
Column (K)	Enter the amount of chemical P ₂ O ₅ to be applied. For example type of fertiliser to be applied was 27:6:12, this contains 6% P ₂ O ₅ . If 300 kg is to be applied per ha then the amount of P ₂ O ₅ would be $6 \times 300 \div 100 = 18$ kg per ha.
Column (L)	Add column (H) and (K) to give total amount of available P ₂ O ₅ to be applied per ha and divide by the area of the field (B) to calculate the application rate per ha. Application to be less than requirement in column (D).

Phosphate (P ₂ O ₅) application worksheet												
Grass/crop details					Organic manure including livestock manures				Chemical (P ₂ O ₅) fertiliser			Total P ₂ O ₅ to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P ₂ O ₅ requirement for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m ³ or t)	Available P ₂ O ₅ content of organic manure to be applied (kg per m ³ or t) Annex G*	Total amount of available P ₂ O ₅ supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P ₂ O ₅ from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes J and G** in the NAP 2019-2022 Guidance Booklet.

Phosphate (P ₂ O ₅) application worksheet												
Grass/crop details					Organic manure including livestock manures				Chemical (P ₂ O ₅) fertiliser			Total P ₂ O ₅ to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P ₂ O ₅ requirement for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m ³ or t)	Available P ₂ O ₅ content of organic manure to be applied (kg per m ³ or t) Annex G*	Total amount of available P ₂ O ₅ supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P ₂ O ₅ from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes J and G** in the NAP 2019-2022 Guidance Booklet.

Phosphate (P_2O_5) application worksheet												
Grass/crop details					Organic manure including livestock manures				Chemical (P_2O_5) fertiliser			Total P_2O_5 to be applied per ha (kg) ((H) + (K)) ÷ (B)
Field No.	Crop	Area of crop (ha)	Soil P index (from analysis)	P_2O_5 requirement for crop according to soil P index (kg per ha) Annex J*	Type of organic manure to be applied Annex G*	Total amount of organic manure to be applied (m ³ or t)	Available P_2O_5 content of organic manure to be applied (kg per m ³ or t) Annex G*	Total amount of available P_2O_5 supplied to crop in organic manure (kg) (F) x (G)	Type of fertiliser product to be applied	Total amount of fertiliser product to be applied (kg)	Total amount of P_2O_5 from fertiliser to be applied (kg) (I) x (J)	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

* Refers to **Annexes J and G** in the NAP 2019-2022 Guidance Booklet.

Northern Ireland Environment Agency (NIEA)Water Management Unit, **17 Antrim Road, Lisburn BT28 3AL****Useful telephone numbers**

Agriculture Regulation Team: Nutrients Action Programme (NAP), NAP Derogations & field storage of poultry litter/anaerobic digestate.	028 9262 3280 028 9263 3486
Silage and Slurry issues: Contact NIEA before planning to substantially alter any existing storage facility or commission new silos or slurry tanks.	028 9262 3280 028 9263 3486
Groundwater Authorisations: Authorisation for disposal of spent sheep dip.	028 9262 3279
Applying Sewage Sludge to Land	028 9262 3280 028 9263 3486
Registration of Waste Carriers	028 9056 9389
Simple Waste Management Exemptions	028 90569380
Other Waste Management Exemptions	028 90569380
Hazardous Waste Queries	028 9056 9710
Pollution Prevention and Control (PPC) licensing	028 9056 9299
24hr Pollution Hotline Number	Freephone 0800 80 70 60

Department of Agriculture, Environment and Rural Affairs (DAERA)

Useful DAERA telephone (Note: 0300 numbers are charged at local rate)

