FINAL REPORT

A STUDY OF HAZARDOUS WASTE TRANSFER FACILITIES IN CANADA

Prepared for:
Transboundary Movement Branch
Environment Canada

Prepared by:

SENES Consultants Limited
121 Granton Drive, Unit 12
Richmond Hill, Ontario
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December 2003

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EXECUTIVE SUMMARY

This report is a study on the operation of hazardous waste transfer stations in Canada, detailing an inventory and a profile of such facilities that manage hazardous wastes, including those that are involved in the export, import, interprovincial movement of such wastes, as well as, those which manage these wastes within their property or intra-provincially.

The required information was gathered from past audits of the transfer facilities conducted by SENES, analysis of the current Canadian Notification and Manifest Tracking System (CNMTS), and scans of the Provincial databases. This was followed by the development of a survey questionnaire to obtain the current status and to fill in the data gaps. This survey was designed to elicit industry specific information with respect to hazardous waste transport, storage and treatment across Canada.

The information presented in the report describes how transfer facilities are used in the life cycle management of hazardous wastes, provides details of the operational controls required to manage hazardous wastes at the transfer facilities, and presents a complete physical and operational description of the transfer facilities used in the management of such wastes.

The Environmentally Sound Management (ESM) requirements and Environmental Management Systems like ISO 14001 were key issues that were discussed with the transfer station operators. Most indicated that they have some working model of an environmental management in place and approximately 10% of respondents possessed EMS certification to ISO 14001.

1.0 INTRODUCTION

Environmentally Sound Management (ESM) of hazardous wastes is one of the underlining principles under the Basel Convention on the Transboundary Movement of Hazardous Waste and Their Disposal and Organization for Economic Co-operation and Development (OECD) Council Acts regarding the transboundary movement of wastes.

SENES Consultants Limited was awarded a contract by Environment Canada (EC) to conduct a study on the operation of hazardous waste transfer stations in the country. This report presents an inventory and a profile of such facilities that manage hazardous wastes, including those that are involved in the export, import, interprovincial movement of such wastes, as well as those which manage these wastes within their property or intraprovincially.

This report is structured in the following manner:

- *Section 2* provides the technical and regulatory definition of transfer facilities, and lists and describes current hazardous waste regulations in Canada (Federal and Provincial) and the European Union (EU), for the operation and management of transfer facilities.
- *Section 3* describes the Methodology, including the development of the Survey/ Questionnaire. The objective of the survey is to create an inventory to identify and profile transfer facilities across Canada.
- *Section 4* shows the Survey Results in a spreadsheet, and presents an analysis of these Results. The results identify all commercial and non-commercial facilities according to their role in the transfer of hazardous wastes in Canada.
- *Section 5*
    - o describes how transfer facilities are used in the life cycle management of hazardous wastes;
    - o provides details of the operational controls required to manage hazardous wastes at the transfer facilities; and
    - o presents a complete physical and operational description of the transfer facilities used in the management of such wastes.
- *Section 6* provides information on the Status of Environmental Management at the transfer stations.
- *Section 7* presents the Conclusions of the study.

2.0 HAZARDOUS WASTES

This section provides information on the current situation related to hazardous wastes in Canada, and provides summaries of the regulatory information relevant to the current project from Canada other jurisdictions.

2.1 DEFINITION OF HAZARDOUS WASTE TRANSFER FACILITY

In most cases, transfer stations are collection agencies that provide a value added service in hazardous waste recycling or disposal operations. They take on the responsibility and liability on behalf of small generators to bulk and arrange for recycling or disposal. Some of these transfer stations are relatively small and deal with hazardous waste/ recyclable materials such as laboratory wastes, small quantities of used oil wastes, contaminated solvents from paint shops, and contaminated soil. Normally, transfer stations bulk these materials and then ship them out to a solvent / used oil recycling facility or a landfill.

Transfer Stations play a very important part in the overall process of dealing with waste management in society. Hazardous waste transfer facilities serve the specific function of providing a service for bridging the gap between generators and receivers (of hazardous materials) by creating economically acceptable levels (quality and quantity) of waste by segregation, bulking, consolidation and intermittent storage of said wastes. It is cumbersome and difficult for waste generators, who are not generating large quantities of waste, to dispose or hand them off directly to a waste treatment / disposal facility.

Similarly, it is important for receivers of wastes to get regular quantity of appropriate wastes for recycling and disposal. Transfer stations provide this much-needed bridging role, between the generators and the receivers.

For the purposes of this study, a hazardous waste transfer facility is defined as a facility involved in the segregation, bulking, consolidation and intermittent storage of hazardous waste destined for disposal and recycling operations.

The federal *Export and Import of Hazardous Waste Regulations* (EIHWR) definition of 'transfer facility' is specific in its treatment of hazardous waste disposal and recycling operations.

Reference is made to Schedule 1, Part I Disposal (D) and Part II Recycling (R) of the EIHWR (shown as tables 2.1 and 2.2), which indicate that :

- Whereas D13-15 operations are considered intermediary operations which will lead to final disposal, D1-D12 and D16 operations are considered to constitute final disposal; and

- Whereas R12-R13 operations are considered intermediary operations which will eventually lead to recycling, R1-R11 and R14 -15 operations are considered to constitute final recycling operations.

