Odour Management Plan for Alberta Livestock Producers

Odour management plans help producers identify where possible odour sources exist on their operation and provide solutions to manage odour from those sources.

Alberta Government

Agdex 092-1

Published by

Alberta Agriculture and Forestry
Environmental Stewardship Division
#306, 7000-113 Street
Edmonton, Alberta T6H 5T6

Acknowledgements

Alberta Agriculture and Forestry
Alberta Beef Producers
Intensive Livestock Working Group
Natural Resources Conservation Board

The committee who prepared this manual gratefully acknowledges:
The MidWest Plan Service (MWPS), Iowa State University, Ames Iowa 50011-3080. Information has been adapted and reprinted with permission from their Livestock and Poultry Environmental Stewardship curriculum. Copyright © 2001

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Table of Contents

Introduction

Factors affecting the release of odour

The level of odour emissions from confined feeding operations depends on a number of factors, including the following:

- size of operation
- type of building and ventilation system
- type of operation and the rearing cycle
- feeding regime
- management of the operation
- manure storage
- manure application practices

The effect of those emissions on the local environment depends on certain variables:

- proximity to neighbours and other sensitive receptors
- local topography
- prevalent weather conditions such as wind speed, wind direction and atmospheric stability

Odour management plan

Odour management plans help producers identify where possible odour sources exist on their operation and provide solutions to manage odour from those sources.

Steps to building an odour management plan:

1. Assessing Your Operation
   - Provide a general description of your operation.
   - Identify neighbouring residents to the operation.
   - Identify land receiving manure.
   - Consider potential concerns neighbours may have because of proximity, nature of the landscape or primary wind direction.
2. Assessing Potential Odour Sources
   - This step is divided into four main management areas: Neighbour and Community Relations, Manure Management, Feed Storage, and Manure Application.
   - The most common odour sources associated within each management area are identified.
   - Odour sources may or may not exist on your operation.
   - By picking practices applicable to your operation, you can assess the potential for your operation to produce odour concerns
   - The objective is to move from a high potential to a low potential.
3. Responses to Odour Concerns
   - Identify what actions could be taken with each of the applicable potential odour sources identified in Step 2.
   - Identify timelines when action items may be implemented.
4. Review and Completion Dates
   - Review odour management plan on a regular basis.
   - Fill in the date when actions were completed.

Contact

If you need assistance, you may want to consult with an Alberta Agriculture and Forestry (AF) Confined Feeding Operation (CFO) Extension Specialist or an industry representative.

Alberta Agriculture and Forestry staff CFO Extension Specialists

Morinville	780.939.1218
Red Deer	403.755.1475
Lethbridge	403.381.5885

Industry

Alberta Beef Producers www.albertabeef.org	403.275.4400
Alberta Cattle Feeders' Association www.cattlefeeders.ca	1.800.363.8598
Alberta Chicken Producers www.chicken.ab.ca	780.488.2125
Alberta Egg Producers www.eggs.ab.ca	1.877.302.2344
Alberta Hatching Egg Producers www.albertahatchingeggs.ca	780.434.8414
Alberta Milk www.albertamilk.com	1.877.361.1231
Alberta Pork www.albertapork.com	780.474.8288
Alberta Turkey Producers www.albertaturkey.com	780.465.5755

Assessing Your Operation

Name: _____ Date: _____

Step 1: Assessing Your Operation

Livestock Type Present on Your Operation	Number (per cycle)	Manure Type (solid, semi-solid, or liquid/slurry)
Beef Cattle		
Dairy Cattle		
Swine		
Poultry		
Other		

Estimated number of acres or hectares manure is applied to annually

_____ acres or _____hectares

Prevailing wind direction at the facility (primary wind direction):

_____

Neighbours of Facility - consider neighbours within a 1 mile (1.6 km) radius (check the appropriate boxes)						
Neighbour	Distance between facility and direction to the neighbour	Topography between the facility and the neighbour			Based on the direction of the prevailing wind, is the neighbour located upwind or downwind of your farm?	
		Low Odour Potential A shelterbelt, woods or hill	**Moderate Odour Potential** Open, flat terrain	**High Odour Potential** Neighbours are located at lower elevation or in valley below facility OR Lake and no trees between facility and neighbours	**Low Odour Potential** Upwind	**High Odour Potential** Downwind
Example Smiths	1 mile east		✓			✓

