

**SUSTAINABLE
DEVELOPMENT**



Applying
Manitoba's
Water
Policies

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INTRODUCTION

Historically, Manitobans have often taken our water resources for granted. There was a tendency to view water as a commodity to be used as needed. The value of water for fish and wildlife habitat and for recreation was not truly considered. Water management was often approached in a reactionary manner to address only the short term benefits. Water quality was virtually ignored until recent years.

During the 1980's there was growing public awareness and concern about the environment. We recognized that environmental management, conservation, and economic development are interdependent and mutually reinforcing. We realized that we must shift our thinking from that of assessing development for the short term to understanding its future benefits and impacts.

Towards a Sustainable Development Strategy

In 1989, as part of its vision to achieve sustainable development, the Government of Manitoba began the preparation of a strategy that would comprehensively address management and development of land and water resources. Water was selected as the first resource to be addressed, since its management affects all other resources. Work on complementary strategies on soils, forests, minerals, natural lands and special places, wildlife, and fisheries has already begun.

All Manitobans have a stake in water management. Success is contingent on public awareness, participation, and support. The Manitoba Round Table on Environment and Economy prepared draft policies and implemented a broad-based public consultation process to obtain feedback on the views of the public. The policies were mailed throughout the province and responses were received through questionnaires, workshops, and formal presentations.

The results of the process yielded more than half a million words of written material expressing the knowledge and insights of people throughout Manitoba. The experience confirmed that the public was very interested in managing our water and soil resources and demonstrated the value of adopting a public consultation process to address future land and water issues. The revised policies were recommended to the government by the Manitoba Round Table on

Environment and Economy in a publication titled "Land and Water Strategy, What You Told Us".

Manitoba Water Policies

The water policies presented in this publication are a synthesis of public and government input into the management of our water resources. These policies are consistent with the Federal Water Policy which views water as both a key to environmental health and well being and as a scarce commodity that must be managed in a sustainable manner.

The Government of Manitoba adopted these water policies in 1990. The policies are not an end to themselves, but represent a commitment to a process that will result in programs and initiatives designed to ensure the sustainable development of our water resources.

Application of these policies is a responsibility that must be shared. The policies will guide a variety of land and water uses and activities throughout Manitoba. All stakeholders including resource owners, managers, and users have important roles to play. We must ensure these policies are applied in all phases of water management from planning to decision-making.

The job of policy application belongs to everyone. Government agencies must work in partnership with an informed public. Application of these policies will involve rural municipalities, local government districts, conservation districts, local soil and water interest groups, nature groups, private organizations, developers, businesses, and the general public.

Development of our water resources can be sustainable if the responsibility is shared by everyone.

HIGHLIGHTS

The Manitoba Water Policies have been prepared to ensure that future water management practices support the goal of sustainable development in the province. These policies will be applied toward achieving seven main objectives:

1. Water Quality

To protect and enhance our aquatic ecosystems by ensuring that surface water and groundwater quality is adequate for all designated uses and ecosystem needs.

Thrusts for protecting water quality in the sustainable use and development of our water resources include:

- adopting water quality objectives to protect water uses.
- enhancing water quality to reflect economic, social, environmental, cultural, and heritage values.
- improving wastewater discharges (e.g. upgrading waste collection and treatment systems to meet discharge standards.)
- consulting affected user groups in the design of pollution control programs.

2. Conservation

To conserve and manage the lakes, rivers, and wetlands of Manitoba so as to protect the ability of the environment to sustain life and provide environmental, economic, and aesthetic benefits to existing and future generations.

Conservation in this policy refers to conserving the cultural, recreational, and other human or natural values of our waterbodies.

The policy has two major thrusts: recognizing the important social, economic, and environmental values of waterbodies, and protecting these values through appropriate practices.

The policy also seeks to conserve, where feasible, waterbodies whose intrinsic values are exceptional or of provincial or national significance. Clearwater Lake, the Seal River, and Delta Marsh, for example, are known nationally and internationally for their environmental, economic, and aesthetic values.

3. Use and Allocation

To ensure the long-term sustainability of the province's surface water and groundwater for the benefit of all Manitobans.

Water must be allocated to maximize social, economic, and environmental values while sustaining it for use by future generations. Particular emphasis is placed on:

- recognition of the value of water for purposes other than simply consumption.
- use of the basin planning process to assist in guiding decisions on water use and allocation.
- development and use of groundwater and surface water to support development but ensuring long-term sustainability of the resource base.
- opposing transfer of untreated water across the Hudson Bay Drainage Basin boundary; using a cautious approach to transfer within basins.

4. Water Supply

To develop and manage the province's water resources to ensure that water is available to meet priority needs and to support sustainable economic development and environmental quality.

Although Manitoba has an abundance of fresh water, good quality water is not always available where, when, and in the amounts it is needed. We depend on dams, reservoirs, and other man made facilities to supplement the natural surface water and groundwater for our water supply. In conjunction with supply management, we must:

- pursue water conservation strategies to reduce the cost of water supply infrastructure and to sustain the supply source.
- consider the impacts of new facilities on existing users and the environment.
- price water to adequately reflect the true cost of water supply and wastewater disposal.
- protect pristine and potable water sources such as Shoal Lake, Winnipeg's water supply.

5. Flooding

To alleviate human suffering and minimize the economic costs of damages caused by flooding.

Although we have floodways, ring dykes, and zoning to protect many of our urban centres, there are still several flooding-related challenges that need to be addressed:

- flash flooding below the Manitoba Escarpment and other areas of the province.
- up-to-date flood-preparedness plans for communities.
- reducing flood damages caused by inadequate urban drainage systems.
- mitigation of damage caused by hydro-electric developments.
- controlling new development in flood prone areas, ie, development must be compatible with risk.

6. Drainage

To enhance the economic viability of Manitoba's agricultural community through the provision of a comprehensively planned drainage infrastructure.

The focus of this policy is to maintain and upgrade existing drainage systems with the objective of maximizing their benefits and minimizing their environmental impacts.

Local authorities, industry, and people on farms and in communities have been taking on a greater responsibility in the construction and maintenance of drainage works. Access to technical support will be critical toward ensuring that drainage works are effective, economically sound, and environmentally sustainable.

7. Education

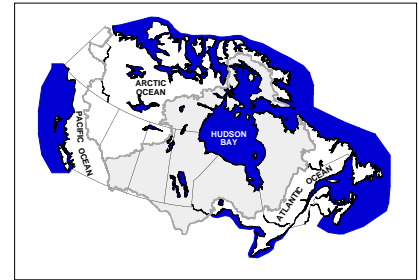
To enhance the awareness and knowledge of Manitoba's water resources.

Individuals, business and industry, and local governments are assuming a greater role than ever before in managing and protecting our water resources. This policy seeks to ensure that the information needed to guide sound water management decisions is available, concise, and user-friendly.

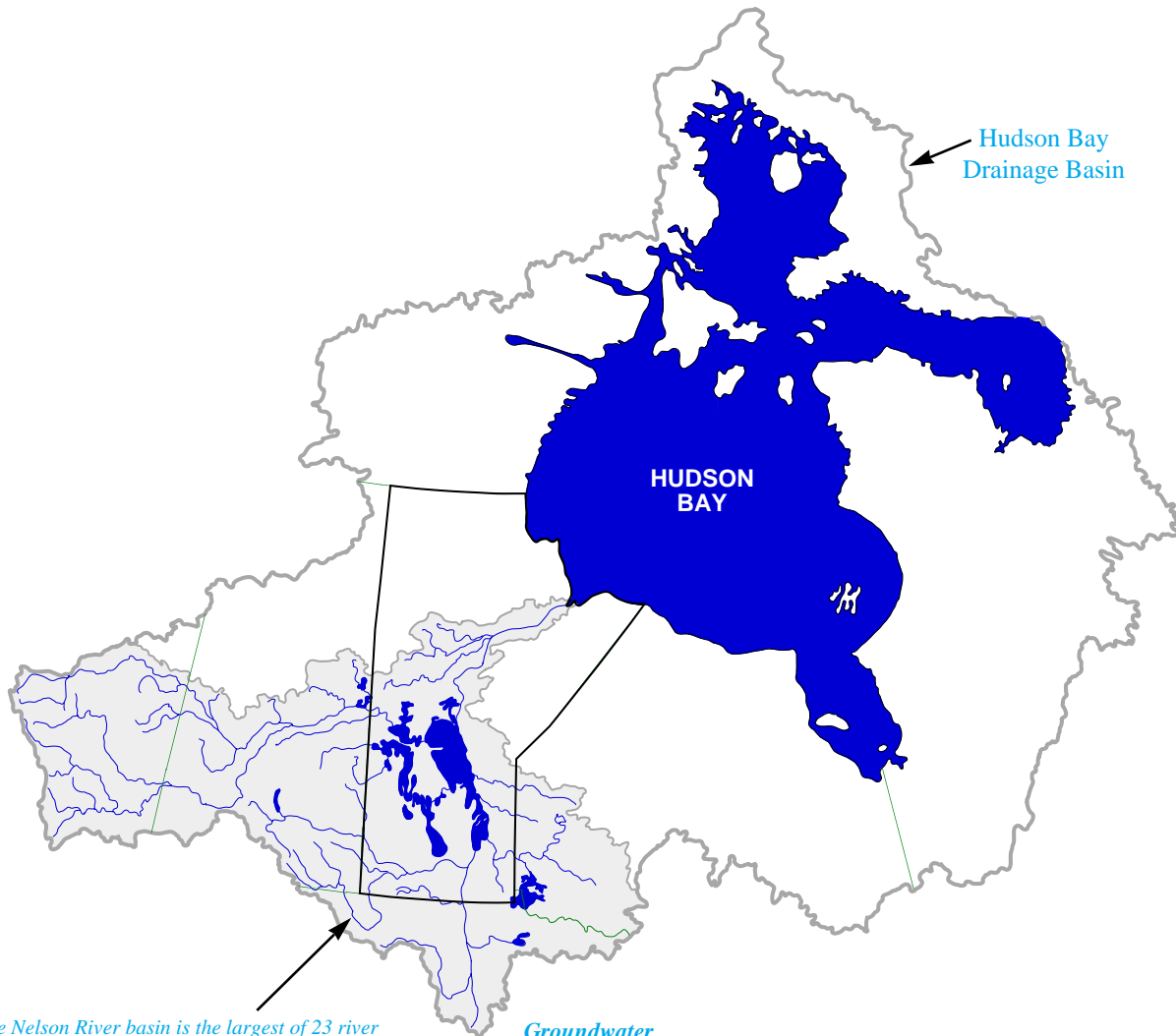
MANITOBA'S WATER RESOURCES

Basins and Watersheds

- The flows from all rivers in Canada ultimately drain into either the Pacific Ocean, the Atlantic Ocean, the Arctic Ocean, or Hudson Bay.
- Manitoba is located within the Hudson Bay drainage basin, which drains about 3.9 million square kilometres - an area about six times the size of Manitoba.
- The Nelson River basin is the largest of the 23 river basins which make up the Hudson Bay drainage basin.
- The Nelson River basin comprises seven major sub-basins. In turn, these sub-basin components each consist of a number of smaller drainage areas, usually referred to as watersheds.
- The unity of natural processes that occur within a basin or watershed make it the ideal geographic unit for water management and related resource management.



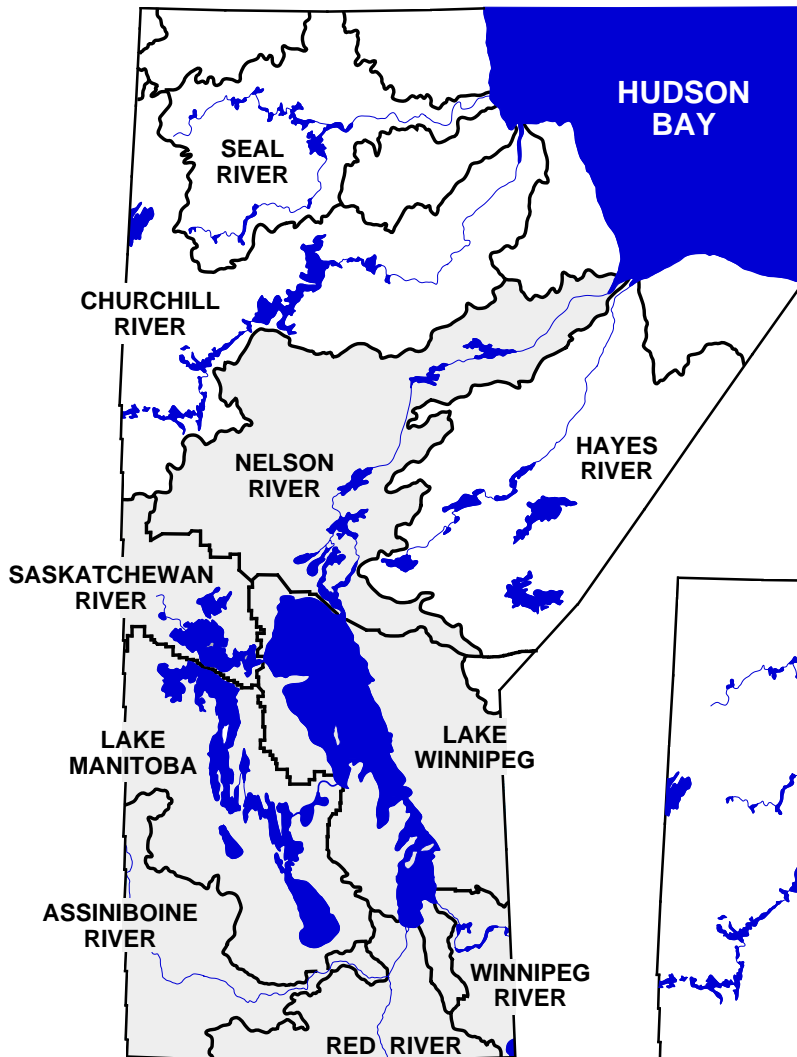
Canada's Oceanic Drainage Basins



The Nelson River basin is the largest of 23 river basins within the Hudson Bay drainage basin.

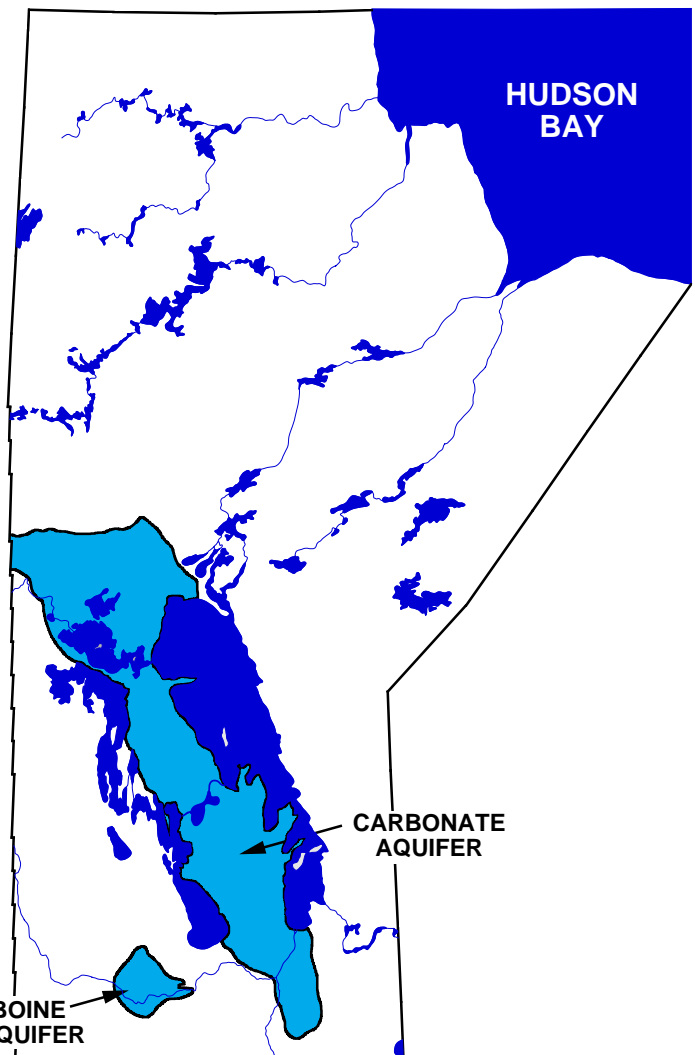
Groundwater

- Groundwater is the main source of water supplies for much of rural Manitoba.
- As with surface water, our groundwater is not always located where it is the most needed.
- The Carbonate Aquifer is the largest source of fresh groundwater in southern Manitoba. It is estimated that the annual sustainable yield is almost 800 million cubic metres.
- Deeper aquifers generally contain brines and are not suitable for consumption.
- Groundwater quantity and quality are influenced by surface water management and land use.
- Because of the confined nature and slow movement of water in aquifers, groundwater pollution is costly and difficult to clean up.



MANITOBA'S SURFACE WATER DRAINAGE

Roughly one-half of the land in Manitoba lies within the Nelson River basin. The volumes and rates of surface runoff within basins and watersheds vary from season to season, year to year, and place to place due to climatic differences and variability, and due to other factors such as land slopes, vegetative cover, soil porosity, and surface storage.



MAJOR HIGH YIELD AQUIFERS IN MANITOBA

Manitoba's two largest high yield aquifers are the Carbonate Aquifer and the Assiniboine Delta Aquifer. Groundwater potential in these two aquifers is good to excellent. The groundwater potential in other areas of the province is variable, while in some areas groundwater potential is poor to nil due to quality and quantity limitations.

ASSINIBOINE DELTA AQUIFER

CARBONATE AQUIFER

1. Water Quality

OBJECTIVE

To protect and enhance our aquatic ecosystems by ensuring that surface water and groundwater quality is adequate for all designated uses and ecosystem needs.

Policy 1.1

The “Manitoba Surface Water Quality Objectives” shall be adopted and implemented to protect water uses for Manitobans.

Policy 1.2

Water quality shall be enhanced through the management of water resources.

Policy 1.3

Water quality enhancement programs shall be designed to restore environmental quality, as well as deliver economic, cultural, and heritage benefits to Manitobans.

Policy 1.4

The quality of wastewater discharges shall be improved and non-point sources of pollution decreased to achieve water quality objectives.

Policy 1.5

Pollution control programs shall be designed in consultation with affected user groups and, where possible, implemented in such a manner as to cause minimum disruption to established land and water uses.



Issues Identified Through the Public Process

- *monitoring, data base development, and assessment*
- *nutrient enrichment of surface water*
- *non-point sources of pollution*
- *aquifer contamination*
- *water quality protection to ensure future economic development*
- *water quality education*
- *pesticides, organic and toxic chemicals*
- *industrial, mining, and municipal point source water pollution*
- *feedlot impacts on water quality*

Overview

The quality of Manitoba's water is a growing public issue. As development expands to serve an increasing population and to improve our living standards, and as industrial, agricultural, recreational and chemical technologies advance, so increases the potential for pollution of our water resources. Despite Manitoba's good record of water quality management, there are areas of the province where quality is deteriorating and others where it is threatened. Even in areas with sufficient water, quality can vary and significantly affect its use, its value as a resource, and its key role in sustaining the ecosystem. Manitobans are particularly concerned about the safety of our drinking water because of the increasing frequency with which toxic substances are being detected in supplies in some areas.

The characteristics of water quality are determined by the type and extent of dissolved and suspended substances in it, but the judgement of quality is also dependent on the uses to which the water will be put. For example, quality criteria for drinking water are very stringent because of the need to protect human health. In Manitoba, water is tested for up to 75 substances and checked to ensure it meets the "Manitoba Surface Water Quality Objectives." From place to place water contains varying amounts of such substances due to differences in human activity and natural processes. The extent to which the substances are present determines the suitability of a given body of water for various uses.

In the past, water quality has often become an issue only after problems have developed. Once degradation has occurred, however, correction of the problem can be very costly and can take a long time. The reactionary approach is not acceptable. The key to successful water quality management is the prevention of pollution.

Clear, publicly supported surface water quality objectives form the starting point or the benchmarks for protecting Manitoba's water for its various important uses. Also essential are adequate water quality data and information, for use in planning and undertaking water quality management, for use in preventing

pollution, and for use in addressing problems that have been caused either by human practices or natural processes. Comprehensive water quality monitoring networks must be maintained to provide the necessary information for guiding development planning and for guiding solutions to water quality problems.

