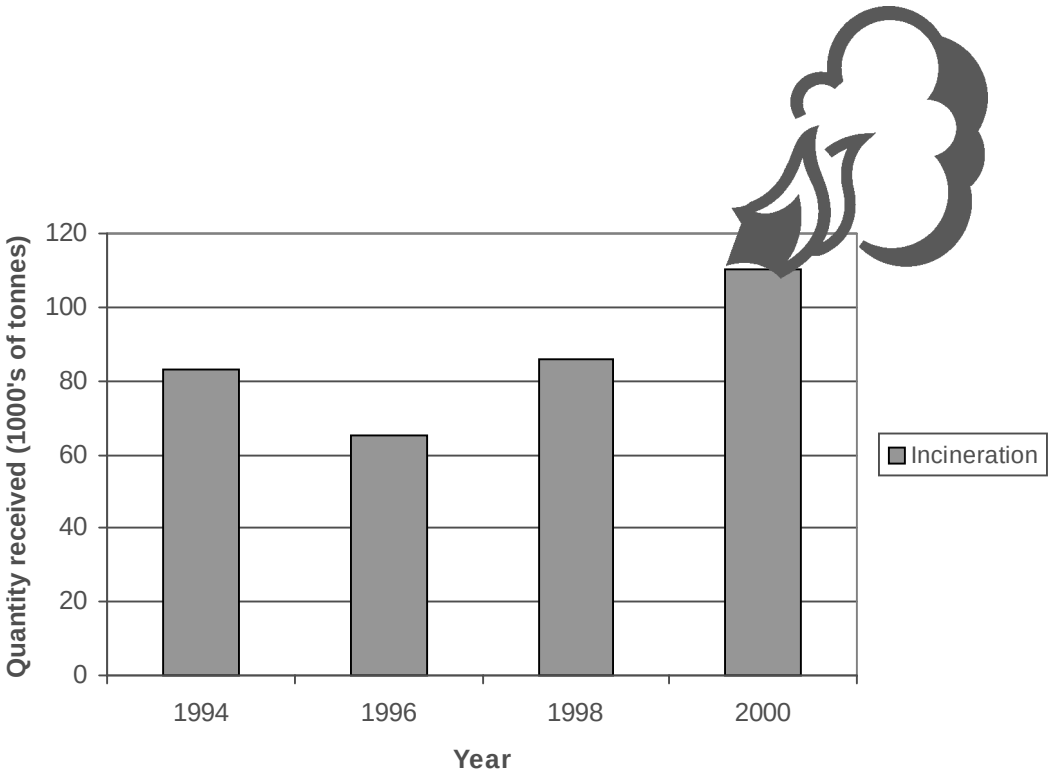
ONTARIO:
OPEN FOR TOXICS



Hazardous waste disposal becomes a burning issue in Ontario

CANADIAN INSTITUTE FOR ENVIRONMENTAL LAW AND POLICY

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Any errors or oversights are the responsibility of the authors.

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SECTION I: INTRODUCTION

In July 2000, the Canadian Institute for Environmental Law and Policy (CIELAP) released a study entitled "Open for Toxics: A Study of Hazardous Waste Generation and Disposal in Ontario" (Open for Toxics 1998) [1]. The study found that weak Ontario laws were drawing waste imports from the United States, particularly into the Sarnia, Hamilton, Burlington, and St. Catharines areas. The importation of U.S. hazardous waste into Ontario rose 138% between 1994 and 1998, while hazardous waste generation by Ontario industries and facilities rose by 41.8% over the same period. The CIELAP study established a baseline analysis from data supplied from the Ontario Ministry of the Environment's Hazardous Waste Manifest Database tracking system and using advanced database software. The Hazardous Waste Manifest Database records and reports the transfers of hazardous waste from generators to receivers within the province and the imports from other provinces and the United States. It does not record the total generation of hazardous waste, as there is no regular reporting requirement in Ontario regarding the hazardous waste that is generated and disposed of on-site through such means as disposal into municipal sewer systems, on-site landfills and incinerators. These wastes are thought to account for approximately 40% of hazardous waste generated in the province.

The Hazardous Waste Manifest Database also records and reports the hazardous waste exported from Ontario to other provinces as well as to the U.S. This general activity of imports and exports is described in Tables i and ii.[2a]

Table i: Hazardous Waste Exports - Trends

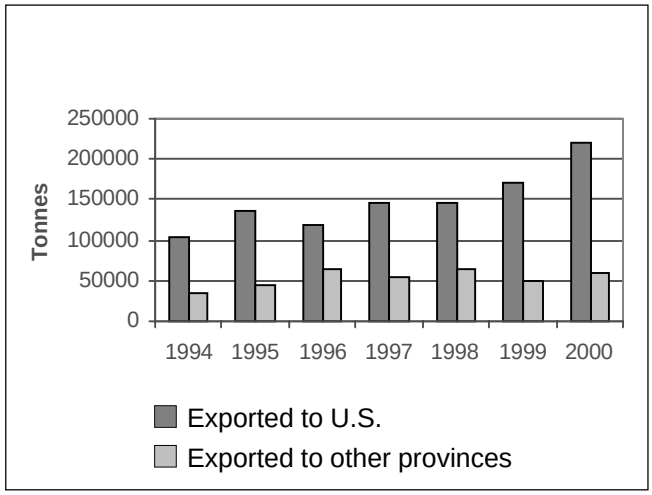
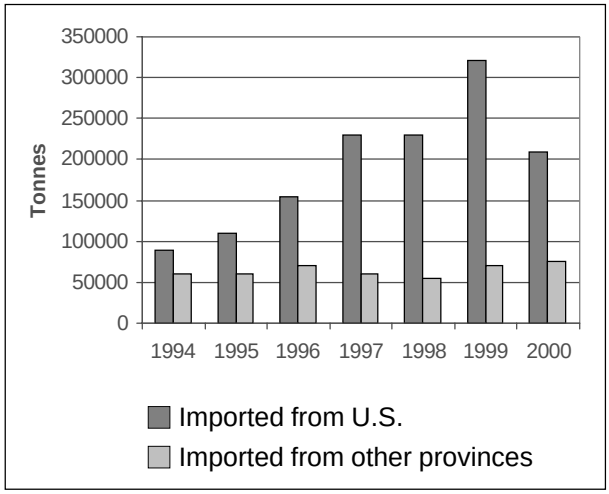


Table ii: Hazardous Waste Imports - Trends



The purpose of this new report (Open for Toxics 2000) is to update the analysis and chart the trends between 1998 and 2000, based upon the most current Ministry of Environment data.[2] Open for Toxics 2000 ranks the largest generators and receivers of hazardous waste in Ontario. Separate charts detail the U.S. generators that ship waste to Ontario and the Ontario receivers of those wastes. Open for Toxics 2000 includes charts that illustrate which companies generate or receive hazardous waste, the types and volumes of hazardous waste imported and produced and the communities which are the destination of waste.

Wastes are considered hazardous if they are ignitable, corrosive, chemically reactive, toxic, or likely to spread disease. They include waste by-products from industrial processes such as waste acids, solvents, lubricants, paints, steel-making residues, contaminated sludges, PCBs, and oils. Many household products, car batteries and biomedical or pathological wastes are also considered hazardous. Discarded material which, because of its inherent nature and quantity, requires special disposal techniques to avoid creating health hazards, nuisances or environmental pollution. Hazardous waste can physically be solid, liquid, semi-solid or gaseous. Leachate hazardous waste is the liquid which escapes from a landfill when water (from precipitation) soaks into and through a landfill, picking up a variety of suspended and dissolved materials from the waste. This report considers both landfill leachate wastes (a grossly polluted liquid from waste disposal sites) and non-leachate waste that is everything else considered in the Hazardous Waste Manifest Database to be hazardous, including severely toxic wastes.

In Open for Toxics 2000 information is included about the composition of hazardous waste generated and received, as well as a regional breakdown and detailed area profiles of waste generation and receipts. The main findings of Open for Toxics 2000 are as follows:

HAZARDOUS WASTE GENERATION IN ONTARIO

- The quantity of hazardous waste generated in Ontario decreased by 4.8% between 1998 and 2000, from 1,816,585 to 1,729,158 tonnes but still increased 35% overall from the base year of 1994. (Table 1).

- Hamilton, Ottawa, and Burlington are now the top hazardous waste-generating districts in Ontario (Table 6). Indeed Burlington ranked as the number one generating district for non-leachate hazardous waste, displacing Hamilton in the 1998 data.

- The top waste types continue to reflect the hazardous waste generated by municipal solid waste landfills, the steelmaking industry, the petrochemical industry and manufacturers that utilize petrochemical products in their processes, such as the auto manufacturing sector (Table 11, Table 38 and Figure 25)

- While Open for Toxics 1998 found landfill leachates to be the waste type with the largest total (amount or quantity) increase between 1994-1998, the data in this report indicates that steel-making residues and landfill leachate saw a decrease of waste generated, declining 25% and 12% between 1998 and 2000 respectively.

- Non-leachate hazardous waste generation has risen since 1998 with emulsified oils increasing by 20%, and oil skimmings and sludges rising by 12%. (Table 12)

ONTARIO RECEIVING SITES OF HAZARDOUS WASTE

- The greatest quantities of hazardous waste transfers in Ontario between 1998 and 2000 were received by local water pollution control plants, which account for 33.7% of the total. (Table 19 and Figure 13)

- Incineration experienced a 28% increase from 1998 to 2000. (Table 20 and Figure 14)

- If the Bennett Environmental Inc. incinerator is approved for Kirkland Lake, the disposal practice of incineration would increase from 6% to approximately 16% by 2004, representing an increasing percentage change of 64%. (Table 15)

- Burlington, Guelph and Ottawa demonstrated the greatest quantity increase in receipts of hazardous waste, with Sarnia maintaining the top ranking of quantity received for both 1998 and 2000. (Table 21)

- The only waste type that showed an increase in amount received is oil skimmings and sludges. (Table 27).

U.S. HAZARDOUS WASTE TRANSFERS TO RECEIVING SITES IN ONTARIO

- 11.8% of all hazardous waste received in Ontario came from the U.S., this is down from 12.4% between 1994 and 1998. (Table 14)

- Between 1998 and 2000 Ontario demonstrated a 12.6% decrease in amount of hazardous waste received from the U.S. This is still a 105.8% increase from the amount received in the base year of 1994. (Table 15)

- From 1998 to 2000 Ontario demonstrated a 12.9% decrease in hazardous waste transfers from the U.S., overall this is still a 105.2% increase in transfers from 1994. (Table 28)

- All hazardous waste imports from the U.S. were non-leachate waste. (Table 29a)

- If the Bennett Environmental Inc. incinerator is approved for Kirkland Lake, the slight decrease in the import of U.S. hazardous waste experienced between 1998 and 2000 to Ontario would be significantly reversed. There would be approximately a 49.3% increase in imports by 2004, assuming that most of Bennett's capacity originated from the U.S. (Figure i)

- Although Ontario's landfill sites received 26.6% less U.S. hazardous waste between 1998 and 2000 (Table 33), landfills remain the number one facility type to receive U.S. hazardous waste, at 43.2% of all facility types. (Table 32 and Figure 21)

- There has been a significant percentage change increase in U.S. hazardous waste being received at Ontario local water pollution control plants (up 36%) and by Ontario incinerators (up 8.6%). (Table 33) The waste type of non-halogenated lean organics, a type of waste for incineration and contaminated with solvents, oils and other organics, increased 36% between 1998 and 2000 (Table 37).

- Ontario's water pollution control plants are receiving non-leachate U.S. hazardous waste, in particular spent pickle liquor. Two of the water pollution control plants are located in Toronto, one in Chatham and one in Woodstock. (Table 33b)

- The bulk of U.S. hazardous waste is received in Sarnia (61%, Table 34). Of the top 5 receiving districts, London experienced a 59% increase in receipts between 1998 and 2000. (Table 35)

The principle conclusion in both Open For Toxics 1998 and Open for Toxics 2000 is that while the U.S. has detailed regulatory standards for waste handling and disposal such rules remain virtually non-existent in Ontario. This situation continues to put the health, safety and environment of Ontario residents at serious risk, and potentially exposes Ontario taxpayers to incalculable future clean-up costs. In many cases it has been found that it is not even technically feasible to fully clean up a site after prolonged or severe contamination.[3]

LITTLE REGULATORY PROGRESS DURING 1998-2000

It is good news that the generation and receipt of domestic and imported hazardous waste has decreased slightly since 1998. This trend, however, is more likely attributable to a decline of U.S. economic activity with a corresponding reduction in hazardous waste generation, as opposed to a tightening of Ontario's regulatory framework.[4] Current hazardous waste generation, transfer and disposal practices continue to underscore the need to implement the previous recommendations put forward by CIELAP and for the Ontario government to modernize its standards for dealing with hazardous waste, as reviewed below.

The Ontario Ministry of Environment (MOE) is quick to emphasize that the quantity of hazardous waste imported in 2000 declined. CIELAP's *6th Annual Report on Ontario's Environment* explored whether this optimism was justified. Although some law reforms were introduced in March 2001, no major changes were implemented during this reporting period, except for the 1999 "mixing rule" that requires a mixture of listed hazardous wastes be recognized as hazardous until delisted or exempted by the Ministry of Environment.[5] The March 2001 amendments did begin to address the trend of increasing hazardous waste imports to Ontario that CIELAP had noted regarding the classification of some waste shipments (particularly to the Taro East landfill in Hamilton) considered as hazardous under American law but not classified as hazardous wastes under Ontario law. In order to assist with this reclassification a new Toxicity Characteristic Leaching Procedure (TCLP) test was adopted and a new "derived from" rule was implemented.[6]

However, the new leachate toxic-waste test procedure allows an MOE director to substitute an "equivalent test method" for the TCLP, it does not set out criteria for the application of this substitute approach. In contrast, American law does not permit the substitution of another test method for the TCLP, except by petitioning for an amendment to the regulations. Similarly, proposed new Canadian federal transportation law reforms do not authorize any departure from the use of the TCLP. This discrepancy between Ontario and federal requirements in Canada and the United States could pose problems in future for the transboundary and interprovincial movement of leachate toxic waste. Also the exemption of four broad hazardous waste streams from the new Ontario rule changes remains problematic.

While reforming the Ontario law that defines and classifies hazardous waste is important, it is just the first step. Importantly, further amendments in December 2001 now require hazardous waste generators to pay certain tonnage charges and to register annually for the purposes of the online hazardous waste information network (HWIN) to track generation, handling and disposal of hazardous waste. [7]

MANDATORY DESTRUCTION OF PCBS?

While the MOE also posted a draft regulation in December 2001 that requires the mandatory destruction of stored PCBs within three years, there is a great deal of concern that its implementation may place the health and safety of Ontario residents and residents of other provinces at higher risk than the current situation. Currently PCB storage sites are subject to extensive federal and provincial regulatory requirements and oversight.

According to the Pembina Institute, the Ministry's proposal fails to provide any assessment of the adequacy of existing PCB disposal facilities in Ontario to destroy these wastes safely.[8] There are only two approved PCB destruction facilities in Ontario. A third commercial PCB processing facility proposed by Bennett Environmental Inc. is currently under consideration by the Ministry and, if approved, will be located in Kirkland Lake, as reviewed below.

In the absence of adequate disposal capacity in Ontario, Ontario's PCBs will likely be shipped for disposal to a facility owned by the Alberta government in Swan Hills, Alberta. Given the extremely serious concerns that exist regarding the adequacy and safety of the province's current and proposed PCB disposal capacity and the safety implications of long-distance transport of PCB wastes, the Pembina Institute believes that the province's proposals for the destruction of PCB stocks within three years should be deferred until a thorough investigation of the province's PCB destruction needs and options can be completed.

RECOMMENDATIONS

In order to avoid treating increasing amounts of hazardous waste in Ontario, pollution prevention remains the key recommendation. The development and implementation of federal and provincial pollution prevention and toxic use reduction laws need to focus on reducing the generation of waste and phasing out the use and generation of specific substances. Better citizen right to know laws are necessary to know about hazardous waste, including information about the proposed transport of wastes across borders and through local communities.

In addition, CIELAP continues to recommend that the government adopt rigorous standards for the treatment, storage and disposal of hazardous waste, and as well require pre-treatment of hazardous waste before it is introduced to landfills and extended liability. These recommendations remain urgent and outstanding matters for law reform. Intending to stem the flow of hazardous waste from the U.S. into Canada, MOE posted a discussion paper proposing to adopt the U. S. pre-treatment requirements in the Universal Treatment Standard (UTS) for hazardous wastes to be disposed on land. As noted in the Ministry's proposal, the principle of the land disposal restrictions is to prohibit activities that place untreated hazardous wastes in or on the land when better treatment or destruction alternatives exist. Through such restrictions, hazardous wastes cannot be disposed of on land until the waste meets specific treatment standards to reduce the mobility or toxicity of its hazardous components.

The Environmental Commissioner and others have identified the absence of such standards as a major gap in Ontario's regulatory framework for hazardous waste management.[9] As of January, 2003, no further action has been taken in this regard requiring the pre-treatment of hazardous waste before it is introduced into landfills. The pollution haven effect from low standards remains unaddressed.

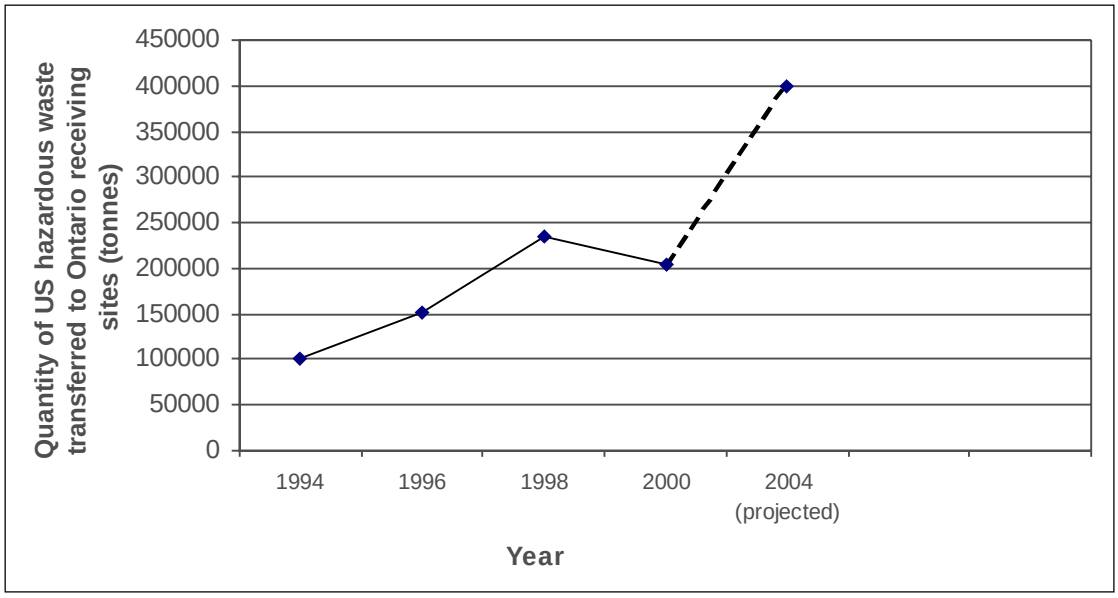
Improving Ontario's standards with respect to hazardous waste treatment would assist Canada in meeting its domestic legal and international obligations in the control of transboundary movements of hazardous wastes and the protection of the Great Lakes. While taking the first step is important, Ontario's long-term strategy needs to address the gaps in available information, and assess the adequacy of existing facilities and the underlying regulatory framework that deals with the generation, handling and fate of hazardous wastes. It also remains critical to ensure the public's right to know the quantities, nature and fate of the wastes being generated and received in their communities.

PROJECTIONS IF BENNETT ENVIRONMENTAL INCINERATOR AT KIRKLAND LAKE IS APPROVED

Bennett Environmental Inc. proposed to construct and operate a controversial high temperature rotary kiln thermal oxidizer facility (incinerator) in the Town of Kirkland Lake. The capacity of the proposed facility would be 200,000 metric tonnes per year from across North America of solids, soils, sludges and other debris impacted with chlorinated and non-chlorinated hydrocarbons including PCBs, PCPs, dioxins, pesticides, plastics and other hazardous wastes. It should be observed that the slight decrease in the import of U.S. hazardous waste experienced between 1998 and 2000 to Ontario would be significantly reversed should the Bennett incinerator be approved. Indeed there would be approximately a 49.3% increase in imports by 2004, assuming that most of Bennett's capacity originated from the U.S., as is expected.

Moreover, recall that in 2000, 6% of all hazardous waste in Ontario was incinerated. (Table 19, 110,253 tonnes) If Bennett's incinerator is approved and an additional 200,000 tonnes of hazardous waste is imported, mainly from the U.S. for incineration, then the percentage of all hazardous waste processed by incineration would rise from 6% to 15.9% by 2004, assuming that the other quantities of hazardous waste remained the same as in 2000. If the Bennett facility were approved, this would represent an increase percentage change of the practice of incineration by 64% from 2000 (see Figure i).

Figure i: Projections If Bennett Environmental Incinerator at Kirkland Lake Is Approved



PCBs are a class of manufactured organic chemicals produced by the direct combination of chlorine and biphenyl, a derivative of benzine. PCBs have been banned in Canada since 1977 due to their adverse effects on the environment and human health. PCBs bio-concentrate and bio-magnify, are extremely persistent toxics, and are known carcinogens. When PCBs are burned, they create dioxin, an even more potent toxic chemical with a wide variety of adverse health effects. Not all PCBs that are intended for incineration actually are. While stack emissions and contaminated ash and waste water are serious concerns, losses during transportation, storage, and processing may be an even greater problem.

On November 1, 2002, the Ontario Director of the Environmental Assessment and Approvals Branch issued a Deficiency Statement under subsection 7(4) of the Environmental Assessment Act because of deficiencies found in Bennett's environmental assessment, including errors and omissions, gaps in data and inconsistencies and discrepancies. Bennett advised the Ministry on November 8, 2002, that it chose to withdraw the EA, amend it to address the deficiencies, and will re-submit it for review and a decision. Upon re-submission, the Ministry will complete its technical review and the public will have a new opportunity to comment upon the amended EA before a Government Review is published. [10]

A 1999 study by the North American Commission for Environmental Cooperation concluded that the hazardous waste systems in the U.S., Canada and Mexico were deficient with respect to the quality, quantity and timing of information. This is due to differences in definitions of hazardous wastes, lack of "real time" tracking of waste shipments and the absence of uniform numbering systems for waste shipments and non-compliance by some waste management facility operators to complete all foreign Manifest requirements.[11] Given the inability to track hazardous wastes from Mexico and the U.S. to Ontario, the Bennett proposal to accept hazardous waste from all NAFTA countries is at best premature and at worst contrary to the public interest and environmental protection.

PURPOSE OF THIS REPORT

The purpose of this report is to present a comprehensive analysis of hazardous waste generation and receipts in the province of Ontario for the period 1994 to 2000. However the report does highlight the changes to hazardous waste generation and receipt for the period 1998 to 2000.

OBJECTIVES OF THIS REPORT

The major objective of this report is to address the information gap concerning the generation and receiving of hazardous waste in Ontario from 1994 to 2000. The specific goals of this report are as follows:

- Identify the quantities of hazardous waste being generated at generating sites in Ontario for the period 1994 to 2000;
- Identify the top generating sites of hazardous wastes in the province for 2000;
- Identify changes in the quantities of hazardous waste generated in Ontario from 1994 to 2000 by district and waste type;
- Identify the quantities of hazardous waste being transferred to receiving sites in Ontario for the period 1994 to 2000;
- Identify the top receiving sites of hazardous wastes in the province for 2000;
- Identify the changes in the quantities of hazardous waste received by Ontario sites from 1994 to 2000 by district and waste type;
- Identify the changes in the quantities of hazardous waste transferred to Ontario receiving sites from U.S. generating sites from 1994 to 2000, by district and waste type;
- Identify the top U.S. generating sites and top Ontario receiving sites of U.S. hazardous waste transfers for 2000.

METHODOLOGY

This report was prepared using the data tables from the 2000 Ontario Hazardous Waste Manifest Database. The report also includes values from the 1994, 1996 and 1998 as reviewed in Open for Toxics 2000. The Hazardous Waste Manifest Database tracks off-site hazardous waste transfers from generating to receiving sites within the province and from other provinces and the United States. As this report is an analysis of the 2000 database and is based on the previous report produced by CIELAP, this report also used the Hazardous Waste Manifest Database in order to do a comparative analysis of the data.

The analysis of the data involved the following:

1) Transfer of the 17 Hazardous Waste Manifest Database tables from Dbase format to a Microsoft Access database format;

2) Using the select query to retrieve data from the GENERATOR file, the MANGEN file, and other tables, using the generator number as the key variable, in order to identify the quantities transferred from generating sites in all districts and in key jurisdictions (i.e. Ontario, U.S., other provinces);

3) Using the select query to retrieve data from the RECEIVER file, the MANREC, and other tables, using the Receiver number as the key variable, in order to identify the quantities transferred to receiving sites in all districts and in key jurisdictions;

4) Aggregation of data columns (generator number, waste type, district, receiver district, receiver type) by quantity generated in the newly created datasheet, a pivot table was created using the MANGEN file to identify the top generating sites, waste types generated, and generating districts in Ontario, and to identify waste transfers from one jurisdiction to another;

5) Aggregation of data columns (receiver number, waste type, district, generator district) by quantity received in the newly created datasheet, a pivot table was created using the MANREC file to identify the top receiving sites, waste types received, and receiving districts in Ontario;

6) Comparison of 1994, 1996, 1998 and 2000 data to identify any trends in hazardous waste transfers (generation and receipts) in Ontario over this time period.

In order to evaluate hazardous waste transfers within Ontario and from the United States to Ontario, the "district" column data was used as the key location variable. Each generator and receiver in the Hazardous Waste Manifest Database is provided with a district number based on their location. There are 22 districts in Ontario defined by the Manifest. Some of the districts include major cities and outlying areas, e.g.) Toronto is district 301, Ajax is district 306. Each province and U.S. state (including the District of Columbia) has their own district number. By aggregating the quantities transferred by generating districts in one jurisdiction to receiving districts in another jurisdiction, it was possible to identify hazardous waste transfers to Ontario from within the province, from other provinces and from the United States.

Note: In some cases districts were numbered incorrectly in the Manifest GENERATOR and RECEIVER tables. For example, a generating site in Sault Ste. Marie was coded incorrectly as 506, when the correct code is 503. When these errors were identified, the correct code was entered, based on the city and province specified in the table for the specific generator or receiver.

DATA QUALIFICATIONS

This report is a compilation of the data available in the Ontario Hazardous Waste Manifest Database. This report does not take responsibility for the accuracy of the data provided by the Ontario Ministry of the Environment (MOE). Any changes made to the Hazardous Waste Manifest Database tables while analyzing the data are explained throughout this report, e.g.) merging of various tables explained previously. No changes were made to the data provided by the Ministry, other than corrections to "district" codes when errors were identified.

