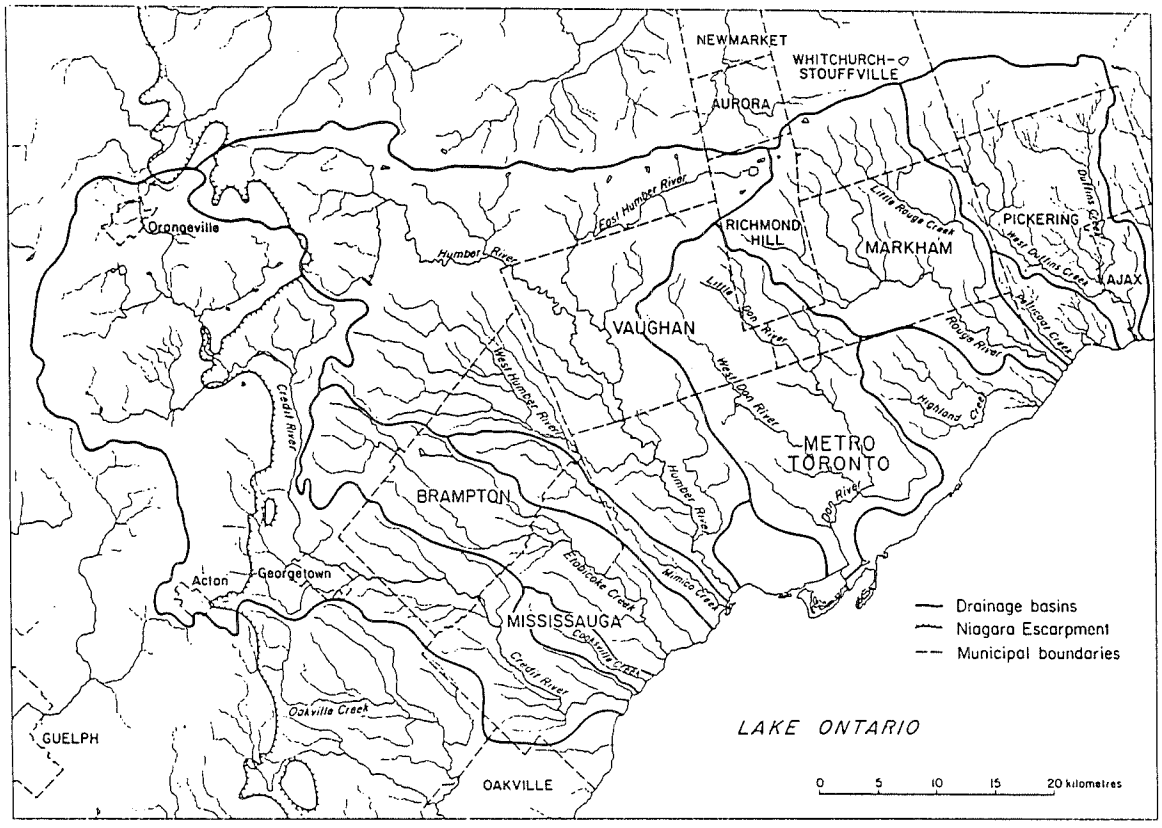
TORONTO AREA WATERS: CURRENT STATUS AND PROSPECTS FOR REHABILITATION

a one-day symposium May 21, 1987



BACKGROUND PAPERS

AQUATIC ECOSYSTEMS OF THE TORONTO AREA

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TORONTO AREA WATERS: THE REGULATORY CONTEXT

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AQUATIC ECOSYSTEMS OF THE TORONTO AREA

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May 7, 1987

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Introduction

Two centuries of agricultural, industrial and urban development in the Toronto area have been accompanied by expanding and intensifying degradation of the natural waters. Streams, rivers, wetlands, estuaries, bays and nearshore waters of Lake Ontario proper have all been abused, with the number of kinds of abuses growing with time. Important components of this Toronto Aquatic Ecosystem (TAE) have been degraded or lost, and the interconnected nature of the watersheds, rivers, wetlands, bays and nearshore areas has been disrupted. We are now coming to recognize the values lost, and are seeking means to protect what remains of natural features and to rehabilitate degraded waters. This paper provides a descriptive overview of what we have learned about past states of Toronto's waters, and how they reached their present degraded state. Some ideas on how we might learn to predict future states, based on analysis of past and present trends, are outlined.

Figure 1 illustrates three development scenarios for an aquatic system such as the TAE. **Conventional Exploitative Development** or **CED** refers to the sequence of practices usually associated with commercialization, industrialization and urbanization. This sequence illustrates events in the Toronto area. A desirable alternative to CED is **Eco-development** or **ED**, - ecologically sensitive and sustainable development from the outset, such that desirable ecosystem components are preserved or enhanced throughout the development process. The last option, **Reform Sustainable Redevelopment**, or **RSR** refers to planning and redevelopment designed to rehabilitate degraded aspects of an aquatic ecosystem, after CED has already taken place. This is now timely in the Toronto area.

A Continuum of Aquatic Habitats

A Toronto Aquatic Ecosystem, or TAE, may be bounded approximately by the watersheds of the river systems that flow through Metropolitan Toronto and its environs. Here, the TAE includes lands of the Credit River on the west to Duffins Creek on the east, and adjacent nearshore areas of Lake Ontario from Port Credit to Ajax, an area of approximately 3,500 km^2 (Fig. 2). The quality of water, aquatic habitat and aquatic biota in this area range from excellent on the upper fringes, to poor in the central portion, to obnoxious in the lower parts of rivers and adjacent nearshore parts of the Harbour and Lake. The degree of degradation now depends mainly on the extent and intensity of urban development.

Three general categories of aquatic habitat may be recognized in the TAE: **stream and river systems**, **river-mouth wetlands**, and **nearshore areas** of Lake Ontario including Toronto Harbour. These three habitats differ in obvious ways - including geographic location, depth and flow of water, but can be recognized as partially integrated components within specified drainage networks or watersheds. The inter-connection of the different aquatic habitats, and predictable aspects of physical and biological change from headwaters to nearshore, have been described as a **land-river-bay-lake continuum**. The concept of a continuum emphasizes physical and biotic linkages between the various components of Great Lakes aquatic ecosystems (in both upstream and downstream directions), their ecological

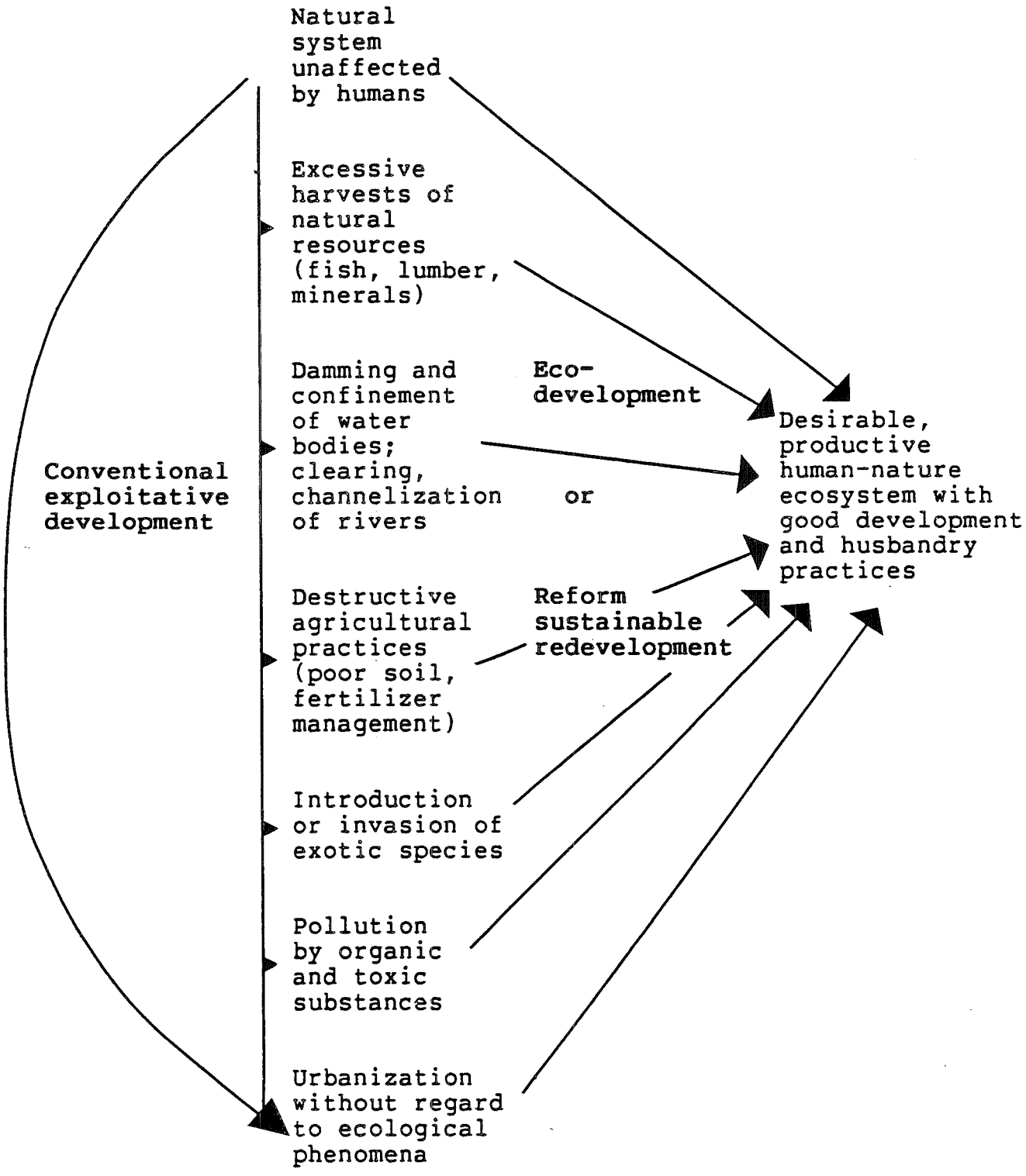

Figure 1. Schema illustrating three pathways for development of aquatic resources.

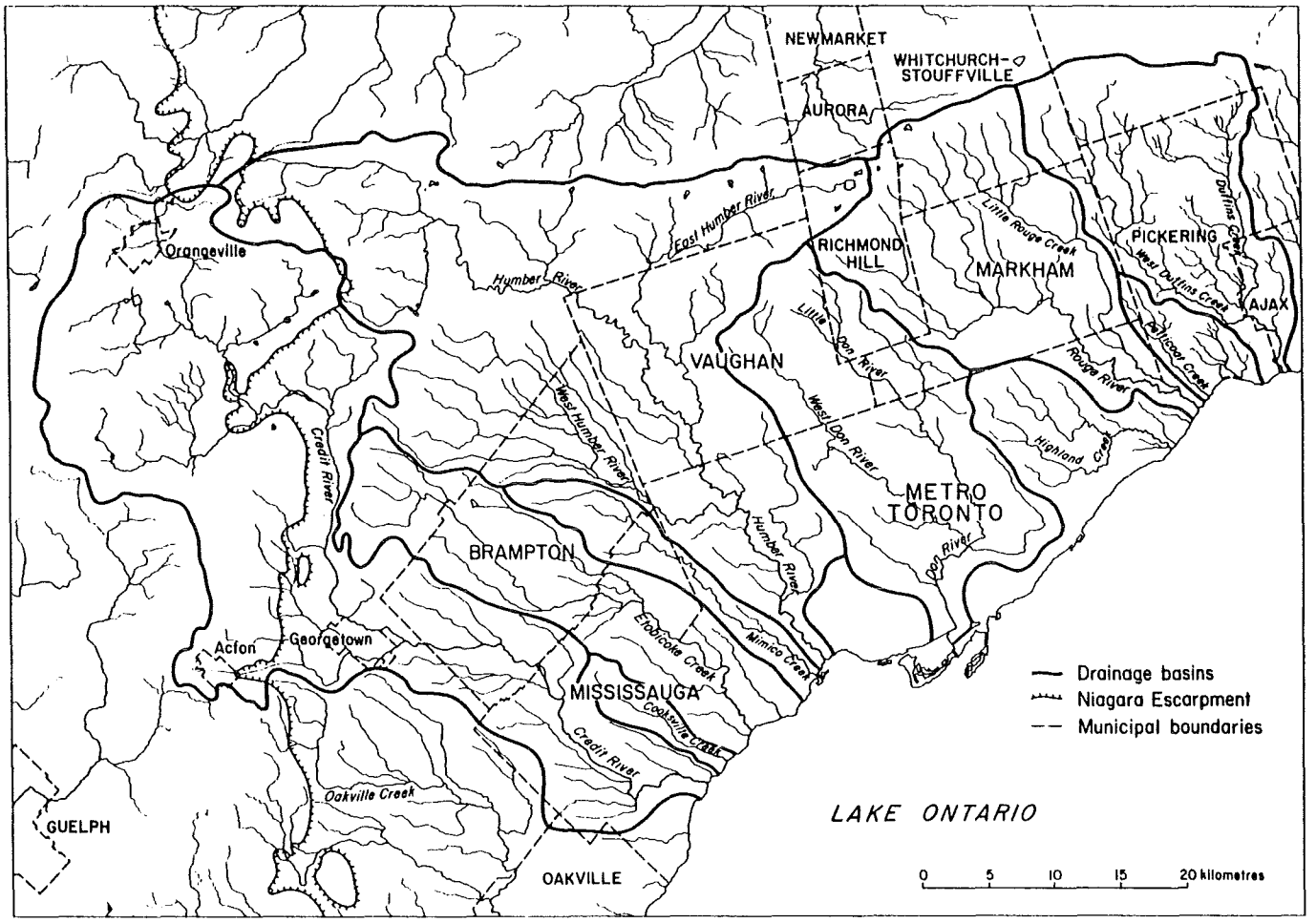

Figure 2. The Toronto Aquatic Ecosystem.

interdependency and the need to coordinate their protection, rehabilitation and management.

Historical Conditions and Ecological Baselines

Prior to settlement in the late 1700's, the Toronto area was almost completely forested. Small areas, such as the "poplar plains" on the Don River, were in a more open condition, probably following fire, blow-down or disease outbreaks.

Several inferences may be drawn regarding the state of aquatic habitats in forested, humid-temperate areas of North America prior to about 1800. Evidence for these inferences comes from comparative and historical studies in the Great Lakes area, the Pacific Coast, and the Midwest U.S. Some local documentation from the Toronto area exists.

Hydrology Tree canopies, pit-and-mound microtopography and absorbant organic soils almost completely eliminate overland runoff in forested watersheds. Water percolates through upper soil layers and reaches stream channels primarily as groundwater seeps or springs. Both flooding and low flows occur in streams, but not with the frequency and severity exhibited after clearing of the forest.

Temperature Groundwater is the major source of stream flow in forested basins. In springs and seeps it generally issues from the ground at a temperature close to the **mean annual air temperature** for the region. In the Toronto area this is about 9°C, or clearly within the preferred temperature range of brook trout and Atlantic salmon that were native to these streams. Dense riparian or streamside forest shades watercourses during summer, and helps prevent solar radiation from warming stream water. Historically, when rivers of the Toronto area received large inputs of groundwater and were extensively shaded, they were probably cool or cold for much of their length, rather than just in the headwaters as is now the case.

Wood Forests deposit large quantities of wood, in the form of branches and boles, into stream channels. In small tributaries most wood is too large to be moved a great distance by the water, and tends to stay where it falls. Fallen logs are often incorporated into the stream channel where they help to create a "stair-step" stream profile consisting of alternating riffles and plunge pools. In larger streams wood is often moved by floods to bends or constrictions in the channel, where it forms log jams or debris dams. Historically, some log jams on larger rivers in the Great Lakes region were known to be kilometers long. Log jams cause rivers to branch into multiple channels, and promote the formation of diverse aquatic habitats such as backwaters, meander cut-offs, plunge pools and gravel bars.

Beaver Beaver were once widespread and abundant throughout forested areas of North America, and were a prime motivation for initial European settlement of the continent. Many headwater streams were dammed by beaver, creating high water tables and extensive areas of impounded water.

Floodplains Many historical aspects of Toronto's river systems as described above, acted to retain and retard the flow of water and

particulate material within the stream network. During high flow periods water would overflow the main river channel (often for several weeks during spring flood), and find its way downslope through forested floodplain areas adjacent to the river. As the water velocity dropped in the off-channel areas, much of its load of suspended sediment was deposited, producing rich floodplain soils and ensuring that only moderate silt loads reached lower portions of the river.

Wetlands Large and complex wetlands developed in river mouths such as the Humber, Don and Rouge Rivers, as a result of low gradients, flooding and sediment deposition. Levees or longitudinal dykes often formed at the edges of estuary channels, so that lateral wetlands were largely isolated from the river channel during low flow periods. River mouths and coastal wetlands were often separated from the main lake by temporary barrier beaches thrown up during storms. These networks of levees and barrier beaches may have protected warm nearshore areas from upwelling of cold lake water, when strong northerly winds blew warm surface waters offshore. Species that prefer warm waters in summer, such as black basses, northern pike and muskellunge, thrived in such habitats.

Fish Associations Early observers in the Toronto area reported diverse and abundant fisheries in the rivers, wetlands, harbour and nearshore. In general, these unexploited fish populations were dominated by large, older individuals. Atlantic salmon, lake trout, northern pike and lake sturgeon all reached weights in excess of 10 kg. Riverine, wetland and nearshore habitats were used for reproduction, nursery areas and feeding, by resident species and migrants from the open lake. Migration and reproduction were timed to coincide with annual cycles of flooding and vegetation growth in the wetlands and floodplain, and of scouring of spawning gravels or rubble in the rivers, the nearshore and shallow shoals.

A Degradation Syndrome Associated with Commercialization, Industrialization and Urbanization

The major ecological stresses of human origin affecting the Toronto Aquatic Ecosystem have changed over the last 200 years, as human activity in the basin has changed. Initial stresses in the 19th Century were associated with intensive fish harvest in the bays and rivers, widespread forest clearing in the watersheds, construction of hundreds of mill dams, and the dumping of bark, sawdust and organic waste into the waters. Since then some of these stresses have run their course - there are no more forests to clear. Others have been partially removed or remediated - primarily sewage and other organic inputs to rivers. The most important stresses nowadays are those associated with extensive urbanization of the watersheds. These stresses include physical restructuring of the watershed and aquatic habitats, altered patterns and intensity of runoff, poor water quality, introduced fish species and persistent toxins and contaminants.

Degradation of Rivers and Streams

Healthy rivers depend on healthy watersheds, where vegetation, soil, groundwater and drainage networks act together to buffer and repair the erosive action of running water. When a watershed undergoes extensive

urbanization, the properties of the land surface are dramatically altered. The forested landscape, with its many features that act to retain rain and meltwater, is replaced with an altered drainage system designed primarily to carry water from the land surface as quickly as possible. This phenomenon of increased surface runoff is at the root of stream degradation in urban areas. Symptoms of channel enlargement, habitat loss and impaired water quality tend to follow as secondary effects, although these may also be caused directly by construction, waste dumping or other activities.

As a river basin is converted from forest and agriculture into urban land use, the proportion of land surface that is impervious to storm runoff is greatly increased. Rather than pooling in the inumerable pits and pockets of a forest landscape, and soaking through porous leaf litter and organic soil to the water table, stormwater washes quickly over rooftops, parking lots and roadways, and enters an efficient underground drainage network, or sewer system. In the process, the water picks up a load of animal waste, silt, oils, metals and chemical contaminants, as well as domestic sewage from combined sewer overflows or illegal sanitary sewer connections. Because most rain and melt water flows quickly off the city surface, little water is left to recharge groundwater supplies, and headwater streams tend to dry up between runoff events. This transformation of the river system may be viewed as a shift from slow, predominantly **vertical** or downward movement of water through groundwater pathways, to rapid, predominantly **horizontal** or lateral movement of water via surface pathways.

Efficient transport and concentration of storm runoff causes urban watercourses to be loaded for short periods of time with much higher flows than occur in forested systems of similar size. In an effort to enable urban watercourses to carry increased flows without flooding, municipalities often straighten and smooth the stream channels. In a cleared and straightened urban stream, the kinetic energy of flowing water is not dissipated by meanders, tree roots and log jams, and is free to work on the banks and bed of the channel. Erosion and destruction of property and aquatic habitat may result. A common remedy for this problem has been protection of urban channels with rock or concrete. However, such measures may simply displace the erosion problem downstream to a location below the armoured reach.

In downtown Toronto, most streams draining watersheds smaller than about 15 km^2 have been converted to underground sewers. As has been the case with historical stream systems along the waterfront, such as Garrison, Russell and Taddle Creeks, most remaining tributaries on the urban fringes may be buried if present trends continue. Larger streams that are left above ground in Toronto are generally confined to straightened, high-gradient channels, often armoured with concrete or gabion baskets, and relatively devoid of natural habitat features. This has happened to the lower Don River, Black Creek on the Humber and Taylors Creek on the Don.

A generalized degradation sequence for a Toronto stream, from the time of European settlement to present, is as follows:

1795 - removal of beaver dams and log jams, to allow navigation by canoe; removal of choice timber from the basin, for export.

1800 - construction of mill dams, dumping of bark and sawdust into stream;

1820 - clearing of large portions of the watershed for agriculture; warming of the stream, increased siltation of lower reaches; more severe floods in spring, very low flows during dry weather;

1840 - increasing urban settlement of basin; construction of first sewers draining into stream; industry locates along lower reaches - dyeworks, feedlots, breweries, distilleries, cheese factories; overharvest of spawning Atlantic salmon;

1860 - widespread concern about water quality in streams; dumping of fill along edges of ravines; tributaries along lower reaches enclosed in buried pipes, their ravines completely filled; floodplain of main river drained and developed; bigger floods with bridges and mill dams washed away; only a few Atlantic salmon returning at spawning time;

1900 - dredging and straightening of main river to reduce flooding of former floodplain; levees or dykes constructed along some sections;

1930 - basin mostly sewered; construction of dozens of small sewage treatment plants along river, that were soon overloaded; much of river in cesspool-like state;

1950 - persistent organic contaminants begin to enter the drainage system, accumulating in sediments and biota;

1960 - small sewage treatment plants being removed as sewage is routed to large facilities of waterfront; stormwater loadings becoming particularly destructive - large reservoirs and concrete channels constructed to reduce flooding and erosion;

1970 - increasingly rapid suburban development; burial of tributaries, channelization, and erosion problems extending to upper portion of watershed; analytical technology now sensitive enough to detect certain organic contaminants in sediments and biota;

1977 - first "Guide to Eating Ontario Sportfish" issued, outlining contaminant levels in fishes from 167 locations in Ontario;

1987 - general recognition of need to manage urban waters within an integrated, "ecosystem" approach; options for **ecodevelopment** of healthy waters, and **redevelopment** and **rehabilitation** of degraded waters are coming to be defined and implemented.

Past responses to urban runoff have emphasized control of storm runoff **after** it reaches stream channels. Only partial solutions are available, requiring expensive, dangerous and unsightly concrete and wire channel structures, or the complete obliteration and burial of natural drainage features. Many desirable attributes of natural watercourses are not protected at all by such an approach, and these values are in essence "written off" as a cost of urban development. These costs are not borne by

developers, but by people who live near the streams.

Recent scientific, planning, and engineering perspectives emphasise control and treatment of urban runoff **before** it enters drainage channels. Control measures can be diffuse, simple and inexpensive, if they are incorporated in plans for development or redevelopment. Where this is not possible, as in high-density residential or industrial areas, natural attributes of watercourses may be partially restored by planting riparian vegetation and providing off-channel retention basins that can serve as "floodplain wetlands".

Degradation of River Mouths, Bays and Nearshore Areas

Shoreline restructuring, contamination and poor water quality have been recognized as the most important degradative influences on wetland and nearshore habitats in the Toronto area. Due primarily to habitat destruction, 20 of the almost 50 native fish species historically associated with the lower tributaries, wetlands and bays of the Toronto Waterfront are extirpated or have not been recorded locally for decades, including the Atlantic salmon, lake whitefish and lake herring.

Extensive wetlands along the Toronto Waterfront, which once supported vast numbers of waterfowl and game fish, have been virtually eliminated by dumping of fill to provide dry land for industry, harbour facilities, roads and residential development. The largest, Ashbridges Bay at the mouth of the Don River was formerly 6 km^2 in size; it was almost completely filled between 1913 and 1928 to create the Eastern Harbour Terminals. Degraded wetlands remain at the mouth of the Humber (1 km^2), and on the Toronto Islands. Portions of other wetlands still exist in less degraded states at the mouths of the Credit River, Rouge River, Frenchmans Bay and Duffins Creek (Fig. 3). The diverse nearshore habitats of the Lake Ontario shoreline and Toronto Harbour have been largely eliminated by restructuring and filling of the shoreline to provide docks, piers and railway lands. Offshore spawning shoals used by lake trout were removed by "stone hooking" ships in the 1800's, which dredged the rocky shoals for building material.

At the time of European settlement Toronto Bay (now Toronto Harbour) contained "beautifully clear and transparent" water. Since about 1840, water quality in the Harbour and adjacent waters has been moderately to severely degraded, primarily as a result of sewage from the City of Toronto. Water quality declined until about 1912, when most sewage was diverted from the Harbour to Ashbridges Bay. At that time a layer of sewage sludge blanketed the bottom of the Toronto Harbour, and had to be dredged annually so ships could dock. Since then sewage and other organic loadings have decreased, although effluent from combined sewer overflows and storm sewers still causes high fecal coliform levels in the Harbour and adjacent waters. Increasing levels of turbidity, chloride and persistent toxic chemicals indicate continued degradation of nearshore water quality, now primarily from urban runoff and untreated industrial waste.

Present State, Future Trends

Valuable clues about future states of the Toronto Aquatic Ecosystem may

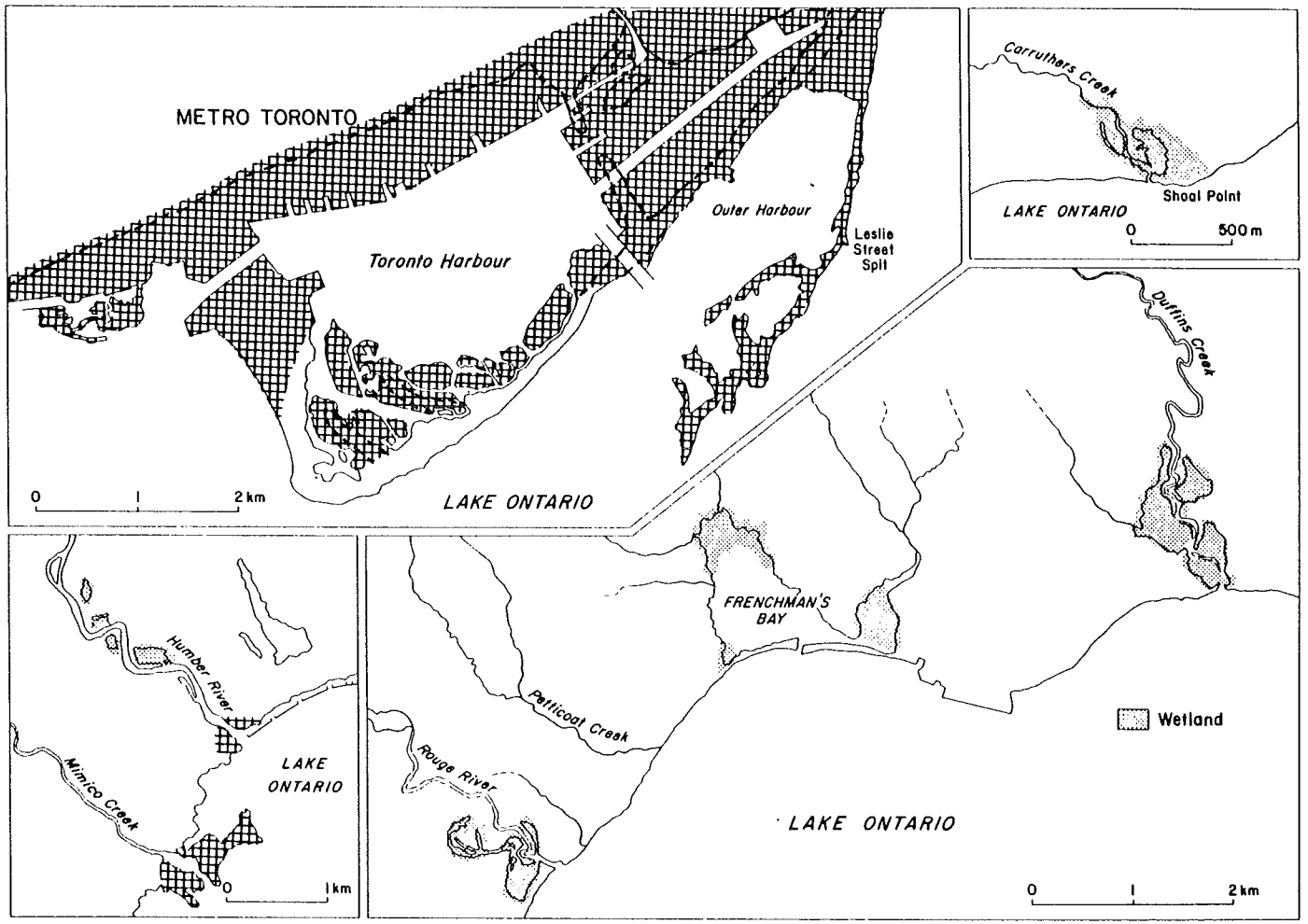

Figure 3. River mouth and nearshore wetlands in the Toronto area. Cross-hatching indicates landfill areas; dotted line indicates pre-landfill configuration.

be obtained by examining past trends and present spatial patterns in the "health" of Toronto waters. Relevant information on the relationships between human activities and ecosystem health has been found in a variety of indicators, including measures or indices based on aquatic biota, water quality, habitat and land use. Aquatic biota such as fish provide a temporally and spatially integrated view of the ecosystem, reflecting in their abundance and diversity such attributes as water quality, habitat diversity and stability, and linkages of terrestrial and aquatic habitats.

Rivers and Streams

The Index of Biotic Integrity (IBI) compares attributes of fish associations in streams and rivers with regional and historical norms. The spectrum of measures assessed by the IBI allows stream reaches to be ranked according to their ecological "health" as reflected by the diversity, abundance and condition of the fish supported there. Figure 4 shows the relative number of "excellent", "good", "fair" and "poor" sites in the TAE watersheds, according to IBI analysis. "Excellent" sites are now restricted to a few streams in forested areas of the Oak Ridges Moraine, on the fringes of the TAE. Loss of "excellent" fish habitat is usually associated with removal of streamside forest in rural areas. Streams in urbanized areas are all of "fair", or "poor" quality, or do not support any fish at all. Figure 5 shows the relationship of stream health with woodland, riparian forest and urbanization, for 10 Toronto river systems. Forest cover is clearly associated with healthy rivers; conversely, land clearing and urbanization are clearly associated with river degradation in the Toronto area.

Wetlands

A single index has not yet been developed for measurement of the "health" of river-mouth and coastal wetlands in the TAE. Because these wetlands provide elements of both riverine and lake habitats, as well as unique elements of their own, physical and biotic conditions are particularly complex and variable. Most wetlands in the TAE have been degraded by filling, sedimentation, poor water quality and contamination. In spite of this at least 36 fish species still use the wetlands for spawning, rearing, feeding or migration (Table 1). Characterization of fish associations may provide relative measures of ecological health in these habitats.

