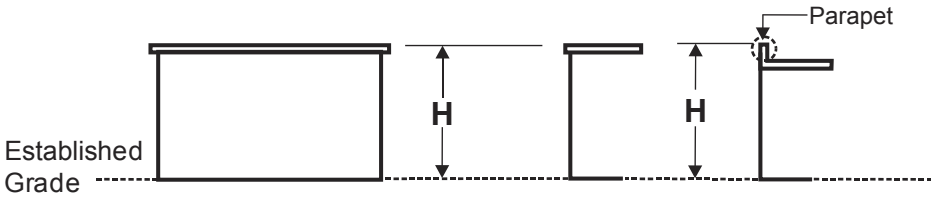
APPENDIX "A"
- CONVERSION TABLES -

DISTANCE	
Metric	Imperial
1 m	3.2 ft
1.2 m	3.9 ft
1.5 m	4.9 ft
1.75 m	5.7 ft
2 m	6.6 ft
2.75 m	9.0 ft
3 m	9.8 ft
3.5 m	11.5 ft
4 m	13.0 ft
4.2 m	13.8 ft
4.5 m	14.8 ft
5 m	16.4 ft
6 m	19.7 ft
6.5 m	21.3 ft
7 m	23.0 ft
7.5 m	24.6 ft
8 m	26.2 ft
9 m	29.5 ft
10 m	32.8 ft
11 m	36.0 ft
12 m	39.4 ft
14 m	45.9 ft
15 m	49.2 ft
18 m	59.0 ft
20 m	65.6 ft
23 m	75.4 ft
25 m	82.0 ft
30 m	98.4 ft
40 m	131.2 ft
50 m	164.0 ft
53 m	173.9 ft
60 m	196.9 ft
135 m	442.9 ft
150 m	492.1 ft
197.25 m	647.3 ft

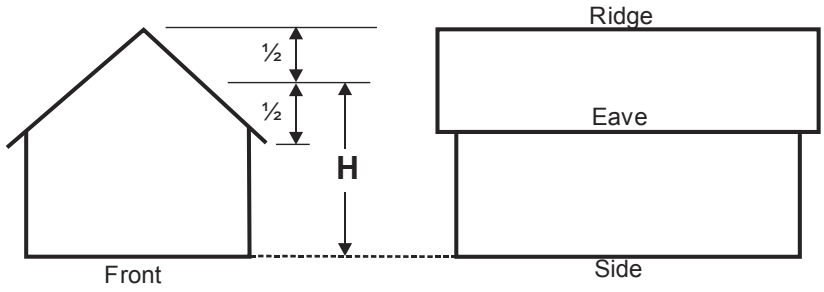
AREA	
Metric	Imperial
0.2 m^2	2.15 ft^2
0.5 m^2	5.4 ft^2
9 m^2	96.9 ft^2
10 m^2	107.6 ft^2
18.5 m^2	199.13 ft^2
20 m^2	215.3 ft^2
25 m^2	269.1 ft^2
28 m^2	301.4 ft^2
30 m^2	322.9 ft^2
35 m^2	376.74 ft^2
45 m^2	484.38 ft^2
50 m^2	538.2 ft^2
60 m^2	645.8 ft^2
70 m^2	753.5 ft^2
100 m^2	1076.4 ft^2
120 m^2	1291.7 ft^2
140 m^2	1506.9 ft^2
225 m^2	2421.9 ft^2
250 m^2	2691 ft^2
450 m^2	4843.8ft^2
750 m^2	8072.9 ft^2
900 m^2	9687.5 ft^2
1000 m^2	10764 ft^2 / 0.25 ac
1950 m^2	20990 ft^2
1999 m^2	21517 ft^2
2000 m^2	21528 ft^2 / 0.49 ac
4000 m^2	0.98 ac
7000 m^2	1.7 ac
10000 m^2	2.47 ac
40000 m^2	9.88 ac
.4 ha	0.98 ac
1 ha	2.5 ac
2 ha	4.9 ac
5 ha	12.4 ac
10 ha	24.7 ac
30 ha	74.1 ac

APPENDIX “B”
- ILLUSTRATIONS -

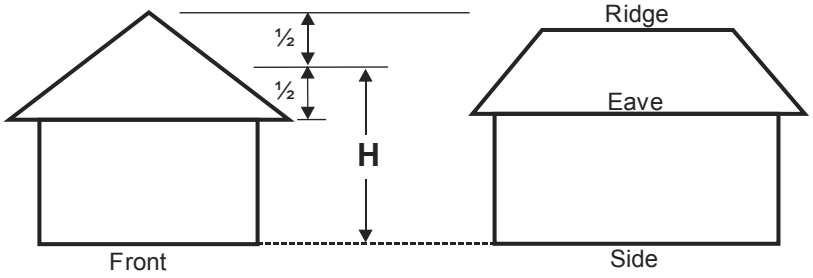
Illustration of Building Height (Section 3.76)



