

Confined Feeding Operations: Jurisdictional Review

Disclaimer:

This report is the last draft assembled by the Jurisdictional Review subgroup, not a final version. The report represents the significant efforts of the subgroup and is presented for information only. Some of the information or interpretation contained in the report does not reflect the opinions or decisions of the Jurisdictional Review subgroup or the Confined Feeding Operations project team.

Therefore, this report did not achieve consensus and does not have the sanction of the CFO project team.

**A report to the CASA CFO Project Team
from the Jurisdictional Review Subgroup**

**DRAFT for discussion purposes
only**

November 1, 2007

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Purpose of this Report

The purpose of the Jurisdictional Effects Subgroup of the Confined Feeding Operations Project Team was to provide information to the team on policy tools that could be included in the strategic plan to address air quality concerns related to CFOs in Alberta. This report provides examples of approaches used in other jurisdictions to help the CFO team move forward to identify potential policy tools for application in Alberta.

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Executive Summary

The Jurisdictional Review Subgroup of the CASA Confined Feeding Operations (CFO) Project Team was charged with providing information to the team on policy tools that could be included in the strategic plan to address air quality concerns related to CFOs in Alberta.

The subgroup reviewed and assembled a great deal of information about CFO and livestock policy tools in other jurisdictions. To help in sorting and organizing the information, members developed a list of the policy tools they found. They also considered the extent to which the policy and implementation tools could be applied in Alberta. To assist in presenting this material to the team, the subgroup prepared a detailed table of the tools being used in jurisdictions around the world. Among other things, the subgroup attempted to assess the effectiveness of the tool, and some of the challenges associated with that task are noted in the conclusions below. Additional material is available and could be reviewed if desired; references are indicated at the end of the table.

The Jurisdictional Review (JR) Subgroup has reached the following conclusions for consideration by the CFO team as it moves forward with its strategic plan.

Conclusions

1: Policy tools specific to each jurisdiction

Other jurisdictions have created policy tools tailored to their situation. When assessing the effectiveness of the tools, it is important to consider the climatic conditions of the area. Other variables must also be taken into account, both in developing policy specific to a jurisdiction and in assessing its effectiveness; these include socio-economic, environmental, equity, timing and the overall policy approach (e.g., some jurisdictions have a strong tradition of legislation and regulation while others focus more on the use of market mechanisms).

Therefore, the CFO Project Team may need to tailor the strategic plan to consider these and other factors.

2: Package of policy tools

Other jurisdictions have tended to use a suite of policy tools. Those jurisdictions that are perceived to be leaders have used:

- A mix of tools,
- Frameworks that bring all the tools together, and
- Frameworks that are also supported by financial incentives

There are many other tools from which to select the best approaches for Alberta; these include the use of enforcement; best management practices; voluntary codes; management plans; market-based instruments; financial assistance; research and development; technology; education programs; and partnerships between government, industry, NGOs. This mix of tools and implementation mechanisms could apply to all priority substances and odour, but not all tools can be applied equally or in the same manner to substances and odours.

Therefore, the CFO Project Team may need to consider a package of policy tools and implementation mechanisms for the strategic plan.

3: Measuring effectiveness of policy tools

The subgroup was uncertain as to how effective some jurisdictions' suite of tools has been in meeting their goals. Part of the difficulty is how others measure effectiveness in the absence of clear indicators and goals specifically for CFOs.

Therefore, the CFO Project Team should consider a plan for evaluating the effectiveness of the strategic plan it develops.

4: Air quality standards

Jurisdictions that have standards on air quality may use ambient or emissions standards that were not specifically designed for CFOs emissions. The subgroup did not find any point-source (from a specific source) standards and measurements for CFOs in other jurisdictions. Ambient (overall air quality) standards can apply to CFOs, but they also include emissions from other industries. (e.g., the US uses ambient standards in licensing CFOs, but these standards apply to other sectors too).

Therefore, the CFO Project Team should consider the following points while developing the strategic plan:

- *Point sources such as lagoons, barns, tractors, and fields do exist on a CFO, but it is very difficult to measure each point source.*
- *It is difficult to attribute emissions to a specific CFO based on an ambient number, particularly if there are many CFOs in the area.*
- *It is possible to measure our five priority substances (ambient air quality) around CFOs.*

5: Cumulative effects

The subgroup did not find many examples of processes to address air cumulative effects from CFOs in other jurisdictions, but it was not a specific focus of the subgroup's search for policy tools.

The CFO project team should consider cumulative effects on air when developing a strategic plan.

6: Odour standards and guidelines

Germany is setting an ambient odour standard/guideline. Odour is measured by a team of scientists, and the overall process involves smelling by several noses, mitigation (enforcement action), and regulation. There is also a protocol to ensure consistency in measurement that includes training, assessment and equipment.

7: Environmental and land use planning that affects air quality

Other Alberta organizations and processes are addressing environmental and land use planning as these issues affect air quality. These include:

- Ambient air quality objectives (AAQO) for H₂S, (some) VOCs, Ammonia, PM, but there are no AAQOs for bioaerosols and odour.
- The proposed Environment Sustainability Act and its associated pilot projects to assess cumulative effects.
- Land use framework.

- Integrated Watershed Management planning, which will affect location of CFOs.
- CASA Clean Air Strategy.

Alberta does have a nuisance-based system to respond to odour complaints. Measurement of odour is done by one inspector, and this approach is not meeting the needs of some stakeholders.