Nearshore

Most of the Lake Ontario nearshore within the TAE is now simplified with respect to fish habitat (Table 2). Historically, small coastal marshes, wood debris from rivers, submerged aquatic plants, gravel bars and shoals provided habitat for nearshore fishes. These areas, however, have long been dredged up or buried under landfill. Some of the best fish habitat is now provided by the numerous lakefill structures constructed since the 1970's along the Toronto shoreline. Fish associations are more abundant, diverse and consistent in the vicinity of lakefill structures, than they are along adjacent shoreline areas (Fig. 6). While lakefilling appears to partially compensate for lost shoreline diversity, future development must carefully consider long-term effects of contaminant concentration in and around these structures, and potentially undesirable

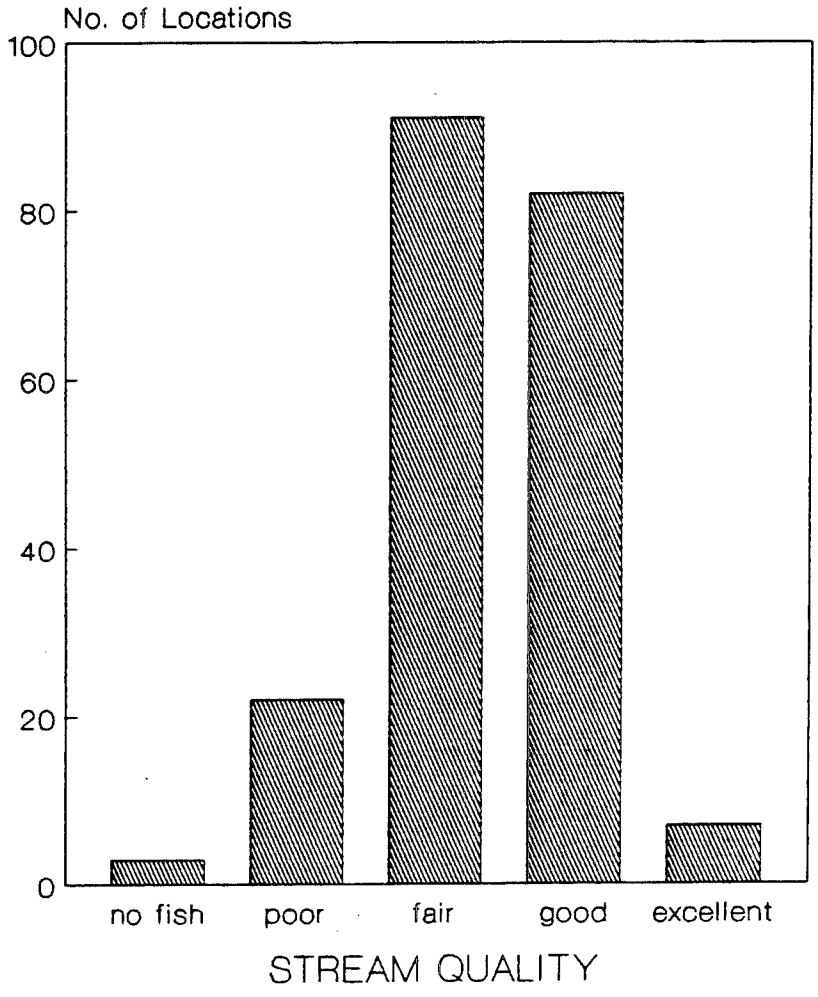

Figure 4. Frequency distribution of Index of Biotic Integrity (IBI) scores for locations on Toronto area streams. Data collected in 1985.

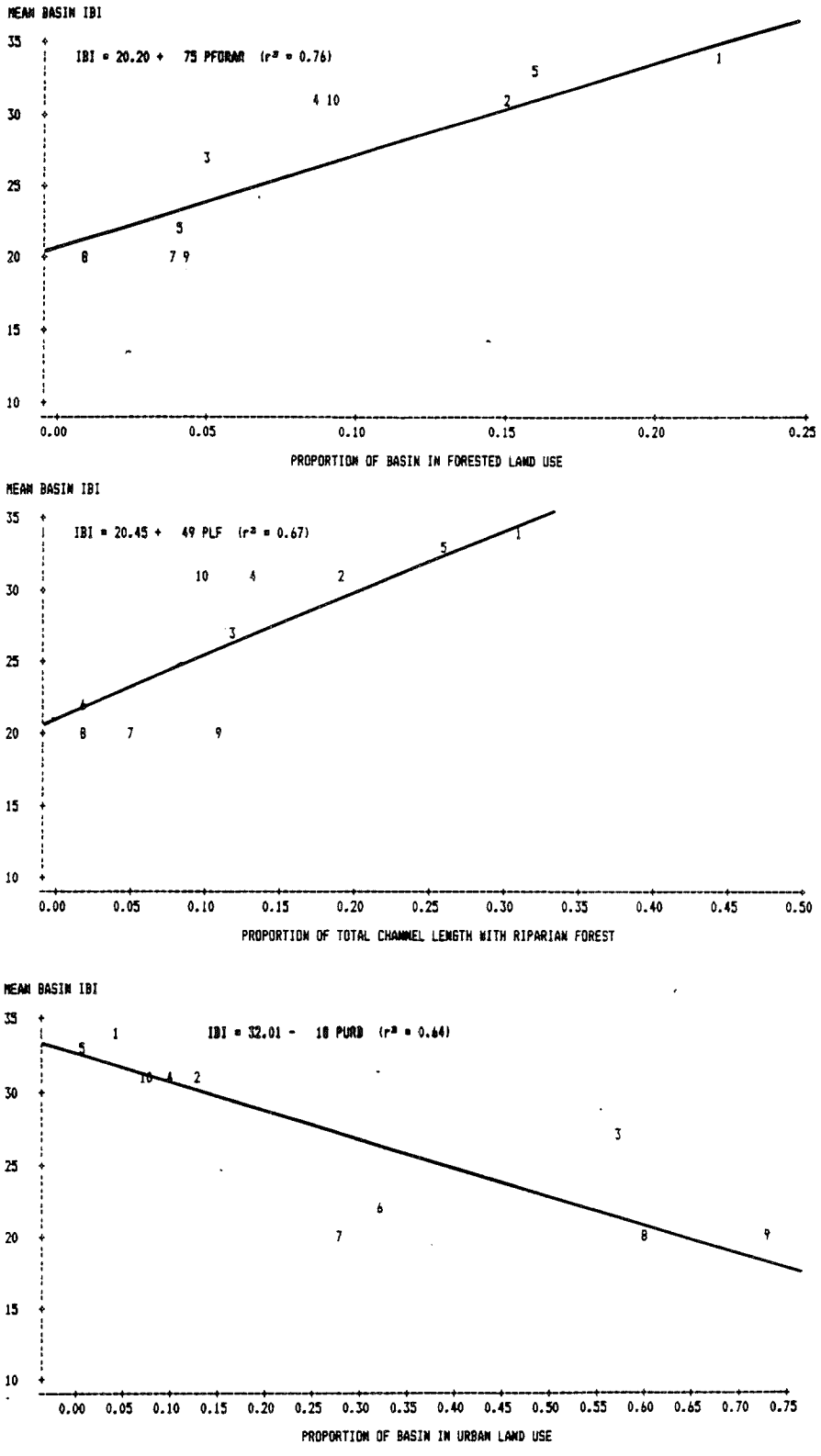

Figure 5. Mean basin IBI as a function of forest area, riparian forest and urbanization. Numbers on plot are watershed codes: 1 = Credit; 2 = Humber; 3 = Don; 4 = Rouge; 5 = Duffins; 6 = Cooksville; 7 = Etobicoke; 8 = Mimico; 9 = Highland; 10 = Petticoat

Table 1. Reproductive use of coastal marshes by fish. O = age I or older, not in spawning condition, S = spawning or ripe adults, Y = young-of-year. Data collected in 1986.

	HUMBER	ROUGE	FRENCH	DUFFIN	CARRUTH
GAME/COMMERCIAL					
carp	O S Y	O S Y	O S	O S	O S Y
brown bullhead	O S	O Y	O S	O S Y	O S Y
white sucker	O Y	O Y	O S	O S Y	O S Y
yellow perch	S Y	O S Y	O S Y	O S Y	O S Y
white perch	O S	O S	O S	O S	O S
white bass	O	O	O S	O	Y
largemouth bass	O Y	O S Y	Y	O Y	
smallmouth bass		O		O Y	O
black crappie	O S Y	O S Y	O S		
pumpkinseed	O S Y	O S Y	O S Y	O S Y	O S Y
rock bass	Y	O Y		O S Y	O Y
northern pike	O S	O S Y	O Y	O Y	O Y
bowfin		O S Y	O S		
rainbow trout		Y		Y	
rainbow smelt			O	O	
longnose sucker				O	
american eel			O		
FORAGE					
alewife	O	O Y	O S	O S Y	O
gizzard shad	O S Y	O S Y	O S Y	S Y	O Y
bluntnose minnow	O S Y	O S Y	O S	O S Y	O S Y
fathead minnow	O S Y	O S Y	S	O S Y	O
golden shiner	O S Y	O S Y	O	O S Y	O S Y
emerald shiner	O S Y	O Y	O S	O S Y	O S
common shiner	O Y	O S Y		O S Y	O
spottail shiner	O S Y	O S Y	O S	O S Y	O S
spotfin shiner	O			O S	
creek chub	O Y	O	O Y	O	O
brook silverside			S		
johnny darter	O	O S		O S	O
logperch				O	O
tadpole madtom		O Y			
central mudminnow		O	O		O
stoneroller		O			
longnose dace	O				
blacknose dace	O			O	
goldfish	O Y				

Table 2. Habitat types and wave exposure along the Toronto waterfront. Data courtesy of D.K. Martin.

Shoreline Type	Length (km)	% of Shoreline
Walls/Bulkheads	41.0	24.3
Armour Stone	32.0	19.0
Rubble	12.4	7.4
Cobble	3.2	1.9
Sand/Gravel	49.6	29.4
Silt	10.3	6.1
Macrophytes	12.4	7.4
Marinas	7.5	4.5
Total	168.4	100.0

Degree of Exposure to Open Lake	Length (km)	% of Shoreline
Protected by Land	63.5	37.4
River Mouth	17.7	10.4
Aquatic Parks	21.3	12.5
Natural Inlets	24.5	14.4
Partially Protected	30.9	18.2
Fully Exposed	75.4	44.4
Total	169.8	100.0

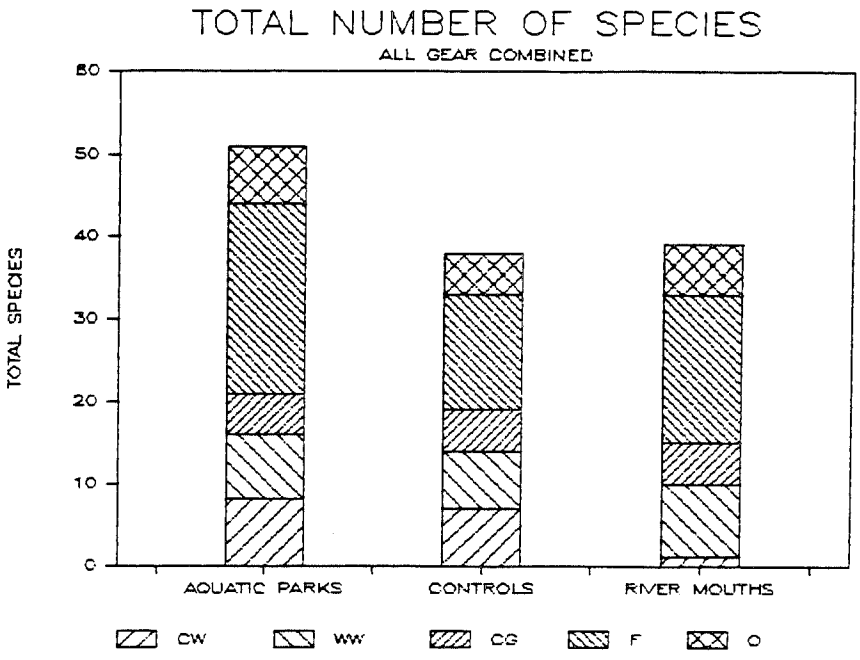

Figure 6. Fish species richness at aquatic landfill parks, river mouths and adjacent nearshore (control) areas. CW = coldwater species, WW = warmwater species, CG = coarse game fish, F = forage fish, O = other species. 1984 data, courtesy of D.K. Martin and B. Hindley.

disruptions in along-shore movements of water and sediment.

Discussion

Certain habitats or components of the TAE may be particularly important to the health and survival of both local and regional Great Lakes aquatic ecosystems. Relatively small or localized habitats that provide essential conditions for breeding, spawning, rearing and feeding of fishes may have an ecological role far more important than would be suggested by their size alone. In temperate aquatic ecosystems such as the Great Lakes, areas which we refer to as "centres of organization" tend to occur in the coastal or nearshore zone and exhibit distinctive combinations of abiotic and biotic characteristics.

The structural aspect of these centres results from the interaction of physical and biological processes involved in water movement, geomorphology, and development of vegetation. In a natural condition, structural and hydrologic features of river channels, complex coastlines, rocky shoals, estuaries and coastal wetlands are such that: 1) substrate and sediment accumulations are of a size and arrangement that either provides clean, well oxygenated substrate surfaces and interstices, and/or sediments suitable for the establishment of aquatic plants; and 2) disruptions by currents, wave action, ice movement, seiches or floods are of a frequency, intensity and predictability that allows a variety of plants and animals to colonize the area, either for the entire life cycle or for certain vulnerable stages (embryonic, juvenile, etc.) of the life cycle. With respect to native, valued species of Great Lakes fishes, the most important requirements of the early life stages, provision of oxygenated water and protection from predation, are best met in these types of areas.

In the Great Lakes basin, as elsewhere, there has been widespread destruction of nearshore and tributary structural features through activities such as shoreworks, channelization, land clearing, landfilling, land drainage, rock removal, dredging and siltation. The remaining locales that we consider to function as ecological "centres of organization" are indeed becoming identifiable as discrete and often isolated entities, probably much more so than would have been the case 200 years ago when such features dominated Great Lakes tributary and nearshore zones. In many areas, especially near older settlements such as Toronto, these features have been altered for so long that our best information about original conditions comes from historical maps and descriptions.

Development of the Toronto area has taken place with little or no planning to accommodate, preserve or enhance natural aquatic features of value to us. Steps to correct abuse and degradation of Toronto waters have frequently been undertaken, but have not considered the integrated nature of the aquatic resource, and have been only partially successful at best. Partially corrected abuses have been accumulating and interacting for many decades, and are now of an extent and intensity that threatens to isolate and eliminate Toronto's remaining aquatic resources.

Past mistakes have been well-documented and may be attributed to ignorance, haste and callousness. Practical understanding of the value of

our diverse aquatic ecosystems, and of techniques to support them are now well developed; gross negligence may be the only excuse for further degradation. There is now reason to believe that large cities and healthy aquatic habitats may not be as incompatible as past practice in Toronto would seem to indicate. Rehabilitation of Toronto waters to a sustainable, healthy and productive state can be accomplished through an "ecosystem" approach to development and redevelopment in the Toronto area.

Acknowledgements

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TORONTO AREA WATERS :

THE REGULATORY CONTEXT

The Canadian Environmental
Law Research Foundation

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TABLE OF CONTENTS

INTRODUCTION

1. INTRODUCTION

This paper has been designed to provide the reader with an overview of the regulatory environment governing the Metropolitan Toronto and Region Watershed.

Numerous federal, provincial and municipal government departments have a role in protecting the quality of Toronto's waters. These bodies are complemented by a multitude of boards, tribunals, Crown corporations, and other bodies created under specific acts. A list of the agencies and statutes discussed in this paper is included in the appendix.

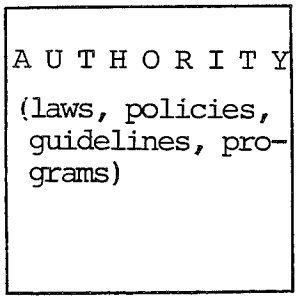
Information is presented in a flowchart format. Each chart is accompanied by a brief description. Circles have been used to depict the bodies involved in regulation, while squares represent the statutes, guidelines, objectives, programs or recommendations which apply. Dotted circles indicate bodies that are only involved under certain circumstances. The different levels of government have been separated by the use of horizontal lines.

This paper is subject to several limitations. An attempt has been made to depict all the major provisions for the regulation of the watershed; however, it has been impossible to provide an exhaustive presentation of applicable laws. Secondly, it has not been possible to include all the accords between agencies, or all delegations of authority from one body to another. Finally, the description of the division of responsibilities between regional and local municipalities has been based on the model provided by the Municipality of Metropolitan Toronto and its area municipalities. It must be recognized that this division of responsibilities will vary somewhat for each region. (In this paper, the Municipality of Metropolitan Toronto will be referred to as a "regional municipality").

Section two of the paper provides an overview of the regulatory context. The remainder of the paper is divided into parts which reflect separate policy aims. The third section discusses provisions aimed primarily at pollution prevention and control. The fourth part deals with laws designed to regulate specific uses of water. The fifth section describes the land use planning process which affects waterfront developments. The final section of the paper discusses regulatory initiatives which do not fall within any of the above categories.

1.1 FLOW CHART ABBREVIATIONS

COA	Committee of Adjustment (Municipal)
DFO	Department of Fisheries and Oceans (Federal)
DNR	Department of Natural Resources (Federal)
DOA	Department of Agriculture (Federal)
DOE	Department of the Environment (Federal)
DOT	Department of Transportation (Federal)
EAB	Environmental Assessment Board (Ontario)
EAP	Environmental Assessment Panel (Federal)
IJC	International Joint Commission
MAF	Ministry of Agriculture and Food (Ontario)
MOE	Ministry of the Environment (Ontario)
MIGA	Ministry of Intergovernmental Affairs (Ontario)
MMA	Ministry of Municipal Affairs (Ontario)
MNR	Ministry of Natural Resources (Ontario)
MOH	Ministry of Health (Ontario)
MOL	Ministry of Labour (Ontario)
MTC	Ministry of Transportation and Communication (Ontario)
MTRCA	Metropolitan Toronto Region Conservation Authority
NHW	Department of National Health and Welfare (Federal)
ODC	Ontario Development Welfare Corporation (Ontario)
OMB	Ontario Municipal Board (Ontario)
PAC	Pesticides Advisory Committee (Ontario)
THC	Toronto Harbour Commission (Federal)



ATDHA	Agricultural Tile Drainage Installation Act (Ontario)
BPA	Beach Protection Act (Ontario)
BNWA	Beds of Navigable Waters Act (Ontario)
BWT	Boundaries Waters Treaty
CAA	Conservations Authority Act (Ontario)
CA	Condominium Act (Ontario)
CAA	Clean Air Act (Federal)
CSA	Canada Shipping Act (Federal)
CWA	Canada Water Act (Federal)
DA	Drainage Act
DCA	Development Corporation Act (Ontario)
DGTA	Dangerous Goods Transportation Act (Ontario)
EAA	Environmental Assessment Act (Ontario)
EARPGO	Environmental Assessment and Review Process Guideline Orders (Federal)
ECA	Environmental Contaminants Act (Federal)
EPA	Environmental Protection Act (Ontario)
FCM	Fish Contaminants Monitoring Program (Ontario)
FeA	Fertilizers Act (Federal)
FA	Fisheries Act (Federal)
GEOSF	Guide to Eating Sport Fish in Ontario (Ontario)
GLFCA	Great Lakes Fisheries Convention Act (Federal)
GLWQA-78	Great Lakes Water Quality Agreement, 1978
HPPA	Health Protection and Promotion Act, 1983 (Ontario)
LRIA	Lakes and Rivers Improvement Act (Ontario)
MA	Municipal Act (Ontario)
MBCA	Migratory Birds Convention Act (Federal)
NWPA	Navigable Waters Protection Act (Federal)
OPDA	Ontario Planning and Development Act (Ontario)

OWRA	Ontario Water Resources Act (Ontario)
PA	Pesticides Act (Ontario)
PA,83	Planning Act, 1983 (Ontario)
PCPA	Pest Control Products Act (Federal)
PLA	Public Lands Act (Ontario)
Pr.PA	Provincial Parks Act (Ontario)
PTHIA	Public Transportation and Highway Improvements Act (Ontario)
PUA	Public Utilities Act (Ontario)
Pu.PA	Public Parks Act (ontario)
RAP	REmedial Action Plan
TDA	Tile Drainage Act (Ontario)
TDGA	Transportation of Dangerous Goods Act (Federal)
THCA, II.	Toronto Harbour Commissioners Act, I and II

REGULATORY OVERVIEW

2.0 REGULATORY OVERVIEW

P R E S C R I P T I V E / L E G I S L A T I V E ⟶ A D M I N I S T R A T I V E ⟶ A D J U D I C A T I V E

Level of Action / Actor	Elected Legislative Bodies	Government Departments	Commissions and Authorities	Administrative Tribunals	Courts
International	Signators of International Agreement		International Commission eg/ International Joint Commission		
Federal	Federal Parliament	Federal Ministries eg/ Environment Canada	Agencies under Federal Jurisdiction eg/ Toronto Harbour Commission	Federal Statutory decisionmakers eg/ Environment Assessment Review Board	Federally appointed courts eg/ Ontario District Court
Provincial	Legislature of Ontario	Provincial Ministries eg/ Ministry of the Environment	Agencies under Provincial Jurisdiction eg/ Metro Toronto Regional Conservation Authority	Provincial Statutory decisionmakers eg/ Environmental Assessment Board	
Municipal					
(A) Regional	Regional Council eg/ Metro Toronto Council; York Regional Council	Regional Departments eg/ Metro Works Department			Provincially appointed courts eg/ Provincial Offences Court
			Agencies under Municipal Jurisdiction eg/ Toronto Board of Health		
(B) Local	Local Council eg/ Toronto Council Markham Town Council	Local Departments eg/ Markham Public Works Department			

2. REGULATORY OVERVIEW

This chapter provides a general overview of the regulatory framework which governs Toronto Waters. This is done by describing the level of action (International, Federal, Provincial, Municipal), the type of action that can be taken at each level (prescriptive/legislative, administrative, adjudicative) and the nature and function of the actors involved (signators, legislators, regulatory bodies, administrative tribunals, courts).

The chart (opposite) indicates a spectrum divided into types of regulatory action. This spectrum ranges from a prescriptive action taken by way of international aggreements, federal, provincial or local law and policy creation (prescriptive/legislative) through implementation of these agreements, laws and policies (administrative) to the resolution of specific disputes or decisions arising from legislative or administrative action (adjudication). Many regulatory actions do not fit neatly within any one of these three types of action, but have characteristics of two or all of them.

For each level of action the chart indicates specific types of actors and approximately where those actors fit on the spectrum. The accompanying text outlines the function of each type of actor in the regulatory process.

2.1 Prescriptive/Legislative Action

For the purposes of this overview legislative or prescriptive regulatory activity can be defined as the first stage in the regulatory process where an actor, or group of actors, invested with the requisite power or authority, makes rules, policies, guidelines, or, in the case of interjurisdictional actors, multilateral agreements. This prescriptive action forms the basis and sets parameters for more specific actions or decisions.

At the international level this type of action is usually undertaken by representatives of various jurisdictions who negotiate international agreements. For example, both the Great Lakes Water Quality Agreement 1978, and the Niagara River Toxic Management Plan were negotiated and signed by elected officials representing each of the participating jurisdictions.

At both the Federal and Provincial levels, prescriptive or legislative activities are done not only by Parliament or the provincial legislature through the passage of legislation but also by Cabinet and individual cabinet ministers through the promulgation of regulations and the development of policies and guidelines. At the municipal level, prescriptive or legislative action is taken by regional or local councils through, for example, the passage of municipal by-laws.

2.2 Administrative Action

Administrative action can be defined as the implementation of prescribed activities such as international agreements, federal or provincial laws, policy initiatives, guidelines, or municipal by-laws. Administrative action could include monitoring and enforcing statutory requirements, issuing approvals for certain activities or specifying conditions which must be met before such activities are allowed to take place.

At the international level, international agreements are often overseen or implemented by boards or commissions comprised of appointed representatives of each of the participating jurisdictions.

Federal and Provincial laws and policies are implemented by the ministry responsible for overseeing the relevant legislation. For example, the Environmental Protection Act, Environmental Assessment Act, and Ontario Water Resources Act are largely the responsibility of the Ontario Ministry of the Environment, while activities undertaken pursuant to the Fish and Game Act are the responsibility of the Ministry of Natural Resources.

In addition, there are a number of independent bodies which are related to but operate independently of a particular federal or provincial ministry. For example, the Metro Toronto and Region Conservation Authority falls within the purview of the provincial Ministry of Natural Resources, but has its own jurisdictional boundary and responsibilities independent of the ministry and related to its mandate to protect, conserve, develop and manage natural resources and features within the Toronto watershed.

At the municipal level, administrative functions are performed by municipal staff, municipally-appointed committees, commissions and Boards. For example, a municipal sewer-use by-law could be monitored and enforced by staff of the municipality's public works department.

2.3 Adjudicative Action

An adjudicative decision-maker can be broadly defined as any actor vested with the power to resolve specific disputes or sanction specific activities or actions, usually after some sort of public hearing. For the purposes of this paper adjudicative decisions may be divided into two categories, those made by administrative tribunals and those made by either federally or provincially appointed Courts of Law.

(A) Administrative Decision-makers:

In contrast with courts, administrative tribunals are not always subject to strict rules of procedure, and do not always resolve clearly defined disagreements about legal rights. Their decisions usually fall between administrative actions, such as the standard setting or policy implementation done by government officials and regulatory bodies on the one hand and the purely judicial functions of courts on the other. For example, under Part V of the Environmental Protection Act, the Environmental Assessment Board (EAB) may be required to hold a hearing to assess the technical adequacy of an application for a waste disposal site and report its findings to the Ministry of the Environment who makes the final decision as to whether the permit will be allowed. Thus EAB's report could include recommendations outlining specific conditions of approval that set standards for the operation and for mitigation of environmental concerns. On the other hand, under the Environmental Assessment Act, the EAB could be required to make a final binding decision, which affects the rights of parties, by interpreting the provisions of that Act.

Administrative tribunals operate at both the provincial and federal levels. They are statutory bodies whose powers are derived from and defined by either provincial or federal legislation, and whose decisions must be based on the specific provisions of that legislation.

(B) Judicial Decision-makers

Judicial decision-makers are defined here as provincially or federally appointed courts. Unlike administrative tribunals, the function of courts is not defined by specific statutes and is not related to a particular legislative objective. Rather, the court's role is to exercise its constitutionally defined judicial powers. In the context of the regulatory framework governing Toronto's waters, court action can arise in a number of ways including:

- judicial review of administrative decisions

- a statutory right of appeal from an administrative decision

- public or private prosecution of activities prohibited by law

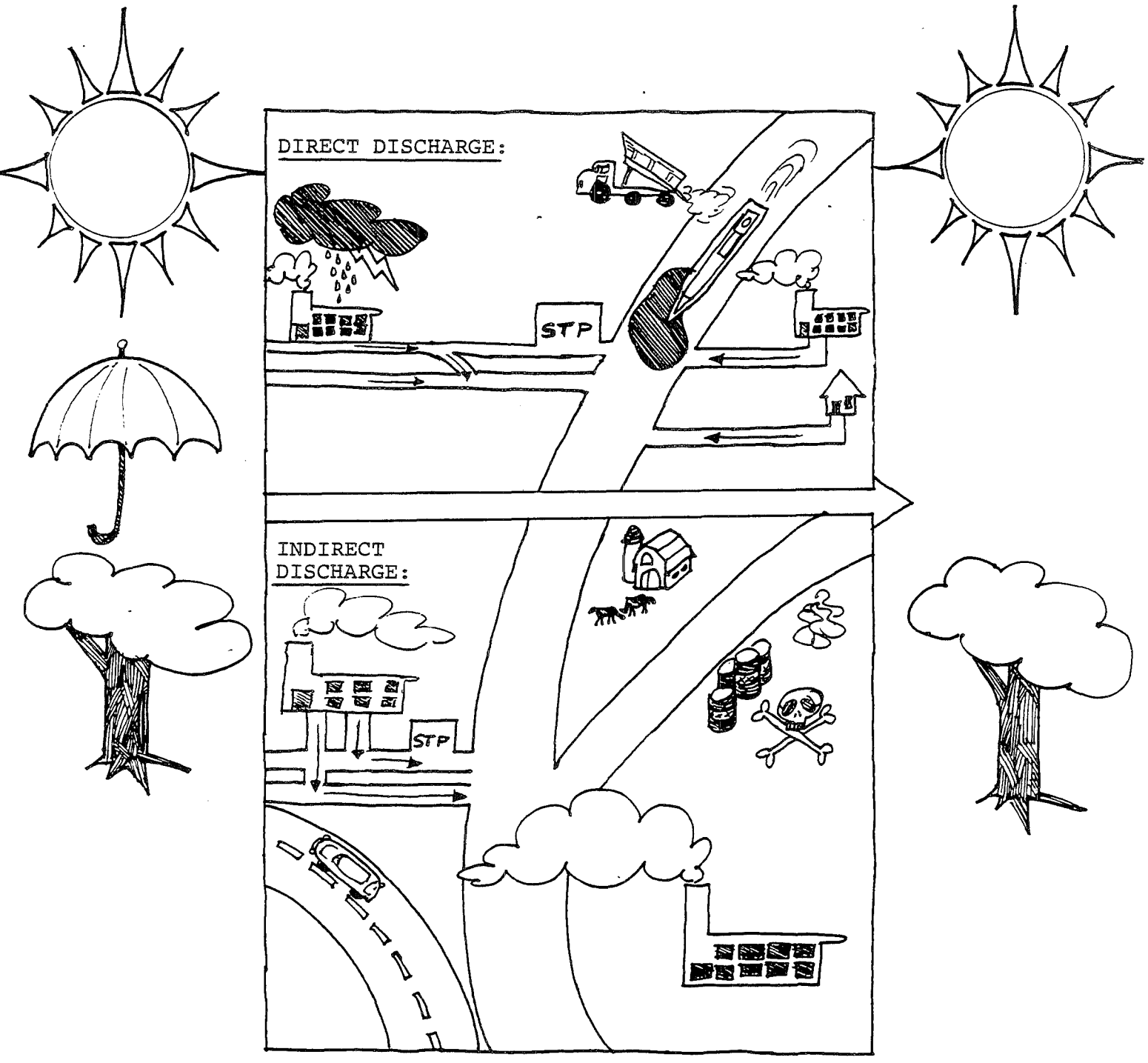
- civil action to obtain a remedy for breach of a statutory or common law right.

At both the federal and provincial level, courts may be called upon to interpret and enforce the penal provisions of statutes, or to review the actions of statutory bodies. Violations of provincial legislation will usually result in prosecution before a provincially appointed court. However, provincial offences could come before federally appointed courts. For example, failure to comply with the provincial court order could result in a prosecution in District or Supreme Court on contempt of court charges. Municipal by-laws are also interpreted and enforced in provincially appointed courts.

Finally, both federally and provincially appointed courts may hear civil actions based on the breach of private rights, and thus make decisions and grant remedies which could have an impact on the use of Toronto waters.

POLLUTION CONTROL

3. POLLUTION CONTROL



PREVENTION

REMEDIAL ACTION

3. POLLUTION CONTROL

Pollution control provisions are aimed at protecting the quality of water from contaminants which enter the watershed.

General Provisions for the Control of Water Pollution

Certain legislative requirements can be classified as general measures to control water pollution, since they control water pollution arising from any source or any activity. Such measures include:

- preventative measures, such as environmental assessments and orders to install pollution equipment,

- limits on the emission of contaminants, and

- remedial actions to restore environmental quality.

Direct Discharges

Controls over direct discharges regulate direct flows of contaminants into a watercourse. Direct discharges include effluents from storm sewers and sewage treatment plants, as well as material flowing into surface waters from industrial and domestic sources. However, material which is discharged into a sewer, rather than directly into the water, is considered an "indirect discharge".

Indirect Discharges

Indirect discharges encompass a wide variety of pollution sources, including:

i) discharges into storm, sanitary or combined sewers;

ii) runoff of salt and bacteria from roads and highways;

(more)

iii) leachate from waste disposal sites;

iv) agricultural runoff; and

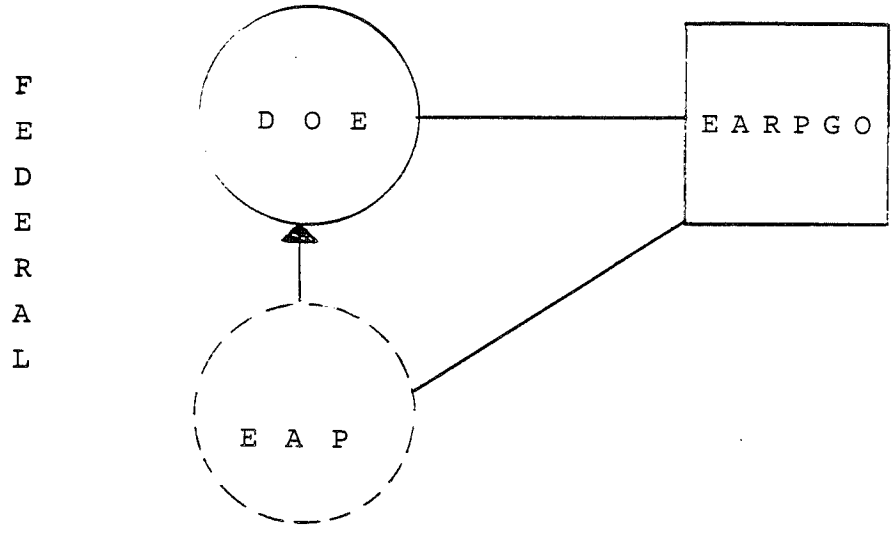
v) fallout from air pollution.