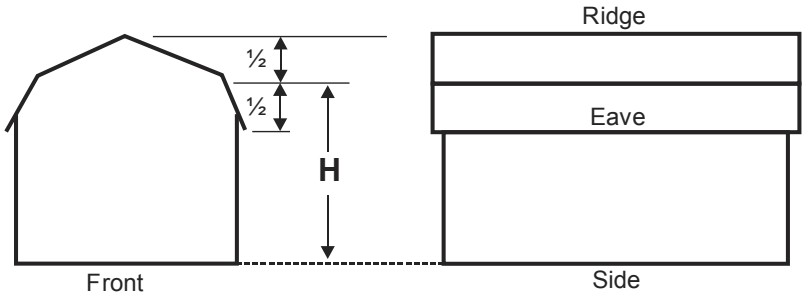
FLAT ROOF



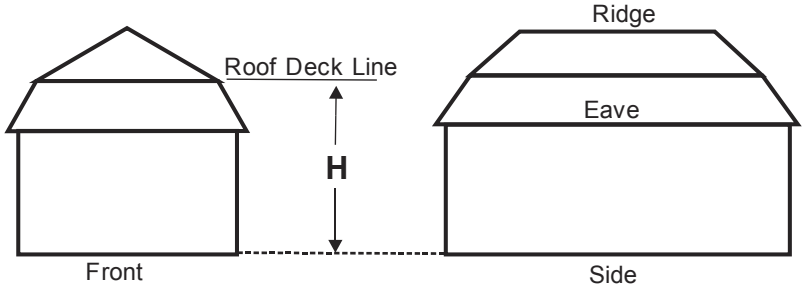
GABLE ROOF



HIP ROOF



GAMBREL ROOF



MANSARD ROOF

H Height of Building

Note: The above illustrations are for clarification and convenience only and do not form part of t he By-Law.

APPENDIX "C"
- MINIMUM DISTANCE SEPARATION FORMULAE -

MDS Implementation Guidelines

Publication 707

Ministry of Agriculture, Food and Rural Affairs

MDS I CALCULATION FORM

The following outlines the 10 Steps on how to calculate setbacks to all adjacent *livestock facilities*, reasonably expected to be impacted by an applicant's proposed development. Each step is colour-coded. The applicable topics found in the Implementation Guidelines Chart on pages 9 to 25 and the applicable Tables are noted in the steps below.

Step 1	Location and contact information	Fill in the pertinent information about the applicant, and each adjacent *livestock facility* within 1000 m or more, of the proposed development. Each *livestock facility* must be on its own separate *lot* and should be treated as separate calculations. All barns and structures located on one *lot* should be treated as part of the same *livestock facility*. Implementation Guidelines #1 through #16 provide direction on the general rules and application of the Minimum Distance Separation Formulae.
Step 2	*Livestock facility* animal/material types	For the first *livestock facility* identified in Step 1, fill in all of its existing animal/material types, descriptions, the total maximum housing capacity, the number of animals/material per *Nutrient Unit* (NU) and associated manure forms. Information on the existing animal/material types, descriptions, the total number of animals/material, and associated manure forms should be obtained from the owner of the *livestock facility*. It may be necessary to verify this information independently. Information on the number of animals/material per *Nutrient Unit* (NU) can be determined from Table 1. Implementation Guidelines #17 through #20 provide guidance on determining *livestock facility* capacity. Implementation Guidelines #21 and #22 provide direction on dealing with *anaerobic digesters*.
Step 3	Existing *Nutrient Units* (NU)	Calculate the existing total maximum NU capacity of the *livestock facility* by dividing existing capacity of each animal/material type by the number of animals/material per NU as found in Table 1. Then, add all the existing NU together for all the types of animal/material present, to obtain the total maximum number of NU.

Step 4	Weighted Factor A	Determine Factor A (Odour Potential Factor) for each animal/material type present, from Table 1, and fill in the calculation form. If necessary, calculate the weighted average for Factor A, if Factor A is not the same for all animals/materials listed. See Implementation Guidelines #26 and #31 for further direction.
Step 5	Weighted Factor D	Determine Factor D (Manure Form in Permanent Storage Factor) from Table 1, for each animal/material type present, and fill in the calculation form. If necessary, calculate the weighted average Factor D, if Factor D is not the same for all animals/materials listed. See Implementation Guidelines #29 and #32 for further direction.
Step 6	*Tillable hectares* and potential NU	Fill in the maximum *tillable hectares* of land on the *lot* where the *livestock facility* is located, based on information obtained from the owner of the *livestock facility*. It may be necessary to verify this information independently. Calculate the potential total number of NU, which equals: # of *tillable hectares* x 7.5, up to a maximum of 300 NU. Implementation Guidelines #33 and #17 provide more specific information.
Step 7	Factor B and existing vs. potential NU	Compare the total number of existing NU calculated in Step 3 with the total number of potential NU calculated in Step 6. Using the greater of these two numbers, determine Factor B from Table 2, and fill in the correct space on the calculation form. In some circumstances, it will be necessary to interpolate Factor B from Table 2, when the number of NU is not specifically identified in the table. Implementation Guideline #27 provides more specific direction on Factor B.
Step 8	Determine Factor E	Determine and fill in Factor E (Encroachment Land Use Factor) on the calculation form. Factor E can be determined from Table 4. Implementation Guidelines #30 and #35 through #39 provide specific direction on Factor E and the determination of Type A and Type B land uses.
Step 9	F, Building Base Distance	Calculate F (Building Base Distance) = (Factor A) x (Factor D) x (Factor B) x (Factor E), which is the required MDS I setback from the proposed development to the nearest barn of the *livestock facility*. For further information, see Implementation Guidelines #23 and #34.