TABLE 2.1
EIHWR SCHEDULE 1: PART 1: DISPOSAL

1. Release into or onto land, other than by any operation set out in items 3 to 5 and 12	D1
2. Land treatment, such as biodegradation of liquids or sludges in soil	D2
3. Deep injection, such as the injection of pumpable discards into wells, salt domes or naturally occurring repositories	D3
4. Surface impoundment, such as placing liquids or sludges into pits, ponds or lagoons	D4
5. Specially engineered landfilling, such as placement into separate lined cells that are capped and isolated from each other and the environment	D5
6. Release into water, other than a sea or ocean, other than by the operation set out in item 4	D6
7. Release into a sea or ocean, including sea-bed insertion, other than by the operation set out in item 4	D7
8. Biological treatment, not otherwise set out in this Schedule	D8
9. Physical or chemical treatment, not otherwise referred to in this Schedule, such as evaporation, drying, calcination, neutralization or precipitation	D9
10. Incineration on land	D10
11. Incineration at sea	D11
12. Permanent storage, such as emplacement of containers in a mine	D12
13. Blending or mixing prior to disposal by any operation set out in items 1 to 12	D13
14. Repackaging prior to disposal by any operation set out in items 1 to 13	D14
15. Release or treatment, other than by any operation set out in items 1 to 12	D15
16. Testing of a new technology to dispose of a hazardous waste	D16

TABLE 2.2
EIHWR SCHEDULE 1: PART 2: RECYCLING

1. Use as a fuel in an energy recovery system	R1
2. Recovery or regeneration of substances that have been used as solvents	R2
3. Recovery of organic substances that have not been used as solvents	R3
4. Recovery of metals and metal compounds	R4
5. Recovery of inorganic materials other than metals or metal compounds	R5
6. Regeneration of acids or bases	R6
7. Recovery of components used for pollution abatement	R7
8. Recovery of components from catalysts	R8
9. Re-refining or re-use, other than the operation set out in item 1, of used oil	R9
10. Land treatment that results in agricultural or ecological improvement	R10
11. Use of residual materials obtained by any operation set out in items 1 to 10 and 14	R11
12. Exchange of a hazardous waste for another waste prior to recycling of the hazardous waste by any operation set out in items 1 to 11 and 14	R12
13. Accumulation prior to recycling by any operation set out in items 1 to 11 and 14	R13
14. Recovery or regeneration of a substance or use or re-use of a hazardous waste, other than by any operation set out in items 1 to 10	R14
15. Testing of a new technology to recycle a hazardous waste	R15

2.2 CANADIAN & EUROPEAN UNION REGULATIONS

2.2.1 Domestic Considerations

In Canada, the federal, provincial and territorial governments all have the authority to set controls to manage hazardous wastes and hazardous recyclable materials. The federal government regulates the transboundary movements of hazardous wastes and hazardous recyclable materials – that is exports from and imports into Canada as well as interprovincial/territorial movements. The provincial and territorial governments establish the controls for the licensing of wastes and recyclable material generators, carriers and treatment facilities, as well as regulating intraprovincial movements. The common objective for each level

of government is to ensure that these hazardous wastes and hazardous recyclable materials are handled safely and in a manner that protects the environment and human health.

The Canadian Council of Ministers of the Environment have identified numerous opportunities to move towards harmonization of relevant federal-provincial-territorial regimes, particularly in defining what is a "hazardous waste" and "hazardous recyclable material".

I. *Canadian Environmental Protection Act, 1999* (CEPA 1999)

CEPA 1999 includes new authorities with respect to wastes and recyclable materials that did not exist under the former CEPA. Some of the most important noteworthy are as follows:

- to prohibit exports, imports or transits of wastes and recyclable materials where required by Canada's international obligations;
- to develop criteria to assess the environmentally sound management of transboundary movement of hazardous wastes and hazardous recyclable materials, and to refuse permits for exports, imports or transits if these criteria are not met;
- to issue permits for the "equivalent level of environmental safety", allowing for variances from the regulations under specific conditions; and
- to require the preparation and implementation of plans to reduce or phase out exports of wastes destined for final disposal.

II. EIHWR

The purpose of the EIHWR is to protect Canada's environment and human health from the risks posed by the traffic of hazardous wastes and hazardous recyclable materials through exports from and imports into Canada and to implement Canada's international obligations.

The EIHWR include the following requirements:

- The prior informed consent mechanism where the receiving country agrees in advance to any shipments;
- The tracking of all transboundary movements of hazardous wastes and hazardous recyclable materials from the facility from which it is shipped to final destinations, and the written confirmation of disposal or recycling when completed;
- The prohibitions on exports of hazardous wastes and hazardous recyclable materials to Antarctica or countries that prohibit their imports;
- Conditions governing who is permitted to import or export;
- The recycling of hazardous material and disposal of hazardous waste only at authorized facilities;

- The requirements for contracts between importers and foreign exporters, and between exporters and foreign receivers;
- The requirements for liability insurance and what insurance coverage is required;
- The obligations to make alternative arrangements or arrange for returns when shipments are not accepted at the intended authorized facility in the country of import. The exporter may dispose of the waste or recycle the material at an authorized facility other than the one named in the permit, in the country of import or arrange for the return of the waste or the recyclable material to the facility in Canada from which it was shipped;
- The requirement that imports, exports and transits are only allowed with countries that are parties to one of the Basel Convention, OECD decision C(92)39/Final or the Canada-USA Agreement on the Transboundary Movement of Hazardous Wastes.

III. *The Interprovincial Movement of Hazardous Wastes Regulations* (IMHWR)

The goal of the IMHWR is to ensure that the current manifest tracking and classification requirements for interprovincial movements of hazardous wastes are maintained. The manifest has been used in Canada as a means to track shipments of hazardous waste since 1985, when it was first introduced under the Transporation of Dangerous Goods Regulations (TDGR). Both the manifest and the classification process under the TDGR have been used as important references for several other federal and provincial regulations on hazardous wastes and hazardous recyclable materials.

As such, the IMHWR will provide a regulatory gap-stop for interprovincial movements of hazardous waste and hazardous recyclable materials. EC is working on a more comprehensive version of the regulations to include the enhanced authority under CEPA, 1999.