The Ontario Hazardous Waste Manifest Database only captures reported off-site hazardous waste transfers from a "generating" site to a "receiving" site. Thus, the data presented in this report does not represent the total quantities of hazardous waste generated and received in Ontario. For example, hazardous waste that is generated at a site but stored or disposed of on-site, would not be recorded in the Manifest, and thus is not included in this report. According to 1997 data, the Ministry of the Environment has estimated that approximately 40%[3] of wastes are dealt with on the site of their generation. As a result, the data in this report captures the remaining 60% of hazardous wastes that that are shipped off-site. In fact, this report may capture less than 60% of hazardous waste quantities in the province, as the 40% estimate by the MOE is very uncertain, given that there are no regular reporting requirements for the on-site disposal of hazardous wastes in Ontario.

To get an estimate of the total quantities of hazardous waste generated in Ontario would require accurate recording of on-site storage and disposal, for which no good data source currently exists. In addition, the quantities of landfill leachate in the report represent only a portion of total leachate generation. Many landfills have direct sewer connections from their leachate collection systems therefore this waste is not reported in the Hazardous Waste Manifest Database.

The terms "generator" and "receiver" are used throughout this report. The term generator refers to the site where a hazardous waste transfer has originated. The term receiver refers to the site where a hazardous waste transfer has been received and the receiver "signs off" on the Manifest. The term "quantity generated" refers to the quantity of waste transferred off-site of a generating site. The term "quantity received" refers to the quantity of waste received at a receiving site from a generating site.

A receiver may also appear as a generator in the Hazardous Waste Manifest Database. For example, wastes received at transfer stations may be processed and sent on to another receiver for final disposal, e.g.) a landfill. This waste quantity may appear twice in the Hazardous Waste Manifest Database, as the transfer station would also be considered a generator when it transfers the waste to another receiver, though it is the same waste that has been transferred. Therefore, there is "double counting" of waste quantities within the Hazardous Waste Manifest Database. It is important to keep in mind that the receiving facility does not refer to the final fate of the hazardous waste in all cases, but refers to the point where the waste was received.

There is no easy way to differentiate between hazardous waste and liquid industrial waste (which may not be hazardous) from the Hazardous Waste Manifest Database.

The term "district" is used throughout this report to identify areas in the province where hazardous waste transfers have originated (named generation districts), and where hazardous waste transfers have been received (named receiving districts). It is important to note that each district is comprised of many generating sites and receiving sites.

The Hazardous Waste Manifest Database has named each district by the major municipality located within it, however in most cases the district includes outlying municipalities, except for the City of Toronto, which is comprised of the City of Toronto only. In all cases, the district names appear as presented in the Hazardous Waste Manifest Database, with the exception of the following:

- In 1998 Ajax district (district 306) was renamed York and Durham Regions as the district included facilities in both regions, however in 2000 the Manifest reverted back to Ajax;
- The Ministry of the Environment changed district names from the 1994 dataset to the 1998 dataset; e.g. Cambridge district was renamed Guelph district, North York district was renamed Toronto district, Oakville district was renamed Burlington district; the 1998 district names were used in all cases (Open for Toxics 1998, p.5).

Appendix A presents the districts in Ontario and some of the municipalities within each district.

THE ENVIRONMENTAL IMPLICATIONS OF INCREASING HAZARDOUS WASTE GENERATION AND TRANSFERS TO RECEIVING SITES IN ONTARIO

The substances and materials constituting the hazardous waste generated and received in Ontario pose a range of potential threats to the environment and human health and safety. The most obvious problems are associated with wastes that are reactive, explosive, corrosive, infectious and radioactive.

In addition, a wide range of components of the waste stream in the province have properties that are harmful to human health or the environment in other ways. For example, steel making residues and other waste types have high metal concentrations. Many of these heavy metals, such as lead, mercury and cadmium, for example, are classified as "toxic" substances under the Canadian Environmental Protection Act (CEPA)[12], and are known to be acutely toxic in high concentrations, and at lower levels may have deleterious effects on various human organs. Other metals, such as arsenic are classified as "toxic" under CEPA and are listed as human carcinogens by the International Cancer Research Centre (ICRC).[13]

The Hazardous Waste Manifest Database identified the generation and receiving of organic compounds at sites in the province from 1994 to 2000. A number of organic compounds are also on the ICRC list of human carcinogens including chloroform, tetracholoroethylene, carbon tetrachloride and benzene.[14] Other persistent organic compounds have been linked to immune system dysfunction, adverse impacts on the nervous system, bone marrow damage, and have been implicated as endocrine disrupting substances.

INCINERATORS

As highlighted in Table 20 and Figure 14, increasing quantities of hazardous wastes are being received at incinerators in Ontario, up 27.6% between 1998 and 2000. This percentage change is projected to escalate to 64% should the Bennett Environmental Inc. application to build a new facility at Kirkland Lake be approved. Hazardous wastes being received and processed at Ontario incinerators pose a significant local and global environmental and public concern. Holdke et al (1998) found that PCBs in the blood of children living near a German hazardous waste incinerator were, on average, higher in concentration or were detected more frequently than among children in a control area.[15] Beside the danger involved in transporting this material along such a vast route, the environmental fall out of burning PCBs transcends the local community.

Indeed, the by-products of PCBs when burned – dioxins and furans – are more dangerous than the PCBs themselves. Importantly these toxic pollutants are transboundary in nature. Canada's Arctic as well as the global polar region is suffering from the adverse effects of PCBs and other persistent organic pollutants (POPs). POPs gravitate to cold climate areas. These toxic substances concentrate in the fatty tissues of many Arctic marine animals, which are in turn consumed by Indigenous peoples who rely upon traditional foods.

When the Canadian Council of Ministers of the Environment agreed to Canada-Wide Standards for emissions of dioxins and furans from incinerators in May 2001, they agreed to "develop the necessary mechanisms to apply pollution prevention as the preferred method of moving toward the virtual elimination of dioxins and furans emissions". [16] These substances are recognized to pose an unreasonable and otherwise unmanageable risk to the environment.

World-wide concern for POPs led to the 2001 Stockholm Convention on Persistent Organic Pollutants, that Canada signed in May of 2001.[17] According to this Convention these wastes must be destroyed in an environmentally sound manner, not merely "deposited" in landfill sites or "processed" by incineration that result in the release of POP residues or by-products, as the Bennett Environmental Inc. plan envisions for the Kirkland Lake facility. Fortunately there are alternatives to incineration, including Canadian technology for the destruction of PCBs and POPs by mobile and closed loop systems.[18] Canada has yet to develop a national implementation plan for the Stockholm Convention.

WATER TREATMENT PLANTS

Hazardous wastes being received at water pollution control plants (WPCPs) pose a significant concern as these facilities are designed generally to deal with organic waste. As a result, many toxic substances pass intact through the plants to receiving waterways, where they contribute to overall contamination of the environment. Despite global and regional agreements otherwise, many toxic chemical are not tested for or even monitored in Ontario's surface and ground waters.[19] Concerns have also been raised about the disruption of sewage treatment processes than can be caused by toxic substances, resulting in the release of large quantities of untreated or partially treated sewage to the environment. [20] Yet as Figure 13 confirms water treatment plants are the number one facility of choice to receive hazardous waste in Ontario. Table 33b shows Ontario's water treatment plants are receiving non-leachate hazardous waste from the U.S., in particular spent pickle liquor, an acid solution of sulphuric and hydrochloric acids containing ferrous salts from steel pickling that may or may not pose an environmental and public health risk, depending upon individual cases whether discharge limits and/or residues have been exceeded. The Environment Commissioner of Ontario estimates that 32,000 industrial facilities discharge hazardous or liquid industrial wastes directly into municipal sewers, some legally and some illegally. [21] WPCP's accept these wastes through the Ontario Water Resources approvals.

LANDFILLS

The quantities of hazardous waste being received at landfills in Ontario raises numerous environmental and health concerns for neighbouring communities, including the risk of off-site migration of leachate through the soil to waterways and to adjacent properties.

TRANSFERS

Lastly, the transfer of hazardous wastes from generating facilities to receiving facilities in the province means that more wastes are being transported throughout the province via highways and railways. This raises the risk of accidents and spills, increasing the risk of exposure to hazardous wastes for communities through which these wastes are transported.

STRUCTURE OF THE REPORT

This report is presented in six sections. Section I presents the introduction to the report's main findings, and outlines the purpose and objectives of the report. This section also explains the methodology and the data qualifications that provide an understanding of how the analysis was conducted.

Section II presents hazardous waste generation in Ontario from 1994 to 2000. This section includes the quantity of hazardous waste generated in Ontario for this period by generating district, business type and waste type. This section also identifies the top generating sites in the province of leachate and non-leachate wastes for 2000.

Section III presents hazardous waste transfers to receiving sites in Ontario from 1994 to 2000. This section includes the quantities of hazardous waste received in Ontario for this period by receiving district, waste type and receiving facility. This section also identifies the top receiving sites in Ontario of leachate and non-leachate wastes for 2000.

Section IV presents hazardous waste transfers from the United States to Ontario from 1994 to 2000. This section includes the quantities of wastes transferred from U.S. generating sites to Ontario receiving sites for this period by generating district, receiving district, waste type and receiving facility. This section also identifies the top generating and receiving sites of U.S. hazardous waste transfers to Ontario for 2000.

Section V presents an analysis of the trends in hazardous waste generation and off-site transfers to receivers in Ontario from 1994 to 2000. The section identifies where the growth in hazardous waste generation has taken place by waste type, generating district, and jurisdiction. The section also highlights where the quantities of hazardous wastes are being received in the province.

Section VI presents the conclusion to the report and comments on future studies and actions on the hazardous waste issue.

SECTION II: HAZARDOUS WASTE GENERATION IN ONTARIO, 1994 TO 2000

Note: The generation quantities presented in this section reflect the quantity of generated hazardous waste transferred off-site from generating sites, and do not represent the total quantity of hazardous waste generated at each generating facility.

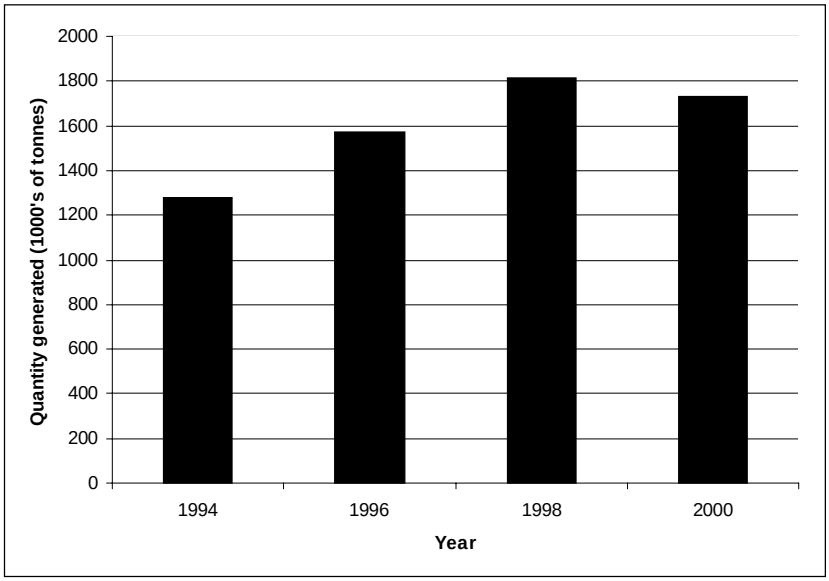
In 2000, 1,729,158 tonnes of hazardous waste was generated in the province of Ontario. The quantity of hazardous waste generated at generating sites in Ontario has increased from 1.28 million tonnes in 1994 to 1.73 million tonnes in 2000, which is an increase of 448,484 tonnes or 35.0% from the quantity generated in 1994. Table 1 presents the quantities generated at Ontario generating sites from 1994 to 2000. Table 1 also shows that the quantity generated has decreased by 87,427 tonnes in 2000 compared to 1998, a percentage change of -4.8%.

Table 1: Quantity of hazardous wastes generated by Ontario generating sites, 1994 to 2000

Year	Quantity received (in tonnes)	Percentage increase from 1994 base year	Percentage change from previous year of record
2000	1,729,158	35.0%	-4.8%
1998	1,816,585	41.8%	15.5%
1996	1,572,460	22.8%	22.8%
1994	1,280,674		

Figure 1 illustrates the increasing trend of hazardous waste generation at Ontario generating sites from 1994 to 1998 and the decreasing value in 2000.

Figure 1: Quantity of hazardous waste generated by Ontario generating sites, 1994 to 2000



THE GENERATORS OF HAZARDOUS WASTE IN ONTARIO

In 1998, there were approximately 13,000 Ontario generating sites of hazardous waste that transferred waste off-site. The major generating sites for 2000 included municipal landfills, waste management company facilities, steel manufacturing facilities and chemical plants amongst others. In 2000, 548,292 tonnes of landfill leachate wastes and 1,180,866 tonnes of non-leachate wastes were generated in Ontario. Landfill leachate wastes made up 31.7% of all hazardous waste generated in the province and thus represent the largest waste type generated in 2000. As seen in Table 2, landfill leachate generators, municipally owned landfill sites are prominent in the list of the top generating sites of hazardous waste in the province as compared to privately owned landfill sites. Out of the top ten, eight generators are landfill sites. The other top generating sites on the list vary from steel manufacturing facilities to petrochemical facilities. Despite the quantity generated decreasing, the primary waste type generated remained the same compared to 1998.

In order to get an accurate picture of the top hazardous waste generators in the province it is useful to separate landfill leachate generation from non-leachate generation[2]. This report makes the distinction between leachate and non-leachate wastes because of the large quantities of leachate wastes generated in the province, and the types of wastes that comprise landfill leachate. Landfill leachate is a highly polluted liquid containing high concentrations of salts, nutrients, biodegradable organics, heavy metals, and trace amounts of numerous synthetic organic compounds.

Table 3 and Table 4 present the top generating sources of landfill leachate wastes and non-leachate wastes respectively.

Table 3: Top 25 generating sites of landfill leachate wastes in Ontario, 2000

1998 ranking	2000 ranking	Generator	Generating site	City	Quantity generated (tonnes)
2	1	Waste Service Inc.	3354 Navan Road	Gloucester	83,505
3	2	Ottawa, City of	Trail Road Landfill Site	Nepean	70,162
5	3	Canadian Waste Services Inc.	Part Lot 3, S. Of 1/2 Of Lot 4, Conc. 3	West Carleton Twp.	50,919
7	4	Hamilton-Wentworth, Regional Mun. of	1500 Haldibrook Road	Glanbrook	48,471
9	5	Halton, Regional Municipality of	5400 Highway 25	Milton	48,086
4	6	London, City of	Conc. 7, R.R. #1	London Township	47,887
1	7	Essex, Corporation of the County of	Landfill #3	Maidstone	35,919
	8	Philip Services Inc.	65 Green Mountain Road West	Stoney Creek	32,110
11	9	Halton, Regional Municipality of	Closed Oakville Landfill Site	Oakville	26,999
19	10	Haldimand-Norfolk, Regional Mun. of	Concession 16, Lot 7 & 8	City Of Nanticoke	21,755
14	11	Cobourg, Town of	John R. Eagleson-Cobourg Landfill Site	Haldimand Township	11,919

continued➤

Table 2: Top 25 generating sites of hazardous waste in Ontario, 2000

1998 ranking	2000 ranking	Generator	Generating site	City	Quantity generated (tonnes)	Primary waste type generated
3	1	Waste Service Inc.	3354 Navan Road	Gloucester	83,505	Landfill Leachates
2	2	Ottawa, City of	Trail Road Landfill Site	Nepean	70,162	Landfill Leachates
6	3	Canadian Waste Services Inc.	Part Lot 3, S. of 1/2 of Lot 4, Conc. 3	West Carleton Twp.	50,919	Landfill Leachates
9	4	Hamilton-Wentworth, Regional Mun. of	1500 Haldibrook Road	Glanbrook	48,471	Landfill Leachates
13	5	Halton, Regional Municipality of	5400 Highway 25	Milton	48,086	Landfill Leachates
5	6	London, City of	Conc. 7, R.R. #1	London Twp.	47,887	Landfill Leachates
1	7	Essex, Corporation of the County of	Landfill #3	Maidstone	35,919	Landfill Leachates
	8	Philip Services Inc.	65 Green Mountain Road West	Stoney Creek	32,110	Landfill Leachates
19	9	Safety-Kleen Limited	2258 River Road	London	30,880	Other Specified Organics
15	10	Safety-Kleen Canada Inc.	23 Regan Road	Brampton	30,363	Transfer Station Oils Wastes
16	11	Halton, Regional Municipality of	Closed Oakville Landfill Site	Oakville	26,999	Landfill Leachates
17	12	Dofasco Inc.	Kenilworth Plant	Hamilton	23,670	Spent Pickle Liquor
	13	Durez Canada Company, Ltd.	100 Dunlop Street	Fort Erie	22,553	Polymeric Resins
10	14	Dofasco Inc.	Bayfront Plant	Hamilton	22,025	Steel Making Residues
11	15	General Motors of Canada Limited	570 Glendale Avenue	St. Catharines	21,980	Alkaline Wastes - Other Metals
18	16	Co-steel Lasco	Hopkins Street South	Whitby	21,859	Steel Making Residues
	17	Haldimand-Norfolk, Regional Mun. of	Concession 16, Lot 7 & 8	City of Nanticoke	21,755	Landfill Leachates
21	18	Philip Services Inc.	4505 Fourth Street	Windsor	20,908	Transfer Station Oils Wastes
	19	Omya (Canada) Inc.	Lot 18, Concession 3	Bathurst Twp.	20,907	Neutralized Wastes - Other Metals
	20	Donohue Forest Products Inc.	Fort Frances Division	Fort Frances	16,404	Other Specified Inorganics
4	21	Philip Services Inc.	800 Parkdale Avenue North	Hamilton	14,836	Halogenated Solvents
	22	Nova Chemicals (Canada) Ltd.	Styrene II Unit	Sarnia	13,410	Aromatic Solvents
	23	Inscape, Office Specialty	67 Toll Road	Gwillimbury, East	11,952	Alkaline Phosphates
14	24	Cobourg, Town of	John R. Eagleson-Cobourg Landfill Site	Haldimand Township	11,919	Landfill Leachates
	25	Faraday, Corporation of the Township of	Faraday Landfill Site	Faraday Township	11,498	Landfill Leachates

Table 3: Top 25 generating sites of landfill leachate wastes in Ontario, 2000 *(continued)*

1998 ranking	2000 ranking	Generator	Generating site	City	Quantity generated (tonnes)
10	12	Faraday, Corporation of the Township of	Faraday Landfill Site	Faraday Township	11,498
16	13	St. Thomas Sanitary Collection	Lot 22, Concession 3	Southwold Township	9,714
13	14	Essex, Co (see & use On1021009) Ty of *	Essex County Landfill No. 1	Colchester North Twp.	7,529
	15	Canadian Waste Systems Inc.	20142 Erieau Road	Blenheim	5,239
12	16	Ridge (see & use On2160060) Limited *	20142 Erieau Road	Blenheim	5,201
	17	Mid-Huron Landfill Site Board	Huron Road Concession, Lot 14	Goderich Township	4,658
17	18	Simcoe, County of	Wasaga Beach Landfill Site - Site #15	Town Of Wasaga Beach	4,506
15	19	Owens-Corning Canada Inc.	Scott Road At Imperial Avenue	Sarnia	4,494
	20	Canadian Waste Services Inc.	Part Lots 1-3, Concession 4	Napanee	3,120
18	21	Dow Chemical Canada Inc.	Dow Scott Road Landfill	Sarnia	2,062
	22	Niagara - (See & Use On0148201) *	Part of Lot 106, Line 5	Niagara-on-the-Lake	1,959
	23	North Glengarry, Corp. of the Twp. of	Concession I, Part of Lot 35	Alexandria	1,776
	24	Canadian Waste Services Inc.	8039 Zion Line	Watford	1,650
21	25	Simcoe, County of	Concession 5 West, 1/2 Lot 13	Essa Township	1,592

** according to manufacturer's data*

The top generating sources of landfill leachates in the province for 2000 were mainly municipally and some privately owned landfill sites. The majority of these landfills are operational, some have closed, but are still producing landfill leachates. These landfills are scattered across Eastern and Southern Ontario, principally around major urban centres including Ottawa, Hamilton and Sarnia.

As highlighted in Table 4, the top generating sources of non-leachate hazardous wastes in the province for 2000 included environmental services (waste management) firms such as Safety-Kleen Ltd. (now known as Clean Harbours), and Philip (Environmental) Services Inc., and steel producers such as Dofasco and Co-Steel Lasco. The table also identifies that there were no municipally non-leachate hazardous waste generators. The table also shows an increase in privately owned generating sources. The top producers of non-leachate hazardous wastes were concentrated in southwestern Ontario and in Hamilton-Wentworth Region.

Table 4: Top 25 generating sites of non-leachate wastes in Ontario, 2000

1998 ranking	2000 ranking	Generator	Generating site	City	Quantity generated (tonnes)
8	1	Safety-Kleen Limited	2258 River Road	London	30,880
5	2	Safety-Kleen Canada Inc.	23 Regan Road	Brampton	30,363
6	3	Dofasco Inc.	Kenilworth Plant	Hamilton	23,670
	4	Durez Canada Company, Ltd.	100 Dunlop Street	Fort Erie	22,553
2	5	Dofasco Inc.	Bayfront Plant	Hamilton	22,025
4	6	General Motors of Canada Limited	570 Glendale Avenue	St. Catharines	21,980
7	7	Co-steel Lasco	Hopkins Street South	Whitby	21,859
10	8	Philip Services Inc. (used to be Lynx Environmental)	4505 Fourth Street	Windsor	20,908
	9	Omya (Canada) Inc.	Lot 18, Concession 3	Bathurst Twp.	20,907
22	10	Abitibi-C (see & use On0009302)	Fort Frances Division	Fort Frances	16,404
1	11	Philip Services Inc.	800 Parkdale Avenue North	Hamilton	14,836
21	12	Nova Chemicals (Canada) Ltd.	Styrene II Unit	Sarnia	13,410
15	13	Inscape, Office Specialty	67 Toll Road	Gwillimbury, East	11,952
	14	Ivaco Rolling Mills Limited Partnership	1040 Highway 17	Champlain	10,108
	15	958160 Ontario Limited	Da-lee Waste Oil Services, Operating As	Stoney Creek	9,841
25	16	Canflow Environmental Services Corp./	4164 Discovery Line Road	Petrolia	9,771
	17	Safety-Kleen Canada Inc.	1220 Skae Drive	Oshawa	9,682
	18	Spill/Emergency Cleanup (Moe)	Halton-Peel District Office	Burlington	9,117
2	19	Dofasco Inc.	Bayfront Plant	Hamilton	8,510
	20	Hudson General Aviation Services Inc.	Lester B. Pearson International Airport	Mississauga	8,286
9	21	Imperial Oil	Area 1/Area 2/Research Buildings	Sarnia	8,115
	22	Ethyl Canada Inc.	220 St. Clair Parkway	Corunna	7,992
	23	Safety-Kleen Canada Inc.	89 Bentley Avenue	Nepean	7,651
	24	Safety-Kleen Canada Inc.	65 Woolwich Street	Breslau	7,541
23	25	Philip Services Inc.	1731 Pettit Road	Fort Erie	7,423

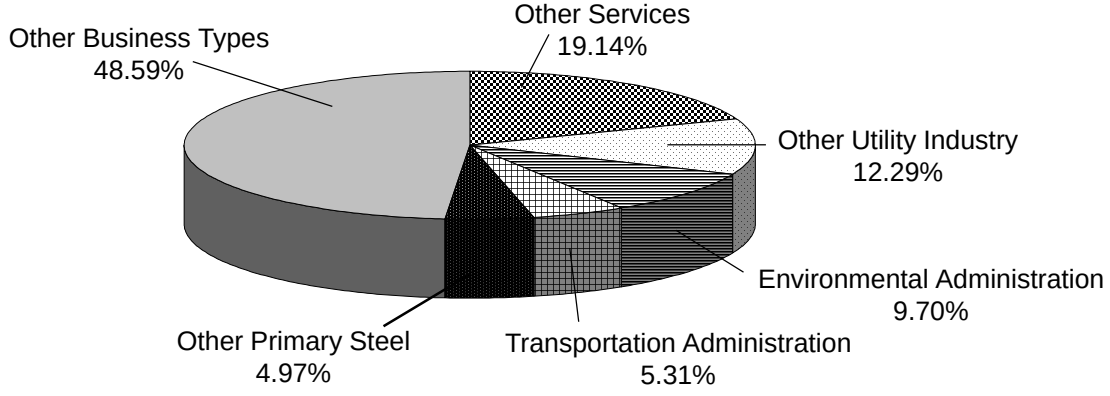
In Open for Toxics 1998, Laidlaw Inc., was identified as one of the top generating sources of non-leachate hazardous wastes however due to the sale of Laidlaw to Safety-Kleen in 1998, the opposite is true in 2000. Table 4 reflects this change; there are no records in the top 25 as Laidlaw Inc.

The Hazardous Waste Manifest Database classifies hazardous waste generators by business type. Table 5 presents the top 25 business types that generated hazardous waste in 2000. The top generators of hazardous waste were businesses related to waste management (i.e. municipal corporations operating landfill sites), and businesses related to the chemical, steel producing and automobile industries.

Table 5: Top 25 business type generators of hazardous waste in Ontario, 2000

1998 ranking	2000 ranking	Business type	Quantity generated (tonnes)	Percentage of total
1	1	Other Services	262,675	19.14%
3	2	Other Utility Industry	168,715	12.29%
2	3	Environmental Admininistration	133,138	9.70%
7	4	Transportation Administration	72,878	5.31%
8	5	Other Primary Steel	68,262	4.97%
11	6	Bulk Liquid Trucking	62,902	4.58%
6	7	Ferro-Alloys Industry	61,725	4.50%
9	8	Regulatory Services	60,545	4.41%
4	9	Other Construction Services	50,997	3.72%
5	10	Industrial Organic Chemical	43,665	3.18%
18	11	Plastic and Synthetic Resins	39,038	2.84%
10	12	Vehicle Engine Industry	36,603	2.67%
13	13	Coating Of Metal Processing	35,047	2.55%
15	14	Limestone Quarries	32,546	2.37%
14	15	Other Truck/Transportation	31,226	2.27%
19	16	Motor Vehicle Industry	28,744	2.09%
17	17	Lubricants Oil and Grease	26,874	1.96%
16	18	Other Waste Materials	23,700	1.73%
12	19	Industrial Inorganic Chemical	21,659	1.58%
	20	Marble Quarries	20,970	1.53%
20	21	Pulp Industry	19,273	1.40%
22	22	Other Petroleum and Coal	18,717	1.36%
	23	Machine Shop Industry	18,127	1.32%
21	24	Other Vehicle Accessories	17,512	1.28%
25	25	Other Stamped Metal	17,053	1.24%

Figure 2: Business type generators of hazardous waste in Ontario, 2000



HAZARDOUS WASTE GENERATING DISTRICTS IN ONTARIO

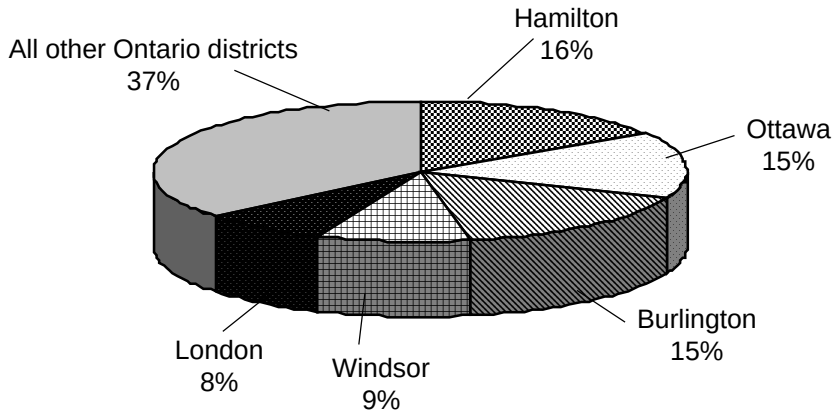
Hazardous waste generation in Ontario for 2000 varied amongst the various districts[23] in the province. Appendix A provides a list of the districts classified in the Hazardous Waste Manifest Database and the municipalities that fall within each district. Table 6 presents the quantity of hazardous waste generated by sites in each Ontario district and the primary waste type generated in each district.