Step 10	S, *Manure Storage* Base Distance	Establish S (*Manure Storage* Base Distance) by first using Table 5 to choose the existing storage at the *livestock facility* with the highest odour potential: Very Low, Low, Medium, and High. Then, enter Table 6 under the appropriate column and read across using 'F' calculated from Step 9. It may be necessary to interpolate. S, is the required MDS I setback from the proposed development to the nearest *manure storage* at the *livestock facility*. Implementation Guidelines #24 and #25 provide further information. Implementation Guidelines #21 and #22 provide further information on dealing with *anaerobic digesters*. Steps 2 through 10 should be completed for any other *livestock facilities* present, in accordance with Implementation Guideline #6.
Now What?	Using calculated MDS	The calculated values of MDS can now be used in the context of the land use planning application for which they have been prepared. Implementation Guidelines #35 through #40 provide direction around issues regarding Type A and Type B land uses. Implementation Guidelines #41 through #44 provide direction around issues of measurement of MDS setbacks, and, Implementation Guidelines #45 and #46 provide direction on issues regarding minor variances.

MDS I CALCULATION BLANK FORM

Evaluator: _____

Date: _____

File Number: _____

Contact Information:

	Applicant Information	Owner of Adjacent *Livestock Facility* #1	Owner of Adjacent *Livestock Facility* #2, etc
File Name			
Last Name			
Farm/Company			
Address			
City/Town			
Province			
Postal Code			
Upper Tier			
Lower Tier			
Lot			
Concession			
911 Number			
Roll Number			
Telephone			
Fax			
Email			

MDS I CALCULATION BLANK FORM

Animal Type or Material	Description	Number per NU	Manure Form	Existing Maximum Housing Capacity	Existing NU	Factor A	Factor D
Swine							
Chickens							
Imported Manure							
Total Number of NU							
Factor A (Odour Potential Factor)...a weighted average may be necessary							
Factor D (Manure Form Factor)...a weighted average may be necessary							
Factor B (*Nutrient Units* Factor)							
Factor E (Encroaching Land Use Factor)							
Maximum tillable hectares on the lot with the livestock facilities				X		=	(Maximum 300 NU)
F (Building Base Distance, m) = Factor A x Factor D x Factor B x Factor E							
S (Manure Storage Base Distance, m)							
Now What?	Repeat MDS calculation process as appropriate for other *livestock facilities* in the vicinity. Apply calculated MDS in the context of the land use planning application for which they were prepared.						

MDS II CALCULATION FORM

The following outlines the 10 Steps on how to calculate setbacks to all development reasonably expected to be impacted by a proposed *first* or *expanded livestock facility*. Each step is colour-coded. Applicable topics are found in the Implementation Guidelines Chart on pages 9 to 25 and applicable Tables are noted.

Step 1	Location and contact information	Fill in the pertinent information about the applicant who is proposing a *first*, or *expanded, livestock facility*. Implementation Guidelines #1 through #16 provide direction on the general rules and application of the Minimum Distance Separation Formulae.
Step 2	*Livestock facility* animal/material types	Fill in all existing, and proposed to be added, animal/material types, descriptions, the total maximum housing capacity, the number of animals/material per *Nutrient Unit* (NU) and associated manure forms. Table 1 and Implementation Guidelines #17 through #20 provide guidance on determining *livestock facility* capacity. Implementation Guidelines #21 and #22 provide direction on dealing with *anaerobic digesters*.
Step 3	Existing, and proposed to be added *Nutrient Units* (NU)	Calculate the existing, and proposed to be added, NU capacity of the *livestock facility* by dividing existing, and proposed to be added, capacity of each animal/material type by the number of animals/material per NU as found in Table 1. Then, add all the existing, and proposed to be added, NU together for all the types of animal/material present, to obtain the total number of NU.
Step 4	Weighted Factor A	Determine Factor A (Odour Potential Factor) from Table 1, for only each animal/material type proposed to be added, and fill in the calculation form. If necessary, calculate the weighted average for Factor A, if Factor A is not the same for all animals/materials added. See Implementation Guidelines #26 and #31 for further direction.

Step 5	Weighted Factor D	Determine Factor D (Manure Form in Permanent Storage Factor) from Table 1, for only each animal/material type added, and fill in the calculation form. If necessary, calculate the weighted average for Factor D, if Factor D is not the same for all animals/materials added. See Implementation Guidelines #29 and #32 for further direction.
Step 6	Factor B	Determine Factor B from Table 2, based on the Total NU to be housed at the *livestock facility*, and fill in the space on the calculation form. In some cases, it will be necessary to interpolate Factor B from Table 2, when the number of NU is not specifically identified in the table. Implementation Guideline #27 provides more specific direction on Factor B.
Step 7	Determining Percentage Increase for *livestock facility*	Determine if a building permit was issued on this *lot* in the past 3 years that increased the *livestock* capacity of the *livestock facility*. If 'No', use Approach (i) below to calculate Percentage Increase. If 'Yes', use Approach (ii) below to calculate Percentage Increase. Approach (i) Enter total Added NU as calculated in Step 3 above. Enter total Existing NU as calculated in Step 3 above. If total Existing NU is zero (i.e. this is the *First Livestock Facility* on the *lot*), then the Percentage Increase is considered to be at its maximum, or 700% as per Table 3. If total Existing NU is not zero, divide Added NU by Existing NU and multiply by 100. This value is the Percentage Increase. In rare cases of downsizing, the Added NU would actually be 'negative'. In this case, the Percentage Increase is 'negative', but considered to be at its minimum, or 0% as per Table 3. Approach (ii) Enter total Added NU as calculated in Step 3 above, as well as the total number of NU added in the past 3 years by previous building permit(s). Enter total Existing NU of the *livestock facility* as it was 3 years ago, prior to the current application date. If total Existing NU 3 years ago was zero, then the *livestock facility* in this current application and the one(s) constructed in the past 3 years are all considered to be the *First Livestock Facility* on the *lot*, and the Percentage Increase is considered to be at its maximum, or 700% as per Table 3. If total Existing NU 3 years ago was not zero, divide Added NU

continued...

