# APPENDIX B – MDS II

The Minimum Distance Separation (MDS) Formulae Implementation Guidelines (Publication 707), Ministry of Agriculture, Food and Rural Affairs provide detailed information on both the MDS I and MDS II formulae.

Appendix B includes excerpts from the Implementation Guidelines, specifically the MDS II calculation forms (pages 35 to 41).

Appendix A contains the remainder of the Implementation Guidelines and should be referred to in order to appropriately apply MDS II. All the necessary Factor Tables are included in Appendix A.

# 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. |

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| **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*.<br><br>If 'No', use Approach (i) below to calculate Percentage Increase.<br>If 'Yes', use Approach (ii) below to calculate Percentage Increase.<br><br>Approach (i)<br><br>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.<br><br>Approach (ii)<br><br>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<br><br>continued... |

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| **Step 7**<br>continued... | | continued...<br>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.<br><br>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<br>continued... |

**Now What?**

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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 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 | Feeders (27 kg - 105 kg) | 6 | Liquid | 1200 | 200 | 1200 | 200 | 400 | 1.2 | 0.8 |
| Chickens | Broilers (9 week cycle) | 300 | Solid | 33000 | 110 | N/A | N/A | 110 | N/A | N/A |
| Imported Manure | Maximum Capacity (10m x 12m x 2m) | 19.8 | Solid | 240 | 12 | N/A | N/A | 12 | N/A | N/A |
| Totals | | | | | 322 | | 200 | 522 | | |

| | |
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| Factor A (Odour Potential Factor) weighted average may be necessary | 1.2 |
| Factor D (Manure Form Factor) weighted average may be necessary | 0.8 |
| Factor B (*Nutrient Units* Factor) | 563 |

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) | 200 | 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) | 322 | 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 | 62.1% | % Increase: (Total 2/Total 1) x 100 | |

| | |
|---|---|
| Factor C (Orderly Expansion Factor) | 0.825 |
| F (Building Base Distance, m) = Factor A x Factor D x Factor B x Factor C | 446 |
| S (*Manure Storage* Base Distance, m) | 446 |

| | |
|---|---|
| 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. |

## 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 | |

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|---|---|
| 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) | |

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|---|---|
| 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. |