Neighbours of Manure Application Sites - consider nieghbours within a 2 mile (3.2 km) radius (check the appropriate boxes)							
Field receiving manure (use legal land location OR name OR field #)	Neighbour	Distance between neighbour and direction to the manure application site	Topography between the manure application site and the neighbour			Based on the direction of the prevailing wind, is the neighbour located upwind or downwind from the land receiving manure?	
			Low Odour Potential A shelterbelt, woods or hill	**Moderate Odour Potential** Open, flat terrain	**High Odour Potential** Neighbours are located at lower elevation or in valley below application site OR Lake and no trees between neighbour and application site	**Low Odour Potential** Upwind	**High Odour Potential** Downwind
Dad's quarter	Jones	1 mile south		✓			✓
Bob's quarter	Bishops	1.5 miles N			✓	✓	

Example of How to Complete

STEP 2 Assessing Potential Odour Sources For each issue listed in the left column, read across to the right and check the statement that best describes conditions on your farm. If any issue does not apply, then under Step 3, mark them not applicable (N/A). The objective is to move from the high potential to the low potential.				**STEP 3 Possible Responses to Odour Concerns** • Identify what actions could be taken with each of the applicable potential odour sources identified in Step 2. • Identify timelines when action items may be implemented.		**STEP 4 Review and Completion Dates** • Review odour management plan on a regular basis. • Fill in the date when actions were completed.
Issue	**Low Odour Potential**	**Moderate Odour Potential**	**High Odour Potential**	**Actions Taken to Minimize Odour or N/A**	**Timeline**	**Date Completed**
Loading point of liquid storages	☐ Storage facility is always loaded below liquid manure surface	☐ Storage facility is usually loaded below liquid manure surface	☑ Storage facility is loaded above liquid manure surface.	Move loading point of liquid storage.	☐ 3-6 months ☐ Within 2 years ☑ 2-5 years ☐ _____	
Silage	☐ A plan is in place to manage silage seepage and spoiled silage		☐ No plan is in place to deal with silage seepage and spoiled silage.	N/A	☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Neighbour/Community Relations

Producer knowledge of and response to neighbour concerns						
Concerns	**Low Concern Potential**	**Medium Concern Potential**	**High Concern Potential**	**Actions Taken to Minimize Odour or N/A**	**Timeline**	**Date Completed**
Do neighbours express odour-related concerns?	☐ Never	☐ Occasional odour-related concerns over the past one to three years.	☐ Several odour-related concerns over the past year.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Have you asked your neighbours about their odour-related concerns?	☐ All neighbours have been asked about their odour-related concerns.	☐ Some neighbours have been asked about their odour-related concerns.	☐ No neighbours have been asked about their odour-related concerns.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Do neighbours know who to contact (name and phone number) if they have an odour- related concern?	☐ All neighbours have a contact name and phone number for my farm.	☐ Some neighbours have a contact name and phone number for my farm.	☐ No neighbours have a contact name and phone number for my farm.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
How are odour-related concerns addressed?	☐ Odour-related concerns are taken seriously and acted upon quickly, and action is shared with neighbours.	☐ Odour-related concerns are taken seriously but may not be acted upon quickly.	☐ Odour-related concerns are not addressed.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Do you regularly communicate with neighbours when there is a potential odour increase due to operations?	☐ Always	☐ Occasionally	☐ Never		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Do you participate in community awareness events?	☐ Frequently	☐ Occasionally	☐ Never		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Is the farm owner or farm manager active in the community? (e.g., school, service groups, 4-H)	☐ Farm owner/manager is active in community.	☐ Farm owner/operator has limited involvement in community.	☐ Farm owner/manager is not active in the community. OR farm owner/manager does not reside in the same community as the farm.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Stockpiling	☐ Manure is stockpiled in well-drained, remote locations away from neighbours.	☐ Manure is stockpiled in well drained areas near public roads or near neighbours.	☐ Manure is stockpiled in poorly drained areas near public roads or near neighbours.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Neighbour/Community Relations Continued

