

**ADDENDUM**

TO THE

# **1995 CODE OF PRACTICE**

FOR THE SAFE AND ECONOMIC HANDLING

OF ANIMAL MANURE

MAY 3, 1999

**Note:**

This Addendum includes  
corrected pages 12 and 16



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# Introduction

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This document updates the following sections of the 1995 *Code of Practice for the Safe and Economic Handling of Animal Manures*.

## Section 2

The definition of an Intensive Livestock Operation (ILO) has been rewritten to clarify the three criteria used to qualify an ILO. These criteria being: threshold size, density of confinement, and confinement time.

## Section 3

This section has been updated and several new clauses added to clarify former areas of ambiguity and confusion.

## Appendices

**Appendix A:** Values have been updated. Phosphorus and potassium are expressed in elemental forms.

**Appendix B:** Several new categories have been added in keeping with changes in the industry.

**Appendix C:** These tables have been simplified and updated with new categories in keeping with changes in the industry.

**Appendix D:** Several new Minimum Distance Separation category tables have been added.

This addendum supercedes the corresponding sections of the 1995 *Code of Practice for the Safe and Economic Handling of Animal Manures*.

# Section 2

## Definitions

### 2.8 Livestock Facility

#### 2.8.3 Intensive Livestock Facility (ILO)

The following definition may be used to define an Intensive Livestock Facility (ILO) as a conditional use under the Land Use Bylaw. For the purpose of this *Code*, all three of the following criteria must be met to be considered an Intensive Livestock Operation.

An ILO is deemed to have permanence, significant cost, service and resource requirements, environmental, and community implications.

##### 1. Threshold Size

Any feedlot or covered facility of significant investment or permanence, capable of confining the minimum number of livestock set out in **Table 1** or such table in the Land Use Bylaw that sets out the threshold size.

##### 2. Density of Confinement

- livestock housed at a density of more than one livestock manure unit per 90 m<sup>2</sup> (1000 ft<sup>2</sup>) in open confinement or
- housing in a covered facility necessitating feed to be brought to the livestock.

##### 3. Confinement Time Interval

Continuous confinement of at least 90 days.

*The following are not considered an intensive livestock operation for the purpose of this Code:*

- where livestock are confined for branding, sorting, herd health management, and market delivery with confinement not exceeding 30 consecutive days or
- livestock in intensive grazing management systems.

Table 1. Intensive Livestock Operations - Min. Size

Livestock Type	Threshold #
Beef Feeder (500 - 1200 lbs)	300
Dairy (milking)	All
Piggery (sows: farrow - finish)	30
Piggery (sows: farrow - wean)	50
Piggery (feeders only)	300
Veal	100
Horses (PMU)	75
Poultry (broilers)	10000 ft <sup>2</sup> (920 m <sup>2</sup> )
Poultry (breeders)	500
Poultry (layers)	5000
Poultry (turkey broilers)	3000
Sheep (ewes)	650
Other	Discretionary

# Section 3

## Livestock Facility Siting Guidelines

### **Minimum Distance Separation (MDS) Method**

Separation between intensive livestock facilities and neighbours can compensate for normal odour production, thereby reducing potential nuisance conflicts. The MDS applies reciprocally for the siting of either the odour source (intensive livestock operation) and/or the neighbouring landowner (neighbour). The MDS method is based on Livestock Siting Units (LSUs) which considers site specific factors such as livestock type, manure production, and manure handling system.

### **Application of MDS**

MDS provides a consistent and uniform technique for assessing the conflict potential of a land use or development change.

#### **3.1 Application of MDS for Non-agricultural Developments**

MDS provides a recommended minimum separation distance between new or expanding non-agricultural developments (residential, commercial, or recreational) and existing intensive livestock facilities.

#### **3.2 Application of MDS for Agricultural Developments**

MDS provides a recommended minimum separation distance between new intensive livestock developments, the expansion of existing intensive livestock operations, and neighbouring land uses. Where expansion to existing facilities is involved, the MDS may be applied in either of two ways:

- MDS may be applied to the existing portion of an expanding operation. In such case the expansion factor (**Appendix C-2**) is applied.
- MDS may be applied to the expanding portion of an existing intensive livestock operation. In such case the MDS is based on the total LSUs of the operation as if it was entirely new (no expansion factor applied) but the measurement is applied to the expanded portion of the development. Changes in management may be required for the existing portion of the facility to bring it into compliance with present standards.

#### **3.3 MDS Tables**

MDS distances have been pre-calculated into tabular form to simplify their use (**Appendix D**). In no case shall the MDS be less than 500 feet (150 metres).