Table 6: Hazardous waste generating districts in Ontario; 1998 and 2000

1998 ranking	2000 ranking	Generating district	Quantity generated in 1998 (tonnes)	Primary waste type generated in 1998	Quantity generated in 2000 (tonnes)	Primary waste type generated in 2000
1	1	Hamilton	299,660	Landfill leachates	277,295	Landfill leachates
2	2	Ottawa	227,698	Landfill leachates	262,296	Landfill leachates
3	3	Burlington	217,797	Landfill leachates	260,829	Landfill leachates
4	4	Windsor	177,059	Landfill leachates	149,927	Landfill leachates
6	5	London	137,153	Landfill leachates	138,548	Landfill leachates
8	6	Ajax	110,901	Steel making residues	112,530	Steel making residues
7	7	St. Catharines	111,920	Alkaline wastes - Other metals	107,363	Alkaline wastes - Other metals
10	8	Guelph	86,335	Emulsified oils	96,984	Emulsified oils
5	9	Sarnia	143,517	Halogenated solvents	89,930	Aromatic solvents
11	10	Toronto	82,604	Oil skimmings & sludges	80,433	Oil skimmings & sludges
9	11	Barrie	87,447	Landfill leachates	44,045	Transfer station oils wastes
14	12	Peterborough	21,349	Landfill leachates	21,716	Landfill leachates
15	13	Kenora	12,860	Other specified inorganics	18,559	Other specified inorganics
	14	Belleville			17,217	Landfill leachates
13	15	Cornwall	30,165	Inert inorganic wastes	16,954	Steel making residues
12	16	Kingston	41,720	Landfill leachates	11,438	Landfill leachates
16	17	Thunder Bay	12,826	Landfill leachates	8,036	PCBs
17	18	Sudbury	8,643	Transfer station oils wastes	7,263	Transfer station oils wastes
19	19	Owen Sound	2,324	Inert inorganic wastes	3,463	Alkaline wastes - Other metals
18	20	South Porcupine	2,595	Waste oils & lubricants	2,851	Waste oils & lubricants
21	21	North Bay	886	Waste oils & lubricants	2,208	Other specified inorganics
20	22	Sault Ste. Marie	1,124	Waste oils & lubricants	1,270	Spent pickle liquor

As seen in Table 6, generating sites in the Hamilton district continue to generate the greatest quantity of hazardous waste in 2000, having generated almost 278,000 tonnes of hazardous waste, representing 16% of hazardous waste generation (as seen in Figure 3) in the province in 2000. This is due in part to the existence of solid waste landfills in the district in addition to the concentration of industries such as steel producers. Despite the quantities decreasing in most districts; Ottawa, Burlington, London, Ajax and Guelph had increasing quantities of hazardous waste generation. A more detailed description of hazardous waste generation in the Hamilton and Ottawa districts is provided in the following profiles.

Figure 3: Percentage of hazardous waste generation in Ontario by district, 2000



The siting of a solid waste landfill in a specific district is a key factor in determining which districts generate the greatest quantities of waste. As seen in Table 6, all five of the top five generating districts had landfill leachate wastes as their primary generated waste.

The industrial composition of each region was also an important factor in determining the quantity of waste generated. Hazardous waste generation in 2000 was higher in southwestern Ontario and the Greater Toronto area (including the Golden Horseshoe) and lower in northern, eastern and central Ontario. This is not surprising given the concentration of petrochemical producers in southwestern Ontario and the concentration of industrial manufacturers in the GTA and the Golden Horseshoe.

Hazardous Waste District Profile: Hamilton District

Location: located in southern Ontario, on the western corner of Lake Ontario

Municipalities: Hamilton district includes the City of Hamilton and surrounding municipalities includes Ancaster, Dundas and Stoney Creek

Hazardous waste generation in 2000: 277,295 tonnes, which ranks the district as the #1 generator of hazardous waste in Ontario, generating 16% of hazardous waste in the Province. Note that since 2000 Philip's Operations have ceased because of their bankruptcy.

Top generating sites in the district: Hamilton district has five of the top 25 generators of hazardous waste in the Province, they are:

1) Region Municipality of Hamilton-Wentworth, facility located at 1500 Haldibrook Road in Glanbrook
- Generated 48,471 tonnes of hazardous waste in 2000
- Ranked #4 of the top generating sites in Ontario
- Landfill leachate is the primary waste type generated
- In 1998, it was ranked #7 of the top generating sites of landfill leachate waste

2) Philip Services Inc., facility located at 65 Green Mountain Road West in Stoney Creek
- Generated 32,110 tonnes of hazardous waste in 2000
- Ranked #8 of the top 25 generators in Ontario
- Landfill leachate is the primary waste type generated

3) Dofasco Inc., the Kenilworth Plant located in Hamilton
- Generated 23,670 tonnes of hazardous waste in 2000
- Ranked #12 of top 25 generators in Ontario
- Primary waste type generated is spent pickle liquor
- In 1998, it was ranked #6 of the top generating sites of non-leachate wastes

4) Dofasco Inc., the Bayfront Plant located in Hamilton
- Generated 22,025 tonnes of hazardous waste in 2000
- Ranked #14 of top 25 generators in Ontario
- Primary waste type generated is steel making residues
- In 1998, it was ranked #2 of the top generating sites of non-leachate wastes

5) Philip Enterprises Inc., facility located at 799-800 Parkdale Ave N. in Hamilton
- Generated 14,836 tonnes of hazardous waste in 2000
- Ranked #21 of top generating sites in Ontario
- Halogenated solvents is the primary waste type generated
- In 1998, it was ranked #1 of the top generating sites of non-leachate wastes

Table 7: Top waste types generated in the Hamilton district, 2000

1998 ranking	2000 ranking	Waste type	Quantity generated (tonnes)
1	1	Landfill leachates	102,845
5	2	Spent pickle liquor	37,640
2	3	Steel making residues	35,006
3	4	Transfer station oils wastes	17,181
9	5	Halogenated solvents	15,097

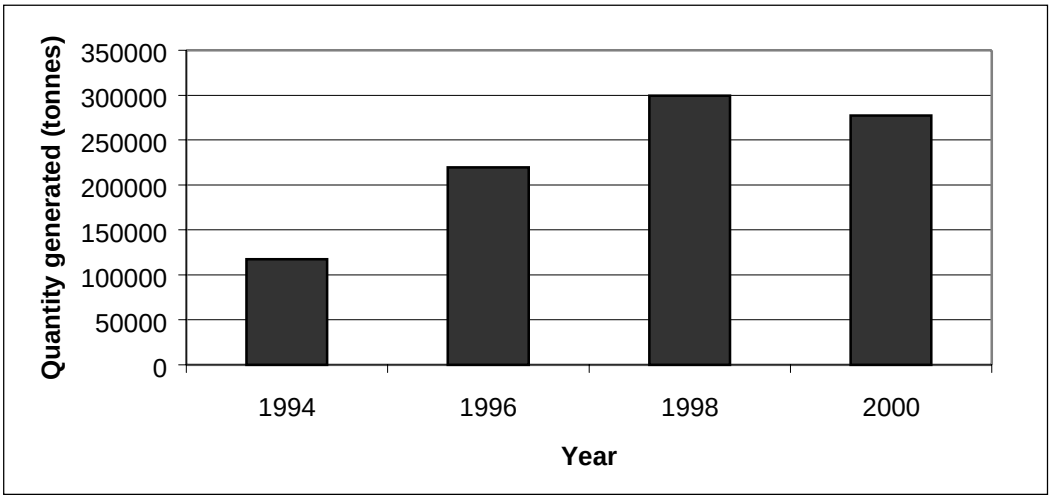
continued ➤

Table 7: Top waste types generated in the Hamilton district, 2000 *(continued)*

1998 ranking	2000 ranking	Waste type	Quantity generated (tonnes)
6	6	Emulsified oils	1,2981
4	7	Other specified inorganics	9,681
7	8	Oil skimmings & sludges	9,253
8	9	Waste oils & lubricants	7,643
	10	Paint/pigment/coating residues	5,164

Hazardous waste generation trend: from 1994 to 2000, the quantity of hazardous waste generated in Hamilton district has increased by 136% from 117,394 tonnes generated in 1994 to 277,295 tonnes in 2000, but decreased in 2000 from 1998 by 7%.

Figure 4: Hazardous waste generation in Hamilton District, 1994 to 2000



Hazardous Waste District Profile: Ottawa District

Location: located in eastern Ontario

Municipalities: Ottawa district includes the City of Ottawa and surrounding municipalities includes Nepean, Gloucester and West Carleton Township

Hazardous waste generation in 2000: 262,296 tonnes, which ranks the district as the #2 generator of hazardous waste in Ontario, generating 15% of hazardous waste in the Province

Top generating sites in the district: Ottawa district has three of the top 25 generators of hazardous waste in the Province, they are:

1) Waste Services Inc., facility located at 3354 Navan Road in Gloucester
- Generated 83,505 tonnes of hazardous waste in 2000
- Ranked #1 of the top generating sites in Ontario
- Landfill leachate is the primary waste type generated
- In 1998, it was ranked #3 of the top generating sites of hazardous waste in Ontario

continued ➤

Hazardous Waste District Profile: Ottawa District *(continued)*

2) City of Ottawa, facility located at Trail Road Landfill Site in Nepean
- Generated 70,162 tonnes of hazardous waste in 2000
- Ranked #2 of the top 25 generators in Ontario
- Landfill leachate is the primary waste type generated
- In 1998, it was ranked #2 of the top generating sites of hazardous waste in Ontario

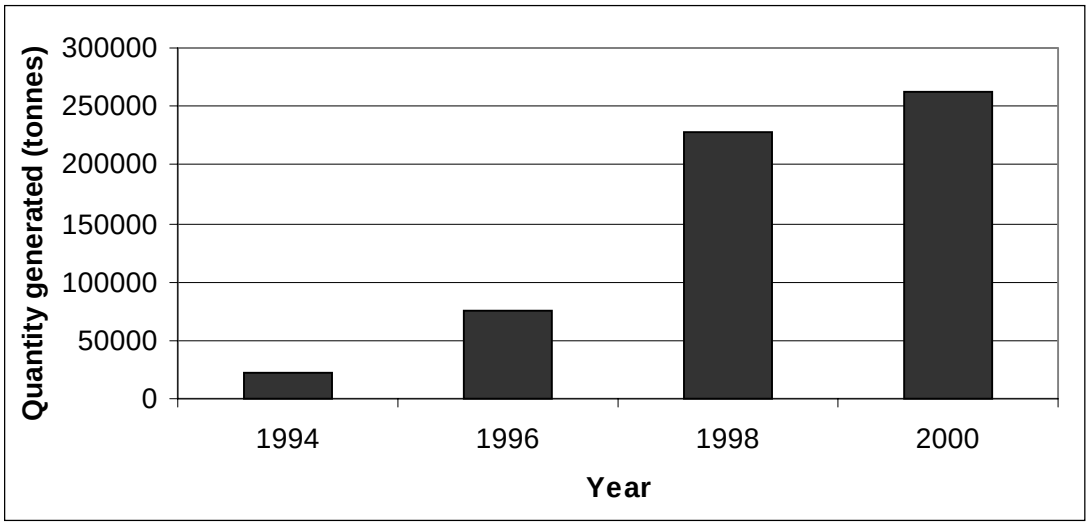
3) Canadian Waste Services Inc., Part Lot 3, S. of ½ of Lot 4, Conc. 3 located in West Carleton Township
- Generated 50,919 tonnes of hazardous waste in 2000
- Ranked #3 of top 25 generators in Ontario
- Landfill leachate is the primary waste type generated
- In 1998, it was ranked #6 of the top generating sites of hazardous waste in Ontario

Table 7a: Top waste types generated in the Ottawa district, 2000

2000 ranking	Waste type	Quantity generated (tonnes)
1	Landfill leachates	204,586
2	Neutralized wastes - other metals	20,907
3	Transfer station oils wastes	12,483
4	Emulsified oils	5,356
5	Oil skimmings & sludges	3,746
6	Aliphatic solvents	2,575
7	Waste oils & lubricants	2,418
8	Non-halogenated rich organics	2,168
9	Light fuels	2,039
10	Petroleum distillates	941

Hazardous waste generation trend: from 1994 to 2000, the quantity of hazardous waste generated in Ottawa district has increased by 1067% from 22,471 tonnes generated in 1994 to 262,296 tonnes in 2000.

Figure 5: Hazardous waste generation in Ottawa District, 1994 to 2000

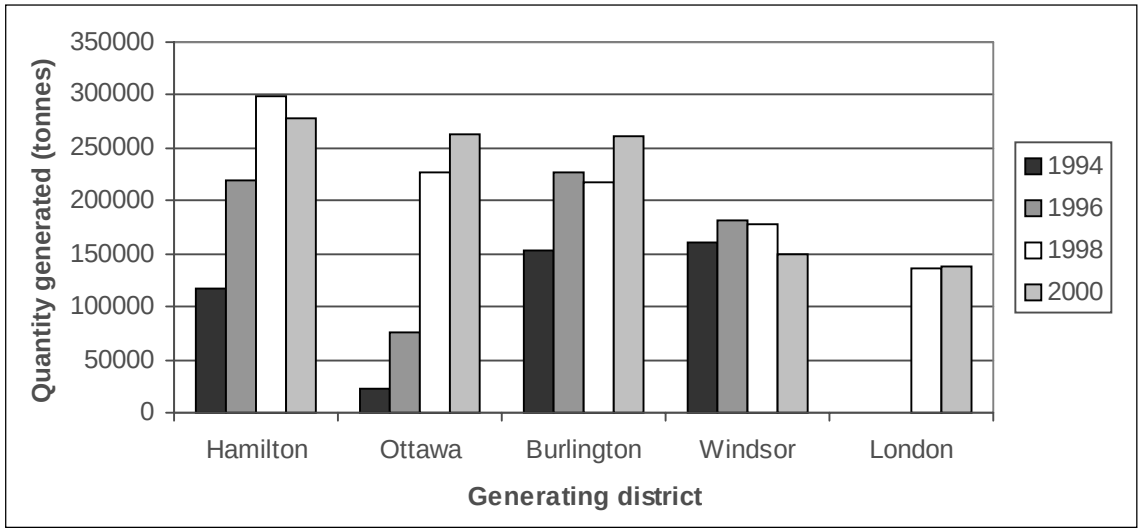


Three of the top five generating districts in the province have experienced an increase in hazardous waste generation from 1998 to 2000. This is highlighted in Table 8 and Figure 6. In Table 8 another comparison was made, the quantity change in generation from 1998 to 2000. The comparison shows that two of the top five generating districts have decreased waste generation quantities, Windsor by 15% and Hamilton by 7%. Despite these decreased quantities three of the top five generating districts have increased by 1% to 20%. The greatest increase in generation was in the district of Burlington. There was no data available for London in 1994 and 1996. Note the 149% increase in hazardous waste generated in North Bay.

Table 8: Quantity of waste generated in each of the 2000 generating districts, 1994 to 2000

Generating district	Quantity generated in 2000 (tonnes)	Quantity generated in 1998 (tonnes)	Quantity generated in 1994 (tonnes)	Quantity change in generation from 1994 to 2000	Percentage change in generation from 1994 to 2000	Quantity change in generation from 1998 to 2000	Percentage change in generation from 1998 to 2000
Hamilton	277,295	299,660	117,394	159,901	136%	-22,365	-7%
Ottawa	262,296	227,698	22,471	239,825	1067%	34,598	15%
Burlington	260,829	217,797	153,741	107,088	70%	43,032	20%
Windsor	149,927	177,059	161,140	-11,213	-7%	-27,132	-15%
London	138,548	137,153				1,395	1%
Ajax	112,530	110,901				1,629	1%
St. Catharines	107,363	111,920				-4,557	-4%
Guelph	96,984	86,335				10,649	12%
Sarnia	89,930	143,517				-53,587	-37%
Toronto	80,433	82,604				-2,171	-3%
Barrie	44,045	87,447				-43,402	-50%
Peterborough	21,716	21,349				367	2%
Kenora	18,559	12,860				5,699	44%
Belleville	17,217					17,217	
Cornwall	16,954	30,165				-13,211	-44%
Kingston	11,438	41,720				-30,282	-73%
Thunder Bay	8,036	12,826				-4,790	-37%
Sudbury	7,263	8,643				-1,380	-16%
Owen Sound	3,463	2,324				1,139	49%
South Porcupine	2,851	2,595				256	10%
North Bay	2,208	886				1,322	149%
Sault Ste. Marie	1,270	1,124				146	13%

Figure 6: Hazardous waste generation in the top five generating districts in Ontario, 1994 to 2000



The top generating districts change considerably when landfill leachate waste generation is separated from non-leachate waste generation. As stated previously, much of the hazardous waste produced in the top generating districts is from solid waste landfills. By separating out the leachate waste and the non-leachate waste, we gain a better understanding of districts in which hazardous waste generation is high due to high quantities of landfill leachate, and districts where generation is high due to industrial generating sources other than landfills. Table 9 and Table 10 present the top generating districts in Ontario for 2000 of non-leachate wastes and landfill leachate wastes, respectively. There was no data for London in 1994 and 1996.

Table 9: Top generating districts of non-leachate hazardous waste in Ontario, 2000

1998 ranking	2000 ranking	Generating district	Quantity generated (tonnes)
2	1	Burlington	185,744
1	2	Hamilton	174,450
5	3	Ajax	110,907
4	4	St. Catharines	103,952
6	5	Guelph	96,808
8	6	Windsor	96,038
9	7	London	80,947
7	8	Toronto	80,365
3	9	Sarnia	76,191
10	10	Ottawa	57,710
12	11	Barrie	35,094
14	12	Kenora	18,559
11	13	Cornwall	15,178
15	14	Peterborough	9,796
13	15	Kingston	8,313
17	16	Thunder Bay	8,036
16	17	Sudbury	7,263

continued➤

Table 9: Top generating districts of non-leachate hazardous waste in Ontario, 2000 *(continued)*

1998 ranking	2000 ranking	Generating district	Quantity generated (tonnes)
	18	Belleville	5,720
19	19	Owen Sound	3,463
18	20	South Porcupine	2,851
21	21	North Bay	2,208
20	22	Sault Ste. Marie	1,270

As highlighted in Table 9, the top generating districts of non-leachate wastes are concentrated in south-central and southwestern Ontario. The Golden Horseshoe, which is comprised of the Greater Toronto Area, Hamilton-Wentworth, and the Niagara region, has a high concentration of non-leachate hazardous waste generators. The Windsor-Sarnia corridor, which has a high concentration of petrochemical industries, is another area in the province where non-leachate hazardous waste generation is very high.

Table 10: Top generating districts of landfill leachate waste in Ontario, 2000

2000 ranking	Generating district	Quantity generated (tonnes)
1	Ottawa	204,586
2	Hamilton	102,845
3	Burlington	75,085
4	London	57,601
5	Windsor	53,889
6	Sarnia	13,739
7	Peterborough	11,919
8	Belleville	11,498
9	Barrie	6,951
10	St. Catharines	3,411
11	Kingston	3,124
12	Cornwall	1,776
13	Ajax	1,622
14	Guelph	176
15	Toronto	68

The top generating districts of landfill leachate wastes in the province for 2000 include municipalities with one or more landfill sites. For example, the Ottawa district contains the Trail Road landfill site in Nepean, and the Hamilton district contains 2200 Brampton Street Landfill operated by the Corporation of the City of Hamilton. In most cases, these landfills were located in suburban and rural areas surrounding the urban municipality. Urban districts that did not include outlying regional municipalities, e.g. the City of Toronto, had minimal generation of landfill leachates, as few landfills are sited within urban municipal boundaries. Windsor district had approximately half the quantity of landfill leachate waste in 2000 than in 1998, a noticeable difference.

HAZARDOUS WASTE TYPES GENERATED IN ONTARIO

In 2000, 53 different types of hazardous wastes were classified in the Hazardous Waste Manifest Database, staying consistent with the waste types in the 1998 Hazardous Waste Manifest Database. Examples of wastes in each waste type are provided in Appendix B. Table 11 lists the top 25 (by quantity generated) waste types generated in 2000. Figure 7 highlights each waste type as a percentage of the total hazardous waste quantity generated in Ontario for 2000.

Figure 7: Waste types generated in Ontario as a percentage of total hazardous waste generation, 2000

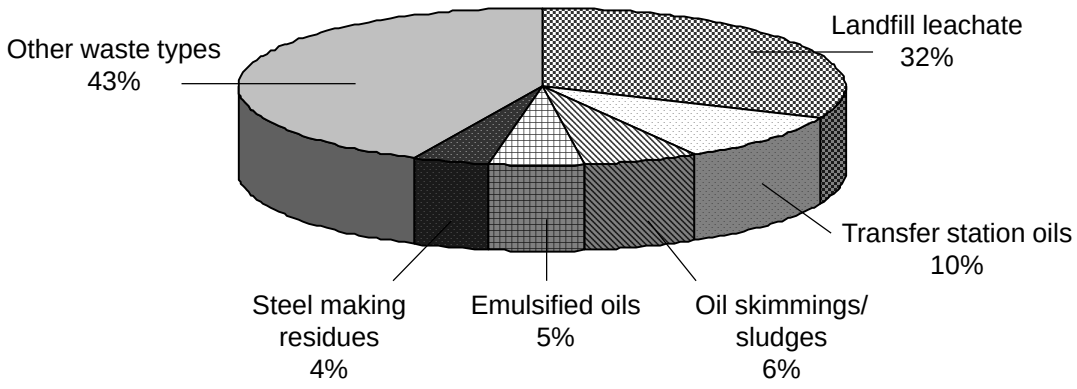


Table 11: Top 25 waste types generated in Ontario, 2000

1998 ranking	2000 ranking	Waste type	Quantity generated (tonnes)	Percentage of total waste generated in 2000
1	1	Landfill leachates	548,292	31.7%
2	2	Transfer station oils wastes	175,327	10.1%
4	3	Oil skimmings & sludges	105,336	6.1%
5	4	Emulsified oils	84,921	4.9%
3	5	Steel making residues	73,945	4.3%
7	6	Waste oils & lubricants	73,652	4.3%
9	7	Alkaline wastes - other metals	60,955	3.5%
10	8	Other specified organics	55,049	3.2%
11	9	Aromatic solvents	49,718	2.9%
6	10	Other specified inorganics	49,277	2.8%
14	11	Spent pickle liquor	47,182	2.7%
12	12	Paint/pigment/coating residues	45,025	2.6%
15	13	Aliphatic solvents	35,883	2.1%
13	14	Acid waste - heavy metals	35,298	2.0%
17	15	Neutralized wastes - heavy metals	33,197	1.9%
	16	Polymeric resins	28,322	1.6%
22	17	Neutralized wastes - other metals	24,502	1.4%
8	18	Halogenated solvents	20,062	1.2%
16	19	Non-halogenated rich organics	19,806	1.1%

continued ➤

Table 11: Top 25 waste types generated in Ontario, 2000 *(continued)*

1998 ranking	2000 ranking	Waste type	Quantity generated (tonnes)	Percentage of total waste generated in 2000
23	20	Non-halogenated lean organics	18,898	1.1%
20	21	Alkaline phosphates	15,210	0.9%
25	22	Petroleum distillates	13,302	0.8%
18	23	Alkanline wastes - heavy metals	12,937	0.7%
24	24	Light fuels	12,760	0.7%
	25	Acid waste - other metals	8,626	0.5%

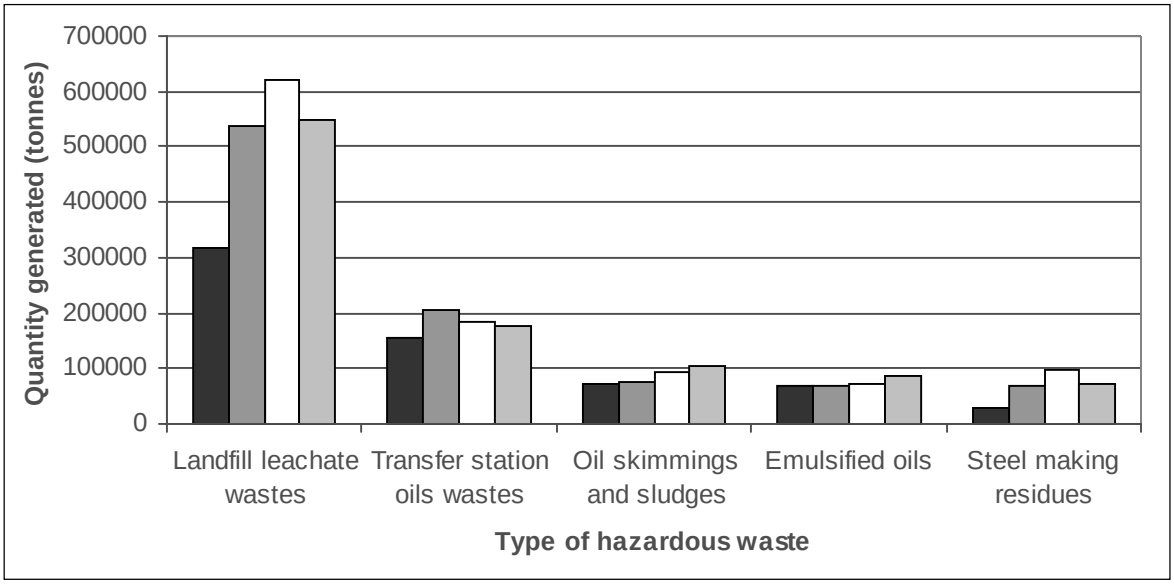
As seen in Table 11 and Figure 7, landfill leachate wastes made up the largest percentage, 31.7% of hazardous waste generated in Ontario for 2000. Transfer station oil wastes, oil skimmings and sludges, and emulsified oils made up another 21% of hazardous waste generation. These waste types reflect hazardous waste generation from solid waste landfills, the steel making industry, the petrochemical industry, and various manufacturers that utilize petrochemical products in the province.