The CFO team needs to understand that no other organization is specifically addressing air quality for CFOs.

1 Introduction

The CASA Board established the multi-stakeholder Confined Feeding Operations (CFO) Project Team in 2005. The goal of the team was to work within the CASA consensus process to develop a strategic plan to improve the management of air emissions from existing and future CFOs in Alberta and to improve relationships between stakeholders.

The team realized that the task was very large and decided to divide its work into four parts, each to be addressed by a subgroup. The Jurisdictional Review Subgroup was asked to summarize information for the Project Team on policy tools that could be included in the strategic plan to address air quality concerns related to CFOs in Alberta. This information is provided in section 3 and is organized by priority substance, as defined and investigated by the team.

Members of the Jurisdictional Review Subgroup and their terms of reference appear in Appendix A of this document.

2 Policy Tool Definitions

Policy Tools

Legislation - A law or act which expresses the will of a legislature or parliament.

Regulation - An official rule made under the authority of an act (a law).

Standards - A definite rule established by authority. Environmental standards often take the form of prescribed numerical values that must be met.

Codes of Practice - A set of written rules that states operating requirements for specified activities. Codes of Practice are being used by Alberta Environment to streamline the old approach of individual approvals to an approach of notification or registration under a Code of Practice.

Ambient Air Quality Objectives - A numerical concentration, value or narrative statement which is intended to provide protection of the environment and human health to the extent which is technically and economically feasible, and is socially and *politically acceptable*.

Policy Implementation Tools

Approval Requirement – most environmental legislation has accompanying regulations, which stipulate those activities that will require an approval to ensure they are meeting air quality legislation. In Alberta, the Activities Designation Regulation sets out those activities in its Schedules. Most provinces apply these to point source emissions. Alberta Guidance states:

Area Emission Standards

In addition to source emission standards, there is a need to develop strategies to control area sources. Area sources are those sources which are numerous and widespread (i.e. vehicles, home furnaces). These sources are not easily regulated through the traditional approval

method. The management of releases from such sources must be done at the product manufacturing stage to be effective. The management tools can be the same as used for source emissions:

- *pollution prevention*
- *use of technology or*
- *use of product bans such as the ban of chlorofluorocarbon compounds.*

License – more applicable to water management, land fills etc. **Defer to Alberta Environment definition sent in by Laura Blair.**

Guidelines - A basis for determining a course of action. An environmental guideline can be either procedural, directing a course of action, or numerical, providing a numerical value that is generally recommended to support and maintain a specified use.

Incentives¹ –applying a fiscal or market-based policy tool to encourage less or more of certain behaviours; can be positive (cost-sharing) or negative (taxes, regulations). Positive examples in environmental management include emissions credit-trading, financial incentives, tax credits, cost-sharing, renewable energy certificates among others.

Mediation - intervention between conflicting parties to promote reconciliation, settlement or compromise; in the environmental legal frameworks, and appeal or review process is typically established. Most times, the Minister responsible for the legislation renders the ultimate decision (e.g., Environmental Appeals Board, AEPEA) but in some cases, a review board renders the decision and attempts to mediate further in addressing the solution (e.g., Farm Practice Review Committees under AOPA).

Management Frameworks – Management frameworks created by CASA generally use a mix of tools that depends on the specific issue and the team’s overall approach. Management frameworks tend to combine tools and also include a system to assess implementation and effectiveness. *[note: this is adapted from the subgroup’s last draft]*

Agricultural Management Tools:

Beneficial Management Practices (BMPs)² – within an Alberta agricultural sector context, these are defined as practices that are environmentally sound, economically feasible and practical to implement. They are typically a level of management beyond ‘generally accepted practices’ or legal requirements. This allows an incentive framework to be applied that encourages behavioural change.

Odour Management Plans³ – a management tool that systematically identifies potential odour sources, determines control strategies to reduce these odours, and establish criteria for implementing these strategies.

¹ In agriculture, the term incentive is often confused with production incentives or subsidies – the topic of intense debate in international trade circles. In this definition, we should stick incentives for environmental management.

² As opposed to ‘Best Management Practices’ that are used in an industry production economic sense. Beneficial Management Practices are used for those producers desiring to achieve excellence in environmental stewardship. [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/crop8206](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/crop8206)

³ <http://www.extension.umn.edu/distribution/livestocksystems/DI7637.html>

3 Review of Policy Tools Used in Other Jurisdictions

The table on the following pages represents the primary product from the JR Subgroup. It summarizes information about a number of policy tools used in diverse jurisdictions in Europe and North America. Additional information is also available that provides more details, and these documents are listed after the table.

GENERAL POLICY

Canada

Legal and Jurisdictional Context	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Is there specific legislation?	Environmental Quality Act	No		Agricultural Operations Act	No	No
Are there provincial strategies/policies?	Yes	Yes		Yes	Yes	Yes
Do programs focus on livestock only?	Livestock/crops	Livestock Focus		Livestock	Livestock	Both (mushroom, greenhouse)
What is the key provincial department?	Environment	Agriculture		Agriculture	Agriculture	Environment, Agriculture
Are provincial approvals required?	Yes	No		Yes	No	No
Building permits/zoning	Prov. Leg., Municipal implementation	Prov. Leg., Municipal implementation	Prov. Leg., Municipal implementation	Prov. Legislation, Municipal requirement	Yes	Prov. Legislation, Municipal requirement
Separation distances	Legislation	Prov. Policy, Municipal Implementation	Provincial guideline (implemented by some mun.)	Yes – where applied by mun.	Yes(municipal implementation)	Manure storage – watercourses
Manure storage (structure/capacity)	250 days (legislation)	240 days (Prov. Strategy) some municipal implementation	Dept. of Env. Approvals required above 400 AU.	180 days	180 days (varies by livestock)	150 days
Environmental studies	Yes	No	Required by some mun.	-	Yes	No