Especially important is education, to enhance public awareness of the causes and mechanisms of water quality degradation, and to provide guidance on the measures which can be adopted by all Manitobans to protect water quality and ensure its sustainability for present and future generations.

POLICY 1.1

The “Manitoba Surface Water Quality Objectives” shall be adopted and implemented to protect water uses for Manitobans.

Background

The “Manitoba Surface Water Quality Objectives” define minimum levels of quality for the long term protection of water uses. These levels of quality specify acceptable concentrations of various dissolved and suspended substances, as well, they describe other desirable or required characteristics. The “Manitoba Surface Water Quality Objectives” are developed through a consultative process involving various levels of government, industries, the scientific community, and the public.

“Watershed Classification” allows present and future water uses within a watershed to be identified. A public consultation process is used to determine the unique water uses, desires of local residents, existing water quality problems, and other issues within watersheds. Water uses in the watershed are then designated, along with “Manitoba Surface Water Quality Objectives” necessary to protect these uses.

The surface water quality objectives are used as a baseline for developing the legally enforceable limits specified in licences issued under The Environment Act. These limits are applied toward controlling pollution from point source discharges. The objectives can also be used to develop strategies to reduce pollutant loadings from non-point sources.

Intent

To establish and use physical, chemical, and biological criteria for defining safe or acceptable levels of water quality for various water uses and ecosystem needs.

Application**1. The Government of Manitoba will:**

- *adopt and refine, through consultation with a wide spectrum of professionals and scientists and with extensive public involvement, surface water quality objectives which describe the required chemical, physical, and biological properties of surface water to ensure its acceptability for various uses.*
- *similarly establish or adopt, and implement, water quality objectives that protect groundwater for various uses.*
- *regularly review and revise the water quality objectives to ensure that they reflect emerging scientific knowledge and ecological issues.*
- *ensure that the refinement and application of the water quality objectives are based on social, economic, environmental, and cultural considerations.*
- *publish the water quality objectives, promote their use by the public, and assist the public in interpreting and applying them.*
- *use the water quality objectives to guide planning, design, and implementation of water management projects and activities that affect water quality.*
- *use the water quality objectives to assist in developing long term water quality protection strategies and management plans for waterbodies or entire watersheds.*
- *use the water quality objectives in conjunction with licensing and other regulatory procedures, as required, to ensure that developments, activities, or operations do not impair water quality for required water uses.*

- *monitor existing and future water uses and quality of waterbodies to facilitate the application of the water quality objectives.*

2. Local authorities, planners, developers, industry, and individuals can:

- *participate in public consultation processes set up for establishing, refining, or applying the water quality objectives.*
- *apply the water quality objectives to ensure that local projects are planned, designed, and operated to avoid impairing the quality of water for required water uses.*
- *use the water quality objectives, in conjunction with quality monitoring data, to determine the suitability of specific waterbodies for certain proposed uses or activities.*

POLICY 1.2

Water quality shall be enhanced through the management of water resources.

Background

Where the existing water quality of a waterbody is not adequate to support the desired uses, enhancement projects can be undertaken in some cases to attain the quality needed. Projects are normally initiated by community based organizations or by local government. Funding for such ventures may include privately raised money or funds from government agencies. Typically, management committees or boards are established with representation from local governments, local interests, and appropriate provincial government agencies. These groups define the problem, identify goals, develop remedial action plans, and guide implementation. Monitoring expertise, project design, initial interpretation of data, and advice on appropriate remedial action can be provided by the provincial government.

A wide range of water quality enhancement projects can be undertaken. Lakes and reservoirs can be aerated to reduce winterkill of fish. Algae control can be undertaken on farm dugouts or on community water supplies to reduce taste and odour problems. Aquatic weeds can be removed periodically from some recreational areas and beaches in order to enhance recreational opportunities. Watershed management plans can be publicized and better land use practices demonstrated to reduce non-point source loading of pollutants affecting our lakes and streams.

Intent

To enhance the water quality of specific degraded surface waterbodies and aquifers to achieve desirable social, economic, and environmental benefits.

Application**1. The Government of Manitoba will:**

- *identify, in response to local concerns and supported by water quality and use monitoring, waterbodies and aquifers where water quality enhancement may be beneficial.*
- *undertake a variety of water management activities and projects to enhance water quality of degraded surface waterbodies or aquifers, such as:*
 - *aeration of lakes and reservoirs to reduce winterkill of fish,*
 - *flow and water level augmentation to improve water quality for water supply, recreation, or environmental purposes.*
 - *exploration of means by which the quality and supply of aquifers may be safely enhanced.*
 - *algae control activities on farm dugouts and community water sources to reduce foul tastes and odours,*
 - *periodic removal of aquatic weeds from recreation areas and beaches to improve recreational opportunities,*
- *promote, and regulate where necessary, land and water management practices to reduce or eliminate water pollution at the source.*
- *provide financial, technical, and monitoring assistance, where appropriate, to support water quality enhancement projects and activities by local authorities, interest groups, and individuals.*

2. Local authorities, interest groups, and individuals can:

- *identify waterbodies and aquifers where water quality enhancement projects or activities may be necessary or beneficial.*
- *obtain sound information and expertise, and any necessary approvals from government, before initiating water quality enhancement projects or activities.*
- *adopt technology and land and water management practices that minimize or avoid degradation of water quality.*

POLICY 1.3

Water quality enhancement programs shall be designed to restore environmental quality, as well as deliver economic, cultural, and heritage benefits to Manitobans.

Background

Water plays an important role in the economic, cultural, spiritual, and physical values of Manitobans. Waterbodies that have suffered water quality degradation generally require major efforts for enhancement, rehabilitation, or restoration. When an enhancement project is being considered, the benefits and effects of the proposed improvements should be assessed in a manner that fully reflects all values of the waterbody.

Extensive public consultation and stakeholder participation can assure that all relevant factors – historical, existing, and potential – are assessed, that all relevant values are taken into account, and that a broad range of options and opportunities are considered.

Intent

To ensure that water quality enhancement projects reflect Manitobans' social, cultural, and heritage values, in addition to achieving economic and environmental benefits.

Application**1. The Government of Manitoba will:**

- *undertake water quality enhancement studies and strategies that examine broad, long term social, cultural, and heritage values, in addition to economic, technical, and environmental criteria.*
- *facilitate extensive consultation and local participation in the planning of water quality enhancement programs.*
- *use the basin and watershed planning processes, wherever possible, as frameworks for planning and implementing water quality enhancement programs and projects, and as effective means of facilitating local participation, understanding, and commitment.*
- *use informational and promotional initiatives to increase local understanding and support of water quality enhancement programs, and to increase local participation in the design and implementation of those programs.*

2. Local authorities, industry, interest groups, and individuals can:

- *participate in studies, strategies, and consultation processes concerning water quality enhancement programs.*
- *enter into partnerships to assist both in developing and in implementing water quality enhancement programs and strategies.*

- *communicate social, cultural, and heritage values, in addition to economic and environmental objectives, in the planning and design of water quality enhancement programs.*
- *participate in basin and watershed planning as an effective means of understanding, planning, and implementing water quality enhancement programs and projects.*
- *use available informational and promotional material to enhance understanding of both the causes of water quality degradation and the solutions to those problems.*

POLICY 1.4

The quality of wastewater discharges shall be improved and non-point sources of pollution decreased to achieve water quality objectives.

Background

Pollutants which can threaten our water uses originate from either point or non-point sources. Most point source pollutants, such as municipal and industrial wastewater discharges, can readily be collected and treated prior to release into the environment. As well, steps can be taken to reduce and recycle the wastewater generated. Wastewater discharges require licensing under The Environment Act and can generally be controlled and monitored for compliance.

Additional actions required to reduce point source water pollution include measures to upgrade some of our waste collection and treatment facilities to meet discharge standards, and measures to reduce the accidental spills and illegal discharges affecting our water systems. As well, some municipal and industrial discharge may contain small quantities of contaminants which cannot be removed by any means, and which can build up to harmful levels. Measures are required to prevent those persistent or non-degradable pollutants from entering our water systems.

Non-point sources of pollution, which affect both our surface waterbodies and aquifers, originate from a variety of activities and can be difficult to identify. Some examples are livestock wastes, agricultural chemicals, and sediment from erosion. Unlike pollution from point sources, contaminants from non-point sources cannot be easily controlled. Reduction of pollution from non-point sources can be achieved through innovative and environmentally sensitive land use and management practices. Education and incentives are effective tools for encouraging the reduction of non-point source pollution.

Intent

To prevent or reduce the degradation of water quality due to human activities and practices.

Application

1. The Government of Manitoba will:

- *define acceptable water quality based on the “Manitoba Surface Water Quality Objectives”, and use them for guiding or limiting activities that affect water quality.*
- *monitor waterbodies and aquifers to determine water quality, and to identify water quality changes and trends that affect the suitability of water for various uses.*
- *identify sensitive areas and pollution hazard areas where water quality in aquifers and surface waterbodies can be easily degraded.*
- *use comprehensive environmental assessment and review processes to ensure that developments, projects, and processes do not degrade water quality.*
- *undertake a variety of initiatives directed at assisting or guiding the local governments, industry, and the public in reducing water pollution, such as:*
 - *informational initiatives to enhance understanding of water pollution, including point source and non-point source pollution;*
 - *promoting land and water management practices and technology that reduces or eliminates water pollution, and encouraging the use of non-polluting products;*
 - *providing incentives to encourage the adoption of non-polluting technology and processes;*
 - *providing information and technical support, and working with local governments and industry in cooperative initiatives to reduce water pollution;*
 - *using licensing, enforcement and penalties, where necessary, to control or prevent activities, construction practices, and use of products that cause or contribute to water pollution;*

- *providing easily accessible collection facilities for the disposal or recycling of containers for pesticides, chemicals, and other environmentally hazardous substances; and*
- *providing appropriate hazardous waste collection and disposal facilities, and encouraging their use.*
- *encourage research concerning:*
 - *sources of water pollutants and the effects of pollutants on human health and the environment; and*
 - *improved technology and management practices directed at reducing water pollution.*
- *enter into agreements with the federal government and neighbouring provinces and states concerning measures to protect water quality in trans-boundary waterbodies and aquifers.*
- *maintain emergency response capability to deal with industrial accidents and other unforeseen events that pose high risks to the quality of waterbodies and aquifers.*
- *reduce, reuse and recycle products that would otherwise cause or contribute to water pollution, or use non-polluting alternatives.*
- *use water pricing techniques to encourage reduction in the generation of wastewater which may contribute to water pollution.*
- *work with other local governments through such mechanisms as basin, watershed, and regional planning to reduce or avoid activities and practices that degrade water quality.*

2. Local authorities can:

- *use the “Manitoba Surface Water Quality Objectives” for defining acceptable water quality and for limiting or guiding activities and developments that affect water quality.*
- *acquire, use, and disseminate available information and support informational initiatives concerning water pollution.*
- *ensure that their practices, as well as the products they use, reduce or eliminate water pollution.*
- *work with industry, government, and individuals in cooperative initiatives to reduce or eliminate water pollution.*
- *undertake land use planning to ensure that developments minimize degradation of water quality.*

3. Industry can:

- *participate in basin, watershed, and regional planning as a means of ensuring that their plans, developments, and operations are compatible with quality objectives established for the basin, watershed, or region.*
- *acquire and use all necessary information and technical expertise in planning, designing, and constructing works that have potential to cause pollution of waterbodies and aquifers.*
- *ensure that operating practices as well as development and usage of products are supported by extensive research and testing to minimize the potential for water quality degradation and the associated risks to human health and the environment.*
- *undertake necessary actions and plant or process modifications to reduce or eliminate discharges, wastes, and airborne emissions that constitute either point source or non-point source water pollution.*
- *minimize the development and use of products and the disposal of wastes that are toxic or non-biodegradable.*
- *reduce the amount of wastes that have to be assimilated by the environment, both in the manufacture of products and in the production processes.*

- *use appropriate precautions, processes, and facilities in the handling, transport, and containment of hazardous wastes, and maintain an effective emergency response capability to minimize the potential risks and effects that industrial accidents might have on water quality.*
- *avoid discarding toxic and other potentially hazardous wastes in sewage systems and in disposal sites from which the materials may be transported to water supplies; use the appropriate hazardous waste collection and disposal facilities instead.*
- *use the collection sites provided by the provincial government, local governments, and industry for disposal of containers for pesticides, chemicals, and other potentially hazardous substances.*
- *use more environmentally benign products in their homes, on their fields, gardens, and lawns, in their workplace, and in all day-to-day activities; adopt land and water management practices which do not cause or contribute to pollution of aquifers or surface waterbodies.*
- *participate in water quality protection initiatives by the provincial government, local authorities, various associations, and interest groups.*
- *acquire information to enhance their understanding and awareness concerning water pollutants, pollutant transport mechanisms, the effects of water pollution, and measures to reduce water pollution.*
- *use water conservation measures to reduce the amount of wastewater to be assimilated by the environment.*

4. Individuals can:

POLICY 1.5

Pollution control programs shall be designed in consultation with affected user groups and, where possible, implemented in such a manner as to cause minimum disruption to established land and water uses.

Background

Water pollution control programs are most effective when they are carried out cooperatively by water managers and water users. Reducing pollution usually means that some forms of water and land use management must change. Programs are normally implemented when the benefits outweigh the costs; however, the costs must be determined not only on the economic and social factors, but also on environmental and health factors. Careful planning with all involved stakeholders can turn potential conflicts into situations where everyone benefits or, at least, where disruptions are minimized.

Intent

- 1. To ensure that pollution control programs adequately address the needs and values of water users.**
- 2. To minimize the negative impacts that pollution control programs have on existing and future land and water uses.**

Application

1. The Government of Manitoba will:

- *ensure that all water users have access to available information, data, and expertise related to water quality in their region.*
- *use informational initiatives to enhance public awareness of activities and practices that cause degradation of waterbodies and aquifers.*
- *undertake promotional initiatives to enhance water users' awareness of their right for protection of water quality and their opportunities to pursue corrective action.*
- *ensure that water users have access to environmental review and assessment processes.*
- *consider technical and economic constraints, and provide reasonable technical assistance and time frames for necessary modifications to industrial plants, works, and operations to comply with environmental requirements.*
- *use municipal input and a public consultative process to ensure that the design of water pollution control programs considers local and regional economic, social, environmental, and health factors, technical constraints, and cultural and heritage values.*

2. Local authorities can:

- *participate in the environmental assessment and review processes concerning projects and developments that could affect water quality.*
- *identify local economic values, impacts, and constraints that might affect the planning and design of pollution control programs.*

- *undertake or support informational and promotional initiatives to enhance the public's awareness of water pollution problems, and to enable public participation in solutions to the problems.*
- *organize local round tables and other forums to facilitate public participation in the planning and design of pollution control programs.*

3. Industry and individuals can:

- *acquire available information and data to enhance their knowledge of water pollution problems and to facilitate an informed input to the planning and design of water pollution control programs.*
- *participate in local round tables and other forums to inform the provincial and local government on how they may be affected by proposed pollution control programs.*

2. Conservation

OBJECTIVE

To conserve and manage the lakes, rivers, and wetlands of Manitoba so as to protect the ability of the environment to sustain life and provide environmental, economic, and aesthetic benefits to existing and future generations.

Policy 2.1

River, lake, and shoreland habitat and the general environmental, subsistence, and economic values of rivers, lakes, and wetlands shall, where possible, be conserved.

Policy 2.2

Soil conservation, wetland retention, and the application of appropriate land use practices shall be promoted primarily by the provision of incentives, but with regulation where required, not only as essential elements of water conservation and protection, but also as key measures to reduce siltation impacts, downstream flooding, and non-point source pollution.

Policy 2.3

Those waterways whose cultural, natural and/or recreational values are of provincial or national significance shall be given special consideration.

Policy 2.4

Water retention, and control and timing of runoff, shall be promoted as part of watershed management.



Issues Identified through the Public Process

- *degradation and destruction of aquatic ecosystems*
- *intrinsic and aesthetic values of waterbodies, wetlands, and shorelands*
- *conservation incentives and promotion, supported by regulation*
- *government must work with landowners at the grass roots level*
- *different parts of the province require different conservation activities*
- *all Manitobans must participate in conservation*
- *action must span the entire watershed*

Overview

Manitoba's lakes, streams, wetlands, and shorelands possess natural and human values and provide innumerable opportunities for recreation and tourism, aesthetic enjoyment, and cultural and heritage appreciation. Some wetlands are important groundwater recharge areas while many provide natural storage for flood waters. All types and sizes of waterbodies provide habitat for a wide range of fish, wildlife, and other life-forms and provide for natural water purification. Waterbodies support commercial and sport fishing, hunting, trapping, and tourism, thus contributing millions of dollars annually to our economy. These values and opportunities need to be sustained and enhanced.

Water conservation policies to protect ecological, economic, and aesthetic values of our waterbodies recognize that soil and water conservation are inseparably linked. Soil erosion contributes sediment and associated contaminants into waterbodies which affects water uses. Water erosion, on the other hand, destroys land values, disrupts transportation systems, and scars the landscape. Soil erosion and deposition are dimensions of the same process. A basin or watershed approach to the management and conservation of water and related resources is essential for sustainable development.

Some waterbodies merit special efforts due to their unique characteristics. For example, Clearwater Lake, the Seal River, and Delta Marsh are known nationally and even internationally for their environmental, economic, and aesthetic values.

Public input into the development of the water policies demonstrated that Manitobans from all walks of life are becoming more aware of the roles and interdependencies of water and other natural resources in the environment. Governments, industries, and the public will have to work together to ensure that human use and enjoyment of water, land, and all related resources do not jeopardize their present and future values.

POLICY 2.1

River, lake, and shoreland habitat and the general environmental, subsistence, and economic values of rivers, lakes and wetlands shall, where possible, be conserved.

Background

From the U.S. border to the Hudson Bay, an astonishing array of large and small lakes, rivers, streams, wetlands, and the various types of associated shorelands are found in abundance. Equally diverse is the array of plants, birds, mammals, amphibians, fish, and other flora and fauna living in, on, and near these aquatic habitats.

The values of aquatic resources are many: as an integral element of a healthy eco-system; as vital life support for citizens subsisting only with the continued availability of natural resources; as economic return from commercial resource harvesting, for example, fishing, trapping, and wild rice; as a setting for outdoor recreation, tourism, and cottaging; as groundwater recharge areas and stream flow management.

Many tools are available for the conservation of aquatic resources, including education, financial incentives, and regulation. The effectiveness and appropriateness of all management options need to be fully explored for each situation.