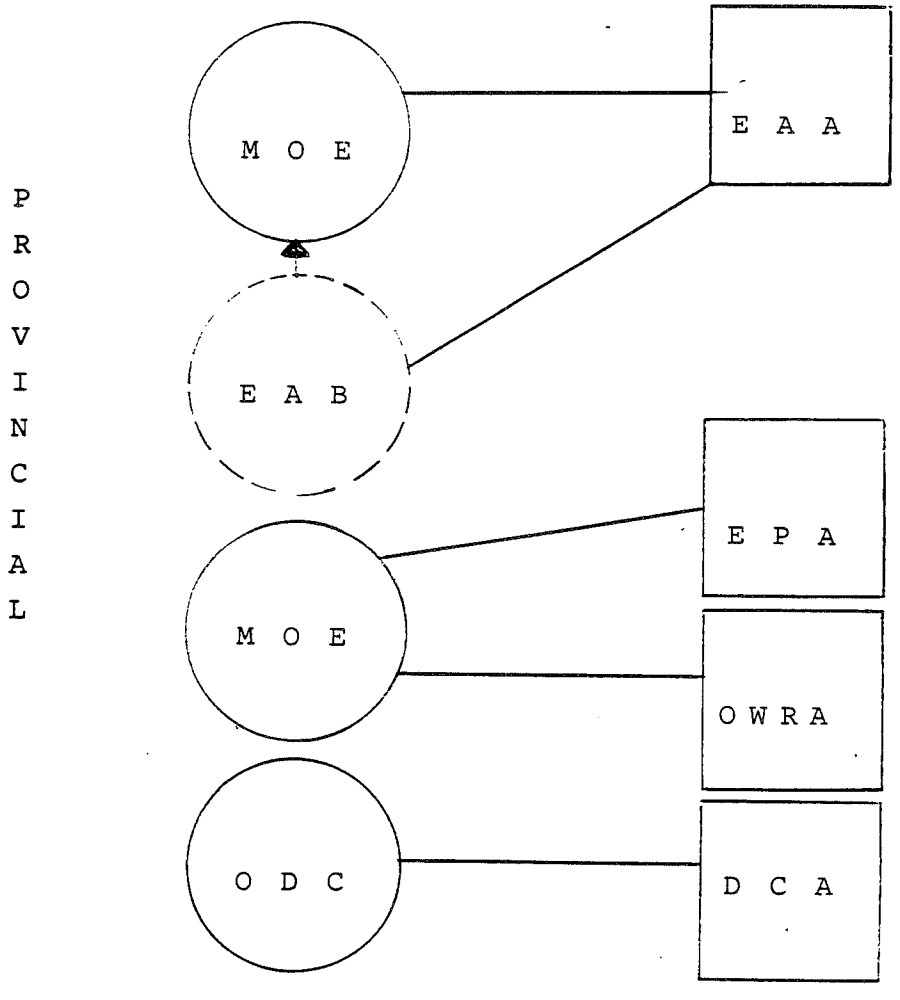
Spills and Emergencies

These laws deal primarily with unexpected, direct discharges into the environment.

3.1 GENERAL PROVISIONS FOR THE CONTROL OF WATER POLLUTION

(A) PREVENTION





3.1 GENERAL PROVISIONS FOR THE CONTROL OF WATER POLLUTION

THE PROBLEM:

Polluting material enters a waterway from a variety of direct and indirect sources. General prohibitions against contamination are therefore required to limit the degradation of water quality.

THE LAW:

Provisions which apply to water pollutants generally can be classified into three types: preventative measures which come into force before pollution occurs; sanctions intended to deter emission of excessive amounts or concentrations of contaminants into the water; and requirements to take remedial action once pollution has occurred.

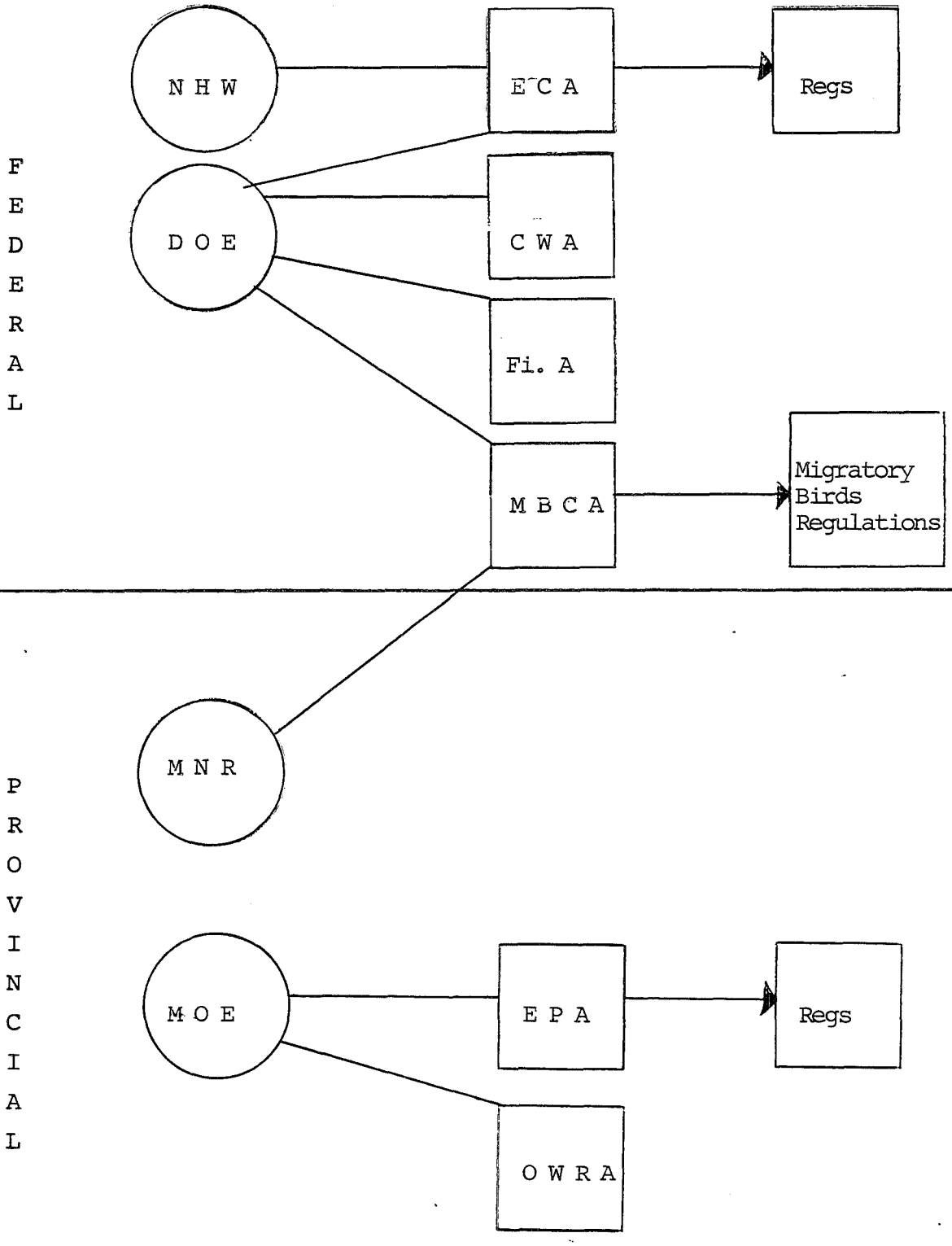
(A) Prevention:

Mandatory environmental assessments, requirements to install pollution control equipment, and the provision of financial and technical assistance to assist in pollution control are all methods which can be used to prevent or limit pollution.

Government undertakings are generally subject to environmental assessments. The federal Environmental Assessment and Review Process Guidelines Order applies to federal departments, boards, agencies, regulatory bodies and certain federal Crown corporations. The guidelines apply to any proposal that is initiated by a federal department, could have an environmental effect on an area of federal responsibility, is supported by federal funds, or is located in federal lands. Where a public review is required by the Guidelines, it is conducted by the Environmental Assessment Panel. The provincial Environmental Assessment Act requires a review of

3.1 GENERAL PROVISIONS FOR THE CONTROL OF WATER POLLUTION

(B) POLLUTION CONTROL



the environmental impact of undertakings carried out by the provincial Crown, provincial public bodies, and municipalities, unless they are specifically exempted. Designated major private undertakings must also undergo an environmental assessment. The Environmental Assessment Board will often hold hearings into the proposed undertaking, the environmental assessment, or the review of the assessment, pursuant to the terms of the Environmental Assessment Act. The Minister of the Environment has the power to vary its decision, substitute another decision, or require a new hearing.

Under certain circumstances the installation of pollution control equipment designed to control pollution may be ordered (s. 17 Environmental Protection Act; s. 18 Ontario Water Resources Act). Financial assistance to purchase pollution control equipment may be obtained from the Ontario Development Corporation under the Development Corporations Act.

(B) Pollution Control:

The Environmental Contaminants Act prohibits the release of specified substances into the environment during commercial or industrial activities, in quantities or concentrations exceeding those specified by the regulations (s. 8).

The Canada Water Act prohibits the disposal of waste into waters designated as a "water quality management area", except under the conditions prescribed for the area in question (s. 8). This provision is basically ineffective, because of the lack of designated water quality management areas.

The federal Fisheries Act also contains provisions that prevent the pollution of waters inhabited by fish. This Act is discussed below in section 4.4.

3.1 GENERAL PROVISIONS FOR THE CONTROL OF WATER POLLUTION

(C) REMEDIAL ACTION

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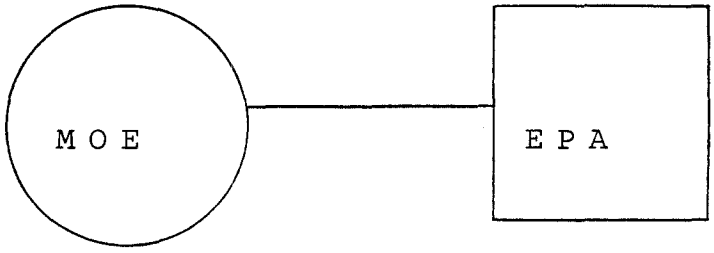


The Migratory Birds Regulations under the Migratory Birds Convention Act, prohibit any person from allowing a substance that is harmful to migratory birds to enter waters frequented by such birds (s. 35 of the Regulations). Employees of the Ontario Ministry of Natural Resources have been appointed as officers to enforce the provisions of this Act and its regulations.

Provincial legislation also sets contamination limits. Under the Environmental Protection Act, it is prohibited to emit any contaminant into the natural environment in a level exceeding that prescribed by regulation (s. 5). Section 13 also prohibits a person from discharging a contaminant that is likely to harm the environment, humans, animals, plants or property. Control orders may also be used to abate pollution. Stop orders may be used to prohibit polluting activity. (ss. 6 and 7, and Part X). Finally, a polluter may submit a program to the Ministy of the Environment to control the discharge of a pollutant into the natural environment. Compliance with program approvals or control orders will protect the polluter from prosecution under the Environmental Protection Act. (ss. 9 and 146 Environmental Protection Act).

The Ontario Water Resources Act prohibits the discharge of polluting material into any watercourse or into any place that may impair the quality of water (s. 16).

(C) Remedial Action:

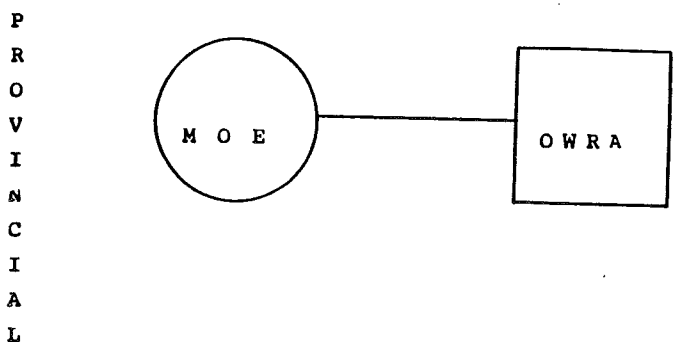
Whenever a contaminant has a harmful effect on water which forms part of the natural environment, the person responsible for the discharge of that contaminant may be required to repair the damage pursuant to an order under the Environmental Protection Act (s. 16).

Remedial Action Plans for Toronto Waters are described in Section 6.2.

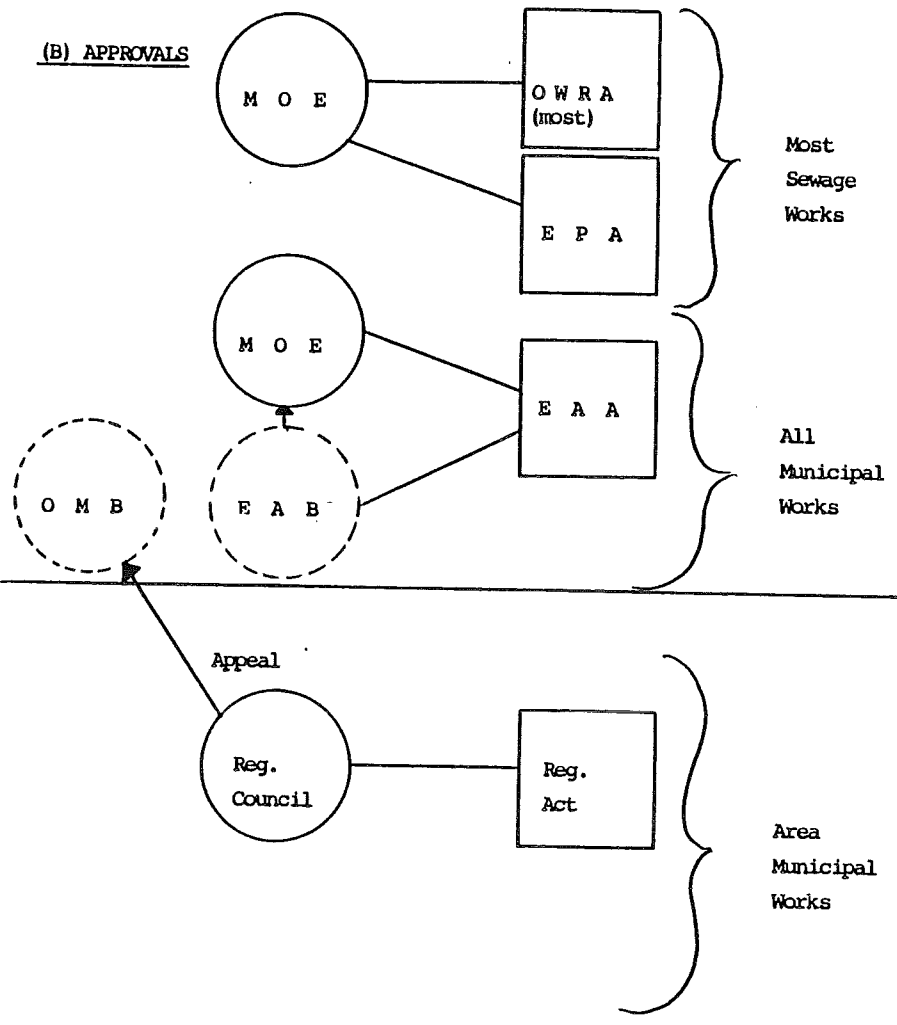
3.2 DIRECT DISCHARGES

3.2.1 SEWAGE WORKS

(A) INITIATION



(B) APPROVALS



3.2 DIRECT DISCHARGES

3.2.1 Sewage works

THE PROBLEM:

Effluents from sewage treatment plants suffer from bacterial and chemical contamination, indicating that sewage treatment is not completely effective. Another problem occurs when the capacity of combined sewers (which function as both storm and sanitary sewers) is exceeded, causing untreated sewage to overflow into the watershed.

THE LAW:

In considering the legal provisions below, it should be kept in mind that sewage works generally include works designed to carry land drainage, domestic sewage, or industrial waste, as well as sewage treatment plants.

(A) Initiation:

Sewage works can be initiated by the Ministry of the Environment or by a regional or local municipality (s. 33 Ontario Water Resources Act; s. 52 Municipality of Metropolitan Toronto Act; s. 210¶78 Municipal Act). In Metropolitan Toronto, the region is responsible for the larger trunk sewers and sewage treatment plants, whereas the local municipalities provide local sewers and sewer connections.

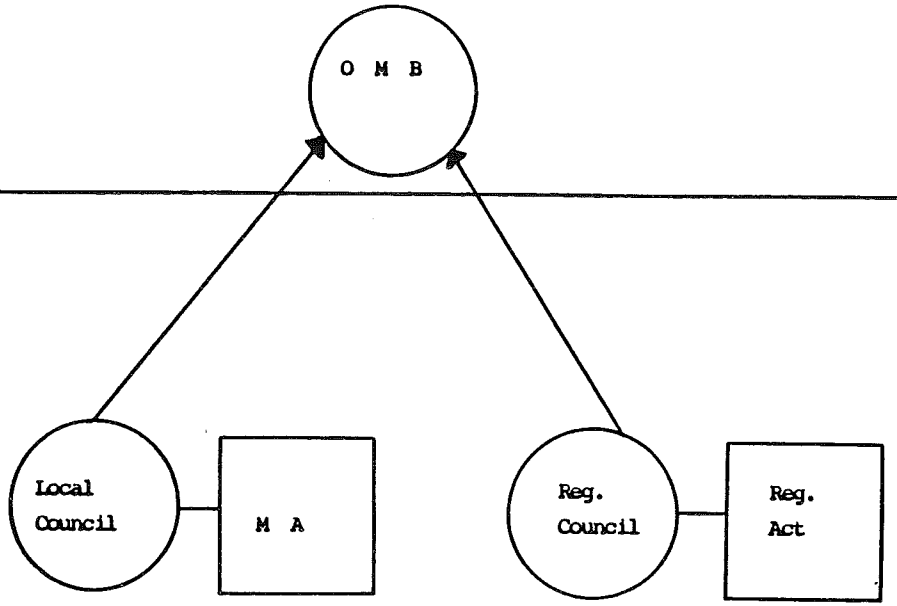
(B) Approvals:

Most sewage works must be approved by the Ministry of the Environment (s. 24 Ontario Water Resources Act; Part VII Environmental Protection Act). All municipal works are also required to undergo an environmental assessment

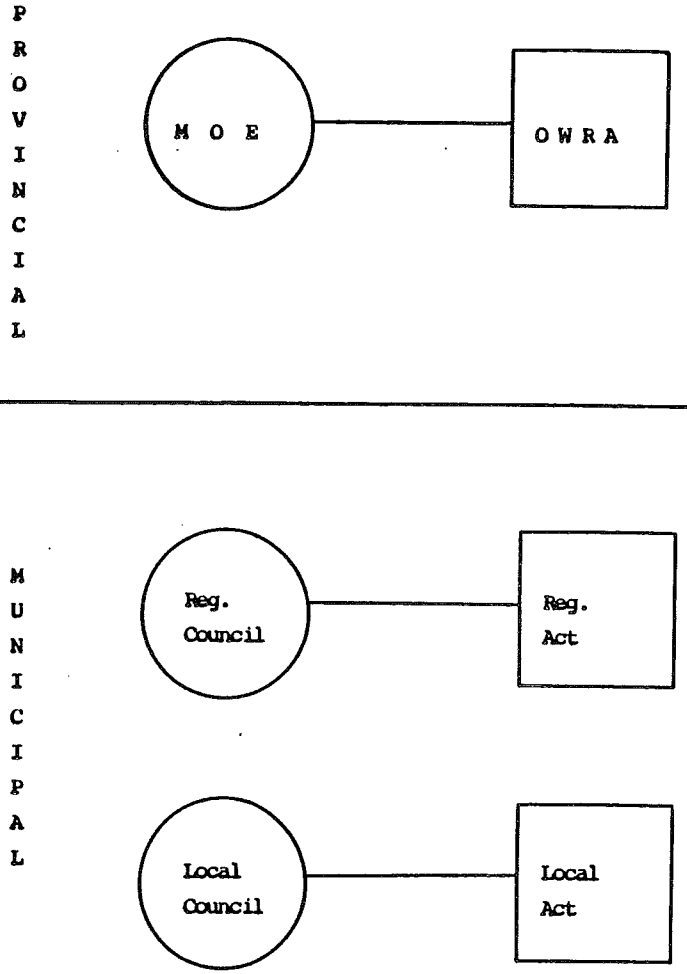
3.2 DIRECT DISCHARGES

3.2.1 SEWAGE WORKS

(C) FINANCING



(D) MAINTENANCE & REPAIR



under the Environmental Assessment Act, unless exempted. Finally, the regional municipality must give its approval to the extension of a local municipal sewage system which will discharge into the regional system. Where the region refuses to approve the extension, the local municipality has a right of appeal to the Ontario Municipal Board (ss. 59 and 60 Municipality of Metropolitan Toronto Act).

(C) Financing:

The approval of the Ontario Municipal Board is required for any municipal by-law passed to finance sewage works (s. 57 Municipality of Metropolitan Toronto Act; s. 218(2) Municipal Act).

(D) Maintenance and Repair:

Duties to maintain and repair sewage works are found in the Ontario Water Resources Act, and may be included in municipal by-laws. (Ontario Water Resources Act ss. 32 and 44(j); Municipality of Metropolitan Toronto Act s. 56(1); Municipal Act s. 210 ¶62, 77, 78).

(E) Pollution Control:

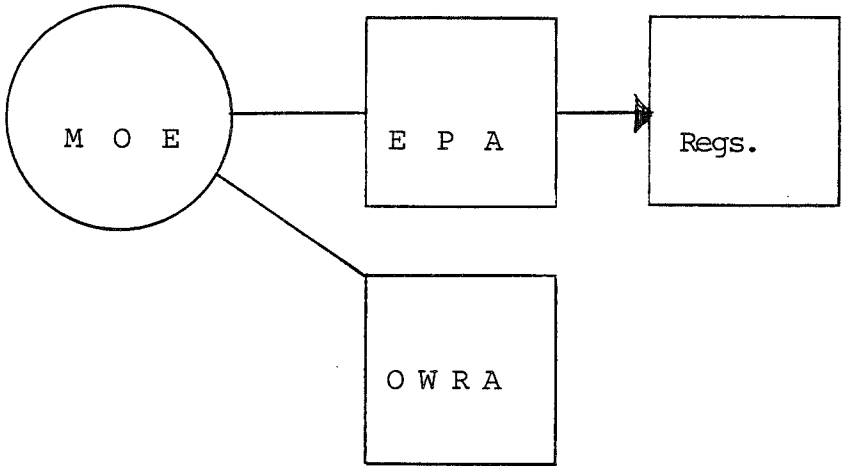
Direct discharges are subject to the general pollution prevention provisions found in the Environmental Protection Act and the Ontario Water Resources Act. (These Acts are discussed in Section 3.1 (B)).

3.2 DIRECT DISCHARGES

3.2.1 SEWAGE WORKS

(E) POLLUTION CONTROL

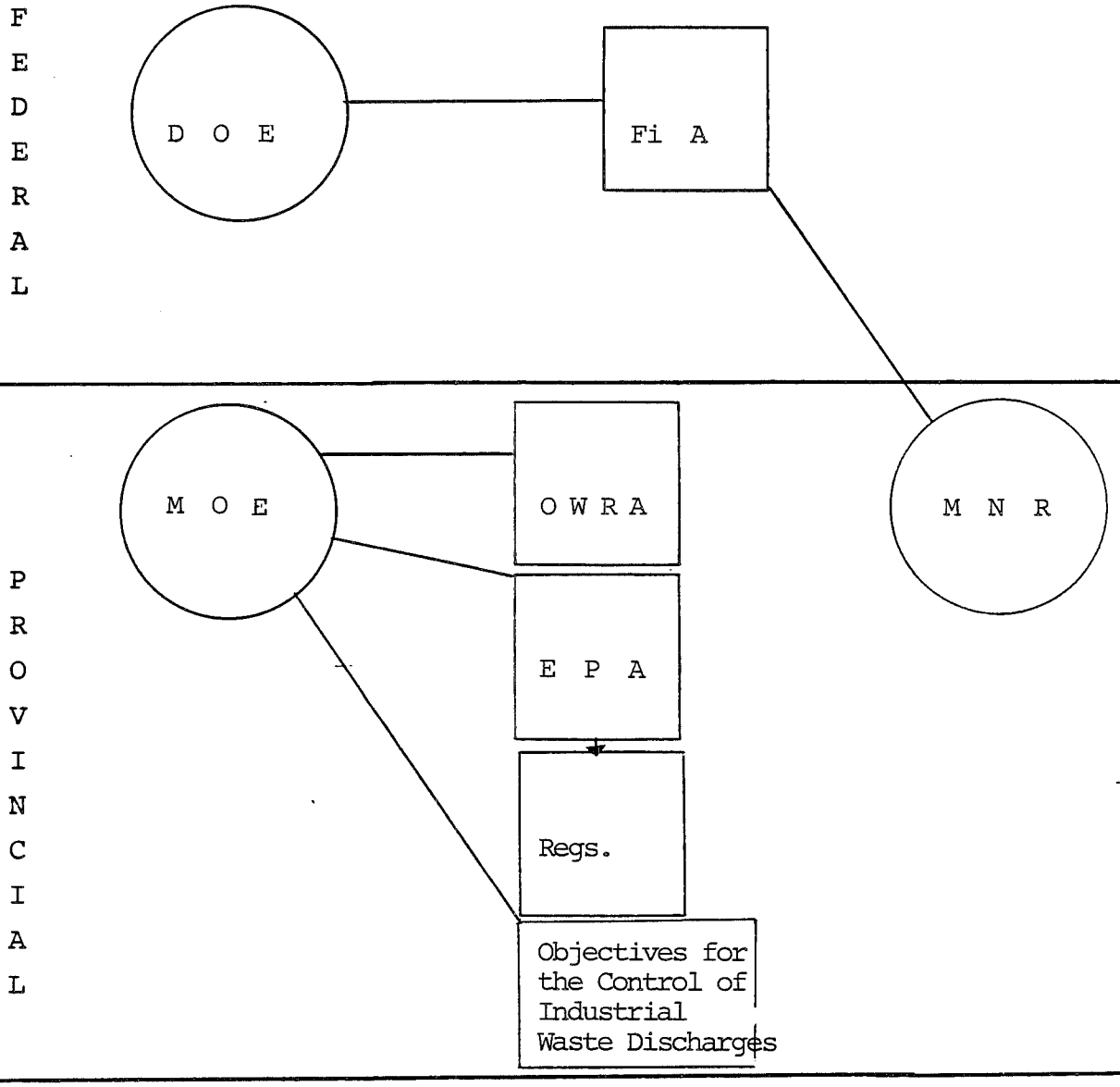
PROVINCIAL



MUNICIPAL

3.2 DIRECT DISCHARGES

3.2.2 OTHER DIRECT DISCHARGES



3.2.2 Other direct discharges

THE PROBLEM:

Unapproved or illegal discharges that drain directly into a waterway could severely impair its water quality.

THE LAW:

The Fisheries Act contains measures to prevent the pollution of waters inhabited by fish. (These are discussed in Section 4.4). The Ministry of Natural Resources has powers to enforce the Fisheries Act.

Direct discharges are also subject to the general pollution control measures in the Environmental Protection Act, and the Ontario Water Resources Act described in Section 3.1 (B) above. Section 17 of the Ontario Water Resources Act also permits a Director under that Act to issue an order to prohibit or regulate the discharge of sewage into a watercourse.

Non-enforceable "Objectives for the Control of Industrial Waste Discharges" have been prepared by the Ministry of the Environment.

The Municipal Act gives power to the councils of local municipalities to pass by-laws requiring owners to connect their buildings to municipal sewage works (s. 219).

3.3 INDIRECT DISCHARGE

3.3.1 DISCHARGES INTO SEWERS

(A) APPROVAL

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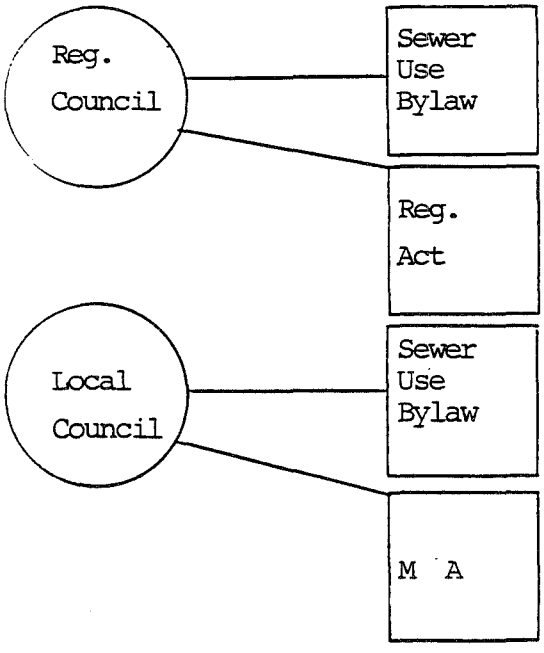


3.3 INDIRECT DISCHARGE

3.3.1 Discharges into Sewers

THE PROBLEM:

There are three basic types of sewers:

i) Storm sewers: These sewers carry storm water, drainage water and uncontaminated water directly into a watercourse.

ii) Sanitary sewers: These sewers carry domestic sewage and industrial sewage (including wastes) to a sewage treatment plant.

iii) Combined sewers: These sewers function as both storm and sanitary sewers and therefore require sewage treatment.

Contaminants discharged into storm sewers flow directly into watercourses. Discharges into sanitary and combined sewers affect the quality of the material entering sewage treatment plants, which in turn affects the quality of the effluent emerging from these plants. Finally, overflows from combined sewers enter the watershed directly without treatment.

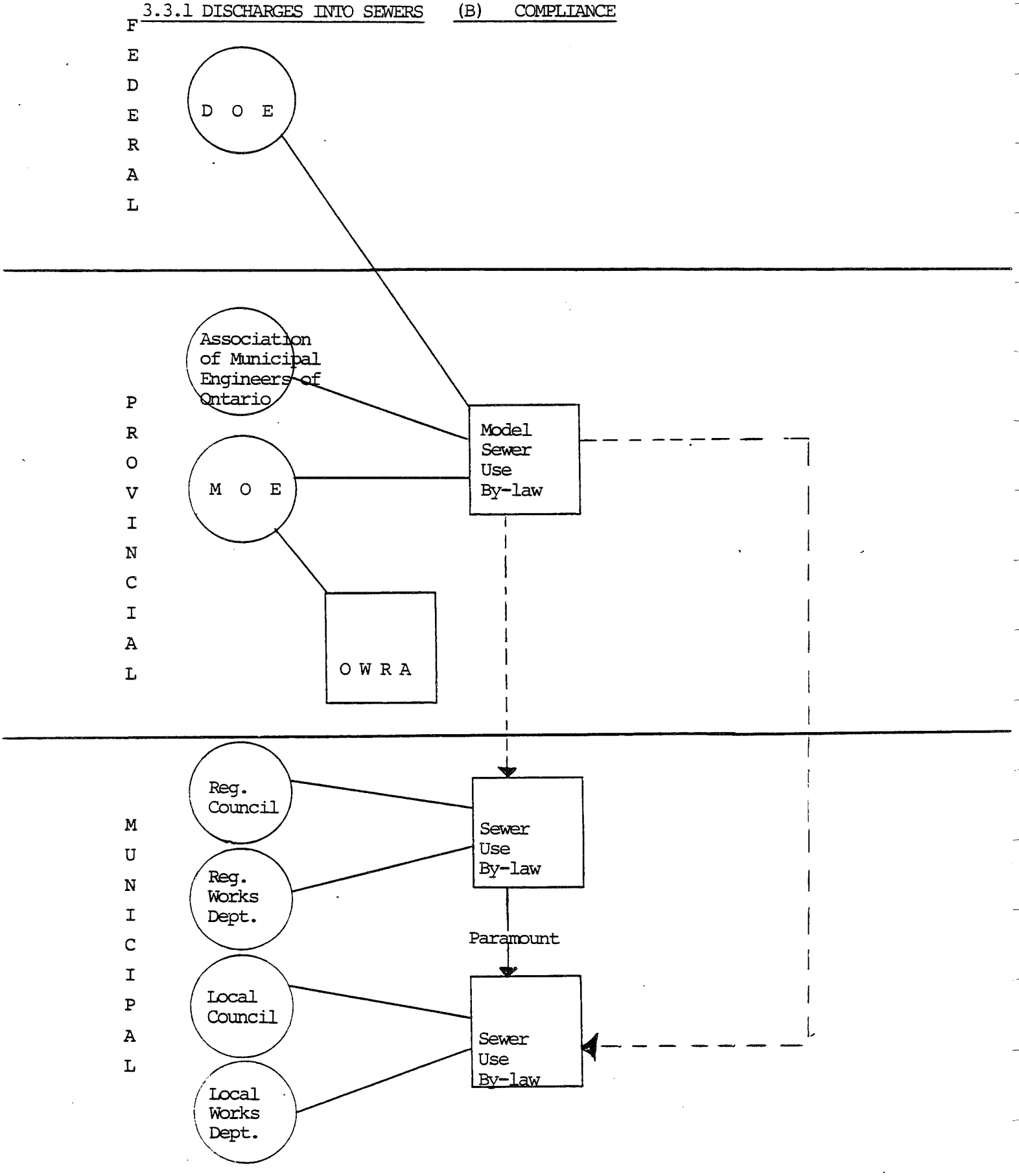
THE LAW:

(A) Approvals:

The regional council must approve the connection of any local work, private drain or private sewer to the municipal works (s. 58(1) Municipality of Metropolitan Toronto Act). Regional or local sewer use by-laws may also provide for agreements or program approvals which enable particular industries to discharge sewage, that would otherwise by prohibited by

3.3 INDIRECT DISCHARGE

3.3.1 DISCHARGES INTO SEWERS (B) COMPLIANCE



the sewer use by-law, into the municipal works (By-law No. 148-83 Metropolitan Toronto). These industries will be immune from prosecution to the extent of their compliance with these agreements.

