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Consultation sur le développement durable
de la production porcine au Québec

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***OVERVIEW OF PROVINCIAL AND FEDERAL
LEGISLATION & REGULATIONS
FOR LAND PLANNING AND
THE PROTECTION OF THE ENVIRONMENT
IN RURAL AREAS***

FINAL REPORT

JANUARY 2002



January 4, 2002

As the protection of the environment in rural areas and land planning are mainly a jurisdiction of the provincial governments and the municipalities, Canadian hog producers are faced with a wide array of regulations, legislation, and by-laws pertaining to these two issues. During the last years, partly as a result of the Wakerton incidents, the provincial and federal governments, and municipalities are revising their regulations or adopting new ones.

In order to evaluate how the environment in rural areas is protected in Canada and how this regulatory environment is affecting hog producers, the Canadian Pork Council invited specialists of the provincial and federal governments to submit an overview of their regulatory/legislative framework. We also asked them to indicate the dates and possible trends of potential revisions of these regulations/legislation.

This information will also be useful for the development of the environmental management system standard for the Canadian hog farms as a source of information. Indeed, the EMS standard will require that farmers registered to the program will need to comply with their federal, provincial and municipal regulations/legislation pertaining to environment.

This final report includes a brief description of the federal and provincial legislation except from Newfoundland & Labrador. The legislation from the three Canadian territories are also not covered. As many provincial and federal regulations are currently under revision, the reader should be aware that the content of this report is only a snapshot portrait.

The Canadian Pork Council would like to acknowledge all of those who participated to the making of this report,

Sincerely,

Eric Aubin, M.Sc., agr.
Hog Production Analyst
Canadian Pork Council

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Environment Canada and the Agricultural and Agri-Food Industry

Environment Canada's involvement in environmental concerns in the agricultural and agri-food industry stem from its mandate as defined by the *Department of the Environment (DOE) Act*.

Departmental Mandate

This Act delineates Environment Canada's mandate as:

- the preservation and enhancement of the quality of the natural environment, including water, air and soil quality,
- the conservation of renewable resources, including migratory birds and other non-domestic flora and fauna,
- the conservation and protection of Canada's water resources, including, specifically, transboundary water,
- carrying out meteorology, and
- the co-ordination of environmental policies and programs for the federal government.

In fulfilling this broad mandate, the Minister is expected to:

- 1) administer those federal government Acts for which he is wholly responsible,
- 2) initiate, recommend and undertake programs, and co-ordinate programs of the Government of Canada targeting environmental quality, or pollution control objectives or standards,
- 3) advocate practices and conduct leading to the better preservation and enhancement of environmental quality, and
- 4) co-operate with provincial governments or their agencies, or any other entities, in any programs having similar objectives.

Departmental Organisation

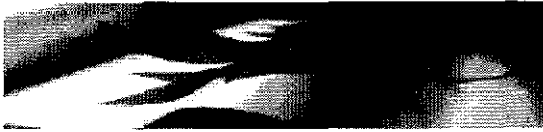
For the administration of the various Acts for which the Minister is responsible, the Department of Environment is organised into three main branches:

- 1) Meteorological Service of Canada,
- 2) Environmental Conservation Branch, and
- 3) Environmental Protection Branch

The *Meteorological Service of Canada* (MSC) provides services in the areas of weather, climate, air quality, ice and hydrology and is directly responsible for the:

- *Weather Modification Information Act*, 1970-71-72

The mandate of the *Environmental Conservation Branch* is to conserve the wildlife and ecosystems through the ongoing application, advancement, and communication of scientific



knowledge. The Branch administers nationally significant habitat located in National Wildlife Areas and Migratory Bird Sanctuaries. The Branch is directly responsible for the:

- **Canada Wildlife Act, 1973-74**
- **Wildlife Area Regulations**
- **Migratory Birds Convention Act, 1994**
- **Migratory Bird Sanctuary Regulations**
- **Migratory Bird Hunting Regulations**
- **Migratory Birds Convention, 1916**
- **Game Export Act, 1970**
- **Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA), 1992**
- **International Rivers Improvement Act (IRIA), 1970**
- **Canada Water Act**
- **Convention on International Trade in Endangered Species (CITES)**
- **Convention on Biological Diversity**
- **Federal Wetlands Policy**

The Environmental Protection Branch (EPB) is the regulatory arm of Environment Canada, and carries out activities related to environmental assessment, pollution prevention, toxics, and enforcement and compliance with pollution and wildlife regulations. The Branch is directly responsible for the:

- **Canadian Environmental Protection Act, 1999**

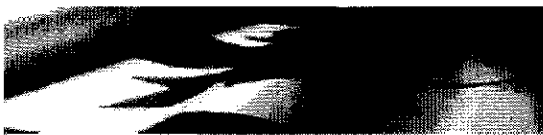
Canadian Environmental Assessment Agency

The Minister is also responsible to ensure that new federal projects, programs and activities are assessed early in the planning process for potential adverse effects on the quality of the natural environment and that a further review is carried out of those projects, programs, and activities that are found to have probable significant adverse effects, and the results thereof taken into account. For project for which the Department is not directly responsible, he does this through his responsibilities to Parliament for the Canadian Environmental Assessment Agency. The Agency is responsible for promoting that departments, boards and agencies of the Government of Canada comply with the requirements of the **Canadian Environmental Assessment Act (CEAA)**. The individual departments (including the Department of Environment for projects for which the Department is directly responsible), boards and agencies are accountable for the implementation of the requirements of **CEAA**.

Responsibility for Other Legislation

Besides the above legislation for which the Minister is directly responsible, there are certain sections of other federal Acts which the Minister is responsible for administering or for which the department delivers an advisory role.

Environmental Conservation Branch, these include the:



-
- ***International Boundary Waters Treaty Act***
 - ***Northern Inland Waters Act,***

and for the Environmental Protection Branch, these include the:

- ***Fisheries Act*** (Sections 36)
- ***Arctic Waters Pollution Prevention Act***
- ***Canada Shipping Act***
- ***Motor Vehicle Safety Act***
- ***Pest Control Products Act***
- ***Transportation of Dangerous Goods Act.***

The Department is further obliged under the ***DOE Act*** to advise departments, boards and agencies of the Government of Canada all matters pertaining to the preservation and enhancement of the quality of the natural environment.

As well, Environment Canada has entered into harmonisation agreements with a number of provinces whereby the Department may participate in the provincial review processes and vice versa.

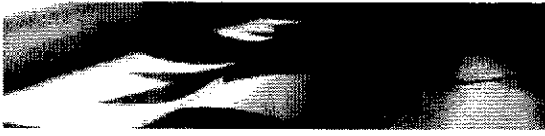
While many of the above pieces of legislation have relevance to agriculture and the agri-food industry, of particular importance may be:

- 1) The ***Migratory Bird Convention Act*** regulation prohibiting the damaging, destroying, removing or disturbing nests, or eggs of a migratory bird,
- 2) The ***Fisheries Act*** prohibition of the discharge of deleterious substances to fishery waters, and
- 3) The requirements for an environmental assessment of any project triggering the ***Canadian Environmental Assessment Act***

Because neither of the blanket prohibitions of the ***MBCA*** regulation nor the ***Fisheries Act*** section 36 referred to above are likely to be fully achievable in normal agricultural or agri-food operations, operators are at risk of prosecution for non-compliance. To reduce such risk requires a demonstration of "due diligence" on part of the operator, meaning that the operator must have taken all reasonable steps to prevent the transgression. The application of best practicable technology (best available and economically feasible) and management practices in a verifiable and documented environmental management system for the operation would be expected to support the contention of "due diligence".

It should be noted that the definitions of what constitutes best practicable technology and best management practices are dynamic and should be expected to be progressively updated in the light of new developments in technology, social attitudes and pressures of continued growth. This then necessitates the periodic review and updating of an operation's EMS to continue to support the claim of "due diligence".

With respect to the requirements for an environmental assessment of a project under the ***Canadian Environmental Assessment Act***, the Act may be triggered when a federal department, boards and agencies:



- 1) is a proponent of the project and is conducting any act or thing that commits the department, boards or agency to carrying out the project in whole or in part;
- 2) is making or authorising any form of payment or other financial assistance to the proponent for the purpose of enabling the project to be carried out in whole or in part;
- 3) administers any lands involved in enabling the project to be carried out in whole or in part; and
- 4) issues a permit, licence, grant an approval or take any other action for the purpose of enabling the project to be carried out in whole or in part.

While the responsibility for the preparation of an assessment would lie with the individual department, board or agency affected by the **CEAA** triggers, Environment Canada's provision of specialist environmental information and knowledge as federal authorities in the review of such assessments would be in context of the Departmental mandate as outlined above and would consider the appropriateness of the technology and management practices proposed in countering potential adverse environmental effects. As for the argument above for supporting "due diligence", this information would be expected to be found in the environmental management system for the proposed development.

Information collected by:

Fred Zaal

Division of Alberta, Environment Canada

Environmental FACTSHEET



BRITISH
COLUMBIA

Ministry of Agriculture, Food and Fisheries

Order No. 870.000-1
September 1998

Environmental Legislation Affecting Agriculture

This Factsheet briefly outlines federal and provincial legislation that affects the environment and agriculture in B.C. Some acts are very specifically related to environmental concerns, while others that are listed have a more minor roll. This Factsheet is not intended to be a legal interpretation of these acts - please refer to a lawyer or other legal authority for specific advice.

Environmental Concerns

The very nature of agriculture requires interaction with the environment. In B.C., much of the farm and ranch land is in valleys which often have streams or waterways and are important wildlife wintering areas. Farmers and farmland have an important role in protecting and preserving fish and wildlife habitat. This requires careful 'balancing' of agriculture with the environment. Much of the following legislation concerns water, habitat and fish.

Stewardship

The Webster's dictionary defines *stewardship* as "*the individual's responsibility to manage his life and property with proper regard to the rights of others*". From this we could say that **environmental stewardship is the proper management of the environment on or by your property.** While you don't "own" the environment, your care of it shows respect for others and their rights. Environment stewardship is often stated in relation to specific areas, such as 'watershed stewardship', 'stream stewardship', 'land stewardship', etc.

Importance to Landowners

For more information on various aspects of the legislation, please refer to the references noted in this left hand column throughout this Factsheet.

Stewardship is important to more than 'fish and wildlife'; it is also important to landowners. Healthy streams, healthy streambanks, healthy riparian areas; these all assist in maintaining healthy adjacent land areas. And the health of the land is fundamental to agriculture.

Preventing loss of streambanks, reduced soil erosion and sustaining the water table are just some of the benefits to landowners of good stream stewardship. And of course the possible increase in birds, other wildlife and fish populations can be of interest and pleasure to landowners.

Legislation List

The following is an alphabetical listing of legislation, and therefore the laws, we are all expected to meet. Although many landowners daily practice good stewardship that benefits us all, some landowners may not realize that certain practices are a concern.

Federal Legislation

Federal acts are available on the Internet at:
<http://canada.justice.gc.ca/STABLE/EN/Laws/Chap/F/index.html>

Click on the letter of the first word of the act, find the act in the list under that letter, choose the English or French version, then choose the text version you wish.

Any "Regulations" of the act are also available at this point.

See the DFO publication *Canada's Fish Habitat Law* for more details of this Act.

See also the *Stewardship Series* publication *Watershed Stewardship: A Guide For Agriculture*.

(phone 604.666.6614 for a copy)

Canadian Environmental Assessment Act

This act is administered by Environment Canada. It applies only to federal lands, works and undertakings, lands subject to the *Indian Act*, as well as lands in respect of which Indians have interests.

Canadian Environmental Protection Act

This act is administered by Environment Canada with Health Canada. It applies to all lands in Canada and concerns toxic substances, hazardous materials, new substances, export and import of substances, fuels, international air pollution, ocean dumping, etc.

Fisheries Act

This act is administered federally by Department of Fisheries & Oceans (DFO) and Environment Canada as well as provincially by Ministry of Environment, Lands and Parks (MELP). It is the main federal act affecting all fish and fish habitat as well as water quality.

- Sections 20, 21, 22 may require fish passage ways be installed; one-half of the costs may be recovered.
- Sections 26, 27, 30 prohibits obstructions of streams and the need for fish screens and fish guards in water intakes, ditches, etc.
- Section 32 prohibits the destruction of fish except by fishing.
- Section 34 has important definitions used in following sections ("deleterious substance"; "deposit"; "fish habitat").
- Section 35 prohibits harmful alteration, disruption or destruction of fish habitat (habitat on which the fish depend *directly or indirectly*).
- Section 36 prohibits the deposit of deleterious substances into streams (anything that degrades or alters the water quality so that it is, or likely to be, harmful to fish or fish habitat, including sediment). This section is usually enforced by Environment Canada.
- Section 37 requires approval for work that may impact fish habitat.
- Section 38 allows inspectors the right of entry onto private property.
- Section 40 sets out serious finer or imprisonment for offences.