Intent

- 1. To conserve, protect, or enhance aquatic habitat for present and future generations.**
- 2. To protect lakes, rivers, shorelands, and wetlands for their environmental, aesthetic, subsistence, and economic values.**

Application

1. The Government of Manitoba will:

- *identify and monitor aquatic habitat and other ecological and socio-economic values of lakes, rivers, shorelands, and wetlands.*
- *undertake promotional and educational initiatives to enhance public awareness of the numerous ecological and socio-economic values of lakes, rivers, shorelands, and wetlands.*
- *promote the inclusion of conservation education in the sustainable development education programs.*
- *review, and modify if necessary, provincial land use policies to ensure that they support conservation.*
- *protect ecologically significant Crown Land, and water-related ecosystems on Crown Land by either withholding these lands from sale or lease, or placing special conditions or restrictions on their use.*
- *ensure that provincial resource management programs and initiatives support conservation.*
- *incorporate the conservation ethic into basin/watershed/local plans.*
- *ensure that integrated planning approaches are used in resource management projects, whereby all potential impacts and opportunities affecting the water-related ecosystem are considered.*
- *ensure that water management project designs and construction procedures minimize degradation of aquatic ecosystems.*

- *provide technical assistance and economic incentives to local authorities, organizations, and farmers to develop and implement soil, water, and habitat conservation projects and to incorporate conservation measures into community projects and farm management.*
- *encourage local governments to adopt conservation criteria in local development plans and development restrictions.*
- *explore and promote technologies and land uses which can replace those causing degradation of aquatic ecosystems.*
- *guide land and water use practices, through promotional initiatives, regulation, and enforcement where appropriate, to support conservation.*
- *enter into agreements with the federal government, local governments, conservation organizations, and private individuals concerning programs, projects, and initiatives that support conservation.*
- *encourage federal agencies to modify federal policies and systems where those policies and systems do not support conservation.*
- *consult with local authorities, business, industry, and the public, where appropriate, to facilitate a mutual exchange and understanding of views and values related to conservation.*
- *ensure that local views and values related to conservation are recognized in the development and implementation of government policies, programs, projects, and initiatives.*
- *ensure that their projects and operations incorporate measures to minimize degradation of aquatic ecosystems.*
- *obtain technical assistance and advice from government agencies and qualified consultants and specialists, where necessary, in designing and constructing projects.*
- *adopt conservation criteria in development restrictions and in the review and approval of local development plans and proposals.*
- *participate with the provincial government in promotional and informational initiatives to enhance local public awareness of the ecologic and socio-economic values of lakes, rivers, shorelands, and wetlands.*
- *participate with senior governments and local conservation agencies and interest groups in programs, projects, initiatives, and incentives that support conservation.*
- *ensure that taxation of land clearly portrays the reduced assessed values which are applied to undeveloped marginal land, and which may be applied to land with local development restrictions which support conservation.*

2. Local authorities can:

- *participate in basin/watershed planning, and develop local plans which are compatible with the guidelines and objectives established in the basin/watershed plans.*

3. Business and industry can:

- *participate in basin, watershed, and local planning.*
- *enhance their understanding and awareness of the broader ecologic and socio-economic values of lakes, rivers, shorelands, and wetlands.*
- *adopt appropriate land and water use practices to minimize degradation of aquatic ecosystems.*
- *participate in consultations with local authorities and government to exchange views and values related to conservation, and to enable these views and values to be recognized in government programs and local initiatives.*

POLICY 2.2

Soil conservation, wetland retention, and the application of appropriate land use practices shall be promoted primarily by the provision of incentives, but with regulation where required, not only as essential elements of water conservation and protection, but also as key measures to reduce siltation impacts, downstream flooding, and non-point source pollution.

Background

Our social and economic system generally rewards individuals according to the worth of their labours and skills. Businesses succeed or fail on their abilities to generate profits. In this system, markets do not always function properly to provide the goods and services demanded by society from its human, capital, and natural resources. As well, success is often achieved at the sacrifice of tomorrow's resources. Accordingly, the provision of appropriate incentives can be a powerful tool for water conservation and protection.

Because farmers' actions directly affect soils, wetlands, and land use, many conservation and resource programs need to be directed primarily at the agricultural community, as well as other major resource users. Incentives are needed to encourage the farming community to maintain or adopt more environmentally benign management practices.

However, there are situations where public education and incentives cannot be totally relied upon. In these cases government regulations for the common good are necessary. Experience has shown that incentives and regulations work best when local authorities are consulted in the development of the programs and when local authorities play a large role in identifying and delivering program details.

Intent

To achieve conservation and associated objectives through incentives and regulation.

Application

1. The Government of Manitoba will:

- *enter into agreements with the federal government and local authorities, conservation organizations, and private individuals concerning programs, projects, and initiatives which advance local interests while achieving conservation objectives.*
- *provide technical assistance and economic incentives to local authorities, organizations, and farmers to develop soil, water, and habitat conservation projects and to incorporate conservation measures into community projects and farm management.*
- *develop and implement programs and projects to reduce or prevent waterfowl and other wildlife damages to crops and to provide compensation for such damage.*
- *guide land development to achieve conservation objectives through application of the "Provincial Land Use Policies."*
- *protect ecologically significant Crown Land and water related ecosystems on Crown Land by either withholding these lands from sale or lease, or by placing special conditions or restrictions on the use of these lands.*
- *review and modify government legislation and policy to ensure that they support conservation.*
- *regulate activities and enforce compliance, where necessary, to ensure that the public's general conservation interests are not undermined.*

- *undertake promotional initiatives to enhance public awareness of conservation incentive programs, as well as relevant legislation and regulation.*
- *participate with the provincial government and local authorities in agreements, programs, and initiatives that support conservation.*
- *incorporate the conservation ethic in day-to-day activities.*

2. Local governments and planning bodies can:

- *assume a lead role in promoting and coordinating grass roots involvement in conservation projects, and ensuring local awareness of conservation incentive programs.*
- *review local by-laws and development regulations, and modify or adopt new by-laws and regulations if necessary, to ensure that the local development supports the conservation objective.*
- *guide land development to support conservation objectives through conservation district or planning district management plans.*
- *participate with senior governments, conservation organizations, and individuals in agreements, programs, projects, and initiatives which advance local interests while achieving conservation objectives.*
- *regulate activities and undertake enforcement to support conservation, in accordance with the responsibility and jurisdiction provided in legislation.*

3. Business, industry, conservation groups, and private individuals can:

- *ensure that they are fully aware of incentives and regulations that promote conservation.*
 - *participate in consultations with government and local authorities to develop conservation incentives.*
 - *use the technical assistance and economic incentives that are available to achieve conservation objectives.*
-

POLICY 2.3

Those waterways whose cultural, natural, and/or recreational values are of provincial or national significance shall be given special consideration.

Background

There are many waterbodies in Manitoba which have significant values due to their historic, cultural, ecological, recreational, locational, and other unique characteristics. The diversity of these values requires conservation and development programs that must often be tailored to the specific features of each situation.

Heritage programs are applicable to many of the waterways and waterbodies that require special consideration. Preservation of river systems that are still essentially in a natural state, such as the Bloodvein and Seal Rivers, can be accomplished by designation under the Canada-Manitoba Heritage River Program. These rivers and their basins served historically as transportation routes and harvest areas in the fur trade, and continue to be valuable for ecological and recreational purposes. Designation as Heritage Marshes provides for the conservation of major marshes. The Oak-Hammock Marsh near Manitoba's largest city, Winnipeg, has special value due to its urban proximity. A structural development program was implemented to restore the marsh functions.

Waterbodies having rare and exceptional character, such as Clearwater Lake, require protection programs to maintain their intrinsic ecological values. Other waterbodies with important cultural and natural values are certain reaches of major rivers such as the Red and Assiniboine rivers in and near Winnipeg. Both before and after settlement these have served as major meeting and settlement places due to their location and ability to foster human life.

Intent

To conserve, where feasible, waterbodies or waterbody features whose intrinsic values are exceptional or are of provincial or national significance.

Application

1. The Government of Manitoba will:

- *support national and international programs that designate and protect special heritage values of waterways.*
- *ensure that waterways with exceptional heritage values are appropriately identified and managed.*
- *undertake promotional initiatives to enhance public awareness of and respect for waterbodies that have special heritage designation.*
- *provide incentives and regulate water and land uses and development to ensure that the intrinsic values of heritage waterbodies are conserved.*
- *initiate dialogue with local authorities and aboriginal and cultural groups to identify exceptional natural, cultural, and historical values of waterways worthy of consideration for special protective status.*
- *encourage and support conservation and revitalization initiatives for important urban waterways.*
- *provide opportunity for general public and private sector participation in the development of management plans for proposed heritage waterbodies and important urban waterbodies.*
- *undertake or support programs to restore aquatic environments and special cultural, natural, historical, or recreational features of designated heritage waterways, and to make those waterways accessible to Manitobans.*
- *ensure that Crown Land sales and lease restrictions support the protection of designated heritage waterways.*

- *review legislation, and modify it if necessary, to ensure that it supports the protection of designated heritage waterbodies and the conservation of other waterbodies and waterbody features that have exceptional intrinsic value.*
- *incorporate the cultural, natural, historical, and recreation values of waterbodies in environmental impact assessments.*

2. Local authorities can:

- *be fully aware of national and international programs that designate and protect waterways whose intrinsic values are of provincial or national significance.*
- *be aware of any local waterbodies that have been designated as heritage waterbodies.*
- *participate in provincial, national, and international programs that designate and protect the heritage values of waterbodies.*
- *support and participate in comprehensive and inter-jurisdictional management and revitalization efforts for important waterways.*
- *identify local waterbodies or waterbody features that have exceptional intrinsic values worth considering for special protection, preservation, or enhancement and development for the local community.*
- *ensure that local planning and development restrictions consider the protection, enhancement, and development of designated heritage waterbodies and the conservation of other waterbodies or waterbody features that have exceptional intrinsic value.*
- *ensure that their programs and operations support the protection of designated heritage waterbodies and the conservation of other waterbodies or waterbody features that have exceptional intrinsic value.*

3. Business, industry, and private individuals can:

- *participate with the provincial government and local authorities in developing management plans which support the protection or enhancement of designated heritage waterbodies and other important waterbodies.*
- *ensure that their land and water uses support the protection of designated heritage waterbodies and other local waterbodies or waterbody features that have exceptional intrinsic value.*
- *communicate their special historical, cultural, recreational, or natural values inherent in local waterbodies worth consideration for designation for protection as heritage waterbodies.*
- *respect the variety of intrinsic values of waterbodies held by Manitobans.*

POLICY 2.4

Water retention, and control and timing of runoff, shall be promoted as part of watershed management.

Background

Watershed management should consider the full range of potential activities for resolving issues pertaining to water or for meeting water-related needs. In many instances a solution can be found by dealing with water at or near the location where it falls to the ground in the form of rain or snow.

One technique is to maintain vegetative cover, for example, by retaining standing stubble to trap snow on fields, or by growing forages and trees on hillsides. Another is to retain small wetlands which collectively can store large amounts of water for groundwater recharge, wildlife habitat, and the moderation of stream flows. If storm or snowmelt runoff can be both reduced and retarded, downstream channels can better accommodate the remaining flows without the flooding of adjacent lands.

Excessive volumes and velocities of flowing water often lead to erosion which can take many destructive forms. Land productivity is reduced by the loss of topsoil. Fields can be ruined through the formation of large gullies, and roadways can be destroyed. Sediment from the erosion process may cause siltation of drainage channels and reservoirs. Silt in streams and lakes can degrade or destroy fish spawning habitat and food supplies.

Intent

- To retain water, where appropriate, for water supply, soil moisture replenishment, groundwater recharge, and wetland habitat.**
- To moderate flows, where appropriate, to reduce erosion and deposition and their negative effects on aquatic ecosystems.**

Application

1. The Government of Manitoba will:

- promote the retention of runoff water, where appropriate, for water supply, soil moisture replenishment, groundwater recharge, and wetland habitat.*
- promote water retention, and control and timing of runoff as measures to adopt, where appropriate, to reduce peak flows and flow velocities, prolong flows, reduce erosion and deposition, and protect or enhance aquatic habitat.*
- support the retention of wetlands, through promotional initiatives, incentives, and regulation where appropriate, as a highly effective mechanism to store and slow runoff while accomplishing numerous other conservation objectives.*
- provide or support incentives to encourage use of privately owned marginal lands for water retention and wetland habitat, and to encourage conversion of developed marginal agricultural lands into natural cover, water retention, and wetland habitat areas.*
- promote retention of natural vegetation cover to slow runoff and reduce erosion in areas of steep topography.*
- promote limiting drainage development and reduced drainage conveyance capacities in headwater areas as effective measures to reduce peak flows.*
- ensure that planning and design of provincial drainage works and those of local governments and conservation districts support water retention and runoff moderation, where appropriate.*

- *provide technical assistance and advice to local governments, conservation districts, conservation groups, and individuals concerning practical drainage and water retention measures to support conservation.*
- *protect natural water retention areas on Crown Land, and control inappropriate drainage of ecologically sensitive areas on Crown Land by withholding these lands from sale or lease, or by placing special restrictions or conditions on their use.*
- *adopt water retention, flow moderation, erosion control, and associated conservation benefits as criteria in basin/ watershed/local planning.*

2. Local governments and conservation districts can:

- *ensure that local planning and development restrictions support overall watershed conservation.*
- *plan and design drainage and water retention works to achieve conservation objectives.*
- *consult government departments or qualified consultants for technical assistance and advice, where appropriate, on practical means to retain runoff, attenuate flows, and achieve associated conservation objectives.*
- *participate with the provincial government and the federal government, conservation organizations, and individuals in agreements, programs, promotional initiatives, and incentives to achieve conservation objectives.*
- *participate with the provincial government in basin and watershed planning, and adopt appropriate measures in local plans and projects to support water retention, flow moderation, erosion control, and associated benefits.*

3. Landowners can:

- *adopt practical measures, where appropriate, to store or delay runoff for water supply purposes, soil moisture replenishment, and groundwater recharge.*
- *retain natural cover and use appropriate land management practices to slow runoff and prevent erosion in areas of steep topography.*
- *obtain available technical assistance from government departments or other qualified sources on practical drainage and water control measures to slow and store runoff, attenuate flows, and achieve associated conservation objectives.*
- *participate with senior governments, local authorities, and conservation organizations in agreements, programs, and initiatives which provide incentives and technical support to achieve conservation objectives.*

3. Use & Allocation

OBJECTIVE

To ensure the long term sustainability of the province's surface water and groundwater for the benefit of all Manitobans.

Policy 3.1

Economic well being and sustainability shall be the goal in the allocation and utilization of Manitoba's water resources for consumptive and instream uses.

Policy 3.2

Water management priorities shall be determined through a basin planning process that takes into account the protection of potable water supplies, environmental integrity, existing commitments, and economic requirements.

Policy 3.3

Groundwater development and utilization shall be managed so that the long term sustainability of aquifers is achieved and existing uses are not negatively impacted.

Policy 3.4

Surface water shall be managed to ensure sustainability of supplies.

Policy 3.5

Transfer of untreated water across the Continental Divide (to or from the Hudson Bay drainage area) shall be opposed. Transfers within the Hudson Bay drainage area shall be minimized and only considered after a complete assessment of the environmental, social, and economic impacts on the donor and receiving basins.



Issues Identified Through the Public Process

- *allocation priorities guided by local input*
- *identify sustainable levels of water use*
- *enforcement of the Water Rights Act*
- *impact of high volume water uses on limited water supplies*
- *cautious approach to interbasin water transfers*
- *environmental assessments for water development projects*
- *water allocation with allowances for future priority water uses - an uncertain future*
- *monitoring groundwater withdrawals and availability*

Overview

Water is essential for life. We depend on water not only to maintain our physical well being, but also to enhance or maintain our lifestyle. We use water for drinking, cleansing, cooking, cooling, heating, growing food, generating electricity, recreation, waste assimilation, and many other purposes. Water is also essential for fish and wildlife habitat.

Taking all household uses into account, Manitobans, in 1990, used about 450 litres of water per person per day on the average. This is about 40 percent of our total water use, which includes municipal, rural, agricultural, and industrial uses. Manitobans obtain about 80 percent of their water supplies from surface sources and the remaining 20 percent from groundwater wells.

While Manitoba has an abundance of fresh water, good quality water is not always available where and when it is needed, and in the amounts it is needed. In some areas, water use is approaching the rate of supply, and in other areas, water shortages already exist.

As living standards and economic development in the province are ever increasing, so also is the demand for water. More communities are installing water supply and sewerage systems, and industrial and agricultural demands continue to grow. Water use has been increasing at a rate of about five percent per year. Some important aquifers and larger streams in southern Manitoba are now either fully allocated or nearly fully allocated. User conflicts are becoming more common. Water must be carefully allocated to ensure that available supplies are used in the best possible manner, the ecosystem is supported, and withdrawals do not exceed the rate at which the supplies are naturally replenished.

The provincial government, through the water rights licensing system, has the responsibility for allocating the use of water resources within the province. The water rights licensing system operates under the legal authority of the Water Rights Act. The Water Rights Act establishes the priorities of allocating our water resource. Domestic usage is given the highest

priority, followed in order by municipal, agricultural, industrial, irrigation, and other uses. The issuance of a water rights licence establishes the legal right to use a prescribed amount of water over a specified time.

Water allocation decisions must be made on a rational basis and in a consistent, fair, and equitable manner. Such decisions could be enhanced through the application of an integrated basin planning approach, whereby the geographic unit for water planning and decision making is the watershed or basin. There must be more local involvement in decision making. Decisions must ensure that the basin supplies are sustained, that all existing and potential uses of water within the basin are considered, and that the environmental and economic consequences of various water management options are taken into account.

POLICY 3.1

Economic well being and sustainability shall be the goal in the allocation and utilization of Manitoba's water resources for consumptive and instream uses.

Background

Manitoba's water resources are quite variable, in quantity and quality, geographically and temporally. Many situations arise whereby the consumptive and instream water uses and water demands approach or exceed the waterbodies' or aquifers' rate of supply. These competing and often conflicting demands for water have been increasing over time with increasing development, and have been particularly evident during periods of drought. Manitobans are increasingly being forced to decide how these scarce resources would best be allocated to maximize economic well being and ecosystem needs, while at the same time ensuring that the resource is sustained for the future.

Under the Water Rights Act the responsibility for allocating and monitoring water for consumptive and instream uses rests with the provincial government. In allocating water, the provincial government must not only ensure that the rate of use does not exceed the natural recovery rate of the supply, but also must ensure that certain higher priority uses are given preferential consideration. The water rights licensing system establishes priorities for consumptive water uses, taking into account social, economic, and environmental objectives which would be supported by alternative water uses.

Under the water rights licensing system, domestic use is the highest priority use. Domestic use means water obtained from a source other than a municipal or community distribution system, at a rate of not more than 25,000 litres per day, for household and sanitary purposes, for the watering of lawns and gardens, and for the watering of livestock and poultry. Following domestic use, the order of priorities is municipal, agricultural, industrial, and irrigation. The provincial government recognizes that surface water also has important instream uses such as maintenance of natural ecosystems, recreation, waste assimilation, and hydro-electric development.

In practice, the priority between water licences is based on "first in time - first in right". The water allocation priorities don't normally become a factor unless two or more applications for a licence are filed on the same day and the total demands of the applicants exceed the waterbody's available supplies. As well, water allocation priorities may come into play in reserving water for priority future consumptive uses and instream uses, or for rescinding an existing use in favour of a higher priority use.

Allocation decisions must be supported by extensive information on both the supply and use of water. This requires monitoring both surface water and groundwater use, availability, and quality. Mechanisms must be implemented to coordinate local input, so that allocation decisions consider local objectives and priorities.

Intent

- 1. To manage water usage to meet basic environmental and human needs and maintain or enhance quality of life.**
- 2. To manage water usage to realize development opportunities while protecting the environment and sustaining the supply.**

Application

1. The Government of Manitoba will:

- *facilitate the identification and promotion of economic and environmental objectives that can be achieved through water use.*

- *implement specific projects and programs to achieve these objectives.*
 - *facilitate the identification of natural functions that extractive and instream uses must respect and ensure.*
 - *ensure that water needed for ecosystem functions is not allocated for uses that would threaten environmental sustainability.*
 - *facilitate resolution of conflicting priorities of water users through coordination of municipal input and public participation in water management decisions.*
 - *ensure effective legislation is in place and is used appropriately to guide water use and allocation.*
 - *monitor water supplies and uses and undertake enforcement, as necessary, to support use and allocation decisions.*
 - *undertake water demand studies to project future priority needs for water and water use growth.*
 - *place reservations on water, where appropriate, to ensure sufficient quantities are available for projected priority future needs and important instream uses as determined in demand studies.*
 - *promote and apply water conservation measures, particularly in water short areas, to control the growth of water use.*
 - *work cooperatively with neighbouring states and provinces in developing and implementing trans-boundary water management agreements to ensure that Manitoba receives its fair share of water and to ensure that Manitoba's water-related economic and environmental interests are protected or enhanced.*
- 2. Local authorities, industry, landowners, and the general public can:**
- *participate with the provincial government in establishing economic and environmental objectives to be achieved through water use.*
 - *adopt appropriate land and water management practices that support the conservation and protection of water.*

POLICY 3.2

Water management priorities shall be determined through a basin planning process that takes into account the protection of potable water supplies, environmental integrity, existing commitments, and economic requirements.

Background

A river basin is a large unit of land which encompasses the entire surface drainage area of a major river or lake at its outlet. The river basin includes the drainage areas of all of the smaller tributary rivers and streams that flow into the major river or lake. Most of Manitoba's basins are shared with neighbouring provinces, states, or territories. The most familiar river basins are the Red River Basin, the Assiniboine River Basin, the Lake Manitoba Basin, the Lake Winnipeg Basin, and the Saskatchewan River Basin.

A watershed is a smaller unit of land which encompasses the surface drainage area of one or more of the smaller tributaries of the larger river basin. An aquifer is a groundwater reservoir of varying size. Aquifers obtain their water from precipitation and surface water that seeps into the ground.