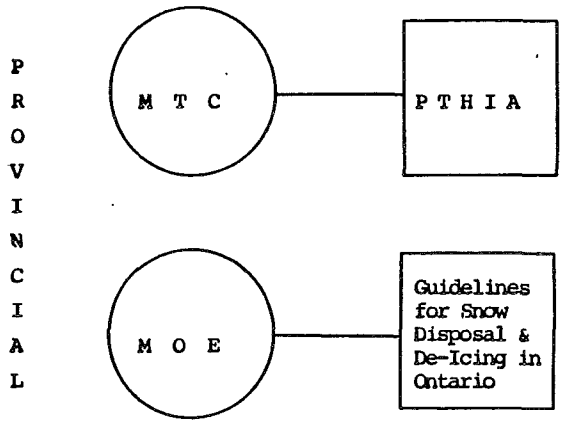
(B) Compliance:

At the provincial level, a Director under the Ontario Water Resources Act may require a person to stop or regulate any discharge which may interfere with the proper operation of sewage works (s. 52). Also, regulations under the Ontario Water Resources Act may regulate the content of sewage and drainage entering sewage works (s. 44 (f)). The Ministry of the Environment, along with the federal Department of the Environment and the Association of Municipal Engineers of Ontario, has developed a model sewer use by-law to assist municipalities in developing their own by-laws.

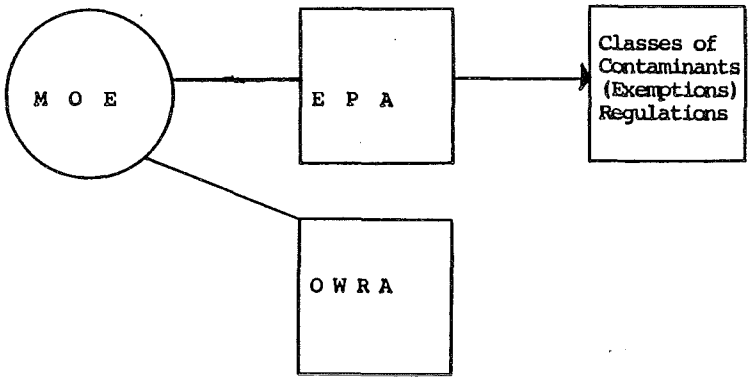
Municipal sewer use by-laws prohibit certain materials from being discharged into sewers. These by-laws are passed by municipal council and administered by the Works Department (ss. 56, 65a Municipality of Metropolitan Toronto Act; s. 210 ¶ 77, 78, 147 Municipal Act). The regional by-law can regulate matter which enters local municipal works if these works flow into the regional sewer system. This regional by-law is paramount to an incompatible local sewer use by-law (s. 56 Municipality of Metropolitan Toronto Act).

3.3.2 RUNOFF FROM ROADS AND HIGHWAYS

(A) DUTY TO MAINTAIN



(B) POLLUTION CONTROL



3.3.2 Runoff from Roads and Highways:

THE PROBLEM:

Bacteria, road salt, and other contaminants from roadways enter storm sewers and watercourses.

THE LAW:

(A) Duty to Maintain:

The Ministry of Transportation and Communications, the regional municipal corporation, and the local municipal corporation all have a duty to maintain the roadways falling within their jurisdiction (s. 33 Public Transportation and Highway Improvement Act; s. 284 Municipal Act). In this regard, the provincial Ministry of the Environment has also prepared the non-binding "Guidelines for Snow Disposal and De-Icing Operations in Ontario (1975)."

(B) Prohibition Against Pollution:

The Classes of Contaminants (Exemptions) Regulation (RRO 1980, Reg. 298) under the Environmental Protection Act states:

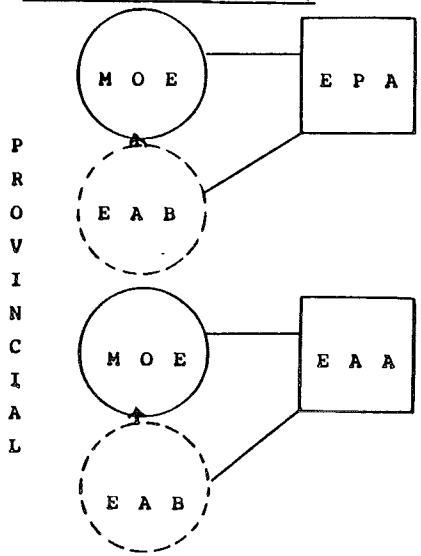
> 2. Where any substance used on a highway by the Crown as represented by the Minister of Transportation and Communications or any road authority or any agent or employee of any of them for the purpose of keeping the highway safe for traffic under conditions of snow or ice or both, it is classified and is exempt from the provisions of the Act and the regulations.

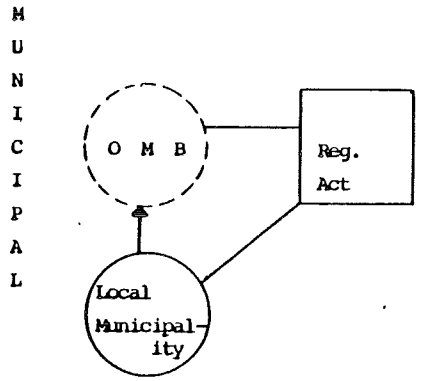
Therefore the Environmental Protection Act is not applicable.

The provincial Ontario Water Resources Act prohibits the discharge of polluting material into any watercourse or into any place that may impair the quality of water (s. 16).

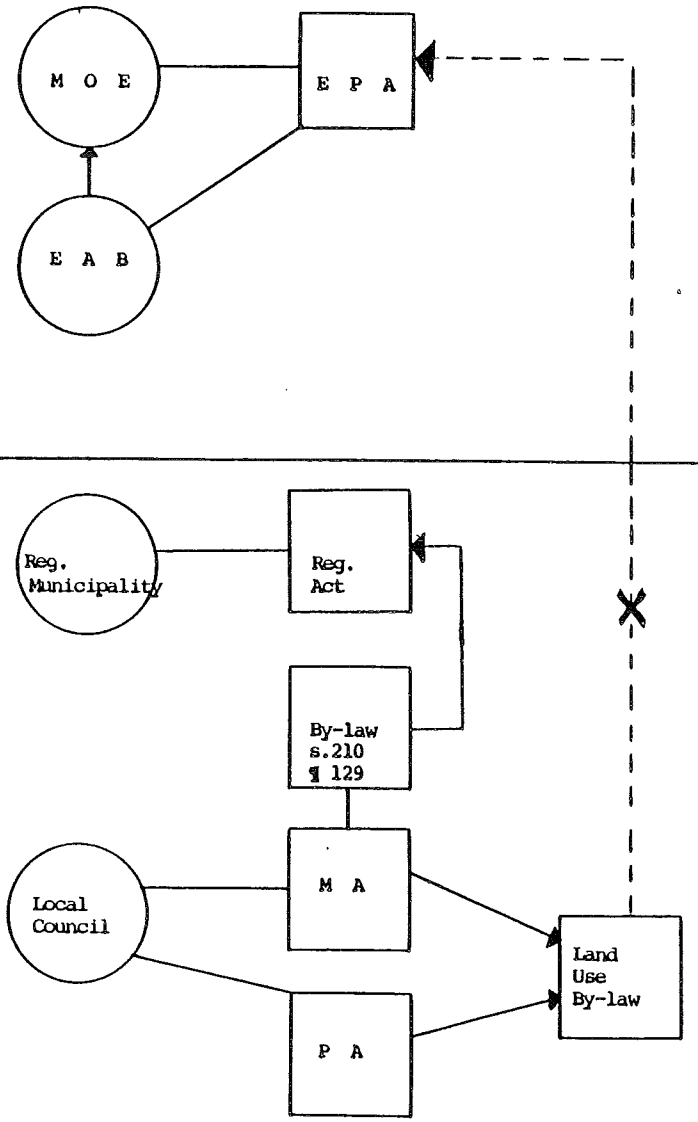
3.3.3 WASTE DISPOSAL

(A) APPROVALS (General)





APPROVALS PROCESS FOR OVERRIDING EXISTING MUNICIPAL BY-LAWS



3.3.3 Waste Disposal

THE PROBLEM:

Contaminants leach from wastes located in disposal sites, polluting surface waters and groundwaters.

THE LAW:

(A) Approvals:

An approval to establish or operate a waste disposal site or a waste management system must be obtained from a Director under the Environmental Protection Act (Part V). Under certain circumstances the Environmental Assessment Board will participate in this approval process. However, the Board's report is not legally binding.

Approvals would also have to be obtained under the Environmental Assessment Act for any municipal waste management undertaking. (Please refer to Section 3.1 (A) for a description of that Act).

At the municipal level, a regional municipality cannot acquire land in a local municipality for the purpose of waste disposal without the approval of the local municipality or the Ontario Municipal Board (s. 66(2) Municipality of Metropolitan Toronto Act).

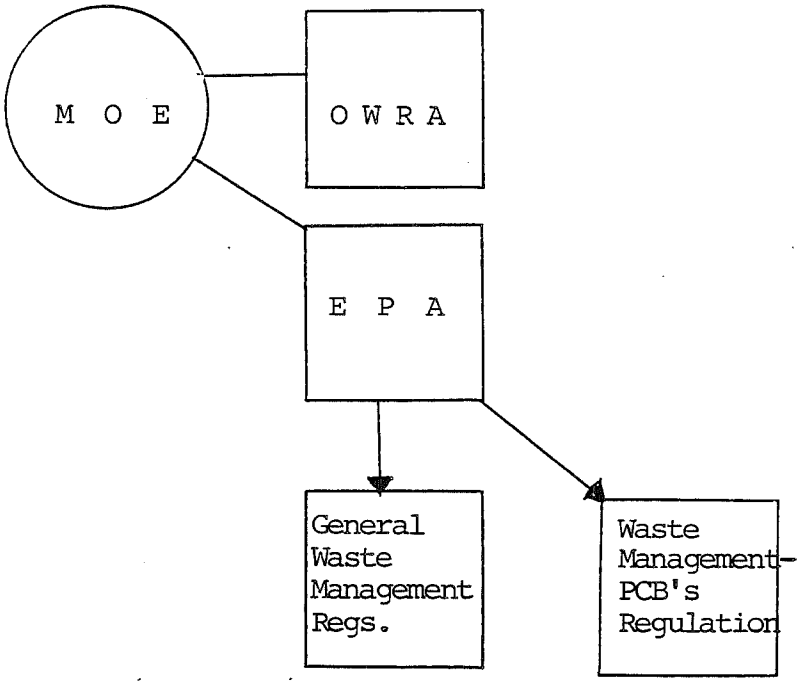
An approval may also be obtained to override a municipal by-law.

Local municipalities may pass by-laws prohibiting or controlling the use of any land as a waste disposal site (s. 210¶129 Municipal Act). However, no by-law passed under that section applies to the waste disposal operations of the regional municipality (s. 66(12) Municipality of Metropolitan Toronto Act). Local municipalities may also pass land use by-laws which prohibit a waste disposal site under s. 34 of the Planning Act.

3.3.3 WASTE DISPOSAL

(B) POLLUTION CONTROL

PROVINCIAL



MUNICIPAL

Where any municipal by-law affects the location of a proposed waste disposal site, the person seeking approval for the site may obtain a hearing before the Environmental Assessment Board, to determine whether or not the by-law should apply to the site in question. After receiving the report of the Environmental Assessment Board, the Minister of the Environment may issue an order that the by-law does not apply to the proposed site. (s. 35 Environmental Protection Act).

(B) Pollution Control:

The general provisions in the Ontario Water Resources Act described in Section 3.1 (B) would apply to waste disposal sites.

A waste disposal site would also be subject to the general provisions against contamination of the environment in the Environmental Protection Act, which are described in Section 3.1 (B). Furthermore, under Part V of the Environmental Protection Act it is prohibited to deposit waste in an unapproved site (s. 39) or to use unapproved waste disposal facilities (s. 40). A Director may order the removal of waste deposited in an unapproved site (s. 41), and may order the owner of any waste disposal site or waste management system to conform with the requirements of Part V of the Environmental Protection Act as well as the regulations established thereunder. Waste disposal regulations under the Environmental Protection Act include:

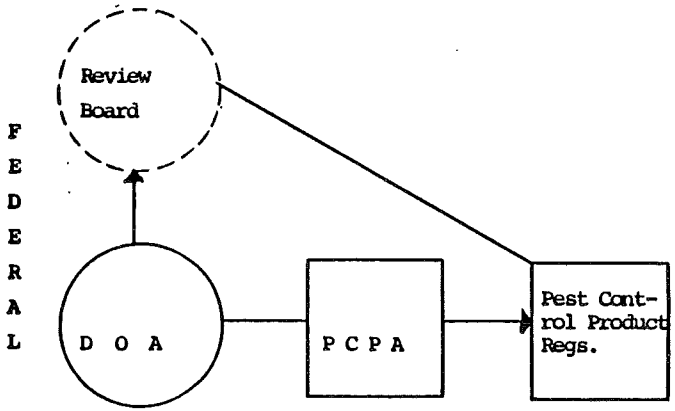
- Environmental Protection (General Waste Management Regulations) (RRO 1980, Reg. 309), which includes a "manifest system" for tracking the movement of hazardous wastes through the province.

- Waste Management - PCBs Regulation (O. reg. 313)

3.3.4 AGRICULTURAL RUNOFF

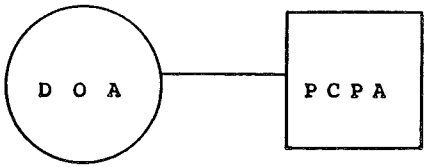
(A) PESTICIDES

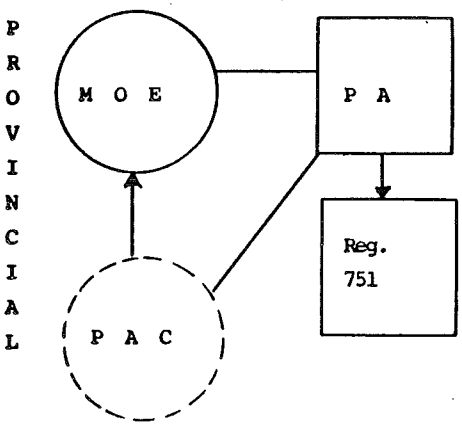
(i) APPROVALS

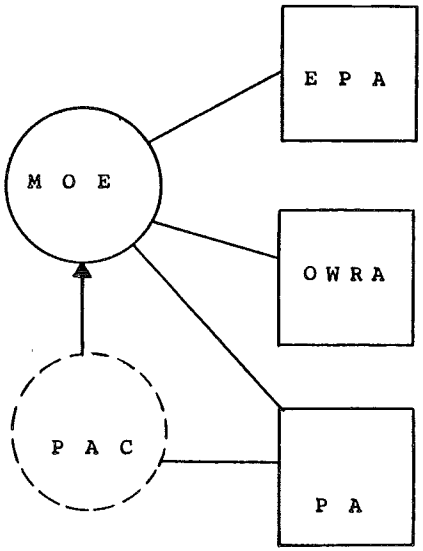


(A) PESTICIDES

(ii) COMPLIANCE







3.3.4 Agricultural Runoff

THE PROBLEM:

Farmlands contain chemicals which may drain into the local watershed. Fertilizers are composed of nutrients which can result in eutrophication of the water supply. In eutrophication the biological productivity of the acquatic system increases, leading to algal growth and seasonal oxygen depletion in the water body. Pesticides, containing a variety of toxic chemicals, also drain into municipal and natural watercourses. (The problems and provisions discussed in this section also apply to non-agricultural applications of pesticides).

THE LAW:

(A) Pesticides:

(i) Approvals: The Department of Agriculture prohibits the sale of pesticides (i.e. "control products") unless they are registered and conform to prescribed standards (s. 4). The procedure for the registration of a control product is set out in regulations under the Pest Control Products Act. Where the registration of a control product has been refused or suspended, the aggrieved party has a right to a hearing before a Review Board appointed by the federal Minister of Agriculture.

The Ontario Ministry of the Environment is responsible for issuing licences to operate an exterminating business and permits for particular exterminations under the Pesticides Act and the regulations thereunder (RRO 1980, Reg. 751). The Pesticides Advisory Committee reviews the Act and the regulations, and makes recommendations for changes to the law.

(ii) Compliance: The Pest Control Products Act prohibits the use of a control product under unsafe conditions. The presence of pesticides in

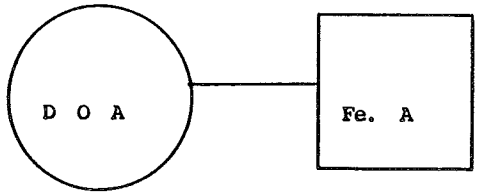
3.3.4 AGRICULTURAL RUNOFF

(A) PESTICIDES

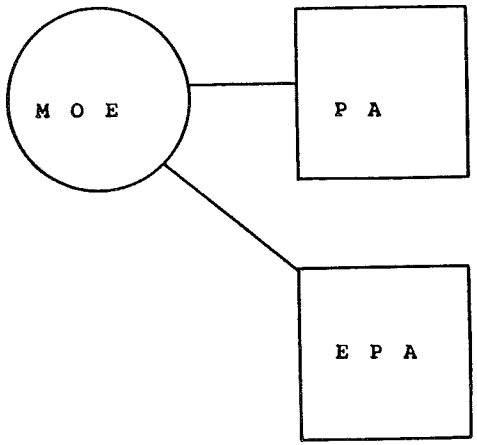
(iii) REMEDIAL ACTION

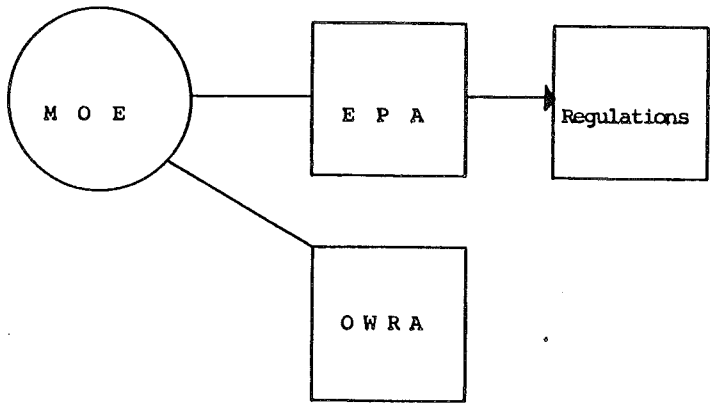
(B) FERTILIZERS

FEDERAL



PROVINCIAL





lakes and watercourses is monitored under the Department of Agriculture's national water investigation program.

The Ontario Pesticides Act prohibits any improper discharge of a pesticide that is likely to harm the environment (s. 4). Under certain circumstances the Ministry of the Environment may also employ stop orders and control orders to control pesticide use (ss. 20 and 21). The Pesticides Advisory Committee has the power to recommend changes to the Pesticides Act. General prohibitions against pollution in the Environmental Protection Act and the Ontario Water Resources Act also apply to contamination by pesticides. (For a discussion of these provisions, please refer to Section 3.1 (B)).

(iii) Remedial Action: Requirements to clean up and decontaminate areas harmed by the improper use of pesticides exist under the Pesticides Act. The Minister of the Environment may also order the repair of damage caused by pesticide discharges (s. 23). An order to repair damage may be given under the Environmental Protection Act, as well (s. 16).

(B) Fertilizers:

The federal Department of Agriculture prohibits the sale or import of any fertilizer which is not registered or which fails to conform to prescribed standards (s. 3 Fertilizers Act).

General prohibitions against pollution contained in the Environmental Protection Act and the Ontario Water Resources Act apply to contamination by fertilizers. (These Acts are discussed in Section 3.1 (B)).

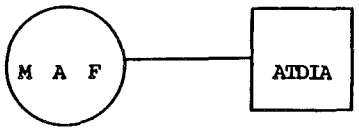
(C) Agricultural Drainage:

(i) Approvals: Under the Agricultural Tile Drainage Installation Act, a licence is required to install a drainage work below agricultural land.

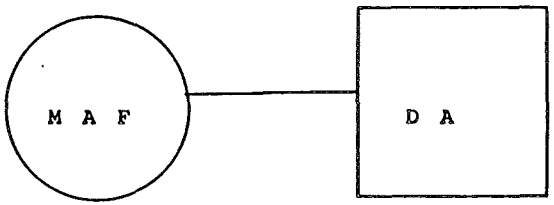
(C) AGRICULTURAL DRAINAGE

(i) APPROVALS

PROVINCIAL



(ii) POLLUTION CONTROL



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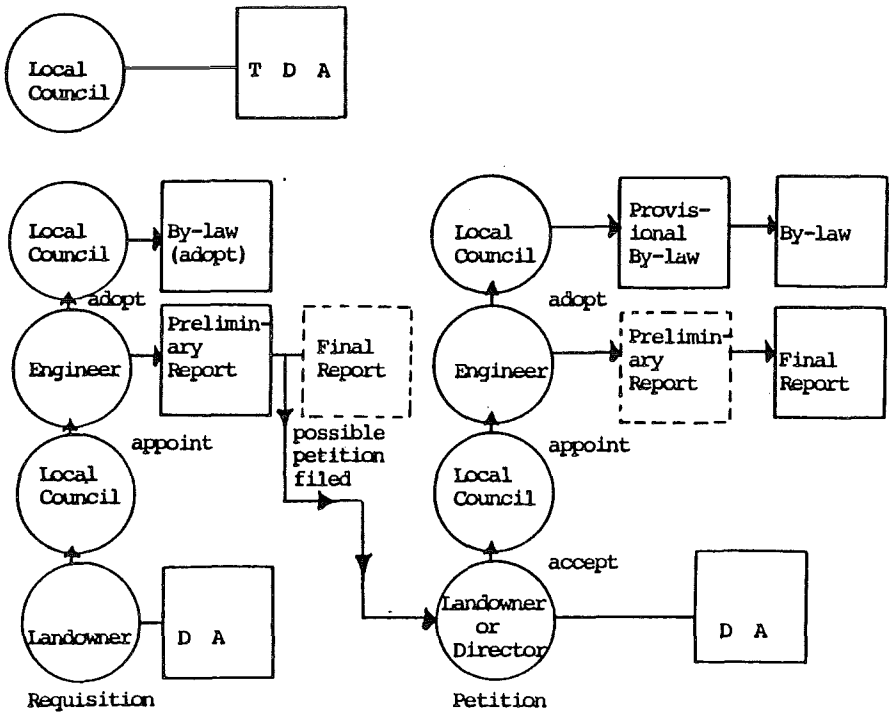
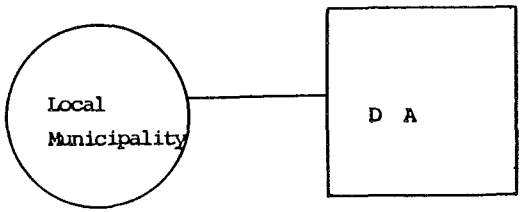


(iii) DUTY TO REPAIR



The Tile Drainage Act allows local municipal councils to pass by-laws to permit owners of agricultural lands to borrow money for the construction of drainage works.

The Drainage Act outlines the process by which a drainage work is approved and implemented. A drainage work may be initiated by landowners (with the filing of a requisition or a petition) or by a Director under the Drainage Act (ss. 3 and 4). An engineer is appointed to prepare a report on the area to be drained. The initiating municipality, any affected local municipality, or the conservation authority regulating the area in question, may require an environmental appraisal in the engineer's report (s. 6). Construction of the drainage works may commence following the approval and adoption of the engineer's report. At a number of points during the approval process, an aggrieved party has the right to appeal to one of the following bodies (as determined by the Act): a referee, The Ontario Drainage Tribunal, or the court of revision (subss. 3(16), 5(2), 6(3), 8(3), 10(6), 45(2) and ss. 47-55 and 64). These appeal pathways are not shown in the flowchart.

(ii) Pollution Control: The Drainage Act prohibits the discharge of "any liquid, material or substance other than unpolluted drainage water" into drainage works (s. 83).

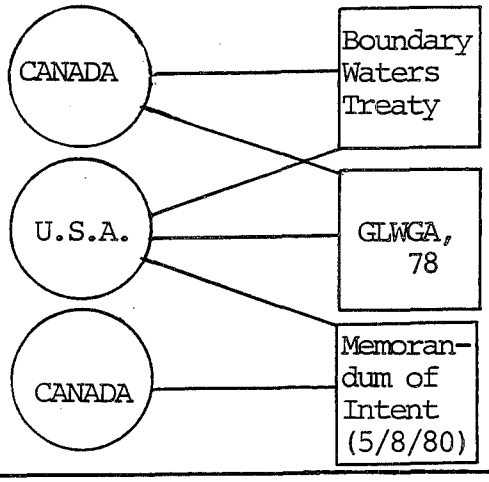
(iii) Duty to Repair: Under the terms of the Drainage Act, the duty to maintain and repair drainage works falls upon the local municipality (ss. 74 and 79).

3.3.5 AIR POLLUTION

(A) TRANSBOUNDARY POLLUTION

(B) APPROVALS

INTERNATIONAL



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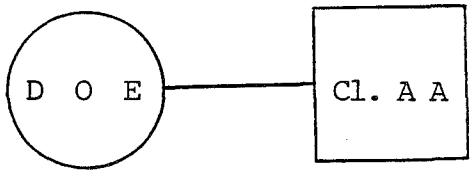

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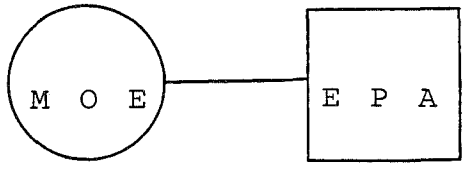


3.3.5 Air Pollution

THE PROBLEM:

Contaminants carried by air currents are often deposited into water. This water pollution may be caused by both local and distant sources of contaminants. The ability of air pollutants to cross national boundaries requires that problems of transboundary pollution be addressed.

THE LAW:

(A) Transboundary Pollution:

The International Joint Commission (IJC) created by the Convention Concerning Boundary Waters between the United States and Canada (1909) has the power to study and make recommendations on transboundary pollution problems which are referred to it (Art. IX). The IJC is also given powers under the Great Lakes Water Quality Agreement, 1978 to report to the Canadian and American governments about the condition of the Great Lakes and to make recommendations in that regard. The Great Lakes Water Quality Agreement, 1978 requires programs to study the effects of air pollutants on the water quality of the Great Lakes.

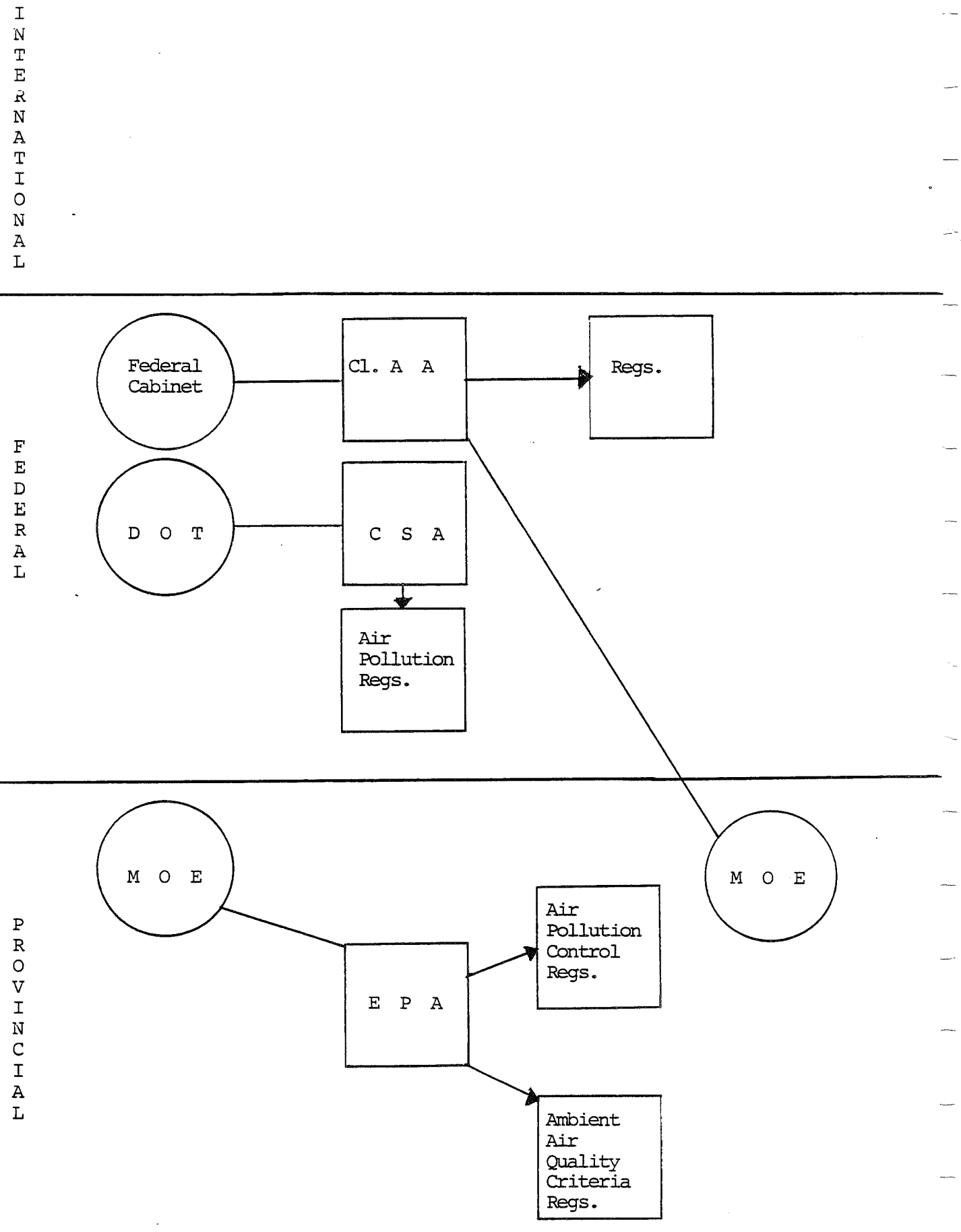
On August 5, 1980, the Canadian and American governments signed the Memorandum of Intent Concerning Transboundary Air Pollution, which demonstrates an intention to develop bilateral agreements to fight transboundary air pollution. No such agreements have yet been implemented.

(B) Approvals:

An inspector under the federal Clean Air Act may require the submission of plans for any proposed federal work or undertaking that could result in the emission of an air contaminant. Following an

3.3.5 AIR POLLUTION

(C) COMPLIANCE



examination of the plans and specifications, he may require modifications to be made or may prohibit the construction of the undertaking (s. 15).

In Ontario, a certificate of approval is required to construct or alter any structure or production process which may emit an air contaminant (s. 8 Environmental Protection Act).