This act has the main habitat protection legislation and section 35 is the part of the act that may be of most interest to producers. While DFO enforces this section, they also have a very active habitat restoration branch which works cooperatively with landowners. Water quality concerns (section 36), enforced by Environment Canada, may be somewhat duplicated by MELP's enforcement of the *Waste Management Act* (see page 8).

Migratory Birds Convention

This convention, administered by Environment Canada, is designed to protect migratory birds that inhabit Canada during part or all of the year. There are provisions in the act covering when and where birds may not be killed or captured or their nests or eggs disturbed. Although migratory birds may damage agricultural lands, it is an offence to release substances which may harm them.

Federal Legislation (cont'd)

Pest Control Products Act

This act, administered by National Health and Welfare Canada, is to ensure the safety, merit, and value of pest control products. It concerns the protection of human health, the environment, and product performance. All pest control products used or imported into Canada must be registered.

Plant Protection Act

The purpose of this act is to protect plant life and the agriculture and forestry industries by preventing the importation, exportation, and spread of injurious pests. It is administered by Agriculture Canada

Transportation of Dangerous Goods Act

This act regulates the transport of all dangerous goods, whether by rail, road, air, or water. Safety standards must be met and all containers clearly marked as prescribed. It is administered by Transport Canada

Wildlife Act

This act, administered by Environment Canada, makes provisions for the conservation of Canadian wildlife. It provides for activities which encourage wildlife conservation and interpretation and the enactment of measures to protect species of wildlife in danger of extinction.

Provincial Legislation

Provincial acts are available from: Crown Publications Inc., 521 Fort St., Victoria, B.C. V8W 1E7

(phone 250-386-4636)
or, on the Internet at:
http://www.qp.gov.bc.ca/stat_reg/statutes/

Choose the volume by alphabetical order using the first letter of the Act you wish to locate, and then the Act from that volumes' list.

Note that Bills or new Acts can be located at:
<http://www.legis.gov.bc.ca/bills>

(this is where you will find the *Fish Protection Act* and the *Fisheries Renewal Act*, as they are both new at the time of this writing)

Agricultural Land Commission Act

This act creates a commission whose objectives are to preserve agricultural land; encourage the establishment and maintenance of farms and to encourage local governments to support and accommodate farm use of agricultural land in their bylaws, plans and policies. It is administered by the Provincial Agriculture Land Commission.

- Section 11 allows land to be designated as suitable for farm use and established as an agricultural land reserve.
- Section 14 allows exclusion of land from a reserve.
- Section 17(3) prohibits use of agricultural land for other than farm use, except as permitted.
- Section 19 allows a covenant, in favor of the commission, be registered against the title for the use of the land.
- Section 47 requires local bylaws be consistent with the Agricultural Land Commission but they may relate to the use of agricultural land.

Drainage, Ditch and Dyke Act

This act, administered by MELP, establishes a system for the regulation and authorization of ditches, watercourses, drainages, and dykes in B.C.

Environment and Land Use Act

This act, administered by MELP, establishes the Environment and Land Use Committee which recommends programs to increase environmental awareness, ensures that the natural environment is considered in land-use and resource development decisions, etc. The Minister of Environment traditionally chairs the committee. Orders may be made respecting the environment or land use which may override other Acts and regulations.

Provincial Legislation (cont'd)

See also MAF Factsheets
*Strengthening Farming, The
FPP Act*
a series of seven
that outline this Act.

Environment Management Act

This act gives MELP responsibility for managing, protecting, and enhancing the environment. Specific responsibilities are listed including establishing and operating the Environmental Appeal Board.

Environmental Assessment Act

This act, administered by MELP, is to promote sustainability by protecting the environment through assessment of the environmental, economic, social, cultural, heritage and health effects of reviewable projects and to prevent or mitigate adverse effects of such projects. Regulations prescribe what constitutes a reviewable project. The Minister may also designate a project as reviewable. An Environmental Assessment Board is mandated.

Farm Practices Protection (Right to Farm) Act

This act was enacted in 1995 and is administered by MAF and Ministry of Fisheries (MF).

- Section 2 protects a farmer from liability in lawsuits alleging nuisance for odour, noise, dust or other disturbance resulting from the farm operation. The land must be in the ALR and the farmer must use normal farm practices and not contravene other listed legislation, such as the *Waste Management Act*, the *Code of Agricultural Practice for Waste Management* and land use regulations (e.g. a zoning bylaw).

With the introduction of this act, concurrent changes were made to the *Municipal Act*. These changes require any zoning or rural land use bylaw that may prohibit or restrict agriculture on ALR land be approved by the Minister of Agriculture and Food if a regulation under section 918 of the *Municipal Act* is in place (see *Municipal Act*, page 6).

Fire Services Act

This act, administered by Ministry of Municipal Affairs and Housing, provides for the prevention, suppression, and investigation of fires. The B.C. Fire Code Regulation sets out requirements for the siting and installation of storage tanks containing hazardous substances such as combustible liquids (i.e., fuel tanks).

Fish Protection Act

This is a new act as of 1997, administered by MELP. It restricts new dam construction on protected (major) rivers; deals with sensitive streams, maintaining minimum stream flows, water management plans and streamside protection. It also makes significant changes to other acts.

- Section 4 prohibits new dam construction on specified major rivers.
- Section 5 requires fish & fish habitat (on which fish may depend *directly or indirectly*) to be considered in water licenses.
- Sections 6 & 7 allow sensitive streams designation & recovery plans. Such streams will have restrictions placed on new licenses or approvals, or amendments to existing, until the stream has recovered.
- Section 8 allows for streamflow protection licenses to be issued. These are non-use water licenses, only to be held by organizations with a

Provincial Legislation (cont'd)

Note that the requirements of Section 12 do not specify "agriculture". *Guidelines* for agriculture are being written in conjunction with MAF, MELP and the agriculture industry.

As of this writing, two regulations are being introduced under this Act:

- *Urban Streamside Protection Regulation*
- *Sensitive Streams Regulation*

community based interest and are without appurtenancy (i.e., not tied to a land base). These licenses are intended to enhance fish habitat, to provide education programs and to promote the efficient use of water.

- Section 9 allows for temporary reduction of water licenses to protect fish during a drought. Although no reduction amount is specified, "due consideration" must be given to agriculture users.
- Section 10 outlines considerations of water management plans (along with additions to section 22 of the *Water Act* regarding these plans). These plans are to conserve water, for the more efficient use of water and for reductions as stated in section 11.
- Section 11 allows an reduction of a water license of up to 5% where a water management plan provides for reductions for the purpose of providing additional water for fish and fish habitat (reduction is only on license transfer, apportionment or property sale). Any reduction is without compensation and without appeal.
- Section 12 requires municipal bylaws, where directed, regarding the protection and enhancement of riparian areas that may be subject to residential, commercial or industrial development.
- Sections 14 - 16 make administrative amendments to the *Waste Management Act*.
- Sections 17 - 24 make amendments to the *Water Act* (see page 9).
- Sections 25 - 35 make amendments to the *Wildlife Act* (see page 9).

This act allows for some basic changes affecting water licenses. Fish and fish habitat must be considered in new and existing licenses. Minimum stream flows and water use efficiency are given priority. Irrigators with properly designed systems (from intake to nozzle) using their allotted quantities will not normally be affected. Permanent license reductions are not for existing licenses, unless transferred.

Note: At the time this note was prepared most of the Fish Protection Act has not been proclaimed and many provisions are not yet in effect. The only substantive section that is in effect is section 4. The implications of some sections will be more fully understood with time and experience.

Fisheries Act

This act concerns licensing of fisheries, processors and safe fish passage. It is administered by MF and enforced by MELP and MF.

- Part 1 allows enforcement officers to enter private property without being liable for trespass and to enter buildings related to fishing without a warrant. It is an offense to obstruct an officers duties.
- Part 4 requires safe fish passage for any dam or other hydraulic work. This may include fish ways, screens, etc.

Currently, part 4 is not actively enforced by MF. These requirements are also provisions of the Federal *Fisheries Act* (see page 2) and the Provincial *Fish Protection Act* (see page 4) and are enforced by the agencies responsible for those acts.

Provincial Legislation (cont'd)

Legislation includes the *Forest Practices Code of BC Act* as well as various *Regulations*. *Guidebooks* interpret these requirements.

Note that these are available from the Ministry of Forest Internet home page :

<http://www.for.gov.bc.ca/>

and then choose "Forest Practices Code" from which *Guidebooks* may be ordered or the *Regulations* accessed.

In particular, refer to the *Riparian Management Area Guidebook*; *Community Watershed Guidebook*; *Range Management Guidebook*.

Fisheries Renewal Act

This is a new act as of 1997, administered by MF. The act's purpose is to renew fisheries and enhance fish, fisheries and fish habitat in B.C. The definition of 'fish' includes aquatic plants.

A Crown corporation has been formed and may be active in habitat restoration work as part of its mandate. It is now being organized.

Forest Practices Code of BC Act

This act regulates all forest practices (which include grazing). It provides riparian protection on Crown land as well as private land in Tree Farm Licenses and woodlots. Sections concern range use plans, community watersheds, planned fires, soil conservation, noxious weeds, range developments, trespass livestock, hay cutting, trails, etc.

- Section 45 states a forest practice must not damage the environment.

The *Range Practices Regulation* of the *Forest Practices Code* contains details of interest to Crown range users, such as;

- Section 1 has definitions of terms - note that a *stream* is defined differently than in the *Water Act* or the *Code of Agricultural Practice*
- Section 3 states that in community watersheds, you must not construct: a range development that encourages livestock within 50 m of a stream; a livestock trail that abuts or crosses a stream; a cabin or a livestock corral within 50 m of a stream.
- Section 6 prohibits the tracks or wheels of ground-based machinery coming within 5 m of a stream bank (exceptions allowed). It also prohibits fueling or servicing of machinery in a riparian area.
- Section 7 requires dead livestock within 100 m from a stream in a community watershed be removed within 24 hours or a.s.a.p.

Health Act

This act provides the legislative framework which permits the health of British Columbians to be monitored and safeguarded. It regulates farm practices that may result in a health hazard, such as when nutrients, contaminants, or pathogens are discharged into the environment.

Motor Vehicle Act

This act is to protect people traveling on public roads. It is an offence to dump or deposit any "noisome, nauseous or offensive matter" on a highway or right-of-way.

Municipal Act

This act provides the legislative frame work for the establishment, function and operation of local governments. It provides for the authority for local government to establish rules and regulations and for the provision of services to the local community. Several sections may apply to streams and habitat.

- Sections 343.1 & .2; 344(4) and 845.1 & .2 allow municipal or regional district bylaws to exempt riparian property from property tax where a covenant is registered against the property title.

Provincial Legislation (cont'd)

See the *Stewardship Series*
publication
Stewardship Options
for Private Landowners in BC.

(phone 1.800.387.9853
for a copy)

- Section 551 allows bylaws to prohibit a person from polluting or from obstructing or impeding the flow of a stream.
- Section 557 states a person is liable for restoration work and a penalty if they obstruct, fill up or injure a ditch, drain, creek or watercourse constructed under this act or they cut, destroy or injure a dike or other drainage or reclamation work connected with it.
- Sections 561 - 573 relate to municipal ditching projects including property changes & appeals, maintenance levies, etc.
- Sections 875 - 885 relate to official community plans. These may restrict the use of land that is environmentally sensitive to development and provide for the designation of development permit areas in plans (see also section 920) for various purposes including the protection of the natural environment and the protection of farming.
- *Sections 886 - 889 relate to rural land use bylaws that may be adopted and may set conditions, requirements and restrictions on the use of land that is environmentally sensitive.
- *Sections 903 - 914 relate to zoning bylaws that may be adopted.
- Section 907 allows bylaws to control runoff related to the construction of a roofed area or paved area and to establish the maximum percentage of the area of land that can be covered by impermeable material.
- *Sections 915 - 919 outline the use of land for agricultural operations; section 916 allows for bylaw standards; section 917 provides for farm bylaws.
- Section 920 provides the authority to issue development permits relating to the protection of the natural environment and the protection of farming.

*Note that under section 918, subsections 887(8) -rural land use bylaws- and 903(5) -zoning bylaws- and section 917-farm bylaws- do not apply until the Lieutenant Governor in Council, by regulation, declares that they apply. These provisions require that, for land in the Agricultural Land Reserve (ALR), a rural land use bylaw or zoning bylaw which prohibits or restricts the use of land for a farm business, or a farm bylaw, must be approved by the Minister of Agriculture and Food.