Mandatory public meetings/notification	No	No	Required by many mun.	Yes (recommended under guidelines)	In some municipalities	No
Nutrient Management Plans (NMP)	Yes	Prov. Strategy, implemented by some municipalities	Yes	Yes	Yes	No
3rd party review of submissions	Yes (government)	Yes	-	By government	-	-
Who can complete NMP	Agrologist	Farmers (some municipalities require consultants)	-	Anyone	-	-
Approach to enforcement	Fines – complaint driven	Local Ag. Review Committee (some municipalities try to enforce)	Random Audits	Complaint driven	Peer Review, Stop Order (Mun. Government Act)	-
Register land for nutrient application	Yes	Some mun. considering	-	No	-	No
Prohibit winter manure application	Yes	No	Yes for large operations	No	Yes as per Code of Practice (some mun. implementation)	Indirectly (waste management)
Limitations on livestock densities/total size	Indirectly through agro-environmental fertilization plan	Indirectly through NMP	Indirectly through NMP	Indirectly NMP	Indirectly NMP	No
Landbase requirements for spreading	Indirectly through agro-environmental fertilization plan	NMP	NMP	NMP	NMP	No (spreading guidelines)
Thresholds defining large	75 LU	150 LU	400 LU (200 LU some mun.)	300 LU	Varies by livestock (some Municipalities.)	NA

European Union

Tools Used	Type of Tools	Implementation Information
<p>Common Agricultural Policy, applies to all members of the EU</p>	<p>Regulation</p>	<p>Key elements of the reformed CAP:</p> <ul style="list-style-type: none"> • A single farm payment for EU farmers, independent from production; limited coupled elements may be maintained to avoid abandonment of production, • This payment will be linked to the respect of environmental, food safety, animal and plant health and animal welfare standards, as well as the requirement to keep all farmland in good agricultural and environmental condition (“cross-compliance”), • A strengthened rural development policy with more EU money, new measures to promote the environment, quality and animal welfare and to help farmers to meet EU production standards starting in 2005, • A reduction in direct payments (“modulation”) for bigger farms to finance the new rural development policy, • A mechanism for financial discipline to ensure that the farm budget fixed until 2013 is not overshot, • Revisions to the market policy of the CAP: <ul style="list-style-type: none"> • Asymmetric price cuts in the milk sector; The intervention price for butter will be reduced by 25% over four years, which is an additional price cut of 10% compared to Agenda 2000, for skimmed milk powder a 15% reduction over three years, as agreed in Agenda 2000, is retained, • Reduction of the monthly increments in the cereals sector by half, the current intervention price will be maintained, • Reforms in the rice, durum wheat, nuts, starch potatoes and dried fodder sectors. <p>Implemented by way of three Commission Regulations.</p> <p>Member states are given no latitude for national variations as regards the tying of direct payments to compliance with already existing EU Regulations and Directives.</p>

PARTICULATE MATTER

Netherlands

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient air quality standard	Legislation 1 st daughter directive, 1999	Standards to protect people and nature	<p>The current policy has not been adequate to achieve timely compliance with the European standards for particulate matter (by 2005). That is why the government has decided to take additional measures. But even with these additional measures, it will not be possible to comply with the European standards everywhere in 2010.</p> <p>The EU emission objective for road traffic. This has led to a 45% fall in emissions of primary particulate matter by road traffic since 1990, despite an increase in road traffic of 30%.</p> <p>The national policy for combating primary particulate matter is made up of local environmental permits and the standards required for installations by Emission Requirements for Combustion Installations Decree (BEES) and the Dutch Emission Guideline (NER). As a result of this policy, particulate matter emissions from companies in the Netherlands have fallen by 60% since 1990.</p>	<p>Has been force since July 19, 2001.</p> <p>Air Quality Standards:</p> <ul style="list-style-type: none"> • relate to chronic exposure and peak concentrations, the aim is to protect people and ecosystems. • The National Air Quality Measurement Network provides continuous monitoring. <p>Agriculture and horticulture - 20% of particulate emissions.</p> <p>In 2005, the particulate matter limit values will be revised in a European context (CAFE, Clean Air For Europe). It looks as though the aim will be a limit value for PM_{2.5} (particles with a diameter of less than 2.5 µm) for which compliance will be required from 2015 or 2020 onwards. Because it cannot be said that 'coarse' particulate matter (PM₁₀ - PM_{2.5}) is harmless, it has been proposed to maintain the 2005 limit values for PM₁₀.</p> <p>At present, no agreements have been made at either the EU or national levels about setting emission objectives for primary particulate matter. Counter-measures for secondary PM₁₀ are in place in the form of compulsory emission objectives for ammonia, oxides of nitrogen, sulphur dioxide and volatile organic hydrocarbons as formulated in the context of the European directive for national emission ceilings (EU 2001, UNECE, 1999; VROM 2001). The current policy for combating primary particulate matter has a European and a national component.</p>

Denmark

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient air quality standard	Legislation 1 st daughter directive, 1999	Standards to protect people and nature		In 2005, the particulate matter limit values will be revised in a European context (CAFE, Clean Air For Europe). It looks as though the aim will be a limit value for PM _{2.5} (particles with a diameter of less than 2.5 µm) for which compliance will be required from 2015 or 2020 onwards. Because it cannot be said that 'coarse' particulate matter (PM ₁₀ - PM _{2.5}) is harmless, it has been proposed to maintain the 2005 limit values for PM ₁₀ .