Distance is determined as follows:

##### **3.3.1 Intensive Livestock Facility to a Neighbouring Residence**

Measure the distance from the neighbouring residence (not property line) to the developing livestock facility at the point nearest the neighbouring residence. The livestock facility, for the purpose of determining MDS, is considered to be that part of the operation confining the livestock. The manure storage is considered part of the

facility. Facilities associated with the livestock facility, such as feed handling and storage, office, and water supply, are not considered to be part of the livestock facility.

### **3.3.2 Intensive Livestock Facility to a Neighbouring Land Use Change**

Measure the distance from the existing livestock facility to the property line of the land undergoing the zoning or land use change (no development involved). This ensures that any development on the land undergoing the zoning change will be in compliance with the reciprocal MDS.

### **3.4 Operations on Separate Land Parcels**

Livestock operations on separate land titles are considered to be separate for the purpose of determining MDS.

### **3.5 Exemptions to MDS**

Residences owned or under the control of the livestock operation are exempted from MDS siting requirements of the livestock operation.

### **3.6 Variance to MDS**

All possible ways of reducing nuisance associated with a livestock facility design such as siting, topography, climate, and manure management cannot be included in the MDS tables. Management techniques or technology that clearly reduce nuisance are encouraged by allowing a reduction in the MDS. Variance to the MDS may be permitted by the approving authority upon consultation with Alberta Agriculture, Food and Rural Development staff after consideration and documentation of the following factors.

#### **3.6.1 Unique Topography and/or Micro-climate which Mitigate Nuisance**

Where topographical features will reduce the effect of odour movement and dispersion.

#### **3.6.2 Physical and Visual Screening**

Physical screening can assist in minimizing odours by reducing wind effects at the storage site. Natural or constructed screening can also improve the aesthetics of the facility.

#### **3.6.3 Prevailing Winds**

Where the nearest available meteorological data demonstrates a significant reduction of odour intensity or frequency of occurrence to a neighbouring land use.

#### **3.6.4 Unique Management/Technology**

The use of management or technology capable of significant reduction in nuisance.

### **3.7 Application of MDS to Creeping Expansion**

A series of developments at the same site in any three year period shall use an MDS as if it were one development.



# Appendices

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# Appendix A

## Nutrient Content of Typical Agricultural Livestock Manures for Various Species

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### Explanation of Appendix A:

**Total N:** Includes both mineral (nitrate and ammonium nitrogen) and organic nitrogen. The organic portion is not available to the plant without further microbial mineralization into available nitrogen.

**Available N:** This is the portion of the total nitrogen that is in the mineral (usually ammonium), plant available form at the time of application.

**Crop N:** This is an estimate of the available nitrogen plus the portion of the organic nitrogen that is mineralized over the growing season less estimated losses.

**Total P:** Total P is expressed as total phosphorus in the manure including mineral and organic forms. Phosphorus is largely contained in the solids portion of the manure so mixing of the manure is necessary for uniformity of phosphorus content.