Pesticide Control Act

This act regulates the selling, applying or providing a service respecting pesticides and is administered by MELP. Some Regulations are:

- Sections 4,5 and 6 require (except as provided by regulation) a licence, certificate or permit to sell or apply pesticides.
- Section 7(2) prohibits improper disposal of a pesticide; prohibits a person from washing or submerging in a body of water equipment or containers used to prepare, mix or apply a pesticide; and prohibits drawing water into a container used to contain, prepare, mix or apply a pesticide directly from a body of water or from an irrigation system by means of equipment unless an air gap is maintained between the equipment and the liquid in the container to avoid back siphoning.

Provincial Legislation (cont'd)

- Regulation 2(1a) states no person shall use a pesticide in a manner that would cause an unreasonable adverse effect (defined as damage to humans or the environment).
- Regulation 7(2) and 10(2) exempt a man made self contained body of water from use and permit restrictions.
- Regulation 10(3) requires written notice for pesticide use within 10 m of a body of water on leased Crown land.
- Regulation 44(1) exempts certain requirements for specified pesticides used on private land.

Plant Protection Act

This act provides for the prevention of the spread of pests destructive to plants in B.C. It is the provincial counterpart to the federal *Plant Protection Act*.

Soil Conservation Act

This act is to protect soil on land in the Agricultural Land Reserve by regulating its removal and the placement of fill. The Provincial Agricultural Land Commission sets terms and conditions on the quantities of earth involved, how the work is to be done, and the restoration required to a condition fit and suitable for agriculture.

Transportation of Dangerous Goods

This act, administered by the Attorney General, establishes requirements to provide for the safe transport of goods deemed to be dangerous. Regulations specify substances and establishes classes of dangerous goods.

Waste Management Act

This act is administered by MELP and is concerned with waste disposal. A regulation allows agricultural operations to be exempt from the permit requirements of one part of this act.

- Section 1 has definitions of terms.
- Section 3 states that "...a person must not introduce or cause or allow waste to be introduced into the environment..." unless in compliance with a permit, approval, order or regulation.

The *Agricultural Waste Control Regulation* allows exemption from two clauses of Section 3 for agricultural operations when they follow the *Code of Agricultural Practice for Waste Management*; i.e., agricultural wastes may be introduced into the environment if the *Code* is followed (and no pollution occurs). This exemption is only for clauses 3(2) and 3(3) of this act, specific to introducing wastes into the environment; all the rest of this act applies to agricultural operations.

Refer to MAF publications *Environmental Guidelines for* *Producers of BC*, a series of commodity-specific books which include the *Code* and ideas on how to meet it.

It is important to note that this exemption is only for "agricultural wastes" and that this *Code* is only concerned with these wastes and "pollution"; stream stewardship issues such as habitat are not specifically covered. In other words, while following the *Code* can ensure that pollution concerns are properly dealt with, other needs of fish habitat must also be addressed.

Provincial Legislation (cont'd)

For details of an irrigation water licence refer to the MAF Factsheet #502.100-4 *Understanding an Irrigation Water Licence*.

See also MELP pamphlets:

- *Water Rights in BC*
- *How to Apply for a Water Licence*
- *Water Licences - Rights and Obligations*
- *A Users Guide to Working In and Around Water*

Look for future Factsheets in a new *Stream Stewardship* series for habitat information.

Other regulations such as the *Special Waste Regulation*, *Spill Reporting Regulation*, *Open Burning Smoke Control Regulation* *Composting Regulation*, *Contaminated Sites Regulation* could affect farmers and ranchers.

Water Act

This act is administered by MELP; it is concerned with water licencing (sec 5-7; 10 - 29) and approvals for changes in and about a stream (sec 9). Note the *Fish Protection Act* has amended sections 1,22,23,39,40,41,46.

- Section 1 has definitions of terms.
- Sections 5 & 6 list the rights acquired under a water licence.
- Section 7 lists who may acquire a water licence.
- Section 8 allows short term approvals (water use less than 12 months).
- Section 9 allows approvals for changes in and about a stream; these must also meet with DFO approval under the *Federal Fisheries Act*.
- Sections 10 - 50 outline licence applications, rights, administrative concerns, rights of appeal, offences, water users' communities.

The *Fish Protection Act* (see page 4) has made significant changes to the *Water Act* including: Section 22.1 - 22.4, water management areas & plans; Section 40.1, prohibiting introducing debris into a stream or area adjacent to a stream that may harm or damage the stream, stream channel, property of riparian owners, fish or fish habitat and Section 40.2 allows for remediation orders for mitigation of effects of introduced debris.

Weed Control Act

This act is administered by MAF. It places the responsibility for the control of noxious weeds on the occupiers of the land. It provides for the appointment of inspectors to ensure compliance and, failing that, for a method by which they can control weeds and recover the costs for doing so from the occupier. Weed Control Committees may be established by municipal councils to administer the act within a municipality. Committees report to the municipal council and the Minister.

Wildlife Act

This act is administered by MELP and MF and includes management of habitat concerns on Crown land and protection of habitat in general.

- Section 4 allows designation of wildlife management areas.
- Section 7 makes it an offence to alter, destroy or damage wildlife habitat within a wildlife management area.
- Section 9 makes it an offence to disturb, molest or destroy a muskrat or beaver house, den or dam unless you are a licensed trapper or have lawful authority to protect property or maintain irrigation or drainage facilities.
- Section 34 makes it an offence to possess, take injure, molest or destroy the nest of an eagle, peregrine falcon, osprey, heron or burrowing owl or the nest of any bird not mentioned above when the nest is occupied by the bird or its egg.

Provincial Legislation (cont'd)

- Section 39 makes it an offence to hunt or trap on cultivated land or on a Crown land grazing lease while occupied by livestock without the lessee or owners consent.
- Section 89 gives an officer powers of entry on proof of identification.
- Section 111 concerns the Habitat Conservation Fund.

This act has been amended by the *Fish Protection Act* (see page 4) to have wildlife include aquatic plants; and aquatic invertebrate or plants can be considered as endangered or threatened. Critical wildlife areas or sanctuaries can be designated in wildlife management areas.

Municipal Bylaws

See the MAF publication *Guide For Bylaw Development In Farming Areas* for information on the Minister's standards, the review of zoning and rural land use bylaws and the development of farm bylaws.

As noted under the *Municipal Act* (page 6) local governments may make bylaws dealing with a number of matters. Farm bylaws and, where a regulation has initiated the requirement, those rural land use or zoning bylaws applied to the ALR which prohibit or restrict agriculture, require approval by the Minister of Agriculture and Food.

Once a regulation is in place for a particular area it may authorize local government to enact farm bylaws; require the review of existing farm bylaws; and require approval and review of the rural land use and zoning bylaws take place. This review is to determine to what extent the bylaws are inconsistent with the standards established by the minister (under section 916 of the *Municipal Act*). This process is new and just beginning to be applied.

Summary

Please refer to the following for more stewardship information:

- *Farms & Streams - The Farmers Guide to Stream Stewardship*, from MAF office Duncan, BC (phone 250.746.1210 for a copy)
- *Caring For The Greenzone - Riparian Areas & Grazing Management*, from Canadian Cattlemens Assoc, Calgary (phone 403.275.8558 for a copy)

A federal act for fish and fish habitat and water quality; many provincial acts that in some way protect the environment, fish and fish habitat, and water quality; municipalities and regional districts that may make local bylaws; it can seem overwhelming.

Although this is a lengthy list, it includes acts which play a small part in environmental stewardship as well as acts which have a major influence, such as the Federal *Fisheries Act*. Recent provincial legislation, such as the *Fish Protection Act*, are too new to fully know their impact.

However, the intent of all of this legislation is very similar; the concern of negative impacts from human activity on the environment, some of which could be agricultural impacts.

If you have a concern or question about any of these acts, please contact the ministry that administers that act, or contact your local MAF office.

FOR FURTHER INFORMATION, CONTACT:

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Background

The Municipal Government Act, under Municipal Affairs, assigns responsibility for land use planning to Alberta's municipalities and provides the framework within which these duties are carried out. All municipalities must adopt a land use bylaw; larger municipalities must prepare and adopt a long range municipal development plan. The 66 rural municipalities and many of the urban ones as well address the preservation and protection of agricultural land in the preparation of these planning documents. There are substantial participation opportunities in the preparation of the municipal development plan and the land use bylaw.

There is the subdivision and development regulation that complements the act and it provides more details on the planning process. One of the requirements of the regulations is that municipalities consider the Provincial Land Use policies when they develop their land use plans and issue subdivision and development approvals. The policies specifically reference agriculture and their general thrust is to protect farm land. In some circles it is felt that the policies are not very effective in stemming the conversion of farm land and that the Province should replace them with regulations.

In addition to planning the Environmental Protection and Enhancement Act, under Alberta Environment, provides for persons to put land under conservation easements. The easements are intended to preserve land in a wildland state.

On July 4, 2001 the Alberta government announced plans to introduce legislation this fall that will amend the Agricultural Operation Practices Act (AOPA) to include provincial responsibility for the siting of new and expanding confined feeding operations (CFOs) and monitor and enforce provincial technical standards. Previously, these agricultural operations were referred to as intensive livestock operations. The Natural Resources Conservation Board (NRCB) will assume responsibility for the siting, enforcement and monitoring of CFOs on January 1, 2002. Alberta Agriculture, Food and Rural Development (AAFRD) is leading the development of the legislation, regulations and standards in consultation with the NRCB, Alberta Environment, Alberta Municipal Affairs and Alberta Health.

What is the status of the legislation?

Drafting of the legislation amending the AOPA is underway. The legislation itself will be enabling - in other words; it will enable regulations and standards to be developed and implemented that will carry out the intent of the legislation.

Under the policy, applications for larger operations will be required to apply through a formal approval process while applications for smaller operations will apply through a streamlined registration process.



What are CFOs?

CFOs are fenced or enclosed areas where livestock are confined for the purpose of growing, sustaining, finishing or breeding by means other than grazing. Seasonal feeding and bedding sites are not CFOs. Grazing operations and seasonal feeding and bedding sites will not require an approval or registration under AOPA.

When will regulations and standards be developed?

Regulations and standards are under development concurrent with the legislation. The regulations and standards will outline the provincial approval process for new and expanding CFOs. They will outline the science-based technical standards and procedures for approving CFOs, along with ongoing monitoring and enforcement provisions.

How are legislation, regulations and standards being developed?

Amendments to the AOPA as well as regulations and standards are being built on three years of extensive public consultations. Amendments are based on and acknowledge the work previously accomplished by the Livestock Regulations Stakeholder Advisory Group (LRSAG) as well as the report from the Sustainable Management of the Livestock Industry in Alberta committee. They include provision for a peer review to deal with nuisance complaints from agricultural practices.

When will stakeholder groups be advised of the content of the legislation, regulations and standards?

AAFRD has met with key stakeholders to provide a briefing and discussion on the Act, Regulations and Standards. These stakeholders were the Alberta Association of Municipal Districts and Counties (AAMD&C), Alberta Urban Municipalities Association (AUMA), Alberta Pork, Alberta Milk Producers (AMP), Alberta Cattle Commission (ACC), Alberta Cattle Feeders Association (ACFA), Feather Industry Boards (Alberta Egg Producers, Alberta Hatching Egg Producers, Alberta Turkey Producers and the Alberta Chicken Producers), and the Regional Health Authorities (RHA).

When will proposed legislation, regulations and standards be released?

The legislation is being developed and will be brought forward in the fall 2001 session of the Alberta Legislature, with the intent of the NRCB assuming its expanded role on January 1, 2002.

What role does the legislation propose for the NRCB?

The NRCB will expand its mandate to assume responsibility for approval and siting of CFOs as well as monitoring and enforcement of province-wide standards. This one-window approach will provide a consistent, transparent process for the industry and the public.



What roles does the legislation propose for municipalities?

Municipalities will continue to play a vital role in the siting of CFOs. They will be encouraged to develop agricultural land-use plans and identify areas where CFO development would not be compatible with current or future land uses. Municipal recommendations will be an important component in NRCB decisions for siting of new and expanding CFOs. What is AAFRD's role? The department will be responsible for amending the AOPA, developing regulations and standards, as well as ensuring future updates are consistent with the needs of the livestock industry and the public. AAFRD will continue to provide research and technology transfer to the livestock industry.