Any activity that changes the water regime in any part of a river basin or watershed will affect the water regime and related resources along lower reaches of the river basin or watershed and in underlying aquifers. Accordingly, water use and allocation decisions should ideally be made within the framework of integrated basin, watershed, and aquifer plans. Such plans would consider a number of factors within the basin or watershed, for example: existing and future uses of water; the soils, topographic, geologic, and other physiographic characteristics; the elements of water supply, quality, and flow; the linkages between surface water and groundwater; land use; pollution hazard areas and other environmental sensitivities; and other resource opportunities and impacts, including environmental impacts.

The river basin planning process, in its entirety, would encompass three levels of planning, with the broadest level being basin planning, the second level being watershed and aquifer planning, and the third

level being local planning. Basin planning would establish broad water and other resource management policies, objectives, and guidelines within the large river basin. Watershed and aquifer planning would establish more specific policies, objectives, and guidelines based on more localized characteristics, land and water activities, and on economic and environmental factors affecting the watersheds and aquifers. Local plans would be developed for implementation by local jurisdictions and would be in accordance with the policies, objectives, and guidelines established in the basin, watershed, and aquifer plans. Watershed and aquifer plans would be of greatest relevance to water use and allocation decisions. By its nature, the basin planning process normally spans a period of many years.

All three levels of planning require public participation, with the greatest public involvement being in the development of local plans. The river basin planning process with public involvement is seen as a very important tool for allocating the water resource rationally while promoting environmentally and economically sound land and water management.

Intent

To ensure that water management priorities are determined on a watershed-wide basis rather than only through site-specific or single purpose planning.

Application

1. The Government of Manitoba will:

- *use the river basin, watershed, and aquifer planning processes to guide the practical application of the water use and allocation priorities established in the Water Rights Act.*
- *establish and maintain effective programs and procedures to monitor water quality, water availability and use, and other environmental indicators.*
- *undertake appropriate incentives, promotion and enforcement to support the guidelines and priorities established through the river basin and watershed planning processes.*

2. Local authorities can:

- *participate with the provincial government in developing basin, watershed, and aquifer plans.*
- *incorporate the objectives and guidelines of the basin, watershed, and aquifer plans into local plans and activities.*

3. Landowners, industry, and the local public can:

- *participate with the provincial government and local authorities in the basin, watershed, aquifer, and local planning processes.*
- *ensure that their land and water management activities support the priorities and guidelines established in the basin, watershed, aquifer, and local planning processes.*

POLICY 3.3

Groundwater development and utilization shall be managed so that the long term sustainability of aquifers is achieved and existing uses are not negatively impacted.

Background

About 25 percent of all Manitobans use groundwater as their primary source of domestic water supply. Groundwater is also important for various industrial uses, irrigation, and for agricultural uses such as stock watering. In addition to direct human uses, groundwater provides substantial natural benefits such as replenishing streamflow and water supplies to wetlands, lakes, and other waterbodies.

Not all parts of the province have an adequate supply of good quality groundwater. In some areas the supplies are poor, due either to quality or quantity limitations. In addition to natural limitations, the values of our groundwater resources can be seriously affected by overdraft and by contamination, both caused by human activities.

Overdrafting occurs when water is drawn out of an aquifer faster than nature can replenish it. The most obvious problem is the effect that overdraft has on critical water supplies and priority water uses. Overdraft can also cause serious quality-related problems, such as saltwater intrusion or shifting of the freshwater-saltwater boundary.

Contamination occurs when undesirable substances enter our groundwater system. Contamination can render groundwater unsuitable for various uses and can adversely affect water quality in wetlands, streams, and lakes into which groundwater discharges. Typical point sources of contamination include faulty septic systems, chemical and petroleum leaks and spills, livestock feedlots, leaking sewer lines, and municipal landfills. Familiar non-point or diffuse source contaminants include fertilizers and pesticides. The incidence of aquifer contamination is increasing as development increases and as the number and volume of toxic substances used by society increase.

Because groundwater contamination is so difficult and costly to clean up, and because it takes such a long time before the affected aquifer can be used again, prevention is the most practical solution. Regulation alone cannot prevent groundwater contamination; the most important tools are education and adequate information.

Intent

- 1. To ensure the sustained quality and quantity of water in aquifers to meet the needs of present and future generations.**
- 2. To ensure that proposed groundwater uses do not negatively affect existing and potential higher priority uses.**

Application

1. The Government of Manitoba will:

- *establish water quality objectives for all groundwater uses and apply these objectives to specific aquifers.*
- *maintain a comprehensive aquifer data base.*
- *evaluate aquifers to define their location and dimensions, water table, flow dynamics, water quality, yield, pollution hazard areas, and inter-relationships with other aquifers, wetlands, and streamflow.*

- *monitor changes in aquifer level and groundwater quality.*
- *monitor and regulate groundwater use:*
 - *to ensure that withdrawals do not exceed the sustainable yield of the aquifer, and*
 - *to support aquifer management guidelines and priorities established through the basin, watershed, and aquifer planning processes.*
- *undertake appropriate incentives, promotion and regulation to support groundwater allocation decisions and the protection and wise use of groundwater.*
- *protect aquifer quality by guiding and regulating land use activities in sensitive recharge areas and pollution hazard areas.*
- *protect aquifers by promotional, informational, and regulatory initiatives to guide drilling contractors in well design and construction, and to guide land developers in planning groundwater development.*
- *support research and enhance public awareness concerning the effects of non-point source pollution on groundwater quality and human health.*
- *explore and promote suitable alternative farm management technology and land use practices where existing farming technology and practices may harm groundwater quality.*
- *promote conservation of groundwater, through informational and water pricing initiatives, particularly in areas where the growth in the rate of use threatens to exceed the sustainable yield of aquifers.*

2. Local authorities can:

- *maintain effective liaison with the provincial government to ensure that aquifer conditions and development constraints and guidelines are adequately understood.*

- *promote, plan, and control local development to support the protection of groundwater quality and the sustainable yield of aquifers.*
- *incorporate appropriate pricing systems for water from municipal or community groundwater supplies to encourage wise use and conservation of water.*

3. Landowners, corporations, industry, and all other groundwater consumers can:

- *ensure that well construction is in accordance with standards and guidelines provided in legislation and as specified by provincial authorities.*
- *ensure that development is undertaken in accordance with legislation and the guidelines developed by provincial and local authorities.*
- *adopt appropriate land and water management practices to protect the integrity of aquifers.*
- *adopt appropriate water conservation measures to ensure that groundwater withdrawals do not exceed the recharge capability of aquifers.*

POLICY 3.4

Surface water shall be managed to ensure sustainability of supplies.

Background

Approximately 80 percent of Manitoba's water supplies are obtained from surface sources. A significant proportion of these water supplies – that used by residents, businesses, and industries of the City of Winnipeg – is obtained from Shoal Lake. The water supplies for the remaining surface water uses outside Winnipeg are obtained from a variety of smaller sources including lakes, rivers, and streams of smaller sizes. These surface water sources vary considerably in quality, quantity, and dependability.

One of the main limitations affecting surface water supply capability is the intermittent nature of streamflow. Flows vary from short periods of extreme runoff or flood flows to long periods of moderate, low, or zero flows. Generally, the larger watersheds produce the more dependable flows and water supplies, while the small steeper watersheds generate the more intermittent flows and less dependable water supplies. In some circumstances, water supply capability along intermittent streams is enhanced by natural or constructed water storage reservoirs.

On streams where flows are very intermittent and where storage opportunities are few, water use planning and allocation decisions become difficult and complicated, and water use conflicts are common. Demands for water often approach or exceed the supply capability of the waterbody. Flow requirements needed to support the aquatic ecosystem and other instream uses are often overlooked or compromised.

The value and sustainability of surface water supplies are also greatly affected by water quality. In addition to the many natural factors which affect quality, our surface sources can be contaminated or degraded by human activities. Domestic sewage, sediment from field erosion, municipal and industrial wastes, animal wastes, fertilizers, pesticides, leachate from landfill sites, petroleum products, and acid rain

are some of the many examples of pollutants that enter surface waterbodies as a result of human activities. Waterbodies can purify themselves biologically, but only to a degree. There is a point at which the natural cleansing processes can no longer cope. Pollution can destroy aquatic life and diminish its productive ability. It can diminish the aesthetic quality of lakes and rivers, and make water unsuitable for drinking, recreation, agriculture, or industry. Water pollution can ultimately affect human health and well being. Measures must be adopted to minimize the degradation of our surface water supplies by human activities.

Intent

- 1. To ensure the sustained quality and quantity of surface water to meet the needs of present and future generations.**
- 2. To ensure that proposed surface water uses do not negatively affect existing or potential higher priority uses.**

Application

1. The Government of Manitoba will:

- *ensure that water storage dams and reservoirs are developed and operated to maximize the use of surface water supplies.*
- *explore, and implement where practical, economically and environmentally sound water retention and flow augmentation projects to improve the supply of water.*

- *develop standards, guidelines, and objectives to define acceptable water quality for all uses.*
- *monitor flow, volume, and water quality in surface water sources and maintain a comprehensive surface water data base.*
- *evaluate surface water sources to define their flow regimes, water quality, and suitability for water supply and use.*
- *allocate water from surface sources and regulate use in accordance with the capacity and quality limitations of the waterbody, and in support of the guidelines and priorities established through basin planning processes.*
- *apply land use planning, and regulation where necessary, to guide land and water use and other activities that can affect water quality.*
- *undertake promotional, informational, and technical support initiatives concerning measures to protect surface water supplies.*
- *promote water conservation and explore measures, such as demand management, that support conservation of water.*

2. Local authorities can:

- *maintain effective liaison with provincial authorities to ensure that surface water supply conditions and development constraints and guidelines related to water and use supply are clearly understood.*
- *promote, plan, and control local development in accordance with the supply limitations and quality objectives determined for local surface water sources.*
- *incorporate appropriate pricing for water from municipal or community systems to encourage the wise use and conservation of water.*

3. Landowners, corporations, industry, and all other surface water users can:

- *ensure that development is undertaken in accordance with legislation and the guidelines developed by provincial and local authorities.*
- *ensure that land and water uses and other activities support the protection and sustainability of surface water sources.*
- *adopt appropriate water conservation measures to ensure the availability of sufficient surface water.*

POLICY 3.5

Transfer of untreated water across the Continental Divide (to or from the Hudson Bay drainage area) shall be opposed. Transfers within the Hudson Bay drainage area shall be minimized and only considered after a complete assessment of the environmental, social, and economic impacts on the donor and receiving basins.

Background

The Hudson Bay drainage basin, an area of about 3.9 million square kilometres, comprises 23 major river basins of which the Nelson River basin is the largest - about one quarter of the Hudson Bay basin area. The Nelson River basin, in turn, comprises four smaller basins - the Red River, Saskatchewan River, Winnipeg River, and Lake Winnipeg basins, and these basins, in turn, are made up of smaller component basins or watersheds.

The ability now exists to substantially modify basin water flow regimes to support development and other human activity, for example, by diverting or transferring water within basins and between basins for such purposes as flood control and hydro-electric development, and water supply for municipal, industrial, irrigation, and recreation purposes. Diversion works have in some circumstances been undertaken within and between some of the watersheds within the Hudson Bay drainage basin, and these works have resulted in substantial social and economic benefits to Manitobans.

In some situations the economic, social, and environmental risks and consequences of water transfers are unacceptable. Manitobans are particularly concerned about proposals that entail transfer of untreated water across the continental drainage basin boundaries, to or from the Hudson Bay basin. Such water transfer projects, for example the proposed Garrison Diversion project, have a high potential of introducing harmful foreign organisms into the waters of the Hudson Bay basin, organisms for which our ecosystems have very poor or no defence. These organisms can seriously upset the ecosystem balance in the Hudson Bay basin and cause enormous and potentially irreversible environmental and economic harm to Manitobans.

Other concerns about water transfer across continental or internal basin boundaries relate to the impact on the present and future water supplies within the donor basin, and the possible irreversible dependencies that develop in the receiver basin. Transfers of water between the smaller internal basins may in some circumstances be judicious, but any such proposed transfer must be conditional to assurance that the social, economic, and environmental consequences to both donor and receiver basins are acceptable.

Intent

- 1. To preserve the quality of water in basins.**
- 2. To ensure that harmful foreign organisms are not introduced to Manitoba water basins through inter-basin transfer.**
- 3. To ensure that inter-basin transfers are justified based on full assessment of the needs, the supply alternatives, and the socio-economic and environmental impacts within both the donor and receiver basins.**

Application

1. The Government of Manitoba will:

- *use international agreements between Canada and the United States, agreements between Manitoba and neighbouring states and provinces, negotiations, and court action if necessary, to prevent the introduction of foreign organisms into the Hudson Bay drainage basin.*
 - *undertake educational and promotional initiatives to enhance public awareness of the economic and environmental dangers presented by the introduction of foreign organisms into Manitoba waters.*
 - *promote and undertake measures to prevent the transfer of foreign organisms into Manitoba's waters.*
 - *thoroughly examine, in considering proposals for inter-basin transfers within Manitoba, development objectives, priority needs for water, alternative uses, alternative sources of supply, and the economical, social, and environmental impacts affecting both the donor and receiving basins.*
 - *apply comprehensive environmental impact assessments, required by provincial and federal legislation, to determine the acceptability of basin transfer, and to determine any necessary modifications of preferred options.*
 - *encourage the adoption of alternatives and conservation measures by local governments, industry, and the public to minimize the need for inter-basin water transfer.*
- *take all necessary measures and precautions to minimize the risk of foreign organisms being introduced to the Hudson Bay drainage basin.*
 - *support demand management options and undertake conservation measures to reduce the needs for inter-basin transfers.*
 - *participate in the basin, watershed, and aquifer planning processes, and in the environmental impact assessment process.*

2. Local governments, the hydro-electric utilities, industry, and the general public can:

- *become well informed of the dangers and risks presented by the introduction of foreign organisms into the Hudson Bay drainage basin.*

4. Water Supply



OBJECTIVE

To develop and manage the province's water resources to ensure that water is available to meet priority needs and to support sustainable economic development and environmental quality.

Policy 4.1

Demand management programs shall be implemented to conserve water and reduce the requirements for new water supply infrastructure.

Policy 4.2

Irrigation, industrial, and other development proposals involving direct or indirect water use shall consider impacts on existing and potential water uses as well as impacts on the environment.

Policy 4.3

The cost of developing, operating, and maintaining the water resource infrastructure shall be apportioned among the beneficiaries in accordance with their share of the benefits.

Policy 4.4

Pristine and potable water sources shall be afforded special protection.

Issues Identified Through the Public Process

- *financing the high costs of water supply infrastructures*
- *impact of supply shortages on people, lifestyle, and economy*
- *determination of aquifer dependable yields and recharge mechanics*
- *demand management to sustain supplies, reduce infrastructure costs*
- *high use water development... effects on priority uses and environment*
- *need for comprehensive supply strategies, with local input*
- *apportion costs to beneficiaries.*

Overview

Water has many important uses: drinking, cooking, cleaning, and various other uses in our homes, businesses, and institutions; cooling, processing, mineral extraction, and other industrial uses; irrigation and agricultural uses such as stock watering; recreation uses; providing fish and wildlife habitat; and various other non-withdrawal uses.

Manitobans obtain their water supplies from a number of sources. Surface water sources range from large bodies of water such as Lake of the Woods, to reservoirs of varying size, to farm dugouts. Groundwater sources vary from large regional aquifers to small localized aquifers. About 80 percent of all water used by Manitobans is obtained from surface sources and 20 percent is obtained from groundwater sources.

In some parts of the province water supplies are often quite variable, due either to the seasonal variability of streamflow or to climatic variability. Shortages are not uncommon, and special water conservation and emergency water supply operations have often been necessary, particularly during periods of drought. The provincial government has been examining ways to augment water supplies to water-short and drought-sensitive regions to reduce the effects that water shortages have on economic development.

In some parts of the province, the sustainability of our water supplies is being threatened by a variety of human activities that affect both water quantity and water quality, and that affect both groundwater and surface water. Depletion or degradation of our water supplies must be prevented, otherwise future uses may be greatly reduced or restricted. Corrective action is often very difficult and costly.

Manitobans are becoming increasingly concerned about the high costs of water supply infrastructure. Water supply costs include not only the direct costs of water storage, transport, treatment, and distribution, but also the costs of wastewater treatment and disposal and the environmental costs related to both the withdrawals and return flows. Increasing attention is now

being given to water conservation as a means of limiting or reducing the costs of supply management.

All Manitobans must share the responsibility for water supply. Success in managing our water supplies will be greatly enhanced by the participation of an informed public in planning, developing, and operating our water supply infrastructures, in ensuring that our supplies are sustainable, and in conserving water and reducing costs.

POLICY 4.1

Demand management programs shall be implemented to conserve water and reduce the requirements for new water supply infrastructure.

Background

Traditionally, Manitoba has dealt with growing water demands through a supply management approach, whereby demands were met by developing additional sources of supply and constructing or improving water supply and wastewater infrastructures. However, the realities of resource scarcities — the shortages of both water and water infrastructure capital — have caused Manitobans to look seriously at expanding their range of options to include demand management. Demand management involves a variety of techniques to conserve water, or to reduce the peak and average water demands and the costs associated with upgrading, operating, and maintaining the water supply infrastructures.

In the past, most water users have received few accurate signals on the true cost of water and have had little incentive to conserve water. Water sources are usually developed by the provincial or federal governments, and large portions of the municipal infrastructure costs are supported by government grants. Many municipalities' water rates provide little incentive to conserve water. Some municipal water rates, in fact, actually encourage more water use. Some municipal water systems do not even have metering of individual water uses.

The primary demand management technique is water pricing, using water use charges that reflect the true cost of supplying water and treating effluent, and using rate structures that promote water conservation. Additional demand management techniques include other monetary incentives and disincentives such as rebates, tax credits, fines, and penalties. Demand management also includes structural measures such as metering, retrofitting, leakage repair, and policy and promotional techniques such as improved building and plumbing codes, government economic policies, and public awareness programs. The most success in

demand management is usually achieved by the application of a number of these techniques in combination.

Different user classes – municipal, industrial, irrigation, agricultural – require the application of different demand management techniques, taking into account where and how supplies are obtained, the quantity and quality of the supplies, and special local problems and circumstances. More stringent demand management measures must be adopted to target higher volume users or user classes, and areas where supplies are limited, infrastructure costs are high, or effluent discharge creates excessive environmental problems.

Intent

- 1. To reduce or defer water supply and wastewater infrastructure costs.**
- 2. To ensure that the rate of water use does not exceed the natural regeneration of the supply.**

Application**1. The Government of Manitoba will:**

- *work cooperatively with the federal government and local authorities in exploring and implementing agreements, incentives, promotional initiatives, and regulatory reform to facilitate demand management.*

- *develop, through consultation with local authorities and user groups, municipal water use rate structure options and other demand management measures.*
 - *promote the use of municipal rate structures that encourage conservation of water but are sensitive to socio-economic and technical constraints.*
 - *develop and maintain comprehensive water source and use monitoring networks and databases to facilitate demand management planning and implementation.*
 - *require that demand management options be explored and appropriate options implemented before providing financial assistance to construct or improve water supply and wastewater handling infrastructures.*
 - *encourage extensive metering in water supply systems to monitor uses and losses and to facilitate the application of appropriate rate structures and cost recovery.*
 - *review and modify legislation to ensure that it allows for water use rate structures that encourage conservation of water.*
 - *review and modify government supports and subsidies to municipal water supply infrastructures to ensure that such supports and subsidies do not excessively reduce the effectiveness of demand management.*
 - *explore and promote water conservation technology.*
 - *promote practices that reduce the need for water or that reschedules uses and reduces peak demands.*
 - *ensure that legislation and regulation supports demand management.*
 - *provide incentives for acquisition and use of water conservation technology.*
 - *promote the use of local land use planning that ensures that developments are compatible with water supply and wastewater handling capability.*
 - *undertake, in cooperation with local authorities and the public, basin and watershed planning which includes the development of water supply strategies and identifies need and opportunities for demand management and other water conservation measures.*
- ### 2. Local authorities can:
- *participate with the provincial government in developing municipal water use rate structure options and other demand management measures for application to local conditions.*
 - *participate in basin and watershed planning which includes the development of water supply strategies and identifies needs and opportunities for demand management and other water conservation measures.*
 - *adopt appropriate and visible water pricing rate structures to encourage water conservation.*
 - *develop, operate, and maintain water supply infrastructures to standards designed to minimize water losses.*
 - *incorporate extensive metering in municipal supply systems to identify uses and losses and to facilitate the application of water use charges to support conservation.*
 - *use planning and development restrictions to ensure that land uses and industrial development are compatible with local water supply and wastewater disposal capability.*
 - *promote land and water use practices and technology that support conservation of water.*
 - *ensure that contingency plans and appropriate by-laws are in place to control or ration water use in times of emergencies or drought.*
-

3. Business, industry, and individuals can:

- *enhance their awareness of local water supply capability and needs for conservation measures.*
- *adopt appropriate water conservation measures and technology in day-to-day activities to reschedule water use, reduce the cost of water use, sustain supplies, and reduce wastewater.*
- *ensure that land use and industrial development are compatible with local water supply and wastewater handling capability.*
- *participate in local plans and strategies that consider water supply capability and conservation needs.*
- *adopt appropriate water conservation measures in times of drought and other community water supply emergencies.*

POLICY 4.2

Irrigation, industrial, and other development proposals involving direct or indirect water use shall consider impacts on existing and potential water uses as well as impacts on the environment.