**Total K:** Total K is expressed as total potassium in the manure.

**Appendix A-1: Nutrient Content of Typical Agricultural Livestock Manures for Various Species**

Type of Livestock	Moisture %	Total N % Range	Total N - Typical			Available N			Crop N			Total P			Total K		
			%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne
Beef	Open	30 - 70 (50)	1.00	20.0	10.0	0.26	5.1	2.6	6.5	3.2	0.24	4.8	2.4	0.67	13.3	6.7	
	Paved	50 - 75 (65)	0.70	14.0	7.0	0.27	5.4	2.7	5.0	2.5	0.09	1.7	0.9	0.38	7.5	3.8	
Dairy	Free stall	85 - 95 (92)	0.40	8.0	4.0	0.18	3.6	1.8	3.3	1.7	0.09	1.7	0.9	0.42	8.3	4.2	
	Tie stall	70 - 85 (80)	0.50	10.0	5.0	0.21	4.2	2.1	3.8	1.9	0.09	1.7	0.9	0.42	8.3	4.2	
Hogs		90 - 99 (96)	0.35	7.0	3.5	0.16	3.2	1.6	3.1	1.6	0.11	2.2	1.1	0.17	3.3	1.7	
Poultry	Layers (solid)	50 - 70 (60)	1.60	32.0	16.0	1.31	24.6	12.3	21.5	10.8	1.22	24.3	12.2	0.83	16.7	8.4	
	Layers (liquid)	85 - 95 (90)	0.96	19.2	9.6	0.77	14.8	7.4	12.9	6.5	0.73	14.6	7.3	0.50	10.0	5.0	
	Broilers	30 - 50 (35)	1.85	37.0	18.6	1.23	24.7	12.4	21.4	10.7	0.65	13.0	6.5	0.83	16.7	8.4	
	Breeders	30 - 50 (35)	1.96	39.2	19.7	1.31	26.1	13.1	22.6	11.4	1.30	26.1	13.1	0.83	16.7	8.4	
Turkeys		30 - 50 (35)	1.85	37.0	18.6	1.23	24.7	12.4	21.4	10.7	0.65	13.0	6.5	0.83	16.7	8.4	
Horses			0.60	12.0	6.0	0.30	6.0	3.0	5.7	2.9	0.13	2.6	1.3	0.50	10.0	5.0	
Mink			1.80	36.0	18.0	0.90	18.0	9.0	17.1	8.6	1.09	21.7	10.9	1.67	33.3	16.7	
Fox			0.40	8.0	4.0	0.20	4.0	2.0	3.8	1.9	0.09	1.7	0.9	0.08	1.7	0.8	
Rabbit			0.50	10.0	5.0	0.21	4.2	2.1	4.6	2.3	0.52	10.4	5.2	0.42	8.3	4.2	
Veal			0.38	7.6	3.8	0.19	3.8	1.9	4.0	2.0	0.22	4.3	2.2	0.31	6.2	3.1	
Elk			0.65	13.0	6.5	0.20	3.9	2.0	4.5	2.2	0.22	4.3	2.2	0.50	10.0	5.0	
Bison			0.65	13.0	6.5	0.20	3.9	2.0	4.5	2.2	0.22	4.3	2.2	0.50	10.0	5.0	
Sheep		30 - 65 (50)	0.70	14.0	7.0	0.28	5.6	2.8	5.3	2.7	0.20	3.9	2.0	1.04	20.8	10.4	

# Appendix B

## Manure Production Volumes for Various Livestock Types

### Explanation of Appendix B:

The following values are the average manure volumes expected from common livestock species. Volumes are from typical housing systems and include added water (spillage, wash and precipitation) as well as bedding and spilled feed. These variables should be taken into account and adjustments made where appropriate. These volumes are used to determine recommended manure storage volumes and land spreading.

### Appendix B-1: Liquid Manure Production Volume

Species		Daily			Monthly			Yearly		
		gal	litres	cu. ft.	gal	litres	cu. ft.	gal	cu. m	cu. ft.
Sows	<i>Farrow - finish</i>	14	66	2.31	433	1970	69	5270	24	840
	<i>Farrow - wean</i>	4.4	20	0.71	133	610	21	1620	7.4	260
	<i>Farrow - early wean</i>	3.5	16	0.56	105	480	17	1280	5.8	200
Weaners	<i>Early</i>	0.4	2	0.07	13	60	2	160	0.7	26
	<i>Standard</i>	0.5	2.2	0.08	14.5	66	2.3	180	0.8	28
Hogs	<i>Feeders</i>	1.6	7	0.25	47	210	7	570	2.6	91
Dairy	<i>Free stall</i>	20	91	3.20	600	2730	96	7300	33	1170
	<i>Tie stall</i>	18	81	2.88	540	2440	86	6570	30	1050

## Appendix B-2: Solid Manure Production Volume

Species		Daily			Monthly			Yearly		
		lbs	kgs	cu. ft.	lbs	kgs	cu. ft.	tons	tonnes	cu. ft.
Beef	<i>Open lot</i>	13	5.9	0.32	390	180	9.6	2.4	2.1	117
	<i>Paved</i>	20	9.0	0.43	590	270	12.8	3.6	3.2	156
Dairy	<i>Tie stall</i>	150	69	2.88	4540	2060	86.4	27.6	25.1	1050
Poultry	<i>per 100 layers</i>	9	4.0	0.41	264	120	12.3	1.6	1.4	149
	<i>per 100 broilers</i>	6.6	3.0	0.36	198	90	10.7	1.2	1.1	130
	<i>per 100 breeders</i>	16	7.2	0.64	480	220	19.2	2.9	2.6	234
	<i>per 100 Turkey hens</i>	32	14.3	1.46	950	430	43.7	5.8	5.1	532
	<i>per 100 Turkey toms</i>	36	16.5	1.67	1090	490	50.1	6.6	5.9	610
	<i>per 100 Turkey broilers</i>	26	11.6	1.03	770	350	30.9	4.7	4.2	376
Horses		46	21	0.92	1370	620	27.7	8.4	7.5	337
Mink	<i>per 100</i>	31	14.0	0.71	920	420	21.3	5.6	5.0	260
Fox	<i>per 100</i>	77	35	1.24	2310	1050	37.3	14.1	12.5	454
Rabbit	<i>per 100</i>	100	45	2.49	3000	1370	74.7	18.3	16.3	908
Veal		12	5.4	0.19	360	160	5.8	2.2	1.9	70
Elk		5.8	2.6	0.14	170	80	4.3	1.1	0.9	52
Bison		7.3	3.3	0.18	220	100	5.3	1.3	1.2	65
Sheep	<i>Ewes</i>	3.1	1.4	0.10	90	40	3.0	0.6	0.5	36
	<i>Feeders</i>	0.6	0.3	0.02	17	7	0.5	0.1	0.1	6