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A number of provincial acts and regulations affect the development or operations of Intensive Livestock Operations (ILOs) in Saskatchewan. The more common agencies that may be involved in approvals, licences and permits are:

Saskatchewan Agriculture and Food

- The Intensive Livestock Provisions of the *Agricultural Operations Act (AOA)* require operators of certain ILOs obtain approved waste storage and waste management plans

Saskatchewan Environment and Resource Management

- Large intensive livestock operations may require pre-screening under the *Environmental Assessment Act (EAA)*

Rural Municipalities

- Land use planning, zoning and discretionary use permits are the responsibility of local governments

Saskatchewan Water Corporation

- Both surface and groundwater use may require approval from SaskWater

Saskatchewan Municipal Affairs and Housing

- Municipal affairs approval is required for any site sub-division

Saskatchewan Highways and Transportation

- Administers setback requirements from provincial highways

Saskatchewan Health

- Development of an ILO within 1.5 km of an urban centre may require approval of the local health authority

Intensive Livestock Approval Process

The review and approval of waste management plans is led by Saskatchewan Agriculture And Food (SAF). The information provided to SAF in the application for approval of waste storage and waste management plans is circulated to review agencies based on pre-determined triggers for review and comment. The agencies are allowed 40 days to complete their review and return their comments. SAF will usually then provide a decision within 10 days of the referral due date. Agencies such as Saskatchewan Environment and Resource Management, Saskatchewan Water Corporation, Saskatchewan Health, Saskatchewan Municipal Government and local municipalities are included in the referral process.

Information collected under the AOA allows the referral agencies to identify any regulatory requirements their agencies may have and identify any local environmental concerns that have not been addressed in the application. Each of these agencies may have specific requirements of ILOs above and beyond the requirements of the AOA provisions.

Saskatchewan Agriculture and Food (Agricultural Operations Act)

The Intensive Livestock Provisions of the *Agricultural Operations Act* (AOA) require operators of certain ILOs obtain approved waste storage and waste management plans. An “intensive livestock operation” is described as:

“The confining of any of the following animals, where the space per animal is less than 370 square meters; poultry, hogs, sheep, goats, cattle, horses, elk, mule deer, white-tail deer, fallow deer, bison, or any other prescribed animal”

Approval is required for any intensive livestock operation which:

- Contains an earthen manure storage area or lagoon
- Involves the rearing, confining or feeding of 300 or more animal units; or
- Confines more than 20 animal units but less than 300 animal units for more than 10 days in any 30-day period, within 300 meters of surface water or 30 meters of a domestic well not controlled by the operator

The protection of groundwater and surface water is the basis of the Intensive Livestock Provisions of the AOA. Compliance with the AOA will demonstrate that the manure and waste by-products resulting from the ILO are regulated and will be managed in such a manner that pollution will not result.

The applicant/operator must develop a manure storage plan that provides for 400 days of storage. For manure storage, the proposal must be supported by site-specific engineering investigations and design appropriate to the method of storage as well as the site geology and physical environment. Protection of surface and groundwater resources must be clearly demonstrated in any design. Groundwater monitoring may be a condition of approval but no formal reporting requirements are in place.

Land application of manure must be done according to an approved manure management plan at rates that supply crop nutrients equal to plant use to maximize the fertilizer value of the manure and minimize the risk of pollution. SAF requires confirmation of the suitability and availability of manure spreading areas. Calculation of the total area required is currently based on crop rotation, crop yield and soil climatic zones. Nitrogen balance is currently used to determine the required acreage. Operators are required to comply with the approved manure management plan however documentation and reporting are not a part of the current requirements.

A mortalities management plan must be prepared and approval received. Current options include rendering, burial, incineration or composting. Rendering is the preferred method of managing dead animals. Use of an incinerator requires approval and licensing from SERM.

Odour management is encouraged but not legislated.

SAF does not define or enforce mandatory separation distances – rather they may be dealt with by municipal land use bylaws if the local municipality sees fit to do so. SAF does however publish recommended separation distances between ILOs and residences or towns.

The act balances environmental responsibilities with the realities of agricultural production. In addition to the provisions for protection of groundwater and surface water by proper management of manure and animal waste, it includes protection for farmers who are using normally accepted agricultural practices from unwarranted nuisance lawsuits as well as a mechanism for resolving disputes between agricultural producers and their immediate neighbours. The Act establishes an Agricultural Operations Review Board to receive and review complaints.

Saskatchewan Environment and Resource Management (SERM)

Saskatchewan Agriculture and Food maintains a close working relationship with SERM and applications for large livestock operations (or where environmental sensitivities may exist) are provided to SERM for review. SERM treats referred applications as project proposals to determine whether a project is considered a development under the Environmental Assessment Act (EAA). Projects that qualify as developments under the act must prepare an Environmental Impact Statement and receive approval from SERM (as well as SAF) before proceeding. Projects which are not developments may proceed but must comply with other relevant regulations or bylaws.

The EAA sets out several criteria defining a development. To date (2001), no ILOs in Saskatchewan have been defined as developments under the EAA and none have required an Environmental Impact Statement as defined in the EAA.

Saskatchewan Water Corporation

The Saskatchewan Water Corporation (SWC) regulates water allocation and use in Saskatchewan. SWC requires detailed information relating to the quantity and source of water to ensure that the use of local water resources is not compromised. SWC normally requires that an operator obtain

- A groundwater investigation permit for drilling test wells
- Approval to construct and operate wells and use groundwater
- Approval to construct and operate earthworks for the use of surface water
- Approval to construct in reservoir development areas
- Approval to alter drainage



Rural Municipalities

The Planning and Development Act empowers local municipal governments to prepare and adopt a basic planning statement and zoning bylaw at their discretion. The basic planning statement is a growth management tool that provides the basis for regulations and decisions under the zoning bylaw. It basically provides a framework within which future land sub-division, use and development in the municipality will be encouraged and directed. Zoning bylaws provide control of use and development in the municipality and are the principal method of implementing the objectives of the basic planning statement. Zoning bylaws typically provide specific development standards for ILOs. Minimum separation distances and setbacks are usually included in the bylaw as requirements.

Both the basic planning statement and zoning bylaws are voluntary and not mandatory activities. Thus many municipalities in Saskatchewan do not have them in place, in which case development of an ILO is dealt with as a discretionary use subject to the discretionary approval of the local municipal government. In that case the local government decision is completely discretionary and cannot be appealed.

ACTS, REGULATIONS AND BY-LAWS AFFECTING HOG PRODUCTION IN MANITOBA

There are various provincial Acts and regulations and local municipal by-laws that could affect the establishment, expansion and/or management of hog operations. Siting and other land use considerations are dealt with through *The Municipal Act* and, more appropriately, *The Planning Act* and the consequent by-laws. Under these Acts the permitting and planning authorities have been delegated to local municipal governments. Livestock manure and mortalities management are regulated under *The Environment Act* while odour and other nuisance issues are addressed by *The Farm Practices Protection Act* as well as municipal by-laws. Water supply may be affected by *The Water Rights Act*.

MUNICIPAL LAND USE ISSUES

The ultimate responsibility and authority to regulate land use rests with local governments. Pursuant to *The Planning Act* or *The Municipal Act*, a municipality may enact municipal by-laws, development plans and zoning by-laws with the conditional use permitting process to regulate the location, size and operation of livestock production operations.

The Planning Act

The Planning Act is the main mechanism for land use planning at the local government level. The Provincial Land Use Policies Regulation provides guidance to the local governments.

PROVINCIAL LAND USE POLICIES

Under *The Planning Act*, the Province developed and adopted the Provincial Land Use Policies Regulation (184/94) to promote sustainable development and guide provincial and local authorities undertaking or reviewing local land use plans.

The Policies are also used as a benchmark in the review of subdivisions or other developments in areas where a development plan has not been adopted at the local level. Provincial Land Use Policies encompass Development Policies in nine broad policy areas (including Agriculture) and establish separate Subdivision Policies. Considerations with respect to livestock operations are most directly addressed in the General Development and Agriculture Policies sections.

Included in the General Development area are Policy objectives to ensure that development is:

- environmentally sound and consistent with the sustainable use of Manitoba's resources including the land base, arable soils and water;
- compatible and in harmony with other land uses; and,

- unlikely to result in the creation of dangers and nuisances.

One specific Policy Application statement indicates that non-resource-related uses shall be directed away from prime agricultural land and existing or approved livestock operations.

With respect to Agriculture, the intent of this Policy is to enhance stability and foster economic growth which is environmentally sustainable by encouraging development, use and management of agricultural lands. This development should occur in a manner that will enhance present and future options for food production and agricultural diversification. The objectives of the Policy are to maintain a viable base of agricultural lands for present and future food production and agricultural diversification, and to protect economically viable agricultural operations from encroachment by other land uses which could adversely affect their sustainability.

In applying these policies, it is indicated that land use plans should develop programs and policies that ensure protection for prime agricultural land and agricultural operations and promote economic growth that is environmentally sustainable. Land use plans should provide for the designation of areas in which livestock operations are permitted to operate without major restrictions on their operation and expansion.

Ultimately, the Provincial Land Use Policies state that criteria related to the establishment or expansion of livestock operations should be developed by local authorities. Local governments were established as the authority responsible for enacting land use regulations, covering many land uses including livestock production operations.

DEVELOPMENT PLAN

Broad local land use policies may be enacted by means of the establishment of a municipal or planning district development plan in accordance with *The Planning Act*. Such a plan may establish broad land use categories for the area for such uses as residential, commercial and agricultural, and identify prime agricultural lands and areas where livestock operations may develop. Although not a regulation in itself, the development plan may establish criteria by which livestock operations will be evaluated.

ZONING BY-LAW

Once a development plan has been approved, a municipality must enact a zoning by-law that is consistent with its development plan. Such a by-law divides a municipality into various zones such as rural residential, highway-commercial and general agricultural and generally lists specific permitted and/or conditional uses within each zone. There will also be specific requirements pertaining to each permitted or conditional use.

Conditional Use - Livestock operations are generally directed to agricultural zones. Within these zones, livestock operations may be listed as either a permitted and/or a conditional use, the distinction generally depending upon the size of the operation. As a permitted use, a livestock operation has a basic right to be established or expanded but a development permit must be issued.

Amendments to section 53 of *The Planning Act* were introduced in August of 2000 requiring any council considering a conditional use application for a proposed livestock operation that is 400 animal units or greater to obtain a Technical Review report from the Province. Upon receiving the conditional use application, the council should forward the application and accompanying material to the appropriate Technical Review Committee Chair for review and provide a copy to the Minister of Intergovernmental Affairs.

Before deciding on a conditional use, municipal council must first serve public notice, notify adjoining landowners and conduct a public meeting as proposed for under section 53 of *The Planning Act*.

As a conditional use, an operation may be allowed, subject to it meeting the requirements of the zoning by-law and complying with any other conditions municipal councils deem necessary to ensure the objectives of the development plan and by-law are adhered to. A conditional use permit may also be declined at the discretion of the council.

The decision of the municipal councils on a conditional use application is final. There is no appeal process.

SITUATION IN MANITOBA

Currently, most municipalities in Manitoba have adopted development plans and/or zoning by-laws or are in the process of developing plans. A wide variety of requirements and standards for the development of livestock operations have been adopted by these municipalities, ranging from permitting almost all operations to exclusion of large operations. However, in most municipalities, larger operations and those within a certain distance of residential or urbanized areas are usually deemed conditional uses and therefore subject to the conditional use/public review process.

In consultation with municipalities and the public, the Minister of Intergovernmental Affairs is currently undertaking a comprehensive review of the planning legislation in Manitoba. From this review, the Government will identify opportunities to improve the land use planning process with respect to livestock issues.

The Municipal Act

The Municipal Act is limited in its scope in relation to land use controls and is not intended to be used as a long-range alternative to sound land use planning. It may not be used to zone lands for specific purposes and, it does not have provisions to restrict other uses of land, such as residential, from locating near a livestock operation.

Where a municipality has no planning document in effect (as described in the previous section), it may use *The Municipal Act* to enact by-laws to:

- prohibit a development, activity, industry or business until a licence, permit or approval is granted; and,
- address activities that are or could become a nuisance (including noise, odours, and unsightly property).

THE ENVIRONMENT ACT

The Livestock Manure and Mortalities Management Regulation MR 42/98, under *The Environment Act*, strengthens the protection of the environment, enhances enforcement capabilities, and helps to ensure that livestock production will be sustainable in the long term in Manitoba.

Winter spreading of manure – All livestock operations are prohibited from land application of livestock manure between November 10 and April 15, unless they are exempted by regulation. Existing producers, defined as those in existence prior to March 30 1998, with fewer than 400 animal units of any one type of livestock, are exempt from the prohibition unless their manure management practices are causing an environmental concern. Existing large-scale producers, defined as having more than 400 animal units of a given livestock type, have until November 10 2003 to comply with the prohibition. Operations with greater than 400 animal units established after March 30 1998 must comply with the prohibition on winter spreading as soon as the operation is established.