Germany

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient air quality standard	Legislation 1 st daughter directive, 1999	Standards to protect people and nature		In 2005, the particulate matter limit values will be revised in a European context (CAFE, Clean Air For Europe). It looks as though the aim will be a limit value for PM _{2.5} (particles with a diameter of less than 2.5 µm) for which compliance will be required from 2015 or 2020 onwards. Because it cannot be said that 'coarse' particulate matter (PM ₁₀ - PM _{2.5}) is harmless, it has been proposed to maintain the 2005 limit values for PM ₁₀ .

New Zealand

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient Air Quality National Environmental Standards under the Resource Management Act 1991	Regulatory	The primary purpose of the ambient standards is to provide a guaranteed level of protection for the health of New Zealanders. Source: Updated users guide to Resource Management Regulations 2004 Ministry of Environment	Need more in-depth analysis. Criteria to determine effectiveness is needed	PM ₁₀ - 50 µg/m ³ averaged over 24 hours. These values are based on reviews of research into the health effects of PM ₁₀ and current concentrations in New Zealand. It reflects a risk-based approach to setting a standard for health protection, given the absence of any threshold below which no adverse effects are observed. The concentration limit is consistent with several international standards, including the Australian national environmental protection measures (which New Zealand contributed to developing), United Kingdom objectives, and Californian standards. The maximum limit is based on the former World Health Organization standard for PM ₁₀ .

British Columbia

Tools Used	Type of Tools	* Outcome	Is it Effective?	* Implementation Information
Ambient air quality objectives and standards	Objective – PM ₁₀ CWS – PM _{2.5}	Objectives are benchmarks for determining whether concentrations of pollutants in ambient air (or in emissions from sources of pollution) ought to be of concern to regulators or the public.		Air quality objectives in BC are used for : <ul style="list-style-type: none"> • reporting on the state of the environment • reporting on hourly air quality through the Air Quality Index (AQI) • establishing approval conditions for permitting new or modified sources • assessing compliance for permitted sources • developing and instituting episode management strategies • developing long-term air management strategies and evaluating progress.

* From - Updating BC Provincial Air Quality Objectives –An Options Discussion Paper, 2003 available at: <http://www.env.gov.bc.ca/air/airquality/index.html>

AMMONIA

Netherlands

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Emission targets or objectives	Policy objective	Target is to reduce environmental pressure: - formulated in part in the context of Acidification and transboundary air pollution.	Ammonia emissions from Agriculture and horticulture fell 5% between 2001 and 2002; as a result of using low-emission approach to spreading manure.	Emission ceilings in place for 2010 (Gothenburg Protocol and NEC directive), with a lower National target. There are also emission targets by sector for 2010. Agriculture and horticulture sector - 91% of ammonia emissions. <i>At the international level, 31 countries, including all the EU member states, have made agreements about emission ceilings for 2010 (the Gothenburg Protocol). In the Environment Council meeting of 22 June 2000, the EU member states agreed on national emission ceilings (the NEC directive).</i>
Fertilizer policy	Statutory standard		Has reduced the use per hectare of manure in concentrated livestock farming areas and increased the use in arable farming areas.	The Fertilisers Act was evaluated in the spring of 2002 (RIVM, 2002). In response to this evaluation, the government put forward a proposal in October 2002 to phase in a number of standards (LNV, 2002). A number of transitional standards will apply in 2003: <ul style="list-style-type: none"> • for grassland on dry sand, the transitional standard is 160 kg N/ha grassland instead of 140 kg (column B in the table); • for developed land, the amended standard is 80 kg N/ha instead of 60 kg (column D). The standards for 2004 are therefore those that had previously been set for 2003
Mineral Accounting System (MINAS)	Policy instrument	The aim of the mineral accounting system known as MINAS is to limit losses of minerals. To prevent farms exceeding the levy-free surpluses, a levy has to be paid for each kilogram of nitrogen or phosphate above the levy-free surplus. Farms can offset exceedances of the levy-free surpluses against shortfalls in preceding or later years	In 2001, 17% of farms exceeded the MINAS levy-free surpluses. The average levy these farms had to pay was more than EUR 3700. The average levy to be paid per farm has increased. This is due to the stricter levy-free surpluses and to the increase in the amounts of the levies. Of the pigs, poultry and intensive cattle farms, approximately 40% exceed the levy-free	The MINAS mineral accounting system has been in force since 1 January 1998. It requires farmers to keep up-to-date accounts of minerals and to pay a charge if their mineral/nutrient surplus per hectare exceeds the established loss standard for phosphate and/or nitrogen. With effect from 2001, all holdings are required to submit a MINAS report, with the exception of very small holdings. To safeguard the MINAS system of levy-free surpluses, livestock holders must hold manure transfer contracts by 1 January 2002 In 2001, the Dutch Lower House introduced a stricter manure policy. This change requires the standards for 2008/2010 to be achieved by 2003. These standards are therefore the current policy and they are shown in the table above.