Background

In Manitoba, industrial use of water accounts for nearly 50 percent of total water used for all purposes excluding instream uses. Industry depends on water for cooling, condensing, processing, and sanitation. In addition to direct water use, industry affects our water supplies indirectly by using waterbodies to assimilate wastes produced by processing and other operations.

Irrigation also is a major user of water, accounting for the largest proportion of all groundwater used in Manitoba. Interest in irrigation and demand for irrigation water supplies have been rapidly increasing in recent years, particularly for growing potatoes. The increasing interest in irrigation is partly in response to recurring drought and partly due to the greater crop production stability and better produce quality demanded by the potato processing industry.

Use of our water supplies for industry, irrigation, and other development can have significant impacts on other water uses and the environment. This is

often especially true in regions of variable or inadequate supplies, and during periods of drought whereby the volumes of water required by industry, irrigation, or other development may constitute a very large proportion of the available supply. A significant concern, also, is the impacts that industrial discharges and irrigation return flow have on water quality, and ultimately on other water uses and on the sustainability of the supplies. When planning industrial, irrigation, and other developments involving large volume water use, measures must be adopted to ensure that impacts on existing water uses, on high priority future water uses, and on the environment are appropriately mitigated.

Intent

To use water to support development while protecting priority existing water uses, maintaining opportunities for priority future water uses, and sustaining environmental quality.

Application

1. The Government of Manitoba will:

- *develop and maintain comprehensive water supply and use monitoring networks to facilitate water supply and use planning and water allocation decisions.*
- *identify existing and future water use priorities through basin and watershed planning.*
- *ensure that development proposals are compatible with water use priorities, water supply capabilities, and water quality guidelines identified in basin, watershed, and local plans.*
- *use regulation, where appropriate, to prevent or minimize negative impacts of development on existing water uses, priority future uses, and environmental quality.*

2. Local authorities can:

- *establish water use and development priorities through participation in basin and watershed planning.*
- *use available information, including that developed from the provincial government's water supply and use monitoring networks, in planning and guiding local development.*
- *develop and implement local plans and by-laws that are compatible with the water use priorities, water supply capability, water quality guidelines, and other environmental constraints identified in basin and watershed plans.*

3. Residents, landowners and industry can:

- *ensure that water development projects and initiatives are in accordance with guidelines established in basin, watershed, and local plans, and in accordance with provincial environmental and water legislation and local land use policies.*
- *use available information, including that developed from the provincial government's water supply and use monitoring networks, in planning and constructing water development projects and works.*

POLICY 4.3

The cost of developing, operating, and maintaining the water resource infrastructure shall be apportioned among the beneficiaries in accordance with their share of the benefits.

Background

Direct costs of water supply infrastructure include the costs of constructing, operating, maintaining, and refurbishing water supply dams and reservoirs, water supply pipelines and diversions, water treatment facilities, and water distribution systems. Indirect costs include costs of collecting, treating, and disposing of domestic sewage and industrial discharges resulting from water use, as well as environmental costs and damages related to water supply, water use, and wastewater discharges.

The allocation of costs and benefits of water supply infrastructure is complicated because of the number of interests involved. All three levels of government – federal, provincial, and local – as well as industry and individuals are likely to be involved in funding the construction or operation of some element of the supply infrastructure. Beneficiaries may include the primary user of the water, whether it be for domestic, municipal, agricultural, industrial, irrigation, recreation, or other uses, or they may include those who benefit indirectly from water use through the resulting economic activity related to manufacturing, processing, sales, transportation, and service industries.

In the past, the primary water users have usually paid only a small portion of the full cost of water supply, while the remaining major portion of the costs have been funded through the public tax system.

In developing water supply infrastructure, economics of scale should be pursued, wherever possible, by developing additional infrastructure capacity to accommodate additional uses. Decisions to develop water supply projects and decisions of project scale should be based on full knowledge of each participant's portion of the costs and benefits.

In apportioning costs of water supply infrastructure, all direct and indirect costs, whether related to the water supply, wastewater disposal, or environmental impacts, must be taken into account. Primary water users or participants in water development projects should pay a fair share of water supply project costs, based first on the extent to which each user benefits from the project, and secondly on the extent to which each particular use affects the cost of the project. The public tax system should legitimately pay a portion of the water supply costs to reflect societal benefits in the form of ecosystem maintenance and increased economic activity, incomes, and tax revenue resulting from the water development.

Intent

- 1. To enhance the economic viability of water supply infrastructure.**
- 2. To ensure fair apportionment of water supply infrastructure costs.**

Application

1. The Government of Manitoba will:

- *undertake, in cooperation with other levels of government and water user groups, planning and economic studies and strategies which consider:*
 - *all practical water supply and wastewater management options,*
 - *all potential water uses and user groups,*
 - *potential environmental impacts, and*
 - *costs and benefits specific to various water use categories.*

- *explore water pricing structures and mechanisms which reflect the true cost of water supply, wastewater management, and environmental impacts.*
- *review and modify arrangements for financing water supply and wastewater management projects, and facilitate agreements among various levels of government and water user groups to ensure fair apportionment of capital, operating, and maintenance costs of water supply and wastewater infrastructures.*
- *review and modify legislation to ensure that it supports the user-pay principle.*
- *undertake promotional initiatives to enhance public understanding and the application of the user-pay principle.*

2. Municipal councils and other local jurisdictional bodies can:

- *participate in regional planning and economic studies and strategies related to water supply and wastewater management.*
- *participate with the provincial government and user groups in exploring water pricing structures and mechanisms which reflect the true cost of water supply and wastewater management, and which apportion water supply infrastructure costs fairly.*
- *ensure that all licensed water uses are monitored to enable accurate cost accounting and fair cost recovery.*
- *ensure that revenues from water use and wastewater charges are dedicated to water and wastewater infrastructure replacement, upgrading, and maintenance.*

3. Local water user groups can:

- *participate in local and regional planning and economic studies and strategies related to water supply and wastewater management.*
- *participate with the provincial government and other levels of government in exploring water pricing structures and mechanisms directed at infrastructure cost recovery.*

POLICY 4.4

Pristine and potable water sources shall be afforded special protection.

Background

The needs of ecosystem maintenance aside, the highest priority in water development and allocation decisions is to ensure that sufficient water is available for drinking and other domestic uses. Not all available water is suitable for drinking. Virtually all water, whether surface water or groundwater, contains a variety of dissolved and suspended substances. Some of these substances are naturally occurring and some result from human activities. Much of our water requires some form or degree of treatment to make it safe for drinking and other domestic uses.

Some water pollutants can be fairly easily broken down or removed by water treatment processes. Other, more persistent or non-degradable pollutants such as some pesticides, petroleum products, dioxins, radioactive materials, and metals are not easily broken down, and their removal by treatment is often either difficult and costly or impossible.

All Manitobans share the responsibility for ensuring the availability and the safety of our drinking water supplies. The most effective solution we can pursue is prevention. We must ensure that our drinking water supplies are not depleted and not degraded.

Intent

To ensure that pristine and other drinking water sources are protected and available for present and future generations.

Application

1. The Government of Manitoba will:

- *identify, through basin, watershed, and aquifer planning and through other water management studies and strategies, present and future drinking water needs and sources of supply.*
- *identify groundwater pollution hazard areas and other areas and situations where potable water sources are highly susceptible to degradation by human activity.*
- *prepare and continually update drinking water quality guidelines regarding contaminants and other undesirable substances in drinking water.*
- *monitor drinking water sources to assess quality and quantity, and to determine any changes or trends affecting quality and quantity.*
- *use land use planning and land use policies to ensure that land uses are compatible with the protection of drinking water sources.*
- *regulate human activities, where necessary, to ensure that essential potable water sources are neither adversely degraded nor depleted.*
- *allocate water, and place reservations on water where necessary, to ensure its availability for drinking as the highest priority for human use.*
- *undertake promotional and educational initiatives to enhance public awareness of drinking water sources, and measures and precautions needed to protect those drinking water sources.*

- *explore and implement, in cooperation with local authorities and user groups, water pricing and other demand management techniques to discourage specific high volume water uses that might jeopardize the availability of drinking water.*
- *test drinking water samples, on a cost-recovery basis where applicable, for local jurisdictions and individuals for assessment of the water's safety, suitability, and any required treatment.*

2. Municipal councils and other local jurisdictional bodies can:

- *participate in basin, watershed, and aquifer planning and other water supply and demand studies and strategies.*
- *consult with government specialists and other knowledgeable sources to enhance local awareness of drinking water sources, pollution hazard areas, and measures necessary to protect drinking water sources.*
- *use local land use planning and by-laws to ensure that land use does not directly or indirectly cause drinking water sources to be degraded.*
- *adopt water pricing and other supporting demand management measures to ensure that drinking water needs are not superseded by lower priority uses.*
- *ensure that local government works and operations do not harm potable drinking water sources.*
- *assist the provincial government in identifying activities and situations that might damage drinking water sources.*
- *periodically have samples from community drinking water sources tested to confirm the water's safety and suitability, and to determine any additional water treatment needs.*

3. Industry, business, and individuals can:

- *participate in basin, watershed, and aquifer planning and other strategies and studies to assess present and future drinking water needs and sources of supply.*
- *ensure they are aware of potable water sources, pollution hazard areas, and practices and activities that may damage their drinking water sources.*
- *adopt appropriate development, land use, and sewage and waste disposal technology and practices to protect their drinking water supplies.*
- *periodically have samples of their drinking water tested to confirm its safety and suitability, and to determine any required treatment.*

5. Flooding

OBJECTIVE

To alleviate human suffering and minimize the economic costs of damages caused by flooding.

Policy 5.1

Development on land subject to flooding or other water related hazards shall occur only under planning guidelines which prevent human suffering and property damage, limit public costs and liabilities, and address environmental impacts.

Policy 5.2

Economically viable measures to alleviate personal and property damage to existing development in flood prone areas shall be fostered.

Policy 5.3

The negative impacts of changes to water level and flow regimes caused by hydro-electric development projects shall be mitigated to the extent possible.



Issues Identified Through the Public Process

- *effective flood forecasting and flood fighting to reduce damages*
- *high cost of flood protection works*
- *curb new development in flood prone areas through zoning*
- *effective compensation programs*
- *environmental benefits of limited flooding*
- *flooding caused by hydro-electric development*
- *basin - based planning — upstream development vs. downstream effects*
- *value of wetlands and marginal lands for water storage*

Overview

The largest part of Manitoba's streamflows occurs during the spring as a result of snowmelt. In most years the streamflows are contained within channel banks with few flooding problems. Periodically, however, some combination of high soil moisture, above normal snow accumulations, rapid snowmelt, and spring rains results in runoff which greatly exceeds stream channel capacities and which causes extensive flooding of the adjoining land. Financial losses to governments and the public are immense. Personal hardships are immeasurable.

One of the areas most prone to flooding, the Red River Valley, flooded 14 times in the past 200 years. To minimize the ever increasing costs of flood fighting and flood damage in the province, the provincial government, with the help of the federal government, constructed an extensive network of flood damage reduction facilities, including the Red River Floodway, Winnipeg Dykes, Portage Diversion, Shellmouth Reservoir, Fairford Dam, ring dykes for all communities in the Red River Valley and other parts of Manitoba, the Ste. Rose du Lac dykes, and the Carman Diversion. After the floods of 1966, 1974 and 1979, an extensive dyking and raising program was carried out to protect the residents, farm sites, and structures in the Red River Valley.

These efforts prevent about 95 percent of the flood damages that would otherwise occur. However, such structural measures are costly to construct and to maintain. They also do not provide protection against all floods and could lead to a false sense of security. The best course of action is to avoid new development in areas where flood protection is unfeasible. In some situations, limited development that does occur must be accompanied by cost effective measures such as raising the structure on earthen fill or on piles.

Although many urban communities have dykes which provide protection to the 100-year flood level, a flood of a greater magnitude could be devastating. We must be able to forecast these events and the provincial and municipal governments must remain prepared and have effective flood fighting plans.

Flash flooding below the Manitoba Escarpment is a continuing problem. Extensive developments in these areas are at risk by their location in an area which is naturally flood prone. These developments, in some cases, also contribute to the flooding as a result of the land use changes and water control activities that have occurred. Water retention in headwater areas and appropriate land management practices should be adopted to minimize downstream flooding and its effects.

Flooding is also caused by hydro-electric projects in the north. Significant natural resources and cultural heritage can be negatively affected by changed water level regimes. Many people make their living off the land through trapping, hunting, tourism, and other activities which are dependent upon the land and water resources. Planning of hydro-electric development projects must consider the effects of changes to water level and flow regimes caused by these projects.

POLICY 5.1

Development on land subject to flooding or other water related hazards shall occur only under planning guidelines which prevent human suffering and property damage, limit public costs and liabilities, and address environmental impacts.

Background

Flooding is a common occurrence in Manitoba. Flooding is basically a natural process whereby streamflow occasionally spills over the channel banks and reclaims the stream's natural flood plain. When this occurs, unprotected property located in the flood plain is damaged or destroyed. Lives are disrupted. Substantial human suffering and economic hardships occur.

A substantial amount of development has already occurred in flood risk areas, due largely to a lack of knowledge about which areas were at risk. A number of structural measures such as dyking and diversions have been undertaken to limit flood damage. However, protecting people and property in flood prone areas is often neither economically nor technically feasible, and solutions are often limited.

The best solution is prevention. Manitobans should ensure that new development that occurs in a flood risk area is adequately protected, and that any new development in flood prone areas should be avoided if flood proofing is impractical or infeasible. Development in flood prone areas must be compatible with risk.

Intent

To minimize flood costs, damages, and human suffering associated with new development in flood prone areas.

Application

1. The Government of Manitoba will:

- *continue flood risk mapping of urban communities that are flood prone.*
- *actively discourage new development in flood risk areas through promotion and education concerning the risks, requirements, and restrictions associated with development in flood prone areas.*
- *ensure that basin and watershed planning processes consider measures to minimize flooding and other water-related hazards and damages.*
- *discourage new development in flood risk areas by denying loans or loan guarantees for flood prone structures.*
- *adopt the 100-year flood level, which is a flood level that is not exceeded more frequently than once in 100 years on the average, as the standard for the allowable elevation to which all new development must be protected in designated flood prone areas.*
- *define, in accordance with the Provincial Land Use Policies, standards and criteria for guiding development in flood prone areas.*
- *ensure that new development and land use in compliance with the Provincial Land Use Policies are also in compliance with environmental requirements.*
- *designate, under the Water Resources Administration Act, the Red River Valley as a flood prone area in which new structures must be protected to the 100-year flood level, and in which no new construction can proceed without provincial approval.*

- *encourage local authorities to identify flood prone areas in development plans and zoning by-laws and to regulate new development within those areas.*
- *develop and promote land use policies that support the intent of this policy.*
- *work cooperatively with the federal government and local authorities in planning and implementing programs and initiatives that support the intent of this policy.*
- *neither provide compensation for damages nor assist in flood protection associated with new developments that occur in designated flood prone areas.*
- *avoid construction of residences and other buildings in flood prone areas where flood proofing is not practical or feasible.*
- *participate, where opportunity exists, in preparing local development plans and zoning by laws.*

2. Local authorities can:

- *identify flood prone areas in development plans, and adopt zoning by-laws to regulate new development in flood prone areas.*
- *ensure, through the building permit process, that all new structures are flood proofed to the 100-year flood level.*
- *actively discourage, through promotion and public education, development of new structures in flood prone areas.*
- *obtain technical assistance and advice from the provincial government and other competent sources in establishing flood levels, safe building elevations, and flood proofing techniques.*

3. Landowners, residents, businesses, and industries can:

- *consult with local and provincial authorities to determine if proposed new structures would be flood prone, and to determine what appropriate flood proofing measures can be adopted.*
-

POLICY 5.2

Economically viable measures to alleviate personal and property damage to existing development in flood prone areas shall be fostered.

Background

The Red River Floodway, the Portage Diversion, the Shellmouth Reservoir, the Carman Diversion, the Ste. Rose du Lac Dykes, and raising the Red River Valley town dyke systems to the 100-year flood level are all measures that have been taken to reduce Manitoba's flood damage potential. Projects such as these are considered economically viable if they can reduce flood related damages and costs by at least the cost of the projects. Other similar projects will continue to be considered to further reduce flood damages in Manitoba.

In spite of these flood protection measures, we should not become complacent about the dangers and risks of flooding. Awareness and preparedness are the keys to limiting the damage caused by a flood. The provincial government provides flood forecasts to enable individuals and municipalities to prepare for a flood event. Whenever necessary, provincial flood fighters and the Emergency Measures Organization will supervise and coordinate emergency actions such as dyking and the relocation of people and livestock in the threatened areas.

In addition to real property damage, flood damages include erosion and gulying of cultivated land and destruction of crops, particularly in flood prone sub-escarpmental areas. Effective and practical structural solutions to these types of flooding problems are limited. Structural measures may often be neither economically feasible nor environmentally sound. Appropriate land management practices and other non-structural measures must be adopted either in support of or in place of structural solutions.

Intent

To minimize flood costs, damages, and human suffering associated with existing developments in flood prone areas.

Application**1. The Government of Manitoba will:**

- *operate and maintain existing flood control dams, reservoirs, and associated works to maximize the level of flood protection.*
- *provide an effective flood forecasting system which assesses, as timely and accurately as possible, the probability of flooding, the projected time of the flood, and the projected level of the flood.*
- *plan and construct, in cooperation with the federal government and local authorities, flood control projects which are economically justifiable, socially acceptable, and environmentally sound.*
- *assist local governments, communities, and individuals in emergency flood fighting activities where local capability is exceeded.*
- *undertake flood emergency preparedness planning in cooperation with emergency measures organizations and local authorities.*
- *undertake dam safety programs to ensure the functionality and safety of provincial flood control works.*

-
- *enhance public awareness of flood risks and flood protection preparedness through informational, educational, promotional initiatives.*
 - *assist emergency measures organizations, local governments, and the public during emergency flood fighting through operating an effective and responsive communications centre and through providing accurate and timely information on flood levels, evacuation routes, protective measures, and assistance available.*
 - *promote appropriate land management practices in flood prone sub-escarpmental areas to minimize the economic losses due to flooding and erosion of agricultural land.*
 - *ensure that provincial drainage and other water control projects are planned and designed to minimize any potential increase in flooding.*
 - *undertake flood preparedness planning, and implement flood proofing measures.*
 - *obtain, through various instructional publications prepared by the provincial and federal governments, or through consultation with the provincial government or other competent sources, sound information and advice on flood preparedness planning.*
 - *adopt appropriate measures to ensure personal safety, to protect property, or to evacuate belongings during a flood.*
 - *participate in local evacuation efforts and in flood fighting measures.*
 - *participate, where appropriate, in local emergency preparedness planning undertaken by local authorities.*
 - *adopt appropriate land use and management practices to minimize the economic losses due to flooding and erosion of agricultural land.*

2. Local authorities can:

- *take the lead role in ensuring local public preparedness for floods.*
- *consult with the provincial government and neighbouring local governments in undertaking ongoing flood emergency preparedness planning.*
- *take the lead role in protecting local residents and property against flooding.*
- *ensure that local drainage and water control works are designed and constructed to minimize any potential increase in flooding.*

3. Property owners, landowners, residents, businesses can:

- *determine, through consultation with the provincial government, the flood risk potential of their property.*

POLICY 5.3

The negative impacts of changes to water level and flow regimes caused by hydro-electric development projects shall be mitigated to the extent possible.