Upon approval by Manitoba Conservation, emergency situations may warrant exceptions to the prohibition of winter spreading. Livestock operations that are exempt from the prohibition of winter application must meet minimum setback distance requirements from sensitive areas such as watercourses, wells, sinkholes and springs.

Application rate – All manure applied to land must be as a fertilizer for crop production. For those lands receiving manure, the regulation sets enforceable limits on the amount of nitrate-nitrogen that can be present in the soil at any point in time. To ensure that the soil nitrate-nitrogen limits are not exceeded, the rate of manure application should be determined on the basis of nitrogen content in the manure, residual nitrogen concentrations in the soil, soil texture and annual nitrogen requirements for the particular crop on that land.

Manure management plans – All large-scale livestock operations (>400 animal units) must prepare and register an annual manure management plan with Manitoba Conservation at least 60 days prior to spreading manure on land. The manure management plan ensures that adequate land is available for fertilization with the manure. The manure management plan describes the volume, type (i.e. liquid or solid) and nitrogen content of the manure produced. It also reports how, when and where the manure will be applied and the crop to be grown on each parcel of land receiving manure.

Manure storage structures – Livestock manure must be stored in appropriate structures. In the case of solid manure, field storage is also acceptable. All structures require a permit from Manitoba Conservation prior to construction. In addition, before their use or operation, the structures must be certified by an Engineer as being constructed according to engineering design standards.

Allowance for innovative practices – Considerable research and development is occurring in the field of livestock production and technological advancements are occurring at a rapid rate. Hence, the requirements of the regulation may be varied where innovative and environmentally sound practices or procedures are practiced.

Mortalities – The Livestock Manure and Mortalities Management Regulation permits proper disposal of mortalities by rendering, composting, incineration, or burial where environmental conditions are suitable. Mortalities must be stored in a secure manner and kept either refrigerated or frozen if retained for more than 48 hours after death.

Manure spills – As defined in section 9 of the regulation, persons transporting livestock manure are required to report the occurrence of a spill or other discharge of livestock manure immediately, where the location or quantities involved may cause an adverse effect on the environment. Minor spills or spills in locations that do not pose a significant threat or risk to the environment do not need to be reported.

Setbacks – Setbacks offer strong protection for our water resources. The minimum allowable distance from a manure storage facility or compost site to a surface water course, sinkhole, well or spring is 100 m.

Pollution issues – Other sections of the regulation prohibit the direct contamination of surface and ground waters by livestock manure. As well, livestock manure must not escape the property boundaries of land where it is either stored or applied as a fertilizer.

Mandatory review of the regulation – Under section 18 of the regulation, no later than 5 years after the day the regulation comes into force, the Minister of Conservation must review the effectiveness of the operation of the regulation and make recommendations that it be amended, continued or repealed.

The regulatory review is a consultative process that is expected to begin this winter and be completed by March 30, 2003.

THE FARM PRACTICES PROTECTION ACT

The Farm Practices Protection Act was proclaimed on January 31, 1994 and is intended to protect farmers who carry on normal farm practices from unreasonable court action under the common law of nuisance. It will also protect neighbours from nuisance due to unacceptable farm practices. The Act establishes a process for reviewing and mediating nuisance disputes arising from the practices of legally established agricultural operations.

The Act provides protection from nuisance claims by specifying that a person who carries on an agricultural operation, and who:

- a) uses normal farm practices; and
- b) does not violate:
 - i) a land use control law;
 - ii) *The Environment Act* or the regulations and orders; or
 - iii) *The Public Health Act* or the regulations and orders,

is not liable in nuisance to any other person for any odour, noise, dust, smoke or other disturbance, and shall not be prevented from carrying on the agricultural operation. In addition, should the land use by-law of a municipality be amended, or the ownership change, the agricultural operation may continue to operate and be given protection from nuisance complaints.

Normal farm practices are defined as practices conducted in a manner consistent with proper and acceptable customs and standards as established and followed by similar agricultural operations

under similar circumstances. This includes the use of innovative technology with advanced management practices and in conformity with all provincial legislation.

The Farm Practices Protection Board has been established to consider nuisance complaints against an agricultural operation from persons directly affected by the disturbance. Complainants may not undertake a nuisance action in court unless they have applied to the Board in writing at least 90 days previously for a determination as to whether a farm practice is normal. The Board will only consider complaints about odour, noise, dust, smoke and other such disturbances. It will not deal with pollution issues, erosion problems, inhumane treatment of animals or other non-nuisance items.

The complaint must be in writing and shall state the nature of the disturbance; name and address of the person making the application; and the name and address of the agricultural operation. There is a nominal application fee, which is refundable if the Board upholds the complaint.

Upon receipt of the complaint, the Board may investigate the disturbance, attempt to mediate the complaint, gather evidence, hold hearings and rule on the acceptability of the farming practices relating to the nuisance complaint. The Board may also refuse to consider the complaint if, in its opinion, the subject matter is trivial, frivolous, vexatious, or the complainant does not have sufficient personal interest.

The Board shall either dismiss the complaint if the disturbance complained of results from a normal farm practice, or order the agricultural operation to either cease or modify the farm practice causing the disturbance. The Act makes provisions for the Board to file its orders with the courts and have the orders enforced. Failure to comply with an order could result in a contempt of court action. The Board's orders may also be used as evidence against an agricultural operation in subsequent court proceedings based on the common law of nuisance.

The Act is intended to provide for a quicker, less expensive and more effective way than lawsuits to resolve complaints about farm practices. It may create an understanding of the nature and circumstances of an agricultural operation, as well as bring about changes which benefit all concerned, without the confrontational and unwarranted expense of the courts.

THE WATER RIGHTS ACT

A licence may be required under *The Water Rights Act* to withdraw water from either a surface or below ground source. For agricultural operations, this licence is required when water usage exceeds 25,000 Litres per day (5 500 imp. gal/day). At lesser rates of usage, no licence is required.

If a licence is required, an application must be submitted to the Water Licensing Section of Manitoba Conservation, prior to developing the water source. An initial office review of the application is then carried out to determine if the required volume is available from the indicated source and if impacts may result from the development. If water is available for allocation, a Groundwater Exploration Permit (groundwater) or a Preliminary Works Construction Permit (surface water) is issued. The Groundwater Exploration Permit authorizes the construction of wells for abstraction of groundwater and the carrying out of tests to evaluate the availability of water and effects of pumping on nearby wells in the same aquifer. A Preliminary Works Construction Permit authorizes the construction of

intakes etc. needed to withdraw water from a surface source. The permit may also require the proponent to undertake additional testing required for a full evaluation of the proposal.

After the terms of the permit has been satisfied, this information is supplied to the Water Licencing Section where a final decision on licensing will be made. If the water supply volume is available and there are no expected adverse effects on other users that cannot be mitigated, a licence is issued. The licence will specify the allowable withdrawal rate and annual withdrawal volume and will also include a requirement for monitoring and reporting of water use.

Many important water sources are at or near full allocation. It is therefore important to submit an application for a water rights licence as soon as possible as licences have precedence based on the date of application. A project should not be developed without first obtaining a water rights licence, where required.

Current Rules dealing with Siting and Construction of Swine Barns in Ontario

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When a producer wants to build a barn in Ontario, he/she needs to meet the following criteria. Most criteria is required as part of the issuance of a building permit by the local municipality.

Siting

Most livestock barns and storages are located following the Minimum Distance Criteria (MDS2) developed by the Ontario Government. The local municipalities have the option to accept the use of this criteria; however, most municipalities in Ontario are now using these calculations. The municipalities not using MDS to site the barns are typically using one fixed distance from the barn to the neighbour's home.

Engineering Requirements

Most swine barns and manure storages being constructed require an engineered set of drawings to obtain a building permit.

Nutrient Management Plan Requirement

Currently the local municipality can require a nutrient management plan as part of issuance of a building permit. To achieve this, the municipality develops and passes a Nutrient Management Bylaw. In May 2001, 9 counties had countywide Nutrient Management Bylaws, 14 had individual bylaws, and 25 had no Nutrient Management Bylaws. A number of additional counties have developed bylaws since May 2001. All the nutrient management plan requirements are not uniform across Ontario. Most municipalities have followed the Ontario Farm Environmental Coalition's suggested plan as a base (see <http://www.ofa.on.ca/aglibrary/Research/Nutrient%20Management%20Planning%20Strategy/default.htm> for more details) and have added or deleted requirements based on local needs. The following requirements of a nutrient management plan was obtained from a report called Report on Nutrient Management Bylaws in the Province of Ontario by Dr. John FitzGibbon and Lucas Thacker, University of Guelph, May 2001.

1. Nutrient Management Plan Trigger

The need for a Nutrient Management Plan can be triggered by the number of Livestock Units, (LU), or by livestock density. In Oxford County (one of the larger counties requiring a typical plan), an intensive livestock operation is one with 150 or more livestock units, or one where there are more than 50 livestock units per 2LU/acre. In Ontario, 150 LU consists of 750 sows, 3000 weaners or 600 finishing hogs.

2. Maximum Distance from Land Base to Livestock Facility

Many areas do not have a minimum distance. However, counties such as Oxford have a distance such as no more than 10 km for transfer of liquid manure. The most stringent is Ashfield and Hay townships (Huron County) having a distance of 4 km.

3. Land Ownership Requirement

Most counties do not have an ownership requirement; however, Lucan and Biddulph Townships in Middlesex County have a 66% ownership requirement (unsure of status due to possible appeal via the Farming and Food Production Protection Act (see later).

4. NMP Renewal Period

Varies from one year in Thames Centre and Middlesex Centre to no requirement. In Oxford County, the renewal period is three years. Many areas require annual manure lease agreement updates. Counties such as Oxford and Perth track the agreements and map the location of each agreement. This ensures that the land is only allotted once for the use of manure application.

5. Storage Days Required.

The report found 365 days is the most stringent, while 240 or 200 days with a third party approval is most common.

6. Lot Size

Minimum lot size (96 acres - 100 acres) is specified in two townships.

7. Incorporation of Manure

Incorporation of manure within 24 hours of application when near dwellings is required by Saugeen Shores and West Elgin, while Huron-Kinloss always requires incorporation except on hay. The current Ontario Agricultural Code of Practice suggests that liquid manure be incorporated within 24 hours if applied within 1000' of a neighbour's residence.

8. Third Party Approval

Third Party Approval of NMP's is required by most bylaws with third party review (OMAFRA, consultants, or professionals certified by OMAFRA). Four bylaws allow peer review.

9. Enforcement

Municipalities enforce bylaws. Inspection is the primary source of detection. Any spills are typically referred to the Provincial Ministry of Environment for enforcement under the Water Resources Act or the Environmental Protection Act.

10. Unique Traits

Some local bylaws have interesting local variations:

- Engineering reports are required by Saugeen Shores, Stone Mills, and Tynendinaga. Lucan requires them for liquid facilities only.
- Nearly all bylaws apply to both dry and liquid manure. 15 bylaws make provision for both.
- A consultant is required to prepare the NMP in 22 bylaws.
- All bylaws comply with Minimum Distance Separation I & II.
- All Nutrient Management Bylaws are governed by the Municipal Act, 102.0 and or 210.0
- Bacterial water tests are required in Delhi and Norfolk.
- Global Positioning Satellite (GPS) soil testing is required in Hope.
- Application of manure on frozen ground is prohibited in West Elgin and Hope.
- Liability insurance is required in Saugeen Shores.
- Developments must have Class I road access in Saugeen Shores.
- In Saugeen Shores only 80% of allocated land can be used for manure application.
- Environmental Farm Plan is required in Saugeen Shores.
- Tiling and well monitoring is required in Saugeen Shores.

Appealing Restrictive Local Bylaws

The farmer has the option to appeal bylaws under the Farming and Food Production Protection Act. A number of appeals have been made. See <http://www.gov.on.ca/OMAFRA/english/engineer/nfppb/nfppb-decisions.htm> for a copy of the decisions completed.

The ministry also has to ability to give directives to the board. The following is a directive dated June 2000. The directive is as follows:

"Whereas the Farming and Food Production Protection Act, 1998 is intended to promote farm practices in a way that balances the needs of the agricultural community with provincial health, safety and environmental concerns; pursuant to subsection 9(1) of the Act I direct that an agricultural operation proposed to be carried on in an area which is the subject of an interim control by-law under the Planning Act shall be deemed not to be carried on as a normal farm practice until a by-law providing for nutrient management planning, minimum distance separation and manure storage has been passed."

Dated at Toronto this 26th day of June, 2000.