From 1994 to 2000, quantities of the top generated waste types have increased in the province. Table 12 and Figure 8 present the 1994 and 2000 generation quantities for the top five waste types generated in 2000. Table 12 also includes a comparison of generation quantities for the top five waste types generated between 1998 and 2000. As demonstrated in Table 12, three of the five waste types have decreased in quantities, for example steel making residues decreased by 25%, followed by landfill leachates, 12%, and transfer station oil wastes by 5%. However oil skimmings and sludges increased by 12% followed by emulsified oils at 20%. Landfill leachate wastes saw the largest decrease as far as quantity is concerned by 73,887 tonnes compared to 1998 values.

Table 12: Quantity of waste generated for the top five 2000 generated waste types, 1994 to 2000

Waste type	Quantity generated in 2000 (tonnes)	Quantity generated in 1998 (tonnes)	Quantity generated in 1994 (tonnes)	Quantity change in generation from 1994 to 2000	Percentage change in generation from 1994 to 2000	Quantity change in generation from 1998 to 2000	Percentage change in generation from 1998 to 2000
Landfill leachates	548,292	622,179	315,743	232,549	74%	-73,887	-12%
Transfer station oils wastes	175,327	185,445	154,791	20,536	13%	-10,118	-5%
Oil skimmings & sludges	105,336	94,049	70,701	34,635	49%	11,287	12%
Emulsified oils	84,921	71,055	66,812	18,109	27%	13,866	20%
Steel making residues	73,945	98,265	28,324	45,621	161%	-24,320	-25%

Figure 8: Quantity of waste generated for the top five 2000 generated waste types, 1994 to 2000



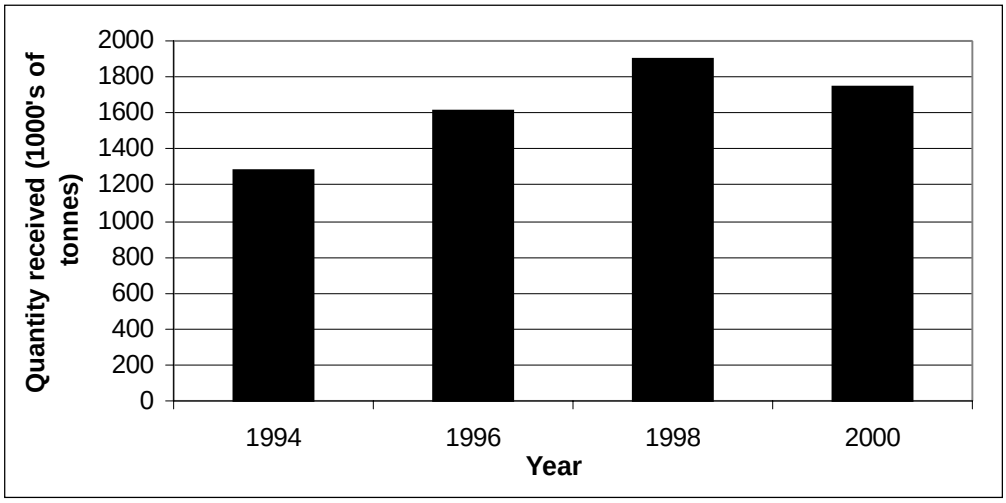
SECTION III: HAZARDOUS WASTE TRANSFERS TO RECEIVING SITES IN ONTARIO, 1994 TO 2000

In 2000, receiving sites in the province of Ontario received 1,748,771 tonnes of hazardous waste, which is an increase of 462,010 tonnes or 35.9% from 1994 to 2000. However, percentage change from 1998 is -8%, a decrease of 152,288 tonnes. The increase and decrease is highlighted in Table 13 and Figure 9.

Table 13: Quantity of hazardous waste received by sites in Ontario, 1994 to 2000

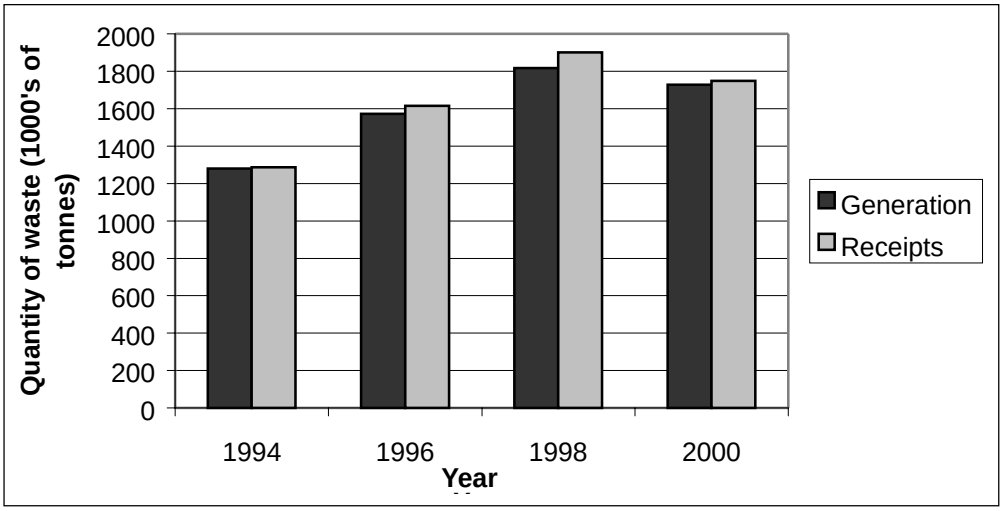
Year	Quantity received (in tonnes)	Percentage increase from 1994 base year	Percentage change from previous year of record
2000	1,748,771	35.9%	-8.0%
1998	1,901,059	47.7%	17.7%
1996	1,615,461[24]	25.6%	25.5%
1994	1,286,761		

Figure 9: Quantity of hazardous waste received by sites in Ontario, 1994 to 2000



The decrease in hazardous waste receipts in the province closely matches the decrease in hazardous waste generation during the same period. Figure 10 compares hazardous waste generation and receipts in Ontario from 1994 to 2000, and highlights the increase from the base year. It is also interesting to note that from 1994 to 2000, Ontario has received more waste than it has generated, which indicates that Ontario receives hazardous wastes from outside the province.

Figure 10: Hazardous waste generation and receipts in Ontario, 1994 to 2000

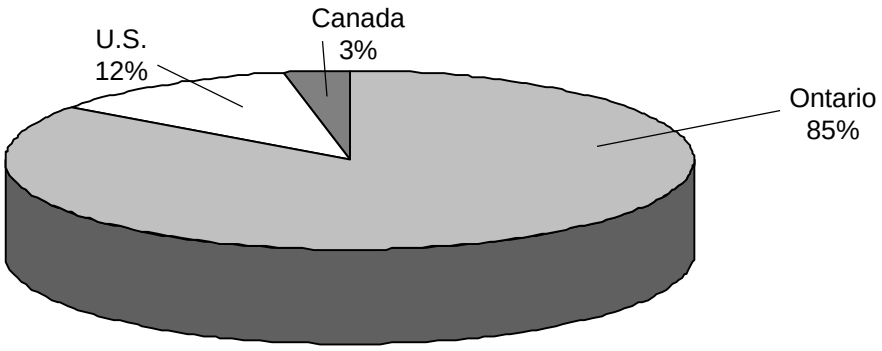


Most of the hazardous waste received by sites in Ontario is "home grown", i.e., is transferred from generating sites within the province. In 2000, roughly 85% of hazardous waste received in Ontario was transferred from generating sites in the province. Hazardous waste transfers from the United States accounted for 12% of waste received by Ontario sites, and hazardous waste transfers from other provinces accounted for 3%. The quantities and percentage of waste received from within and outside of the province is presented in Table 14 and Figure 11.

Table 14: Quantity of hazardous waste received by Ontario sites from various jurisdictions, 2000

Generating jurisdiction	Quantity of waste received in Ontario (tonnes)	Percentage of waste received in Ontario
Ontario	1,486,232	85.0%
United States	205,732	11.8%
Canada (other provinces)	56,807	3.2%

Figure 11: Quantity of hazardous waste received by Ontario sites from various jurisdictions, 2000



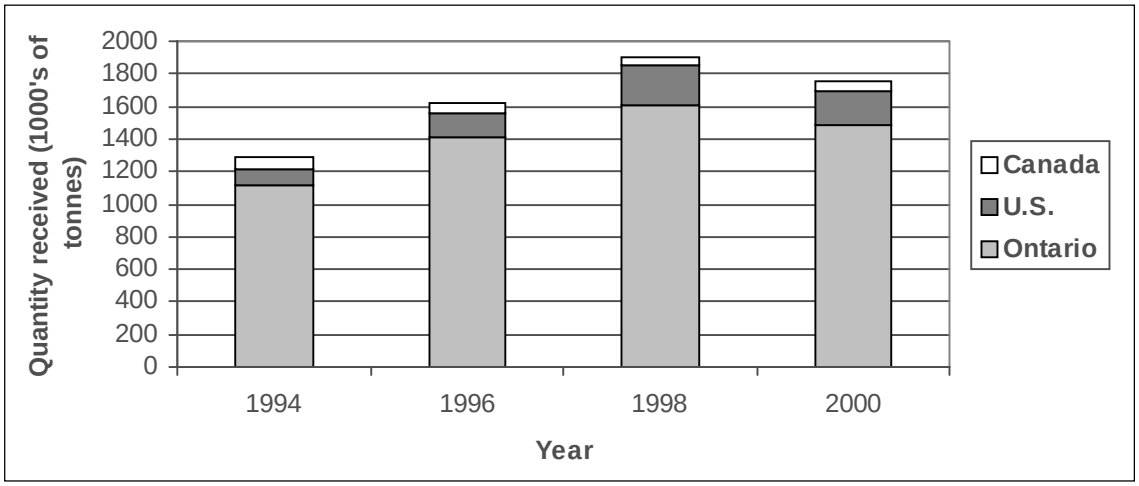
From 1994 to 1998, Ontario had received increasing quantities of hazardous waste from generating sites within the province, however from 1998 to 2000 the quantity received decreased by 125,899 tonnes. Continuing to compare 1998 to 2000, waste received by sites in Ontario from provincial generating sites increased by 3,374 tonnes. As seen in Table 15 and Figure 12, the quantity of hazardous waste transferred to Ontario sites from U.S. generators also has decreased, by 29,763 tonnes since 1998, which represents a 12.6% decrease from the 1998 to 2000. Despite good trends (decrease) as the analysis in Section V describes, Bennett Environmental's proposal to build an incinerator at Kirkland Lake, Ontario would reverse this trend.

Between 1994 and 2000 the quantity of hazardous waste received by Ontario sites doubled from the United States from approximately 100,000 tonnes to approximately 200,000 tonnes.

Table 15: Quantity of hazardous waste received by Ontario sites from various jurisdictions, 1994 to 2000

Generating jurisdiction	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Ontario	1,486,232	1,612,131	1,120,057	366,175	32.7%	-125,899	-7.8%
United States	205,732	235,495	99,972	105,760	105.8%	-29,763	-12.6%
Canada (other provinces)	56,807	53,433	66,732	-9,925	-14.9%	3,374	6.3%

Figure 12: Quantity of hazardous waste received by Ontario sites from various jurisdictions, 1994 to 2000



ONTARIO RECEIVING SITES OF HAZARDOUS WASTE

In 2000, there were approximately 222 sites in Ontario that received hazardous waste (a reduction of 78 sites since 1998). The receiving sites that received the greatest quantities of hazardous waste included water pollution control plants (WPCPs) and landfill sites. Waste management companies, including Philip Services Inc. and Safety-Kleen Ltd. owned many of these receiving facilities. The top receiver of hazardous waste in the province and from the U.S. for 2000 was the Safety-Kleen facility in Moore Township, near Sarnia. This facility alone received 249,447 tonnes of hazardous waste in 2000, the primary waste type received being organic wastes. Table 16 presents the top 25 receiving sites in Ontario of hazardous waste for 2000 and their primary waste type received.

Again, it is useful to separate the receivers of landfill leachate wastes from the receivers of non-leachate wastes in order to get a better understanding of where landfill wastes and wastes from industrial processes are being received in the province. Table 17 and Table 18 present the top 25 receivers of landfill leachate wastes and non-leachate wastes, respectively.

Table 16: Top 25 Ontario receiving sites of hazardous waste, 2000

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)	Primary waste type received
1	1	Safety-Kleen Ltd.	Lot 9 & Pt.Lot 8, Conc. 10	Corunna	249,447	Other specified organics
2	2	Regional Municipality of Ottawa-Carleton	Robert O. Pickard Environmental Centre	Gloucester	208,302	Landfill leachates
3	3	Safety-Kleen Canada Inc.	300 Woolrich Street South	Breslau	131,581	Transfer station oils wastes
7	4	Safety-Kleen Ltd.	Lot 9 Conc. 10(Incinerator)	Corunna	81,943	Non-halogenated lean organics
13	5	Philip Enterprises Inc.	112 Adams Blvd.	Brantford	79,638	Landfill leachates
8	6	London (Greenway) WPCP	Greenside Avenue	London	56,548	Landfill leachates
12	7	Hamilton-Wentworth WPCP, Azurix	700 Woodward Ave.	Hamilton	48,572	Landfill leachates
22	8	Skyway WPCP	1125 Lakeshore Rd.	Burlington	47,937	Landfill leachates
6	9	West Windsor WPCP	4155 Ojibway Parkway	Windsor	43,449	Landfill leachates
15	10	Safety-Kleen Ltd.	2258 River Road	London	36,335	Steel making residues
5	11	Philip Enterprises Inc.	55 Vulcan Street	Toronto	31,971	Transfer station oils wastes
20	12	Dofasco Inc.	#1 Acid regeneration plant	Hamilton	30,597	Spent pickle liquor
21	13	Philip Enterprises Inc.	4505 Fourth St.	Windsor	29,550	Waste oils & lubricants
	14	St. Lawrence Cement Company	2391 Lakeshore Road West	Mississauga	28,203	Halogenated solvents
16	15	Oakville, (South West WPCP)	1385 Lakeshore Road West	Oakville	27,186	Landfill leachates
17	16	Safety-Kleen Ltd.	551 Avonhead Road	Mississauga	25,590	Paint/pigment/ coating residues
14	17	General Motors of Canada Limited	285 Ontario Street	St. Catharines	23,095	Alkaline wastes - other metals
19	18	Quantex Technologies Inc.	260 Shoemaker Street	Kitchener	22,223	Waste oils & lubricants
	19	U.S. Filter Operations Services	Regional Road #9 West	Hagersville	21,755	Landfill leachates
10	20	Philip Services Inc.	799-800 Parkdale Avenue	Hamilton	21,016	Non-halogenated rich organics

continued➤

Table 16: Top 25 Ontario receiving sites of hazardous waste, 2000 *(continued)*

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)	Primary waste type received
	21	Perth, Town of Lagoon	Rogers Rd.	Perth	20,907	Neutralized wastes - other metals
	22	Quantex Technologies Inc.	309 Cherry Street	Toronto	20,086	Oil skimmings & sludges
	23	Donohue Forest Products Inc.	Parcel 12,712, Rainy River	Fort Frances	17,513	Other specified inorganics
	24	Bayer Rubber Corp./ Polysar	1265 Vidal Street	Sarnia	17,270	Aromatic solvents
	25	Safety-Kleen Canada Inc.	23 Regan Road	Brampton	17,186	Waste oils & lubricants

Table 17: Top 25 Ontario receiving sites of landfill leachate wastes, 2000

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)
1	1	Regional Municipality of Ottawa-Carleton	Robert O. Pickard Environmental Centre	Gloucester	204,586
3	2	London (Greenway) WPCP	Greenside Ave/Dingman Creek	London	56,512
5	3	Hamilton-Wentworth WPCP, Azurix	700 Woodward Avenue	Hamilton	48,471
9	4	Skyway WPCP	1125 Lakeshore Rd.	Burlington	47,899
2	5	West Windsor WPCP	4155 Ojibway Parkway	Windsor	43,449
	6	Philip Enterprises Inc.	112 Adams Boulevard	Brantford	36,233
7	7	Oakville (South West WPCP)	1385 Lakeshore Road West	Oakville	27,186
14	8	U.S. Filter Operations Services	Regional Road #9 West	Hagersville	21,755
11	9	Town of Cobourg	WPCP 2	Cobourg	11,919
8	10	Bancroft WPCP	Hasting St. South	Bancroft	11,498
10	11	Chatham WPCP	100 Irwin Street	Chatham	10,441
4	12	Barrie WPCP	249 Bradford St.	Barrie	6,951
	13	Town of Goderich	57 West Street	Goderich	4,658
	14	Great Napanee Water Supply & Pollution	300 Water Street	Napanee	3,120
17	15	London (Pottersburg) WPCP	1145 Hamilton Road	London	2,740
13	16	Dow Chemical Canada Inc.	Vidal St. South, Biox WW.&Sewage Treatment Plant	Sarnia	2,062
	17	Regional Municipality of Niagara	3450 Stanley Road	Niagara Falls	1,933

continued➤

Table 17: Top 25 Ontario receiving sites of landfill leachate wastes, 2000 *(continued)*

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)
	18	Corporation of the Town of Alexandria	20503 McCormick Road	Alexandria	1,776
20	19	Region of York	Aurora Pumping Station	Aurora	1,622
	20	Welland WPCP		Welland	1,230
18	21	Bayer Rubber Corp./ polysar	1265 Vidal Street	Sarnia	875
	22	Quantex Technologies Inc.	309 Cherry Street	Toronto	489
6	23	Philip Enterprises Inc.	55 Vulcan Street	Toronto	454
	24	Regional Municipality of Niagara/Pt. Dalhousie WPCP	40 Lighthouse Road	St. Catharines	199
	25	Ontario Clean Water Agency	Cambridge City Galt WPCP	Cambridge	176

As highlighted in Table 17, water pollution control plants received the greatest quantities of landfill leachate wastes in the province, making up 11 of the top 25 receivers of these types of wastes.

Table 18: Top 25 Ontario receiving sites of non-leachate wastes, 2000

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)
1	1	Safety-Kleen Ltd.	Lot 9 & Pt.Lot 8, Conc. 10, Moore Twp.	Corunna	249,447
2	2	Safety-Kleen Canada Inc.	300 Woolrich Street South	Breslau	131,581
4	3	Safety-Kleen Ltd.	Lot 9 Conc. 10, Moore Township	Corunna	81,943
7	4	Philip Enterprises Inc.	112 Adams Blvd.	Brantford	43,406
10	5	Safety-Kleen Ltd.	2258 River Road	London	36,330
9	6	Philip Enterprises Inc.	55 Vulcan Street	Toronto	31,517
13	7	Dofasco Inc.	#1 Acid regeneration plant	Hamilton	30,957
14	8	Philip Enterprises Inc.	4505 Fourth St.	Windsor	29,550
18	9	St. Lawrence Cement Company	2391 Lakeshore Road West	Mississauga	28,203
11	10	Safety-Kleen Ltd.	551 Avonhead Road	Mississauga	25,584
8	11	General Motors of Canada Limited	285 Ontario Street	St. Catharines	23,095
12	12	Quantex Technologies Inc.	260 Shoemaker Street	Kitchener	22,223
	13	Philip Services Inc.	799-800 Parkdale Avenue	Hamilton	21,016

continued➤

Table 18: Top 25 Ontario receiving sites of non-leachate wastes, 2000 *(continued)*

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)
	14	Perth, Town of Lagoon	Rogers Rd.	Perth	20,907
21	15	Quantex Technologies Inc.	309 Cherry Street	Toronto	19,597
	16	Donohue Forest Products Inc.	Parcel 12,712, Rainy River	Fort Frances	17,513
22	17	Safety-Kleen Canada Inc.	23 Regan Road	Brampton	17,186
19	18	Philip Enterprises Inc.	Lot 6 Con 5, Niagara Riv. Pt. of	Fort Erie	17,039
	19	Detox Environmental Ltd.	Part 1, RP10R-1912, Clarington	Bowmanville	16,719
	20	Bayer Rubber Corp./ Polysar	1265 Vidal Street	Sarnia	16,395
	21	Safety-Kleen Ltd.	520 Southgate Drive	Guelph	15,995
24	22	Fielding Chemical Technologies Inc.	3549 Mavis Road	Mississauga	15,695
17	23	Esso Petroleum Canada	Pt.Lots 11&10 Land Farm Lambton County	Sarnia	15,059
25	24	Aimco Solrec Ltd.	425 Morobel Drive	Milton	13,185
16	25	Dofasco Inc.	#2 Cold Mill WWTP	Hamilton	12,375

The top 25 receiving sites of non-leachate wastes in the province for 2000 were primarily facilities owned by environmental services (waste management) companies, petrochemical producers and steel producers. In particular, two companies, Safety-Kleen, Philip Services and their subsidiaries had the greatest number of facilities that received high quantities of non-leachate hazardous waste in 2000.

Having identified the individual receivers of hazardous waste in the province for 2000, it is also important to examine the types of facilities that receive these wastes transfers. Table 19 and Figure 13 present the quantities of hazardous waste transfers received by various types of facilities for 2000.

These facilities do not necessarily represent the final fate of the hazardous waste, but are the facilities where the waste was received and "signed-off" on the Hazardous Waste Manifest Database. In the case of transfer stations, the hazardous waste may be processed or unprocessed and transferred to another receiving facility (e.g. landfill). Processing of the waste may result in the waste being categorized as non-hazardous before it is transferred. In this case the transfer station is considered the final receiving facility for the hazardous waste. Processing may also affect the quantity and composition of hazardous waste transferred to another type of facility for final disposal.

Table 19: Quantities of hazardous waste transfers received in Ontario by receiving facility, 2000

Receiving facility	Quantity of hazardous waste received (tonnes)	Percentage of hazardous waste received in Ontario
Water pollution control plant	588,540	33.7%
Transfer station - processing	364,665	20.9%
Transfer station	277,856	15.9%
Landfill	249,957	14.3%
Reclaim	132,787	7.6%
Incineration	110,253	6.3%
Private landfill & sludge farms	24,503	1.4%
PCB storage site	209	0.01%
TOTAL	**1,748,771**	

Figure 13: Quantities of hazardous waste transfers received in Ontario by receiving facility, 2000

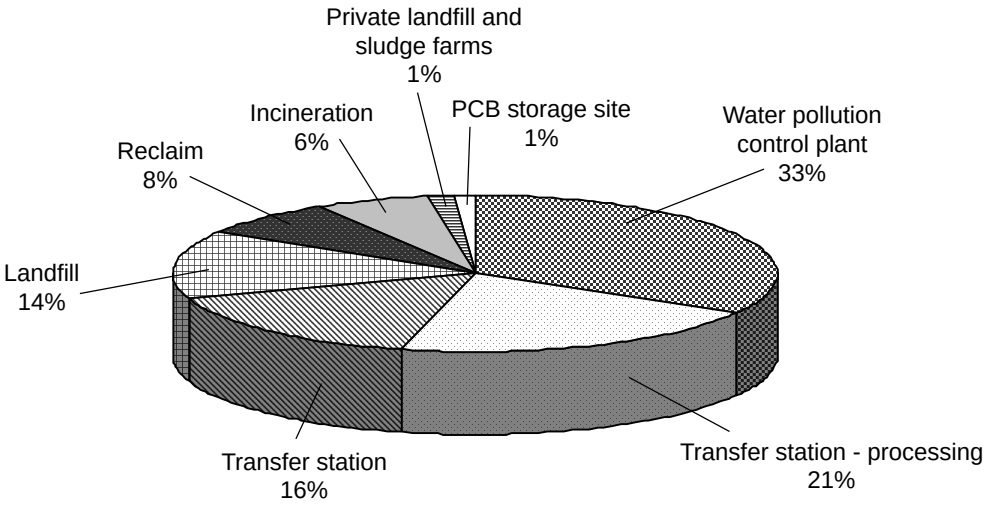


Table 19 and Figure 13 illustrate that in 2000, water pollution control plants in the province received one third of hazardous waste transfers from generating sites. These plants are unable to treat all of the toxic contaminants in these hazardous wastes and as a result some of these contaminants eventually end up in the Great Lakes and in watersheds throughout Ontario.

From 1994 to 2000, the quantities of hazardous waste received by various facilities across the province have increased except for private landfill and sludge farms. Comparing 1998 to 2000 quantities, five out of the eight receiving facilities had a decrease of 0 to 64%. Table 20 highlights the changes in the amounts of hazardous waste received by these facilities from 1994 to 2000.

As seen in Table 20, water pollution control plants, transfer stations, and private landfill and storage farms account for the largest decrease in waste quantities received. Water pollution control plants received 38,166 less tonnes of hazardous waste in 2000 than in 1998, which represents a 6.1% decrease. Incineration sites however, experienced 23,867 tonnes or 27.6% increase of hazardous waste receipts from 1998 to 2000. The trend in hazardous waste receipts by incineration facilities are further highlighted in Figure 14. The number one incinerator facility is Safety-Kleen Ltd. in Sarnia, followed by the St. Lawrence Cement Company in Burlington, as seen as in Table 19A.

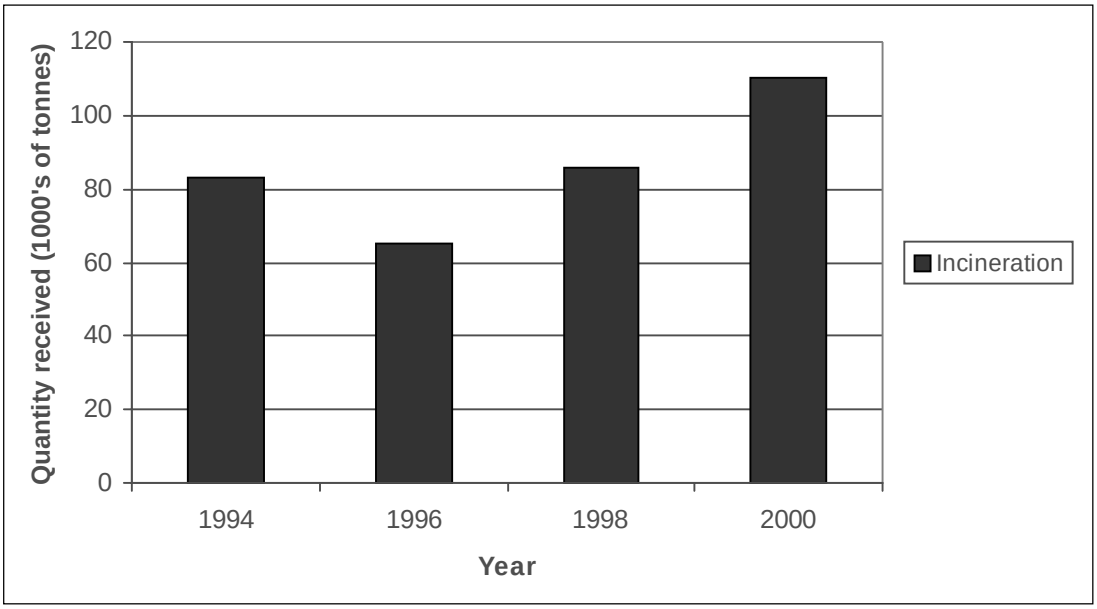
Table 19A: Quantities of hazardous waste transfers received in Ontario by incinerator, 2000

Incinerator	District	Quantity received in 2000 (tonnes)
Safety-Kleen Ltd	Sarnia	81,943
St. Lawrence Cement Company	Burlington	28,203
Haldimand War Memorial Hospital	Hamilton	99
Grey Bruce Regional Health Centre	Owen Sound	4
Eco Waste Solutions Inc.	Burlington	3
West Nipissing Hospital	North Bay	1

Table 20: Quantity of waste received by facility type, 1994 to 2000

Receiving facility	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Water pollution control plant	588,540	626,706	452,926	135,614	30%	-38,166	-6%
Transfer station - processing	364,665	366,432	227,091	137,574	61%	-1,767	-0.4%
Transfer station	277,856	346,100	233,967	43,889	19%	-68,244	-20%
Landfill	249,957	254,918	112,018	137,939	123%	-4,961	-2%
Reclaim	132,787	131,569	116,861	15,926	14%	1,218	1%
Incineration	110,253	86,386	82,945	27,308	33%	23,867	28%
Private landfill & sludge farms	24,503	68,520	30,766	-6,263	-20%	-44,017	-64%
PCB storage site	209						

Figure 14: Hazardous waste receipts by incineration facilities in Ontario, 1994 to 2000



HAZARDOUS WASTE RECEIVING DISTRICTS IN ONTARIO

The quantity of hazardous wastes received in Ontario for 2000 varied amongst the receiving districts in the province. Table 21 presents hazardous waste receipts by Ontario districts and the primary waste type received in each district in 2000.