IV. *PCB Waste Export Regulations, 1996* (PCB WER)

The PCB WER apply to PCB liquids, PCB solids, PCB mixtures, PCB equipment, PCB-contaminated solid or electrical equipment, and packaging that held any of these materials. PCB liquids, solids and mixtures with concentrations greater than 50 ppm are controlled by these regulations. These Regulations are an enhancement of similar controls already in place for hazardous waste under the EIHWR and establish strict conditions on the export of PCB waste. Export is only allowed for treatment and destruction at authorized and environmentally sound United States of America facilities, and export for landfilling and purposes other than those listed in the Regulations is not allowed. Exports of PCB waste to countries other than the United States are prohibited.

V. *Transportation of Dangerous Goods Regulations* (TDGR)

Prior to 2002, the tracking requirements for hazardous wastes and hazardous recyclable materials were under the TDGR made pursuant to the *Transportation of Dangerous Goods Act, 1992* (TDGA). The introduction of CEPA 1999 of a new authority to control the movement of hazardous wastes and hazardous recyclable material signalled the intent of the Government of Canada to transfer this authority from the TDGA. In August 2002, the manifest tracking requirements were removed from the TDGR. Simultaneously with this repeal, amendments to the EIHWR with respect to the tracking of exports and imports of hazardous wastes and hazardous recyclable materials through the use of a manifest system came into force.

VI. Canadian Provincial Government Regulations

The following chart identifies each province's principal Hazardous Waste Regulations:

Province	Act	*Regulation*
Ontario	*Environmental Protection Act*	O.Reg. 347 (General – Waste Management)
Alberta	*Environmental Protection and Enhancement Act*	A. Reg. 192/96 (Waste Control)
British Colombia	*Waste Management Act*	B.C. Reg. 63/88 (Special Waste) (including amendments up to B.C. Reg. 52/95)
	Transportation of Dangerous Goods Act	B.C. Reg. 203/85 (Transportation of Dangerous Goods)
Manitoba	*The Dangerous Goods Handling and Transportation Act*	M. Reg. 175/87 (Generator Registration and Carrier Licensing)
		M. Reg. 282/87 (Classification of Products, Substances and Organisms)
		M. Reg. 139/88 (Manifest)
Newfoundland and Labrador	*Environmental Protection Act*	N.F. Reg. 82/02 (Used Oil Control)
		N.F. Reg. 61/03 (Storage of PCB Wastes)
Nova Scotia	*Environment Act*	N.S. Reg. 55/95 (Asbestos Management)
		N.S. Reg 23/2002 (Dangerous Goods Management)
		N.S. Reg. 163/97 (PCB Management)
		N.S. Reg. 61/95 (Pesticide)
		N.S. Reg. 179/96 (Used Oil)
	Dangerous Goods Transportation Act	N.S. Reg 152/85 (Dangerous Goods Transportation)
Quebec	*Environmental Quality Act*	R.R.Q. 1981, c. Q-2, Rob. 3.01 (Respecting Hazardous Materials)
Saskatchewan	*Environmental Management and Protection Act*	E-10.2 Reg. 3 (Hazardous Substances and Waste Dangerous Goods)
		E-10.2 Reg. 4 (Municipal Refuse Management Regulation)

Province	Act	*Regulation*
		E-10.2 Reg. 6 (PCB Waste Storage)
Northwest Territories	*Environmental Protection Act*	
Yukon Territories	*Environment Act*	O.I.C. 1995/047 (Special Waste)
	Dangerous Goods Transportation Act	O.I.C. 1986/118 (Dangerous Goods Transportation Regulations)
Nunavut	Environmental Protection Act	

2.2.2 European Union / UK Regulatory Context

The EU's environmental regulations adopt the form of more than 200 measures (or Directives).

EU Directives suggest all EU Member States must prohibit the uncontrolled discarding, discharge and disposal of waste.

In the EU, the definition of hazardous waste varies between countries. In general, waste containing metallic compounds, halogenated solvents, acids, asbestos, organo-halogen compounds, organophosphate compounds, cyanides or phenols is regarded as hazardous waste.

National figures identifying the amount and type of waste produced within each European country vary widely. Different countries use differing classifications and waste classification methodologies. Hazardous waste streams prove, therefore, virtually incomparable from one country to the next.

National governments in the EU begin with the generic definition of what they consider to be 'municipal' waste versus 'industrial' waste. In practice, EU Member States respond to their national regulatory apparatus, and not to the European Parliament.

I. International Waste Identification Code (IWIC)

To date, there is no inventory of waste paths (production, composition and disposal) for Europe as a whole. Waste statistics across EU countries are often not comparable due to diverging definitions, classification systems and scope. An example of the latter is the treatment of materials destined for recovery operations in the EU. Oftentimes European hazardous waste management reporting activity does not treat materials destined for recovery as waste.

In response to this lack of statistically relevant information, the IWIC (OECD Council Decision / C(88)90 – Final) calls for the establishment of a hazardous waste uniform classification system.

IWIC uses six methodological points to create a schema of hazardous wastes, each point highlighted below:

1) the reasons why the material is intended for disposal;
2) disposal operations;
3) generic types of potentially hazardous wastes;
4) their constituents;
5) the hazardous characteristics; and
6) the activities generating them.

The IWIC will provide a coded list of substances falling under each 'point (above)', intending to create a 'cradle-to-grave' hazardous waste management system.

II. European Union (EU) / UK 'National Treatment' of Hazardous Wastes

Despite efforts by the European Economic Community (EEC) (including adopting IWIC, summarized above), each EU Member State identifies hazardous wastes (and transfer facility activities) in a unique manner. The UK, not yet an EU Member State, is no exception to this observation.

The UK does have multiple pieces of legislation but do not have one single consolidated piece of legislation that controls waste management. However, wherever possible, UK regulations for governing hazardous waste are routinely modified to meet EEC Common Directives.