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
			surpluses.	
Low-emission animal accommodation	?			In 2001, approximately 15% of pigs were housed in low-emission accommodation. Only 1.3% of the cubicle accommodation at dairy holdings was equipped with a Green Label system.

Denmark

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ammonia Action Plan	Implemented 1987	Series of measures to prevent loss of nitrogen	Emission to the atmosphere decreased by almost 27,000 tons NH ₃ -N from 1987 – 1999	Measures have included demands on improved utilisation of nitrogen in husbandry manure, ban against application of husbandry manure in winter, broad spreading of manure is prohibited, demand on establishment of second growth, regulation of the number of animals per hectare and a ceiling for the supply of nitrogen to crops.
Ammonia Action Plan II – 2001	Statutory Order No. 604	Reduce NH ₃ emissions		The plan introduces the following elements: <ul style="list-style-type: none"> • Optimisation of manure handling in cattle, pig and poultry houses, • Optimisation of manure handling in fur farming, • Covers on stores of solid manure that are not in daily use, • Covers on slurry containers in livestock farms, • A ban on surface spreading (broad spreading) and reduction of the time that applied manure is allowed to remain on the ground surface, • A ban on ammonia treatment of straw
Action Plan for Reducing NH ₃ Volatilization from Agriculture – 2001	Supplement to Ammonia Action Plan II		Together with full implementation of the Action Plan on the Aquatic Environment II, which is expected to reduce ammonia volatilization by approx. 15–20,000 tonnes nitrogen annually, total ammonia volatilization from agriculture will thus be reduced from around 90,000 tonnes in the mid 1990s to around 60,000	1) Optimization of manure handling in cattle, pig and poultry housing: <ul style="list-style-type: none"> • A call on the agricultural sector to initiate an information campaign focusing on the importance of farm management for limiting ammonia volatilization. • Applications under the improvement scheme for both new and existing livestock housing will be required to include measures aimed at limiting ammonia volatilization. • The reduction in ammonia volatilization is to be taken into account when calculating the nitrogen content of livestock manure ab storage. 2) Optimization of manure handling in housing for fur animals: <ul style="list-style-type: none"> • A requirement entering into force on 1 August 2004 on mucking out and storage of manure aimed at reducing the nitrogen loss.

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
			tonnes in 2004.	<ul style="list-style-type: none"> • The reduction in ammonia volatilization is to be taken into account when calculating the nitrogen content of the livestock manure ab storage. 3) Covers on stores of solid manure that are not in daily use: <ul style="list-style-type: none"> • A requirement entering into force on 1 August 2002 that solid livestock manure in stores that are not in daily use must be covered with a compost mat or airtight material immediately after the manure has been stored. • The reduction in ammonia volatilization is to be taken into account when calculating the nitrogen content of the livestock manure ab storage. 4) Covers on slurry containers on livestock holdings: <ul style="list-style-type: none"> • A requirement entering into force on 1 August 2001 for floating membranes, tents, etc. on slurry containers on all livestock holdings. Exemption from this requirement can be obtained by participation in an in-house control scheme to document the presence of a sufficiently tight floating layer. • If in-house control is inadequate or if the requirement for a tight floating layer is not met, the farmer is excluded from the scheme and immediately ordered to establish a fixed cover on the container. • When new containers are established in the vicinity of vulnerable natural habitats or in cases where the municipal authorities grant exemption from the general proximity requirements stipulated in Section 4 of the Statutory Order on Livestock Manure, no exemptions may be granted from the requirement for a fixed cover. • After two fertilization years – after 1 August 2003 – the Government will investigate compliance with the requirement for tightly fitting covers on slurry containers. If the findings prove unsatisfactory, the exemption provision will be phased out. 5) A ban on surface spreading and a reduction in the time that applied manure is allowed to remain on the ground surface: <ul style="list-style-type: none"> • A ban entering into force on 1 August 2002 on surface spreading of liquid animal manure. • A requirement entering into force on 1 August 2002 imposing a 6-hour limit on the time that applied livestock manure is allowed to remain on the ground surface (compared with 12 hours under the current regulations). 6) A ban on ammonia treatment of straw: <ul style="list-style-type: none"> • A ban entering into force on 1 August 2004 on ammonia

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
				<p>treatment of straw. It will be possible to grant general or regional exemption in extremely wet harvest years.</p> <p>7) Limiting local ammonia volatilization from livestock holdings in the vicinity of vulnerable natural habitat types:</p> <ul style="list-style-type: none"> • Municipal authorities will be advised to accord special importance to ammonia-reducing measures and to requirements on the preparation of annual nitrogen balances (green accounts) when issuing approvals under Part 5 of the Environmental Protection Act.

Germany

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
National Programme		Program put in place to meet National Emission Ceilings – Directive 2001/81/EC		<p>Additional measures to achieve compliance with the national emission ceilings:</p> <p>Measures to reduce ammonia emissions from agriculture, covering the following areas:</p> <ul style="list-style-type: none"> • Common Agricultural Policy (CAP) <ul style="list-style-type: none"> - Reduction of the stocking density for the special premium for male bovines and the suckler cow premium - Decoupling the headage payment from production - Promotion of organic farming • Recommendations for good agricultural practice • Development of BAT for small holdings • Support measures for reduction of livestock densities and ammonia emissions <ul style="list-style-type: none"> - Agri-environmental measures - Support measures which provide for a maximum stocking limit per holding - Support measures for the introduction of low-emission techniques • Adaptation of building law to restrict landless livestock production • Adaptation of the Use of Fertilisers Ordinance • Adaptation of immission control legislation <ul style="list-style-type: none"> - Extension of the licensing requirement - Inclusion of nitrogen inputs when assessing the existing pollution load within the scope of the TA Luft - Adaptation of the state of the art within the scope of the TA Luft