Table 21: Hazardous waste quantities received in Ontario by district, 1998 and 2000

1998 ranking	2000 ranking	Receiving district	Quantity received in 1998 (tonnes)	Primary waste type received in 1998	Quantity received in 2000 (tonnes)	Primary waste type received in 2000
1	1	Sarnia	424,084	Other specified organics	383,355	Other specified organics
3	2	Guelph	221,516	Transfer station oils wastes	260,903	Transfer station oils wastes
4	3	Ottawa	213,865	Landfill leachate wastes	248,797	Landfill leachate wastes
5	4	Burlington	162,454	Landfill leachate wastes	205,950	Landfill leachate wastes
2	5	Hamilton	269,901	Steel making residues	174,504	Landfill leachate wastes
6	6	Windsor	142,694	Landfill leachate wastes	101,778	Landfill leachate wastes
7	7	London	100,744	Landfill leachate wastes	99,660	Landfill leachate wastes
10	8	St. Catharines	73,942	Alkaline wastes - other metals	61,668	Alkaline wastes - other metals
11	9	Ajax	36,787	Alkaline phosphates	53,670	Alkaline phosphates
8	10	Toronto	93,600	Landfill leachate wastes	52,920	Oil skimmings & sludges
9	11	Barrie	78,465	Landfill leachate wastes	31,780	Landfill leachate wastes

continued➤

Table 21: Hazardous waste quantities received in Ontario by district, 1998 and 2000 *(continued)*

1998 ranking	2000 ranking	Receiving district	Quantity received in 1998 (tonnes)	Primary waste type received in 1998	Quantity received in 2000 (tonnes)	Primary waste type received in 2000
13	12	Peterborough	24,462	Landfill leachate wastes	23,015	Landfill leachate wastes
14	13	Kenora	12,289	Other specified organics	17,733	Other specified inorganics
12	14	Kingston	31,912	Landfill leachate wastes	16,151	Landfill leachate wastes
19	15	Owen Sound	137	Light fuels	4,706	Landfill leachate wastes
15	16	Thunder Bay	8,396	Landfill leachate wastes	3,600	Oil skimmings & sludges
16	17	Sudbury	4,101	Waste oils & lubricants	3,255	Waste oils & lubricants
17	18	South Porcupine	1,204	Waste oils & lubricants	2,511	PCBs
18	19	Cornwall	394	Light fuels	2,497	Landfill leachate wastes
	20	North Bay			226	Pathological wastes
20	21	Sault Ste. Marie	108	Oil skimmings and sludges	93	Transfer station oils wastes

Figure 15: Percentage of hazardous waste receipts in Ontario by district, 2000

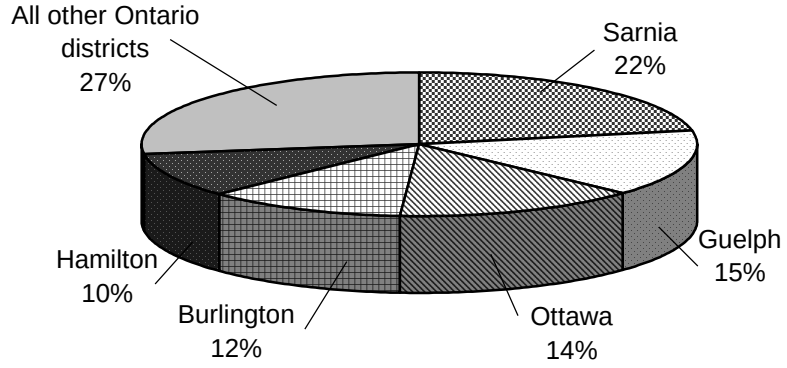


Table 21 shows that receiving sites in the Sarnia district received the greatest quantity of hazardous waste in 1998 and 2000, having received 383,355 tonnes of hazardous waste, representing 22% of hazardous waste receipts (as seen in Figure 15) in the province in 2000. The largest receiver of hazardous waste in the province, the Safety-Kleen facility in Corunna, is located within the Sarnia district. A more detailed description of hazardous waste receipts in Sarnia and Ottawa districts is provided in the following profiles.

Hazardous Waste District Profile: Sarnia District

Location: located in southwestern Ontario, along the St.Clair River

Municipalities: Sarnia district includes the City of Sarnia and surrounding municipalities including Lambton County, Moore Township, Enniskillen Township, and the towns of Corunna, Petrolia, etc.

Hazardous waste receipts in 2000: 383,355 tonnes, which ranks the district as the #1 receiver of hazardous waste in Ontario, receiving 22% of hazardous waste in the Province

Top receiving sites in the district: Sarnia district has three of the top 25 receivers of hazardous waste in the Province, they are:

1) Safety-Kleen Ltd., facility (landfill) located in Lot 9 and Pt. Lot 8, Concession 10 in Moore Township near Corunna
- Received 249,447 tonnes of hazardous waste in 2000
- Ranked #1 of the top receiving sites in Ontario
- Other specified organics is the primary waste type received

2) Safety-Kleen Ltd., facility (incinerator) located in Lot 9, Concession 10 in Moore Township near Corunna
- Received 81,943 tonnes of hazardous waste in 2000
- Ranked #4 of the top 25 receiving sites in Ontario
- Non-halogenated lean organics is the primary waste type received

3) Bayer Rubber Corp./Polysar, 1265 Vidal Street located in Sarnia
- Received 17,270 tonnes of hazardous waste in 2000
- Ranked #24 of the top 25 receivers in Ontario
- Aromatic solvents is the primary waste type received

Table 22: Top hazardous waste types received in Sarnia district, 2000

1998 ranking	2000 ranking	Waste type	Quantity received (tonnes)
1	1	Other specified organics	79,088
2	2	Other specified inorganics	60,805
5	3	Steel making residues	41,040
4	4	Oil skimmings & sludges	37,288
6	5	Aromatic solvents	28,724
7	6	Non-halogenated lean organics	28,631
	7	Polymeric resins	23,808
8	8	Neutralized wastes - heavy metals	12,537
9	9	Transfer station oils wastes	11,155
10	10	Alkaline wastes - other metals	8,641

Hazardous waste receiving trend: from 1994 to 2000, the quantity of hazardous waste received in Sarnia district has increased by 30% from 294,953 tonnes generated in 1994 to 383,355 tonnes in 2000. Between 1998 and 2000 there has been a decrease of 40,729 tonnes, a 10% change from 1998.

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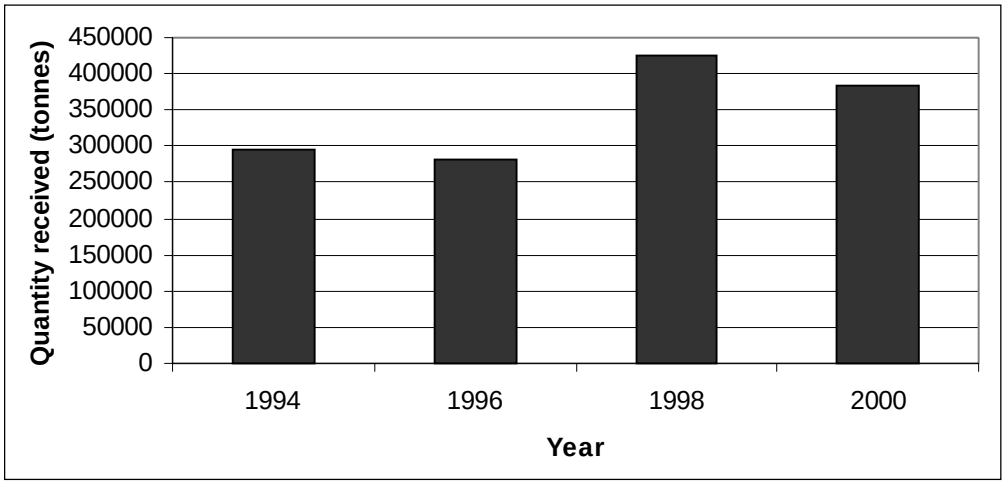
Hazardous Waste District Profile: Sarnia District *(continued)*

Figure 16: Hazardous waste receipts in Sarnia District, 1994 to 2000



Hazardous Waste District Profile: Ottawa District

Location: located in eastern Ontario, along the Ottawa River

Municipalities: Ottawa district includes the City of Ottawa and surrounding municipalities including Cumberland, Gloucester, Goulbourn, Kanata, Nepean, Osgoode, Rideau, Rockcliffe Park, Vanier and West Carleton.

Hazardous waste receipts in 2000: 248,797 tonnes, which ranks the district as the #3 receiver of hazardous waste in Ontario, receiving 14% of hazardous waste in the Province

Top receiving site in the district: Ottawa district has one of the top 25 receivers of hazardous waste in the Province, which is:

1) Regional Municipality of Ottawa-Carleton, Robert O. Pickard Environmental Centre in Gloucester
- Received 208,302 tonnes of hazardous waste in 2000
- Ranked #2 of the top receiving sites in Ontario
- Landfill leachates is the primary waste type received
- In 1998 this site was ranked #4 of the top receiving sites in Ontario

continued ➤

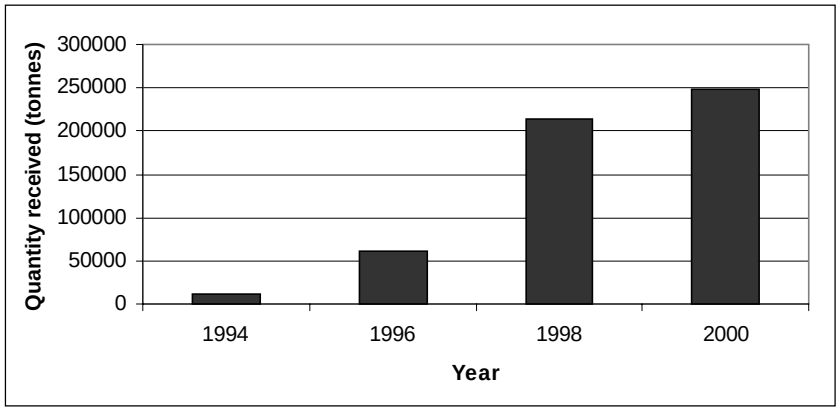
Hazardous Waste District Profile: Ottawa District *(continued)*

Table 22a: Top hazardous waste types received in Ottawa district, 2000

2000 ranking	Waste type	Quantity received (tonnes)
1	Landfill Leachates	204,586
2	Neutralized wastes - other metals	20,989
3	Emulsified oils	5,382
4	Oil skimmings and sludges	4,066
5	Waste oils and lubricants	3,987
6	Light fuels	2,699
7	Transfer station oils wastes	2,130
8	Aliphatic solvents	765
9	Spent pickle liquor	723
10	Paint/Pigment/Coating Residues	716

Hazardous waste receiving trend: from 1994 to 2000, the quantity of hazardous waste received in Ottawa district has increased by 2258% from 10,550 tonnes generated in 1994 to 248,797 tonnes in 2000. Between 1998 and 2000 there has been an increase of 34,932 tonnes, a 16% change from 1998.

Figure 16a: Hazardous waste receipts in Ottawa District, 1994 to 2000

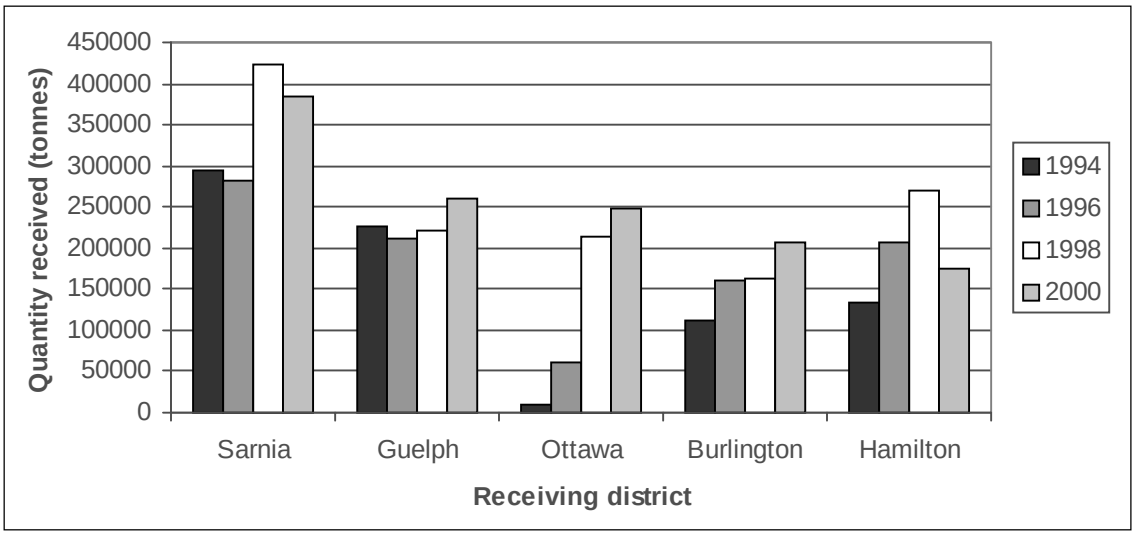


All of the top five receiving districts in the province have experienced an increase in hazardous waste receipts from 1994 to 2000. However when receipts are compared between 1998 and 2000 we see that only three of the top five receiving districts show an increase in hazardous waste receipts. This is highlighted in Table 23 and Figure 17. Continuing to examine the 1998 and 2000 receipts in the districts the three that did increase showed a 16% to 27% increase. The greatest increase in waste receipts is in the district of Burlington, which is primarily due to an increase in incineration and landfill leachate received in the district from solid waste landfills. Owen Sound experienced the largest change between 1998 and 2000. The districts of Sarnia and Hamilton showed a decrease in its hazardous waste receipts over this time period, 1998 to 2000.

Table 23: Quantity of waste received in each of the top five 2000 receiving districts, 1994 to 2000

Receiving jurisdiction	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Sarnia	383,355	424,084	294,953	88,402	30%	-40,729	-10%
Guelph	260,903	221,516	225,306	35,597	16%	39,387	18%
Ottawa	248,797	213,865	10,550	238,247	2,258%	34,932	16%
Burlington	205,950	162,454	112,866	93,084	82%	43,496	27%
Hamilton	174,504	269,901	134,079	40,425	30%	-95,397	-35%
Windsor	101,778	142,694				-40,916	-29%
London	99,660	100,744				-1,084	-1%
St. Catharines	61,668	73,942				-12,274	-17%
Ajax	53,670	36,787				16,883	46%
Toronto	52,920	93,600				-40,680	-43%
Barrie	31,780	78,465				-46,685	-59%
Peterborough	23,015	24,462				-1,447	-6%
Kenora	17,733	12,289				5,444	44%
Kingston	16,151	31,912				-15,761	-49%
Owen Sound	4,706	137				4,569	3,335%
Thunder Bay	3,600	8,396				-4,796	-57%
Sudbury	3,255	4,101				-846	-21%
South Porcupine	2,511	1,204				1,307	109%
Cornwall	2,497	394				2,103	534%
North Bay	226	0				226	
Sault Ste. Marie	93	108				-15	-14%

Figure 17: Hazardous waste receipts in the top five receiving districts (for 2000), 1994 to 2000



It is necessary to separate hazardous waste receipts by the types of waste received in each district in order to identify those districts that received primarily landfill leachate wastes and those districts that received all other wastes (from industrial processes and manufacturing). Table 24 and Table 25 present the top receiving districts in Ontario for 2000 of non-leachate and leachate wastes, respectively.

Table 24: Top receiving districts of non-leachate hazardous waste in Ontario, 2000

1998 ranking	2000 ranking	Receiving district	Quantity received (tonnes)
1	1	Sarnia	382,480
2	2	Guelph	224,494
4	3	Burlington	130,858
3	4	Hamilton	104,278
5	5	St. Catharines	58,263
8	6	Ajax	52,047
6	7	Toronto	51,978
9	8	Windsor	45,826
10	9	Ottawa	44,211
7	10	London	40,404
11	11	Barrie	24,829
12	12	Kenora	17,733
13	13	Peterborough	11,096
16	14	Thunder Bay	3,600
14	15	Sudbury	3,255
17	16	South Porcupine	2,511
15	17	Kingston	1,529
18	18	Cornwall	721
	19	North Bay	226
20	20	Sault Ste. Marie	93
19	21	Owen Sound	48

Similar to hazardous waste generating districts, the top receiving districts of non-leachate wastes are concentrated in south-central (Golden Horseshoe) and southwestern Ontario. The district of Sarnia by far received the greatest quantity of non-leachate wastes. In 2000, Sarnia district received 157,986 tonnes more than the second highest receiving district, Guelph. Again, the districts receiving the greatest quantities of non-leachate hazardous wastes were municipalities with an industrial base that included petrochemical, steel making and automobile manufacturing facilities. In addition, many facilities owned by environmental services (waste management) companies were located in these districts and received primarily non-leachate wastes.

The top receiving districts of landfill leachate wastes in the province for 2000 include municipalities with one or more landfill sites. The landfill leachate being produced by these sites is collected and discharged to local water pollution control plants in these districts. Ottawa and Burlington districts received the greatest amounts of landfill leachate wastes in 2000, reflecting the existence of landfill sites in those districts and the receipt of landfill leachate wastes at local WPCPs and hazardous waste handling facilities. For example, Ottawa district contains the Robert O. Pickard Environmental Centre, which is the main waste water treatment plant for the Region of Ottawa-Carlton, and received the greatest quantity of leachate wastes in Ontario for 2000.

Table 25: Top receiving districts of landfill leachate waste in Ontario, 2000

1998 ranking	2000 ranking	Receiving district	Quantity received (tonnes)
1	1	Ottawa	204,586
5	2	Burlington	75,091
6	3	Hamilton	70,226
3	4	London	59,256
2	5	Windsor	55,951
14	6	Guelph	36,409
8	7	Kingston	14,622
9	8	Peterborough	11,919
4	9	Barrie	6,951
	10	Owen Sound	4,658
13	11	St. Catharines	3,405
	12	Cornwall	1,776
11	13	Ajax	1,622
7	14	Toronto	943
12	15	Sarnia	875

HAZARDOUS WASTE TYPES RECEIVED IN ONTARIO

In 2000, Ontario received 50 of the 55 hazardous waste types categorized in the Hazardous Waste Manifest Database. Table 26 lists the top 25 waste types received by receiving sites in the province during 2000. Figure 18 highlights each waste type as a percentage of the total hazardous waste quantity received by receiving sites in Ontario for 2000.

Table 26: Top 25 waste types received in Ontario, 2000

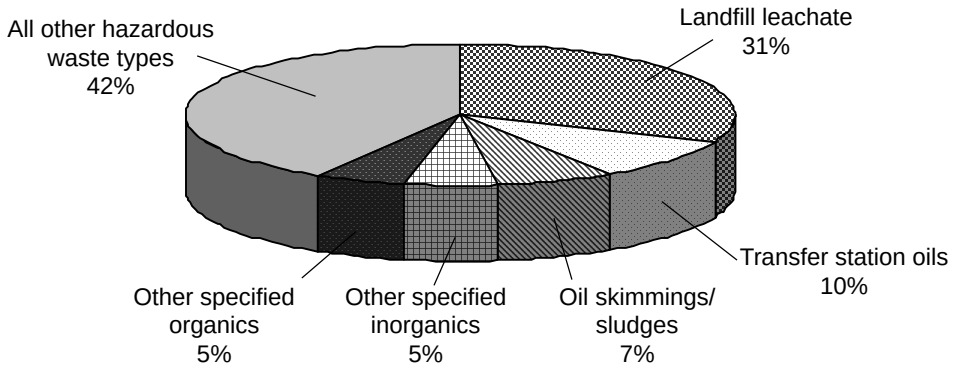
1998 ranking	2000 ranking	Waste type	Quantity received (tonnes)	Percentage of total hazardous waste received in 2000
1	1	Landfill leachates	548,290	31.4%
2	2	Transfer station oils wastes	173,197	9.9%
4	3	Oil skimmings & sludges	123,478	7.1%
3	4	Other specified inorganics	97,225	5.6%
5	5	Other specified organics	86,800	5.0%
8	6	Emulsified oils	82,139	4.7%
9	7	Waste oils & lubricants	73,901	4.2%
10	8	Alkaline wastes - other metals	56,274	3.2%
11	9	Aromatic solvents	50,943	2.9%
6	10	Steel making residues	49,831	2.8%
13	11	Spent pickle liquor	42,491	2.4%
14	12	Aliphatic solvents	38,673	2.2%
12	13	Paint/pigment/coating residues	36,391	2.1%
16	14	Non-halogenated lean organics	29,667	1.7%
	15	Polymeric resins	28,715	1.6%
7	16	Halogenated solvents	26,663	1.5%

continued➤

Table 26: Top 25 waste types received in Ontario, 2000 *(continued)*

1998 ranking	2000 ranking	Waste type	Quantity received (tonnes)	Percentage of total hazardous waste received in 2000
15	17	Neutralized wastes - heavy metals	22,621	1.3%
20	18	Neutralized wastes - other metals	22,521	1.3%
22	19	Non-halogenated rich organics	19,243	1.1%
17	20	Alkaline phosphates	14,778	0.8%
19	21	Acid waste - heavy metals	13,936	0.8%
21	22	Light fuels	12,451	0.7%
25	23	Petroleum distillates	9,344	0.5%
18	24	Alkaline wastes - heavy metals	8,711	0.5%
	25	Inorganic laboratory chemicals	7,568	0.4%

Figure 18: Waste types received in Ontario as a percentage of total hazardous waste receipts, 2000



As seen in Table 26 and Figure 18, landfill leachate wastes made up the largest percentage (31%) of hazardous wastes received at Ontario receiving sites in 2000. Transfer station oil wastes, oil skimmings and sludges, and other specified inorganics made up another 17% of hazardous waste receipts. These waste types reflect hazardous waste transfers from solid waste landfills, electrical transfer stations, and manufacturers that utilize petrochemicals and inorganics.

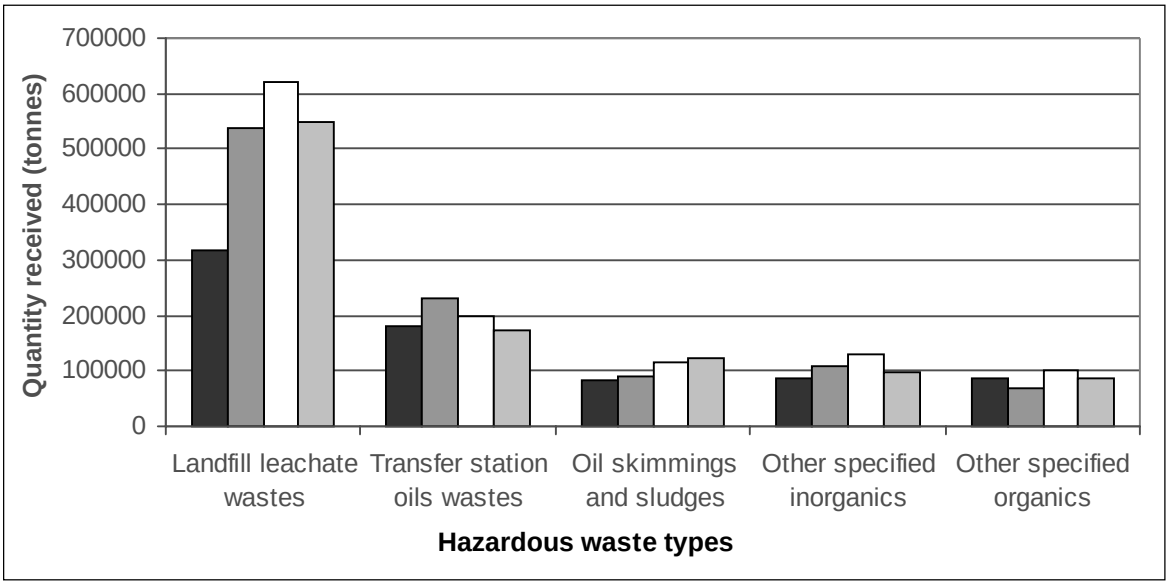
Other specified inorganic wastes include flue gas scrubber wastes, wet fly ash, metal dust and abrasives wastes amongst others. Other specified organic wastes include mixed sludges from waste screening, tank bottoms from mixed organic waste bilking tanks at waste transfer stations, etc. Each waste type is described in further detail in Appendix B.

From 1994 to 2000, the quantities of the most received waste types in the province have increased. However between 1998 and 2000, the quantities of the most received waste types in the province has decreased, with the exception of oil skimmings and sludges. Table 27 presents the 1994 and 2000 quantities received for the top five waste types (received in 2000). As demonstrated in Table 27 and Figure 19, quantities of landfill leachates being received at receiving sites in Ontario have nearly doubled from 1994 levels, but decreased 12% since 1998 to 2000. The largest decrease in percentage change in quantity received from 1998 to 2000 was other specified inorganics.