The UK's Special Waste Regulations Control Act (1996) terms hazardous wastes "special wastes". Special wastes are those wastes that are dangerous to treat, keep or dispose of. Special wastes are generally harmful to human, plant or animal life. The UK's Special Waste Regulations Control (SWRC) Act covers not only hazardous waste destined for further treatment, but also further characterizes as 'special wastes' such wastes which may be explosive, highly flammable, toxic, *carcinogenic, mutagenic,* or have other hazardous properties.

Transfer facilities in the UK vary in terms of their definition of hazardous waste streams, scope of hazardous waste treatment and overall operational mandate. Surrey County Council (U.K.) deems a Transfer Facility to be a short term bulking operation limited in their handling of hazardous wastes. The Surrey County transfer facility acts as a short term storage facility until such time as incineration, landfilling or other treatment options are initiated. A Material Reclamation Facility (MRF), on the other hand, is designated by the Surrey County Council (UK) as a facility designated to perform: reclamation, sorting, storage, and transport of waste materials at a single site. (This latter definition is similar to the Questionnaire definition of a Transfer Facility used in this study).

In the EU (and the UK), wastes are usually approached by examining the material "life-cycle" of a waste stream, from extraction to final disposal. Waste materials, by the EU's terms and definitions, are transformed into secondary waste via a broad range of production and consumption processes. Residuals from transformation processes that are discharged directly into the air or into water may be reported as *emissions*, while residuals which are further handled before being discarded are referred to as *waste*. This distinction is not made in this sense to the same degree in North America.

Once generated, waste (as per the above definition) may be re-used (through in-plant processes), recycled (after being treated) or transferred to a treatment plant (to reduce its toxicity) or to an incineration plant (to reduce its volume). The heterogeneity of hazardous waste generated by industrial processes makes their treatment and disposal difficult. In the EU (and UK) today, waste prevention is preferred to recycling, recycling is preferred to incineration, and disposal onto (and into) land is the least preferred option of the accepted methods of disposing of waste.

In the UK / EU, the final decision regarding which waste ends up in landfill (or other suitable treatment option) is made according to a Best Practicable Environmental Option (BPEO) determination. The BPEO determination, made on a particular waste stream, represents the *solution that does the least damage to the environment as a whole, at an acceptable cost.*

III. Council Directive 91/156/EEC of 18 March 1991 (amending Directive 75/442/EEC on waste)

The EU Directives governing the control (and treatment) of hazardous waste management activities are reviewed next. The first Directive, 91/156/EEC, sets guidelines, priorities and criteria to be followed by the member states regarding waste treatment and management.

This directive provides a definition of wastes. As well, the definitions of "waste producer", "waste owner", "management", "elimination", "recovery" and "collection" are also modified or added. Anything not considered as waste is also specified. Different substances or objects considered as waste are listed in an annex. This list will be revised periodically.

EU member states are required to enhance:

- Prevention or reduction of waste generation.
- Development of clean technologies.
- Technical and commercial development to avoid waste generation and contamination risks.
- Recycling, reuse or recovery of waste.
- Energy recovery from waste, as a second option.

To specifically meet the objectives of Directive 91/156/EEC, EU member states should establish a waste management plan to include:

- Type, quantities and origin of waste to be recovered or eliminated.
- General Technical prescriptions (re: transfer facilities).
- Adequate elimination sites / facilities.

Plus

- Responsible organization for waste management.
- Cost estimates of elimination / recovery.
- Adequate measures for the rationalization of waste collection, classification and treatment.

IV. Community Strategy for Waste Management COM (96) 399 Final

Among the considerations presented in this report, includes:

- Implementation of a common, company-wide policy on integrated waste management, treating waste as a whole, and
- Plan waste management at different governmental levels (local, regional, national).

This section has presented a review of some relevant definitions and concepts from Canada and other jurisdictions, in the context of the current study.

3.0 METHODOLOGY / INFORMATION COLLECTION

The main objective of the project is to create an inventory of existing domestic transfer facilities engaged in the management of hazardous waste in Canada. As such, this inventory was developed to address the following requirements:

- Company/facility name;
- Facility Type;
- Facility mailing address;
- Number of employees;
- Sources of hazardous waste material collected;
- Destination of collected material from transfer facilities;
- Presence of any environmental management system;
- Presence of any plans to address emergencies, training needs, and decommissioning; and
- Mixing or diluting of the hazardous waste streams.

This task was accomplished by initiating an Information Requirements Analysis, which include information gathered from past audits of the transfer facilities conducted by SENES, analysis of the current Canadian Notification and Manifest Tracking System (CNMTS), and scans of the Provincial databases. This was followed by the development of a Survey Questionnaire to obtain the current status and to fill in the data gaps. The following provides more details.

Audits

SENES past experience includes conducting over 50 hazardous waste transfer facility audits (Environmental Management Systems and ISO 14000 compliance and operations / procedures auditing). EMS / ISO 14000 audits offer a very specific "snap shot" of a particular transfer facility. Topics addressed include: what types of hazardous (and non-hazardous) wastes are handled; how are they collected, stored, reused (if any); and, what recovery / disposal methodologies are employed for hazardous waste residual materials.

CNMTS

SENES performed a thorough analysis and cross-reference of the CNMTS, which provides a database information package on the movement of hazardous waste across Canada. Lists of the companies involved in these activities were prepared.

Provincial Databases

SENES then performed an analysis of waste receiver databases at the provincial level. Several provinces maintain electronic databases of hazardous waste transport. SENES contacted all provincial environmental departments across Canada to request information from their files for waste manifests. This information is updated yearly. This analysis provided a preliminary

screening of those facilities potentially engaged in any type of hazardous waste management activity. Along with a cursory analysis of those companies involved, the types of wastes handled at each facility were also identified. Information indicated that transfer facilities operated in 7 provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, and Nova Scotia). Information from the Territories is included with that of BC and AB.