Step 7 continued...		continued... in this application plus Added NU over the past 3 years, by Existing NU 3 years ago and multiply by 100. This value is the Percentage Increase. In rare cases of downsizing, the Added NU would actually be 'negative'. In this case, the Percentage Increase is 'negative', but considered to be at its minimum, or 0% as per Table 3. Implementation Guideline #28 provides further direction and assistance on calculating Percentage Increase, and establishing Factor C.
Step 8	Factor C	Determine and fill in Factor C (Orderly Expansion Factor) on the calculation form, based on the Percentage Increase calculated in Step 7. Factor C can be determined from Table 3. In some instances, it may be necessary to interpolate Factor C. Implementation Guideline #28 provides direction on calculating the Percentage Increase in NU for the proposed construction.
Step 9	F, Building Base Distance	Calculate F (Building Base Distance) = (Factor A) x (Factor D) x (Factor B) x (Factor C), which is the required MDS II setback from all proposed *first* or *expanded livestock facilities* to the nearest development. For further information, see Implementation Guidelines #23 and #34.
Step 10	S, *Manure Storage* Base Distance	Establish S (*Manure Storage* Base Distance) by first using Table 5 to choose the proposed new storage at the *livestock facility* with the highest odour potential: Very Low, Low, Medium, and High. Then, enter Table 6 under the appropriate column and read across using 'F' calculated from Step 9. It may be necessary to interpolate from the table. 'S' is the required MDS II setback from all proposed new storages to the nearest development. Implementation Guidelines #24 and #25 provide further information. Implementation Guidelines #21 and #22 provide further information on dealing with *anaerobic digesters*.
Now What?	Using calculated MDS	The calculated values of MDS II can now be applied to the building permit application. Implementation Guidelines #35 through #39 provide direction around Type A and Type B land uses. For Type A land uses, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 1.0 to determine the required MDS setback. For Type B land uses, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 2.0 to determine the required MDS setback. Implementation Guideline #40 provides direction around setbacks from rear *lot* lines, side *lot* lines and road allowances. For rear and side *lot* lines, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 0.1 to determine the required continued...

Now What?

continued...

continued...

MDS setback. In accordance with Implementation Guideline #44, the required MDS setback from a rear or side *lot* line should never exceed 30 metres. For road allowances, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 0.2 to determine the required MDS setback. Implementation Guidelines #41 through #44 provide direction around issues of measurement of MDS II setbacks. Implementation Guidelines #45 and #46 provide direction on issues regarding minor variances.

Example:

Mr. Jones proposes to build a second 1200 head swine feeder barn with concrete liquid *manure storage* to go along with his existing:

- 1200 head swine feeder barn over a slatted floor where all the swine manure is stored;
- 33000 bird chicken broiler barn (9-week cycle) with solid *manure storage* outside, uncovered, dry enough for a flowpath option;
- 10 m x 12 m x 2 m permanent concrete storage with flowpath option, for his imported solid dairy manure; and
- The existing facilities were constructed more than 3 years ago.

How far must the proposed barn be sited from all development reasonably expected to be impacted?

Evaluator: _____

Date: _____

File Number: _____

Applicant Information:

First Name	Jim	**Lower Tier**	Lower Somewhere
Last Name	Jones	**Lot**	2
Farm/Company	Swiney-Acres Farm	**Concession**	2
Address	124 New Road	**Fire Number**	123456
City/Town	Somewhere	**Roll Number**	667
Province	Ontario	**Telephone**	905-555-3333
Postal Code	NOG OJO	**Fax**	905-555-4444
Upper Tier	Upper Somewhere	**Email**	jjones@newroad.ca

MDS II CALCULATION BLANK FORM

Evaluator: _____

Date: _____

File Number: _____

Contact Information:

	Applicant Information	Owner of Adjacent *Livestock Facility* #1	Owner of Adjacent *Livestock Facility* #2, etc
File Name			
Last Name			
Farm/Company			
Address			
City/Town			
Province			
Postal Code			
Upper Tier			
Lower Tier			
Lot			
Concession			
911 Number			
Roll Number			
Telephone			
Fax			
Email			

MDS II CALCULATION BLANK FORM

Animal Type or Material	Description	Number per NU	Manure Form	Existing Maximum Housing Capacity	Exisiting NU	Proposed Maximum Housing Capacity	Added NU	Total NU	Factor A	Factor AD
Swine										
Chickens										
Imported Manure										
Totals										

Factor A (Odour Potential Factor) weighted average may be necessary	
Factor D (Manure Form Factor) weighted average may be necessary	
Factor B (*Nutrient Units* Factor)	

Has a building permit been issued for the *livestock facility* on this property, in the last 3 years that has increased its *livestock* capacity? No? Yes? *If No, proceed to Approach (i); if Yes, proceed to Approach (ii)*