Background

Hydro-electric power is essential to Manitobans, providing a low cost, reliable supply of energy for our homes, farms, and workplaces. Hydro-electric development in the Province has contributed substantially to Manitoba's economy and well being.

Virtually all of Manitoba's hydro-electric development has occurred on four major river systems – the Winnipeg River, the Saskatchewan River, the Churchill River, and the Nelson River. The main features of hydro-electric projects are large dams, generating stations, diversions, and reservoirs or forebays. Operation of these features result in water regime changes on those river systems, such as flooding above the dams, reduced peak flows below the dams, altered flows due to diversions, altered seasonal flow distribution, and changed water quality.

These changes in water regime can result in significant impacts affecting the local people and the environment. Damages may include impacts to land, incomes, food supplies, traditional lifestyles, and health. Hydro-electric projects must be planned and constructed to minimize these impacts.

Compensation for flood damages and changed flow regimes may be necessary as a result of hydro development. Compensation agreements, such as the Northern Flood Agreement, have been negotiated to compensate affected people for adverse impacts due to flooding and changed flows. The emphasis must be on reducing damages before they can occur. The provincial government, federal government, hydro-electric utilities, and public groups must work cooperatively to ensure that the location, timing, construction, and operation of facilities sustains both our economy and environment.

Intent

To mitigate the negative economic, social, and environmental impacts due to altered regimes caused by hydro-electric development projects.

Application

1. The Government of Manitoba will:

- *issue and administer water power licences in accordance with relevant legislation.*
- *require comprehensive environmental impact assessments of major new hydro-electric projects, proposed major modifications to existing systems, and proposed significant operational changes.*
- *issue environmental licences stipulating all measures to be taken during construction and operation of hydro-electric projects.*
- *identify development setbacks and apply available means to control new development in areas where regimes may be altered due to hydro-electric projects.*
- *participate with the federal government, the hydro-electric utilities, and local public groups in implementing fair and comprehensive compensation/mitigation/off-set agreements.*
- *periodically review, in consultation with the hydro utilities and local public groups, the operation of hydro-electric projects and associated works to identify any practical operational changes that improve local conditions while meeting project objectives.*

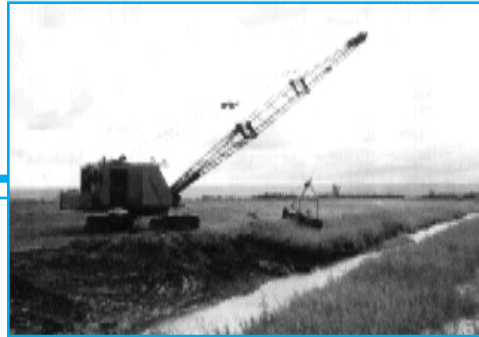
2 Hydro-electric utilities can:

- *undertake, in accordance with federal and provincial requirements, comprehensive environmental impact assessments of major new hydro-electric projects, major modifications to existing projects, and proposed significant operational changes.*
 - *minimize negative physical, environmental, and economic impacts of hydro-electric projects through appropriate design and construction.*
 - *implement, in consultation and participation with the federal and provincial governments, residents, landowners, and operators, fair and comprehensive multi-party compensation agreements.*
 - *provide compensation for unmitigated physical, environmental, and economic impacts of hydro-electric projects in accordance with multi-partite agreements.*
 - *identify, in consultation with local authorities, landowners, and reservoir users, requirements for water power reserves to prevent inappropriate development in areas where flow and water level regimes will change due to hydro-electric project development.*
 - *periodically review operations, in consultation with the provincial government and local public groups, to identify practical operational changes that could improve local conditions while meeting hydro-electric project objectives.*
 - *inform the potentially affected local public of possible alterations to flow and water level regimes.*
- *participate with the federal and provincial governments and the hydro utilities in implementing fair and comprehensive compensation agreements.*
 - *participate with the provincial government and hydro-electric utilities in identifying local improvements that could be achieved by operational changes.*
 - *participate in environmental impact assessments of hydro-electric projects.*

3. Local authorities, residents, businesses, resource users, and special interest groups can:

- *ensure that new development within a water power reserve is done in accordance with conditions established in legislation.*

6. Drainage



OBJECTIVE

To enhance the economic viability of Manitoba's agricultural community through the provision of a comprehensively planned drainage infrastructure.

Policy 6.1

Drainage works shall be designed to remove excess rainfall from cropland during the growing season.

Policy 6.2

The standard of drainage shall be based on the production capability of the soil and on technical, economic, and environmental criteria, recognizing watershed, community, and farm impacts.

Policy 6.3

Maintenance of existing drainage systems shall be of higher priority than reconstruction.

Policy 6.4

Reconstruction of drainage systems to improve productivity and to reduce erosion and deposition shall be given a higher priority than expansion into new agricultural lands.

Policy 6.5

Drainage projects shall be planned and executed so that projects in one area do not adversely affect another area.

Policy 6.6

The protection of wetlands shall be a consideration in planning and developing drainage projects.

Policy 6.7

Water retention, and control and timing of runoff, shall be promoted as part of watershed management.

Issues Identified Through the Public Process

- *drainage essential to maintain viability of farming community*
- *maintenance of existing drain systems to ensure maximum capacity.*
- *integrated systems approach – impacts and opportunities over entire basin.*
- *high costs of good drainage vs. limited funds*
- *split jurisdiction and responsibility; coordination needed*
- *control excessive drainage; store water whenever appropriate*
- *landowner interests and rights vs. basin and community implications*
- *education and technical support to local governments and landowners*

Overview

In Manitoba, agriculture uses a total land resource base of 8.1 million hectares, of which about 5.3 million hectares have been improved or developed.

Under natural drainage conditions that existed historically, agricultural productivity of vast areas of this resource base was severely limited by wetness. As the land was settled, massive drainage programs were initiated, particularly on the flat clay soils of the former Lake Agassiz bottom. The drainage and land development that occurred have distinctively changed the landscape of the province. An estimated two million hectares of very productive farmland have been made possible by agricultural drainage. These lands are now some of the best farmland in the province and they contribute substantially to the economy of Manitoba.

On the flat, fertile clay soils of the Red River Valley, drainage systems are well developed and most of the land has been converted to agriculture purposes. Although there is unlikely to be any major expansion of drainage systems in this area, the existing systems require costly regular maintenance. In addition, many of these drainage systems require upgrading to bring them up to standards that reflect current agricultural needs.

In the Interlake, drainage and land development are less advanced, due in part to later settlement, smaller proportions of fertile cropland, and economic and climatic disadvantages. In southwestern Manitoba, the natural drainage problems that inhibit agricultural production are few, and a high level of artificial drainage is not required; yet, landowners continue to drain sloughs and potholes to enhance farm incomes and farming operations, causing widespread public concern about the socio-economic and environmental impacts of this wetland loss. Peat soils and wet sands in other parts of the province have special problems of both water excess and water deficiency, and prudent water management must be practised on these landscapes.

One of the most challenging drainage problems of the future will be the runoff and erosion control activities below the Manitoba escarpment. Drainage and land development in this area have contributed to a multitude of socio-economic and environmental problems. Structural solutions are often very costly and marginally effective, and sometimes damaging. Non-structural options will have to be pursued, either in support of or in place of structural solutions.

An adequate level of drainage is essential for the economic viability of Manitoba's farming community. There are approximately 48,000 kilometres of designated drains in Manitoba of which about 32,000 are fully man-made and 16,000 are improved or maintained natural waterways. About 4,350 kilometres of the largest drains are provincial waterways. Rural municipalities, local government districts, and conservation districts have jurisdiction over the drains that are not provincial waterways. Landowners are responsible for on-farm drains.

POLICY 6.1

Drainage works shall be designed to remove excess rainfall from cropland during the growing season.

Background

Drainage works remove excess surface water from cropland and minimize ponding and wetness. Drainage of cropland results in increased crop yields, stronger plants, improved crop quality, increased fertilizer efficiency, more uniform field operations, reduced labour and farm operation costs, reduced losses at harvest, and ability to grow higher value crops. The overall goal of drainage is to improve net farm productivity.

Although the most widespread ponding of farmland is normally caused by spring snowmelt, such ponding usually poses few problems. Quick drainage of snowmelt water is both imprudent and unnecessary. To prevent snowmelt ponding would require the construction of very large and costly drains. Removing snowmelt ponding from farmland too rapidly also increases the risk of flooding along downstream drains and natural channels. Drainage works sized for summer rainstorms are normally adequate for removing spring snowmelt over a reasonable period to enable timely spring seeding.

The ponding which causes the most serious productivity losses is that which occurs due to excess rainfall in late spring or in summer, after crops have been seeded and before they have been harvested. The losses increase as either the duration or the area of the ponding increases. The purpose of drainage works is to minimize such ponding on cropland during the growing season.

Agricultural land drainage works must be sized large enough to protect crops from excess precipitation during the growing season, but not so large as to add unnecessary project costs or contribute excessively to downstream flooding.

Intent

- 1. To ensure drainage works are sized to protect crops from excess rainfall during the growing season.**
- 2. To minimize the potential for agricultural drainage works to contribute to downstream spring flooding problems.**

Application**1. The Government of Manitoba will:**

- *monitor rainfall and agricultural ponding, and collect rainfall and crop yield data.*
- *consult with local authorities and farmers, and monitor drainage system performance to assess the effectiveness of existing drainage works.*
- *ensure that rainfall, ponding, crop yield, and drainage system performance data and observations are taken into account in the design of drainage projects.*
- *design provincial drainage works and those for local governments and individuals so that these works:*
 - *effectively protect crops from ponding caused by excess rainfall,*
 - *enable snowmelt to be drained in a reasonable time so as not to unduly delay spring seeding,*
 - *limit, where feasible, upstream drainage capacities to reduce the risk of downstream spring flooding, and*

- *include reasonable supplementary measures such as dyking to prevent breakout of flood water in built up areas.*
- *guide drainage design and construction practices of individuals and local authorities through:*
 - *promotional and educational initiatives,*
 - *licensing procedures, and*
 - *provision of information and technical support.*
- *obtain available information, technical assistance, and guidance from government departments or other qualified sources in developing on-farm drains.*
- *inform local government or conservation district officials of any on-farm drainage problems resulting from inadequate municipal, conservation district, or provincial drains.*

2. Local governments and conservation districts can:

- *work with government and landowners in monitoring drainage system performance.*
- *take a lead role in identifying local drainage deficiencies and improvement needs.*
- *develop or improve local drains to effectively protect crops from ponding caused by excess rainfall.*
- *ensure that local government drain capacities are compatible with the on-farm drainage needs of local landowners and with the capacities of downstream provincial waterways or major outlets.*
- *use available data and information and obtain technical assistance and guidance from government departments or other qualified sources in designing local drainage improvement works.*

3. Farm operators and landowners can:

- *develop on-farm drains to effectively protect crops from excess rainfall.*
- *adopt appropriate on-farm measures to slow runoff in spring, subject to not unduly delaying spring planting.*

POLICY 6.2

The standard of drainage shall be based on the production capability of the soil and on technical, economic, and environmental criteria, recognizing watershed, community, and farm impacts.

Background

Agricultural drainage involves a number of water management techniques to minimize crop productivity losses due to excess precipitation. Drainage of flat clay soils, escarpmental drainage works, pothole and slough drainage, wet sands water management, and peat soils water management – each are distinct drainage situations reflecting different water regimes, problems, solutions, benefits, constraints, and environmental impacts. The standard or level of drainage provided to an area, as well as drainage technology applied, must vary to suit local physiographic conditions – differences in soil texture, soil fertility, topography, natural drainage, groundwater conditions, and ecosystem sensitivity.

Not all drainage upgrading projects are equally cost-effective. Because drainage works are costly and provincial and local government funds are limited, decisions must be made concerning which project will be developed, when they will be developed, and what level of drainage will be provided. These decisions must also consider environmental impacts.

The lands that normally yield the greatest economic return from a high level of drainage are the flat and depressional lands characterized by fine-textured, fertile, clay soils. These lands have the potential to grow high value crops but, without drainage, their productivity is limited due to the soils' susceptibility to ponding and water logging. Drainage in such areas might be developed to standards which enable the production of cereals, oilseeds, or special crops such as sunflowers or sugar beets.

In other areas, where soils are poor in quality, drainage might be developed to standards suitable for growing forages, or perhaps only to "pioneer" standards. Poor soils, limited economic return, and environmental impacts tend to make projects economically marginal or even sub-marginal. Yet, marginal pro-

jects might be justified in situations where failure to maintain or upgrade an existing system would result in excessive hardship affecting farm and community viability.

To maximize the benefits of drainage expenditures, drainage projects must be planned and developed on a systems basis, whereby the system is considered as a unit which comprises the main drains, the laterals, and the on-farm drains. Failure to adequately develop or maintain any one component of the system reduces the effectiveness of the entire system. To achieve value for money spent, all three components of the system must be designed to consistent standards and constructed within a short, consistent time frame. An integrated planning approach must also be adopted which considers long-term cumulative benefits, costs, and impacts, as they affect people, the resource base, and the environment within the entire watershed, drainage basin, or region.

Intent

To ensure that decisions concerning the standard of drainage provided to an area are broadly based, taking into consideration both the physiographic characteristics of the project area and the benefits, costs, and impacts as they affect the farm, the community, and the watershed.

Application

1. The Government of Manitoba will:

- *use extensive public consultation in drainage systems project planning and decision making.*
- *apply, in planning and designing provincial drainage works and those of local governments and conservation districts, drainage project standards based on:*
 - *soil texture, soil capability, and land use;*
 - *rainfall criteria and maximum allowable ponding time for affected crops;*
 - *local physiographic features and natural drainage;*
 - *a systems approach whereby the project is a unit comprising the main drains, the laterals, and the on-farm drains;*
 - *economic and environmental impacts affecting the watershed, basin, or region; overriding social implications affecting farm and community viability.*
- *promote the application of these project standards by local governments and conservation districts, and provide advice or assistance in the application of these standards.*
- *review legislation and government operating policy, and modify these where necessary, to ensure that they support the application of these project standards.*
- *undertake educational initiatives to improve local government and public input to drainage system project planning and decisions.*
- *use licensing and regulation, where appropriate, to ensure that proposed drainage projects meet environmental criteria.*
- *promote on-farm drainage, land use practices, and crop selection that are compatible with the standard of drainage provided by municipal, provincial, and natural outlets.*

2. Local governments and conservation districts can:

- *consult with government and other qualified sources to obtain rational project standards and planning criteria, and where necessary, to obtain information or advice on their use.*
- *use extensive public consultation in drainage systems project planning.*

3. Farm operators and landowners can:

- *ensure that land uses, cropping practices, and on-farm drainage are compatible with the standard of drainage provided by the municipal, provincial, and natural outlets.*

POLICY 6.3

Maintenance of existing drainage systems shall be of higher priority than reconstruction.

Background

Over time, drainage channels tend to become obstructed by vegetative growth and silt deposition. Consequently, drainage systems require regular maintenance so that they can continue to perform the service for which they were designed and constructed. Normal maintenance involves removing silt and debris from the channel and culverts, and removing willows, cattails, and other vegetative growth. Inadequate maintenance causes reduced channel capacities, reduced levels of protection, crop losses, and reduced economic benefits of past drainage investments.

Where drains have badly deteriorated due to either erosion or bank failures, regular maintenance becomes difficult or impossible. Such drains often require reshaping or restoration to permit future maintenance.

Reconstruction of drains to higher standards is also frequently desirable. Such reconstruction, however, is costlier than maintenance or restoration. Fewer miles of channel are improved and fewer acres of land benefit from the funds that are expended. Available drainage program funds are used more effectively in maintaining existing drainage systems, as opposed to drainage reconstruction.

Intent

- 1. To ensure that existing drains provide the optimum level of crop protection.**
- 2. To use total available drainage program funds in the most cost-efficient manner.**
- 3. To achieve the maximum benefits from past investments in drainage construction.**

Application

1. The Government of Manitoba will:

- *monitor provincial waterway condition and performance to identify maintenance requirements.*
- *conduct regular and timely provincial waterway maintenance operations to minimize flow obstructions.*
- *reshape or restore badly deteriorated provincial waterways to a condition that enables regular maintenance to be carried out.*
- *promote the importance of effective drainage maintenance, and encourage municipalities, conservation districts and landowners to carry out regular maintenance works on their drains.*

2. Municipalities, conservation districts, farm operators, and landowners can:

- *closely monitor drain condition, drainage performance, and ponding problems, conduct timely drainage maintenance and cleanout works wherever required, and reshape or restore eroded or deteriorated drains to enable effective maintenance.*
- *dedicate necessary funding on a regular basis to ensure that essential drainage maintenance operations can be carried out.*

POLICY 6.4

Reconstruction of drainage systems to improve productivity and to reduce erosion and deposition shall be given a higher priority than expansion into new agricultural lands.

Background

Development of land for agricultural crop production involves, among other things, clearing of the land followed by the construction of an extensive infrastructure of roads and drains. Most of Manitoba's best quality agricultural lands have now been developed for crop production. These developed lands support large populations and contribute substantially to the province's economy.

There still remains some significant areas of potentially arable land that has not yet been developed. However, much of this remaining land is of marginal quality for crop production. To develop those remaining lands in most cases would require very costly drainage reclamation works or the expansion of existing drainage systems. The economic benefits of such new drainage and land development are often marginal, affect small numbers of people, and take a long time to accrue. Overall economic viability of such projects may often be marginal. Such projects may also have significant environmental impacts.

In contrast, many of the existing drains in developed areas are in serious need of restoration to reduce erosion and deposition, and others are in need of rebuilding to new higher standards in order to improve agricultural productivity. Economic benefits of restoration and reconstruction to higher standards are immediate and affect established farmers, many with large farm investments. Restoration or reconstruction normally has fewer environmental impacts than new construction.

While drainage expansion to serve new agricultural lands may be justifiable under some circumstances, available drainage funding would be used more effectively in improving existing systems serving developed areas.

Intent

To ensure that available drainage reconstruction funds are used in the most cost-efficient, environmentally sound, and socially conscious manner.

Application**1. The Government of Manitoba will:**

- *monitor and evaluate existing drainage systems and areas served to assess system performance, agricultural productivity, and problems related to poor drain capacity, drain erosion, and deposition.*
- *consult with local governments and farming communities to assess existing drainage system compatibility with current land use and soil capability, farming technology, and economic and environmental sustainability.*
- *undertake comprehensive analysis of proposed drainage system expansion to new agricultural lands to determine if such expansion is socially, economically, or environmentally justifiable.*
- *establish priorities for drainage system construction projects through comparative analyses of project options taking into account such factors as:*
 - *areas of developed and undeveloped lands served by the project;*
 - *numbers of landowners directly affected by the project, and size and nature of the community indirectly affected;*
 - *existing agricultural productivity of the affected land, and potential agricultural productivity due to drainage;*
 - *economic benefits and their immediacy, social implications, and potential environmental impacts of proposed projects.*

- *assign highest priorities to drainage systems construction or reconstruction projects affecting the largest number of established landowners and residents, having the greatest and most immediate benefits, and having the lowest environmental impacts.*
- *assign lower priorities to drainage reclamation projects or drainage expansion to new lands, affecting few people, having marginal and delayed benefits, and having high economic and environmental costs.*
- *promote a similar establishment of priorities for projects by municipalities and conservation districts based on comparative analyses of economic, social, and environmental factors.*
- *provide information and technical support to assist local municipalities and conservation districts in assessing drainage projects options and priorities.*
- *use basin and watershed planning, where available, to guide drainage reconstruction program planning and setting priorities.*
- *undertake comprehensive environmental impact assessments of projects where significant negative impacts may result from such projects.*
- *develop, regularly update, and implement long term plans or programs for drainage construction based on comprehensive analysis of options and their established priorities.*
- *dedicate an appropriate level of funding to ensure that essential drainage reconstruction projects are undertaken.*
- *use of basin and watershed planning to assist in drainage reconstruction program planning.*
- *guide local land development through land use planning, to ensure that such development is compatible with existing or planned drainage systems.*

3. Farm operators and landowners can:

2. Rural municipalities and conservation districts can:

- *monitor local drainage systems to determine system performance, compatibility with current agricultural needs or potential, and problems related to poor drain capacity, erosion, and deposition.*
- *have comprehensive analyses conducted for proposed drainage projects, and establish priorities for drainage construction project options based on comparative analyses of economic, social, and environmental factors.*
- *obtain planning and technical assistance from government and other qualified sources in evaluating drainage construction project options and priorities.*

POLICY 6.5

Drainage projects shall be planned and executed so that projects in one area do not adversely affect another area.