Environment Awareness Agri-environment scheme information. Countryside Management advice including Cross-Compliance, Nitrates Directive, Nutrients Action Programme, Codes of Good Agriculture Practice, Farm Waste Management, Uncultivated Land Regulations and Field Boundary Removals.	0300 200 7842
Education and Training The College of Agriculture, Food and Rural Enterprise offers training on topics including Cross-Compliance, Nutrients Action Programme and Nutrient Management Planning (www.cafre.ac.uk).	0300 200 7841
DAERA Corporate Services DAERA Headquarters, Press Office, Information Services and Systems, Human Resources and Facilities Management.	0300 200 7850
DAERA Animal By-Products Section	028 9052 5275
Textphone For people with hearing difficulties.	0300 200 7851
Calls from non-UK numbers or networks/international calls	+44 (0)28 9049 5780
A list of DAERA contact numbers can be obtained by visiting the Contact Us section of the DAERA Website - www.daera-ni.gov.uk	

DAERA Direct Offices

Public office opening hours are 9.00am - 4.00pm each working day

Location and Email Address	Postal Address
Armagh daeradirect.armagh@daera-ni.gov.uk	Atek Building, Edenaveys Industrial Estate, Newry Road, Edenaveys, ARMAGH BT60 1NF
Ballymena daeradirect.ballymena@daera-ni.gov.uk	Academy House, 121a Broughshane Street, Town Parks, BALLYMENA BT43 6HY
Coleraine daeradirect.coleraine@daera-ni.gov.uk	Crown Buildings, Artillery Road, Millburn, COLERAINE BT52 2AJ
Downpatrick daeradirect.downpatrick@daera-ni.gov.uk	Rathkeltair House, Market Street, Demesne of Down Acre, DOWNPATRICK BT30 6LZ
Dungannon daeradirect.dungannon@daera-ni.gov.uk	Crown Buildings, Thomas Street, Drumcoo, DUNGANNON BT70 1HR
Enniskillen daeradirect.enniskillen@daera-ni.gov.uk	Inishkeen House, Killyhevlin Industrial Estate, Killyhevlin, ENNISKILLEN BT74 4EJ
Magherafelt daeradirect.magherafelt@daera-ni.gov.uk	Units 36 - 38, Meadowlane Shopping Centre, Moneymore Road, Townparks of Magherafelt, MAGHERAFELT BT45 6PR
Mallusk daeradirect.mallusk@daera-ni.gov.uk	Castleton House, 15 Trench Road, Grange of Mallusk, Mallusk NEWTOWNABBEY BT36 4TY
Newry daeradirect.newry@daera-ni.gov.uk	Glenree House, Unit 2, Springhill Road Carnbane Industrial Estate, Carnbane NEWRY BT35 6EF
Newtownards daeradirect.newtownards@daera-ni.gov.uk	Sketrick House, 16 Jubilee Road, Corporation South, NEWTOWNARDS BT23 4YH
Omagh daeradirect.omagh@daera-ni.gov.uk	Sperrin House, Sedan Avenue, Lisnamallard, OMAGH BT79 7AQ
Strabane daeradirect.strabane@daera-ni.gov.uk	Strabane Government Buildings 18 Urney Road, STRABANE, BT82 9BX

Common Conversions

Fertiliser Application

Area

1 hectare (ha) = 10,000 square metres (m²)

1 hectare = 2.47 acres

1 acre = 0.405 hectares

Volumes

1 cubic metre (m³) = 1,000 litres (l)

1 cubic metre = 220 gallons (gal)

1 cubic metre is assumed to weigh 1 tonne (t)

1 litre = 0.22 gallons

1 gallon = 0.0045 m³ or 4.55 litres

1,000 gallons = 4,545 kilograms (4.5 tonnes)

Weight

1 kilogram (kg) = 2.2 pounds (lbs)

1 pound = 0.45 kilograms

1 tonne = 1,000 kilograms

1 metric tonne = 0.98 imperial ton

Application rates

1 m³ per hectare = 90 gallons per acre

1 gallon per acre = 0.011 m³ per hectare

50,000 litres per hectare = 50 m³ per hectare = 4,500 gallons per acre

1 tonne per hectare = 0.4 ton per acre

1 ton per acre = 2.5 tonnes per hectare.