Approach (i) - No Building Permits in Last 3 Years		**Approach (ii)** - Building Permit(s) issued in Last 3 Years	
Calculation of Percentage Increase		Calculation of Percentage Increase	
Total 2 - Total Added NU (From Above)		Total 2 - Total Added NU (From Above) + Total Added NU from building permit(s) issued in the last 3 Years	
Total 1 - Total Existing NU (From Above)		Total 1 - Total Existing NU at *Livestock Facility* - 3 Years Ago	
If Total 1 = Zero - Treat as a *First Livestock Facility*		If Total 1 = Zero - Treat as a *First Livestock Facility*	
% Increase: (Total 2/Total 1) x 100		% Increase: (Total 2/Total 1) x 100	

Factor C (Orderly Expansion Factor)	
F (Building Base Distance, m) = Factor A x Factor D x Factor B x Factor C	
S (*Manure Storage* Base Distance, m)	

Now What?	Apply MDS calculation to building permit application as appropriate. For Type A land uses, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 1.0 to determine the required MDS setback. For Type B land uses, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 2.0 to determine the required MDS setback. Implementation Guideline #40 provides direction around setbacks from rear *lot* lines, side *lot* lines and road allowances. For rear and side *lot* lines, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 0.1 to determine the required MDS setback. In accordance with Implementation Guideline #44, the required MDS setback from a rear or side *lot* line should never exceed 30 metres. For road allowances, the values of Building Base Distance 'F' and Storage Base Distance 'S' should be multiplied by 0.2 to determine the required MDS setback.

FACTOR TABLES

Table 1: Factor A (Odour Potential) and Factor D (Manure or Material Form in Storage Facility)

Animal Type or Material	Description	Number per NU	Factor A	Manure or Material Form in Permanent Storage	
				Liquid Manure: Factor D = 0.8 < 18% Dry Matter	Solid Manure: Factor D = 0.7 18 - 100% Dry Matter
Swine	Sows with litter, dry sows/boars Segregated Early Weaning (SEW)	3.33	1.0	Most systems have liquid manure stored under the barn slats for short or long periods, or in storages located outside	Systems with solid manure inside on deep bedded packs, or with scraped alleys
	Sows with litter, dry sows or boars (non-SEW)	3.5			
	Breeder gilts (entire barn designed specifically for this purpose)	5			
	Weaners (7 kg – 27 kg)	20	1.1		
	Feeders (27 – 105 kg)	6	1.2		
Dairy Cattle	**Milking-age cows (dry or milking)**		0.7	Free-stall barns with minimal bedding, or sand bedding, or tie-stall barns with minimal bedding & milking centre washwater added	Tie-stall barns with lots of bedding, or loose housing with deep bedded pack, and with or without outside yard access
	- Large-framed; 545 kg – 636 kg (e.g. Holsteins)	0.7			
	- Medium-framed; 455 kg – 545 kg (e.g. Guernseys)	0.85			
	- Small-framed; 364 kg – 455 kg (e.g. Jerseys)	1			
	Heifers (5 months to freshening)				
	- Large-framed; 182 kg – 545 kg (e.g. Holsteins)	2			
	- Medium-framed; 148 kg – 455 kg (e.g. Guernseys)	2.4			
	- Small-framed; 125 kg – 364 kg (Jerseys)	2.9			
	Calves (0 – 5 months)		0.7	Free-stall barns with minimal bedding, or sand bedding, or tie-stall barns with minimal bedding & milking centre washwater added	Bedded pens or stalls or heavily bedded calf hutches that are outside
	- Large-framed; 45 kg – 182 kg (e.g. Holsteins)	6			
	- Medium-framed; 39 kg – 148 kg (e.g. Guernseys)	7			
	- Small-framed; 30 kg – 125 kg (Jerseys)	8.5			
Beef Cattle	Cows, including calves to weaning (all breeds)	1	0.7	N/A	Bedded pack barns with or without outside yard access
	Feeders (7 – 16 months)	3	0.8	Slatted floor systems, or barns with minimal bedding & yard scraped to a liquid storage	
	Backgrounders (7 – 12.5 months)	3			
	Shortkeepers (12.5 – 17.5 months)	2			

Animal Type, or Material	Description	Number per NU	Factor A	Manure or Material Form in Permanent Storage	
				Liquid Manure: Factor D = 0.8 Less than 18% Dry Matter	Solid Manure: Factor D = 0.7 18 to 100% Dry Matter
Veal	Milk-fed	6	1.1	Slatted floors or slatted stall system	Heavily bedded pack barns
	Grain-fed	6	0.8		
Goats	Does & bucks (for meat kids; includes unweaned offspring & replacements)	8	0.7	N/A	Heavily bedded pack barns
	Does & bucks (for dairy; includes unweaned offspring & replacements)	8			
	Kids (dairy or feeder kids)	20			
Sheep	Ewes & rams (for meat lambs; includes unweaned offspring & replacements)	8	0.7	N/A	All sheep systems
	Ewes & rams (dairy operation; includes unweaned offspring & replacements)	6			
	Lambs (dairy or feeder lambs)	20			
Horses	Large-framed, mature; > 681 kg (including unweaned offspring)	0.7	0.7	N/A	All horse systems
	Medium-framed, mature; 227 kg – 680 kg (including unweaned offspring)	1			
	Small-framed, mature; < 227 kg (including unweaned offspring)	2			
Chickens	Layer hens (for eating eggs; after transfer from pullet barn)	150	1.0	Birds in cages, manure belts, no drying of manure, water added	Birds in cages, manure belts & drying, or floor systems
	Layer pullets (day olds until transferred into layer barn)	500	0.7		
	Broiler breeder growers (males/females transferred out to layer barn)	300	0.7	N/A	Bedded floors
	Broiler breeder layers (males/females transferred in from grower barn)	100	0.7	N/A	Cage or slatted floor systems
	Broilers on an 8 week cycle	350	0.7	N/A	Bedded floor systems
	Broilers on a 9 week cycle	300			
	Broilers on a 10 week cycle	250			
	Broilers on a 12 week cycle	200			
	Broilers on any other cycle, or if unknown, use 24.8 m^2/NU	24.8 m^2			
Turkeys	Turkey pullets (day old until transferred to layer turkey barn)	267	0.7	N/A	Bedded floor systems
	Turkey breeder layers (males/females transferred in from grower barn)	67			
	Breeder toms	45			
	Broilers (day olds to 6.2 kg)	133			
	Hens (day olds up to 6.2 kg to 10.8 kg; 7.5 kg is typical)	105			
	Toms (day olds to over 10.8 to 20 kg; 14.5 kg is typical)	75			
	Turkeys at any other weights, or if unknown, use 24.8 m^2/NU	24.8 m^2			