Future Processes

In May 2001 the Ontario Government completed 1st reading of proposed legislation called the Nutrient Management Act. For more information see <http://www.gov.on.ca/OMAFRA/english/agops/index.html>. The following is a description of the act. As of Nov 15/ 2001 2nd or 3rd reading has not been completed.

**NEW ONTARIO LEGISLATION WILL PROTECT WATER AND
SET CLEAR STANDARDS FOR FARMS**

TORONTO - The Ontario government is introducing a new law that would set and enforce clear, consistent standards for nutrient management on farms and protect the environment, announced Minister of Agriculture, Food and Rural Affairs Brian Coburn today.

"We're proposing preventive measures to address the effects of agricultural operations and municipal activities and the safe and effective management of land-applied materials containing nutrients," Coburn said. "Clear requirements based on the work developed with farmers - and the best practices many farmers already use - will ensure sustainable growth, safeguard the environment and make rural Ontario attractive to economic investment."

"This proposed legislation will protect the environment with strong, new preventive measures. Highly trained Provincial Officers with a knowledge of agriculture will ensure focused and effective environmental enforcement of strong new standards," said Environment Minister Elizabeth Witmer. "We thank all the individuals, organizations and other stakeholders, who participated in the consultation process and encourage them to comment further on this proposed legislation."

Under the proposed *Nutrient Management Act 2001*, clear new standards will be developed for all land-applied materials containing nutrients relating to agriculture - including livestock manure, commercial fertilizer, municipal biosolids, septage and industrial pulp and paper sludge. Stakeholders and the Ministry of the Environment (MOE) will partner with the Ministry of Agriculture, Food and Rural Affairs over the summer to develop the provincial standards.

The proposed legislation would provide authority for regulations governing several areas including:

- mandatory Nutrient Management Plans (NMPs).
- certification of commercial land applicators of materials containing nutrients.
- distance requirements for manure and biosolids application near wells and waterways.
- banning the land application of untreated septage over a five-year period.
- establishing and delivering associated education, training and certification programs.
- establishing a database system to record land applications of materials containing nutrients, with an initial focus on biosolids and manure.
- establishing minimum quality and application standards for land applied nutrients.

The bill would provide for a framework to phase in standards over time, depending on the size of operations and the kinds of practices that are carried out.

At a minimum, the following categories would be defined:

- Large livestock operations (e.g. 450 livestock units)
- Smaller livestock operations
- Other agricultural operations (e.g. greenhouses, mushroom facilities, cash crops)

The proposed legislation responds to consultations conducted with municipal, farm and environmental stakeholders; is consistent with the Environmental Commissioner's report; responds to the "Managing the Environment Report"; and fits with the government's Smart Growth vision.

Introduction

The *Regulation respecting the reduction of pollution from agricultural sources* is designed to minimize the environmental impacts of animal and plant production by providing for leak-proof storage of livestock waste and by further regulating spreading activities on cultivated land, first and foremost on agricultural operations presenting the greatest risk. In particular, it requires farmers to produce an agro-environmental fertilization plan and to keep a spreading register. It also restricts the spreading of livestock waste outside growing periods, or after October 1, unless the plan fixes another date, and prohibits the use of sprinklers and liquid manure cannons from October 1998 onwards.

The *Regulation respecting the reduction of pollution from agricultural sources* replaces the *Regulation respecting the prevention of water pollution in livestock operations*. It applies to the raising of animals such as ducks, cattle, llamas, deer, horses, chickens, rabbits, ostriches, pigs and so on, in the following groups: anatidae, bovidae, camelidae, cervidae, equidae, gallinaceae, leporidae, struthionidae, suidae and fur-bearing animals. It also applies to the facilities used to raise such livestock and store their waste, and covers the spreading of animal waste, farm compost and mineral fertilizers.

The Regulation came into force on July 3, 1997. Some provisions will come into force at a later date, as indicated in this document. Moreover, modifications that came into force on June 17, 1998, April 7, 1999, and September 21, 2000, are also covered.

Facilities used to raise livestock and store waste

If you operate a livestock facility, if you plan to do so in the near future, or if you intend to modify your current facilities, you must ensure that your buildings and storage facilities do not leak and are located on sites where there is no risk of contaminating an aquatic environment or water intake.

Livestock buildings and waste storage facilities that are poorly constructed and poorly located constitute a significant source of soil and water contamination. Three important aspects must be considered in the construction and layout of such facilities: proof against leaks, capacity, and location outside protected zones.

Leak-proof infrastructures with sufficient capacity

At no time must livestock waste accumulating in a raising facility come into contact with the soil. Storage facilities must be leak-proof, and the floor or base must be above the highest level of the underground water table. Storage facilities and yards must be laid out so as to prevent infiltration by runoff. All livestock buildings and all evacuation facilities must be maintained regularly to ensure that they remain watertight.

Some solid manure storage facilities are exempt from the watertight requirement. These must be located far enough from protected watercourses, and the manure must come from facilities whose livestock population is lower than the limit prescribed by the Regulation. Moreover, the facilities must be laid out in such a way that the livestock waste and the contaminated water do not reach surface and underground watercourses. Operators who were exempt from the watertight storage requirement in the former *Regulation respecting the prevention of water pollution in livestock operations* but were no longer exempt had until January 1, 2000 to comply with the new rules.

Storage facilities must have the capacity to receive and accumulate, without overflow, the livestock waste produced in their livestock buildings over a minimum period of 250 days. For facilities built before July 3, 1997, the required minimum capacity is 200 days. However, there must always be sufficient storage space, without overflow, for all waste produced outside the authorized spreading periods. Manure liquid and contaminated water originating from a yard must be intercepted and channelled towards a storage facility.

In addition to livestock waste, only four types of materials may be placed in a storage facility: absorbent materials used for livestock bedding (cereal straw, hay, crop residues, peat, sawdust, wood shavings and bark), water contaminated by livestock waste and absorbent materials, liquid dairy wastes, and water from atmospheric precipitation.

Drains... in the right places!

No overflow drain or sump drain may be installed in storage facilities. However, a drain must be installed in the vicinity of watertight storage facilities, below floor level. The drain outlet must be connected to an observation well with a minimum inner diameter of 40 cm for sampling purposes. The location of the drain outlet must be indicated by a permanent marker. Some marginal cases, i.e. storage facilities exempt from the requirement to be watertight, need not comply with the standards concerning the peripheral drain and observation well.

The person responsible for the storage facility must take the steps required to prevent or stop any overflow or leakage of fertilizers from the facility. Once a year, or before any overflow occurs, the livestock waste contained in the facility must be emptied.

The maximum volume of waste material that may be stored in your building may not be exceeded for any reason whatsoever. If you store livestock waste, the quantities received and stored may not exceed the quantities that you are able to spread on the land at your disposal. If you have surplus waste, you must treat it to obtain useful products, provided you are authorized to do so. If not, you must ship it to an authorized treatment establishment for treatment or destruction. Surplus waste may also be shipped to a manure management organization. In all cases, waste transported to facilities or land outside your operation must be in a watertight container. Containers used to transport manure liquid and contaminated water must also be closed.

Manure in the fields

Some livestock buildings are exempt from the watertight requirement for storage facilities, and the solid manure from these buildings may be stored in a cultivated field. However, the solid manure must come from buildings using bedded housing where no *suidae* are found, or from buildings whose number of animal units and location meet the requirements set by the Regulation. The layout of solid manure storage facilities in cultivated fields is subject to the following conditions:

- the facility must comply with the minimum distances prescribed below:
 - 300 m from a spring, a well or a water intake used to produce spring water or mineral water, or to supply a municipal waterworks or a waterworks operated by the holder of a permit;
 - 150 m from a lake, a watercourse, a natural marsh, a swamp or a pond; and
 - 30 m from a ditch;
- the facility must be secure from any infiltration by runoff;
- the ground on which the facility is laid out must have a slope of less than 5%;
- the facility must not remain on the same site for two consecutive years;
- the facility must not be located within the 20-year floodplain of a watercourse or lake;
- as of October 1, 1998, manure from a set of facilities comprising 35 or more livestock units must be covered by a waterproof material;
- as of September 21, 2000, and up to March 31, 2003, the storage in a cultivated field of solid manure from a pig farm using a litter system is permitted provided the *Environmental criteria for pig farming with solid manure management* published by the Ministère de l'Environnement are met.

Agro-environmental fertilization plan (PAEF)

It is important to prepare an agro-environmental fertilization plan for your agricultural operation. The goal of the plan is to ensure that the livestock waste produced by your operation or received from another operation, as well as all farm compost and mineral fertilizers, are spread on areas of cropland while respecting soil and crop related restrictions to avoid overfertilization, thus minimizing water pollution. The plan places limits on the spreading of fertilizing substances for each parcel of cropland on your operation. The limits are based on a balance between the anticipated nutrient requirements of the crop and the nutrients supplied by the soil and by fertilizers from all sources, in light of various environmental elements.

In the case of phosphorus contributed by animal waste, it is possible to exceed crop requirements without going over the maximum prescribed in the section Phosphated fertilization standard deadlines and phases, as long as the risk of water and soil contamination is minimized.

The plan may cover a single annual growing season, or two or more successive seasons, up to a maximum of five. It must be accompanied by a farm plan containing: the cadastral designation of

the lots on which the parcels are located, the number assigned to each parcel, the area cultivated on each parcel, the type of crop grown and the fertilization applied. It must also indicate the location of springs, wells, rivers, lakes, watercourses, ditches and swamps.

The agro-environmental fertilization plan must be prepared and signed by an agrologist who is a member of the *Ordre des agronomes du Québec*, or by a professional technologist who is a member of the *Ordre des technologues professionnels du Québec*, provided, in the latter case, that he or she acts under the supervision of an agrologist. As of October 1, 1997, you, one of your partners or a shareholder in your agricultural operation may also sign the plan if you have taken a training course authorized by the Minister of Education. The signatory attests that compliance with the plan will make it possible to maintain the fertility of the soil while minimizing the risk of soil and water contamination. The plan may be amended by following the same procedure as for its original preparation and signature. The person who cultivates the parcel of land concerned, the owner of the parcel and, where applicable, the manure management organization, must keep a copy of the plan for two years after the activities it covers have been completed.

The requirement to prepare a plan comes into force gradually for different groups of agricultural operations (see "Timetable for the coming into force of the requirement to prepare an agro-environmental fertilization plan." The plan must contain at the very least the information mentioned under "The Agro-environmental Fertilization Plan: Details."

Keeping records

Agricultural operations whose spreading activities are governed by an agro-environmental fertilization plan, and operations or organizations which ship or receive livestock waste from other operations, must keep registers. The registers may be inspected by the *Ministère de l'Environnement* for up to two years after the date of the last entry. Registers must therefore be kept on the premises. There are three types of registers: the spreading register, the reception register and the shipping register.

Spreading register

From August 1, 1997, a person who cultivates a parcel of land on an agricultural operation whose spreading activities will be covered by an agro-environmental fertilization plan between now and the year 2002 must keep a spreading register for each parcel of land in that operation, and for each growing season. The register must contain:

- the name and address of the agricultural operation;
- the date of each spreading;
- the cadastral designation of the lot containing a fertilized parcel and the corresponding number appearing on the farm plan submitted with the agro-environmental fertilization plan;
- the crop grown on each of the parcels, and the number of hectares occupied by that crop;
- the amount of nitrogen and phosphorus, the type of each fertilizer spread and, in the case of

livestock waste, the type of waste, its origin and its quantity.

In the case of a manure management organization, the register must also contain:

- an evaluation of agronomic efficiency, a description of the verifications made by the organization with the persons bound by an agreement, and the date of those verifications.

Upon request, the person cultivating a parcel of land must provide the Ministère de l'Environnement with a summary of the spreading register. The summary must indicate, for each of the four crop groups (corn; grain; grasslands and pastures; other crops):

- the annual amount of manure, liquid manure and manure liquid, and their origin for each of the following four groups of livestock species: bovines, porcines, poultry and others;
- the annual amount of mineral fertilizers, expressed in tons of nitrogen and phosphorus;
- the fertilized area for each of the crop groups; and
- the total area of the parcels covered by the agro-environmental fertilization plan and whose soil phosphorus saturation percentage is of 10% or more and phosphorus content between 150 and 500 kg/ha, or whose phosphorus content is 500 kg/ha or more.

Reception register

A person who operates a storage facility or an authorized livestock waste treatment establishment must record the following information in an annual operations register for each delivery of livestock waste:

- the name and address of the livestock facility, storage facility or manure management organization which sent the waste;
- the amount and type of livestock waste received;
- the date of the delivery.