HYDROGEN SULPHIDE

Minnesota

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
MINN. R. § 7009.0080 (2001).	Legislation	If as a result of air pollution, the citizens of the state are exposed to imminent and substantial danger to their health and welfare, ¹⁴⁴ the PCA may by emergency order direct the immediate discontinuance or abatement of the pollution without notice and without a hearing or in the alternative, at the request of the PCA, the attorney general may bring a legal action in the name of the state in the appropriate district court for a temporary restraining order to immediately abate or prevent the pollution. The agency's order or, alternatively, the temporary restraining order remains in effect until a notice, hearing, and determination occurs. ¹⁴⁵	In response to citizen complaints of livestock odors, the PCA initiates monitoring to identify potential livestock facility violations of the state ambient air quality standards for hydrogen sulfide. ¹³⁸ When livestock production facilities are found to be in violation of ambient hydrogen sulfide standards, the PCA takes actions necessary to bring about compliance utilizing technical assistance and enforcement authorities.	Ambient hydrogen sulfide standards are violated when an operation exceeds more than 50 ppb, averaged over a half -hour period, twice in one year or 30 ppb, averaged over a half-hour period, twice in five consecutive days at the property line. State ambient air quality standards are applicable at locations to which the general public has access.

VOCS

Netherlands

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient air quality standard - benzene	Legislation Second daughter directive, 2000	Standards to protect people and nature		Has been in force in the Netherlands since December 13, 2002.
National emission objective	Policy	Reduce emissions	Emissions of volatile organic compounds are falling, but more measures are needed if the policy objectives for 2010 are to be met.	The national objective for 2010 is 163 million kg for VOC (VROM, 2001). Objectives have been set for 2010 for VOC emissions by the target sectors.

Denmark

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient air quality standard – benzene	Legislation Second daughter directive, 2000	Standards to protect people and nature		

Germany

Tools Used	Type of Tools	Outcome	Is it Effective?	Implementation Information
Ambient air quality standard - benzene	Legislation Second daughter directive, 2000	Standards to protect people and nature		

California

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
<p>Rule 4570 Rule 4565</p>		<p>The purpose of this rule is to limit emissions of volatile organic compounds (VOC) from operations involving the management of biosolids, animal manure, or poultry litter.</p>		<p>Land incorporate liquid manure within 24 hours, Solid manure/compost within 72 hours.</p> <p>5.2 Land Application Requirements An operator that land-applies material containing biosolids, animal manure, or poultry litter shall implement at least one of the mitigation measures listed below:</p> <ol style="list-style-type: none"> 1. Directly inject the biosolids, animal manure or poultry litter at least three inches below the soil surface within three days of receipt at the facility. 2. Land incorporate the biosolids, animal manure or poultry litter within three hours of receipt at the facility. Materials received after 6 pm must be incorporated by noon of the following calendar day. 3. Cover the biosolids, animal manure or poultry litter within three days of receipt at the facility. The cover shall be one of the following: a waterproof cover; at least six inches of finished compost; or at least six inches of soil. When conditions are appropriate to allow direct injection or land incorporation of the covered material, the material shall be directly injected or land incorporated within three hours of uncovering the material. 4. Implement an alternative mitigation measure(s) not listed that demonstrates at least a 10% reduction in VOC emissions.

ODOUR

New Zealand

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
<p>Good Practice Guide - The recommendations are not legislative requirements under the Resource Management Act or any other legislation.</p>	<p>? Regulatory – siting / land use and Health Act - nuisance</p>	<p>Reduce conflict between neighboring land uses</p>	<p>? will require more in-depth analysis. Criteria to determine effectiveness is needed</p>	<p>Odour –</p> <p>Under the Resource Management Act, regional councils are responsible for managing discharges of contaminants into the air. They must consider the potential odour effects of discharges in the planning and resource consent process. Councils are responsible for monitoring compliance with resource consent conditions applied to odour discharges, and for responding to complaints about offensive odours. Councils will often encourage or facilitate discussions between the discharger and any affected communities. However, if there is no agreement and the issue cannot be resolved, then councils should ensure that the effects are assessed using the methods discussed in section 4 and appropriate action is taken in accordance with the RMA.</p> <p>Territorial local authorities have both RMA and Health Act 1956 responsibilities. Under the RMA they are responsible for controlling land use and must consider the effect of land-use decisions on amenity values when planning and making decisions on resource consents. They are also responsible for preventing nuisances under the Health Act and can monitor and take enforcement action to abate nuisances. Territorial local authorities and regional councils should aim to work together to ensure there are no gaps or unnecessary overlaps in managing discharges to air.</p> <p>Public health authorities have an advocacy role, but they have no direct regulatory function with respect to air emissions. They are able to advocate on behalf of the public when there is a health issue arising from a discharge, rather than a nuisance-type odour.</p> <p>People with activities that discharge to air (dischargers) must comply with the requirements of the RMA, including section 17 (general duty to avoid, remedy or mitigate adverse effects), any relevant regional plan, or resource consent conditions. Dischargers have a duty to ensure that they are not adversely</p>