# Appendix C

## Livestock Siting Units and Expansion Factors

### Explanation of Appendix C:

This table provides the factors for determining the MDS between intensive livestock operations and neighbours. See Appendix D for pre-calculated tables for the common livestock types. The Livestock Siting Unit (LSU) is used in determining the MDS and combines into one factor the contribution of species type, size of operation, and manure system to the level of nuisance. The LSU factor multiplied by the number of livestock can be looked up in Appendix D-11 to give the required MDS for the livestock operation.

Appendix C-1: Livestock Siting Unit Table for Various Livestock Types\*

Species		LSU Factor	Species		LSU Factor
Beef	Feeders 450 - 900 lbs	0.328	Veal		0.545
	Finishers 900 - 1300 lbs	0.441	Horses	Solid	0.455
	Cow with calf	0.504		Liquid	0.715
Dairy	Milking cows	1.232	Mink		0.0228
Swine - Liquid	Farrow - finish	3.96	Fox		0.0438
	Farrow - wean <sup>TD</sup> 50 LBS	1.474	Rabbits		0.0119
	Farrow - early wean <sup>TD</sup> 11-13 LBS	1.166	Poultry	Broilers	0.002
	Weaners (early)	0.120		Breeders	0.0028
	Weaners (standard) <sup>13-45</sup> LBS	0.110		Layers (solid)	0.017
	Feeders 50 LBS →	0.44		Layers (liquid)	0.026
Swine - Solid	Farrow - finish	2.88	Turkeys	Broilers	0.004
	Farrow - wean	1.072	Sheep	Ewes	0.084
	Farrow - early wean	0.848		Lambs	0.034
	Weaners (early)	0.088	Goats	Dairy herd	0.2
	Weaners (standard)	0.080	Elk		0.252
	Feeders	0.32	Bison		0.42

\* LSU for other livestock types to be determined by AAFRD.

Appendix C-2: Expansion Factors

Expansion %	Factor	Expansion %	Factor	Expansion %	Factor
0 - 29	0.6	100 - 199	0.8	> 300	1.0
30 - 99	0.7	200 - 299	0.9		

# Appendix D

## Minimum Distance Separation Tables

### Explanation of Appendix D:

- Category 1:** Low sensitivity siting (e.g. single residence).  
**Category 2:** Moderate sensitivity siting (e.g. multi-parcel country residential, low use recreational, etc.).  
**Category 3:** High sensitivity siting (e.g. large scale country residential development, high use recreational, etc.).  
**Category 4:** From boundary of rural hamlet, village, or residential zoning.

### Appendix D-1: Recommended MDS (ft) for Beef Feeders

No. of Animals	Category 1	Category 2	Category 3	Category 4	No. of Animals	Category 1	Category 2	Category 3	Category 4
400	800	1070	1340	2160	4000	1870	2490	3110	4970
500	870	1160	1460	2330	5000	2020	2700	3370	5400
600	930	1240	1560	2480	6000	2160	2880	3600	5770
700	990	1320	1660	2630	7000	2290	3060	3810	6100
800	1040	1380	1730	2760	8000	2400	3200	4000	6410
900	1080	1440	1800	2890	9000	2510	3340	4180	6690
1000	1120	1500	1870	3000	10000	2610	3470	4340	6950
1200	1200	1600	2000	3210	12000	2790	3710	4640	7430
1400	1270	1700	2120	3390	14000	2960	3930	4810	7860
1600	1340	1780	2230	3560	16000	3090	4120	5160	8260
1800	1390	1860	2320	3720	18000	3230	4310	5380	8610
2000	1460	1930	2410	3860	20000	3360	4480	5690	8960
2500	1570	2090	2620	4190	25000	3640	4860	6070	9710
3000	1680	2240	2800	4480	30000	3890	5190	6490	10380
3500	1780	2370	2960	4740	40000	4320	5760	7200	11630
4000	1870	2490	3110	4970	50000	4690	6250	7820	12600

\* Beef animals in the 450 - 900 lb (200 - 400 kg) weight range.