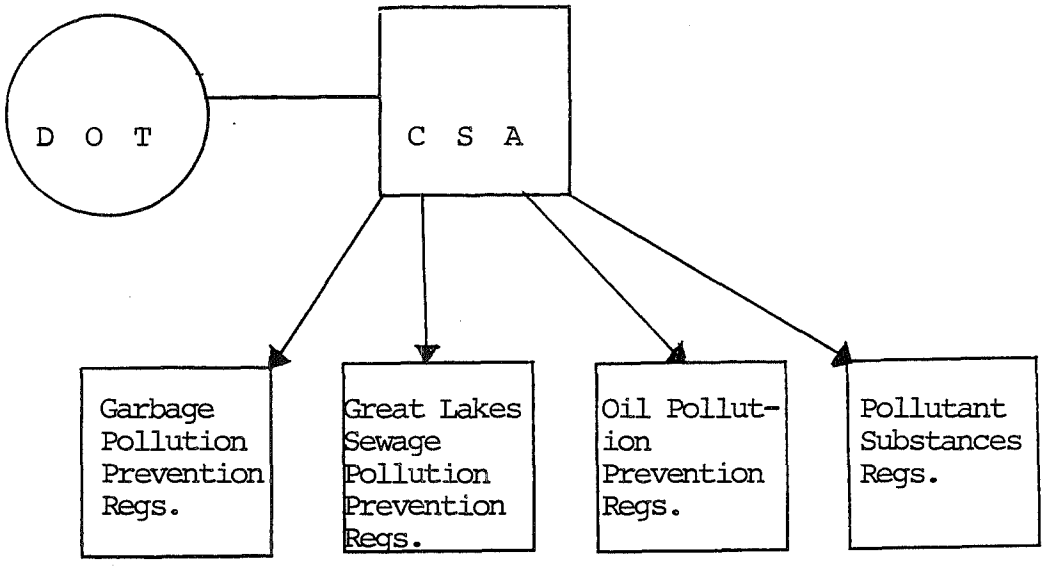
(C) Compliance:

The Clean Air Act enables the federal cabinet to set unenforceable "national ambient air quality objectives" (s. 4) and "national emission guidelines" (s. 8). Legally binding "national emission standards" may be set for emissions of air contaminants which constitute a significant danger to human health, which could result in the violation of an international treaty, or which are emitted from a federal work or undertaking (ss. 7 and 11-13). At present, there are only a small number of federal standards. The provincial Ministry of the Environment has enforcement powers under the Clean Air Act.

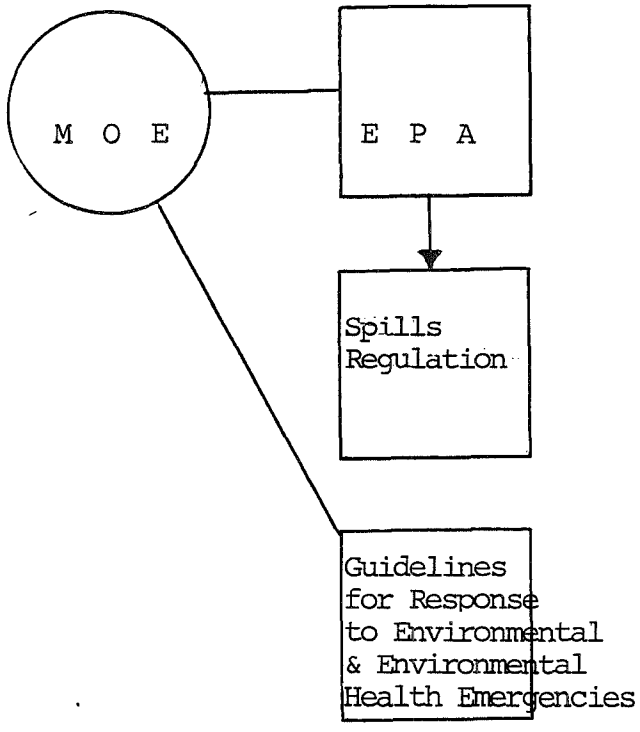
Air pollution is also regulated under the Air Pollution Regulations under the Canada Shipping Act, as well as the Air Pollution Control Regulations (RRO 1980, Reg. 308) and the Ambient Air Quality Criteria Regulations (RRO 1980, Reg. 296) under the provincial Environmental Protection Act.

3.4 SPILLS AND EMERGENCIES

FEDERAL



PROVINCIAL



3.4 SPILLS AND EMERGENCIES

THE PROBLEM:

Unexpected, contaminated discharges into a waterway require rapid emergency response procedures in order to minimize environmental damage.

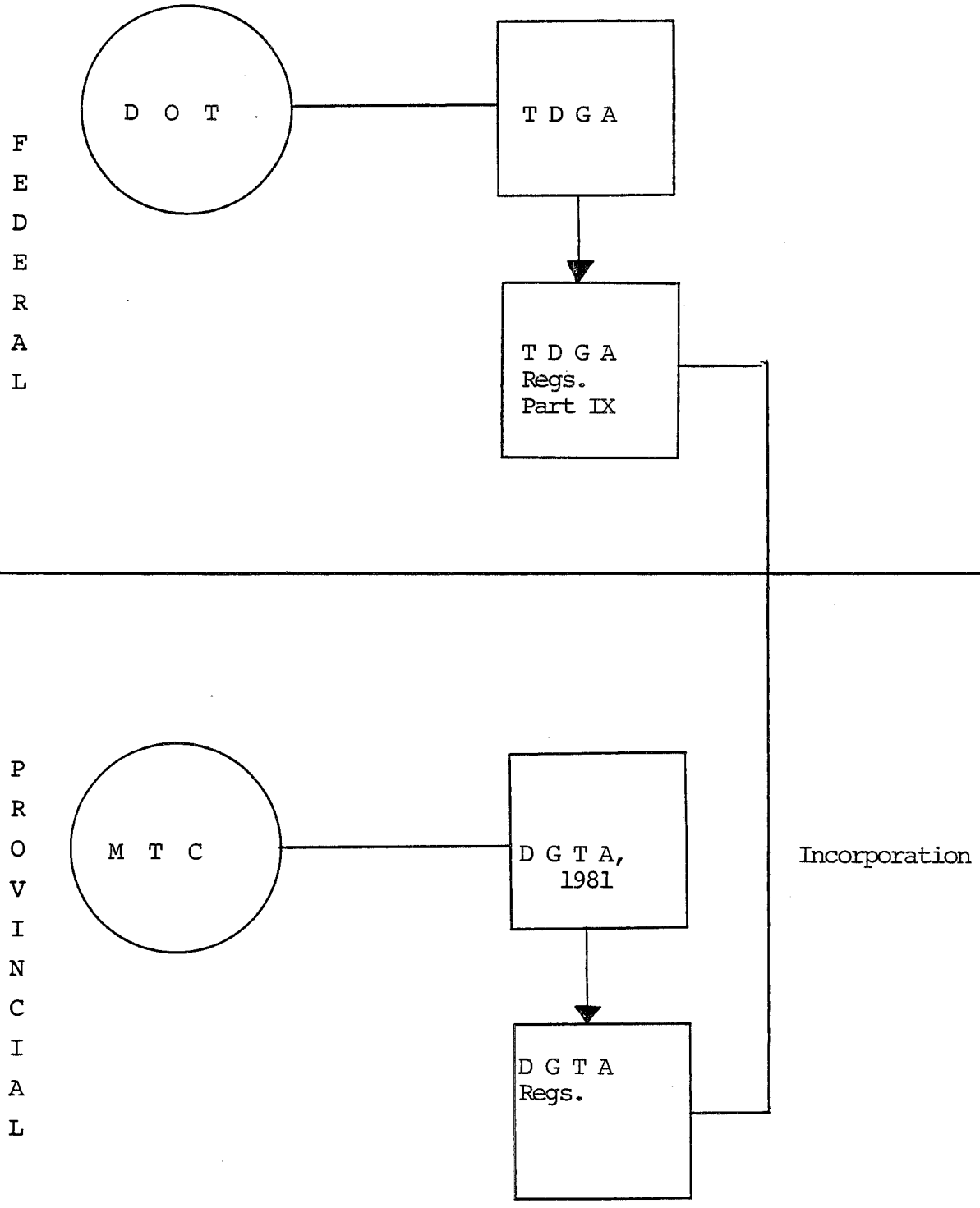
THE LAW:

The Canadian Coast Guard, a unit of the federal Department of Transport, is responsible for minimizing pollution from ships. Its authority stems from the Canada Shipping Act and regulations thereunder. These regulations include:

- Garbage Pollution Prevention Regulations;
- Great Lakes Sewage Pollution Prevention Regulations;
- Oil Pollution Prevention Regulations; and
- Pollutant Substances Regulations.

Part IX of the Environmental Protection Act along with the Spills Regulation outlines the responsibilities of various parties following the spill of a contaminant into the natural environment. An obligation exists to notify the Ministry of the Environment, the municipality or regional municipality affected, and the owner of the pollutant following a spill (s. 80). There exists a further duty to do everything practicable to mitigate the adverse consequences of the spill and to restore the environment (s. 81). The Ministry of the Environment has also prepared the unenforceable "Guidelines for Response to Environmental and Environmental Health Emergencies".

3.4 SPILLS AND EMERGENCIES (TRANSPORTATION)

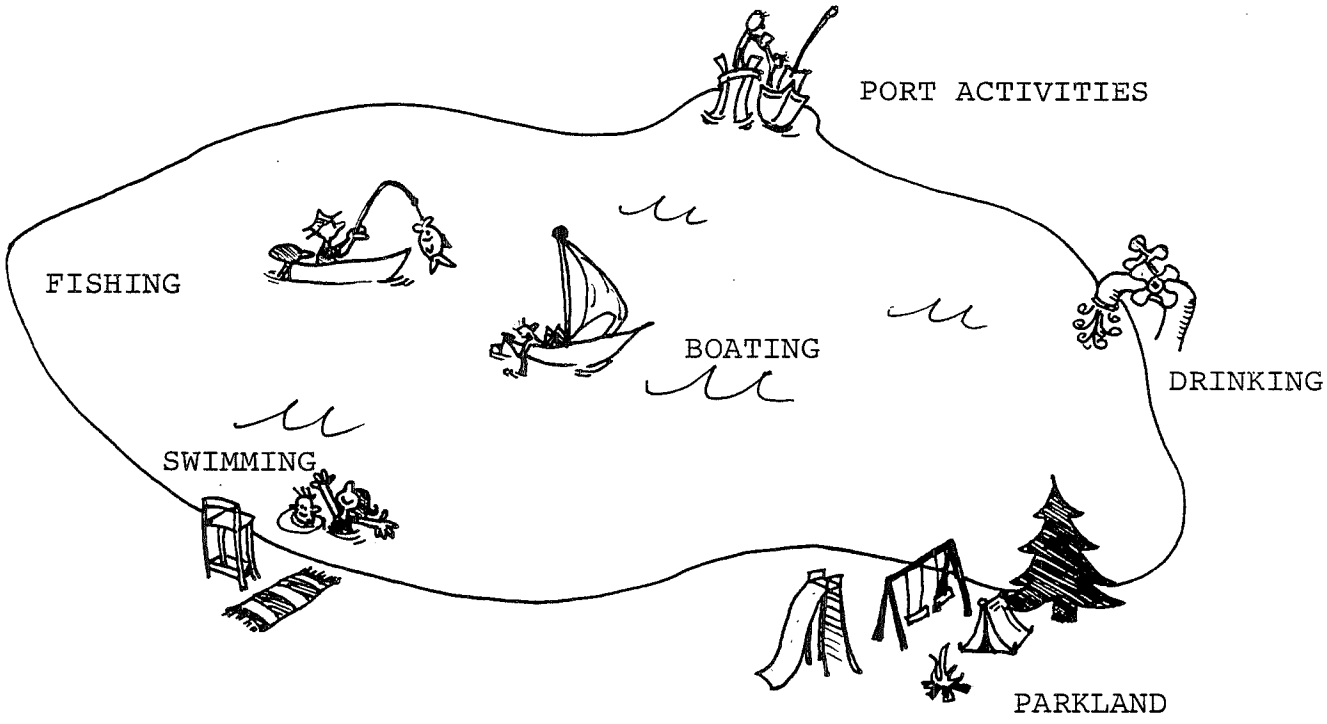


Under the federal Transportation of Dangerous Goods Act, any person having the control of transported dangerous goods has a duty to report an escape of such goods and to take all reasonable emergency measures to mitigate any danger to life, health, property or the environment (s. 17). This Act regulates interprovincial and international transport as well as the transportation of goods by railway or ship.

The provincial Dangerous Goods Transportation Act, 1981 and the Dangerous Goods Transportation Regulation requires the immediate reporting of the escape of a transported dangerous good from its container.

REGULATION OF WATER USE

4. REGULATION OF WATER USE



4. REGULATION OF WATER USE

A number of federal and provincial statutes, regulations and policies have been established to regulate the various uses which can be made of Toronto area waters. These uses can be grouped into the following categories:

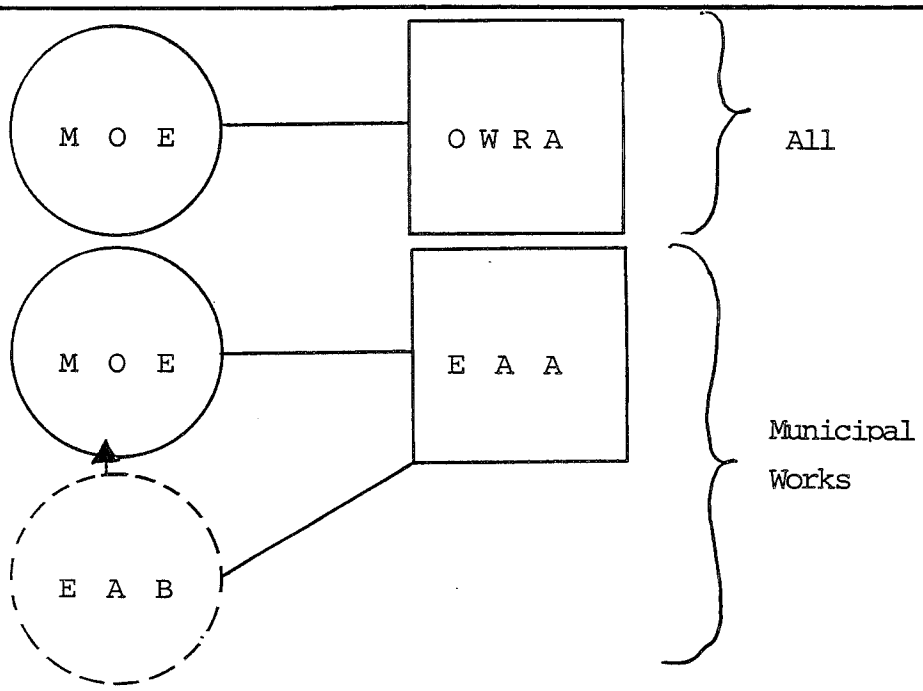
- drinking
- swimming
- boating
- fishing
- parkland
- port activities

4.1 DRINKING

(A) APPROVALS

FEDERAL

PROVINCIAL



MUNICIPAL

4.1 DRINKING

THE PROBLEM:

Many organic and inorganic chemicals have been identified in Toronto's drinking water. Little is known about the long-term human health effects caused by the ingestion of these chemicals. Also, it has been determined that chlorination of the water supply increases the mutagenicity of chemicals present in the water.

THE LAW:

(A) Approvals:

Plans for waterworks must be approved by a Director under the Ontario Water Resources Act. Municipal works will also be subject to the Environmental Assessment Act, (which is discussed in Section 3.1 (A)).

(B) Compliance:

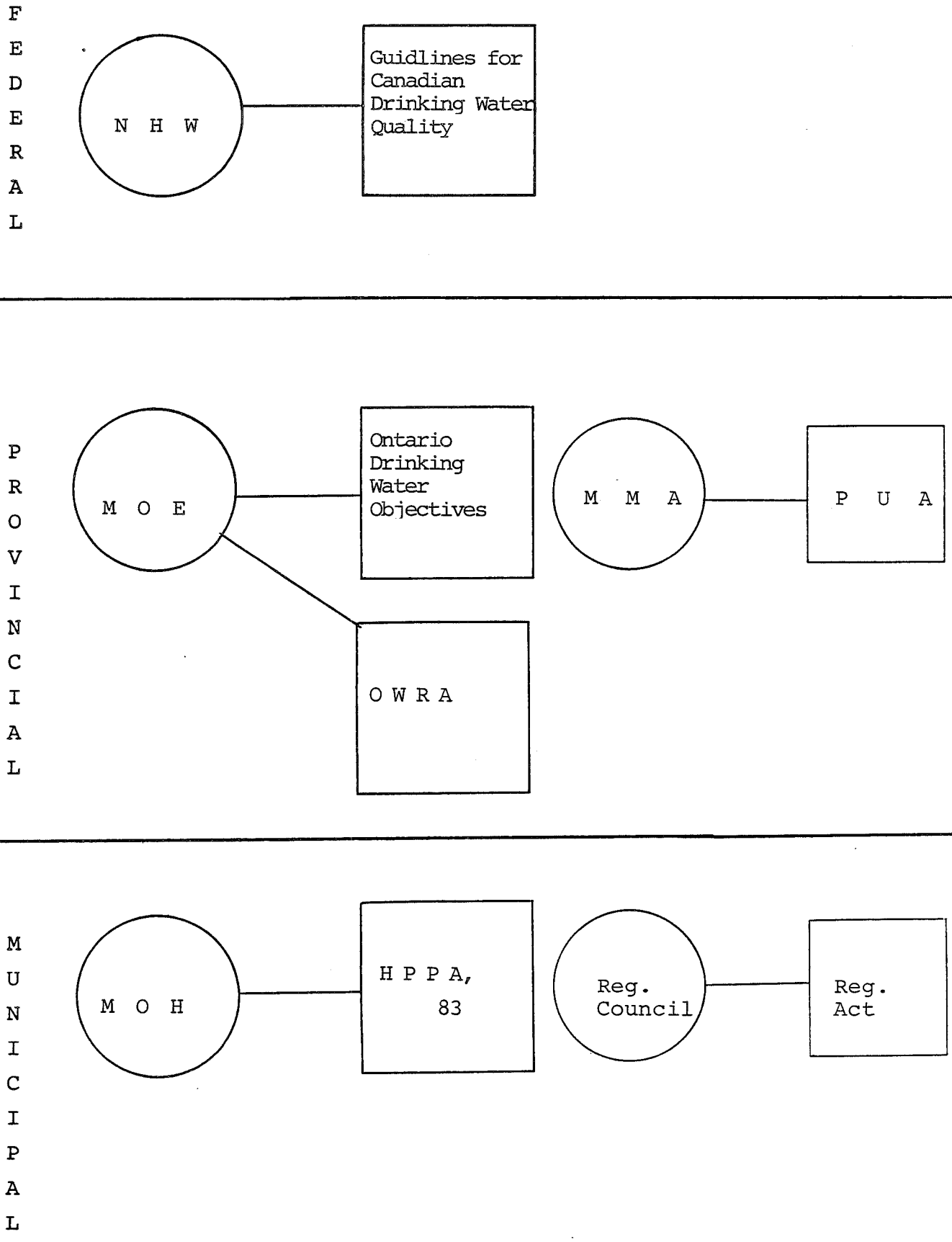
The Department of National Health and Welfare has established "Guidelines for Canadian Drinking Water Quality", and the Ministry of the Environment has prepared " Ontario Drinking Water Objectives". These guidelines are not legally binding.

The Ontario Water Resources Act, administered by the Ministry of the Environment, requires that water works be kept in repair (subs. 23(7)). The Minister of the Environment may also make regulations "prescribing standards of quality for potable and other water supplies", subject to cabinet approval (s. 44(1)(h)).

The provincial Public Utilities Act makes it an offence to deposit offensive matter into water or waterworks (s. 13(e)).

4.1 DRINKING

(B) COMPLIANCE

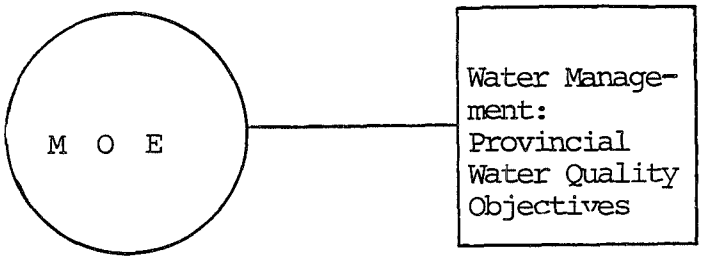


Pursuant to Part IX of the Health Protection and Promotion Act, 1983, the Medical Officer of Health is charged with the protection of community health.

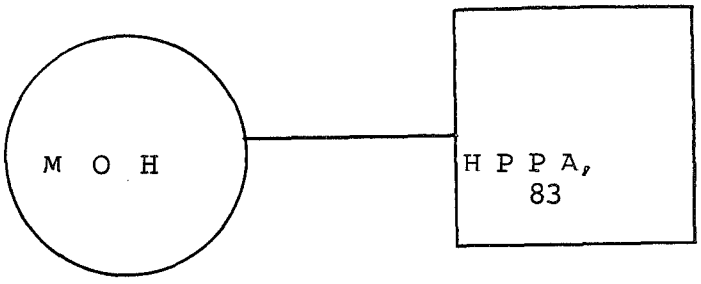
Finally, the regional municipality is responsible for the purification, pumping, and trunk distribution of the water supply. The regional council may pass by-laws to regulate the water supply and to maintain its waterworks system (ss. 33 and 34 Municipality of Metropolitan Toronto Act).

4.2 SWIMMING

PROVINCIAL



MUNICIPAL



4.2 SWIMMING

THE PROBLEM:

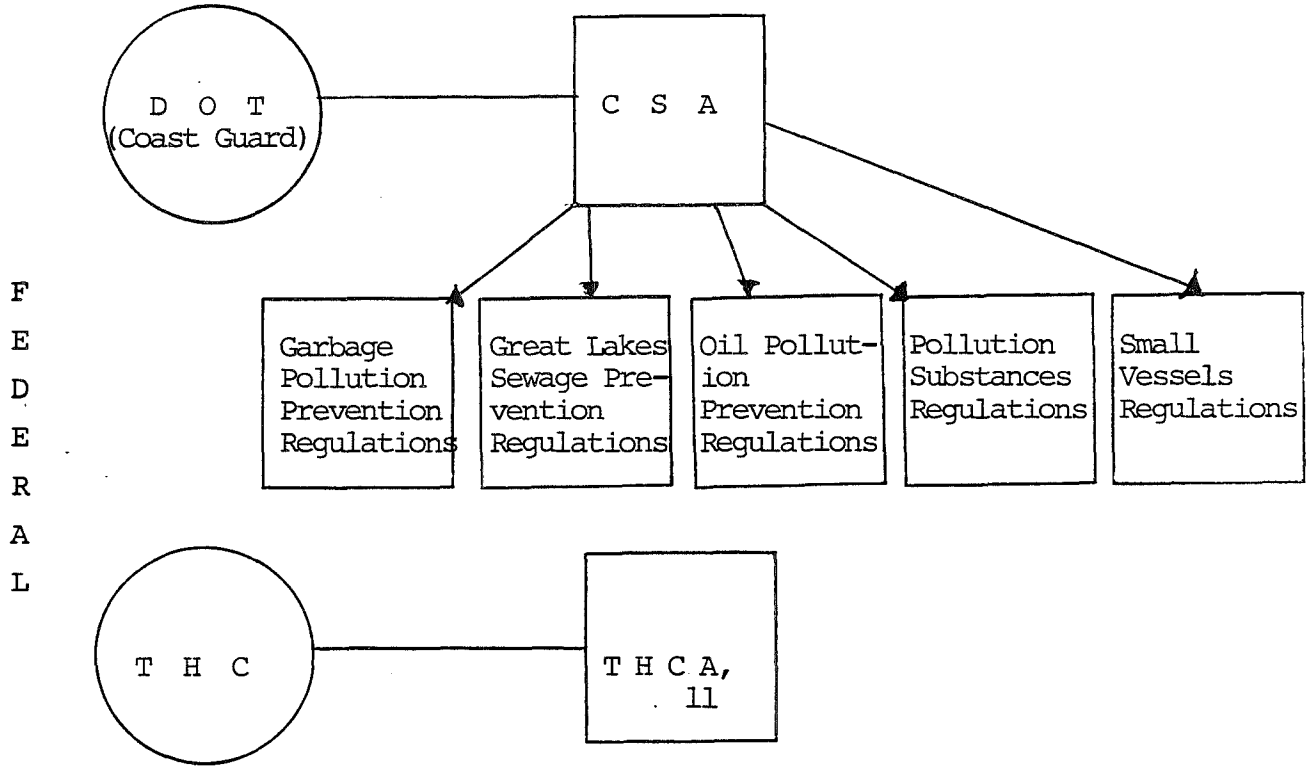
Improperly treated or untreated sewage flowing into Lake Ontario results in unacceptable levels of bacterial contamination at area beaches.

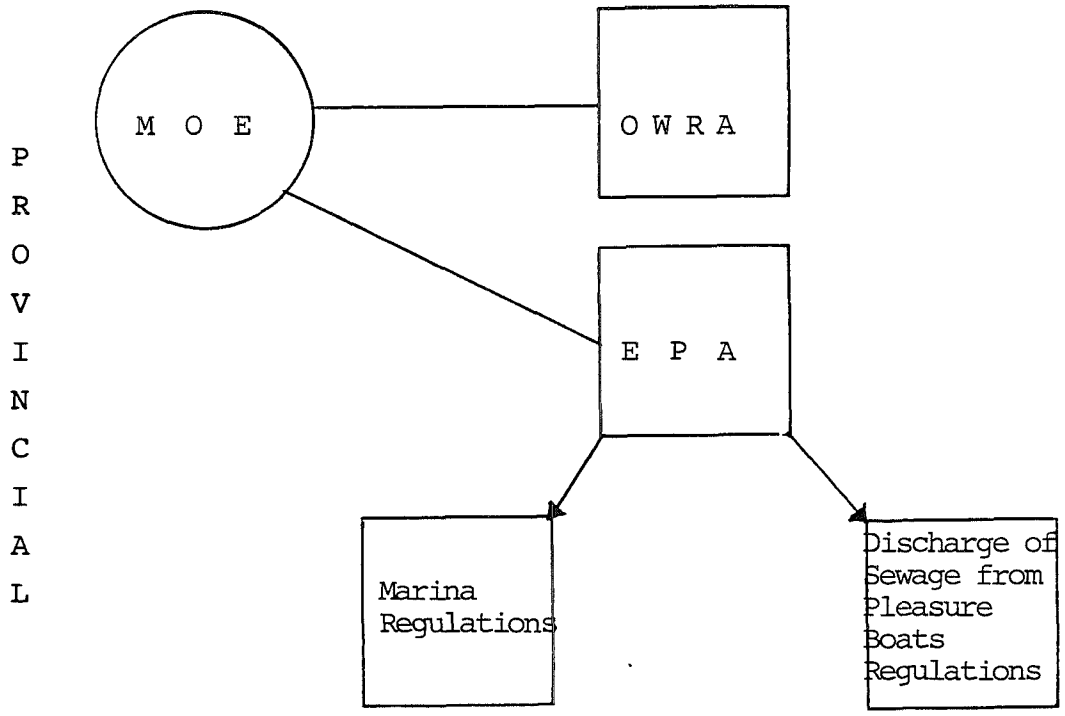
THE LAW:

The Medical Officer of Health is required to protect community health under the Health Protection and Promotion Act, 1983. In the interest of public health, the local Public Health Department will monitor bacterial concentrations at community beaches. When the bacterial count exceeds a desired level, the Medical Officer of Health will close the affected beach.

The Ministry of the Environment has developed Provincial Water Quality Objectives, which are not legally enforceable. The objectives for recreational water uses are based on "public health and aesthetic considerations."

4.3 BOATING


FEDERAL
D O T
(Coast Guard)
C S A
Garbage Pollution Prevention Regulations
Great Lakes Sewage Prevention Regulations
Oil Pollution Prevention Regulations
Pollution Substances Regulations
Small Vessels Regulations
T H C
T H C A, 11


PROVINCIAL
M O E
O W R A
E P A
Marina Regulations
Discharge of Sewage from Pleasure Boats Regulations

4.3 BOATING

THE PROBLEM:

The disposal of sewage from pleasure craft needs to be regulated and monitored to ensure that it is not simply dumped into Lake Ontario. An increasing number of crafts in the Toronto harbour coupled with insufficient pump-out facilities, tends to encourage the illegal dumping of wastes.

THE LAW:

Certain regulations under the Canada Shipping Act apply to the discharge of polluting material from pleasure craft. Applicable regulations include:

- Garbage Pollution Prevention Regulations;

- Great Lakes Sewage Prevention Regulations;

- Oil Pollution Prevention Regulations;

- Pollution Substances Regulations; and

- Small Vessels Regulations.

However, the Coast Guard enforcement of these pollution provisions is primarily geared toward larger craft.

The Toronto Harbour Commissioners have the authority to pass by-laws to regulate the use of pleasure craft under s. 21(h) of the Toronto Harbour Commissioners Act, 1911.

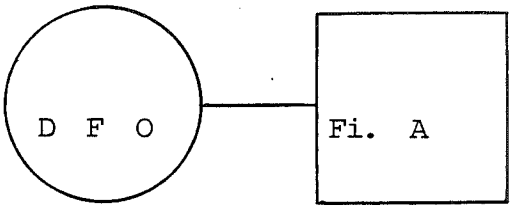
Pollution by pleasure craft is regulated mainly by the Marina

Regulations (RRO 1980, Reg. 310) and the Discharge of Sewage from Pleasure Boats Regulation (RRO 1980, Reg. 305), promulgated under the provincial Environmental Protection Act. The general prohibitions against pollution found in both the Environmental Protection Act and the Ontario Water Resources Act would also apply. (These provisions are discussed in Section 3.1 (B)).

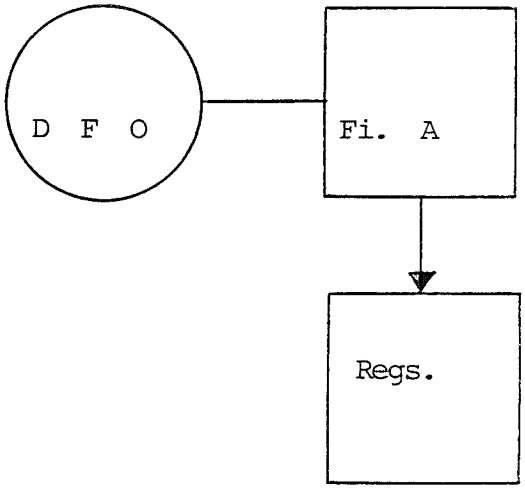
4.4 FISHING

(A) APPROVALS

FEDERAL

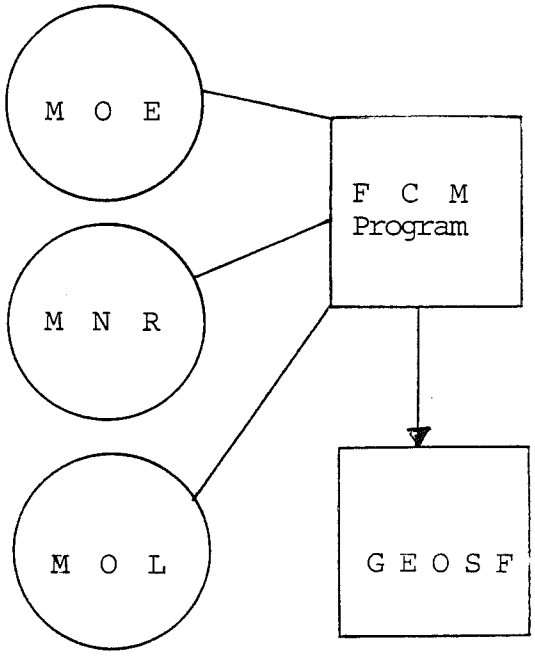


(B) COMPLIANCE



PROVINCIAL

(C) FISH CONTAMINANTS MONITORING PROGRAM



4.4 FISHING

THE PROBLEM:

Aquatic habitats are being adversely affected by the influx of pollutants, dredging, and lakefilling.

THE LAW:

(A) Approvals:

An authorization to deposit a deleterious substance into water frequented by fish may be obtained under the Fisheries Act (subss. 33(13) and 33(14)). The Minister of Fisheries and Oceans may also inspect the plans for any undertaking which may result in the deposit of a deleterious substance into fish-inhabited waters or the alteration of a fish habitat. Modifications to the plan, or limits on the operation of the proposed undertaking may be required (s. 33.1).