Background

Drainage projects in one part of a watershed can change the flow regime in downstream reaches of the watershed, sometimes positively, but sometimes adversely. Higher annual peak flows and runoff volumes, shorter runoff periods, and lower base flows are some of the more common changes in flow regime that can result from extensive drainage. The changed flows can not only affect people and property, but can affect other resources such as fish and wildlife habitat. Water quality can also be affected, due to increased agricultural chemicals and due to increased sediment load from channel and field erosion.

Impacts of drainage projects vary widely, depending on the nature of the project and the setting in which the project occurs. Drainage projects that can have the greatest and most obvious impacts are those which involve extensive new drainage systems to serve new land development. In those situations, flows are changed from basically natural regime to a substantially modified regime in a short period of time.

In developed areas, such as the Red River Valley, the extensive drainage works of the past have already changed the natural flow patterns and regimes. Current drainage projects in these areas usually involve either restoring established drains or upgrading established drains to higher standards. Further changes in flow regime due to these types of projects are usually relatively minor, unless the degree or extent of improvements is large.

Drainage project planning must recognize long-term cumulative impacts. Small projects by themselves may have negligible downstream impacts which are often ignored, but the long-term cumulative impact of many separate small projects may be quite significant.

The costs and significance of adverse impacts are increasing with time, as development and populations increase and as the stock of environmental resources diminishes. Potential impacts of drainage projects must be considered at the project planning stage, and projects must include measures to prevent or mitigate unacceptable downstream impacts.

Intent

To ensure that drainage projects do not adversely affect another area.

Application**1. The Government of Manitoba will:**

- *adopt, during the planning or design of provincial drainage projects and those of local governments and conservation districts, measures or procedures to identify and reduce potential adverse impacts, by:*
 - *consulting with appropriate resource professionals, local authorities, agencies, and individuals to identify possible impacts emanating from proposed projects;*
 - *using the information and adhering to guidelines established in basin and watershed planning;*
 - *taking into consideration the possible long term cumulative impacts of small projects; and*
 - *modifying project designs to prevent or mitigate adverse downstream impacts in the drainage system, watershed, or basin.*

- *guide drainage projects or activities of local governments, conservation districts, and individuals to avoid or minimize adverse impacts, by:*
 - *providing technical support for the planning, design, or construction of drainage projects;*
 - *undertaking promotional and educational initiatives concerning cause-effect relationships concerning drainage impacts; and*
 - *using licensing procedures, and regulation where appropriate.*
- *ensure that comprehensive environmental impact assessments are undertaken for projects that have the potential to cause significant adverse impacts.*
- *explore and promote practical on-farm measures to attenuate spring snowmelt drainage and reduce downstream flood potential.*
- *keep abreast of, and use the best available technology for assessing changes to flow regimes as a result of drainage and land development.*
- *work cooperatively with neighbouring provinces and states to resolve cross-border drainage issues.*
- *obtain information and technical assistance from government or other qualified sources in planning, designing, and constructing drainage projects.*

3. Farm operators and landowners can:

- *obtain available information and technical support from government or other qualified sources in planning and designing drainage projects.*
- *adopt any practical on-farm measures to attenuate spring snowmelt drainage.*
- *adopt farming technology, land use, and cropping practices that are compatible with downstream drainage system capacity.*
- *ensure that on-farm drainage is designed and constructed to avoid harmful impacts on adjacent or downstream lands.*

2. Rural municipalities and conservation districts can:

- *take a lead role in planning and developing drainage works to serve local needs.*
- *plan and design local drainage projects within the framework of a drainage system, to ensure compatibility with the flow capacity of downstream provincial waterways and natural outlets, as well as compatibility with on-farm drainage needs.*
- *ensure that local drainage projects are planned and designed within guidelines and impact constraints identified in basin and watershed planning.*
- *consult with resource professionals, government agencies, and local residents and landowners to identify potential impacts of proposed drainage projects.*

POLICY 6.6

The protection of wetlands shall be a consideration in planning and developing drainage projects.

Background

Wetlands, which include potholes, sloughs, bogs, marshes, and river deltas, are a common feature on Manitoba's landscape. These wetlands provide a number of socio-economic and environmental benefits. Wetlands collect and store runoff, moderate and attenuate downstream flows, reduce downstream flooding and erosion, clean and purify water, recharge aquifers, and provide habitat for plants and animals.

As a result of settlement and development in the province, a large portion of Manitoba's wetlands have now been drained and converted to agricultural production. As these wetlands are eliminated, the value of the remaining wetlands increases. Many of these remaining wetlands are ecologically very important and should be protected.

Most projects and activities that result in wetland destruction occur on privately owned agricultural land. Farmers drain wetlands for economic benefits that accrue within the farm boundary. However, most decisions to drain wetlands do not consider the costs and benefits to society and over the larger region. Local governments and the provincial government can inadvertently contribute to wetland loss through the provision of public drainage systems which serve as outlets for on-farm wetland drainage.

Regulation is not effective in preventing the destruction of wetlands unless used in conjunction with public education and incentives. As well, wetland protection could be enhanced through integrated watershed planning.

Intent

To protect important wetlands from destruction by drainage and land development.

Application

1. The Government of Manitoba will:

- *monitor wetland loss, maintain wetland inventories, and explore practical means of classifying wetlands according to their characteristics and their values.*
- *conduct educational initiatives concerning the role that wetlands play in the hydrologic cycle, how wetlands function, and the broad range of regional and societal values that wetlands provide.*
- *develop and use practical criteria and means for evaluating wetlands and the impacts of wetland loss, and for guiding decisions concerning which wetlands should be retained.*
- *ensure that planning and design of provincial, local government, and conservation district drainage projects include measures to prevent or minimize destruction of important wetlands.*
- *ensure that decisions concerning sale or lease of Crown Land consider water retention, conservation, and other functions and benefits that wetlands provide.*
- *conduct promotional initiatives concerning the reasons, means, and opportunities to protect or restore wetlands.*
- *establish, or participate in, agreements with other levels of government, conservation organizations, landowner associations, and interest groups concerning wetland protection programs and initiatives.*
- *review provincial legislation, policies, and farm support programs, and modify them where appropriate, to ensure that they support wetland protection objectives.*

- *work with the federal government in reviewing, developing, or modifying federal programs and policies that affect wetland conservation.*
- *explore and support practical incentives for encouraging landowners to retain or restore wetlands on privately owned land.*
- *provide technical assistance to local governments, conservation districts, and landowners for drainage and other water management projects to minimize the destruction of important wetlands.*
- *use licensing and regulation, where appropriate, to reduce the potential for adverse off-site impacts due to wetland drainage.*
- *ensure that basin and watershed planning includes consideration for the protection of wetlands.*

2. Local governments and conservation districts can:

- *become well informed about wetlands, how they function, their numerous values, and potential local and regional impacts of wetland drainage and land development.*
- *ensure that planning and implementation of local drainage projects consider the broad economic, social, and environmental values of wetlands in their region, as well as the cumulative impacts of all possible drainage projects over time and throughout the region.*
- *participate in promotional initiatives to conserve or protect wetlands that have important regional values.*
- *participate with senior governments and various organizations and interest groups in agreements, programs, and initiatives concerning protection and conservation of wetlands.*

- *obtain available information, advice, or technical assistance from government and other qualified sources when planning or developing local drainage or other water management projects that might affect wetlands.*
- *include measures in the design and construction of local drainage and other water management projects to minimize or prevent the destruction of important wetlands.*

3. Farm operators and land owners can:

- *become informed about wetland characteristics, how they function, their socio-economic values, and criteria to consider in deciding the practicality of wetland drainage.*
- *modify farming operations and water management activities to minimize the destruction of important wetlands and loss of wetland values.*
- *participate in local programs and initiatives designed to protect or restore wetlands.*
- *obtain information and technical support from government or other qualified sources when planning or designing on-farm drainage or other water management projects that might affect wetlands.*

POLICY 6.7

Water retention, and control and timing of runoff, shall be promoted as part of watershed management.

Background

Agricultural drainage systems are designed and constructed primarily to remove excess precipitation from cropland during the growing season. Except for the most extreme rain storms, summer runoff from cropland is normally contained within the channel banks with few downstream flooding problems.

But agricultural drainage systems also carry spring snowmelt runoff. If the winter snow accumulation is high, if warm spring temperatures cause a quick melt, or if significant rain occurs during the snowmelt period, the resulting flows in the drains can be very high, far in excess of summer flows, and far in excess of the flows needed to drain the farmland in time for spring seeding. High flows and flooding problems along main channels may also be worsened by coincidence of peak flows from tributaries within the watershed.

Downstream works to contain the high flows are often very costly, as are the damages that often result when the flows exceed channel capacity. Flood, erosion, and siltation damages along drainage channels would be reduced if some of the runoff could be retained on the land and the runoff period prolonged. In addition to flood control benefits, runoff retention may result in other benefits related to water supply, soil moisture, and groundwater recharge. In most situations the greatest opportunity to delay spring runoff and retain water on the land lies with the farmer, before the water gets into the municipal and provincial systems.

Intent

- 1. To minimize flooding and erosion along agricultural drainage systems.**
- 2. To retain water, where appropriate, for water supply, soil moisture replenishment, groundwater recharge, and wetland habitat.**

Application**1. The Government of Manitoba will:**

- *promote runoff retention, where appropriate, for water supply, soil moisture replenishment, groundwater recharge, and wetland habitat.*
- *promote retaining natural cover to slow runoff and prevent erosion in areas of steep topography.*
- *provide technical assistance and advice to local governments, conservation districts, and individuals concerning practical measures to adopt in drain designs to retain or slow runoff.*
- *ensure that provincial drainage works and those for local governments and conservation districts are not enlarged to accelerate the removal of spring snowmelt, subject to not excessively delaying spring seeding.*
- *modify drainage system designs, where possible, to minimize coincidence of peak flows from tributaries and to attenuate flows in the mainstream.*
- *use promotional initiatives, and licensing where appropriate, to guide drainage system development in headwater areas and to limit conveyance capacities of upstream drainage works.*

2. Local governments and conservation districts can:

- *include practical measures in the planning and design of drainage works to slow or attenuate flows in spring and to store water for beneficial purposes.*
- *obtain technical assistance and advice from government departments or other qualified sources in the planning, design, and construction of drainage projects.*

3. Farm operators and landowners can:

- *use any practical measures available to attenuate runoff from spring snowmelt.*
- *adopt practical measures, where appropriate, to retain or delay spring runoff for water supply purposes, for soil moisture replenishment, and for groundwater recharge.*
- *retain natural cover and use land management practices to slow runoff and prevent erosion in areas of steep topography.*
- *obtain available technical assistance and advice from government departments or other qualified sources in designing and constructing on-farm drainage.*

7. Education

OBJECTIVE

To enhance the awareness and knowledge of Manitoba's water resources.

Policy 7.1

Schools – Students of all ages shall be provided with information on the significance of Manitoba's water resources.

Policy 7.2

General Public – Education on water matters shall be achieved in part through the sharing of information, demonstration projects, and the involvement of the general public.

Policy 7.3

Forum for Scientific and Technical Input – A forum shall be developed to obtain input from the scientific, technical, and professional communities on water management issues.

Policy 7.4

Community Leaders and Elected Representatives – Community leaders and elected representatives shall be provided with the information they need to make sound water management decisions.



Issues Identified Through the Public Process

- *public education to support sound water management*
- *public forums for debate and information exchange*
- *demonstration projects to show concepts, technologies and equipment*
- *need for accumulation of data and new knowledge*
- *encourage conservation and wise use of water*
- *soil and water conservation education in the school system*
- *a long term commitment*
- *education in conjunction with incentives and regulation*

Overview

Water is not only an important natural resource, but also one of the most important elements of life. It affects our health, economic development, our lifestyles, and the environment. It is also highly variable in space and in time, and is highly vulnerable to abuse and overuse. Water must be carefully protected and managed, not only for today, but also for future generations.

In the past, the job of protecting and managing water was undertaken largely by the provincial and federal governments. Decisions were often based solely on technical criteria and expert opinion. The public often had little input to decisions that affected them and little information on how their own activities, in turn, affected water.

However, there is a growing awareness that the job of managing and protecting water is large and complex, and requires the involvement and support of the public. All Manitobans are stakeholders - provincial agencies, local governments, conservation districts, private agencies, industry, business, landowners, farm operators, special interest groups, and all resource users. The public must not only be informed of decisions that affect them, but they must also participate in shaping these decisions. The public wants to be involved.

Water management decisions must still be based on the best up-to-date technology, information, and data, but decision criteria must be expanded to include public values and a broader range of options. Manitobans must have the information and knowledge to participate effectively in those decisions and to ensure that their own day-to-day activities support the sound management and protection of water. All Manitobans should understand the basic concept of the hydrologic cycle, and the interrelationships between the water, land, other resources, and the environment.

In accordance with the suggestions from the public input to the draft water policies, four general target areas for water education and information were identified: the schools, the general public, forums for scientific and technical input, and community leaders and elected representatives.

The management and protection of our water resources can best be achieved through partnerships between governments and a concerned, informed society of Manitobans. Water education is seen as one of the most important means toward achieving that goal.

POLICY 7.1

Schools – Students of all ages shall be provided with information on the significance of Manitoba’s water resources.

Background

Protecting and managing water will be a major challenge facing Manitobans in the future. Today’s water issues and concerns will be heightened, and there will be new emerging issues and concerns as our water resources are subjected to increased pressures of expanding populations, increased development and economic activity, and growing demands on all fronts.

As today’s young people become tomorrow’s adults, they will have important responsibilities toward protecting and managing water. Some will be resource professionals and water managers, some will be community leaders and decision makers, and some may be major water users. Even tomorrow’s ordinary citizens will be able to affect water management significantly, through their participation in water management decisions, and through their day-to-day activities.

Exposure to water education materials should begin at an early age. Students should be provided with a basic understanding of the hydrologic cycle, the watershed, surface water and groundwater, and linkages between water, our lifestyles, our economic base, and our environment. They should also learn about the fragility and vulnerability of water, and how human activities and natural forces can affect water.

Students should also be informed of the broader concept of sustainable development within which all aspects of water may be evaluated, and the value of water in providing jobs and quality of life.

Opportunities for water education in the school system exist at various grade levels, in various subject areas, and as specialized programs and courses in technical schools and universities. There is currently an abundance of essential knowledge to be shared. The most important tasks will be to assemble the material, to structure or modify it to fit appropriately

into the curriculum, and to provide the experienced resource professionals to assist both the teachers and the students.

Intent

To develop in students, the understanding, respect, skills, and knowledge that will enable them to manage and protect water better in the future than we do today.

Application

1. The Government of Manitoba will:

- *collect and assemble already available water education material from local sources and other sources, such as the federal government, neighbouring provinces and states, and various private agencies and organizations.*
- *work with curriculum developers to determine opportunities and criteria for including water education.*
- *provide curriculum developers with suitable water education material to fit into the school curriculum.*
- *provide experts and other experienced and knowledgeable staff to give classroom presentations and facilitate classroom and field demonstrations to support water education.*
- *support water education through summer employment and student volunteer programs related to water.*

- *provide available data, expertise, and guidance to support school assignments and projects related to water.*
- *support university level research and demonstration projects related to water.*
- *pursue the formation of partnerships with various associations, agencies, and organizations to support water education programs.*
- *ensure that water education materials are developed within a broader interdisciplinary framework incorporating the concept of sustainable development.*
- *ensure that water education materials are developed within a broader interdisciplinary framework incorporating the concept of sustainable development.*

2. School boards, schools, and teachers can:

- *participate in developing suitable water education material and incorporating it into school programs.*
- *provide encouragement and direction to students undertaking school projects and doing volunteer work related to water management.*
- *organize participation by water experts in classroom presentations, field demonstrations, and other forums for water education.*

3. The general public, industry, business, water-related associations, agencies, and organizations, and parents, can:

- *encourage, through their participation in school parent/teacher associations, school boards, and other means, the inclusion of water education in the school curriculum.*
 - *support both the students and teachers in education programs, projects, and assignments related to water.*
 - *reinforce water education by good example.*
-

POLICY 7.2

General Public – Education on water matters shall be achieved in part through the sharing of information, demonstration projects, and the involvement of the general public.

Background

Increasing public concern about water issues, and increasing participation in water management by the public has emphasized the need for accessible data and information regarding water issues. Water managers, in government and private organizations, have key roles to play in supplying this information. In addition to being a source of raw data and providing opportunity for informed analysis, demonstration projects have proven to be effective methods of communication and encouraging participation. Cost-effective means of communicating information must be found and, indeed, will be increasingly demanded by Manitobans.

Intent

- 1. To develop in all Manitobans, the understanding, respect, and knowledge that will support the protection and sound management of water.**
- 2. To enable Manitobans to have an informed input to water management decisions and other decisions that affect water.**

Application**1. The Government of Manitoba will:**

- *actively promote water conservation, and land and water uses and technology that support the sound management and protection of water.*
- *develop and maintain provincial and local water resource information and data bases, and provide assistance to all users in accessing and interpreting the data and information.*
- *collect and assemble existing informational and promotional material related to water, and where appropriate, develop new material such as pamphlets, fact sheets, brochures, and videos relevant to Manitoba conditions, to enhance public understanding of water and to guide public actions to support the sound management and protection of water.*
- *advertise the “Manitoba Surface Water Quality Objectives,” and explain their meaning, uses, and application.*
- *provide water information and expertise, upon request, through easily accessible and appropriately staffed regional centres.*
- *provide local government offices with lists or directories of water information and expertise available for use by the public.*
- *provide knowledgeable staff to speak at local gatherings, meetings, and functions on matters related to water.*
- *support or host conferences, workshops, and seminars related to water.*

- *develop, implement, or participate in demonstration projects designed to illustrate technology and land and water uses that support sound management and protection of water.*
- *conduct tours of water projects and problem areas, where appropriate, to extend information and knowledge related to water.*
- *undertake integrated basin and watershed planning with public involvement, to support both water management and water education objectives.*
- *use a public consultative process, and encourage and organize broad public participation in developing water-related legislation, policy, programs, and initiatives.*
- *reinforce sound management and protection of water by good example.*

2. Local authorities can:

- *collect and assemble educational material that addresses water issues, including that available from the provincial government, and make these materials available to the public through display and distribution in local government business offices and meeting places.*
- *maintain updated lists or directories of water information and expertise available from government and other sources, and assist the public by directing water-related inquiries to government regional offices and other sources.*
- *encourage and help coordinate local participation in basin and watershed planning.*
- *publicize local water management goals, programs, and initiatives, and encourage public participation in formulating those goals and planning local projects and initiatives.*

- *encourage and help organize public participation in water management demonstration projects.*
- *support and help promote conferences, seminars, and workshops related to water.*
- *encourage local media support and promotion of local water management initiatives and achievements.*

3. Industry, business, local interest groups, and individuals can:

- *contact regional information centres and local government business offices, and consult knowledgeable agency representatives and local officials for data, information, and expertise related to water.*
- *attend and participate in water-related demonstration projects, tours, meetings, conferences, workshops, and seminars.*
- *inform government staff and local officials of water-related concerns and information needs.*
- *encourage neighbours to support and adopt economically and environmentally sound land and water management practices.*

POLICY 7.3

Forum for Scientific and Technical Input – A forum shall be developed to obtain input from the scientific, technical, and professional communities on water management issues.

Background

The concept of sustainable development has evolved largely in response to the input of the scientific, professional and technical communities. The integration of disciplines needed to implement sustainable development planning and practice has been dependent on a variety of forums within which the many communities can communicate. Local, national, and international networks of associations, organizations and conferences need to be supported and tapped because of the individual contributions they can make to sustainable development and the synergistic effect of cooperation.