Table 27: Quantity of waste received for the top five 2000 received waste types, 1994 to 2000

Waste type	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Landfill leachates	548,290	622,199	315,743	232,547	74%	-73,909	-12%
Transfer station oils wastes	173,197	197,122	180,856	-7,659	-4%	-23,925	-12%
Oil skimmings & sludges	123,478	114,264	87,931	39,291	47%	9,214	8%
Other specified inorganics	97,225	129,585	294,953	9,294	11%	-32,360	-25%
Other specified organics	86,800	100,086	85,559	1,241	1%	-13,286	-13%

Figure 19: Quantity of waste received for the top five 2000 received waste types, 1994 to 2000



SECTION IV: U.S. HAZARDOUS WASTE TRANSFERS TO ONTARIO RECEIVING SITES, 1994 TO 2000

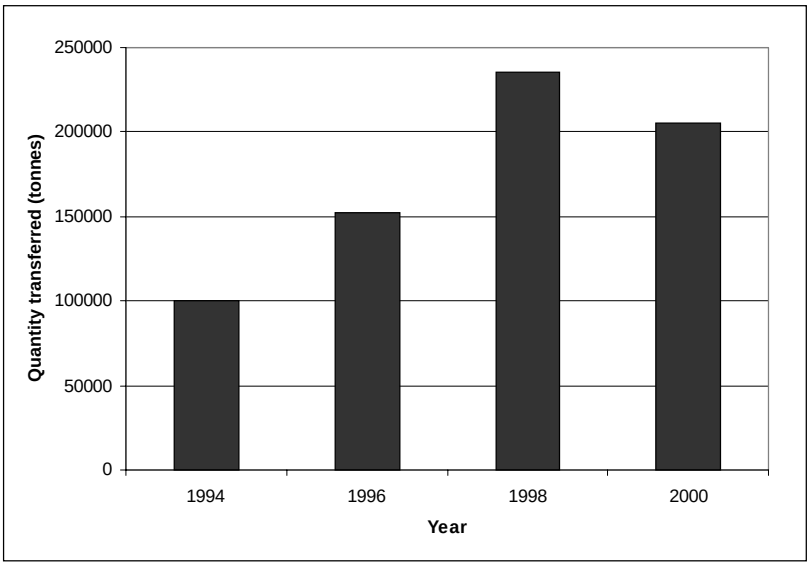
In 2000, 205,127 tonnes of hazardous waste was transferred from U.S. generating sites to receiving sites in Ontario, accounting for 11.8% of hazardous waste transferred to receiving sites in the province. Comparing to 1998 U.S. imports accounted for 12.4%.

Between 1994 and 1998, the amount of waste exported from the U.S. to Ontario increased from 99,972 tonnes to 235,495 tonnes, an increase of 135,523 tonnes or 135.6% over four years. Since 1998, the amount of waste exported from the U.S. to Ontario has decreased, a decrease of 30,368 tonnes or -12.9% over two years. The patterns are highlighted in Table 28 and Figure 20.

Table 28: Quantity of U.S. hazardous waste transferred to Ontario receiving sites, 1994 to 2000

Year	Quantity of U.S. waste transferred (in tonnes)	Percentage change from 1994	Percentage change from 1998
2000	205,127	105.2%	-12.9%
1998	235,495	135.6%	
1996	152,306	52.3%	
1994	99,972		

Figure 20: Quantity of U.S. hazardous waste transferred to Ontario receiving sites, 1994 to 2000



U.S. GENERATING SITES THAT TRANSFER HAZARDOUS WASTE TO RECEIVING SITES IN ONTARIO

Through the data provided in the Ontario Hazardous Waste Manifest Database, it is possible to identify which generating sites in the United States transferred hazardous waste to Ontario receiving sites in 2000. It also identifies which waste types are being transferred to Ontario receiving sites.

Table 29 presents the top 25 U.S. generating sites that transferred hazardous waste to Ontario in 2000. Most of the U.S. hazardous waste transferred to Ontario sites in 2000 came from generating sites in the northeastern and midwestern U.S. states. Ontario received hazardous waste from numerous U.S. generating sites and in general small quantities from each site. While many U.S. sites transferred hazardous waste to Ontario sites in 2000, one U.S. company stood out as a key exporter to Ontario, Safety-Kleen Systems Inc. In 2000, eight of the top 25 U.S. generating sites that transferred hazardous waste to Ontario sites were owned by Safety-Kleen. Increases in oil skimmings and sludges are attributed to transfers from Chevron Products Company in Ohio.

Table 29: Top 25 U.S. generating sites that transferred hazardous waste to Ontario sites, 2000

1998 ranking	2000 ranking	Generator	Generating site	City	Quantity received (tonnes)	Primary waste type generated
1	1	Safety-Kleen Systems Inc.	60 Katherine Street	Buffalo, NY	37,436	Transfer station oils wastes
9	2	Chevron Products Company	Intersection State Route 128 and US Bypass 50	Hooven, OH	13,998	Oil skimmings and sludges
16	3	Petrochem Processing	421 Lycaste	Detroit, MI	12,209	Non-halogenated rich organics
2	4	Dynecol Inc.	6520 Georgia Street	Detroit, MI	12,174	Aromatic solvents
6	5	Safety-Kleen (Bridgeport), Inc.	Route 322 and I-295	Bridgeport, NJ	10,850	Other specified inorganics
4	6	Dow Agrosciences LLC	305 N. Huron Avenue	Harbor Beach, MI	10,359	Other specified organics
3	7	LWD Inc.	2475 Industrial Parkway	Calvert City, KY	10,173	Other specified inorganics
12	8	Safety-Kleen (Pecatonica) Inc.	6125 North Pecatonica Road	Pecatonica, IL	9,670	Other specified inorganics
	9	EQ Resource Recovery	36345 Van Born Road	Romulus, MI	8,028	Non-halogenated lean organics
20	10	Century Aluminum of West Virginia Inc.	Century Road	Ravens-wood, WV	4,001	Other specified inorganics
	11	Aventis Cropscience USA L.P.	5 Factory Lane	Middlesex, NJ	3,819	Halogenated pesticides
	12	Safety-Kleen (TS) Inc.	527 Whiskey Bottom Road	Laurel, MD	3,311	Phenolic wastes
13	13	Zinc Corporation of America	East of Route 248	Palmerton, PA	2,861	Other specified inorganics
	14	Chemical Solvents Inc.	1010 Dennison Avenue	Cleveland, OH	2,813	Non-halogenated lean organics
21	15	Safety-Kleen (NE) Inc.	300 Canal Street	Lawrence, MA	2,795	Other specified inorganics
	16	Safety-Kleen Systems Inc.	1169 Industrial Parkway	Brunswick, OH	2,516	Transfer station oils wastes
	17	Safety-Kleen Systems Inc.	633 East 138th Street	Dolton, IL	2,363	Non-halogenated lean organics

continued➤

Table 29: Top 25 U.S. generating sites that transferred hazardous waste to Ontario, 2000 *(continued)*

1998 ranking	2000 ranking	Generator	Generating site	City	Quantity received (tonnes)	Primary waste type generated
5	18	Lomac LLC	5025 Evanston Avenue	Muskegon, MI	2,041	Aromatic solvents
	19	Dow Corning Corporation	3901 South Saginaw	Midland, MI	1,995	Aromatic solvents
	20	Reilly Industries Inc.	3201 Independence Road	Cleveland, OH	1,980	Other specified organics
	21	Chemtron Corporation	35850 Schneider Court	Avon, OH	1,952	Non-halogenated lean organics
11	22	Ross Incineration Services Inc.	36790 Giles Road	Grafton, OH	1,891	Other specified inorganics
24	23	Safety-Kleen Systems Inc.	10 Industrial Park Drive	Wheeling, WV	1,833	Transfer station oils wastes
14	24	BP Oil Company - Toledo Refinery	4001 Cedar Point Road	Oregon, OH	1,825	Oil skimmings and sludges
	25	Williams Refining & Marketing L.L.C.	543 West Mallory	Memphis, TN	1,788	Oil skimmings and sludges

Table 29a: Quantity of U.S. hazardous waste transferred to receiving sites in Ontario by waste type, 2000

Waste type	Quantity of hazardous waste transferred (tonnes)
Transfer Station Oils Wastes	46,852
Other Specified Inorganics	42,303
Oil Skimmings & Sludges	23,928
Other Specified Organics	22,274
Non-halogenated Lean Organics	15,870
Aromatic Solvents	10,427
Non-halogenated Rich Organics	8,416
Halogenated Pesticides	5,533
Halogenated Solvents	5,512
Aliphatic Solvents	4,640
Phenolic Wastes	3,173
Spent Pickle Liquor	2,791
Waste Compressed Gases	2,604
Paint/Pigment/Coating Residues	1,915
Emulsified Oils	1,726
Organic Laboratory Chemicals	1,562
Neutralized Wastes - Heavy Metals	1,251
Waste Oils & Lubricants	1,151
Inorganic Laboratory Chemicals	1,080
Polymeric Resins	859

All of the U.S. generating sources identified in Table 29 transferred non-leachate hazardous waste to receiving sites in Ontario in 2000. Not one U.S. generator transferred landfill leachate wastes to Ontario in 2000 (see Table 29a).

U.S. GENERATING DISTRICTS THAT TRANSFER HAZARDOUS WASTE TO ONTARIO RECEIVING SITES

Table 30 presents the top U.S. generating districts that transferred hazardous waste to receiving sites in Ontario in 2000. The quantity transferred from each district is the aggregate value for all U.S. generating sites within the district that transferred hazardous waste to receiving sites in Ontario.

Table 30: Top U.S. generating districts that transferred hazardous waste to Ontario sites, 2000

1998 ranking	2000 ranking	Generating district	Quantity transferred (tonnes)
1	1	Michigan	52,795
2	2	New York	41,606
3	3	Ohio	36,543
4	4	New Jersey	17,179
7	5	Illinois	13,406
5	6	Pennsylvania	10,958
6	7	Kentucky	10,694
8	8	West Virginia	6,286
11	9	Massachusetts	3,505
12	10	Maryland	3,311
16	11	Indiana	2,806
9	12	Tennessee	2,069
14	13	South Carolina	720
17	14	Florida	714
13	15	North Carolina	671
10	16	Rhode Island	519
	17	Georgia	473
18	18	Texas	403
23	19	Wisconsin	163
19	20	California	135
15	21	Kansas	80
20	22	Missouri	49
	23	Louisiana	41

Table 30 illustrates that Michigan (generating sites) transferred the greatest quantities of hazardous waste to Ontario receiving sites in 2000. The 52,975 tonnes of hazardous waste transferred to Ontario from Michigan generating sites accounts for 25.8% of all waste transferred to Ontario sites from the U.S. In 1998, Michigan transferred 87,492 tonnes to Ontario sites. Most of U.S. generating districts that transferred hazardous waste in the greatest quantities to Ontario in 2000 were located in the U.S. midwest bordering the Great Lakes, and in the eastern U.S.

ONTARIO RECEIVING SITES OF U.S. HAZARDOUS WASTE TRANSFERS

In addition to identifying the U.S. generators of hazardous waste transferred to Ontario, it is also useful to identify the Ontario sites that received these U.S. hazardous waste transfers. Table 31 presents the top 25 Ontario receiving sites of U.S. hazardous waste transfers in 2000.

Table 31: Top 25 Ontario receiving sites of U.S. hazardous waste transfers, 2000

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)	Percentage change from 1998 to 2000
1	1	Safety-Kleen Ltd.	Lot 9 & PT.Lot 8, Conc.10(Landfill)	Corunna	88,818	-26.6%
2	2	Safety-Kleen Canada Inc.	300 Woolrich Street South	Breslau	48,244	-3.2%
3	3	Safety-Kleen Ltd.	Lot 9 & PT.Lot 8, Conc.10(Incinerator)	Corunna	35,800	8.6%
4	4	Philip Services Inc.	799-800 Parkdale Avenue	Hamilton	11,234	50.5%
7	5	Safety-Kleen Ltd.	2258 River Road	London	5,110	57.7%
6	6	Safety-Kleen Ltd.	1829 Allanport Road	Thorold	3,528	-9.2%
5	7	Dofasco Inc.	#1 Acid Regeneration Plant	Hamilton	2,292	62.0%
8	8	Safety-Kleen Ltd.	551 Avonhead Road	Mississauga	2,125	-26.0%
	9	*Pinnacle Waste Ser (See & Use 2032-4KSKJ3)	38 Forwell Road	Kitchener	1,548	
11	10	Hotz Environmental Services Inc.	239 Lottridge Street	Hamilton	1,391	60.6%
17	11	Quantex Technologies Inc.	260 Shoemaker Street	Kitchener	1,100	525.0%
	12	**Pinnacle Waste Services Inc.	38 Forwell Road	Kitchener	1,069	
20	13	Fielding Chemical Technologies Inc.	3549 Mavis Road	Mississauga	983	873.3%
	14	Extox Industries Inc.	6419 Netherhart Road	Mississauga	459	
	15	Cyanide Destruct Systems Inc.	Lot 67, Plan No. 51M	Barrie	459	
16	16	Philip Enterprises Inc.	Lot 6, Con 5, Niagara Riv. PT of PT 14	Fort Erie	262	11.0%
14	17	Dofasco Inc.	#2 Acid Regeneration Plant	Hamilton	232	-43.8%
	18	Safety-Kleen Canada Inc.	23 Regan Road	Brampton	195	
25	19	Hotz Environmental Services Inc.	239 Lottridge Street	Hamilton	180	1,284.6%
	20	Chatham WPCP	100 Irwin Street	Chatham	164	

continued➤

Table 31: Top 25 Ontario receiving sites of U.S. hazardous waste transfers, 2000 *(continued)*

1998 ranking	2000 ranking	Receiver	Receiving site	City	Quantity received (tonnes)	Percentage change from 1998 to 2000
	21	RPR Environmental Services	164-166 South Service Road	Stoney Creek	142	
15	22	International Marine Salvage Inc.	PT. of Lot 28, Conc. 3	Port Colborne	137	-64.3%
	3	City of Woodstock	195 Admiral Street, WPCP Plant	Woodstock	66	
13	24	Safety-Kleen Canada Inc.	65 Woolwich Street	Breslau	57	-87.7%
	25	Philip Enterprises Inc.	52 Imperial Street	Hamilton	41	
22	26	Philip Enterprises Inc.	4505 Fourth Street	Windsor	26	-10.3%

All of the hazardous waste transferred to Ontario receiving sites from U.S. generating sites in 2000 was non-leachate hazardous waste. As highlighted in Table 31, the main receiver of U.S. hazardous waste in Ontario is Safety-Kleen Ltd./Safety-Kleen Canada Inc. Safety-Kleen facilities in Ontario received 183,877 tonnes of U.S. hazardous waste in 2000, which accounts for approximately 90% of all hazardous waste transferred to receiving sites in the province from U.S. generating sites.

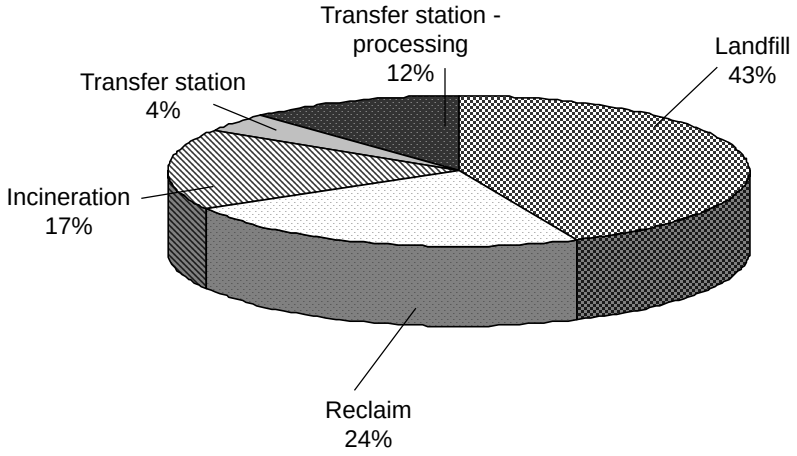
Various types of facilities in Ontario received U.S. hazardous waste transfers in 2000. Table 32 and Figure 19 present the quantities of U.S. hazardous waste received by various types of facilities in Ontario for 2000.

Table 32: Quantities of U.S. hazardous waste received in Ontario by facility type, 2000

Facility type	Quantity of U.S. hazardous waste received for 2000 (tonnes)	Percentage of U.S. hazardous waste received in Ontario, 2000
Landfill	88,818	43.2%
Reclaim	48,244	23.5%
Incineration	35,800	17.4%
Transfer station - processing	24,581	11.9%
Transfer station	8,021	3.9%
Water pollution control plant	267	0.1%

Table 32 and Figure 21 illustrate that just under half of U.S. hazardous waste transferred to Ontario receiving sites was received by landfill sites in 2000 (43%), while 24% was reclaimed, and 17% was incinerated in the province. According to Open for Toxics 1998, in 1998, over half of the U.S. hazardous waste transferred to Ontario receiving sites was received by landfill sites, while 21% was reclaimed, and 14% was incinerated in the province.

Figure 21: Quantities of U.S. hazardous waste received in Ontario by facility type, 2000



From 1994 to 2000, the quantities of U.S. hazardous waste received by various facilities across the province have changed. Table 33 and Figure 22 highlight the changes in the amounts of U.S. hazardous waste received by these facilities from 1994 to 2000.

Table 33: Quantity of U.S. hazardous waste received in Ontario by facility type, 1994 to 2000

Facility type	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Landfill	88,818	120,934	33,690	55,128	163.6%	-32,116	-26.6%
Reclaim	48,244	49,831	32,407	15,837	48.9%	-1,587	-3.2%
Incineration	35,800	32,978	15,491	20,309	131.1%	2,822	8.6%
Transfer station - processing	24,581	13,737	5,990	18,591	310.4%	10,844	78.9%
Transfer station	8,021	17,818	12,395	-4,374	-35.3%	-9,797	-55.0%
Water pollution control plant	267	196	0	267		71	36.2%

According to Table 33, landfill facilities in Ontario received the highest quantity of U.S. hazardous waste, 88,818 tonnes (or 43%), followed by reclaim (24%), then incineration (17%). Between 1998 and 2000, the largest percentage change of U.S. hazardous waste received by Ontario facilities was transfer station-processing (78.9%), water pollution control plants (36.2%) and incineration (8.6%). Landfills received 32,116 less tonnes of U.S. hazardous waste in 2000 than in 1998, which represents a decrease of 27%. These trends in hazardous waste receipts by facility types in Ontario are further highlighted in Figure 22. It is significant to note that Ontario's waste water control plants had the second largest percentage change increase of facilities receiving U.S. hazardous waste, which is all non-leachate (36.2%).

Table 33a shows that one incinerator in Ontario received U.S. non-leachate hazardous waste in 2000. Safety-Kleen Ltd. in Corunna received the waste types listed in the table. Recall from Table 19A that this facility receives by far the greatest amount of hazardous waste processed by incineration.

Table 33a: Waste types received by Safety-Kleen Ltd.

ON Incinerator Facility	Address	City	WasteTypes
Safety-Kleen Ltd.	Lot 9, Conc.10, Moore Twp	Corunna	⚛ Acid waste - Heavy metals ⚛ Paint/Pigment/Coating residue ⚛ Other specified inorganics ⚛ Aromatic solvents ⚛ Aliphatic solvents ⚛ Light fuels ⚛ Latex wastes ⚛ Polymeric resins ⚛ Other polymeric wastes ⚛ Oil skimmings and sludges ⚛ Organic laboratory chemicals ⚛ Organic Acids ⚛ Non-halogenated rich organics ⚛ Non-halogenated lean organics ⚛ Other specified organics ⚛ Halogenated solvents

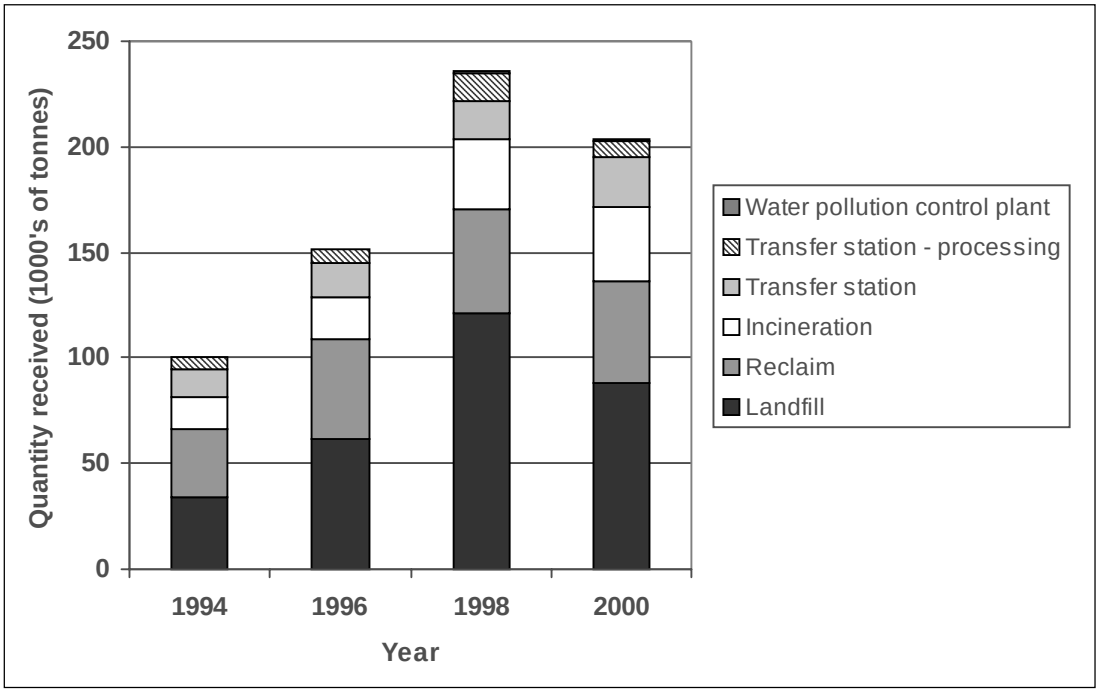
Table 33b shows that four WPCP sites in Ontario were receiving U.S. hazardous wastes. Two of which were in Toronto, one in Chatham and in Woodstock.

Table 33b: WPCP sites in Ontario receiving U.S. hazardous wastes

ON WPCP	Address	City	Quantity received (tonnes)	Waste Type
Chatham WPCP	100 Irwin Street	Chatham	164	Spent pickle liquor
City of Woodstock	195 Admiral Street, WPCP Plant	Woodstock	66	Spent pickle liquor
Metro Toronto - Main Plant WPCP	C/O Metro Works Dept, 1091 Eastern Ave	Toronto	18	Spent pickle liquor
City of Toronto	Humber WPCP, 130 The Queensway	Toronto	18	Spent pickle liquor

Figure 22 demonstrates an overall increase from 1994 to 2000 however it also shows that in 2000 the quantities of U.S. hazardous waste received in Ontario decreased compared to 1998 values.

Figure 22: Trends in U.S. hazardous waste receipts by facilities in Ontario, 1994 to 2000



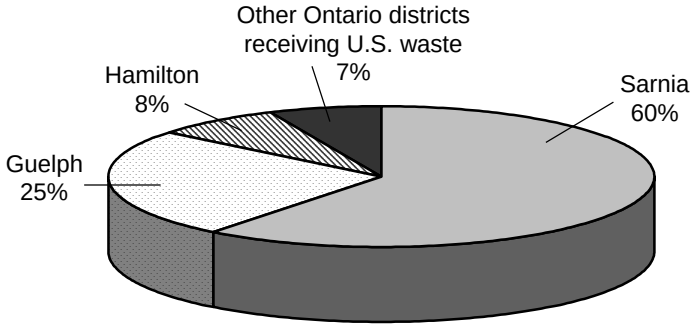
ONTARIO DISTRICTS THAT RECEIVE U.S. HAZARDOUS WASTE TRANSFERS

In 2000, ten districts in Ontario received hazardous waste generated in the United States. Of these ten districts, Sarnia district (i.e. receiving sites in the Sarnia district) received the greatest quantity of U.S. hazardous waste, having received 124,619 tonnes of U.S. hazardous waste in 2000, which accounts for 60.6% of U.S. hazardous waste transfers to Ontario receiving sites. Table 34 and Figure 23 present the quantity of U.S. hazardous waste received by Ontario districts and the corresponding percentages.

Table 34: U.S. hazardous waste received in Ontario by district, 2000

1998 ranking	2000 ranking	Receiving district	Quantity received in 2000 (tonnes)	Percentage of U.S. hazardous waste received in Ontario in 2000	Quantity received in 1998 (tonnes)	Percentage change from 1998 to 2000
1	1	Sarnia	124,619	60.6%	153,912	-19.0%
2	2	Guelph	52,019	25.3%	50,517	3.0%
3	3	Hamilton	15,512	7.5%	15,094	2.8%
6	4	London	5,176	2.5%	3,264	58.6%
5	5	St. Catherines	3,939	1.9%	4,507	-12.6%
4	6	Burlington	3,776	1.8%	5,236	-27.9%
8	7	Barrie	459	0.2%	787	-41.7%
9	8	Windsor	190	0.1%	29	555.2%
10	9	Toronto	36	0.0%	23	56.5%
	10	Peterborough	5	0.0%		0.0%

Figure 23: Percentage of U.S. hazardous waste received by Ontario districts, 2000

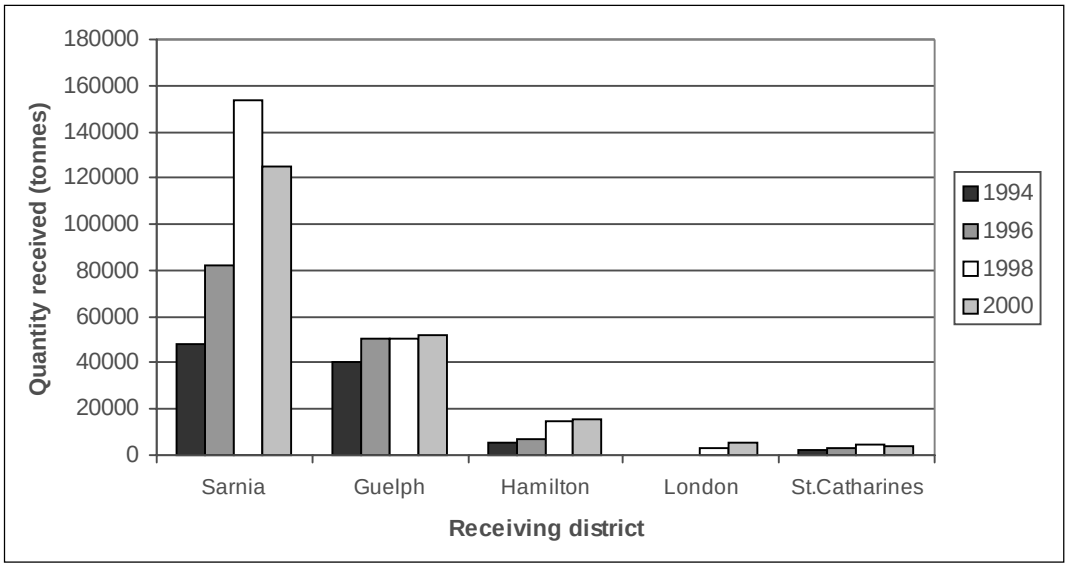


Three of the top five Ontario receiving districts (of U.S. hazardous waste) have experienced an increase in U.S. hazardous waste receipts from 1998 to 2000. This is highlighted in Table 35 and Figure 24. Overall, hazardous waste receipts have ranged from -19% to 59% in these five districts. The greatest increase in U.S. waste receipts is in the district of London, which received 1,912 more tonnes of U.S. hazardous waste in 2000 than in 1998, and which represents a 59% increase over two years, mainly for landfill at the Safety-Kleen facility. The quantity decrease was significant in the Sarnia district, with a total of 29,293 tonnes or -19% change from 1998 to 2000, followed closely by St. Catharines with -13%.