(B) Compliance:

The Fisheries Act prohibits the carrying out of any undertaking which harmfully alters fish habitats (s. 31). It is an offence to throw deleterious substances overboard into waters used for fishing. The deposit of a deleterious substance into waters frequented by fish is also forbidden, except where authorized by regulation (s. 33). Finally, various regulations under the Fisheries Act control the discharge of contaminants into waters containing fish. They are the following:

- Chlor-Alkali Mercury Liquid Effluent Regulations;

- Fishways Obstructions Removal Regulations;

- Meat and Poultry Products Plant Liquid Effluent Regulations;

- Metal Mining Liquid Effluent Regulations;

- Petroleum Refinery Liquid Effluent Regulations;

- Potato Processing Plant Liquid Effluent Regulations; and

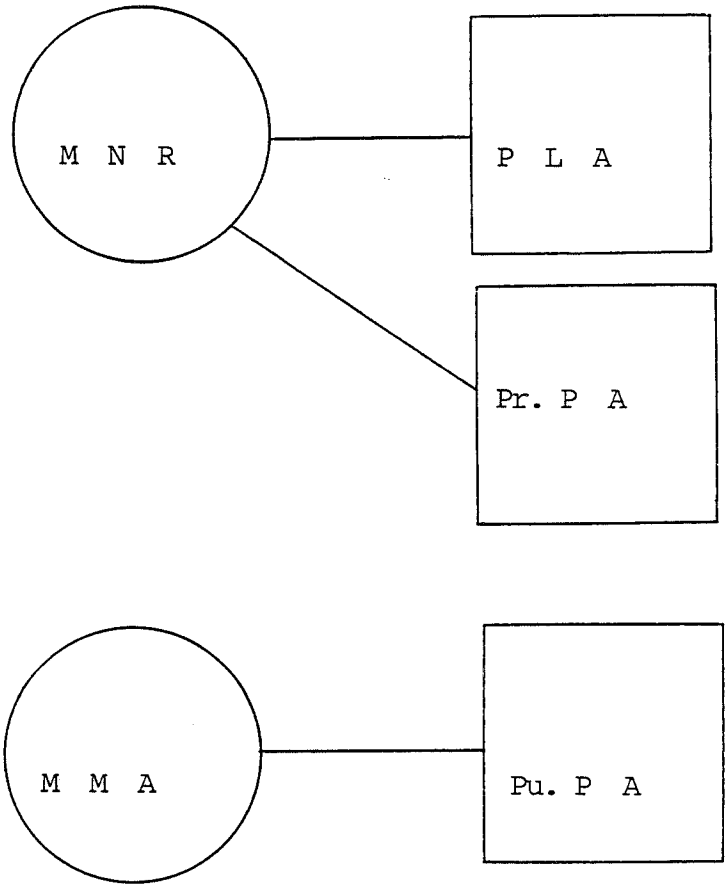
- Pulp and Paper Effluent Regulations.

(C) Fish Contaminants Monitoring Program:

The annual publication entitled, Guide to Eating Sport Fish in Ontario, sets out recommended consumption levels for sport fish. It is the result of the combined efforts of three provincial ministries. The Ministry of Natural Resources collects fish samples. Analysis is then undertaken by the Ministry of the Environment. The health significance of the contaminants found in the fish are determined by the Ministry of Labour.

4.5 PARKLAND

PROVINCIAL



4.5 PARKLAND

THE PROBLEM:

The type and concentration of recreational activities on the waterfront can affect water quality. As a result, measures are needed to prevent the contamination of watercourses, parkland, and any lands surrounding them.

THE LAW:

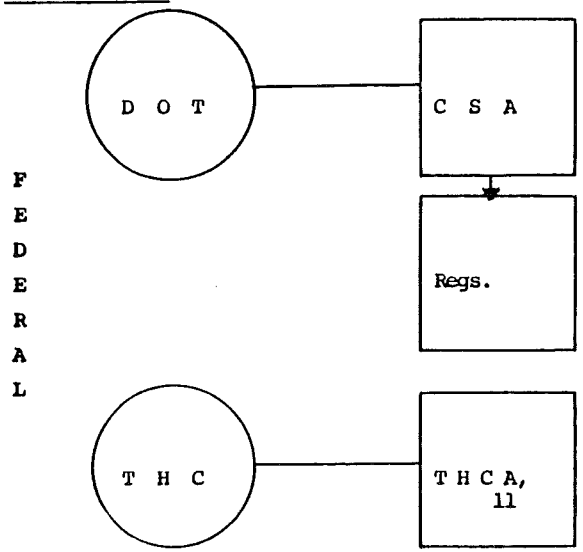
Under the Public Lands Act, it is an offence to deposit an unauthorized substance on public land, regardless of whether the land is covered by water or not (s. 25).

The Provincial Parks Act authorizes the creation of regulations required to manage provincial parks, govern occupation rights in those parks and regulate the activities which may be undertaken therein (s. 21).

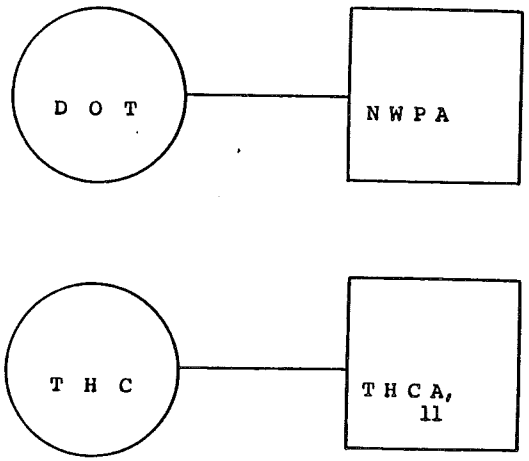
The Public Parks Act, administered by the Ministry of Municipal Affairs, makes it an offence to deposit any injurious matter into the water of any reservoir, lake or pond connected with a municipal park.

4.6 PORT ACTIVITIES

(A) SHIPPING



(B) HARBOUR MAINTENANCE AND CONTROL



4.6 PORT ACTIVITIES

THE PROBLEM:

Shipping activities at the Port of Toronto contribute to the pollution in Lake Ontario. Dredging and other port maintenance activities release toxic chemicals which have bound to sediments at the bottom of the lake. Lakefilling changes currents and wave action in the Harbour, and may therefore interfere with the dilution and dispersal of pollutants. The lakefill may contain contaminated material which will eventually leak into the lake.

THE LAW:

(A) Shipping:

Shipping activities are controlled primarily by the Canada Shipping Act and regulations thereunder. The Toronto Harbour Commissioners Act, 1911 also empowers the Harbour Commission:

> to regulate and control navigation and all works and operations within the harbour and to appoint constables and other officials to enforce the same, or to enforce the provisions of any statute or marine regulations relating to the harbour. (s. 21(2)).

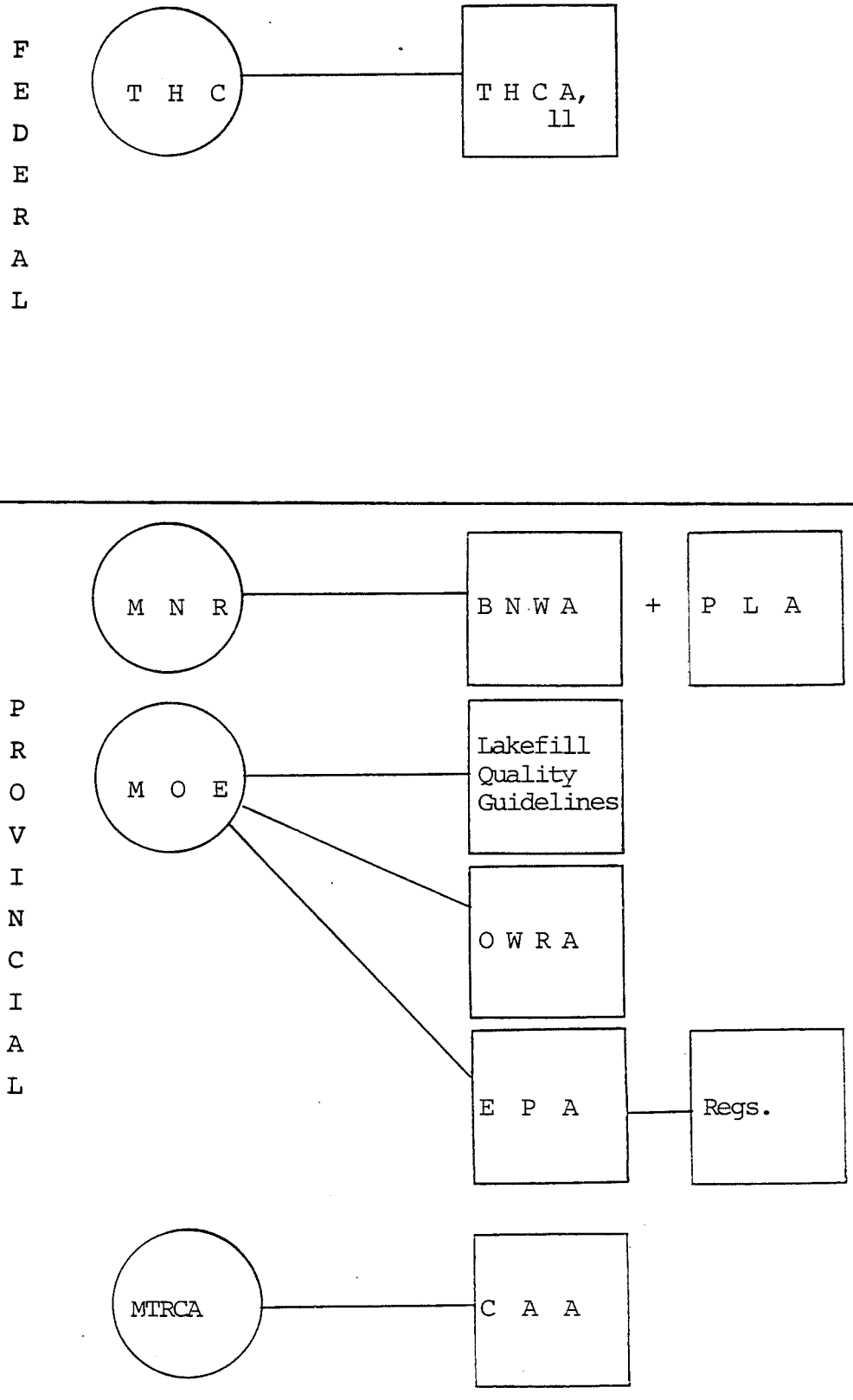
(B) Harbour Maintenance and Control:

Approval from the Minister of Transport is required to build any work in navigable waters (s. 5, Navigable Waters Protection Act). The Navigable Waters Protection Act permits the rebuilding and repair of any bridge, wharf, dock, pier or pipe so long as there is no increased interference with navigation (s. 9).

Under section 21 (b) of the Toronto Harbour Commissioners Act, 1911,

4.6 PORT ACTIVITIES (Continued)

(C) LAKEFILLING



the Toronto Harbour Commission is entitled to pass by-laws:

> to regulate, control or prohibit any building operations within or upon the harbour, excavations, removal or deposit of material, or any other action which would affect in any way the docks, wharfs, or channels of the harbour and water front or the bed of the harbour or the lands adjacent thereto.

Under the provincial Lakes and Rivers Improvement Act, one must obtain an approval from the Minister of Natural Resources prior to constructing a dam in any lake or river (s. 14). This Act permits the Minister of Natural Resources to authorize the removal of any obstruction from any Ontario lake or river (s. 24). Finally, any person who deposits trees, tree parts, refuse or any other substances into a lake or river which could impair its natural beauty, may be forced to remove the offending material (s. 35).

(C) Lakefilling:

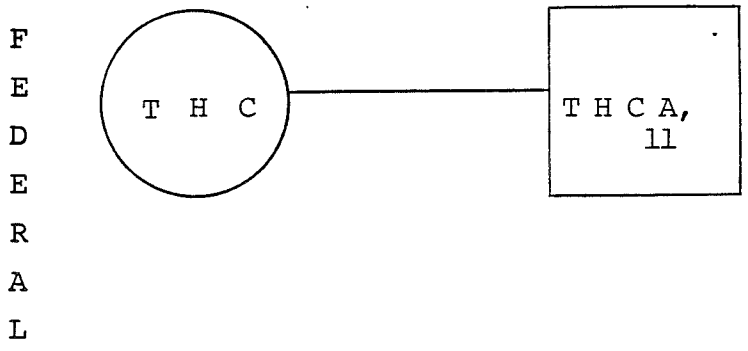
The Toronto Harbour Commission has the power to regulate the deposit of material into Toronto Harbour under section 21 of the Toronto Harbour Commissioners Act, 1911.

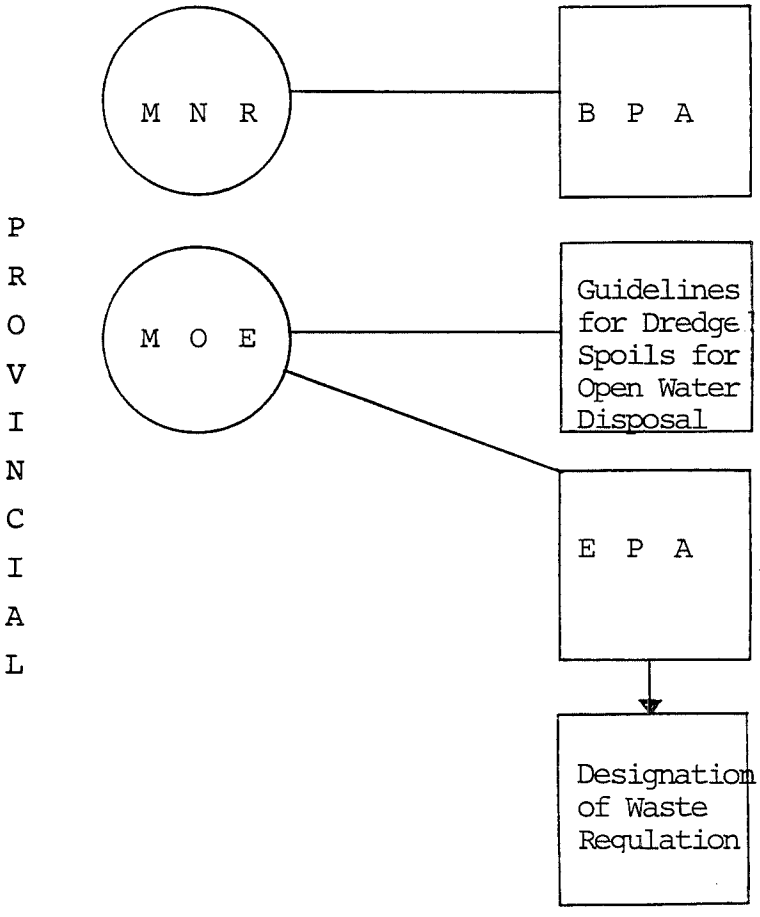
The Beds of Navigable Waters Act vests the ownership of the beds of navigable waters within Ontario in the provincial Crown. Under the Public Lands Act, written consent of the Minister of Natural Resources or an authorized officer is required prior to depositing any substance on public lands.

The Ministry of the Environment has established "Lakefill Quality Guidelines" that are not legally binding. However, anyone dumping lakefill must comply with the general prohibitions against pollution contained in the Ontario Water Resources Act and the Environmental Protection Act. (These laws are described in Section 3.1 (B)).

4.6 PORT ACTIVITIES (Continued)

(D) DREDGING





The Metropolitan Toronto and Region Conservation Authority undertakes lakefilling as part of its watershed management responsibilities under the Conservation Authorities Act.

(D) Dredging:

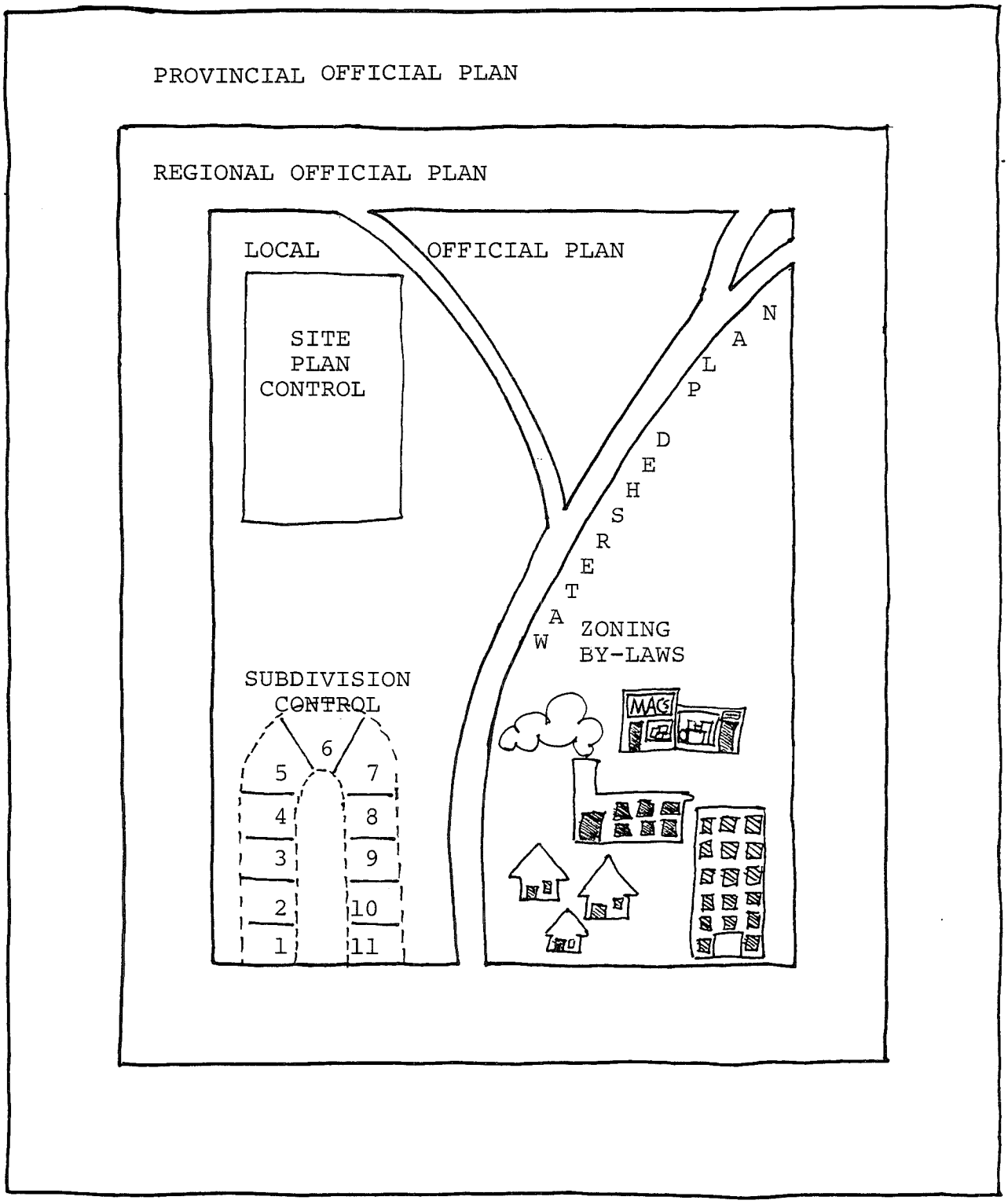
The Toronto Harbour Commission is empowered to regulate dredging in the Toronto Harbour under section 21 of the Toronto Harbour Commissioners Act.

The Beach Protection Act prohibits the removal of any sand for any waters or waterbed, unless a licence is obtained from the Minister of Natural Resources (s. 5(1)).

Dredging is also subject to the terms of the Environmental Protection Act and the Designation of Waste Regulation (which regulates "the Toronto Harbour Commissioners Constructed Dredged Storage Enclosure located on the south side of the Leslie Street Spit in the City of Toronto"). The Ministry of the Environment has also developed unenforceable "Guidelines for Dredge Spoils for Open-Water Disposal (1978)".

LAND USE PLANNING

5. LAND USE PLANNING



5. LAND USE PLANNING

THE PROBLEM:

Improperly planned waterfront development could have a detrimental effect on nearby water quality. The permitted density of development and the allowed uses (i.e. industrial, commercial, or residential), will have an impact on the types and concentrations of contaminants present in the waterfront area. Proper planning is also required to ensure adequate drainage of the developed land and the presence of proper sewer facilities.

THE LAW:

The section on land use planning has been divided into a number of different tools used for land use planning. These include:

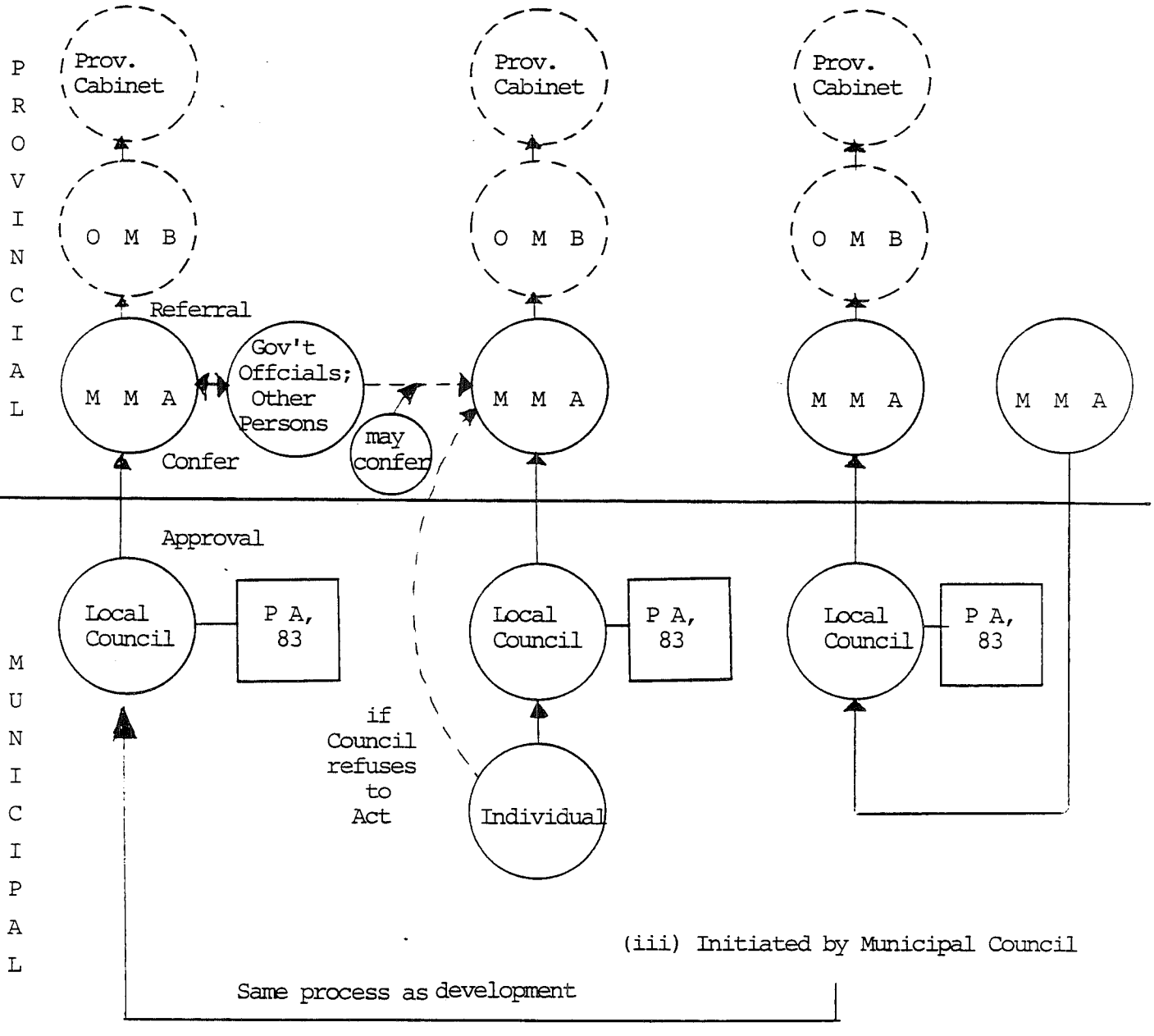
(i) municipal office plans;
(ii) zoning by-laws;
(iii) site plan controls;
(iv) subdivision controls;
(v) provincial plans and policy statements; and
(vi) miscellaneous planning tools.

5.1 MUNICIPAL OFFICIAL PLANS

DEVELOPMENT OF PLAN

AMENDMENTS TO PLAN

(i) Initiated by Individual (ii) Initiated by Minister



(iii) Initiated by Municipal Council

Same process as development

5.1 MUNICIPAL OFFICIAL PLANS

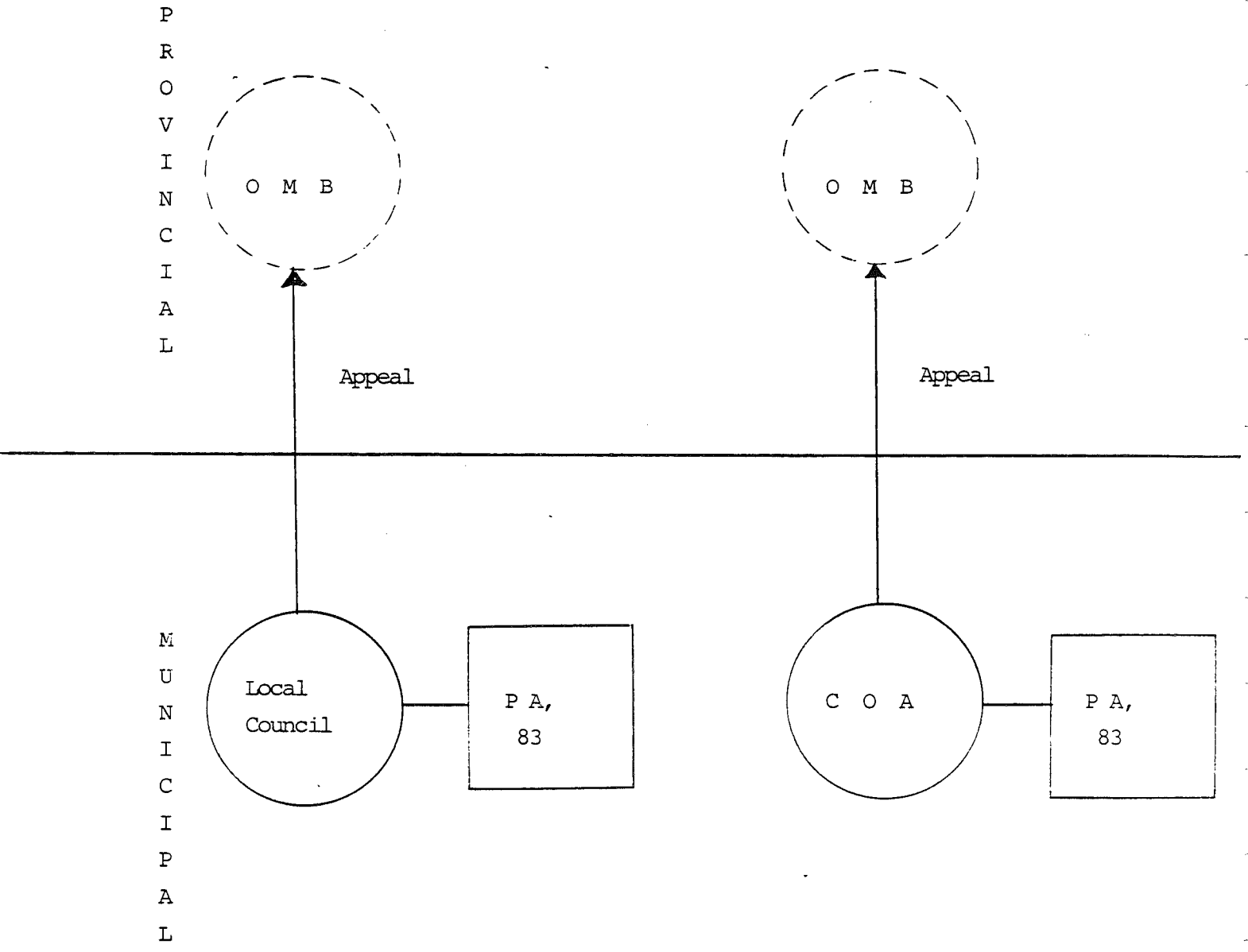
Municipal Official Plans include plans developed by both regional and local municipalities. A municipal council may adopt an official plan covering the territory within its jurisdiction, and submit it to the Minister of Municipal Affairs. The plan must then undergo an approval process before it comes into effect. Where an official plan has been approved, no public works may be undertaken and no by-laws may be passed which do not conform with the official plan. Amendments to the official plan may be initiated by the municipal council, interested individuals, or the Minister of Municipal Affairs. The Ontario Municipal Board and the provincial cabinet may become involved in the development or amendment of a municipal official plan (Part III, Planning Act, 1983).

Where a regional plan exists, all area municipality plans and by-laws must conform to the regional plan (s. 27 Planning Act, 1983).

5.2 ZONING BY-LAWS AND MINOR VARIANCES

(A) ZONING BY-LAWS

(B) MINOR VARIANCES

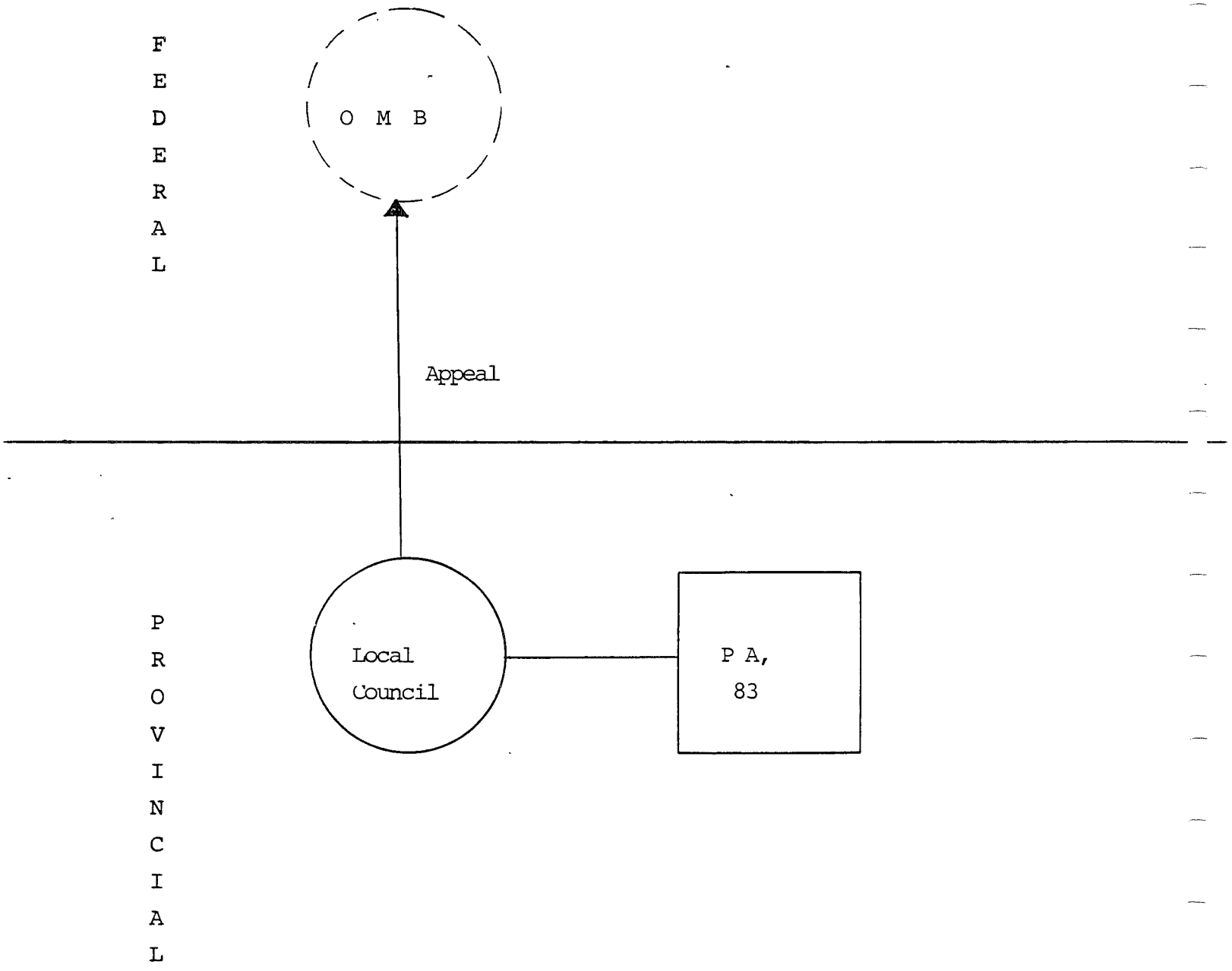


5.2 ZONING BY-LAWS AND MINOR VARIANCES

Zoning by-laws may be passed by the councils of local municipalities. Zoning by-laws may regulate land uses, control the erection or location of buildings, regulate the manner and type of construction, or require a minimum level of municipal services to zoned buildings (s. 34 Planning Act, 1983).