Animal Type, or Material	Description	Number per NU	Factor A	Manure or Material Form in Permanent Storage	
				Liquid Manure: Factor D = 0.8 Less than 18% Dry Matter	Solid Manure: Factor D = 0.7 18 to 100% Dry Matter
Quail	Use 24.8 m2/NU	24.8 m2	0.7	N/A	Bedded floor systems
Partridge	Use 24.8 m2/NU	24.8 m2			
Pheasants	Use 24.8 m2/NU	24.8 m2			
Squab	Use 24.8 m2/NU	24.8 m2			
Rheas	Adults (includes replacements & market birds)	13			
Emus	Adults (includes replacements & market birds)	12			
Ostriches	Adults (includes replacements & market birds)	4			
Ducks	Peking	105	0.8	Wire mesh flooring systems	Bedded floor systems
	Muscovy, use 24.8 m2/NU	24.8 m2			
Geese	Use 24.8 m2/NU	24.8 m2			
Rabbits	Breeding females (including males, replacements & market animals)	40	0.8	N/A	Cage or floor systems
Chinchillas	Breeding females (including males, replacements & market animals)	320			
Fox	Breeding females (including males, replacements & market animals)	25	1.0		
Mink	Breeding females (including males, replacements & market animals)	90			
Bison	Adults (includes unweaned calves & replacements)	1.3	0.7	N/A	Bedded pack barns with outside access or outside confinement areas
	Feeders (170 kg – 477 kg)	4			
Llama	Adults (includes unweaned young & replacements)	5			
	Feeders (45 kg – 86 kg)	16			
Alpaca	Adults (includes unweaned young & replacements)	8			
	Feeders (23 kg – 48 kg)	26			
Wild Boar	Breeding age sows (includes boars, replacements & weaned piglets to 27 kg)	5			
	Finishing boars (27 kg – 86 kg)	7			

Continued...

Animal Type, or Material	Description	Number per NU	Factor A	Manure or Material Form in Permanent Storage	
				Liquid Manure: Factor D = 0.8 Less than 18% Dry Matter	Solid Manure: Factor D = 0.7 18 to 100% Dry Matter
Deer	**White tailed deer**		0.7	N/A	Bedded pack barns with outside access OR outside confinement areas
	- Adults > 24 mo (including unweaned offspring)	11			
	- Feeders	21			
	Red deer				
	- Adults > 24 mo (including unweaned offspring)	7			
	- Feeders	14			
	Elk				
	- Adults > 24 mo (including unweaned offspring)	2			
	- Feeders	6			
	Elk/deer hybrids				
	- Adults > 24 mo (including unweaned offspring)	4			
	- Feeders	10			
	Fallow deer				
	- Adults > 24 mo (including unweaned offspring)	13			
	- Feeders	23			
Other livestock not listed in this table	To determine the number per NU, add up the total maximum live weight of animals and divide by the weight of animals per NU in the next column	453.6 kg (1000 lbs)	0.8	All storages with liquid manure	All storages with solid manure
Manure imported to a lot not generating *manure*[2]	Maximum capacity of permanent storages at any time: solid or liquid capacity	19.8 m^3 (700 ft^3)	1.2	All storages with liquid manure	All storages with solid manure
Storages for *digestate* from an Anaerobic Digester (odours reduced during this process)	Maximum capacity of permanent storages at any time: solid or liquid capacity	19.8 m^3 (700 ft^3)	0.5	All storages with liquid manure	All storages with solid manure

1. On farms with 100 milking-age cows (dry & milking), there are usually about 20 replacement calves and 80 replacement heifers.
2. Average value for typical types of manures that might be imported to a *lot*, such as poultry, dairy, beef, swine, horse or other manure.
N/A = Not Applicable

Table 2: Factor B (Nutrient Units Factor)

In using Table 2 to determine Factor B, it may be necessary to interpolate a value for Factor B. For example, you determine the total number of *nutrient units* at a *livestock facility* to be 255 NU. Table 2 provides a value for Factor B for 250 NU and for 260 NU, but not for 255 NU. The value of Factor B for 250 NU is 435 and the value of Factor B for 260 NU is 441. To determine Factor B for 255 NU interpolate between the numbers 435 and 441. In this example, the value of Factor B for 255 NU is 438.

When interpolating a value for Factor B do not include more than two decimal places. Interpolated values with more than two decimal places should be rounded accordingly. For example, if an interpolated value for Factor B is calculated as 499.238, then use a value of 499.24 for Factor B in the MDS calculation.