Table 35: Quantity of U.S. waste received in each of the top five 2000 Ontario receiving districts (of U.S. hazardous waste), 1994 to 2000

Receiving district	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Sarnia	124,619	153,912	48,043	76,576	159%	-29,293	-19%
Guelph	52,019	50,517	40,141	11,878	30%	1,502	3%
Hamilton	15,512	15,094	5,531	9,981	18%	418	3%
London	5,176	3,264				1,912	59%
St. Catherines	3,939	4,507	1,990	1,949	98%	-568	-13%

Figure 24: U.S. hazardous waste receipts in the top five Ontario receiving districts (of U.S. hazardous waste), 1994 to 2000



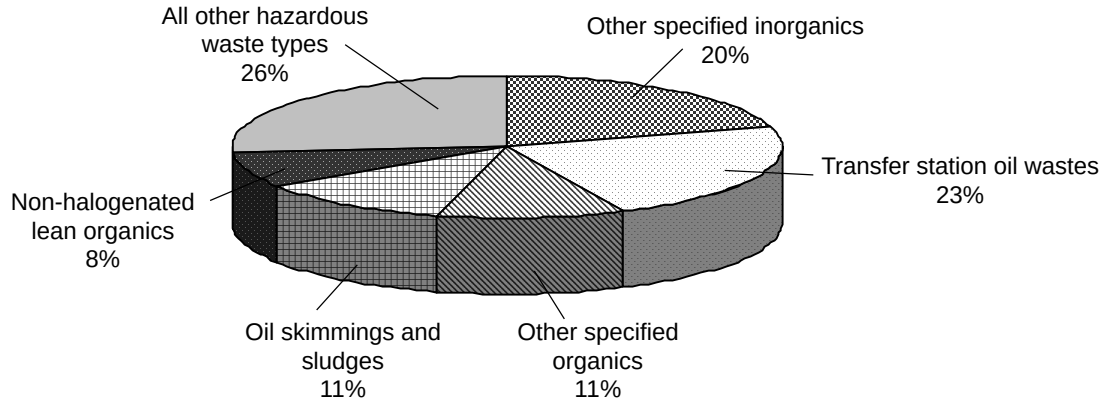
U.S. GENERATED WASTE TYPES RECEIVED IN ONTARIO

In 2000, 40 of the 53 hazardous waste types categorized in the Hazardous Waste Manifest Database were received in Ontario from U.S. generators. Table 36 lists the top 25 (by quantity received) waste types received in the province from U.S. generating sites during 2000. Figure 25 highlights each waste type as a percentage of the total hazardous waste quantity received in Ontario from U.S. sites in 2000.

Table 36: Top 25 waste types received in Ontario from U.S. generating sites, 2000

1998 ranking	2000 ranking	Waste type	Quantity received (tonnes)	Percentage of U.S. hazardous waste received in 1998
2	1	Transfer station oils wastes	46,852	22.8%
1	2	Other specified inorganics	42,366	20.7%
4	3	Oil skimmings & sludges	24,058	11.7%
3	4	Other specified organics	22,274	10.9%
6	5	Non-halogenated lean organics	15,870	7.7%
5	6	Aromatic solvents	10,427	5.1%
22	7	Non-halogenated rich organics	8,416	4.1%
12	8	Halogenated pesticides	5,533	2.7%
7	9	Halogenated solvents	5,515	2.7%
10	10	Aliphatic solvents	4,641	2.3%
16	11	Phenolic wastes	3,173	1.5%
8	12	Spent pickle liquor	2,791	1.4%
	13	Waste compressed gases	2,617	1.3%
9	14	Paint/pigment/coating residues	1,960	1.0%
14	15	Emulsified oils	1,726	0.8%
15	16	Organic laboratory chemicals	1,695	0.8%
13	17	Neutralized wastes - heavy metals	1,252	0.6%
11	18	Waste oils & lubricants	1,187	0.6%
18	19	Inorganic laboratory chemicals	1,099	0.5%
	20	Polymeric resins	859	0.4%
20	21	Alkaline wastes - heavy metals	573	0.3%
17	22	Acid waste - heavy metals	254	0.1%
24	23	Other polymeric wastes	126	0.1%
	23	Petroleum distillates	91	0.0%
23	25	Alkaline wastes - other metals	64	0.0%

Figure 25: Hazardous waste received in Ontario from U.S. generating sites as a percentage of total U.S. hazardous waste transfers, 2000



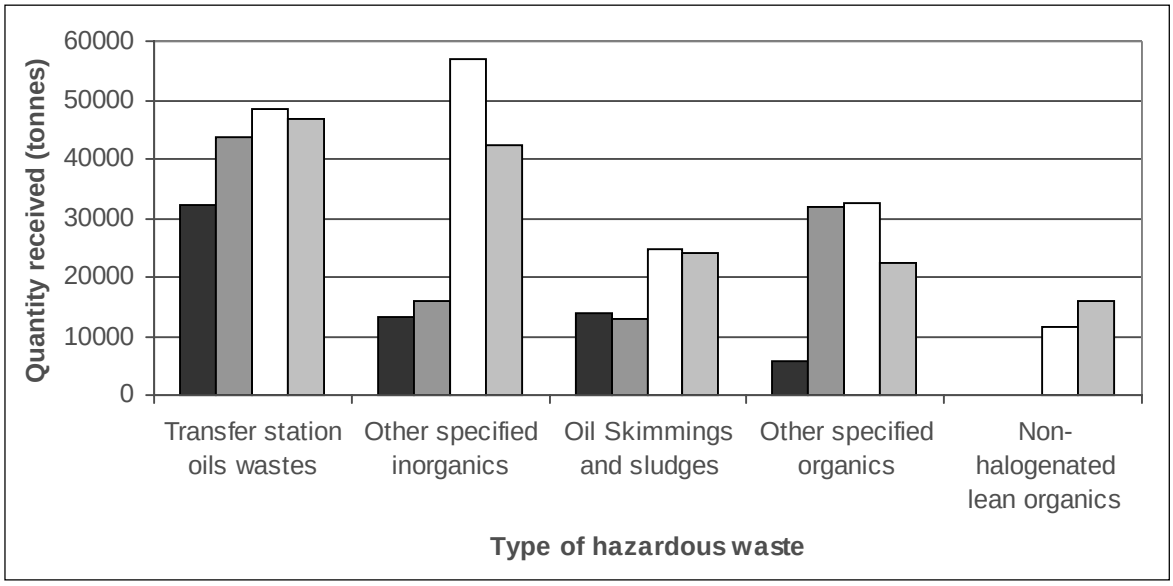
As seen in Table 36 and Figure 25, transfer station oils waste made up the largest percentage (23%) of U.S. hazardous wastes transferred to Ontario receiving sites in 2000. Other specified inorganics, other specified organics, oil skimmings and sludges and non-halogenated lean organics made up another 55% of hazardous waste receipts.

Table 37 presents the 1994 and 2000 quantities received in Ontario for the top five waste types received from U.S. generating sites in 2000. As shown in Table 37, receipts of all waste types have decreased except for non-halogenated lean organics, which increased by 4,222 tonnes or 36% from 1998 to 2000. The waste types that did decrease showed a -31% to -3% percentage change in quantity received from 1998 to 2000. It should be noted that aromatic solvents has been replaced by non-halogenated lean organics in the top 5 and aromatic solvents has decreased to 10,427 tonnes from 20,187 tonnes in 1998 (Open for Toxics, 2000, p. 46). Figure 26 identifies the major waste types.

Table 37: Quantity of hazardous waste received in Ontario from U.S. generating sites for the top five 2000 received waste types, 1994 to 2000

Waste type	Quantity received in 2000 (tonnes)	Quantity received in 1998 (tonnes)	Quantity received in 1994 (tonnes)	Quantity change from 1994 to 2000 (tonnes)	Percentage change from 1994 to 2000	Quantity change from 1998 to 2000 (tonnes)	Percentage change from 1998 to 2000
Transfer station oils wastes	46,852	48,460	32,323	14,529	45%	-1,608	-3%
Other specified inorganics	42,366	56,782	13,104	29,262	223%	-14,416	-25%
Oil skimmings & sludges	24,058	24,775	13,952	10,106	72%	-717	-3%
Other specified organics	22,274	32,489	5,805	16,469	284%	-10,215	-31%
Non-halogenated lean organics	15,870	11,648				4,222	36%

Figure 26: Quantity of hazardous waste received in Ontario from U.S. generating sites for the top five 2000 received waste types, 1994 to 2000



SECTION V: ANALYSIS OF HAZARDOUS WASTE GENERATION AND RECEIPTS IN ONTARIO FROM 1994 TO 2000

The data from the Hazardous Waste Manifest Database clearly demonstrates the overall trend of increasing hazardous waste generation and transfers to receiving sites in the province of Ontario from 1994 to 2000. However between 1998 and 2000 a decreasing trend has occurred. In this six-year period, hazardous waste generation in the province has increased by 35%, while transfers to receiving sites has increased by 36%. It should be noted that during 1998-2000, there was a decrease of 5% for hazardous waste generation and 8% for receipts.

Again it should be observed that the slight decrease in the import of U.S. hazardous waste experienced between 1998 and 2000 to Ontario cannot be explained by a tightening of Ontario standards during this time period. Also the slight decline would be significantly reversed should the Bennett incinerator be approved.

THE DECREASE IN HAZARDOUS WASTE GENERATION IN ONTARIO

In order to understand why hazardous waste generation in the province has decreased from 1998 to 2000, it is important to examine where this decrease has occurred in terms of waste type and generating district.

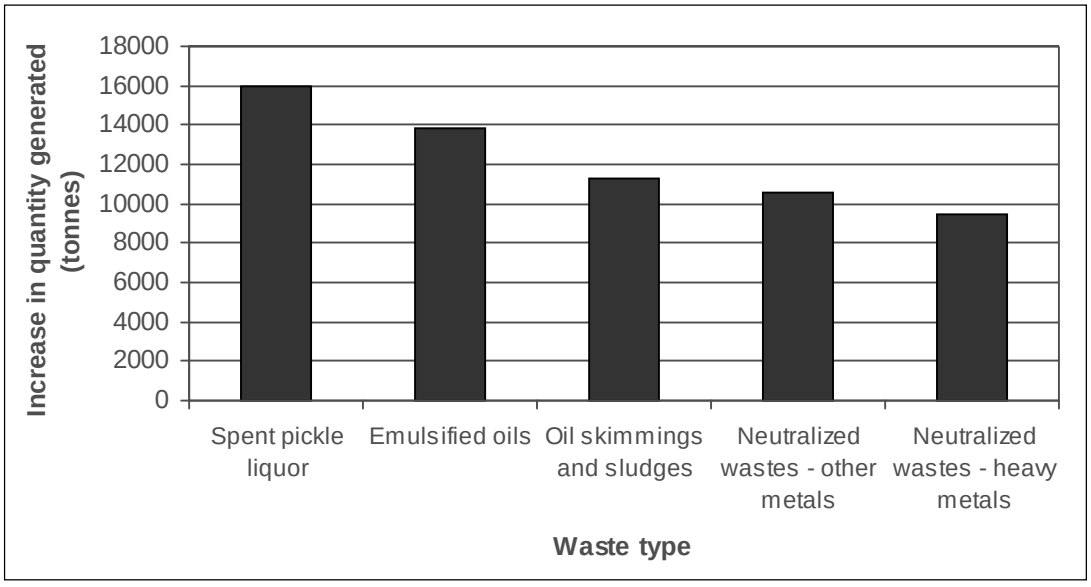
From 1998 to 2000, hazardous waste generation in Ontario decreased by 87,427 tonnes or 5%[25]. The majority of this decreased generation was due to a significant decrease in landfill leachate wastes generated in the province. During this period, landfill leachate waste generation decreased by 73,887 tonnes, followed by halogenated solvents (46,818 tonnes), steel making residues (24,320 tonnes), other specified inorganics (21,454 tonnes), and transfer station oils wastes (10,118 tonnes). Table 38 and Figure 25, on the other hand, present the hazardous waste types that experienced the most significant increases in quantity generated from 1998 to 2000.

Despite the decrease in landfill leachate waste generation, it still makes up the largest percentage of waste type generated in Ontario. According to the results, most generators are municipally owned landfill sites and some are privately owned. In Open for Toxics 1998 it was "anticipated that landfill leachate wastes generated in the province will continue to increase due to the long-term leachate generation of existing sites, and the approval of new landfill sites within the past five years in the province". However Open for Toxics 2000 has found that landfill leachates waste generation was not one of the top five hazardous waste types with the greatest increase in quantity generated, in fact the opposite was found; landfill leachates waste generated decreased the most. As it turned out, the analysis between 1998 and 2000 points to an significant increase in the practice of incineration.

Table 38: Top 10 hazardous waste types with the greatest increase in quantity generated, 1998 to 2000

2000 ranking	Waste type	Increase in quantity generated from 1998 to 2000 (tonnes)
1	Spent pickle liquor	16,012
2	Emulsified oils	13,866
3	Oil skimmings & sludges	11,287
4	Neutralized wastes - other metals	10,545
5	Neutralized wastes - heavy metals	9,429
6	Alphatic solvents	9,401
7	Aromatic solvents	9,361
8	Paint/pigment/coating residues	9,077
9	Waste oils & lubricants	6,740
10	Non-halogenated lean organics	5,185

Figure 25: Top five hazardous waste types with the greatest increase in quantity generated, 1998 to 2000



Three of the top five waste types in Figure 25 are a type of inorganic waste (spent pickle liquor, neutralized wastes – other metals, and neutralized wastes – heavy metals), the other two are within the organic waste category. All of the five waste types are non-leachate wastes most of which come from metal and chemical waste generators; contributors include the steel, automobile and chemical sectors.

While hazardous waste generation has experienced some decline throughout the province between 1998 and 2000, the decrease has varied amongst the various generating districts. Table 39 and Figure 26 present the generating districts with the greatest growth in hazardous waste generation from 1998 to 2000. Burlington and Ottawa districts have experienced the greatest increase in hazardous waste generation in Ontario over the two-year period. Burlington's increase in hazardous waste generation can be attributed to the growth in both landfill and non-landfill hazardous waste generation in the district, while Ottawa's increase reflects the growth in landfill hazardous waste generation. Some districts in the province experienced decreases in hazardous waste generation including Sarnia (decrease of 53,587 tonnes), Barrie (decrease of 43,402 tonnes), Kingston (decrease of 30,282 tonnes) and Windsor (decrease of 27,132 tonnes).

Table 39: Top ten generating districts in Ontario with the greatest increase in hazardous waste quantity generated, 1998 to 2000

1998 ranking	2000 ranking	Generating district	Increase in quantity generated from 1998 to 2000 (tonnes)
3	1	Burlington	43,032
1	2	Ottawa	34,598
0	3	Belleville	17,217
0	4	Guelph	10,649
0	5	Kenora	5,699
5	6	Ajax	1,629
9	7	London	1,395
0	8	North Bay	1,322
0	9	Owen Sound	1,139
10	10	Peterborough	367

Note: In the table above Belleville was a new district in 2000 and therefore, the increased quantity for Belleville is equal to its total generated value.

Figure 26: Top five generating districts in Ontario with the greatest increase in hazardous waste quantity generated, 1998 to 2000

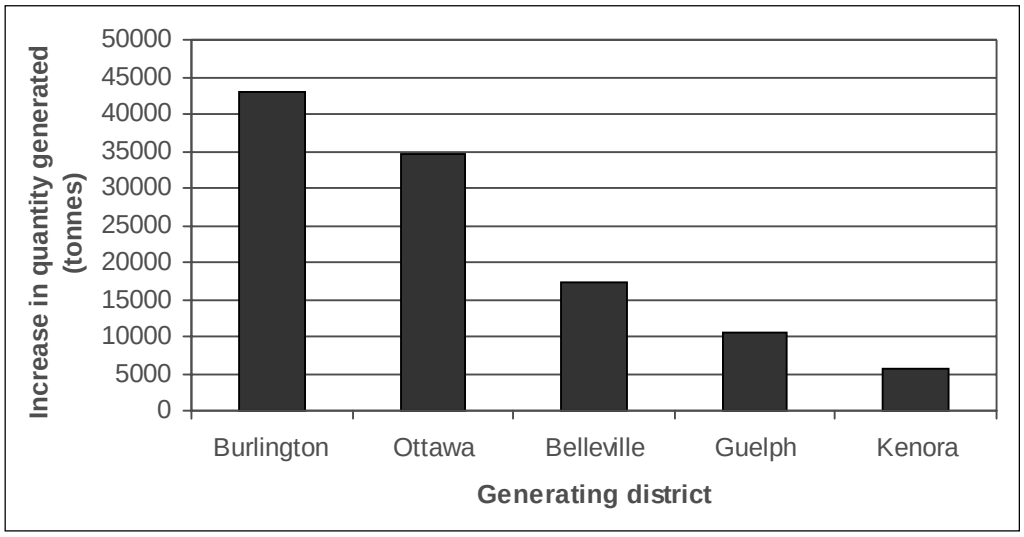


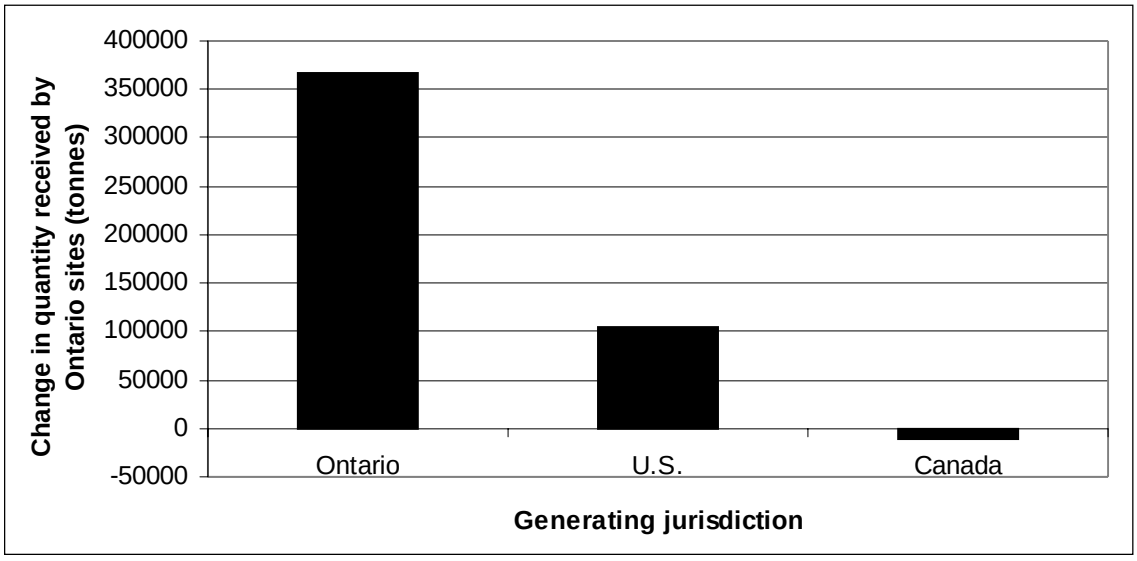
Table 39 and Figure 26 indicate that the growth in hazardous waste generation is concentrated in southern Ontario, with the exception of Kenora. Four of the five generating districts, except for Kenora, having experienced major growth had one or more landfill sites within the top 25 generators of hazardous waste, and some districts including Burlington, Belleville, Ottawa and Kenora had the top generators of non-landfill leachate wastes.

HAZARDOUS WASTE TRANSFERS TO RECEIVING SITES IN ONTARIO

The growth in hazardous waste transfers to receiving sites in Ontario from 1994 to 2000 has outpaced the growth of hazardous waste generation by generating sites in the province. From 1994 to 1998, hazardous waste receipts in Ontario increased by 462,010 tonnes or 36%. However if we look at the period between 1998 and 2000 the quantity of hazardous waste transfers to receiving sites in Ontario has decreased by 152,288 tonnes or -8%.

The growth in hazardous waste received in the province is due primarily to increasing hazardous waste transfers from generating sites within the province. As shown in Figure 27, Ontario's receipts of hazardous waste transferred from Ontario generating sites increased by 366,175 tonnes, while receipts from U.S. generating sites increased by 105,760 tonnes from 1994 to 2000. Receipts from generating sites in other provinces decreased during this six-year period.

Figure 27: Change in hazardous waste received by Ontario receiving sites from various jurisdictions, 1994 to 2000



While hazardous waste transfers from Ontario generation sites have been the largest component of the increase in hazardous waste receipts in Ontario, waste transfers from the United States have also increased significantly during the 1994 to 2000 period. Figure 28 highlights that as a percentage of hazardous waste received by receiving sites in the province, U.S. hazardous waste has increased from 8% in 1994, 12% in 1998, and remained constant at 12% in 2000. On a percentage and quantity basis, Ontario receipts of U.S. hazardous waste have more than doubled (105.8% increase or 105,760 tonnes) over the six years. The weakness of the Ontario regulatory regime for hazardous waste management between 1998 and 2000 relative to that in place in the United States appears to be a significant factor in this growth. Table 39b compares the requirements currently in place in the United States with those in place in Ontario.

Figure 28: Percentage of waste received by Ontario receiving sites from various generating jurisdictions, 1994 and 2000

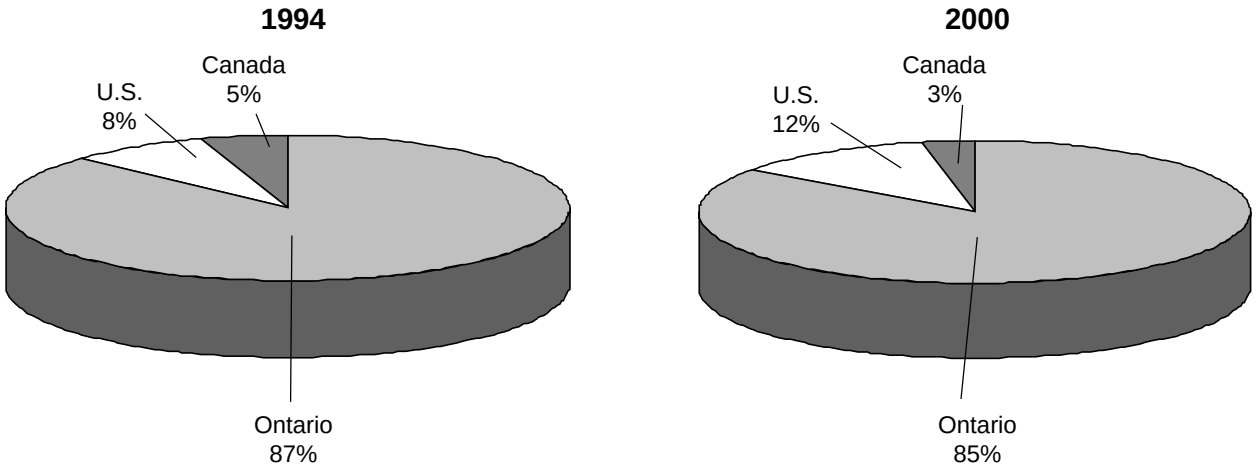


Table 39b: Hazardous Waste Management in Ontario and the U.S.

ENVIRONMENTAL PROTECTION REQUIREMENT	U.S.	ONTARIO
Companies that produce or generate hazardous wastes must:		
⚛ register with environmental protection authorities	Yes	Yes
⚛ report annually or biannually to environmental protection authorities	Yes	No
⚛ follow strict and detailed on-site hazardous waste identification and storage requirements (including emergency planning requirements for large quantity generators)	Yes	No
Companies that transport hazardous wastes must:		
⚛ complete a manifest detailing materials being transported and destination	Yes	Yes
⚛ immediately take measures to contain an accidental spill and report accidental spills to authorities	Yes	Yes
Companies that store, treat, and dispose of hazardous wastes must:		
⚛ apply for permission (by permit or certificate of approval) to operate	Yes	Yes
⚛ provide financial assurance against environmental harm as part of permitting process	Yes	Yes
⚛ have insurance against accidental liability	Yes	No
⚛ analyse all incoming waste to ensure that it conforms both to the description on the waste manifest and to the categories of waste the site is permitted to receive	Yes	No
⚛ make biennial reports on quantities and kinds of wastes received	Yes	No
⚛ provide for groundwater quality monitoring in the area of the site	Yes	No
⚛ have a plan in place to deal with emergencies	Yes	No
⚛ control all dispersion by wind and rainwater of hazardous materials	Yes	No
Environmental protection authorities require by law that:		
⚛ no permit is issued without full and ongoing public involvement in decision-making about the placement and operations of hazardous waste treatment storage and disposal sites	Yes	No*
⚛ hazardous wastes are treated before they are disposed in landfill	Yes	No
⚛ financial assurances reflect the cost of 'most expensive closure'	Yes	No
⚛ information received from waste generators and waste treatment facilities is published in publicly-available documents every two years	Yes	No

continued ➤

Table 39b: Hazardous Waste Management in Ontario and the U.S. *(continued)*

ENVIRONMENTAL PROTECTION REQUIREMENT	U.S.	ONTARIO
The environmental protection authority has legal standards for:		
⚛ Hazardous Waste Containers	Yes	No
⚛ Hazardous Waste Storage Tanks	Yes	No
⚛ Hazardous Waste Containment Buildings	Yes	No
⚛ Hazardous Waste Land Treatment Units	Yes	No
⚛ Hazardous Waste Surface Impoundments and Waste Piles	Yes	No
⚛ Hazardous Waste Incinerators, Boilers and Industrial Furnaces	Yes	No

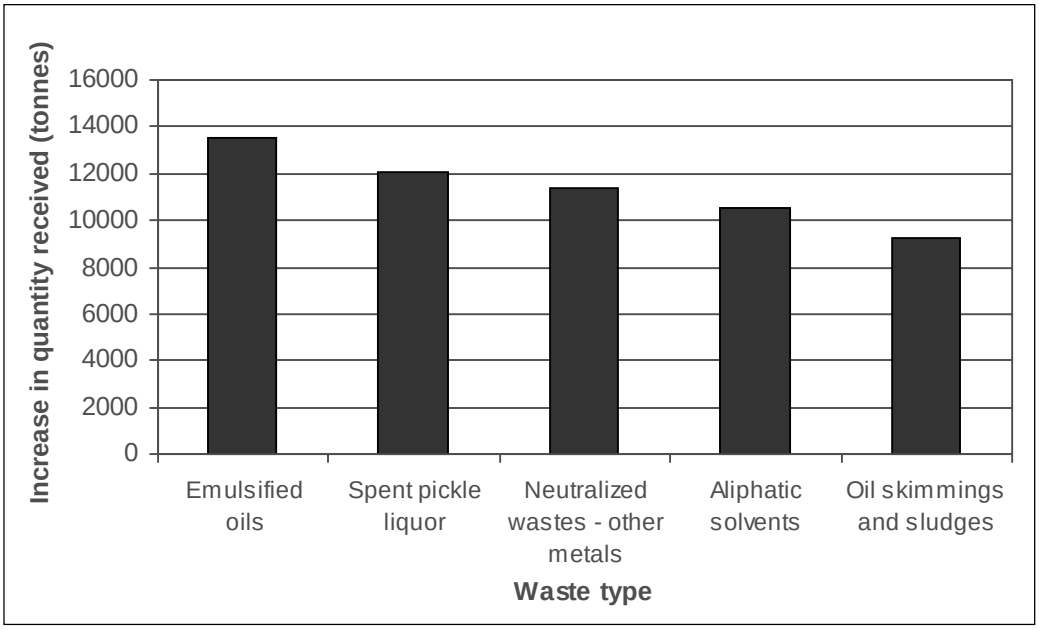
** Public involvement in Ontario is limited to what rights may be available under environmental assessment legislation and/or the Environmental Bill of Rights*

There has been a change in the various types of non-leachate hazardous wastes received by Ontario receiving sites from 1998 to 2000. Table 40 and Figure 29 highlight the waste types with the greatest increase in quantity received by Ontario receiving sites from 1998 to 2000. The waste types between 1994 and 1998 were different than between 1998 and 2000.