The owner of any land or building affected by a zoning by-law may apply to the committee of adjustment of the municipality for authorization for a minor variance from that by-law, provided that the general intent of the by-law and the official plan can be maintained (ss. 44 Planning Act, 1983).

5.3 SITE PLAN CONTROL



5.3 SITE PLAN CONTROL

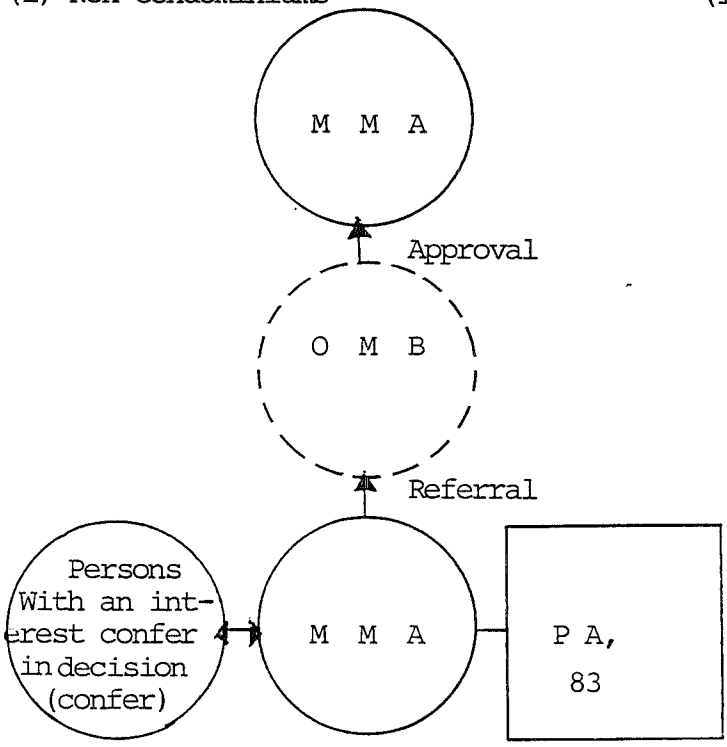
An official plan may describe certain areas as proposed "site plan control areas". In such instances a local municipal council may, by by-law, designate this area (or any portion thereof) as a "site plan control area". In a site plan control area, a person must have plans approved prior to commencing any construction or development within that area.

5.4 SUBDIVISION CONTROL

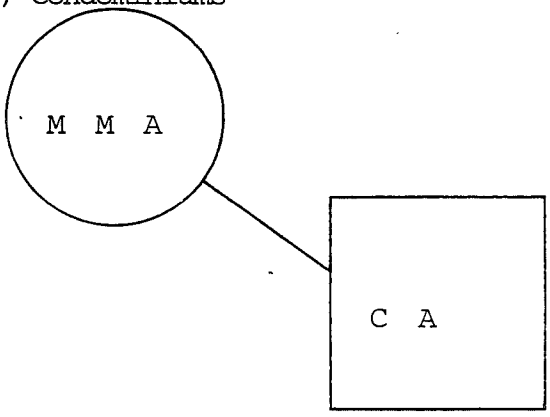
(A) REGISTERED PLAN OF SUBDIVISION

PROVINCIAL

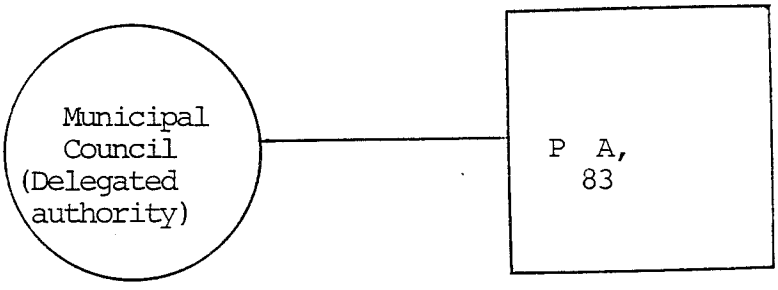
(i) Non-Condominiums



(ii) Condominiums



MUNICIPAL



5.4 SUBDIVISION CONTROL

Subdivision control is one manner of controlling density of development. No person may sell land in Ontario if he retains an interest in abutting land, unless he registers a plan of subdivision or obtains a consent for a land severance.

(A) Registered Plan of Subdivision:

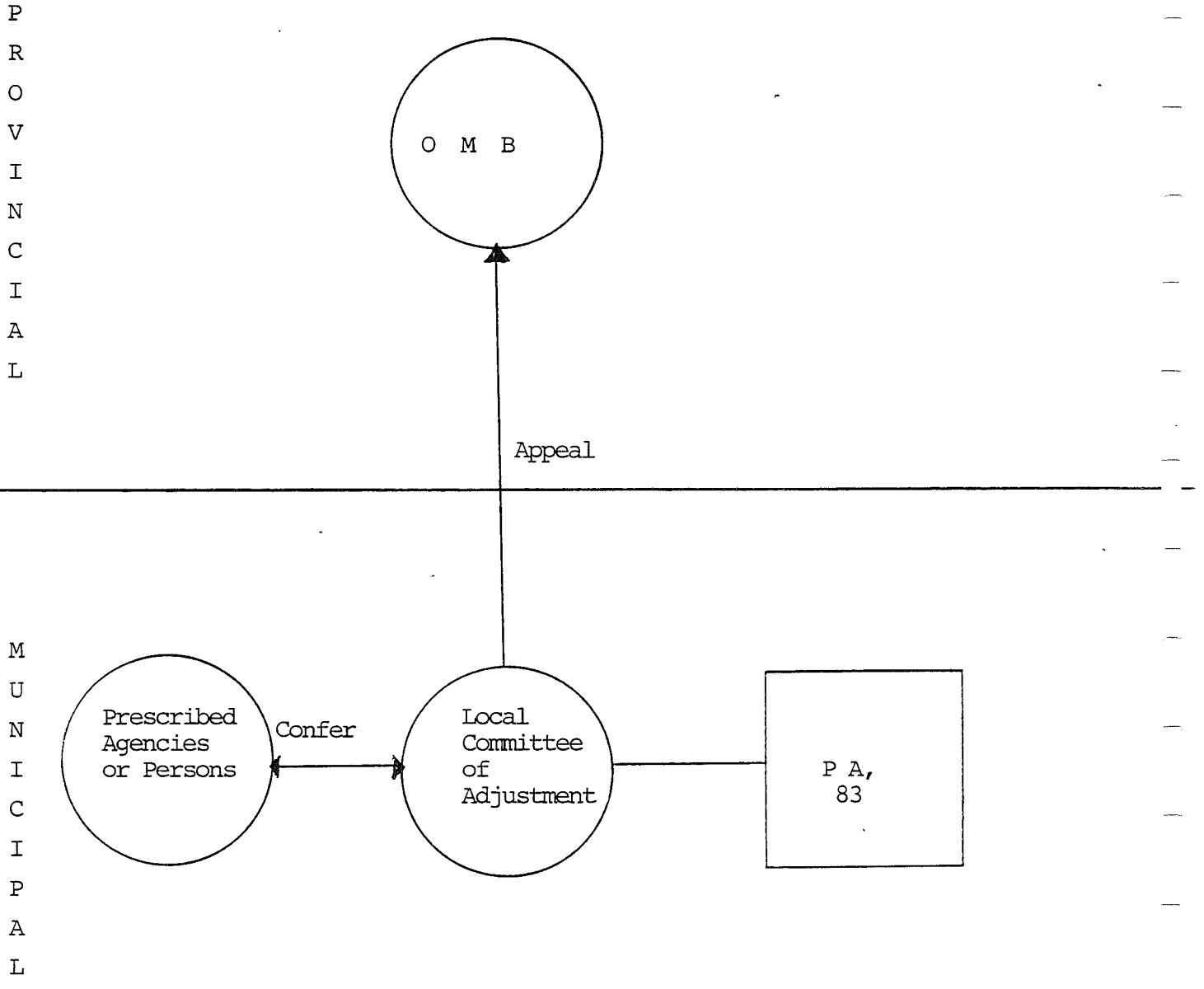
A landowner may apple to the Minister of Municipal Affairs for approval of the proposed subdivision. The Minister may confer with government officials, authorities, corporations, and any persons with an interest in the development. He may also refer the plan of subdivision to the Ontario Municipal Board. Once the plan of subdivision has been approved, the plan may be tendered for registration. This procedure is set out in greater detail in section 50 of the Planning Act, 1983.

For condominiums the registration of a description replaces the requirement for the registration of a plan of subdivision. Under the Condominium Act, a condominium description cannot be registered unless the description has been approved in accordance with the regulations. A description contains a survey of the condominium buildings and structural plans of the building (s. 4). The criteria and procedure for the approval of the description are the same as those used to approve a subdivision plan (s. 50).

The Minister of Municipal Affairs may delegate his authority to approve a plan of subdivision or a condominium description to a municipal council (s. 4 Planning Act, 1983).

5.4 SUBDIVISION CONTROL

(B) CONSENT FOR LAND SEVERENCE



(B) Consent for Land Severence:

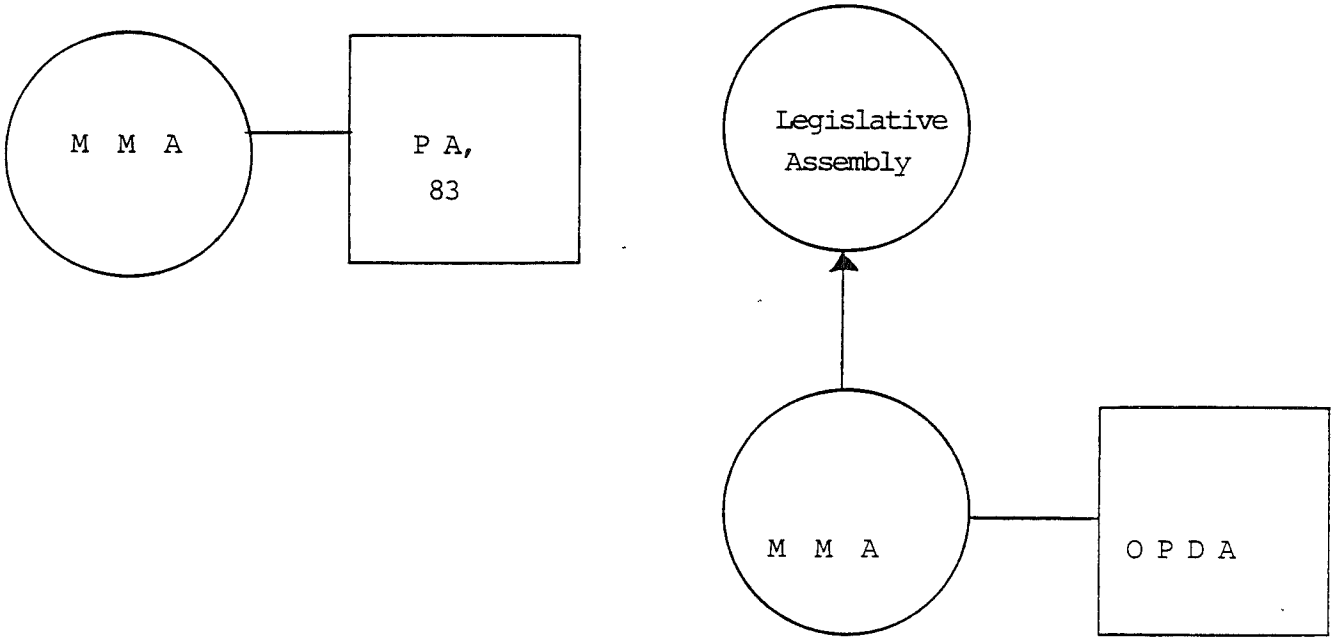
A land severance consent may be obtained from the Committee of Adjustment of the local municipality. The procedure to be followed is detailed in s. 52 of the Planning Act, 1983. This decision of the Committee can be appealed to the Ontario Municipal Board.

5.5 PROVINCIAL PLANS AND POLICY STATEMENTS

(A) PLANS

(B) POLICY STATEMENTS

PROVINCIAL



5.5 PROVINCE PLANS AND POLICY STATEMENTS

(A) Plans:

The Minister of Municipal Affairs may issue approved policy statements concerning matters of provincial interest which relate to the municipal planning process. Every provincial ministry, board or commission including the Ontario Municipal Board and Ontario Hydro, must have regard to these issued policy statements (s. 4 Planning Act, 1983).

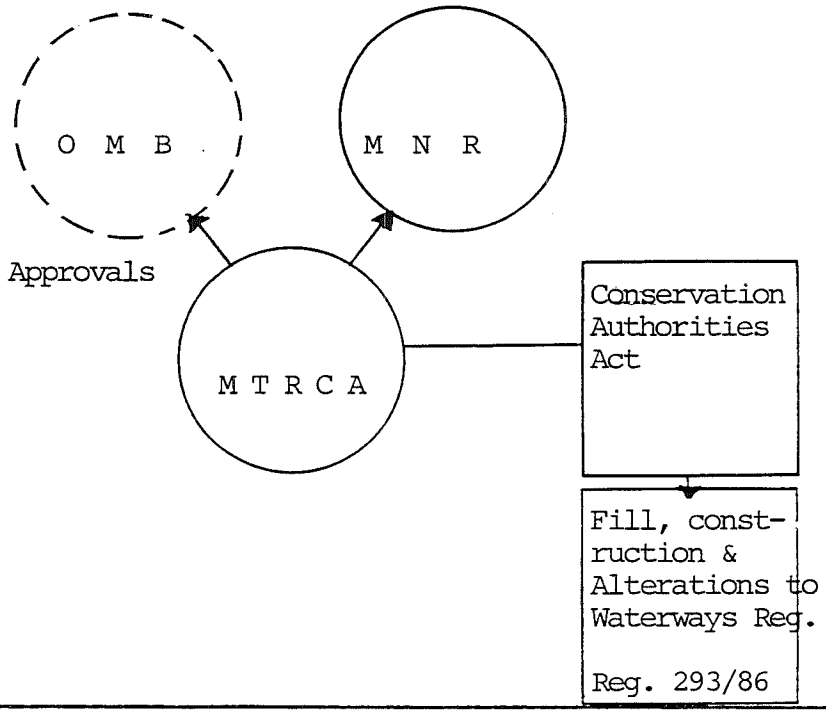
(B) Policy Statements:

The Ontario Planning and Development Act authorizes the creation of a provincial development plan, which may contain policies for water resource management and pollution control. Where a development planning area is established by an order of the Minister of Municipal Affairs, he must place the order before the Legislative Assembly for approval. A development plan may then be created for the area. Where a provincial development plan exists, any by-law passed or work undertaken by any municipality covered by the plan must conform to the plan.

5.6 WATERSHED PLANNING

(A) WATERSHED PLAN

PROVINCIAL



MUNICIPAL

5.6 WATERSHED PLANNING

Watershed planning is the primary planning tool for protecting the Metropolitan Toronto and Region watershed.

(A) Watershed Plan:

The Metropolitan Toronto and Region Conservation Authority (MTRCA) was established pursuant to the provisions of the Conservation Authorities Act. The objects of the authority are to:

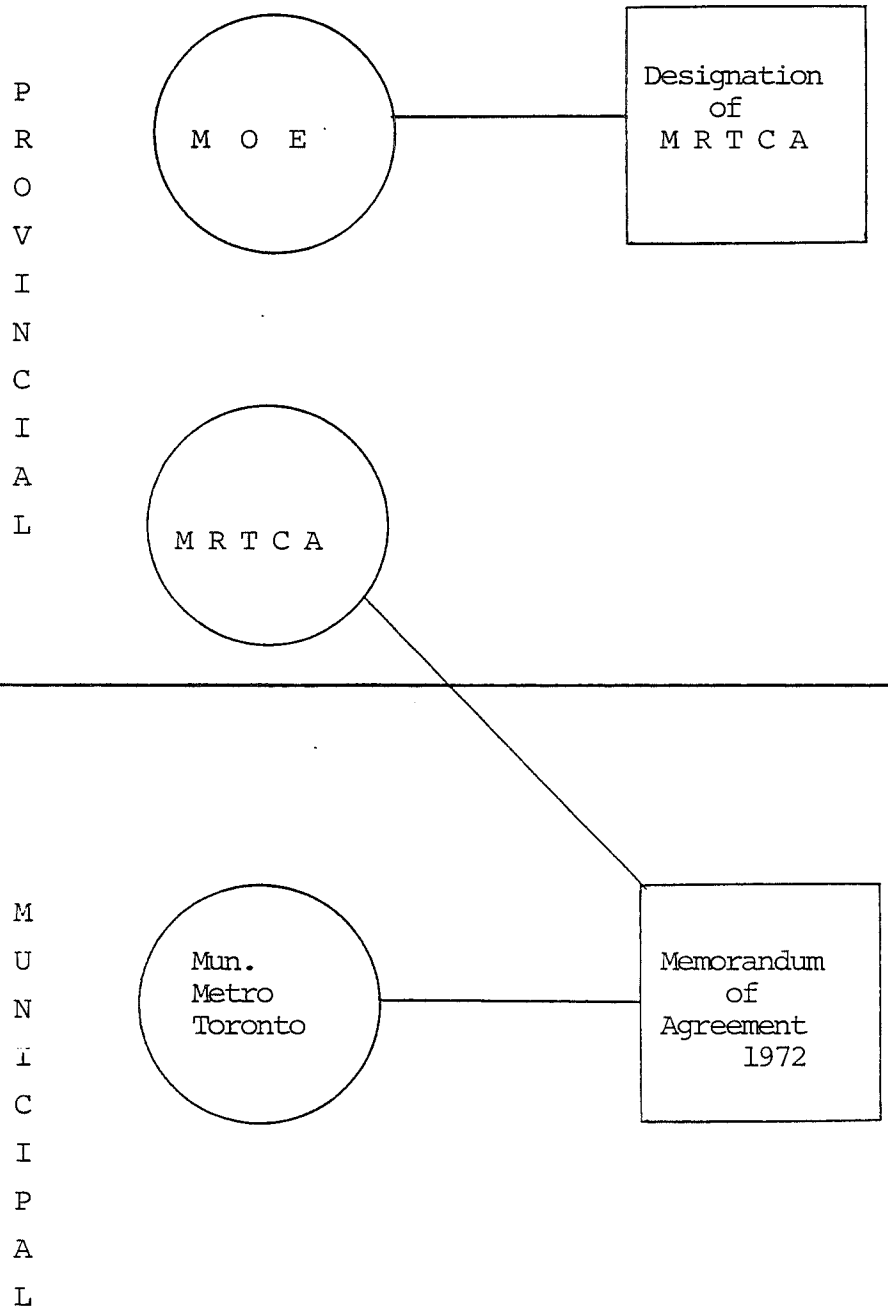
> ... establish and undertake, in the area over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, coal ore and minerals (s. 20).

The watershed controlled by the MTRCA includes all streams entering Lake Ontario, from Carruthers Creek to Etobicoke Creek, as well as parts of Lake Ontario (Territorial Divisions Act; Order-in-Council 49/74). MTRCA has six participating municipalities, which are listed in its Watershed Plan. These are:

- the Municipality of Metropolitan Toronto
- the Regional Municipality of Durham
- The Regional Municipality of Peel
- The Regional Municipality of York
- The Township of Adjala
- the Township of Mono

5.6 WATERSHED PLANNING

(B) ROLE AS IMPLEMENTING AGENCY OF METROPOLITAN TORONTO WATERFRONT PLAN



The Watershed Plan was developed by the MTRCA in 1980. In contains specific programs for:

i) flood control;

ii) erosion and sediment control;

iii) storm water management;

iv) land acquisition;

v) conservation land management;

vi) watershed recreation;

vii) Lake Ontario waterfront development;

viii) shoreline management;

ix) heritage conservation; and

x) community relations.

The objectives of these programs were reviewed in 1986.

It should be noted that the MTRCA requires the approval of the Minister of Natural Resources and possibly the Ontario Municipal Board before it proceeds with a project (s. 24 Conservation Authorities Act).

(B) Role as Implementing Agency of the Metropolitan Toronto and Region Waterfront Plan:

In 1967, the Metropolitan Planning Board prepared The Waterfront Plan

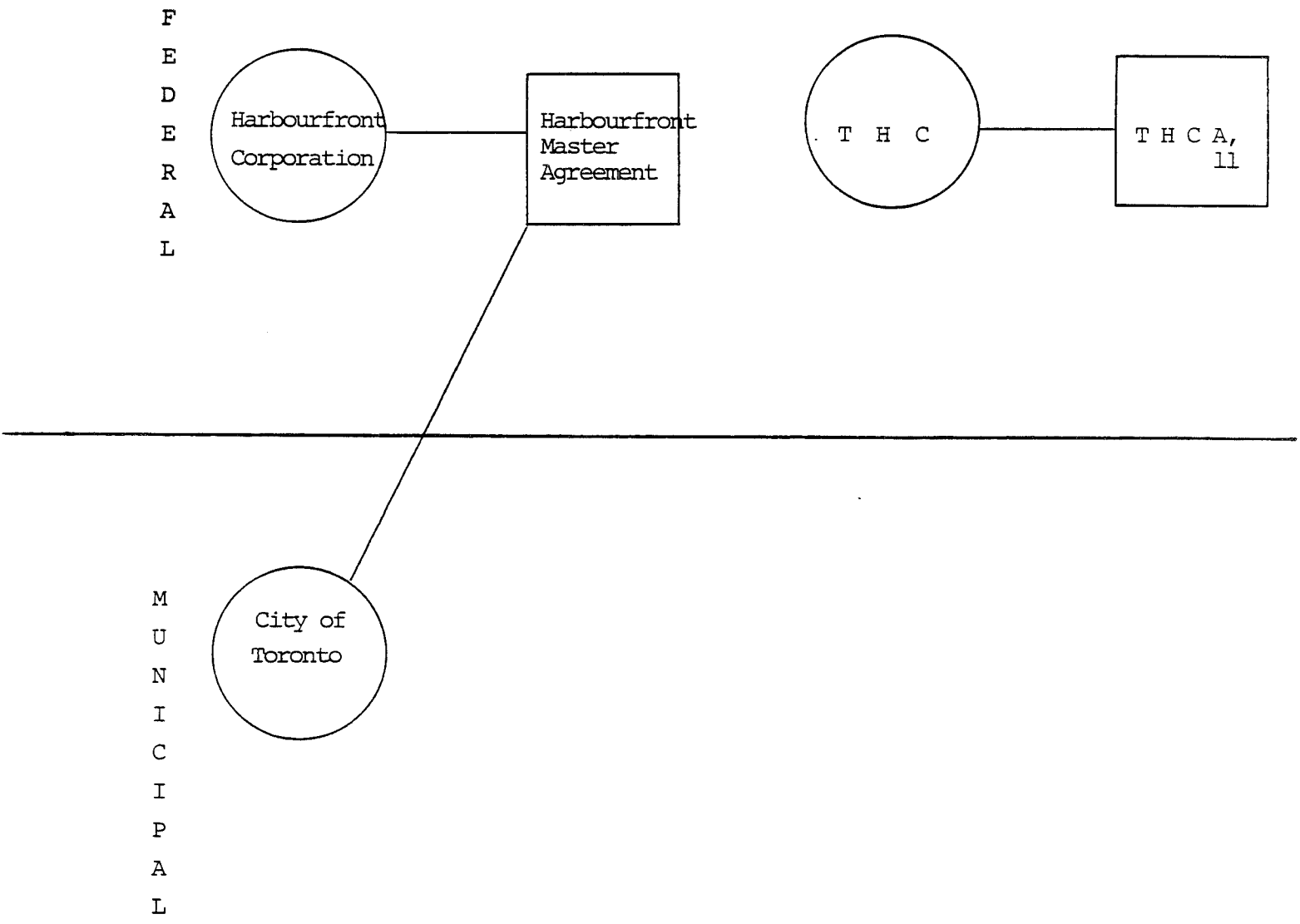
for the Metropolitan Toronto Planning Area, which covered an area from Clarkson to Carruther's Creek. The objective of the plan was "a handsome waterfront, balanced in its uses, readily accessible and fully cognizant of the features which nature has provided". In 1970, the Minister of the Environment designated the MTRCA as the implementing agency for Waterfront Plan for lands falling within its area of jurisdiction (with the exception of the central harbour). A Memorandum of Agreement between the MTRCA and the Municipality of Metropolitan Toronto sets out the rights and obligations of the two parties in the implementation of the Waterfront Plan. Basically, the MTRCA will be acquiring parklands which will eventually be turned over to Metropolitan Toronto for maintenance.

MTRCA's role as the implementing agency for the Metropolitan Toronto Waterfront Plan has been incorporated into the Watershed Plan, described above, under topic number 7: "Lake Ontario Waterfront Development Program".

5.7 OTHER PLANNING TOOLS

(A) HARBOURFRONT

(B) TORONTO HARBOUR COMMISSION



5.7 OTHER PLANNING TOOLS

(A) Harbourfront:

The lands composing the Harbourfront area are primarily federal lands. They are located south of the Gardiner Expressway, between York Street Stadium Road. These lands are managed by the Harbourfront Corporation, a federal Crown corporation. Its board of directors are appointed by the federal government in consultation with the Municipality of Metropolitan Toronto and the City of Toronto.

The Harbourfront Master Agreement defines the respective roles of the Harbourfront Corporation and the City of Toronto in the harbourfront development process.

Harbourfront is subject to the Harbourfront Zoning By-law. Also, official plans have been prepared for the harbourfront area. General planning guidelines were developed by the Toronto Planning and Development Department. More detailed sub-area plans have been developed by either the Metropolitan Toronto Planning and Development Department or the Harbourfront Corporation.

(B) Toronto Harbour Commission:

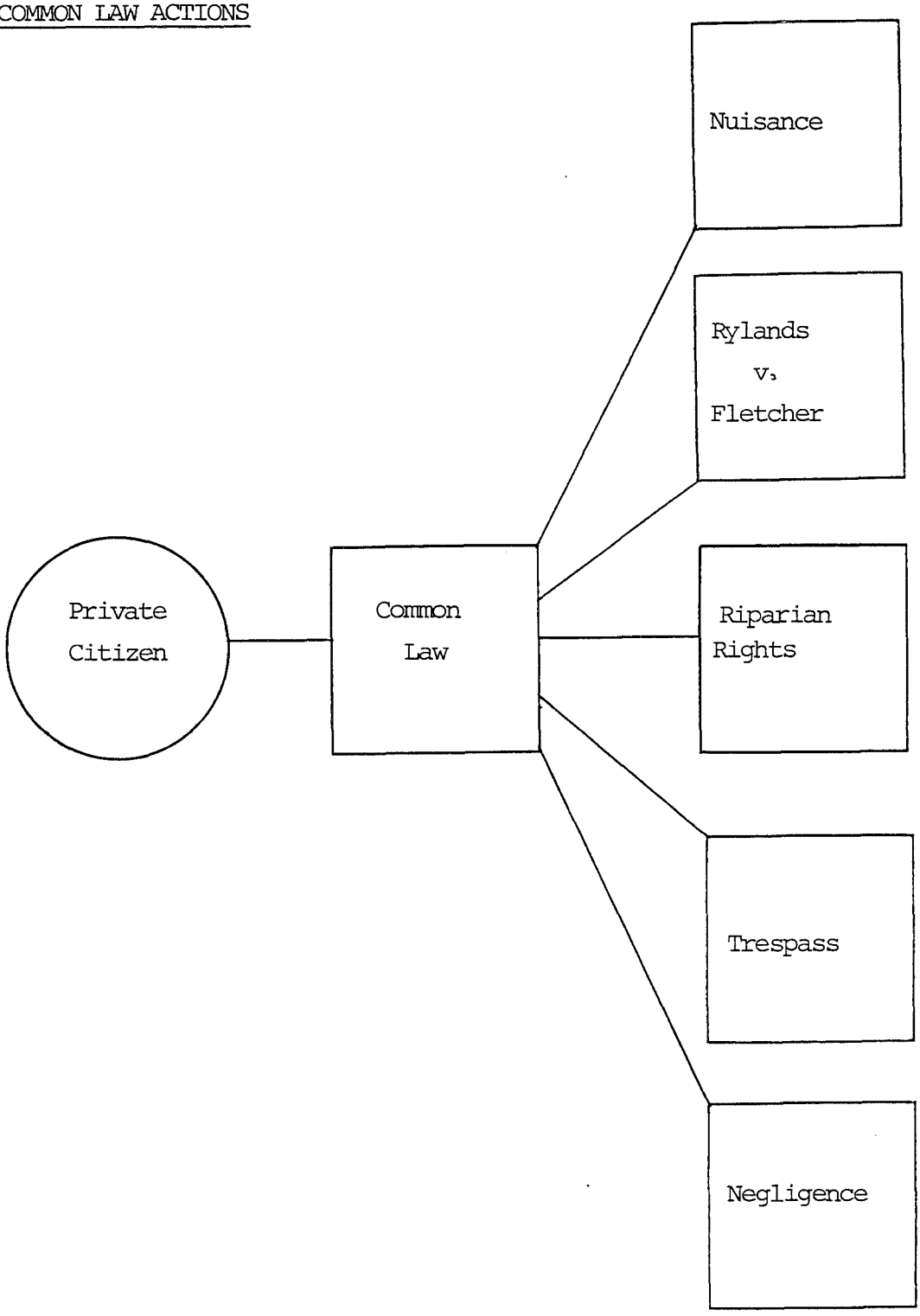
The Toronto Harbour Commissioners Act, 1911 enables the Toronto Harbour Commissioners to regulate, by by-laws:

> ... the use and development of all land and property on the water front within the limits of the city and all docks, wharfs, channels, buildings and equipment erected or used in connection therewith".
> (s. 16 Toronto Harbour Commissioners Act , 1911)

OTHER INITIATIVES

6.1 COMMON LAW ACTION

(A) COMMON LAW ACTIONS



6.1 COMMON LAW ACTIONS

Actions taken by private individuals to protect their rights can lead to the betterment of water quality. Common law actions evolve as principles of law, although they are not set out in legislation.

(i) Nuisance: An occupier may bring a nuisance action against someone who has unreasonably interfered with the use and enjoyment of the land which he occupies.