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
				<p>affecting people in the local community. They also need to demonstrate that they are taking appropriate action to comply with any council requirements within a reasonable timeframe or as specified by the plan or consent conditions.</p> <p>Communication with the community is helpful to determine the main odour concerns and to decide appropriate mitigation measures if they are needed. Prior community discussion may also avoid the need for having to undertake detailed assessments using methods discussed in section 4. Because odour is an effect on people, the community should be involved in processes to determine and resolve odour issues, such as participating in community meetings, keeping diaries or making complaints. The public need to be sure they are genuine in their complaints, and not complaining for an ulterior purpose, bearing in mind that their view of what is acceptable will be judged in terms of the 'ordinary reasonable person', as discussed in section 3.3.1. Likewise, the public has the right to expect a reasonable response from regulators and dischargers when affected by an odour issue. Members of the public may take common law action if they are not satisfied with the response from a council or an industry.</p> <p>When uncertainty and conflict increase between the industry and community, usually the time and cost required to resolve issues also increases. This guide recommends that dischargers are quick to investigate or acknowledge if there is a problem and work with communities to find solutions as a priority.</p> <p>(Source: New Zealand Ministry of Environment Website)</p>

Iowa

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
DNR Manure applicator certification program				Larger confinement feeding operations (more than 500 animal unit capacity) must have an approved manure management plan and use a certified manure applicator to apply manure.

Minnesota

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
<p>-MINN. STAT. ANN. § 116.0713 (West 1997 & Supp. 2001).</p> <p>-Odour management plan</p> <p>Air emissions & emergency response plans</p>	<p>Permit requirement</p> <p>3 part permit</p>			<p>Livestock production facilities, nonetheless, have a limited exemption from state ambient air quality standards on days when manure is being removed from barns or from manure storage facilities and for seven days after manure is removed. Livestock production facilities with greater than 300 AUs have a maximum cumulative exemption in a calendar year of 21 days for the manure removal process. To claim the odor exemption, the operator of the livestock production facility must provide notice to either the PCA or the CFO.140 Notification must include:</p> <ul style="list-style-type: none"> ! The names of the owners or the legal name of the facility; ! The location of the facility by county, township, section, and quarter section; ! The facility's permit number, if applicable; and ! The anticipated date and anticipated number of days of removal.141 <p>Minnesota rule; permit required for an animal feedlot having 1000 or more animal units</p>

California

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
<p>41700 California Air Pollution Control Laws, Health and Safety Code 41705</p>			<p>(b) If a district receives a complaint pertaining to an odor emanating from a compost operation exempt from Section 41700 pursuant to paragraph (2) or (3) of subdivision (a), that is subject to the jurisdiction of an enforcement agency under Division 30 (commencing with</p>	<p>41700. Except as otherwise provided in Section 41705, no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.</p> <p>41705. (a) Section 41700 shall not apply to odors emanating from any of the following:</p> <ol style="list-style-type: none"> (1) Agricultural operations necessary for the growing of crops or the raising of fowl or animals. (2) Operations that produce, manufacture, or handle compost, as defined in Section 40116 of the Public Resources Code, provided that the odors emanate directly from the compost facility or operations. (3) Operations that compost green material or animal waste products

Tools used	Type of tools	Outcome	Is it effective?	Implementation information
			Section 40000) of the Public Resources Code, the district shall, within 24 hours or by the next working day, refer the complaint to the enforcement agency.	derived from agricultural operations, and that return similar amounts of the compost produced to that same agricultural operations source, or to an agricultural operations source owned or leased by the owner, parent company, or subsidiary conducting the composting operation. The composting operation may produce an incidental amount of compost not exceeding 2,500 cubic yards of compost, which may be given away or sold annually.

Additional Sources of Information

Iowa Manure Applicator Training Manual. 1999.

Ontario Ministry of Agriculture, Food and Rural Affairs. 2003. A Review of Selected Jurisdictions and Their Approach to Regulating Intensive Farming Operations

Redwine, JS and RE Lacey. 2000. A Summary of State-by-State Regulation of Livestock Odor. Second International Conference on Air Pollution from Agricultural Operations, Des Moines, IA, ASAE.

State Environmental Laws Affecting Texas Agriculture. A Project of the National Association of State Departments of Agriculture Research Foundation through the National Center for Agricultural Law Research and Information; online at <http://www.nasda.org/> under the Research Foundation Section.

State Environmental Laws Affecting North Carolina Agriculture. A Project of the National Association of State Departments of Agriculture Research Foundation through the National Center for Agricultural Law Research and Information; online at <http://www.nasda.org/> under the Research Foundation Section.

4 Conclusions

The Jurisdictional Review (JR) Subgroup has reached the following conclusions for consideration by the CFO team as it moves forward with its strategic plan.

Conclusions

1: Policy tools specific to each jurisdiction

Other jurisdictions have created policy tools tailored to their situation. When assessing the effectiveness of the tools, it is important to consider the climatic conditions of the area. Other variables must also be taken into account, both in developing policy specific to a jurisdiction and in assessing its effectiveness; these include socio-economic, environmental, equity, timing and the overall policy approach (e.g., some jurisdictions have a strong tradition of legislation and regulation while others focus more on the use of market mechanisms).

Therefore, the CFO Project Team may need to tailor the strategic plan to consider these and other factors.