Initial Telephone contacts

Based on the information developed, 320 companies were identified for further contact. In some cases, contact information was incomplete. When necessary, this information was obtained from the company web sites, telephone and postal code directories, or by telephoning the company directly. Each call explained Environment Canada's reasons for conducting the Survey and requested Industry participation, through a survey questionnaire.

Survey/Questionnaire

The Survey / Questionnaire were designed to specify industry activities with respect to hazardous waste transport, storage and treatment across Canada. A copy of the blank form is included in Appendix A.

A copy of the letter from Environment Canada introducing the purpose of the survey to the correspondents is also included in Appendix A.

The Questionnaire's General Headings and Specific Sections are as follows:

Section A. General Information

This section provides the identification and the contact information for the facility. Also requested in this section are the appropriate Certificates of Approval numbers, and a description of the Facility Type and Waste Handling Capability .

Section B: Facility Questions

This section deals with the information on the number of employees, and types and sources/destination of hazardous waste handled.

Section C: Services Provided

This section included a check box to indicate which of the following services were offered by the facility:

- Landfill;
- Fuels Blending;
- Treatment (solidification, neutralization, etc.);

- Reclaim/Recycling;
- Incineration;
- Transfer;
- Brokerage;
- Drum Reconditioner;
- Oily Water Treatment;
- Laboratory;
- On Site Soil Remediation;
- On Site Water Treatment;
- Air Pollution Control ;
- Above Ground Storage Tanks; and
- Underground Storage Tanks.

Other

Section D: Operations

This section deals with questions about the waste inventory, and to determine the degree of Environmentally Sound Management (ESM) practiced, with specific references to facility / site monitoring, ISO 14000, emergency response plan, waste management training for employees.

Section E: Information on Site Plan and Brief Process Flow Diagrams to be sent by the facility along with this Form.

Follow-up telephone calls

A follow-up call was made to each of the companies. These calls resulted in the identification of 147 facilities as transfer facilities.

Period of Survey

The Survey/Questionnaire was administered over an eight (8) week period commencing on May 1, 2003. The company responses were received throughout May, and ended in mid June, 2003.

4.0 SURVEY RESULTS AND ANALYSES

The information received from all the sources described was reviewed. As required, the results have been analysed to include a breakdown based on:

- distribution by province/territory;
- distribution based on number of employees;
- distribution based on quantity of material collected at transfer facility within a year; and
- distribution based on whether the facility adheres to an environmental management system or has created any plans.

Distribution of Responses by Province

Based on these addresses, the number of companies/head-offices from each province is shown in Table 4.1

TABLE 4.1
NUMBER OF RESPONDENTS TO THE SURVEY

BC	AB	SK	MB	ON	QC	NS	Totals
15	26	2	2	46	12	2	105

Number of employees

For the purposes of this study, facility size is based on the number of employees, and is characterized as micro (<10 employees), small (<50 employees), and medium (<250 employees). It should be noted that a company may have more than one facility, in more than one province. Table 4.2 below shows the categorisation of the transfer facilities based on the size, as developed from information derived from all sources. Ontario has the largest number of facilities in each class, followed by Alberta and BC.

TABLE 4.2
SIZE OF TRANSFER FACILITIES

	BC	AB	SK	MB	ON	QC	NS	Totals
Micro (<10)	5	15	2	1	18	0	0	41
Small (<50)	8	10	0	1	23	7	2	51
Medium(<250)	1	0	0	0	4	1	0	6

Sources of hazardous waste material collected

Table 4.3 shows the responses to the questions on "Facility Type" and "Typical sources of hazardous material collected/processed". It should be noted that a company may have more than one facility, in more than one province, with waste source from more than one type of industry.

The table provides the following information for the provinces:

British Columbia - Mainly automotive and other (industrial) wastes, including smelting, refining etc. are collected / treated.

Alberta - The predominant waste source in Alberta is automotive, industrial and waste oil / filters. These wastes are treated in micro to small sized facilities.

Saskatchewan / Manitoba – the sample size too small.

Ontario - The large majority of hazardous waste transferred and treated is classified as 'other (industrial)' i.e. plastics-related, spent waste oils, waste amalgams, solvents, including electroplating rinse, process wastes in general. The automotive sector is the largest segment of hazardous materials generation in the province, equally spread between micro, small and medium sized transfer facilities.

Quebec - The transfer facility profile for hazardous waste sources mirrors industrial, chemical, and automotive waste streams found in Canada in general.

TABLE 4.3
INDUSTRY TYPES AND SOURCES OF HAZARDOUS WASTES

	BC	AB	SK	MB	ON	QC	NS
Auto	11	26			41	6	1
Oil / petroleum	1	3			13	2	
Dry Cleaning		1			2		
Govt. Institutions	1	1			2	1	
Chemical	1	3		1	15	3	
Gen. Mfging		2			3		
Agriculture		1					
Waste oil & filters	7	22	2	1	2	4	
Battery	3				3		

TABLE 4.3 (Cont'd)
INDUSTRY TYPES AND SOURCES OF HAZARDOUS WASTES

	BC	AB	SK	MB	ON	QC	NS
Paint & solvents	1				10	2	
House hazardous				1	3	1	
Storage	1				4		
Other (Industrial)	10	26	2	2	28	9	2

Destination of collected material from transfer facilities

Information received on the destination of the material collected at the transfer facilities is shown in Table 4.4. It should be noted that one facility can send material to multiple destinations. It was further indicated that 26 facilities send their wastes out of Canada to USA.