Shipping register

A person who operates a livestock facility or who stores livestock waste must keep a register of livestock waste shipped outside the agricultural operation. The register must contain all information on the livestock waste shipped for spreading, storage or processing purposes, or to be handed over to a manure management organization. The register must contain the following information for each shipment:

- the shipping date, the quantity shipped and the type of livestock waste;
- the name and address of the livestock facility and the agricultural operation from which the waste originates;
- the destination and the name and address of the person to whom it is shipped;
- the cadastral designation of each parcel of land on which the livestock waste is to be spread, the corresponding number appearing on the farm plan, the name and address of the recipient agricultural operation and the name and address of the operator of the parcels in

- question;
- the name and address of the storage facility, treatment establishment or manure management organization to which the waste is shipped.

The manure management organization must also keep a register.

Some basic rules

If you operate a livestock facility, you have four options for the management of your livestock waste: you may spread it on your land or on neighbouring land, you may send it to a manure management organization, you may have it treated by an authorized establishment, or you may send it to a storage facility for spreading or treatment.

Special cases: liquid manure management in limited activity zones

Liquid manure generated by an agricultural operation located in a limited activity zone must be managed in one of the following three ways:

- 1) spreading on land belonging to the owner of the operation;
- 2) treatment by an authorized establishment;
- 3) handing over to a manure management organization.

Clear agreements for good business

Whatever management method you choose, you must enter into and honour agreements with the key players in the management of livestock waste that cannot be spread on your own land. If the content of these agreements is changed in any way, you must inform the Ministère de l'Environnement within 180 days of the date on which the change is made. A copy of every agreement must be kept by the parties concerned for at least two years after the expiry date. The Minister may ask you for a copy. It should be noted that a parcel of land cannot be covered by more than one spreading agreement.

Many different agreements may be entered into by the parties involved in livestock waste management. Do not forget to sign those concerned with the management of livestock waste outside your operation.

It should be noted that operators of parcels of land located in limited activity zones may not enter into or renew an agreement to spread liquid manure from another municipality, except if the said operators are in a municipality specified in Schedule VII of the Regulation and have entered into an agreement with a manure management organization.

Livestock breeder

If you are a **livestock breeder**, you must sign an agreement with:

- the operator of the land on which the livestock waste from your facilities is to be spread. The spreading agreement must cover a minimum period of two years;
- the operator of the storage facility to which you will ship the livestock waste from your facilities;
- the operator of an authorized livestock waste treatment establishment to which you will ship the livestock waste from your facilities;
- the manure management organization that will take charge of the livestock waste from your facilities.

Livestock waste stores

If you store livestock waste, you must sign an agreement with:

- the various livestock breeders who will send their livestock waste to your storage facility;
- the operator of the authorized livestock waste treatment establishment to which you will ship the livestock waste from your storage facility;
- the manure management organization that will take charge of the surplus livestock waste from your storage facility;
- the operator of the land on which the livestock waste stored in your facility will be spread.

Data Sheet for the *Regulation respecting the reduction of pollution from agricultural sources*

1) History

- The *Regulation respecting the reduction of pollution from agricultural sources* (R.R.Q.-2, R.18.2), which replaces the *Regulation respecting the prevention of water pollution in livestock operations* (R.R.Q.-2, R.18), was passed in June 1997 and has been the subject of several updates since that time. The most recent changes were passed on June 6, 2001.
- These measures are in response to the need for more rigorous limits for municipalities with manure surpluses expressed by many stakeholders, such as the Quebec Environmental Health Committee of the ministère de la Santé et des Services sociaux, the Conférence de préfets des MRC de Chaudière-Appalaches, the Coalition pour le développement d'une agriculture durable, the Direction régionale de la santé publique de Chaudière-Appalaches, and several municipalities.
- These measures are transitional, since the Ministère de l'Environnement intends to propose an overall modernization project for the *Regulation respecting the reduction of pollution from agricultural sources* as soon as possible.
- Modernization of the *Regulation respecting the reduction of pollution from agricultural sources* is an important aspect of the ministerial policy project on environmental management in agricultural environments, which the Ministère de l'Environnement is designing.

2) Objectives

The changes made to the *Regulation respecting the reduction of pollution from agricultural sources* follow four main objectives with respect to prevention, specifically in drainage basins that are most at risk:

- To identify the limited activity zones (LAZ) using a phosphorous-based method, and to identify the creation of new LAZs;
- To encourage operators of new livestock facilities to have their manure undergo treatment and to spread the treated product outside of the LAZs;
- To reduce the quantities of phosphorous spread on lands belonging to agricultural operations that are increasing the livestock on their existing livestock sites;
- To increase the zones receiving manure from livestock facilities located in LAZs instead of phosphorous-based mineral fertilizer;
- To encourage the development of environmentally and economically viable alternative storage methods.

3) Highlights

The changes passed by the Conseil des ministres, on June 6, 2001:

- establish new limited activity zones (LAZs) using a phosphorous assessment, including 165 municipalities deemed to be most at risk, to which other municipalities may be added according to the mechanism established for this purpose;
- require the complete treatment of animal wastes from all new livestock sites in an LAZ and the spreading of the treated product outside LAZs;
- for any increase in animal units in an existing livestock site located in an LAZ, requires spreading of animal waste from the agricultural operation on lands which belong to it, applying the second phase of the phosphated fertilization standard immediately, or requires complete treatment of these animal wastes and spreading of the treated product outside of the LAZs;
- enables spreading of animal waste from one municipality to another in an LAZ through manure management organizations (MMOs);
- permits new spreading agreements, and the renewal of existing agreements, until March 31, 2002, in LAZs that are not served by an MMO, if the agreements are submitted to the municipality for public consultation purposes;
- permits storage methods other than covering manure piles in the field and leakproof storage of contaminated water from yards having a lower animal population, as long as these methods ensure water protection, and requests for certificates of authorization are supported by a professional's report (agronomist, engineer or professional technologist supervised by an agronomist).

4) Technical definitions

Complete treatment:

Complete treatment of animal wastes must allow them to be transformed into a product of a different nature, such as fertilizer granules or mature compost. Complete treatment of animal wastes allows bacteria to be destroyed and will produce marketable products that can be used beyond agricultural lands. They cannot be spread in LAZs.

Deployment of the phase 2 fertilization standard (P2):

Changes to the *Regulation respecting the reduction of pollution from agricultural sources* (RRPAS) were passed by the Conseil des ministres on June 6, 2001. They are specifically intended to anticipate the application of phase 2 of the phosphate fertilization standard for individuals operating livestock sites located in a limited activity zone (LAZ), who are adding animals to their site.

However, this alternative to complete treatment is permitted only if the agricultural operation owns all the area required for spreading, according to phase 2, of animal wastes that it produces and that are not processed.

Phase 2 of the phosphate fertilization standard sets more restrictive maximum fertilization limits than phase 1 (see [Appendix 1](#)). The phase 2 limits apply once a plan to add animals to an existing livestock site located in an LAZ has been authorized, rather than to the final year established as 2011 for operations with sufficient spreading zones (see calendar in [Appendix 2](#)).

For operations with an agro-environmental fertilization plan (PAEF), the individual who prepares the plan must also take into account the requirement to minimize the risk of soil and water contamination in order to set the fertilization restrictions.

5. Administrative Impact

In order to ensure monitoring of the *Regulation respecting the reduction of pollution from agricultural sources*, the Ministère de l'Environnement will obtain:

- \$250,000 for digitizing the maps of drainage basins in limited activity zones;
- \$100,000 for the acquisition of computer equipment;
- additional staff equal to 15 FTEs assigned to data entry in the municipalities with manure surpluses.

APPENDIX 1
**MAXIMUM FERTILIZATION LIMITS OF TWO ENFORCEMENT PHASES,
 ACCORDING TO FERTILITY AND SOIL SATURATION AND PRI RISK (APPLICABLE
 ONCE THIS METHODOLOGY HAS BEEN VALIDATED).**

Fertility (MEHLICH III)		0 – 60	61 – 150	151 – 250	215 – 500	500
Fertilization dose ¹	Phase 1	N	N	S<10: N S>10: 40	S<20: 20 S>20: 0	0
	Phase 2	N	N	S<10: 40 S>10: 20	S<10: 20 S>10: 0	-20
PRI risk		Very low	Low	Moderate	High	Very high

¹ Fertilization dose: the numeric values in italics indicate the phosphorous fertilization objectives to be reached under the various phases of enforcement of the standard. These objectives express excess of total phosphorus content in kg P₂O₅/ha in relation to crop samples.

N: indicates that the fertilization doses must be set so that nitrogen fertilization does not exceed the CPVQ recommendations with respect to nitrogen available from fertilizers.

S: percentage soil saturation of phosphorus.

NB Agricultural Land & Environment Legislation

A Summary for Canadian Pork Council

The NB Department of Agriculture, Fisheries and Aquaculture currently has responsibility for the administration of three Acts related to protection of agricultural land and environment:

- ***Agricultural Land Protection and Development Act (ALPDA)***,
- ***Agricultural Operation Practices Act (AOPA)***,
- ***Livestock Operations Act (LOA)***

Agricultural Land Protection and Development Act (ALPDA) was passed in 1996 and most sections of the Act were proclaimed in 1997.

The Act contains a broad spectrum of provisions to deal with protection of agricultural land through the land planning and zoning process. The *Registry of Agricultural Land Regulation* establishes a mechanism whereby land can be registered as agricultural land for protection under the Act. The Act is closely linked to the planning process under the *Community Planning Act (CPA)*.

Agricultural Operation Practices Act (AOPA) was passed by the Legislature in 1999 but has not yet been proclaimed.

The Act will provide for a complaint resolution process to deal with nuisances from agricultural operations. As well, the Act will protect farmers against liability in nuisance if they use acceptable farm practices. A Farm Practices Review Board will be established under the Act to attempt to resolve complaints and to make determinations on acceptable farm practices.

The details necessary for the Act to be proclaimed will be contained in the Regulations. As part of the development of the Regulations, the former Department of Agriculture and Rural Development drafted several comprehensive discussion papers and has consulted with farm organizations and other government and public stakeholders.

Livestock Operations Act (LOA) came into force on May 1, 1999.

This Act and the regulation under the Act came into force on May 1, 1999. It currently provides for the licensing of new livestock operations only.

Primary purpose of LOA was to facilitate the development of the livestock industry, with recognition of the needs of the rural community and the protection of the environment.

Its guiding principles include:

- responsible manure management that recycles manure as a valuable soil nutrient for crop production;
- reduced conflict with neighbours by means of minimum separation distances between livestock facilities on licenced farms, and nearby dwellings and land uses;
- proper siting, design and construction of manure storage and handling facilities;
- reduced risk of contamination of water and soil resources by setting attainable controls on manure application

The first phase of its implementation focused on requiring new operations to become licenced to ensure that these are properly sited, that the manure facility is properly designed and constructed, and that the manure is managed in an agronomic and environmentally sound manner.

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November 5, 2001



**Agro-Environmental and Land Use Planning Legislation
in Prince Edward Island
November 2001**

Environmental Protection Act

1. The purpose of the Act is to manage, protect and enhance the environment.
2. The Act requires buffer zones to be established and maintained on all non-forested land adjacent to (a) watercourses, including intermittent streams and springs that have a defined sediment bed and flow-defining banks that connect with a larger watercourse, or exhibit continuous flow during any 72-hour period from July 1 to October 31 of any year; and (b) wetlands identified as open water, deep marsh, shallow marsh or salt marsh as defined in the 1990 Prince Edward Island Wetland Inventory.
3. Buffer zones are measured landward from the watercourse or wetland boundary. "Watercourse boundary" means the top edge of the bank or slope that defines, under normal circumstances, the course of water flow or the edge of standing water
4. Buffer zones must be 10 m in width where non-forested land is in non-agricultural use, including but not limited to residential, commercial, industrial, institutional and recreational use.
5. Buffer zones must be 10 m in width where the land is in agricultural use. Where land in agricultural use is within 50 m of the upland boundary of a buffer zone and has a slope of 5% or greater, fall tillage is prohibited and a winter cover is required. Alternatively, instead of these measures, a 20 m buffer zone may be established.
6. Agricultural crops cannot be planted within a 10 or 20 m buffer zone except forage crops under certain conditions.
7. As of April 1, 2000 buffer zones must be established at sites with intensive livestock operations. New intensive livestock operations, including associated buildings, manure storage facilities, exercise yards and concentrated feeding areas cannot be constructed within 90 metres of a watercourse or wetland. Existing livestock operations require a 20m buffer zone where the slope of the land between the intensive livestock operation and a watercourse or wetland is 9% or less and 30m buffer zone where the slope of the land between the intensive livestock operation and a watercourse or wetland is greater than 9%. Buffer zone provisions required for intensive livestock apply to all watercourses and natural wetlands except landlocked ponds and man-made ponds with no permanent flowing outlet.