Manitoba is in a unique position to capitalize on the potential benefits of information exchanged through the International Institute for Sustainable Development. Water management will be an issue dealt with frequently by the Institute. Scientific, professional, and technical communities, as well as all Manitobans, will have ready access to information about issues and management practices worldwide.

Intent

To enhance the sharing and application of the most up-to-date technology and information on water management.

Application

1. The Government of Manitoba will:

- *facilitate the exchange of scientific and technical information related to water through the provincial government's partnership in the establishment of the International Institute for Sustainable Development.*
- *support international, national, provincial, or local conferences, technical seminars, and workshops related to water.*
- *support or participate in water management research and demonstration projects involving water management experts and professionals from the federal and provincial governments, industry and organizations, and the universities.*
- *consult with other provinces, neighbouring states, industry, business, and other sources to obtain and assemble the most current technology, information, and expertise related to water management.*
- *solicit and use high quality scientific and technical information and expertise in basin and watershed planning and local resource management planning.*
- *support professional and scientific organizations and associations dedicated to developing, exchanging, and sharing water management technology and information.*
- *modify or enhance government agency organizational structures, working arrangements, and mechanisms to improve integrated, multi-disciplinary planning and decision making.*

2. Local authorities, industry, business, and individuals can:

- support conferences, seminars, workshops, and demonstration projects related to water.
- support basin and watershed planning and integrated resource management planning as vehicles for obtaining and sharing scientific, technical, and professional inputs.

3. The scientific, technical, professional, and academic communities can:

- organize and participate in conferences and seminars concerning a broad spectrum of water-related issues.
- seek out and bring attention to important emerging water-related issues, and dedicate research efforts to help resolve those issues.

POLICY 7.4

Community Leaders and Elected Representatives – Community leaders and elected representatives shall be provided with the information they need to make sound water management decisions.

Background

Community leaders and elected representatives are the ultimate decision makers regarding the development of public waterworks and sewage systems. They are also the creators of legislation affecting access to water, the development of water sources and distribution systems, and the setting of quality standards.

It is crucial, therefore, that these people receive information about water issues which accurately reflects scientific understanding, economic realities, and public values. They must have a good understanding of the options that are available to them, and the implications of each option – their costs, benefits, risks, and impacts. If information is either insufficient or inaccurate, the resulting decisions, policies, and actions might ultimately be ineffective, or may have serious economic, social, and environmental consequences.

The greatest challenge is to find ways of providing this information so that it is thorough, yet concise. Great amounts of information are available, but, much of it is unusable by community leaders and elected

representatives. Much information is in a scientific or technical form that a lay person cannot readily use, and analyses and other educative material often cannot be brought to decision makers' attention rapidly enough to meet day-to-day needs. This is particularly the case in smaller communities and rural municipalities since they do not have the resources to research issues.

Intent

To ensure that community leaders and elected representatives have the necessary information and data to support sound water management decisions and programs.

Application

1. The Government of Manitoba will:

- *develop and maintain water resources information and data bases.*
- *where appropriate, undertake or support comprehensive, integrated studies and investigations to facilitate the planning and development of local and regional water-related strategies and projects.*
- *supply information and data to community leaders and elected representatives, and provide assistance in interpreting and understanding the information, where necessary.*
- *attend local meetings, as requested, to provide information on available programs and assistance, and to provide information required for local water management decisions.*
- *use basin and watershed planning to enhance local authorities' knowledge of water-related issues, opportunities, and constraints, and to enhance local planning and decision making.*
- *support and help organize local community round tables, local advisory committees, management boards, and other forums as effective means of transferring water-related data and information and facilitating the resolution of local water management problems and issues.*

2. Local authorities can:

- *establish or support local advisory committees, management boards, community round tables, and other forums to acquire water-related data and information for assisting local planning and decisions making.*
- *consult with resource professionals, or resource management consultants where appropriate, to acquire technical assistance, information, and data to assist local planning and decision making.*

- *collect, assemble, and use data and information from government and other sources to assist local planning and decision making related to water.*
- *participate in basin and watershed planning and use the information, knowledge, and data gained from the processes to support local planning and decisions related to water.*
- *invite resource management professionals to local council meetings and other functions to communicate local needs and concerns related to water, and to solicit assistance and information.*

3. Individuals and interest groups can:

- *participate in basin and watershed planning, and assist in developing water-related information and data to support local planning and decision making.*
- *communicate water-related concerns, knowledge, and experience to local leaders and elected representatives to assist them in planning and decision making.*

MANITOBA'S SUSTAINABLE DEVELOPMENT STRATEGY

What Is Sustainable Development ?

Our efforts to manage water successfully need to be placed in the context of wider efforts to achieve a sound environment and a sustainable economy. The problems of the environment and economy are many and global. When the United Nations set out to formulate a global agenda for change, "...there were those who wanted its considerations to be limited to "environmental issues" only. This would have been a grave mistake. The environment does not exist as a sphere separate from human actions, ambitions, and needs....The word "development" has also been narrowed by some into a very limited focus....But the "environment" is where we all live; and "development" is what we all do in attempting to improve our lot....The two are inseparable." ¹

It was therefore determined that a "...new development path was required, one that sustained human progress not just in a few places for a few years, but for the entire planet into the distant future. Thus "sustainable development" becomes a goal not just for the "developing" nations, but for industrial ones as well." ²

A Global Perspective

Sustainable development, as expressed in the World Commission on Environment and Development Report, "Our Common Future", is a process of changing the character of society. It involves fundamental changes in the way business is done, what is taught to our children, how we as individuals live and conduct our lives and how government and societies' public institutions address the essential problems affecting our life.

The U.N. Commission described sustainable development as paths of environmental, economic, social and political progress that "...meets the needs of the present without compromising the ability of future generations to meet their own needs." ³

The Commission indicated that to achieve sustainable development, we will need: "a political system that secures effective citizen participation in decision making, an economic system that is able to generate surpluses and technical knowledge on a self-reliant and sustained basis, a social system that provides for solutions for the tensions arising from disharmonious development, a production system that respects the obligation to preserve the ecological base for development, a technological system that can search continuously for new solutions, an international system that fosters sustainable patterns of trade and finance, and an administrative system that is flexible and has the capacity for self-correction." ⁴

The U.N. Governing Council of Environmental Programs, further clarified the definition stating it means: "...progress towards equity within and among nations; the need for a favourable international economic environment that would help to sustain economic growth in all countries, and emphasizing that such growth is essential for sound management of the environment as

well as maintenance and rational use of natural resources; the need for integration of environmental concerns into development planning; and the recognition of the sovereignty of nations to pursue the development methods of their own choice." ⁵

A National Perspective

Canada's National Task Force on Environment and Economy agreed with the U.N., stating: "... our economic systems should be managed to maintain or improve our resource and environmental base so that the generations that follow will be able to live equally well or better. Sustainable economic development does not require the preservation of the current stock of natural resources or any particular mix of human, physical, and natural assets. Nor does it place artificial limits on economic growth, provided that such growth is both economically and environmentally sustainable." ⁶

A Provincial Perspective

For the province of Manitoba and the Manitoba Round Table on Environment and Economy, sustainable development is a general philosophy and approach to guide our individual and collective behaviour in respect of the environment (the life sustaining processes of the earth and its natural resources) and the economy (the provision of jobs, incomes, and wealth resulting from economic activity).

Sustainable development resolves the perceived conflict between human prosperity and sustaining the natural world for in reality, the environment and economy are interdependent and interrelated.

Sustainable development means environmentally sound and sustainable economic development, described by a vision for Manitoba, comprising certain beliefs, principles, and guidelines.

Manitoba's vision is of economic growth which is environmentally sustainable. Our environment will be clean, safe and healthy. Our economy will provide the ongoing wealth and ability to provide goods and services for present and future generations.

It is believed that we cannot continue to develop economically unless we protect the environment, that continued economic development will be needed to pay for important environmental initiatives, that the needs of the present must be met without sacrificing the ability of future generations to meet their own needs, and that attention must be paid to long term effects of both environmental and economic decisions.

While the earth's ability to sustain and assimilate human development and activity is limited, sustainable development provides the opportunity to pursue quality growth and wealth generation in an environmentally responsible manner.

It allows us to address the real and emerging problems of:

- sustaining human life by protecting the earth's life support system,

Applying the Policies

- providing jobs and incomes for those presently unemployed and for the work force of the future,
- cleaning up degraded areas,
- anticipating and preventing or mitigating environmental and economic mistakes,
- enhancing our natural resources upon which jobs and incomes depend,
- providing mobility, health care, education, and social services, and
- assisting the world community in feeding, clothing, and sheltering a population which is expected to double from five to ten billion by 2040.

However, realizing these opportunities and solving these problems will require:

- generating more from less through efficient and effective use of resources,
- reducing, reusing, recycling and recovering the products and by-products of production and consumption,
- ensuring environmentally sound value-added processing and manufacturing,
- enhancing productivity through political, technological, scientific, institutional, and social innovation,
- replenishing and reclaiming damaged environments,
- increasing the productive capability and quality of natural resources, and
- conserving and developing substitutes for scarce resources.

Land and Water Strategy

The Land and Water Strategy is part of Manitoba's overall sustainable development strategy. It is being developed through a series of workbooks like this one. Workbooks, public consultation, and release of "What You Told Us" Reports on water, soil, forests, minerals and natural lands have already been completed. Cabinet approval of policies has already been completed for soils and water.

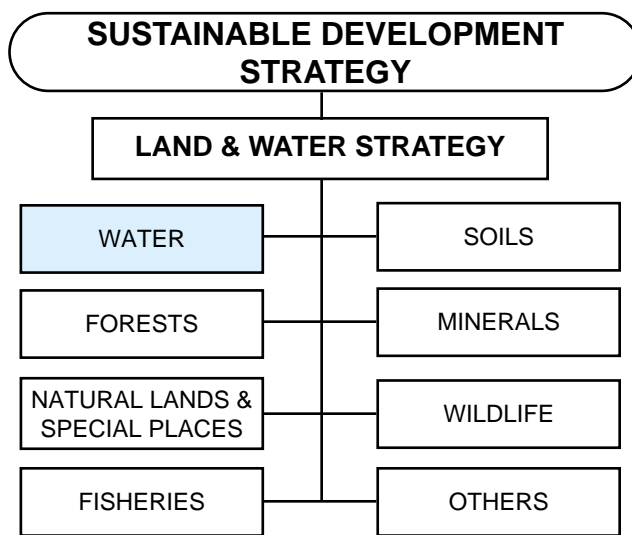
The Land and Water Strategy addresses the development, use, conservation, and protection of our natural and environmental resources which are vital to our economic future. We have not always treated our land and water resources wisely. The time has now come for us to ensure the sustainability of our natural heritage. The Land and Water Strategy will guide the management of our resources and help us to develop and protect them for present and future generations. The goals of the Land and Water Strategy are:

- To sustain resources, enhance productivity, and improve environmental quality, including human health.
- To improve and diversify income and job opportunities through the management, protection, and development of land and water resources.
- To manage resource and related activities in order to preserve

development options for future generations.

- To protect ecological systems, maintain the genetic diversity of species, and preserve the resilience and productivity of the natural environment.

Government agencies will work in partnership with a concerned and informed public. Besides provincial and federal government departments, the job of policy application will involve rural municipalities, local government districts, and conservation districts, local soil and water interest groups, nature groups, private organizations, developers, business people, landowners, and all residents, whether rural or urban. The job of policy application belongs to all of us. Only through sharing this responsibility can we ensure that our development is sustainable.



1 *The World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press. Toronto, Canada. pp.xi*

2 *Ibid., pp.4.*

3 *Ibid., pp.8.*

4 *Ibid., pp.65.*

5 *Environmental Conservation. 1989. Vol. 16, No. 4, Winter. Switzerland. pp.374*

6 *The National Task Force on Environment and Economy. 1987. Report. Canadian Council of Resource and Environmental Ministers. Ontario, Canada. pp.3*

PRINCIPLES AND GUIDELINES OF SUSTAINABLE DEVELOPMENT

The following principles and guidelines are fundamental to the achievement of environmentally sound and sustainable economic development.

Principles

- 1. Integration of environmental and economic decisions:** requires that we ensure economic decisions adequately reflect environmental impacts including human health. Environmental initiatives shall adequately take into account economic consequences.
- 2. Stewardship:** requires that we manage the environment and economy for the benefits of present and future generations. Stewardship requires the recognition that we are caretakers of the environment and economy for the benefit of present and future generations of Manitobans. A balance must be struck between today's decisions and tomorrow's impacts.
- 3. Shared responsibility:** requires that all Manitobans acknowledge responsibility for sustaining the environment and economy, with each being accountable for decisions and actions, in a spirit of partnership and open cooperation.
- 4. Prevention:** requires that we anticipate, prevent or mitigate significant adverse environmental (including human health) and economic impacts of policy, programs, and decisions.
- 5. Conservation:** requires that we maintain essential ecological processes, biological diversity, and life-support systems of our environment; harvest reusable resources on a sustained yield basis; and make wise and efficient use of our renewable and non-renewable resources.
- 6. Waste minimization:** requires that we endeavour to reduce, reuse, recycle, and recover the products of our society.
- 7. Enhancement:** requires that we enhance the long term productive capability, quality, and capacity of our natural ecosystems.
- 8. Rehabilitation and reclamation:** requires that we endeavour to restore damaged or degraded environments to beneficial uses. Rehabilitation and reclamation require ameliorating damage caused in the past. Future policies, programs, and developments should take into consideration the need for rehabilitation and reclamation.
- 9. Scientific and technological innovation:** requires that we research, develop, test, and implement technologies essential to further environmental quality including human health and economic growth.
- 10. Global responsibility:** requires that we think globally when we act locally. Global responsibility requires that we recognize there are no boundaries to our environment, and that there is ecological interdependence among provinces and

nations. There is a need to work cooperatively within Canada and internationally to accelerate the merger of environment and economics in decision making and to develop comprehensive and equitable solutions to problems.

Guidelines

- 1. Efficient use of resources:** we shall encourage and support development and application of systems for proper resource pricing, demand management, and resource allocation together with incentives and disincentives to encourage efficient use of resources and full environmental costing of decisions and developments.
- 2. Public participation:** we shall establish appropriate forums which encourage and provide opportunity for consultation and meaningful participation in decision making processes by all Manitobans. We shall endeavour to ensure due process, prior notification and appropriate and timely redress for those affected by policies, programs, decisions and developments.
- 3. Understanding and respect:** we shall be aware that we share a common physical, social and economic environment in Manitoba. Understanding and respect for differing social and economic views, values, traditions and aspirations is necessary for equitable management of these common resources. Consideration must be given to the aspirations, needs and views of various regions and groups in Manitoba.
- 4. Access to adequate information:** we shall encourage and support the improvement and refinement of our environmental and economic information base and promotion of the opportunity for equal and timely access to information by all Manitobans.
- 5. Integrated decision making and planning:** we shall encourage and support decision making and planning processes that are open, cross-sectoral, incorporate time horizons relevant to long-term implications and are efficient and timely.
- 6. Substitution:** we shall encourage and promote the development and use of substitutes for scarce resources where they are both environmentally sound and economically viable.

THE MANITOBA WATER POLICIES

1. Water quality

To protect and enhance our aquatic ecosystems by ensuring that surface water and groundwater quality is adequate for all designated uses and ecosystem needs.

Policy 1.1 - The “Manitoba Surface Water Quality Objectives” shall be adopted and implemented to protect water uses for Manitobans.

Policy 1.2 - Water quality shall be enhanced through the management of water resources.

Policy 1.3 - Water quality enhancement programs shall be designed to restore environmental quality, as well as deliver economic, cultural, and heritage benefits to Manitobans.

Policy 1.4 - The quality of wastewater discharges shall be improved and non-point sources of pollution decreased to achieve water quality objectives.

Policy 1.5 - Pollution control programs shall be designed in consultation with affected user groups and, where possible, implemented in such a manner as to cause minimum disruption to established land and water uses.

2. Conservation

To conserve and manage the lakes, rivers, and wetlands of Manitoba so as to protect the ability of the environment to sustain life and provide environmental, economic, and aesthetic benefits to existing and future generations.

Policy 2.1 - River, lake, and shoreland habitat and the general environmental, subsistence, and economic values of rivers, lakes, and wetlands shall, where possible, be conserved.

Policy 2.2 - Soil conservation, wetland retention, and the application of appropriate land use practices shall be promoted primarily by the provision of incentives, but with regulation where required, not only as essential elements of water conservation and protection, but also as key measures to reduce siltation impacts, downstream flooding, and non-point source pollution.

Policy 2.3 - Those waterways whose cultural, natural, and/or recreational values are of provincial or national significance shall be given special consideration.

Policy 2.4 - Water retention, and control and timing of runoff, shall be promoted as part of watershed management.

3. Use and allocation

To ensure the long term sustainability of the province’s surface water and groundwater for the benefit of all Manitobans.

Policy 3.1 - Economic well being and sustainability shall be the goal in the allocation and utilization of Manitoba’s water resources for consumptive and instream uses.

Policy 3.2 - Water management priorities shall be determined through a basin planning process that takes into account the protection of potable water supplies, environmental integrity, existing commitments, and economic requirements.

Policy 3.3 - Groundwater development and utilization shall be managed so that the long term sustainability of aquifers is achieved and existing uses are not negatively impacted.

Policy 3.4 - Surface water shall be managed to ensure sustainability of supplies.

Policy 3.5 - Transfer of untreated water across the Continental Divide (to or from the Hudson Bay drainage area) shall be opposed. Transfers within the Hudson Bay drainage area shall be minimized and only considered after a complete assessment of the environmental, social, and economic impacts on the donor and receiving basins.

4. Water supply

To develop and manage the province’s water resources to ensure that water is available to meet priority needs and to support sustainable economic development and environmental quality.

Policy 4.1 - Demand management programs shall be implemented to conserve water and reduce the requirements for new water supply infrastructure.

Policy 4.2 - Irrigation, industrial, and other development proposals involving direct or indirect water use shall consider impacts on existing and potential water uses as well as impacts on the environment.

Policy 4.3 - The cost of developing, operating, and maintaining the water resource infrastructure shall be apportioned among the beneficiaries in accordance with their share of the benefits.

Policy 4.4 - Pristine and potable water sources shall be afforded special protection.

5. Flooding

To alleviate human suffering and minimize the economic costs of damages caused by flooding.

Policy 5.1 - Development on land subject to flooding or other water related hazards shall occur only under planning guidelines which prevent human suffering and property damage, limit public costs and liabilities, and address environmental impacts.

Policy 5.2 - Economically viable measures to alleviate personal and property damage to existing development in flood prone areas shall

be fostered.

Policy 5.3 - The negative impacts of changes to water level and flow regimes caused by hydro-electric development projects shall be mitigated to the extent possible.

6. Drainage

To enhance the economic viability of Manitoba’s agricultural community through the provision of a comprehensively planned drainage infrastructure.

Policy 6.1 - Drainage works shall be designed to remove excess rainfall from cropland during the growing season.

Policy 6.2 - The standard of drainage shall be based on the production capability of the soil and on technical, economic, and environmental criteria, recognizing watershed, community, and farm impacts.

Policy 6.3 - Maintenance of existing drainage systems shall be of higher priority than reconstruction.

Policy 6.4 - Reconstruction of drainage systems to improve productivity and to reduce erosion and deposition shall be given a higher priority than expansion into new agricultural lands.

Policy 6.5 - Drainage projects shall be planned and executed so that projects in one area do not adversely affect another area.

Policy 6.6 - The protection of wetlands shall be a consideration in planning and developing drainage projects.

Policy 6.7 - Water retention, and control and timing of runoff, shall be promoted as part of watershed management.

7. Education

To enhance the awareness and knowledge of Manitoba’s water resources.

Policy 7.1 - Schools: Students of all ages shall be provided with information on the significance of Manitoba’s water resources.

Policy 7.2 - General Public: Education on water matters shall be achieved in part through the sharing of information, demonstration projects, and the involvement of the general public.

Policy 7.3 - Forum for Scientific and Technical Input: A forum shall be developed to obtain input from the scientific, technical, and professional communities on water management issues.

Policy 7.4 - Community Leaders and Elected Representatives: Community leaders and elected representatives shall be provided with the information they need to make sound water management decisions.