Producer knowledge of and response to neighbour concerns						
Concerns	**Low Concern Potential**	**Medium Concern Potential**	**High Concern Potential**	**Actions Taken to Minimize Odour or N/A**	**Timeline**	**Date Completed**
Manure application sites.	☐ All manure application sites are in remote locations away from neighbours.	☐ Some manure application sites are in close proximity to neighbours.	☐ All manure application sites are in close proximity to neighbours.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Timing of manure application – weekends/holidays.	☐ Manure application on weekends and holidays is always avoided.	☐ Manure application on weekends and holidays is often avoided.	☐ Manure application can occur on any day. Manure application on weekends and holidays is not avoided.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Neighbours are informed of application timing and fields.	☐ Always	☐ Sometimes	☐ Never		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Manure is spilled while emptying storage facility.	☐ Manure does not accumulate around the storage facility.	☐ Sometimes manure accumulates around the storage facility.	☐ Manure accumulates around the storage facility.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Manure is spilled on roadways during transportation.	☐ Manure spilled from application equipment on public roadways is removed as soon as possible.	☐ Manure spilled from application equipment on public roadways is removed sometimes.	☐ Manure spilled from application equipment on public roadways is rarely or never removed.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Manure Management

Indoor Facilities

Potential Source	Low Odour Potential	Medium Odour Potential	High Odour Potential	Actions Taken to Minimize Odour or N/A	Timeline	Date Completed
How is manure managed within the confinement area? (In- barn pits are considered storage facilities)	☐ Manure collects in barn for less than one week before it is moved to a storage facility.	☐ Manure collects in barn for one to two weeks before it is moved to a storage facility.	☐ Manure collects in barn for more than two weeks before it is moved to a storage facility.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Mechanical ventilation.	☐ System is monitored regularly to ensure proper air flow and system automatically responds to changes in weather.	☐ System is monitored occasionally and manually responds to changes in weather.	☐ System is seldom monitored and does not respond to changes in weather.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Dust minimization in confined facilities?	☐ Two or more of the following are implemented: • clean interior building surfaces regularly • reduce dust from feed • drop tubes on all augers	☐ Housing facilities use some "low-odour potential" dust control.	☐ No efforts have been made to control dust.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Outdoor Facilities

Potential Source	Low Odour Potential	Medium Odour Potential	High Odour Potential	Actions Taken to Minimize Odour or N/A	Timeline	Date Completed
Pen drainage after a storm event (rain or snow).	☐ Pen surfaces drain quickly.	☐ Pen surfaces are prone to temporary flooding.	☐ Pen surfaces are part of the runoff storage.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Frequency of cleaning pens.	☐ Pen cleaning two to three times a year.	☐ Pen cleanings occur after each feeding cycle.	☐ Pen cleaning occurs once per year or less frequently.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Water leakage.	☐ Regular inspections are made for overflow waterers and system leaks, AND problems are quickly corrected.	☐ Inspections for overflow waterers and system leaks are infrequent.	☐ Overflow waterers and system leaks are not a priority.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Outdoor Facilities Continued

Potential Source	Low Odour Potential	Medium Odour Potential	High Odour Potential	Actions Taken to Minimize Odour or N/A	Timeline	Date Completed
Emptying runoff catch basin.	☐ Low pressure flood.	☐ High pressure irrigation.	☐ Management practice either starts on the weekend or is carried out in close proximity to neighbours.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Dust minimization.	☐ Groom pens regularly.	☐ Sprinkle pens.	☐ No preventative action taken.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Composting	☐ Neighbours are more than 2 miles downwind from composting site, OR composting occurs in enclosed, controlled facility.	☐ Actively turning manure with an adequate (25:1 – 30:1) carbon:nitrogen and moisture content.	☐ Actively turning manure with a low carbon:nitrogen and high moisture content OR composting process is not properly managed.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Loading point of liquid storages.	☐ Storage facility is always loaded below liquid manure surface.	☐ Storage facility is usually loaded below liquid manure surface.	☐ Storage facility is loaded above liquid manure surface.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Manure storage cover.	☐ Undisturbed crust forms over the entire surface OR manure is held in enclosed tank OR manure is covered with crop residue, plastic membrane or other type of cover.	☐ Crust forms over only part of manure surface. OR manure surface is partially covered by crop residue, plastic membrane or other type of cover.	☐ Natural crust does not form.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Manure is agitated below the surface.	☐ Yes		☐ No		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Feed Storage