For operations less than 5 NU in size, do not interpolate, but use a Factor B of 150. For operations greater than 5000 NU in size, contact OMAFRA staff to determine Factor B.

Final NU	Factor B
Up to 5	150
6	153
7	157
8	160
9	163
10	167
11	170
12	173
13	177
14	180
15	183
16	187
17	190
18	193
19	197
20	200
21	202
22	204
23	206
24	208
25	210
26	212
27	214
28	216
29	218
30	220
31	222
32	224
33	226
34	228
35	230
36	232
37	234
38	236
39	238
40	240
41	242
42	244
43	246
44	248
45	250

Final NU	Factor B
46	252
47	254
48	256
49	258
50	260
52	264
54	268
56	272
58	276
60	280
62	282
64	284
66	285
68	287
70	289
72	291
74	293
76	294
78	296
80	298
82	300
84	301
86	303
88	305
90	307
92	309
94	310
96	312
98	314
100	316
102	318
104	320
106	322
108	324
110	326
112	329
114	331
116	333
118	335
120	337
122	339

Final NU	Factor B
124	340
126	342
128	344
130	346
135	351
140	355
145	360
150	364
155	368
160	372
165	376
170	380
175	384
180	388
185	392
190	395
195	399
200	402
205	406
210	409
215	413
220	416
225	419
230	423
235	426
240	429
245	432
250	435
260	441
270	447
280	453
290	458
300	464
310	469
320	474
330	480
340	485
350	490
360	494
370	499
380	504

Final NU	Factor B
390	508
400	513
410	517
420	522
430	526
440	530
450	535
460	539
470	543
480	547
490	551
500	555
520	562
540	570
560	577
580	584
600	591
620	598
640	605
660	611
680	618
700	624
750	639
800	654
850	668
900	681
950	694
1000	707
1100	731
1200	753
1300	775
1400	795
1500	815
2000	870
3000	980
4000	1090
5000	1200
Greater than 5000	Contact OMAFRA staff

Table 3: Factor C (Orderly Expansion Factor)

In using Table 3 to determine Factor C, it may be necessary to interpolate a value for Factor C. For example, you determine the percentage increase at a *livestock facility* to be 155%. Table 3 provides a value for Factor C for a 150% increase, and for a 160% increase, but not for a 155% increase. The value of Factor C for a 150% increase is 0.9371 and the value of Factor C for a 160% increase is 0.9497. To determine Factor C for a 155% increase interpolate between the numbers 0.9371 and 0.9497. In this example, the value of Factor C for a 155% increase is 0.9434.

When interpolating a value for Factor C do not include more than four decimal places. Interpolated values with more than four decimal places should be rounded accordingly. For example, if an interpolated value for Factor C is calculated as 0.977643, then use a value of 0.9776 for Factor C in the MDS calculation.

For operations with a 0% increase, or a decrease, i.e. 'negative' percentage increase, use a value of 0.5000 for Factor C. Do not interpolate below a value of 0.5000. For operations with a 700% increase or greater, or for a *first livestock facility*, use a value of 1.1400 for Factor C. Do not interpolate above a value of 1.1400.

% Increase in *Nutrient Units*	Factor C
0% increase or decreases ('negative' increase)	0.5000
1%	0.5062
2%	0.5124
3%	0.5186
4%	0.5248
5%	0.5310
6%	0.5372
7%	0.5434
8%	0.5496
9%	0.5558
10%	0.5620
11%	0.5682
12%	0.5744
13%	0.5806
14%	0.5868
15%	0.5930
16%	0.5992
17%	0.6054
18%	0.6116
19%	0.6178
20%	0.6240
21%	0.6302
22%	0.6364
23%	0.6426
24%	0.6488
25%	0.6550
26%	0.6612

% Increase in *Nutrient Units*	Factor C
27%	0.6674
28%	0.6736
29%	0.6798
30%	0.6860
31%	0.6922
32%	0.6984
33%	0.7046
34%	0.7108
35%	0.7170
36%	0.7232
37%	0.7294
38%	0.7356
39%	0.7418
40%	0.7480
41%	0.7542
42%	0.7604
43%	0.7666
44%	0.7728
45%	0.7790
46%	0.7852
47%	0.7914
48%	0.7976
49%	0.8038
50%	0.8100
55%	0.8167
60%	0.8230
65%	0.8294
70%	0.8357
75%	0.8420

% Increase in *Nutrient Units*	Factor C
80%	0.8484
85%	0.8547
90%	0.8610
95%	0.8674
100%	0.8737
105%	0.8800
110%	0.8864
115%	0.8927
120%	0.8990
125%	0.9054
130%	0.9117
135%	0.9180
140%	0.9244
145%	0.9307
150%	0.9371
160%	0.9497
170%	0.9624
180%	0.9751
190%	0.9877
200%	1.0000
300%	1.0280
400%	1.0560
500%	1.0840
600%	1.1120
700% increase, or more, or *First Livestock Facility* on *lot* of record.	1.1400

Table 4: Factor E (Encroaching Land Use Factor)

Encroaching Land Use	Factor E
Type A Land Use	1.1
Type B Land Use	2.2

Encroachment of urban development

Table 5: Permanent *Manure or Material Storage* Types

Solid *Manure*: 18% dry matter, or more
Liquid *Manure*: Less than 18% dry matter
***Digestate*: Less than 18% dry matter**