8. The Act provides for an environmental impact assessment process. No person shall initiate any undertaking without a written proposal to the Department and obtaining written approval to proceed. An undertaking is defined as any construction, industry, operation or other project or any alteration or modification of any existing undertaking which will or may cause emission or discharge of any contaminant into the environment, have an effect on any unique, rare or endangered feature of the environment, cause public concern because of its real or perceived effect or potential effect on the environment. Livestock operations fall under this definition.
9. The Act and/or its regulations also provides for petroleum storage tanks, wells, waste treatment and water supply systems, discharge of contaminants, sand dunes littering

Pesticides Control Act

10. The Act regulates the sale, use, storage, transportation, disposal, inspection of pesticides and licensing of pesticides services and vendors.
11. The Act Prohibits the sale or supply to any person a pesticide that does not meet the standards prescribed by regulation in respect of registration, packaging and labeling and efficacy in relation to the purpose for which it was manufactured or made.

Agricultural Crop Rotation Act

12. Assented to on May 15, 2001 but not proclaimed.
13. The purpose of the Act, through crop rotation and responsible land management, is: to maintain and improve surface water quality by reducing run-off and soil erosion; to maintain and improve groundwater quality; to maintain and improve soil quality; and to preserve soil productivity.
14. The Act prohibits any grower from planting or any landowner from permitting regulated crops (potatoes) to be planted on any area of land greater than 1 hectare at any time for more than one calendar year in any three consecutive calendar years.
15. Regulated crops are also prohibited from being planted on a land area greater than 1 hectare where the average slope of the land area is equal or greater than 9%.
16. The Lieutenant Governor in Council may make regulations: designating specific crops as cereals and forages; prescribing qualifications and identification for inspectors and management specialists; respecting management plans; respecting the issuance of permits to plant regulated crops; respecting the method of identifying land that has an average slope of greater than 9%; etc.



Animal Health and Protection Act

17. The objectives of the Act are: to promote animal health and to eradicate, prevent or control the spread of disease among animals in the province; to provide for the welfare of or prevention of cruelty to animals; and to provide for the protection of animals deemed to be in state of distress if it is in need of food, water, care or treatment; is sick, in pain or suffering or has been injured; is abused or subjected to cruelty or neglect.
18. The definition of "animal" includes livestock. The definition of "livestock" includes swine.

Farm Practices Act

19. The Act was proclaimed September 25, 1999.
20. The purpose of the Act is to protect farmers who carry on normal farm practices from nuisance complaints or court action.
21. A farmer who uses normal farm practices and complies with *Environmental Protection Act*, *Pesticides Control Act*, *Public Health Act*, *Planning Act* and regulations made pursuant to those Act is not liable for damages in nuisance to any person for any noise, odour, dust, vibration, light, smoke or other disturbance resulting from an agricultural operation and shall not be prevented, by injunction or other order, from conducting an agricultural operation because it causes or creates any noise, odour, dust, vibration, light, smoke other disturbance.
22. A normal farm practice is defined as "a practice conducted by a farmer in a manner which is consistent with (i) any codes of practice designated by the board, and (ii) proper and accepted customs and standards as established and followed by similar agricultural operations under similar circumstances, in the province or in the same agricultural sector including practices making use of innovative technology in a manner consistent with proper advanced farm management practices in appropriate circumstances."
23. The Act provide for the appointment of a Farm Practices Review Board made up of 3 non-farm members and 6 members recommended by the farm organizations of the province.
24. The Board has three major responsibilities: designate and publish codes of practice for farming operations after consulting with farm organizations and other interested parties or the public; determine whether a farm practice is normal; and consider complaints about farm operations from noise, odour, dust, light, smoke, vibrations or other disturbances.
25. Any person who is aggrieved by any noise, odour, dust, vibration, light, smoke or other



disturbance resulting from an agricultural operation may make an application in writing to the Board for a determination as to whether the disturbance results from a normal practice

26. The Board can conduct hearings upon request from individuals or groups to determine whether a practice is normal. In the case of complaints, staff of the departments of agriculture or environment will investigate, and if needed, will work with the farmer to help resolve it.
27. If the complaint is valid, and the issue cannot be resolved with the farmer on a voluntary basis, the complainant can apply to the Board. If the complaint is not resolved through mediation, the Board can establish a panel to determine if it should be dismissed or it can order the farmer to cease or modify the practice. Decisions are filed with the Supreme Court, which would hear any appeals.
28. The Board may also refuse to hear complaints if they are considered to be trivial or if it has already rendered a decision on similar complaints.
29. The Board does not deal with complaints which fall under the jurisdiction of the Environmental Protection Act, the Pesticides Control Act, the Public Health Act or the Planning Act. Processes are already in place under these acts to deal with complaints.

Planning Act

30. The objectives of the Act are: to provide for efficient planning at the provincial and municipal level; to encourage the orderly and efficient development of public services; to protect the unique environment of the province; to provide effective means for resolving conflicts respecting land use; and to provide the opportunity for public participation in the planning process.
31. The Subdivision and Development Regulations apply to all areas of the province except in municipalities with official plans and bylaws. The Regulations provide that no person shall be permitted to subdivide land/develop land where the proposed subdivision or development would have a detrimental impact.
32. Detrimental impact means any loss or harm suffered in person or property in matters related to public health, public safety, protection of the natural environment and surrounding land uses, but does not include potential effects of new subdivisions, buildings or developments with regard to real property value, competition with existing businesses, viewsapes or development approved under the Environmental Protection Act.



Guidelines and Best Management Practices

Guidelines for Manure Management on Prince Edward Island

Best Practices for Agricultural Waste Management

Guidelines for Disposal of Dead Farm Livestock

Code of Practice. Watering Livestock While on Pasture

Best Practices for Soil Conservation

AGRO-ENVIRONMENT & LAND PLANNING IN NOVA SCOTIA

The following is a summary and brief description of current provincial regulations/legislation pertaining to agro-environment and land planning.

LEGISLATION

The following Provincial legislation impacts agricultural activity in some way. These acts are briefly described in the following paragraphs.

Environment Act. 1994-95, amended 1998 c. 18, s 557 (Dept. of Environment and Labour)

This legislation impacts on a number of agricultural activities with a number of sets of regulations, that include:

- **Activities Designation Regulations** (NS Reg. 47/95); diversion of water from surface and groundwater sources, construction of ponds, alteration of water courses, stream crossings, wetland alteration, and storage of fertilizers.
- **Air Quality Regulations** (NS Reg. 55/95); regulates burning of solid wastes
- **Emergency Spill Regulations** (NS Reg. 59/95); regulates spills of petroleum products pesticides and fertilizers.
- **Environmental Assessment Regulations** (amended to NS Reg. 71/2000); an environmental assessment is required for any manure storage holding more than 5000 m³.
- **Pesticide Regulations** (NS Reg. 61 /95); regulates pest product usage, licenses, permits, storage, and disposal.
- **Petroleum Storage Regulations** (NS Reg. 62/95) regulates petroleum product storage, handling and spills.
- **Well Construction Regulations** (NS Reg. 58/95) regulates all aspects of the construction, maintenance and abandonment of wells.

Farm Practices Act, 2000 (Dept. of Agriculture and Fisheries) The Farm Practices Act provides protection to farmers who follow normal farm practices from being sued in nuisance or negligence.

The main provisions in the Act include: protection of farmers who are following normal farm

practices from civil lawsuits; A mechanism for resolving issues between farmers and their neighbours resulting from farm activities and protection of farmers who follow normal farm practices from nuisance by-laws that restrict farm activities.

The Act is a tool to resolve concerns about farming practices. A Farm Practices Board has been established to receive applications, hear complaints, and decide on normal farm practices.

Agricultural Marshland Conservation Act, 2000 (Dept. Of Agriculture and Fisheries), preserves dykeland as agricultural land and regulates building and development on dykeland, including agricultural structures. The tidal dyke system in Nova Scotia consists of 241 kilometres of dyke with 260 aboiteaux structures. A total of 17,400 hectares of land are protected by dyke and aboiteaux. The majority of the land protected is used for agricultural purposes.

Ditches and Water Courses Act (Services Nova Scotia and Municipal Relations): An approval from the NS Department of Environment and Labour is required for the construction or maintenance of a dam, the removal of material from a surface watercourse, the diversion of a watercourse from its natural channel, the dredging or modification of a surface watercourse, the placement of rock or other erosion control material in a surface water course, or any other alteration of a surface watercourse or the flow of water.

Fences and Detention of Stray Livestock Act (Services Nova Scotia and Municipal Relations) requires the owner of a livestock farm to build and maintain fences to prevent his livestock from escaping from the farm. It requires the owner of an adjoining non-livestock farm not to plant or cultivate any crop other than hay or pasture that would constitute an enticement to livestock closer than eight feet to the livestock owner's fence. It requires owners of adjoining livestock farms to share the costs of building and maintaining fences. Livestock means cattle, horses, ponies, mules, sheep, swine and goats. It applies only to municipalities designated by the Governor in Council. Only the Municipality of the County of Cape Breton has been designated to 1995.

Fences and Impounding of Animals Act (Services Nova Scotia and Municipal Relations: For those municipalities not designated under the previous Act, the *Fences and Impounding of Animals Act* requires the proprietor of a field adjoining another improved and enclosed field to build or maintain his proportion of the fencing. Owners of wood or barren or burnt lands not under improvement are not compelled to have fences.

The Act prohibits the running at large of animals where a municipal bylaw prohibits it and provides for damages from the owner of an animal who breaks another's fence. It provides for impounding animals.

Forests Act amended 1992, c. 18; 1998, c. 18, s. 559 (Dept. of Natural Resources): Forest Fire

Protection Regulations: A burning permit from the Department of Natural Resources is required to “set, start, kindle or maintain a fire in the woods or within 1000 ft. of the woods” during the forest fire season.

Municipal Government Act 2000 (Services Nova Scotia and Municipal Relations) the Municipal Government Act came into effect April 1, 1999. Sections 193 to 198, Schedule B of Act represent provincial policy on land use. The act protects the Province's interest in; land and water resources, development of communities Provide guidance on land use issues that cross municipal boundaries

Newly adopted or amended municipal planning documents must be reasonably consistent with these Statements At present, five Statement area have been adopted. These deal with: drinking water supply, flood risk areas, agricultural land, housing and infrastructure.

With regards to agriculture the goals of the act are the protection of agricultural land ,and to provide a viable and sustainable food resource base. Planning documents must: identify agricultural land ,address its protection and where possible, direct non-agricultural development to lands with lowest agricultural value.

NON-LEGISLATIVE

Guidelines for the Management and Use of animal Manure in Nova Scotia. These are used where specific by-laws do not exist and provide recommendations for setbacks to be followed. They also provide information on manure storage and handling. These guidelines are presently under revision. Guidelines for management of fur farm waste are also being developed.

Environmental Farm Plan

Various agricultural activities have the potential to pollute or damage the environment. In order to be pro-active the Nova Scotia federation of agriculture and the NS Department of Agriculture and Fisheries have developed an Environmental Farm Plan Program. This program is voluntary and its goal is to help farmers identify and assess environmental risk by examining their farm operation from an environmental management perspective. It allows farmers to incorporate environmental considerations into their business decision making process rather than addressing environmental issues on an stopgap basis.

The program was initiated in 1997 and modified in 1999 to overcome some initial problems. The program includes the following components: an initial farm visit; an on farm environmental review by an Agricultural Engineer; documentation of the review findings; presentation of the findings and

an environmental farm plan (all aspects of the process are kept confidential) and a follow-up visit.

Future Developments

As stated the Guidelines for the Management and Use of animal Manure in Nova Scotia are presently being revised as well as similar guidelines for the fur industry. The environmental farm plan program is ongoing and interest in participation in this program is growing.

Development of **Land Use Planning for Agricultural Areas Guidelines** are under way. This is a joint project of the Department of Agriculture and Fisheries with Services Nova Scotia and Municipal Relations. These guidelines will be made available to all municipalities in the province.

The use of designated watersheds is also being considered more frequently as a water management tool. A water management strategy is also being developed in relationship to drought management in crop production. There is a need for consideration of both agricultural and urban interests in implementing these plans.

There is also a great amount of interest by farmers in nutrient management planning. At present nutrient management recommendations are offered by a number of private consultants. There is a need to develop a set of nutrient management guidelines.

Present problems and future needs are being researched by a number of graduate students in the Agricultural Engineering Department of the Nova Scotia Agricultural College at the Bio-Environmental Engineering Centre. They are also developing several research chairs. For further information on this aspect please contact Dr. Robert Gordon, at rgordon@nsac.ns.ca .

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