Table 40: Top 10 hazardous waste types with the greatest increase in quantity received by Ontario receiving sites, 1998 to 2000

1998 ranking	2000 ranking	Waste type	Increase in quantity received from 1998 to 2000 (tonnes)
	1	Emulsified oils	13,483
	2	Spent pickle liquor	12,099
	3	Neutralized wastes-other metals	11,411
	4	Aliphatic solvents	10,511
5	5	Oil skimmings & sludges	9,214
	6	Non-halogenated rich organics	8,808
	7	Non-halogenated lean organics	7,549
8	8	Waste oils & lubricants	6,079
	9	Petroleum distillates	1,406
	10	Light fuels	1,406

Figure 29: Top five hazardous waste types with the greatest increase in quantity received by Ontario receiving sites, 1998 to 2000



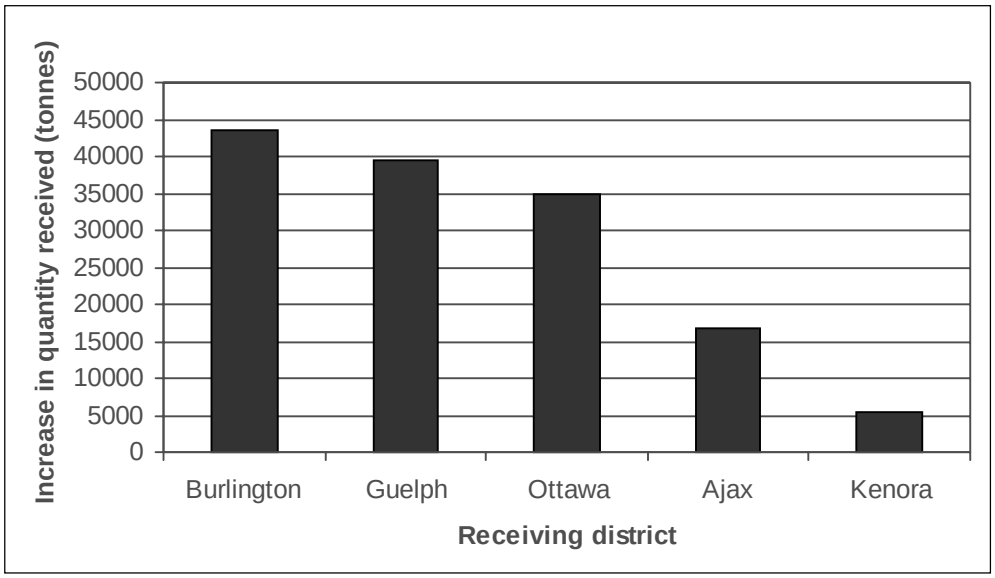
As seen in Table 40 and Figure 29, increases in the transfer of emulsified oils from generating sites to receiving sites in Ontario were a significant factor in the increase in hazardous waste receipts from 1998 to 2000. Increased transfers of spent pickle liquor, neutralized wastes – other metals, aliphatic solvent and oil skimmings and sludges to receiving facilities are also a significant component of the increasing amounts of hazardous wastes being received in the province.

While hazardous waste receipts increased throughout the province between 1994 and 1998, the increase varied amongst the various receiving districts. Table 41 and Figure 30 present the receiving districts with the greatest growth in hazardous waste receipts from 1998 to 2000. Burlington, Guelph, Ottawa, and Ajax districts have experienced the greatest increase in hazardous waste receipts in Ontario over that two-year period.

Table 41: Top nine receiving districts in Ontario with the greatest change in hazardous waste quantity received, 1998 to 2000

1998 ranking	2000 ranking	Receiving district	Change in quantity received from 1998 to 2000 (tonnes)
4	1	Burlington	43,495
	2	Guelph	39,387
1	3	Ottawa	34,932
6	4	Ajax	16,883
	5	Kenora	5,444
	6	Owen Sound	4,569
	7	Cornwall	2,103
	8	South Porcupine	1,307
	9	North Bay	226
	10	Sault Ste. Marie	-15

Figure 30: Top five receiving districts in Ontario with the greatest increase in hazardous waste quantity received, 1998 to 2000



The Ontario districts that experienced the greatest increases in hazardous waste receipts from 1998 to 2000 are some of the same districts that experienced the greatest increases in hazardous waste generation during this period. This finding points to increased off-site transfers from generating to receiving sites within each district.

Table 42: Change in quantities of hazardous waste received in Ontario by facility type, 1998 to 2000

Receiving facility	Increase in quantity received from 1998 to 2000 (tonnes)
Incineration	23,867
Reclaim	1,218
PCB storage site	209
Transfer station - processing	-1,767
Landfill	-4,961
Water pollution control plant	-38,166
Private landfill & sludge farms	-44,017
Transfer station	-68,244

The growth in hazardous waste receipts in Ontario from 1998 to 2000 has occurred primarily in incineration, reclaim and PCB storage sites in the province. These types of facilities received most of the increased waste transfers from 1998 to 2000 as highlighted in Table 42. Recall that incineration saw a 28% increase between 1998 and 2000 (see Table 20). Moreover, if Bennett Environmental Inc.'s incinerator is approved and an additional 200,000 tonnes of hazardous waste is imported, mainly from the U.S. for incineration, then assuming that the other quantities of hazardous waste remained the same as in 2000, this would represent an increase percentage change in the practice of incineration by 64% from 2000 (see Figure i).

Finally, the slight decrease in the import of U.S. hazardous waste experienced between 1998 and 2000 to Ontario would be significantly reversed should the Bennett incinerator be approved. Indeed there would be approximately 49.3% increase in imports by 2004, assuming that most of Bennett's capacity originated from the U.S., as is expected.

SECTION VI: CONCLUSION

From 1994 to 2000, Ontario experienced significant growth in the generation and receipt of hazardous waste. In this six-year period, hazardous waste generation in the province increased by 448,484 tonnes or 35%, a reduction of 87,427 tonnes or 4.8% since 1998. Hazardous waste quantities received in Ontario were 462,010 tonnes more in 2000 than in 1994. From 1998 to 2000, Ontario received 152,288 less tones of hazardous waste, a 8% decrease from 1998.

In 2000, the top hazardous waste generators in the province included municipal landfill sites, steel manufacturing facilities and chemical plants. The top hazardous waste generating sites in the province were concentrated in southern and southwestern Ontario, specifically in Ottawa, the Golden Horseshoe and the Windsor-Sarnia corridor. Landfill leachate wastes, transfer station oils and oil skimmings and sludges as well as emulsified oils were the top waste classes generated in 2000, and accounted for approximately 48% of all hazardous waste generated in the province.

The growth in hazardous waste generated in Ontario from 1994 to 2000 was in large part due to the tremendous increase in landfill leachate generation, and increases in the generation of steel making residues and halogenated solvents. Burlington, Ottawa and London districts experienced the greatest growth in hazardous waste generation in the province from 1998 to 2000.

In 2000, landfill leachate waste was the primary waste type received by Ontario receiving sites, followed by transfer station oils waste as well as oil skimmings and sludges. Facilities owned by environmental services companies, including Safety-Kleen and Philip Services received the greatest quantities of non-leachate hazardous wastes, while water pollution control plants received the greatest quantities of landfill leachate wastes. Most of the hazardous wastes received in 2000 went to sites in the districts of Sarnia, Guelph, Burlington and Ottawa, which cumulatively received 63% of the hazardous waste received in Ontario.

From 1994 to 2000, the quantities of landfill leachate wastes received by Ontario sites showed the greatest increase of all waste classes but decreased by 12% between 1998 and 2000 , followed by transfer station oils waste, emulsified oils, with increases in oil skimmings and sludges. Four districts in the province, Ottawa, Burlington, Hamilton and Sarnia experienced the greatest increase in hazardous waste received over the six-year period.

In 2000, as in 1998, the majority (85%) of hazardous waste received in Ontario came from generating sites within the province. Twelve percent came from U.S. generators, while three percent came from generators in other provinces. Waste transfers from U.S. generators to Ontario receiving sites decreased by 12% between 1998 and 2000. Safety-Kleen Inc. was the main exporter and importer of U.S. hazardous waste in 2000, as this company transferred wastes from its U.S. generating facilities to receiving sites in Ontario.

The majority of hazardous waste received from U.S. generators came from generating facilities in Michigan, New York and Ohio, all of which was non-leachate waste. Just over 43% of U.S. generated waste was received by landfills in Ontario, while lesser quantities were sent for reclamation and incineration. The Safety-Kleen landfill and incinerator near Sarnia received most of the U.S. hazardous waste transferred to Ontario in 2000. As a result, Sarnia district received the greatest quantities of U.S. hazardous waste in 2000, followed by Guelph district. Between 1998 and 2000 London district had the greatest change in the quantity of US hazardous waste received, a 59% increase.

In 2000, water pollution control plants received the greatest quantities of hazardous waste received in Ontario, accounting for 33.7% by facility type. These ill-equiped plants are also receiving non-leachate US hazardous waste, in particular spent pickle liquor, which may or may not be harmful depending upon individual situations, and whether discharge limits and/or residues have been exceeded. More research is needed in this area. The disposal practice of incineration experienced a 27.6% increase from 1998 to 2000. If the Bennett Environmental Inc. incinerator is approved for Kirkland Lake, the disposal practice of incineration would increase from 6% to approximately 16% by 2004, representing an increasing percentage change of 64%. (Table 15) These trends raise serious concerns about the environmental and human health implications associated with transfers to these facilities.

The overall increase in the quantities of hazardous waste generated and received in Ontario from 1994 to 2000 continues to also be a disturbing trend. While it is good news that the generation and receipt of domestic and imported hazardous waste has experienced a slight decrease between 1998 and 2000, this trend is more likely the result of a decline in economic activity in the US rather than a tightening of Ontario's regulatory framework. Ontario continues to accept hazardous waste at landfill sites without extended liability or requiring any pre-treatment as found both in the US as well as in Quebec. CIELAP continues to recommend that pollution prevention remains the key to avoiding hazardous waste.

Moreover the declining trend of U.S. imports of hazardous waste to Ontario would be significantly reversed if the Bennett Environmental Inc. incinerator facility proposed at Kirkland Lake, with a capacity to accept 200,000 tonnes of hazardous waste from across North America, for over a 25 year period, were to be approved. Indeed, there would be approximately a 49.3% increase in imports by 2004, assuming that most of Bennett's capacity originated from the US.

In summary, the growth rates in hazardous waste generation and receipts in Ontario experienced from 1994 to 2000 continue to be unsustainable, placing an unacceptable burden on the environment and posing increasing risks for Ontario communities. A strong response from the government of Ontario is required to reverse this trend in future years. Based on the findings of Open for Toxics 2000, it is vital that provincial government improves its monitoring and reporting of hazardous waste generation, handling and disposal, and strengthen its regulatory framework to prevent and control these activities. Bolstering support for citizen's right to know about the hazardous wastes generated and received and transported through local communities is also fundamental to ensure environmental justice and sustainability.

APPENDIX A: DESCRIPTION OF GENERATING/RECEIVING DISTRICTS IN ONTARIO

The following Ontario generating/receiving districts were identified in the Ontario Hazardous Waste Manifest Database for 1994 to 1998. The table below presents the district code, district name, and an example of municipalities that are located within each district.

District Code	District Name	Representative municipalities and/or counties
101	London	County of Elgin
102	Windsor	Essex and Kent Counties
103	Sarnia	County of Lambton
104	Owen Sound	Counties of Huron, Bruce and Grey
201	Hamilton	Regional Municipality of Haldimand-Norfolk and Hamilton-Wentworth
202	Guelph	Regional Municipality of Waterloo, Counties of Dufferin, Brant and Wellington
203	St. Catharines	Regional Municipality of Niagara
301	Toronto	Metropolitan Toronto
302	Barrie	County of Simcoe
304	Peterborough	Counties of Peterborough, Victoria, Northumberland
305	Burlington	Regional Municipality of Halton and Peel
306	Ajax	Regional Municipality of York and Durham
401	Kingston	Counties of Hastings, Prince Edward, Lennox/Addington, Frontenac, Leeds/ Grenville
402	Ottawa	Regional Municipality of Ottawa-Carleton, Counties of Lanark, and Renfrew
403	Cornwall	County of Prescott & Russell, and Stormont, Dunday and Glengarry
501	Sudbury	Regional Municipality of Sudbury, Sudbury and Manitoulin Isl. Districts
502	South Porcupine	Timiskaming District and Matheson Township
503	Sault Ste. Marie	Algoma District
504	North Bay	Parry Sound and Nipissing Districts
601	Thunder Bay	Thunder Bay District
602	Kenora	Rainy River and Kenora Districts

APPENDIX B: LIST OF HAZARDOUS WASTE TYPES IN THE ONTARIO HAZARDOUS WASTE MANIFEST DATABASE

Source: Ontario Ministry of the Environment, Waste Reduction Branch

INORGANIC WASTES

Waste Code	Waste Type	Examples
ACID SOLUTIONS		
111	Spent pickle liquor	Acid solutions of sulphuric and hydrochloric acids containing ferrous salts from steel pickling.
112	Acid solutions, sludges and residues containing heavy metals	Solutions of sulphuric, hydrochloric and nitric acids containing copper, nickel, chromium, zinc, cadmium, tin, lead or other heavy metals; chromic acid waste, acidic emission control sludges from secondary lead smelting.
113	Acid solutions, sludges and residues containing other metals and non-metals	Solutions of sulphuric, hydrochloric, hydrofluoric and nitric acids containing sodium, potassium, calcium, magnesium or aluminum; equipment cleaning acids; cation regenerant; reactor acid washes; catalyst acid and acid washes.
114	Other inorganic acid wastes	Off-specification acids, by-product hydrochloric acid; dilute acid solutions; acid test/residues
ALKALINE SOLUTIONS		
121	Alkaline solutions, sludges and residues containing heavy metals	Metal finishing wastes; plating baths; spent solutions containing metals such as copper, zinc, tin, cadmium, case hardening sludges; spent cyanide destruction residues; dewatered solids from metal and cyanide finishing wastes and cyanide destruction.
122	Alkaline solutions, sludges and residues containing other metals and non-metals, not containing cyanides	Alkaline solutions from aluminum surface coating and etching; alkali cleaner wastes; waste lime sludges and slurries; anion regenerants.
123	Alkaline phosphates	Bonderizing wastes; zinc phosphates; ferrous phosphates; phosphate cleaners
AQUEOUS SALTS		
131	Neutralized solutions, sludges and residues containing heavy metals	Metal finishing waste treatment sludges containing copper, nickel, chromium, zinc or cadmium; neutral salt baths sludges and washes; lime sludge from metal finishing waste treatment; dewatered solids from these processes.
132	Neutralized solutions, sludges and residues containing other metals	Aluminum surface coating treatment sludges; alum and gypsum sludges.
133	Brines, chlor-alkali sludges and residues	Waste brines from chlor-alkali plants; neutralized hydrochloric acid; brine treatment sludges.
134	Wastes containing sulphides	Petroleum aqueous refinery condensates.
135	Wastes containing other reactive anions	Wastes containing chlorates; hypochlorite, bromate, thiosulphate

INORGANIC WASTES

Waste Code	Waste Type	Examples
MISCELLANEOUS INORGANIC WASTES AND MIXED WASTES		
141	Inorganic wastes from pigment manufacturing	Wastewaters and sludges from production of chrome yellow, molybdate orange, zinc yellow, chrome green and iron pigments; dewatered solids from these sources.
142	Primary lead, zinc and copper smelting wastes	Slurries, sludges and surface impoundment solids; treatment plant sludges; anode slimes and leachate residues; dewatered solids from these sources
143	Residues from steel making	Emission control sludges and dusts; precipitator residues from steel plants; dewatered solids from these sources.
144	Liquid tannery wastes sludges	Lime waste mixtures; chrome tan liquors, detanning solutions and sludges
145	Wastes from the use of paints, pigments and coatings	Paint spray booth sludges and wastes; paper coating wastes; ink sludges, paint sludges.
146	Other specified inorganic sludges, slurries or solids	Flue gas scrubber wastes; wet fly ash; dust collector wastes; metal dust and abrasives wastes; mud sediment and water; tank bottoms from waste storage tanks that contained mixed inorganic wastes; heavy sludges from waste screening/filtration at transfer/ processing sites not otherwise specified in table.
147	Chemical fertilizer wastes	Solutions, sludges and residues containing ammonia, urea, nitrates and phosphates from nitrogen fertilizer plants.
148	Miscellaneous waste inorganic chemicals	Waste inorganic chemicals including laboratory, surplus or off-specification chemicals that are not otherwise specified in the table.
149	Landfill leachate	Surface runoff and leachate collected from landfill sites.
150	Inert inorganic wastes	Sand and water from catch basins at car washes; slurries from the polishing and cutting of marble.

ORGANIC WASTES

Waste Code	Waste Type	Examples
NON-HALOGENATED SPENT SOLVENTS		
211	Aromatic solvents and residues	Benzene, toluene, xylene and residues
212	Aliphatic solvents and residues	Acetone, methylethylketone and residues, alcohols, cyclohexane and residues.
213	Petroleum distillates	Varsol, white spirits and petroleum distillates, thinners.
FUELS		
221	Light fuels	Gasoline, kerosene, diesel, tank drainings/washings/bottoms, spill clean-up residues.
222	Heavy fuels	Bunker, asphalts, tank drainings/washings/bottoms, spill clean-up residues.
RESINS AND PLASICS		
231	Latex wastes	Waste latexs, latex crumb and residues
232	Polymeric resins	Polyester, epoxy, urethane, phenolic resins, intermediates and solvent mixtures.
233	Other polymeric wastes	Off-specification materials, discarded materials from reactors.

ORGANIC WASTES

Waste Code	Waste Type	Examples
HALOGENATED SPENT SOLVENTS		
241	Halogenated solvents and residues	Spent halogenated solvents and residues such as perchloroethylene, trichloroethylene and carbon tetrachloride (dry cleaning solvents), halogenated still bottoms; residues and catalysts from halogenated hydrocarbon manufacturing or recycling processes.
242	Halogenated pesticides and herbicides	2,4-D 2.4.5-T wastes, chlordane, mirex, silvex, pesticide solutions and residues.
243	Polychlorinated biphenyls (PCBs)	Askarel liquids such as Arochlor, Pydraul, Pyranol, Therminols, Inerteen and other PCB contaminated materials.
OIL WASTES		
251	Waste oils/sludges (petroleum based)	Oil/water separator sludge; dissolved air flotation skimming; heavy oil tank drainage; slop oil and emulsions.
252	Waste crankcase oils and lubricants	Collected service station oils; industrial lubricants; bulk waste oils.
253	Emulsified oils	Soluble oils; waste cutting oils; machine oils.
254	Oily water waste oil from waste transfer processing sites	Waste oil and oily water limited to classes 251, 252, 253 that have been bulked/blended/processed at a waste transfer processing site.
MISCELLANEOUS ORGANIC WASTES AND MIXED WASTES		
261	Pharmaceuticals	Pharmaceutical and veterinary wastes other than biologicals and vaccines; solid residues and liquids from veterinary arsenical compounds.
262	Detergents and soaps	Laundry wastes.
263	Miscellaneous waste organic chemicals	Waste organic chemicals including laboratory surplus or off-specification chemicals that are not otherwise specified in this table.
264	Photoprocessing wastes	Photochemical solutions, washes and sludges.
265	Graphic arts wastes	Adhesives; glues; miscellaneous wastes; etch solutions.
266	Phenolic waste streams	Cresylic acid; caustic phenolates; phenolic oils; creosote.
267	Organic acids	Carboxylic or fatty acids; formic, acetic, propionic acid wastes; sulphamic and other organic acids that may be amenable to incineration.
268	Amines	Waste ethanoiamines; urea; Flexzone waste; Monex waste.
269	Organic non-halogenated pesticide and herbicide wastes	Organophosphorus chemical wastes; arsenicals; wastes from MSMA and cacodylic acid.
270	Other specified organic sludges, slurries and solids	Tank bottoms from mixed organic waste bulking tanks at waste transfer sites; mixed sludges from waste screening, filtration at waste transfer/processing sites not otherwise specified in this table.
PROCESSED ORGANIC WASTES FROM TRANSFER STATIONS		
281	Non-halogenated rich organics	Blended/bulked solvents, oils and other rich organics prepared at transfer/processing sites for incineration
282	Non-halogenated lean organics	Blended/bulked aqueous wastes prepared at transfer/processing sites for incineration and contaminated with non-halogenated solvents, non-halogenated oils and other non-halogenated organics.

ORGANIC WASTES

Waste Code	Waste Type	Examples
PLANT AND ANIMAL WASTES		
311	Organic tannery wastes	Fleshings, trimmings, vegetable tan liquors, Bate solutions.
312	Pathological wastes	Human anatomical waste; infected animal carcasses; other non-anatomical waste infected with communicable diseases; biologicals and vaccines.

OTHER WASTES

Waste Code	Waste Type	Examples
EXPLOSIVE MANUFACTURING WASTES		
321	Wastes from the manufacture of explosives and detonation products	Wastewater treatment sludges; spent carbon; red/pink waters from TNT manufacturing; residues from lead base initiating compounds.
COMPRESSED GASES		
331	Waste compressed gases, including cylinders	Methane (natural gas); nitrous or nitric oxide; propane; butane.

FOOTNOTES

[1] CIELAP, Ontario: Open for Toxics – Hazardous Waste Disposal Becomes A Growth Industry in Ontario, 2000, www.cielap.org. (Open for Toxics 1998).

[2] Ontario Ministry of Environment, Environmental Monitoring and Reporting Branch, Manifest and Generator Registration Information for the Year 2000.

[2a] Ontario Ministry of Environment, "Pre-Treatment Requirements for Hazardous Wastes Prior to Land Disposal," Dec. 2001, p. 5, Tables 1 and 2, www.ene.gov.on.ca/envision/documents/2001/pdf.

[3] Office of the Provincial Auditor, "Special Report: Accountability and Value for Money", 2000, p. 126, Contaminated Sites, www http://www.gov.on.ca/opa/english/r00t.htm.

[4] While the U.S. G.D.P. did not begin to decline until the second half of 2000, already in 1998 and 1999 the US economy was experiencing industrial declines in agricultural, forestry and fishing, see for example "Economic Report of the President", 2002, p. 15, http://w3.access.gpo.gov/usbudget/fy2003/pdf/2002_erp.pdf.

[5] September 1999 amendment to Waste Management Reg.347, under Ont. Environmental Protection Act.

[6] March 21, 2001 amendment to Reg. 347 and Schedules.

[7] January 1, 2002, O. Reg. 501/01.

[8] Mark Winfield, Pembina Institute, March 15, 2002, RE: EBR Posting RA01E0023 and RA01E0027 – Strengthening Ontario's Hazardous Waste Management Framework.

[9] See for example, M.Winfield, "Hazardous Waste Management in Ontario: A Report and Recommendations" (Toronto: CIELAP, 1998).

[10] Ontario Ministry of Environment, Environmental Assessment Activities, November 13, 2002, http://www.ene.gov.on.ca/envision/env%5Freg/ea/english/eas/bennett.htm and see Northwatch, news postings November 8, 2002, http://www.onlink.net/~nwatch/toxics.html#bei_withdraws

[11] CEC, "Tracking and Enforcement of Transborder Hazardous Waste Shipments in North America: A Needs Assessment", 1999, www.cec.org/programs_projects/law_policy

[12] Section 11 of CEPA defines substances as toxic if it is "entering or may enter the environment in a quantity or concentration or under conditions:
a) having or may have an immediate or long-term harmful effect on the environment;
b) constituting or may constitute a danger to the environment on which human life depends; or
c) constituting or that may constitute a danger in Canada to human life or health."

[13] Environment Canada. "National Pollutant Release Inventory: 1994 Summary Report" (Ottawa: 1995), Table 7.

[14] Ibid.

[15] B. Holdke, W. Karmus and H. Kruse, "Body burden of PCB in whole human blood of 7 to 10 year old children living in the vicinity of a hazardous waste incinerator", 1998, Das Gesundheitswesen 60 (8-9): 505-512, cited by Canadian Environmental Law Association submission to the MOE on the Bennett Environmental Assessment, September 6, 2002, footnote 28, p. 25.

[16] Canadian Council of Environmental Ministers,www.ccme.ca/initiatives/standards and see "Pollution Prevention Options for Incinerators", Canadian Environmental Law Association, April 2002 report submitted to the CCME's at http://www.cela.ca/toxics/422incineration.pdf.

[17] Stockholm Convention on POPs, http://www.pops.int/documents/convtext/convtext_en.pdf and see Article 5 calling for the use of substitute processes (to incineration) in order to prevent the formation and release of dioxins and furans.

[18] For example see Ontario based Ecologic, Inc. http://www.ecologic.ca. It is a technology called gas phase chemical reduction. Basically at high temperature in a hydrogen rich environment the organics are reduced to methane gas and salts. It is not combustion because there is no oxygen in the reactor. It is a closed loop system with virtually no emissions. The methane is collected and used to heat the next batch of contaminated material to volatilise the organic contaminants.

[19] *Liquid Assets - Monitoring Water Quality in Ontario*, CIELAP, December 2001.

[20] World Wildlife Fund Canada, "Toxics In, Toxics Out: Toxics from Sewage Treatment Plants in the Great Lakes & St.Lawrence River" (Toronto: Undated).

[21] ECO, Annual Report 2000, at p. 48, http://www.eco.on.ca/english/publicat/ar2000.pdf

[22] Non-leachate landfill includes all other classifications of waste types listed in the HW manifest, e.g.) PCBs, acid wastes, alkaline wastes, etc.

[23] The Hazardous Waste Manifest Database classifies hazardous waste generators by a district code. These district codes were isolated to identify hazardous waste generation in each district. Each district is assigned the name of a municipality within it, e.g.) District 101=London, Ont. However, the districts in many cases include surrounding communities.

[24] The 1996 value was derived from a merger of the RECEIVER and MANREC files in the Hazardous Waste Manifest Database. An aggregation of quantities received by district code was conducted to identify wastes received in Ontario districts. An analysis of wastes received in Ontario from the "receiving district" column in the MANGEN file was also conducted. The value for wastes received in Ontario from the MANGEN file was 1,624,833 tonnes. The MANREC value is presented in this report for 1996. There were no discrepancies between the MANGEN and MANREC files in the 1994 and 1998 data for quantities received in Ontario.

[25] The decrease in hazardous waste generation reflects the decrease of off-site hazardous waste transfers from generation facilities in Ontario, and does not represent all hazardous waste generation in the province

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