TABLE 4.4
DESTINATION OF MATERIAL FROM TRANSFER FACILITIES

	BC	AB	SK	MB	ON	QC	NS
To Neighbouring Province	10	28	2	2	18	9	2

Services Provided

Table 4.5 below shows the range of services offered by the transfer facilities in the provinces, as indicated in their responses. It is noted that most of the respondents offer more than one service at their facilities. The tables are classified based on the size of the company (i.e. micro, small and medium). According to the responses, activities related to Treatment, Reclaim/Recycling, Transfer, Brokerage, and Oily Water Treatment appear to be the most prevalent services offered.

TABLE 4.5
SERVICES OFFERED

Services	BC	AB	SK	MB	ON	QC	NS
Landfill	2	4			4	1	
Fuels Blending	11	14	3		18	6	1
Treatment (solidification, neutralization, etc.)	4	4			27	10	1
Reclaim/Recycling	12	21	3		31	10	2
Incineration	2	3	2		3	2	1
Transfer	13	21	2		44	11	2
Brokerage	10	5			12	17	
Drum Reconditioner	2	3			1	1	3
Oily Water Treatment	11	17	1	2	14	13	
Laboratory	3				18	8	1
On Site Soil Remediation	3	3			4	2	
On Site Water Treatment	10	16	6	2	9	5	
Air Pollution Control	1	1			6	2	1
Above Ground Storage Tanks	11	21	1	2	32	9	
Underground Storage Tanks					3		
Other		1*			1^		

* aerosol / cylinder recycling ^lead acid battery recycling.

Presence of any environmental management system

A total of 51 responses were received related to question about a facility having a documented EMS, and whether the system in place was certified per ISO 14000 or similar.

About 10% of the respondents possessed EMS certification for ISO 14001. Approximately 55% of the respondents indicated that they have EMS program in place (not necessarily certified under ISO 14001) and 35% of the facilities were not part of any certified or voluntary program.

Presence of any plans to address emergencies, training needs, and decommissioning

All the facilities contacted indicated having plans to address emergencies. The facilities also indicated they have existing plans for decommissioning of the site, if the need arose, and they have ongoing training for their employees.

Waste streams managed on site (EIHWR; Sch. 3 Part I, II, III)

The types of hazardous waste managed by a transfer facility on site includes:

- Contaminated soils;
- Waste alumina;
- Scrap rubber;
- Organic liquids;
- Lead Slag;
- Used solvents;
- Spent sulphuric and other acids;
- Borosilicate;
- Lithium batteries and wastes;
- Motor oils;
- Resins;
- Inks;
- Waters;
- Cyanides;
- Copper ammonium chloride;
- Ferrous chloride;
- Dry cleaning filters, liquids;
- Ferrous sulphate;
- Lead acid batteries; and
- Aluminium processing by-products.

How Long Waste Manifests Kept on Site

Of the facilities responding, a majority of transfer stations in Alberta, BC and Ontario keep their manifests for 3-7 years on-site.

TABLE 4.6
LENGTH OF TIME WASTE MANIFESTS KEPT ON-SITE

No of years	BC	AB	SK	MB	ON	QC	NS	Totals
2 Years					6		1	7
3 – 7 Years	9	24			10	2	1	46

Throughputs

Throughput information was not available from all facilities. Information received is shown below in Table 4.7.

TABLE 4.7
PROVINCIAL INFORMATION ON FACILITY THROUGHPUTS

British Columbia

Company ID	Throughput Info
BC 1	438 t/yr
BC 2	4,000 tons / yr.

Alberta

Company ID	Throughput Info
AB 1	2,500 tons / year

Ontario

Company ID	Throughput Info
ON 1	41 drums *Certificate of Approval (CofA)*
ON 2	700 drums : CofA
ON 3	300,000 litres *CofA; Actual:150,000 litres (storage) & 10 – 12,000 litres / day-(processing)*
ON 4	440,000 (US) gallons *CofA*
ON 5	Bulk - 100,000 gals; Landfill : 2,419 tons (*waste combined*) *CofA*
ON 6	Bulk : 250,000 gals; Landfill : 200 tons *solids; Actual: 100,000 gals / 50 tons*
ON 7	778,000 litres (storage)
ON 8	25 X 45 gallons-drum *CofA*
ON 9	Actual:<50 drums
ON 10	400,000 plastic totes
ON 11	740,000 litres *CofA*
ON 12	1,500 drum / 1.4 million litres *CofA ; Actual : 500 drum / 1.3 Mn m litres (waiting list)*
ON 13	1,000 drums/wk *CofA ; Actual: 300 drums/wk.*
ON 14	663,000 litres (416 drums) *CofA ; Actual : 200 drums*
ON 15	663,000 litres (416 drums) *CofA ; Actual : 200 drums*
ON 16	47,000 litres *CofA ;Actual : 23,000 litres*
ON 17	308,000 litres *CofA; Actual: 250,000 litres*

Quebec

Company ID	Throughput Info
QC 1	>1 million litres; 2,000 m.cubed – soil; 155 drums capacity *CofA*
QC 2	40,000 tons/yr *CofA*; Actual: 150,000 tons
QC 3	166,000 litres *CofA; Actual: 78,000 litres*

5.0 TRANSFER FACILITY OPERATIONS

5.1 TRANSFER FACILITY DESCRIPTION

Life cycle management of waste requires comprehensive management of waste from cradle to grave. This holistic approach involves a chain of actions from the initiation of waste stream generation, through its storage, handling, processing, treatment, and disposal (or recycling) actions. Commercial hazardous waste management facilities are broken into three broad groups – transfer and storage facilities, treatment and disposal facilities, and recovery facilities.

Treatment and disposal facilities are designed to change the physical, chemical or biological composition of waste to neutralize it, make it safer to transport or dispose of, or make it amenable for recovery, storage, or volume reduction. Treatment and disposal techniques include processes such as incineration, material blending, neutralization and stabilization and landfilling.