2: Package of policy tools

Other jurisdictions have tended to use a suite of policy tools. Those jurisdictions that are perceived to be leaders have used:

- A mix of tools,
- Frameworks that bring all the tools together, and
- Frameworks that are also supported by financial incentives

There are many other tools from which to select the best approaches for Alberta; these include the use of enforcement; best management practices; voluntary codes; management plans; market-based instruments; financial assistance; research and development; technology; education programs; and partnerships between government, industry, NGOs. This mix of tools and implementation mechanisms could apply to all priority substances and odour, but not all tools can be applied equally or in the same manner to substances and odours.

Therefore, the CFO Project Team may need to consider a package of policy tools and implementation mechanisms for the strategic plan.

3: Measuring effectiveness of policy tools

The subgroup was uncertain as to how effective some jurisdictions' suite of tools has been in meeting their goals. Part of the difficulty is how others measure effectiveness in the absence of clear indicators and goals specifically for CFOs.

Therefore, the CFO Project Team should consider a plan for evaluating the effectiveness of the strategic plan it develops.

4: Air quality standards

Jurisdictions that have standards on air quality may use ambient or emissions standards that were not specifically designed for CFOs emissions. The subgroup did not find any point-source (from a specific source) standards and measurements for CFOs in other jurisdictions. Ambient (overall air quality) standards can apply to CFOs, but they also include emissions

1 from other industries. (e.g., the US uses ambient standards in licensing CFOs, but these
2 standards apply to other sectors too).

3
4 *Therefore, the CFO Project Team should consider the following points while developing*
5 *the strategic plan:*

- 6 • *Points sources such as lagoons, barns, tractors, and fields do exist on a CFO, but it*
7 *is very difficult to measure each point source.*
- 8 • *It is difficult to attribute emissions to a specific CFO based on an ambient number,*
9 *particularly if there are many CFOs in the area.*
- 10 • *It is possible to measure our five priority substances (ambient air quality) around*
11 *CFOs.*

12
13 **5: Cumulative effects**

14 The subgroup did not find many examples of processes to address air cumulative effects from
15 CFOs in other jurisdictions, but it was not a specific focus of the subgroup's search for policy
16 tools.

17
18 *The CFO project team should consider cumulative effects on air when developing a*
19 *strategic plan.*

20
21 **6: Odour standards and guidelines**

22 Germany is setting an ambient odour standard/guideline. Odour is measured by a team of
23 scientists, and the overall process involves smelling by several noses, mitigation
24 (enforcement action), and regulation. There is also a protocol to ensure consistency in
25 measurement that includes training, assessment and equipment.

26
27 **7: Environmental and land use planning that affects air quality**

28 Other Alberta organizations and processes are addressing environmental and land use
29 planning as these issues affect air quality. These include:

- 30 • Ambient air quality objectives (AAQO) for H₂S, (some) VOCs, Ammonia, PM, but
31 there are no AAQOs for bioaerosols and odour.
- 32 • The proposed Environment Sustainability Act and its associated pilot projects to assess
33 cumulative effects.
- 34 • Land use framework.
- 35 • Integrated Watershed Management planning, which will affect location of CFOs.
- 36 • CASA Clean Air Strategy.

37
38 Alberta does have a nuisance-based system to respond to odour complaints. Measurement of
39 odour is done by one inspector, and this approach is not meeting the needs of some
40 stakeholders.

41
42 *The CFO team needs to understand that no other organization is specifically addressing air*
43 *quality for CFOs.*

1 **Appendix A: Subgroup Members and Terms of Reference**

2

Jennifer Allan	CASA
Laura Blair	Alberta Environment
Kerra Chomlak	CASA
Jim McKinley	NRCB
Denis Sauvageau	Friends of an Unpolluted Lifestyle (by phone)
Carrie Selin	Alberta Milk
Barb Shackel-Hardman	Alberta Agriculture and Food
Rich Smith	Alberta Beef Producers
Ross Warner	Society for Environmentally Responsible Livestock Operations

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CFO - Jurisdictional Review Subgroup

Terms of Reference

24 November 2006

Objective:

Provide information to the CFO Project Team on policy tools that could be included in the strategic plan to address air quality concerns.

Key Task Areas:

1. Gather information on CFO and livestock policy tools in other jurisdictions. The following steps will be taken:
 - Develop a glossary of terms of policy tools
 - Select jurisdictions to review
 - Review all relevant policy tools in that jurisdiction
 - Consider the definitions of policy tools in those jurisdictions
2. Assess information from other jurisdictions
 - How are policy tools used in those jurisdictions?
 - Context – why are they there? What are the policy tools trying to do?
 - How are they implemented? Are there any incentives, etc. to assist in implementation?
3. Assess applicability of the policy tools in AB and CFO Industry and compare to with other industries in AB – what others do, as well as the effect of CFO policy on other industry
 - Implement
 - Enforce
 - Manage
 - Encourage
 - Adoption
 - Consider other management systems in AB e.g.
 - PMO3 Regional Approach
 - FVPT large number of sources
 - AAQM
 - Acid Deposition
 - Consider similarities/differences in climatological factors, production systems, markets and competitiveness.
4. Ongoing reporting with the CFO team to get direction and feedback.
5. If the CFO Team identifies a need for draft recommendation from the Jurisdictional Review Subgroup, the subgroup will accommodate that request.

Other considerations:

The JR subgroup will attempt to gather information as per the CFO teams' terms of reference item on considering other industries in Alberta. As such, the subgroups focus will be on industries in Alberta. As with other topics, we won't prevent members from reviewing or sharing interesting info with the subgroup on other policy tools for other industries in other jurisdictions.