Potential Source	Low Odour Potential	Medium Odour Potential	High Odour Potential	Actions Taken to Minimize Odour or N/A	Timeline	Date Completed
Feed mill or feed storage area.	☐ Feed mill/storage area is cleaned on a regular basis, and equipment is maintained to prevent spills.	☐ Feed mill/storage area is cleaned occasionally, and equipment is maintained to prevent spills.	☐ Feed mill/storage area is rarely cleaned and equipment is fixed as required.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Silage	☐ A plan is in place to manage silage seepage and spoiled silage.		☐ No plan is in place to deal with silage seepage and spoiled silage.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Manure Application

Potential Source	Low Odour Potential	Medium Odour Potential	High Odour Potential	Actions Taken to Minimize Odour or N/A	Timeline	Date Completed
Liquid manure application.	☐ Subsurface injection of liquid manure OR surface application with drop hose applicator plus same day incorporation.	☐ Broadcast application of liquid manure followed by same day incorporation OR surface application with drop hose applicator followed by incorporation within 48 hours.	☐ Surface application of liquid manure without incorporation.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Solid manure application.	☐ Surface applied followed by same day incorporation.	☐ Surface applied and incorporated within 48 hours.	☐ Surface applied without incorporation.		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Time of day.	☐ Manure is always applied during daylight hours.	☐ Manure is often applied during daylight hours.	☐ Time of day is not considered when manure is applied. Manure application in the evening is common (high chance of inversion that prevents dilution).		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	
Wind direction is considered.	☐ Always	☐ Sometimes	☐ Never		☐ 3-6 months ☐ Within 2 years ☐ 2-5 years ☐ _____	

Complaint Log

As you receive complaints, whether they are from an official source such as the Natural Resources Conservation Board (NRCB) or from conversation with neighbours, record the event.

Date	Who Complained	Complaint	Possible Source(s) of Odour Causing the Complaint	Action Taken
June 15	Jones, Smiths (neighbours)	High odour/smells	Manure storage - wind	Maintain continuous cover over entire manure surface by adding straw to crust especially where manure surface is exposed.

Other Odour Potential Strategies Used on Your Farm

Date Developed: (dd/mm/yy):_____

Review Dates: (dd/mm/yy): _____

(dd/mm/yy): _____

(dd/mm/yy): _____

Resources

Alberta Resources:

1. Beneficial Management Practices: Environmental Manual for Livestock Producers in Alberta (Pages 22, 26, 27, 72, 84)
   www.agriculture.alberta.ca/manure
3. Nutrient Management Planning Guide
   www.agriculture.alberta.ca/manure
4. Manure Composting Manual (Pages 11 and 18)
   www.agriculture.alberta.ca/manure
5. Good Practices Guide for Odour Management in Alberta from Prevention and Mitigation to Assessment and Complaints
   http://casahome.org/Portals/0/DMX/OMT%20GPG/CASA_GPG_webversion_V3.pdf?timestamp=1444833907813

Other

- National Air Quality Site Assessment Tool
  www.naqsat.tamu.edu/
- Practice to Reduce Odors from Livestock Operation Factsheet: Iowa State University
  www.extension.iastate.edu/Publications/pm1970a.pdf
- Overview of Odor Control for Manure Storage Facilities: Factsheet AEX-738-08. Ohio State University
  www.ohioline.osu.edu/aex-fact/pdf/0738.pdf
- Air Management Practices Assessment Tool
  http://www.agronext.iastate.edu/ampat/homepage.html

People Resources

Alberta Agriculture and Forestry
CFO Extension Specialists

Morinville	780.939.1218
Red Deer	403.755.1475
Lethbridge	403.381.5885

NRCB Offices

Lethbridge	403.381.5166
Red Deer	403.340.5241
Morinville	780.939.1212
Fairview	780.835.7111