**Appendix D-2: Recommended MDS (ft) for Beef Finishers\***

No. of Animals	Category 1	Category 2	Category 3	Category 4	No. of Animals	Category 1	Category 2	Category 3	Category 4
300	800	1070	1340	2150	4000	2070	2760	3450	5520
400	890	1190	1490	2380	5000	2250	3000	3760	5990
500	970	1290	1620	2590	6000	2400	3200	4000	6410
600	1040	1380	1730	2760	7000	2540	3390	4240	6780
700	1100	1460	1830	2920	8000	2670	3560	4450	7120
800	1150	1540	1920	3070	9000	2790	3710	4640	7430
900	1200	1600	2000	3210	10000	2890	3860	4820	7720
1000	1250	1670	2080	3330	12000	3090	4120	5160	8250
1200	1340	1780	2230	3560	14000	3270	4360	5450	8730
1400	1410	1880	2350	3770	16000	3440	4580	5730	9160
1600	1480	1980	2470	3950	18000	3590	4780	5980	9570
1800	1550	2060	2580	4130	20000	3730	4970	6210	9940
2000	1610	2140	2680	4290	25000	4040	5390	6740	10780
2500	1750	2330	2910	4650	30000	4320	5760	7200	11530
3000	1870	2490	3110	4970	40000	4800	6400	8000	12800
3500	1970	2630	3290	5260	50000	5210	6940	8680	13890

\* Beef animals in the 900 - 1300 lb (400 - 500 kg) weight range.

**Appendix D-3: Recommended MDS (ft) for Hogs - Farrow to Finish\***

No. of Sows	Category 1	Category 2	Category 3	Category 4	No. of Sows	Category 1	Category 2	Category 3	Category 4
100	1200	1600	2000	3210	500	2160	2880	3600	5770
125	1300	1740	2170	3480	600	2310	3080	3850	6160
150	1390	1860	2320	3720	750	2510	3340	4180	6690
175	1470	1970	2460	3930	1000	2790	3710	4640	7430
200	1550	2060	2580	4130	1500	3230	4310	5380	8610
250	1680	2240	2800	4480	2000	3590	4780	5980	9570
300	1790	2390	2990	4790	2500	3890	5190	6490	10380
350	1900	2530	3160	5060	3000	4160	5550	6930	11090
400	1990	2660	3320	5320	3500	4400	5870	7330	11730
500	2160	2880	3600	5770	4000	4620	6160	7700	12320

\* Piggery raising hogs from birth to market. Size is based on farrowing sow herd and includes all associated hogs.



**Appendix D-4: Recommended MDS (ft) for Hogs - Farrow to Wean (Early)\***

No. of Sows	Category 1	Category 2	Category 3	Category 4	No. of Sows	Category 1	Category 2	Category 3	Category 4
100	770	1030	1280	2050	500	1380	1850	2310	3700
125	840	1110	1390	2230	600	1480	1980	2470	3950
150	890	1190	1490	2380	750	1610	2140	2680	4290
175	940	1260	1570	2520	1000	1780	2380	2970	4760
200	990	1320	1650	2650	1500	2070	2760	3450	5520
250	1080	1430	1790	2870	2000	2300	3060	3830	6130
300	1150	1530	1920	3070	2500	2490	3330	4160	6650
350	1220	1620	2030	3240	3000	2670	3550	4440	7110
400	1280	1700	2130	3410	3500	2820	3760	4700	7520
500	1390	1850	2310	3700	4000	2960	3950	4930	7890

\* Piggery raising hogs from birth to about 18 days. Size based on farrowing sow herd and all associated hogs.

**Appendix D-5: Recommended MDS (ft) for Hogs - Farrow to Wean (Standard)\***

No. of Sows	Category 1	Category 2	Category 3	Category 4	No. of Sows	Category 1	Category 2	Category 3	Category 4
100	840	1120	1400	2230	500	1510	2010	2510	4020
125	910	1210	1510	2420	600	1610	2150	2680	4290
150	970	1290	1620	2590	750	1750	2330	2910	4660
175	1030	1370	1710	2740	1000	1940	2590	3230	5170
200	1060	1440	1800	2870	1500	2250	3000	3750	6000
250	1170	1560	1950	3120	2000	2500	3330	4160	6660
300	1250	1670	2080	3330	2500	2710	3610	4520	7230
350	1320	1760	2200	3530	3000	2900	3860	4830	7730
400	1390	1850	2310	3700	3500	3060	4090	5110	8170
500	1510	2010	2510	4020	4000	3220	4290	5360	8580

\* Piggery raising hogs from birth to about 21 days. Size based on farrowing sow herd and all associated hogs.