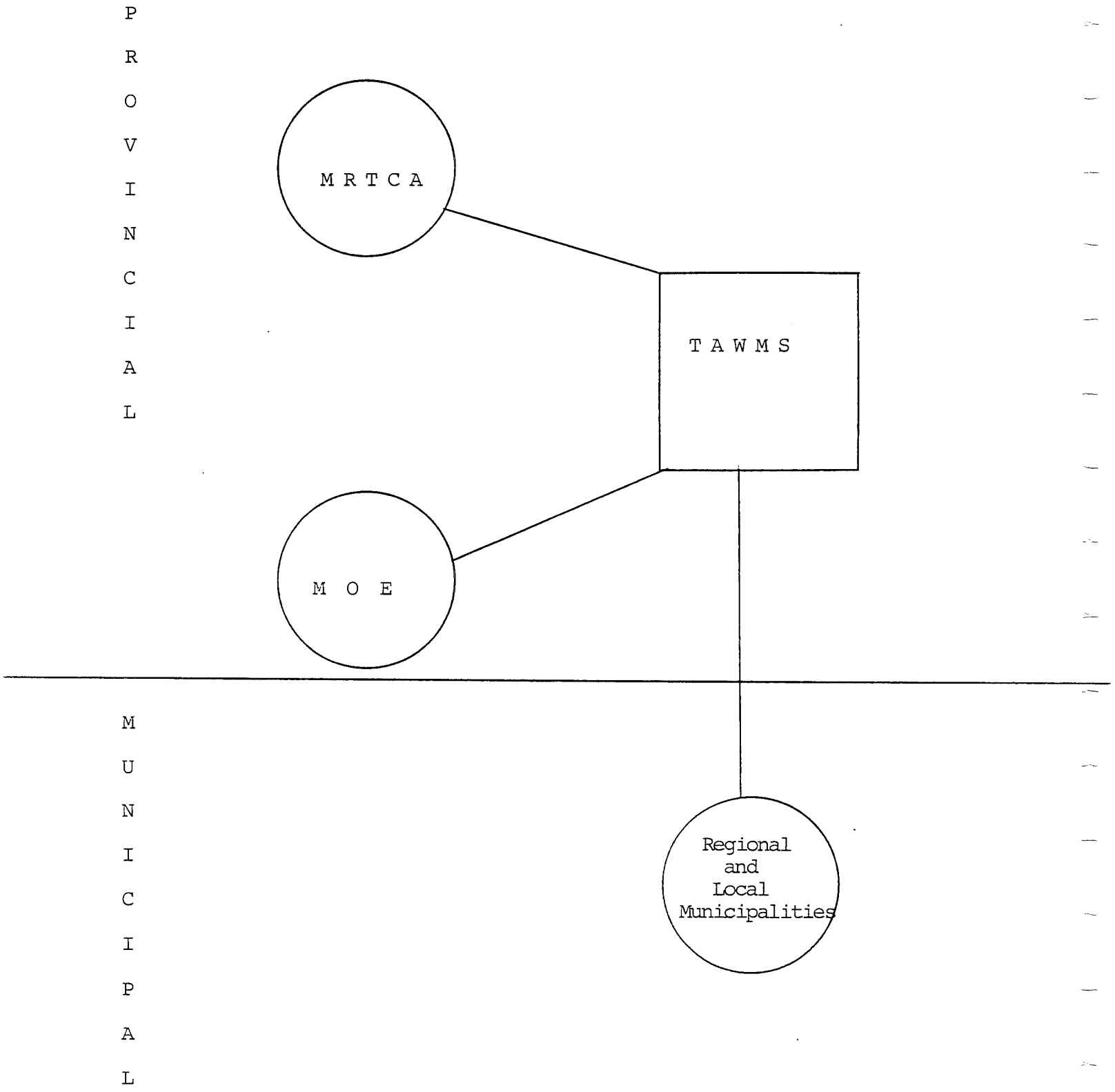
(ii) The principle in Rylands v. Fletcher: Where a person brings a dangerous substance on his land for some non-natural use of that land, he is responsible for all direct consequences flowing from any escape of that substance.

(iii) Riparian rights: An owner of land bordering a stream, river or lake is entitled to have water continue to flow by his land without a sensible decrease in quantity or quality. (This right is subject to the rights of other landowners bordering the same watercourse).

(iv) Trespass: A person may sue in trespass for any direct interference with his land. For example, a trespass is committed when a noxious substance comes into physical contact with the victim's property.

(v) Negligence: A negligence action requires the injured party to establish that the polluting party had a duty not to harm him, that the polluting party failed to take adequate care, and that the victim suffered damages as a result of this breach of care.

6.2 THE TORONTO AREA WATERSHED MANAGEMENT STRATEGY (T A W M S)



6.2 THE TORONTO AREA WATERSHED MANAGEMENT STRATEGY

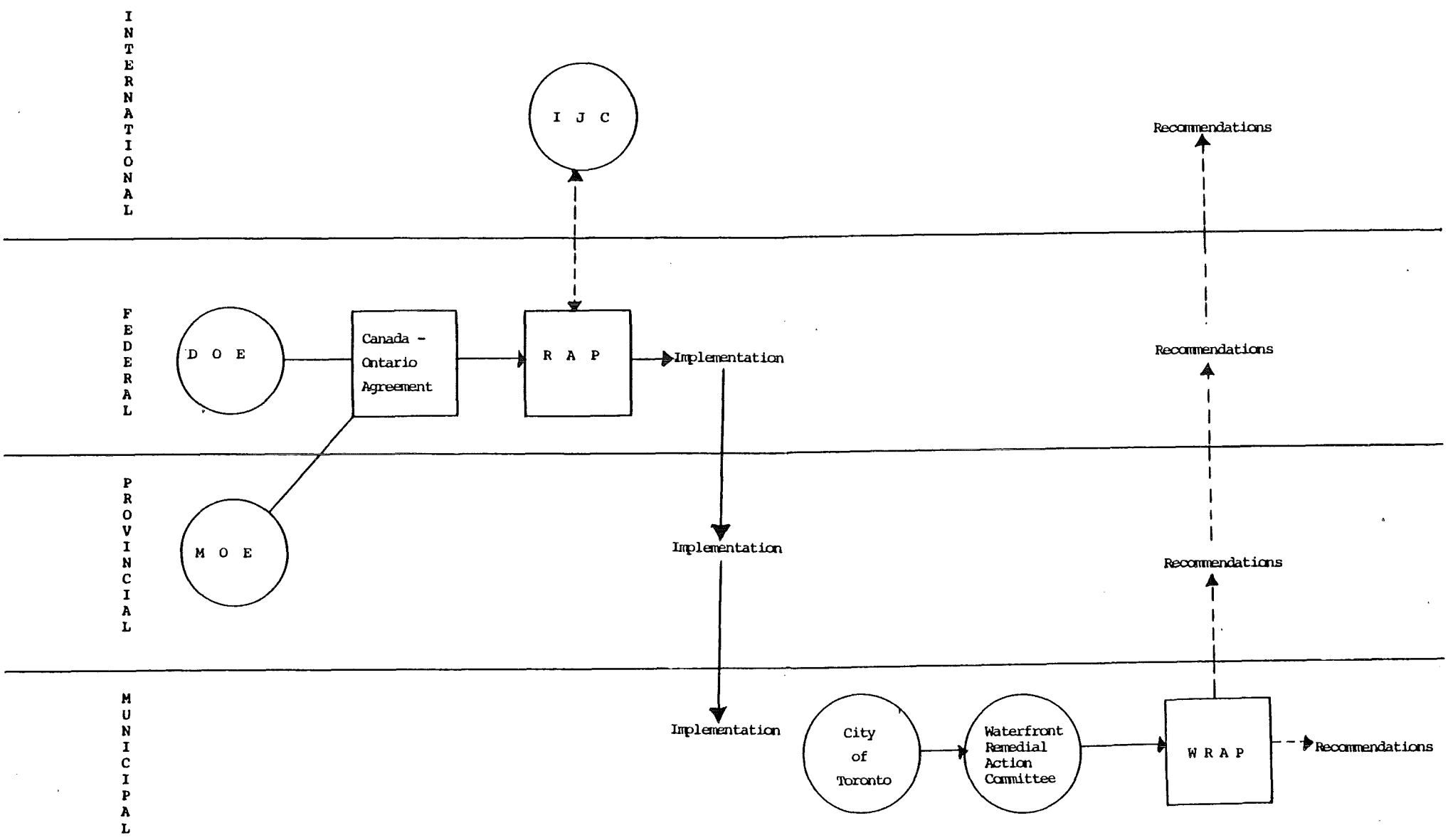
The Metropolitan Toronto and Region Conservation Authority, in conjunction with the Ministry of the Environment, is carrying out the Toronto Area Watershed Management Strategy. As part of this strategy, sewer inputs into the Humber River were measured and measurements were taken of sedimentation and contamination (especially bacterial contamination) in the River. At present, similar work is being carried out on the Don River.

6.3 REMEDIAL ACTION PLANS (R A P)

(A) FEDERAL - PROVINCIAL RAP

6.3 REMEDIAL ACTION PLANS

(B) TORONTO WATERFRONT REMEDIAL ACTION PLAN (W R A P)



6.3 REMEDIAL ACTION PLANS

The Great Lakes Water Quality Board of the International Joint Commission ission has identified 42 areas of serious pollution within the Great Lakes, requiring remedial action. The Toronto Waterfront is one such problem area.

(A) The Federal-Provincial RAP:

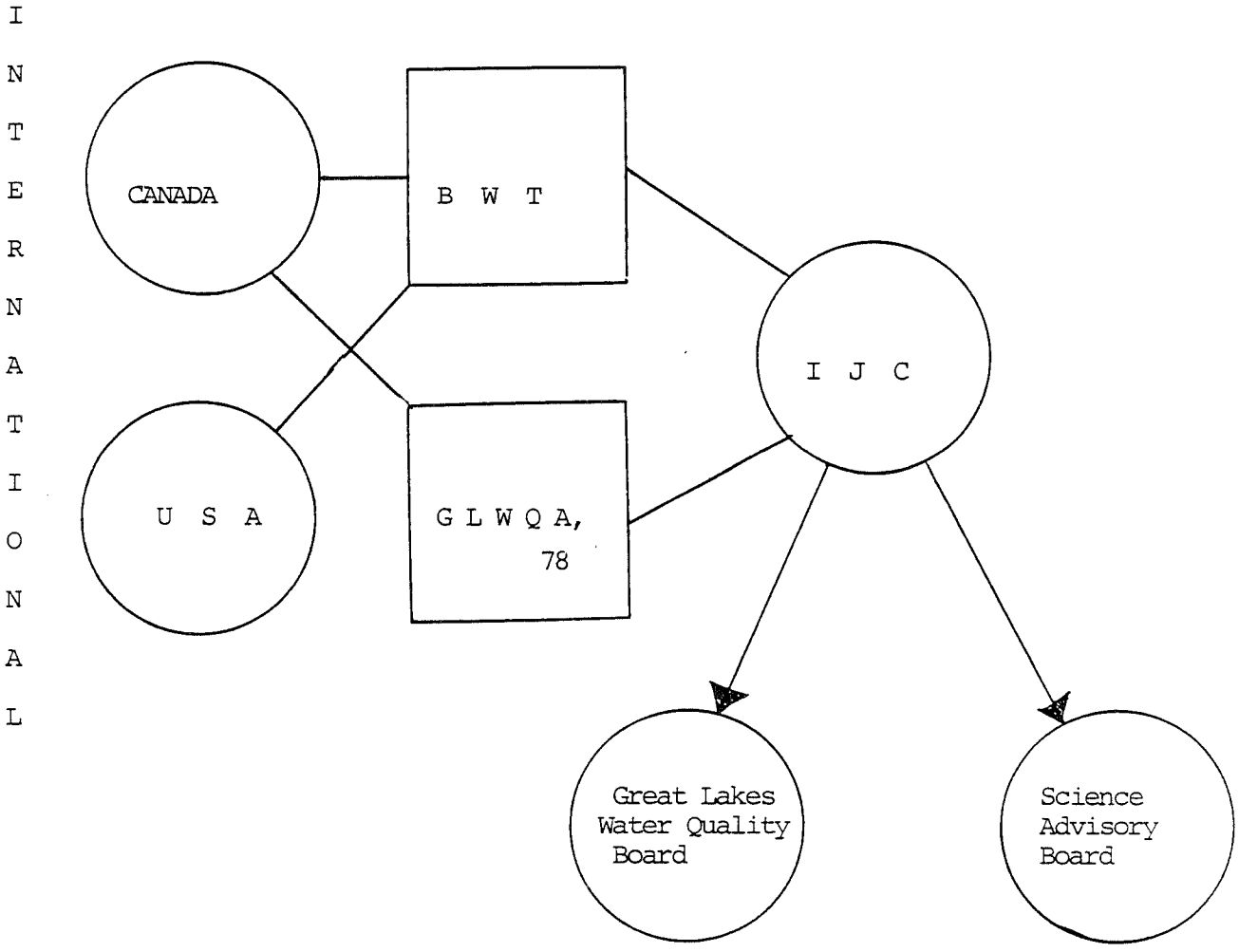
At present, the Ministry of the Environment and the Department of the Environment are developing a remedial action plan for the Toronto Waterfront. This plan is being developed under the Canada-Ontario Agreement Respecting Great Lakes Water Quality. (This Agreement was signed to enable Canada to meet its obligations under the Canada-United States Great Lakes Water Quality Agreement, 1978.) The federal-provincial remedial action plan will be developed in consultation with affected residents. Upon completion, it will be submitted to the International Joint Commission and, finally implemented by all levels of government.

(B) The Toronto WRAP:

A coalition of environmental and citizens' groups known as the Waterfront Remedial Action Committee, obtained funding from the Neighbourhoods Committee of the Toronto City Council to develop an independent remedial action plan. These groups were concerned that the development of the federal-provincial RAP was behind schedule, and that there might be insufficient public input into the federal-provincial RAP. A document entitled A Remedial Action Plan for the Toronto Waterfront was completed in February, 1987.

6.4 INTERNATIONAL DEVELOPMENT

(A) INTERNATIONAL JOINT COMMITTEE



6.4 INTERNATIONAL DEVELOPMENT

(A) International Joint Commission:

The International Joint Commission (IJC) was established by the Treaty Relating to Boundary Waters and Questions arising along the Boundary Between Canada and the United States (January 11, 1909). This treaty has been implemented in Canada under the Boundary Waters Treaty Act.

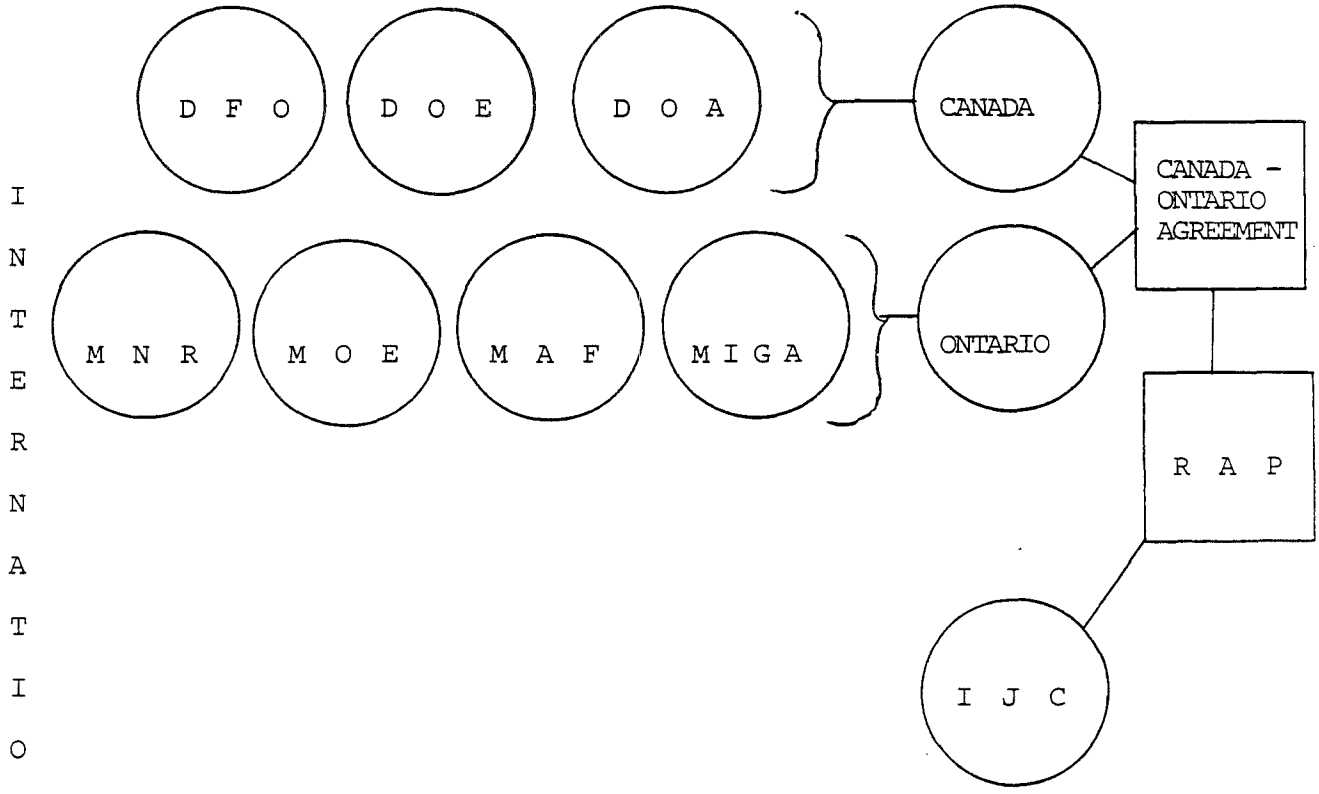
The Treaty recognizes that boundary waters "shall not be polluted on either side to the injury of health or property on the other." (Art IV) The IJC is given several responsibilities including the duty to study and make non-binding recommendations on matters referred to by either the governments of Canada and the United States (Art. IX)

Further rights and responsibilities of the International Joint Commission are outlined in the Great Lakes Water Quality Agreement, 1978 (Art. VII). The aim of the Great Lakes Water Quality Agreement, 1978 is "to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem". This agreement recognizes the need for an ecosystem approach to water quality management by acknowledging the effects of air and land pollution on water quality. The control of toxic substance is also identified as an important goal.

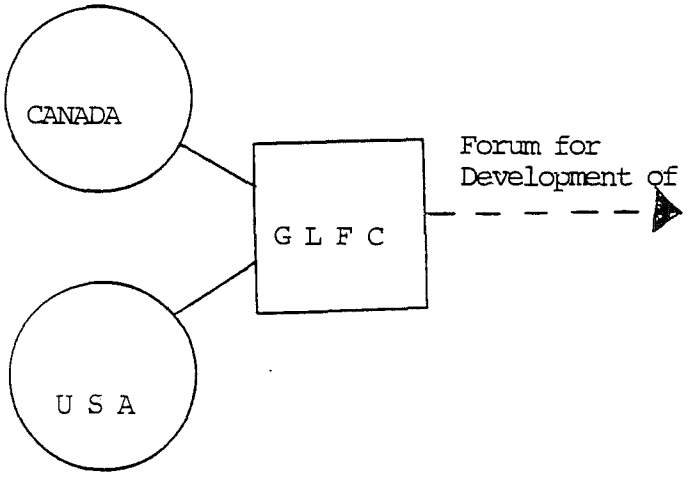
Article VII of the Great Lakes Water Quality Agreement, 1978 establishes the responsibilities of the Great Lakes Water Quality Board and the Great Lakes Science Advisory Board. The Great Lakes Quality Board is identified as "the principal advisor to the International Joint Commission". It is the Board which identified the Toronto Harbour as an "Area of Concern", and called for the development of a remedial action plan.

6.4 INTERNATIONAL DEVELOPMENT (Continued)

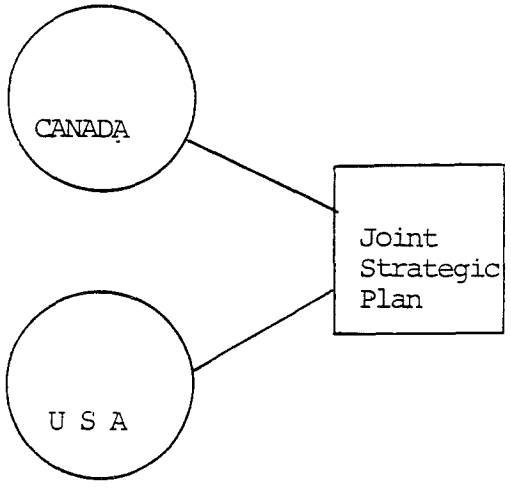
(B) CANADA - ONTARIO AGREEMENT



(C) GREAT LAKES FISHERIES COMMISSION



(D) MANAGEMENT OF GREAT LAKES FISHERIES



(B) The Canada-Ontario Agreement:

The Canada-Ontario Agreement Respecting Great Lakes Water Quality sets out the respective responsibilities of Ontario and Canada in the implementation of the Great Lakes Water Quality Agreement, 1978. A Board of Review is responsible for supervising the implementation of this Agreement.

The federal-provincial remedial action plan for Toronto Harbour is being prepared under the Canada-Ontario Agreement.

(C) The Great Lakes Fisheries Commission:

The Great Lakes Fisheries Commission was created by the Convention on Great Lakes Fisheries between Canada and the United States, and given responsibility to develop measures to maximize the sustained productivity of any fish stock, to eradicate sea lamprey populations, and to publish scientific and other information. This Treaty has been implemented in Canada by the Great Lakes Fisheries Convention Act.

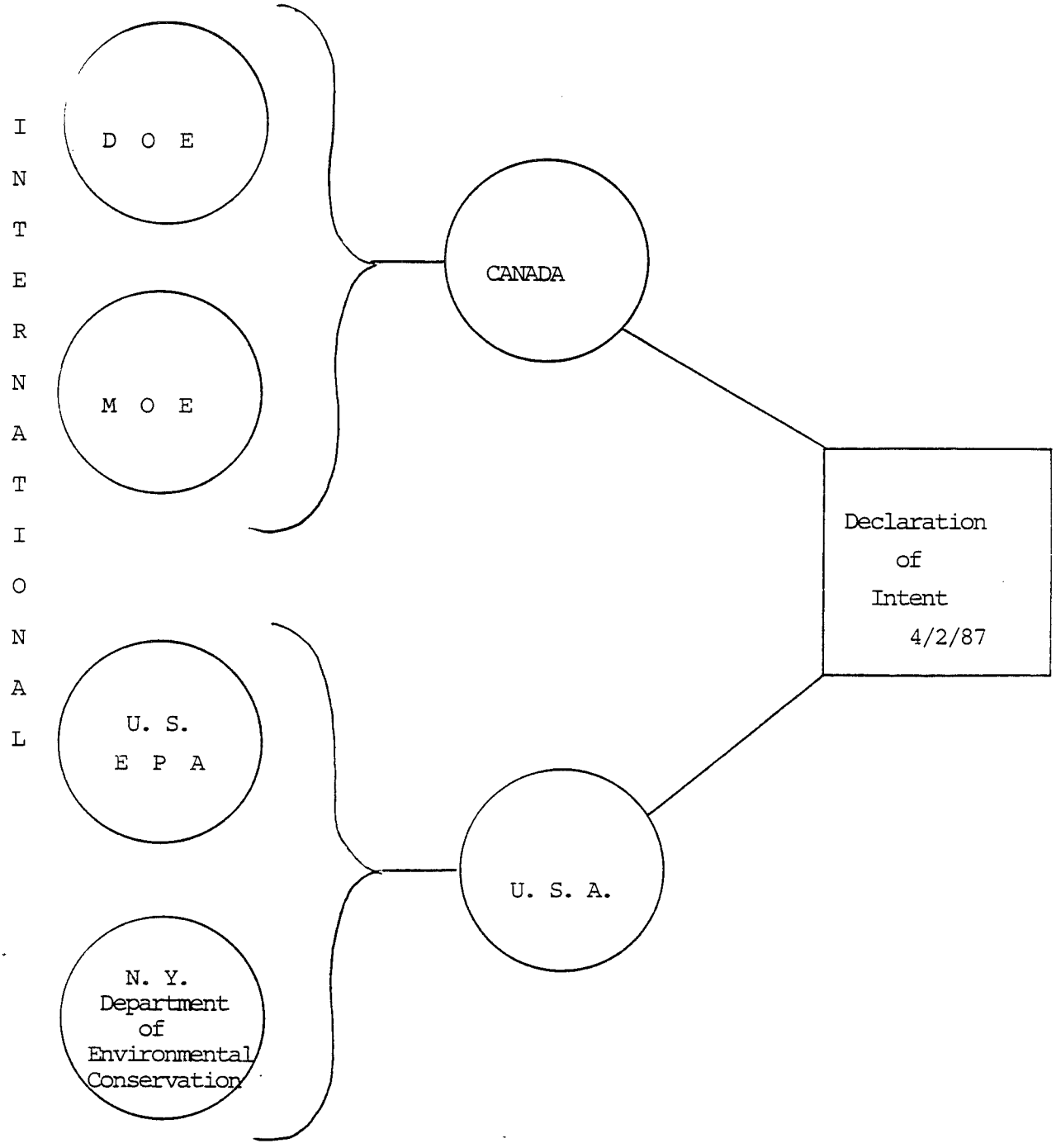
(D) Joint Strategic Plan for Management of the Great Lakes:

The Great Lakes Fisheries Commission was the forum for the development of the Joint Strategic Plan for Management of Great Lakes Fisheries, which was signed by the United States Fish and Wildlife Service, the National Marine Fisheries Service (U.S.), the Department of Fisheries and Oceans (Canada), the Ministry of the Environment (Ontario), and several state agencies. The stated goal of the plan is:

> "To secure fish communities... and provide from these communities an optimum contribution of fresh fishing opportunities and associated benefits to meet needs identified by society for:

6.4 INTERNATIONAL DEVELOPMENT (Continued)

(E) NIAGARA RIVER TOXICS MANAGEMENT PLAN



- wholesome food,

- recreation,

- employment and income, and

- a healthy human environment.

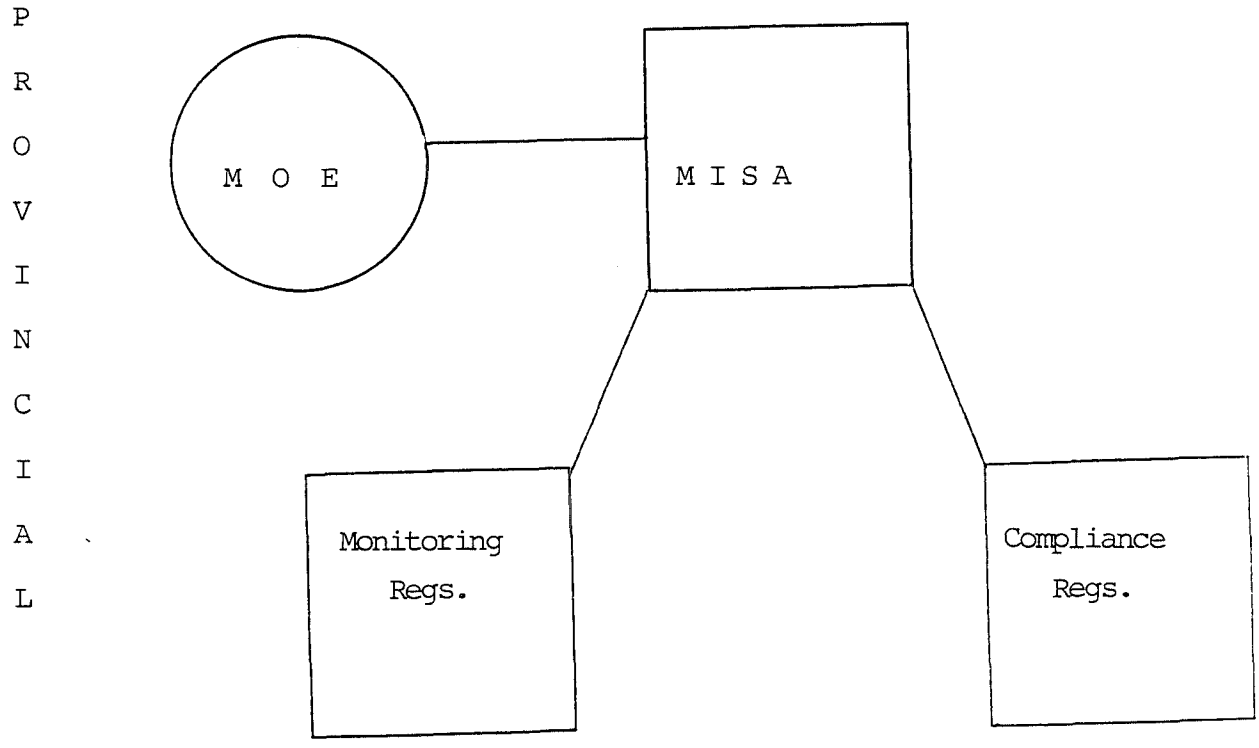
This management plan also recognizes the need for an ecosystem approach to resource management.

(E) Niagara River Toxics Agreement:

The Niagara River, which flows into Lake Ontario, is a major source of contaminants to the Lake. The poor water quality of the Niagara River is the result of industrial discharges, effluents from municipal sewage treatment plants, and leaking material from hazardous waste sites.

The Declaration of Intent Relating to The Niagara River Toxics Management Plan is an attempt to deal with toxic chemical pollution in the Niagara River. The signatories have agreed to develop a cooperative strategy aimed at significantly reducing toxic chemical pollution in the Niagara River (An obligation to work toward the reduction of the discharge of pollutants into the Great Lakes arises from Article II of the Great Lakes Water Quality Agreement, 1978.)

6.5 MUNICIPAL - INDUSTRIAL STRATEGY FOR ABATEMENT (M I S A)



6.5 MUNICIPAL-INDUSTRIAL STRATEGY FOR ABATEMENT

Ontario's Municipal-Industrial Strategy for Abatement (MISA) announced by the Minister of the Environment in June, 1986, is a program designed to limit toxic contamination caused by municipal and industrial discharges into waterways.

The Municipal-Industrial Strategy for Abatement program will apply to the municipal sector and eight major industrial sectors: electric power generation; industrial minerals; inorganic chemicals; iron and steel; metal mining and refining; organic chemicals; petroleum refining; and pulp and paper.

As a first step the Ministry of the Environment will work with the affected industries (on a sector by sector basis) to develop a monitoring program for the assessment and analysis of thier industrial discharges. These monitoring programs will then be incorporated into monitoring regulations for each sector.

Information derived from the monitoring regulations will be used to develop specific compliance regulations for each sector. These regulations will set effluent limits based on both the "best available technology economically achievable" and the impact of the effluent on water quality.

The first sector to be regulated will be the petroleum sector. It is anticipated that final draft monitoring regulations for this sector will be completed in May, 1987.

APPENDIX

7.1 LIST OF AGENCIES

International:

- Great Lakes Fisheries Commission
  (Great Lakes Fisheries Convention Act)
- International Joint Commission
  (International Boundary Waters Treaty Act)

Federal:

A. Government Departments:

- Department of Agriculture
- Department of the Environment
- Department of Fisheries and Oceans
- Department of External Affairs
- Department of National Health and Welfare
- Department of Public Works
- Department of Transport

B. Other Bodies:

- Environmental Assessment Panel
  (Environmental Assessment and Review Process Guidelines Order -- SOR/84-467)
- Harbourfront Corporation
  This is a federal Crown corporation, reporting to Parliament through the Minister of Public Works.
- Review Boards (Pesticides)
  (Appointed pursuant to the Pest Control Products Regulations)
- Toronto Harbour Commission
  (Toronto Harbour Commissioners Act)

Provincial:

A. Government Departments:

- Ministry of Agriculture and Food
- Ministry of the Environment
- Ministry of Health
- Ministry of Intergovernmental Affairs
- Ministry of Labour
- Ministry of Municipal Affairs
- Ministry of Natural Resources
- Ministry of Transportation and Communications

B. Other Bodies:

- Environmental Assessment Board
  (Environmental Assessment Act, Part III)
- Metropolitan Toronto and Region Conservation Authority
  (Conservation Authorities Act)
- Ontario Development Corporation
  (Development Corporations Act)
- Ontario Drainage Tribunal
  (Drainage Act)
- Ontario Municipal Board
  (Ontario Municipal Board Act)
- Pesticides Advisory Committee
  (Pesticides Act)

Municipal:

A. Government Bodies:

A variety of municipal departments exist at both the regional or district level, and at the local level. The names of the departments will vary from municipality to municipality. Common departments include:

- Planning Department

- Public Health Department
- (Public)Works Department
- Roads and Traffic Department

B. Other Bodies:

- Committee of Adjustments
  (Planning Act, 1983, s.43)
- Board of Health
- Planning Board

7.2 LIST OF STATUTES

Federal:

- Canada Water Act
- Canada Shipping Act
- Clean Air Act
- Environmental Assessment and Review Process Guidelines Order (A statutory instrument)
- Environmental Contaminants Act
- Fertilizers Act
- Fisheries Act
- Great Lakes Fisheries Convention Act
- International Boundary Waters Treaty Act
- Migratory Birds Convention Act
- Navigable Waters Protection Act
- Pest Control Products Act
- Toronto Harbour Commissioners Act, 1911

Provincial:

- Agricultural Tile Drainage Installation Act
- Beach Protection Act
- Beds of Navigable Waters Act
- Condominium Act
- Conservation Authorities Act
- Drainage Act
- Dangerous Goods Transportation Act, 1981
- Environmental Assessment Act
- Environmental Protection Act
- Health Protection and Promotion Act, 1983
- Lakes and Rivers Improvement Act
- Municipal Act

- Ontario Planning and Development Act
- Ontario Water Resources Act
- Pesticides Act
- Planning Act, 1983
- Provincial Parks Act
- Public Lands Act
- Public Parks Act
- Public Transportation and Highway Improvement Act
- Regional Acts:

  Municipality of Metropolitan Toronto Act
  Regional Municipality of Durham Act
  Regional Municipality of Peel Act
  Regional Municipality of York Act
- Tile Drainage Act

Municipal:

- Sewer Use By-Law