Storage Odour Potential	Solid or Liquid System	Inside or Outside Livestock Facility	Number referred to in Table 6 (View images in Appendix A)	Description of permanent manure storages being sited by MDS II, or encroached upon through MDS I application
Very Low	Solid	Inside	V1	Solid, inside, bedded pack (manure accumulates under *livestock* over time)
		Outside	V2	Solid, outside, covered (cover keeps off precipitation to prevent runoff)
			V3	Solid, outside, no cover, greater than or equal 30% dry matter (manure is dry enough that a flowpath option can be used for runoff control (*Nutrient Management Act, 2002*)
			V4	Solid, outside, no cover, 18% to less than 30% dry matter, with covered liquid runoff storage (manure not dry enough to soak up precipitation, so a liquid runoff storage needed, but it has a permanent, tight cover
	Liquid	Inside	V5	Liquid, inside, underneath slatted floor (manure is stored under the animals in the barn)
		Outside	V6	Liquid, outside, with a permanent, tight fitting cover (negative pressure tarp, concrete lid, inflatable dome, etc.)
			V7	Liquid, (digestate), outside, no cover (all manure has been treated through anaerobic digestion, or a similar process that reduces odours)
	Solid	Outside	L1	Solid, outside, no cover, 18% to less than 30% dry matter, with uncovered liquid runoff storage (manure not dry enough to soak up precipitation, so a liquid Low runoff storage needed, but it is uncovered, producing more odour than in V4 above)
	Liquid	Outside	L2	Liquid, outside, with a permanent floating cover (tarps, foam panels, etc.)
Medium	Liquid	Outside	M1	Liquid, outside, no cover, straight-walled storage (usually circular or rectangular concrete, or steel storages)
			M2	Liquid, outside, roof, but with open sides (roof keeps off precipitation, but the open sides allow wind to travel over the manure and carry odours)
High	Liquid	Outside	H1	Liquid, outside, no cover, sloped-sided storage (earthen *manure storages*, but not earthen runoff storages associated with a solid manure storage which are L1 above)

Table 6: MDS I/II Separation Distances for Permanent Manure or Material Storage Types in Table 5

In using Table 6 (see page 51) to determine a value for 'S' – Storage Separation Distance, in some instances it may be necessary to interpolate a value.

For example, you determine the value for Encroachment Base Distance 'F' to be 106 metres. From Table 5, you have determined that the *livestock facility* uses a storage facility with an odour potential that is considered medium (M1).

Table 6 provides a value for Storage Separation Distance 'S' for an M1 Storage for an Encroachment Base Distance 'F' of 100 metres and for an Encroachment Base Distance 'F' of 110 metres, but not for an Encroachment Base Distance 'F' of 106 metres. The value of Storage Separation Distance 'S' for an M1 Storage with an Encroachment Base Distance 'F' of 100 metres, is 190 metres. The value of Storage Separation Distance 'S' for an M1 Storage with an Encroachment Base Distance 'F' of 110 metres, is 199 metres. To determine the value of Storage Separation Distance 'S' for an M1 Storage, with an Encroachment Base Distance 'F' of 106 metres interpolate between the numbers 190 and 199. In this example, the value of Storage Separation Distance 'S' for an M1 Storage, with an Encroachment Base Distance 'F' of 106 metres is 195.4 metres. This value should be rounded to the nearest whole number, in this case 195 metres.

When interpolating a value for Storage Separation Distance 'S' do not include any decimal places. Interpolated values with decimal places should be rounded accordingly. For example, if an interpolated value for Storage Separation Distance 'S' is calculated as 202.83 metres, then use a value of 203 metres for Storage Separation Distance 'S'.

In all instances, where Encroachment or Building Base Distance 'F' exceeds 1000 metres, then Storage Separation Distance 'S' will be the same value as 'F'.

Table 6: MDS I/II Separation Distances for Permanent Manure

Building Base Distance (m) for MDS II ('F'), or Encroachment Base Distance for MDS I ('F')	Storage Separation Distances Based on Relative Odour Potential - Storage Base Distance, 'S' (m)			
	Very Low Odour Storages V1 to V7	Low Odour Storages L1 to L2	Medium Odour Storages M1 to M2	High Odour Storages H1
40	40	64	136	232
50	50	74	145	240
60	60	84	154	248
70	70	93	163	256
80	80	103	172	264
90	90	113	181	272
100	100	123	190	280
110	110	132	199	288
120	120	142	208	296
130	130	152	217	304
140	140	162	226	312
150	150	171	235	320
160	160	181	244	328
170	170	191	253	336
180	180	201	262	344
190	190	210	271	352
200	200	220	280	360
210	210	230	289	368
220	220	240	298	376
230	230	249	307	384
240	240	259	316	392
250	250	269	325	400
260	260	279	334	408
270	270	288	343	416
280	280	298	352	424
290	290	308	361	432
300	300	318	370	440
310	310	327	379	448
320	320	337	388	456
330	330	347	397	464
340	340	357	406	472
350	350	366	415	480
360	360	376	424	488
370	370	386	433	496
380	380	396	442	504
390	390	405	451	512
400	400	415	460	520
420	420	435	478	536
440	440	454	496	552
460	460	474	514	568
480	480	493	532	584
500	500	513	550	600
600	600	610	640	680
800	800	805	820	840
1000	1000	1000	1000	1000
Greater than 1000 m	Storage Base Distance, 'S', should be the same as Building Base Distance or Encroachment Base Distance – 'F'			