**Appendix D-6: Recommended MDS (ft) for Hogs - Weaners\***

No. of Weaners	Category 1	Category 2	Category 3	Category 4	No. of Weaners	Category 1	Category 2	Category 3	Category 4
500	580	780	970	1560	2500	1050	1400	1750	2810
600	620	830	1040	1670	3000	1120	1500	1870	3000
700	660	880	1100	1760	4000	1250	1670	2080	3330
800	690	930	1160	1850	5000	1360	1810	2260	3610
900	720	970	1210	1930	6000	1450	1930	2410	3860
1000	750	1000	1260	2010	7000	1530	2040	2550	4090
1500	870	1160	1460	2330	8000	1610	2140	2680	4290
2000	970	1290	1620	2590	9000	1680	2240	2800	4480
2500	1050	1400	1750	2810	10000	1750	2330	2910	4650

\* Piggery housing piglets in a 13 - 45 lb (6 - 20 kg) weight range.

**Appendix D-7: Recommended MDS (ft) for Hogs - Finishing\* (Table corrected May 31, 1999)**

No. of Animals	Solid Manure				No. of Animals	Liquid Manure			
	Category 1	Category 2	Category 3	Category 4		Category 1	Category 2	Category 3	Category 4
500	860	1150	1440	2300	500	970	1290	1620	2590
600	920	1230	1530	2450	600	1040	1380	1730	2760
750	1000	1330	1670	2670	750	1130	1500	1870	3000
1000	1110	1480	1850	2970	1000	1250	1660	2090	3330
1200	1180	1580	1970	3160	1200	1330	1780	2220	3560
1500	1290	1720	2150	3440	1500	1450	1930	2420	3860
2000	1430	1910	2390	3820	2000	1610	2140	2680	4290
2500	1550	2070	2590	4140	2500	1740	2320	2910	4650
3000	1660	2210	2770	4430	3000	1870	2480	3110	4970
3500	1760	2350	2990	4690	3500	1970	2630	3280	5270
4000	1840	2450	3060	4900	4000	2070	2760	3450	5530
4500	1930	2570	3220	5150	4500	2170	2880	3600	5770
5000	2000	2670	3330	5340	5000	2240	3000	3750	6000
6000	2130	2840	3550	5680	6000	2400	3200	4000	6400
7000	2270	3020	3780	6040	7000	2540	3380	4240	6770
8000	2370	3160	3950	6330	8000	2670	3560	4450	7110
9000	2480	3300	4130	6610	9000	2780	3610	4640	7430
10000	2580	3440	4290	6870	10000	2890	3860	4820	7720

\* Piggery housing hogs from about 50 lbs to market.

**Appendix D-8: Recommended MDS (ft) for Dairies\***

No. of Milking Cows	Category 1	Category 2	Category 3	Category 4	No. of Milking Cows	Category 1	Category 2	Category 3	Category 4
80	720	960	1210	1930	300	1170	1560	1960	3120
100	780	1050	1310	2090	350	1240	1650	2070	3300
120	840	1120	1400	2240	400	1300	1730	2170	3470
140	890	1180	1480	2370	450	1360	1810	2260	3620
160	930	1240	1550	2480	500	1410	1880	2350	3760
180	970	1300	1620	2590	550	1460	1950	2440	3900
200	1010	1350	1680	2690	600	1510	2010	2510	4020
225	1050	1410	1760	2810	700	1600	2130	2660	4260
250	1100	1460	1830	2920	800	1680	2230	2790	4470
275	1130	1510	1890	3030	900	1750	2330	2920	4660
300	1170	1560	1950	3120	1000	1820	2420	3030	4850

\* Size based on lactating cows but includes all associated animals and replacement stock. Full year confinement.

**Appendix D-9: Recommended MDS (ft) for Poultry Layer Operations**

No. of Birds	Category 1	Category 2	Category 3	Category 4	No. of Birds	Category 1	Category 2	Category 3	Category 4
5000	680	910	1140	1820	12000	910	1210	1520	2430
6000	720	970	1210	1930	15000	980	1310	1630	2610
7000	760	1020	1270	2030	20000	1080	1440	1800	2870
8000	800	1060	1330	2120	30000	1230	1640	2050	3280
9000	830	1100	1380	2210	50000	1460	1940	2430	3890
10000	860	1140	1430	2290	75000	1670	2220	2780	4440
12000	910	1210	1520	2430	100000	1830	2440	3050	4890

**Appendix D-10: Recommended MDS (ft) for Poultry Broiler Operations**

No. of Birds	Category 1	Category 2	Category 3	Category 4	No. of Birds	Category 1	Category 2	Category 3	Category 4
10000	500	520	650	1040	40000	620	820	1030	1640
15000	500	590	740	1190	50000	660	880	1100	1770
20000	500	650	820	1310	75000	760	1010	1260	2020
25000	530	700	880	1410	100000	830	1110	1390	2220
30000	560	750	930	1490	250000	1130	1500	1880	3000
35000	590	790	980	1570	500000	1420	1890	2360	3780
40000	620	820	1030	1640	1000000	1780	2370	2970	4750

**Appendix D-11: MDS Table (ft) for Livestock Facility Developments Based on Livestock Siting Units (LSUs)**

This table is useful in determining MDS for livestock operations of mixed species, unique types of livestock, and expansions.