Gallons per acre to m³ per hectare (approx)

Gal per ac	90	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500
m ³ per ha	1	5.5	11	17	22	28	33	39	44	50

Fertilisers

1 unit per acre = 1.25 kilograms per hectare (kg per ha)

1 kilogram per hectare = 0.8 units per acre

1 kilogram P = 2.29 kilogram P₂O₅

1 kilogram P₂O₅ = 0.44 kilogram P

Fertiliser bags/acre to kilogram fertiliser product/hectare

1 bag fertiliser = 50 kilograms (kg)

1 bag per acre (ac) = 2.5 bags per hectare (ha) (1 acre = approx 2.5 hectares) (1 x 2.5)

2.5 bags per hectare x 50 kilograms = 125 kilograms fertiliser product per hectare applied

Kilogram fertiliser product applied to kilogram fertiliser nutrient applied N.P₂O₅.K₂O

Kilogram product applied x % N.P₂O₅.K₂O in the bag.

Example of fertiliser application:

1 bag 25.5.5 applied per acre applied (1 bag per acre = 125 kilogram per hectare product)
25% of the bag is N, 5% is P₂O₅ and 5% is K₂O.

Kilogram N = 25% x 125 kilograms = 31.25 kilograms

Kilogram P₂O₅ = 5% x 125 kilograms = 6.25 kilograms

Kilogram K₂O = 5% x 125 kilograms = 6.25 kilograms

Length

Feet	1	2	3	4	5	10	15	20	25	30	35	40	45	50
Metres	0.3	0.61	0.91	1.22	1.52	3.05	4.57	6.1	7.62	9.14	10.67	12.19	13.72	15.24

Notes

A 'unit' is 1% of 1 hundredweight, or 1.12 pounds

Tonne = metric tonne

Ton = imperial ton

Average number of sheep

Livestock type	1 Feb	1 Apr	1 Jun	1 Aug	1 Oct	1 Dec	Total per year				Average number per year = Total ÷ 6
							Total	÷		=	No.
Ewe (over 1 year)								÷	6	=	
Ram (over 1 year)								÷	6	=	
Lamb (0-1 year) ¹								÷	6	=	
Lamb (6-12 months) ¹								÷	3	=	
Lamb (0-6 months) ¹								÷	3	=	

¹ If keeping lambs use either 0-6 and 6-12 months or 0-1 year category.

Typical Annual NAP Regulations Calendar

Date	Activity
31 January	Deadline for: <ul style="list-style-type: none"> • Submission of records to NIEA of any exports of organic manure for the previous calendar year.
Midnight 31 January	End of closed period for spreading all fertiliser and manure. (Increased buffer zones and reduced application rates continue until end of February).
1 March	Deadline for derogated farms for: <ul style="list-style-type: none"> • Submission of derogation application to NIEA. • Completion of fertilisation plan (to be kept on farm for inspection). • Submission of fertilisation account, for the previous calendar year, to NIEA.
15 June	For derogated farm only: At least 50% of slurry produced on the holding must be applied by 15 June. Slurry must be applied using Low Emission Slurry Spreading Equipment (LESSE) after 15 June.
30 June	Completion date for records for the period 1 January to 31 December of the previous year.
1 September	After harvesting any crops: <ul style="list-style-type: none"> • the stubble of the harvested crop must remain in the land; or • the land sown with a crop which will take up N from the soil, or where soil or weather conditions prevent a subsequent crop from being sown, appropriate measures put in place to limit soil erosion, until 15 January next year. For derogated farms only: Livestock manures shall not be spread in the autumn before grass cultivation.
Midnight 15 September	Start of closed period for spreading: <ul style="list-style-type: none"> • Chemical N and phosphate fertiliser to grassland. • Any chemical fertiliser to any land for crops other than grass unless there is a demonstrable crop requirement.
Midnight 30 September	<ul style="list-style-type: none"> • Buffer zones from spreading slurry are increased; • Maximum slurry application rates are reduced.
Midnight 15 October	Start of closed period for spreading: <ul style="list-style-type: none"> • Organic manure, apart from farmyard manure and dirty water, to any land.
Midnight 31 October	Start of closed period for spreading farmyard manure to any land.



Department of
**Agriculture, Environment
and Rural Affairs**
www.daera-ni.gov.uk