Recovery facilities process hazardous wastes or material to make it suitable for its original purpose or use hazardous wastes as a substitute for a raw material in another process. Recovery facilities include categories such as metal recovery and solvent recovery and other.

Transfer and storage facilities hold waste for a temporary period of time. They receive waste from different generators, segregate and store wastes and transfer the wastes to either waste treatment and disposal facilities or recovery / recycling facilities. Transfer Stations form a very important part in all but the waste generation step in this overall schema of activities. They bridge the gap between generators and receivers of hazardous waste by creating economically acceptable levels (quality and quantity) of waste by segregation, bulking and consolidating (waste streams), and offer intermittent storage of said wastes. It is a cumbersome and difficult process for waste generators, who are not generating significant or large enough quantities of hazardous waste to dispose them directly, or even act as a waste treatment processing facility themselves. Similarly, it is important for receivers of wastes (Transfer Stations) to receive regular quantity of appropriate wastes for storage, recycling and disposal.

For example, waste solvents from paint shops need to be sent to recycling. However, recyclers are not willing to deal with shops generating two/three drums of waste per month. In this situation a transfer station can pick up these loads and consolidate the drums into a large bulk consignment for the solvent recycler creating a distillation load and bridging the gap between the small generators and larger receivers.

Waste transfer stations can be defined as facilities where waste is unloaded from collection vehicles and briefly held with or without preliminary waste processing, before it is reloaded onto

larger transport vehicles for shipment to disposal or recycling facilities. Advantages of waste transfer stations include:

- Reduces overall industrial waste traffic.
- Offers more flexibility in waste handling in disposal.
- Reduces air pollution, fuel consumption and probability of accidents by consolidating waste into fewer vehicles.
- Allows for screening of waste.
- Reduces traffic at disposal facility.
- Offers industries a facility for convenient drop-off of waste.

5.2 DESCRIPTION OF TRANSFER FACILITY OPERATIONS SURVEYED

As discussed in Section 4, a total of 105 waste transfer facilities responded to the survey questionnaire. Apart from the current survey project, SENES has also carried out other projects, which included on-site environmental audits of such hazardous waste transfer facilities. Facility description and operations summarised below comprise information that has been compiled by SENES as a part of this project and its over-all broad-ranging field experience.

5.2.1 Facility Types

The transfer facilities receive wastes from a variety of industries such as automotive, chemical, metallurgical and general manufacturing, and thus handle a wide variety of hazardous material such as waste solvents, oils, sludge, organic and inorganic chemicals, and contaminated soils to name a few.

The type of waste handled by a facility depends upon their business preference and the category of waste generators and disposal facilities available in the area. Transfer facilities may carry out transfer operations only for a particular waste category and carry out blending / neutralization (Treatment) operations for another waste category. For example a site may serve as a transfer facility for lead-acid batteries but serve as neutralization and transfer facility for organic acids. These facilities posses separate Certificate of Approval (CofA) for waste processing and for transfer from the respective provincial ministries. More details on the type of facilities types are given in Section 4.

5.2.2 Facility Description

The infrastructure present at the facilities surveyed varies with the type of waste handled (solid / liquid) and the transfer / processing operations conducted. Site plan of some of the waste transfer stations surveyed are shown in Figures 5.1 to 5.4.

FIGURE - 5.1: TYPICAL SITE LAYOUT OF WASTE TRANSFER FACILITY
Facility handling explosive/flammable material.