LSU	Category 1	Category 2	Category 3	Category 4	LSU	Category 1	Category 2	Category 3	Category 4
20	500	540	670	1080	340	1140	1520	1890	3030
30	500	620	780	1250	350	1150	1530	1910	3060
40	520	690	870	1390	360	1160	1550	1930	3100
50	560	750	940	1510	370	1170	1560	1950	3130
60	600	800	1010	1610	380	1180	1580	1970	3160
70	640	850	1060	1700	390	1200	1590	1990	3190
80	670	890	1120	1790	400	1210	1610	2010	3220
90	700	930	1170	1870	410	1220	1620	2030	3250
100	730	970	1210	1940	420	1230	1640	2050	3270
110	750	1000	1260	2010	430	1240	1650	2060	3300
120	780	1040	1300	2070	440	1250	1670	2080	3330
130	800	1070	1330	2130	450	1260	1680	2100	3360
140	820	1100	1370	2190	460	1270	1690	2120	3390
150	840	1120	1410	2250	470	1280	1710	2130	3410
160	860	1150	1440	2300	480	1290	1720	2150	3440
170	880	1180	1470	2350	490	1300	1730	2170	3460
180	900	1200	1500	2400	500	1310	1740	2180	3490
190	920	1230	1530	2450	520	1330	1770	2210	3540
200	940	1250	1560	2500	540	1350	1790	2240	3590
210	950	1270	1590	2540	560	1360	1820	2270	3640
220	970	1290	1620	2590	580	1380	1840	2300	3680
230	990	1310	1640	2630	600	1400	1870	2330	3730
240	1000	1330	1670	2670	620	1420	1890	2360	3770
250	1020	1350	1690	2710	640	1430	1910	2390	3820
260	1030	1370	1720	2750	660	1450	1930	2410	3860
270	1050	1390	1740	2790	680	1460	1950	2440	3900
280	1060	1410	1770	2820	700	1480	1970	2470	3950
290	1070	1430	1790	2860	720	1500	1990	2490	3990
300	1090	1450	1810	2900	740	1510	2010	2520	4030
310	1100	1470	1830	2930	760	1520	2030	2540	4070
320	1110	1480	1850	2970	780	1540	2050	2570	4100
330	1120	1500	1870	3000	800	1550	2070	2590	4140

**Appendix D-11: MDS Table (ft) for Livestock Facility Developments Based on Livestock Siting Units (LSUs) (continued)**

LSU	Category 1	Category 2	Category 3	Category 4	LSU	Category 1	Category 2	Category 3	Category 4
820	1570	2090	2610	4180	2050	2190	2920	3650	5840
840	1580	2110	2640	4220	2100	2210	2950	3680	5890
860	1600	2130	2660	4250	2150	2230	2970	3710	5940
880	1610	2140	2680	4290	2200	2250	3000	3750	5990
900	1620	2160	2700	4330	2250	2270	3020	3780	6040
920	1630	2180	2720	4360	2300	2280	3050	3810	6090
940	1650	2200	2750	4390	2350	2300	3070	3840	6140
960	1660	2210	2770	4430	2400	2320	3090	3870	6190
980	1670	2230	2790	4460	2450	2340	3120	3900	6230
1000	1690	2250	2810	4490	2500	2350	3140	3920	6280
1025	1700	2270	2830	4540	2550	2370	3160	3950	6330
1050	1720	2290	2860	4580	2600	2390	3190	3980	6370
1075	1730	2310	2880	4610	2650	2410	3210	4010	6410
1100	1750	2330	2910	4650	2700	2420	3230	4040	6460
1125	1760	2350	2930	4690	2750	2440	3250	4060	6500
1150	1770	2360	2960	4730	2800	2450	3270	4090	6540
1175	1790	2380	2980	4770	2850	2470	3290	4120	6590
1200	1800	2400	3000	4800	2900	2490	3310	4140	6630
1250	1830	2440	3050	4880	2950	2500	3340	4170	6670
1300	1850	2470	3090	4950	3000	2520	3360	4190	6710
1350	1880	2510	3130	5010	3100	2550	3400	4250	6790
1400	1910	2540	3180	5080	3200	2580	3440	4290	6870
1450	1930	2570	3220	5150	3300	2610	3470	4340	6950
1500	1950	2610	3260	5210	3400	2630	3510	4390	7030
1550	1980	2640	3300	5270	3500	2660	3550	4440	7100
1600	2000	2670	3330	5340	3600	2690	3590	4480	7170
1650	2020	2700	3370	5400	3700	2720	3620	4530	7250
1700	2050	2730	3410	5460	3800	2740	3660	4570	7320
1750	2070	2760	3450	5510	3900	2770	3690	4620	7390
1800	2090	2790	3480	5570	4000	2800	3730	4660	7450
1850	2110	2810	3520	5630	4100	2820	3760	4700	7520
1900	2130	2840	3550	5680	4200	2850	3790	4740	7590
1950	2150	2870	3580	5740	4300	2870	3830	4780	7650
2000	2170	2890	3620	5790	4400	2890	3860	4820	7720

**Appendix D-11: MDS Table (ft) for Livestock Facility Developments Based on Livestock Siting Units (LSUs) (continued)**

LSU	Category 1	Category 2	Category 3	Category 4	LSU	Category 1	Category 2	Category 3	Category 4
4500	2920	3890	4860	7780	12000	4170	5570	6960	11130
4600	2940	3920	4900	7850	12500	4240	5650	7060	11300
4700	2970	3950	4940	7910	13000	4300	5730	7160	11460
4800	2990	3980	4980	7970	13500	4360	5810	7260	11620
4900	3010	4010	5020	8030	14000	4420	5890	7360	11780
5000	3030	4040	5050	8090	14500	4470	5960	7460	11930
5200	3080	4100	5130	8200	15000	4530	6040	7550	12080
5400	3120	4160	5200	8320	15500	4580	6110	7640	12220
5600	3160	4210	5270	8430	16000	4640	6180	7730	12360
5800	3200	4270	5340	8540	16500	4690	6250	7820	12500
6000	3240	4320	5400	8640	17000	4740	6320	7900	12640
6200	3280	4370	5470	8750	17500	4790	6390	7990	12780
6400	3320	4430	5530	8850	18000	4840	6450	8070	12910
6600	3360	4480	5590	8950	18500	4890	6520	8150	13040
6800	3390	4520	5660	9050	19000	4940	6580	8230	13170
7000	3430	4570	5720	9140	19500	4980	6650	8310	13290
7200	3460	4620	5770	9240	20000	5030	6710	8380	13410
7400	3500	4670	5830	9330	20500	5080	6770	8460	13540
7600	3530	4710	5890	9420	21000	5120	6830	8530	13660
7800	3570	4760	5950	9510	21500	5160	6890	8610	13770
8000	3600	4800	6000	9600	22000	5210	6940	8680	13890
8200	3630	4840	6050	9690	22500	5250	7000	8750	14000
8400	3670	4890	6110	9770	23000	5290	7060	8820	14120
8600	3700	4930	6160	9860	23500	5340	7110	8890	14230
8800	3730	4970	6210	9940	24000	5380	7170	8960	14340
9000	3760	5010	6260	10020	24500	5420	7220	9030	14450
9200	3790	5050	6310	10100	25000	5460	7280	9100	14550
9400	3820	5090	6360	10180	25500	5500	7330	9160	14660
9600	3850	5130	6410	10260	26000	5540	7380	9230	14760
9800	3880	5170	6460	10340	26500	5570	7430	9290	14870
10000	3910	5210	6510	10420	27000	5610	7480	9350	14970
10500	3980	5300	6630	10600	27500	5650	7530	9420	15070
11000	4040	5390	6740	10780	28000	5690	7580	9480	15170
11500	4110	5480	6850	10960	28500	5720	7630	9540	15270

**Appendix D-11: MDS Table (ft) for Livestock Facility Developments Based on Livestock Siting Units (LSUs) (continued)**

LSU	Category 1	Category 2	Category 3	Category 4	LSU	Category 1	Category 2	Category 3	Category 4
29000	5760	7680	9600	15360	38000	6360	8480	10600	16960
29500	5800	7730	9660	15460	39000	6420	8560	10700	17120
30000	5830	7780	9720	15550	40000	6480	8640	10800	17280
31000	5900	7870	9840	15740	41000	6540	8720	10900	17430
32000	5970	7960	9950	15920	42000	6590	8790	10990	17590
33000	6040	8050	10070	16100	43000	6650	8870	11090	17740
34000	6110	8140	10180	16280	44000	6710	8940	11180	17890
35000	6170	8230	10280	16450	45000	6760	9020	11270	18030
36000	6230	8310	10390	16620	46000	6820	9090	11360	18180
37000	6300	8400	10490	16790	47000	6870	9160	11450	18320