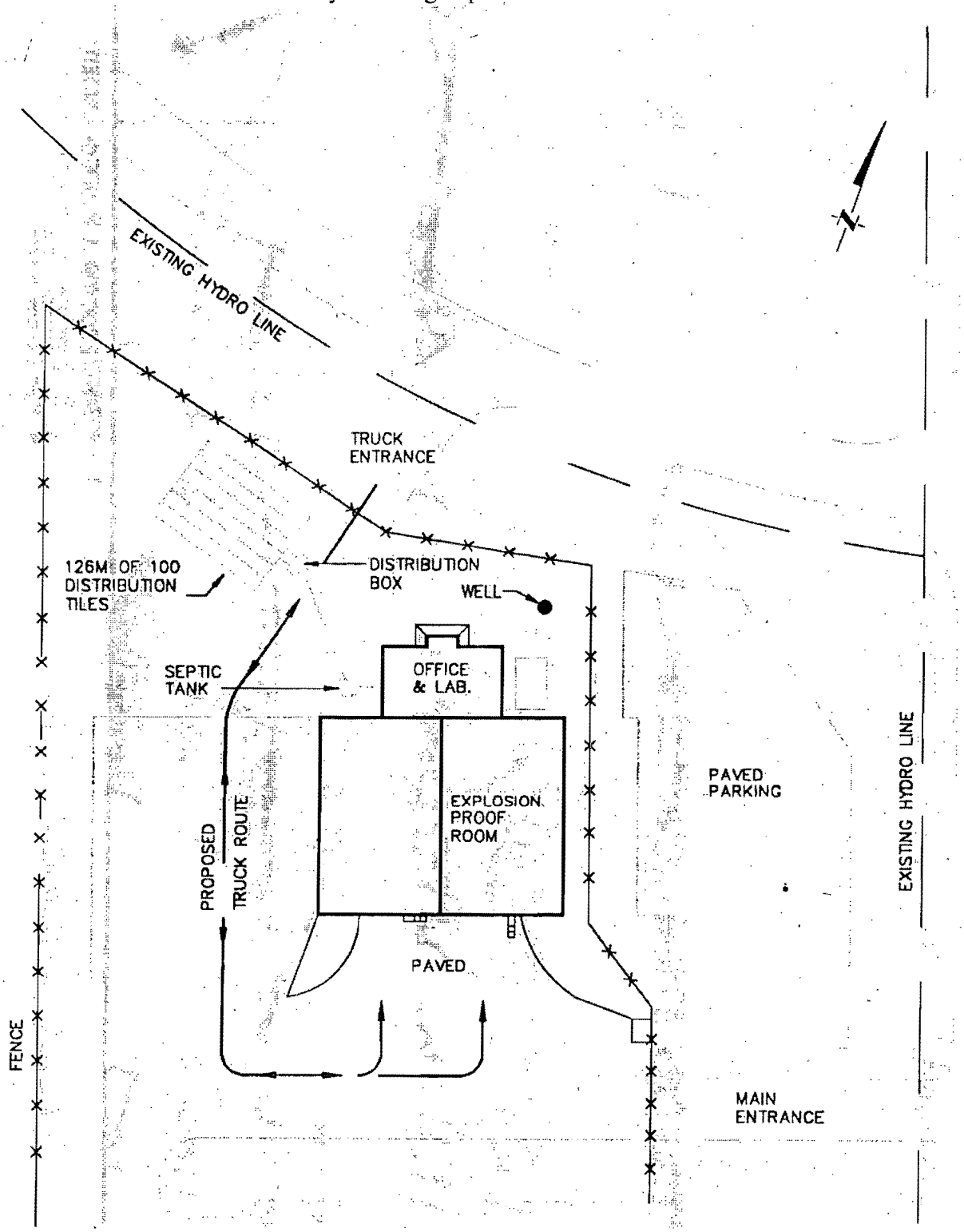


FIGURE 5.2: TYPICAL SITE LAYOUT OF WASTE TRANSFER FACILITY
Typical transfer station handling multiple wastes.

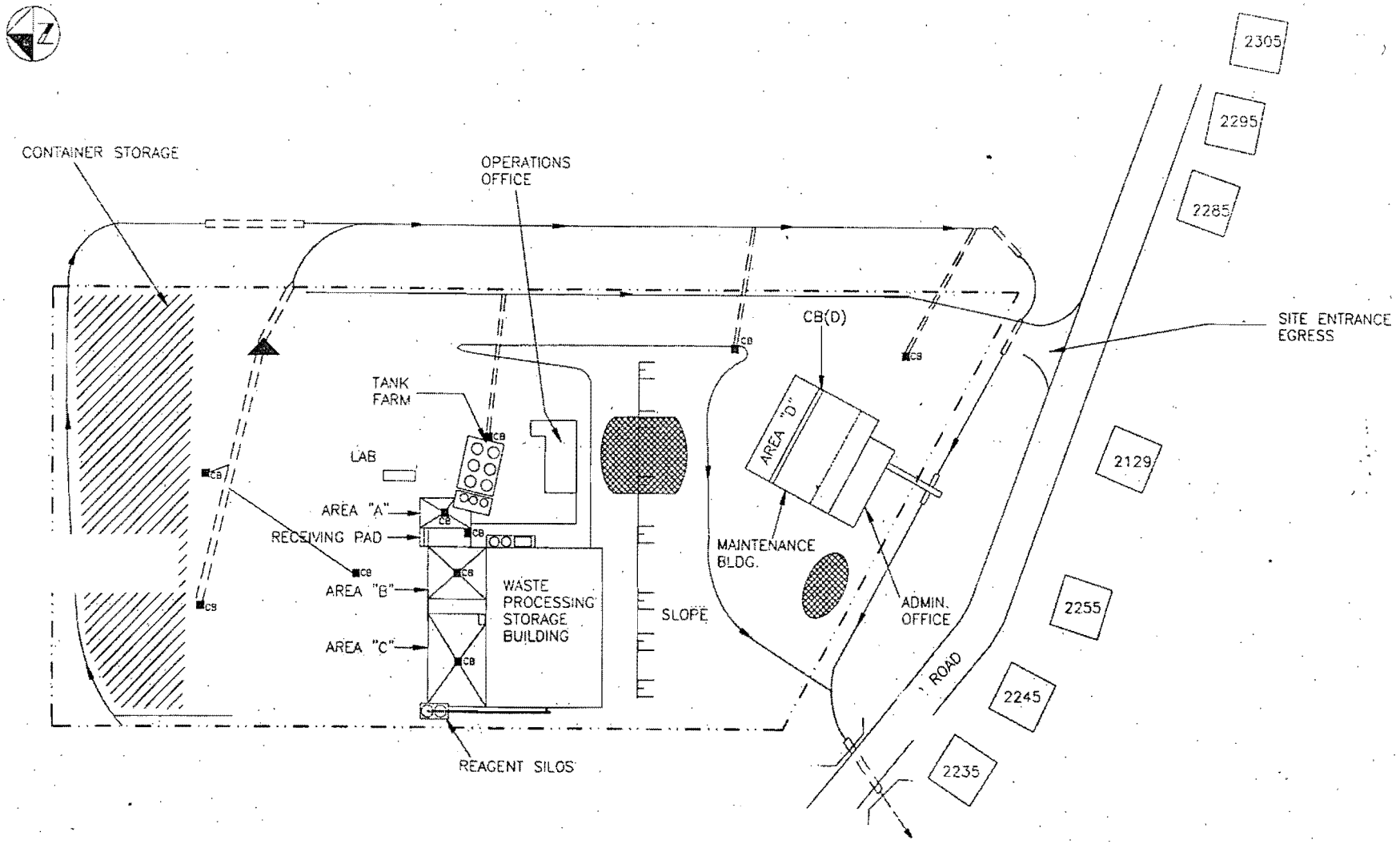


FIGURE 5.3: TYPICAL SITE LAYOUT OF WASTE TRANSFER FACILITY

Waste facility carrying out bulking and stabilization.

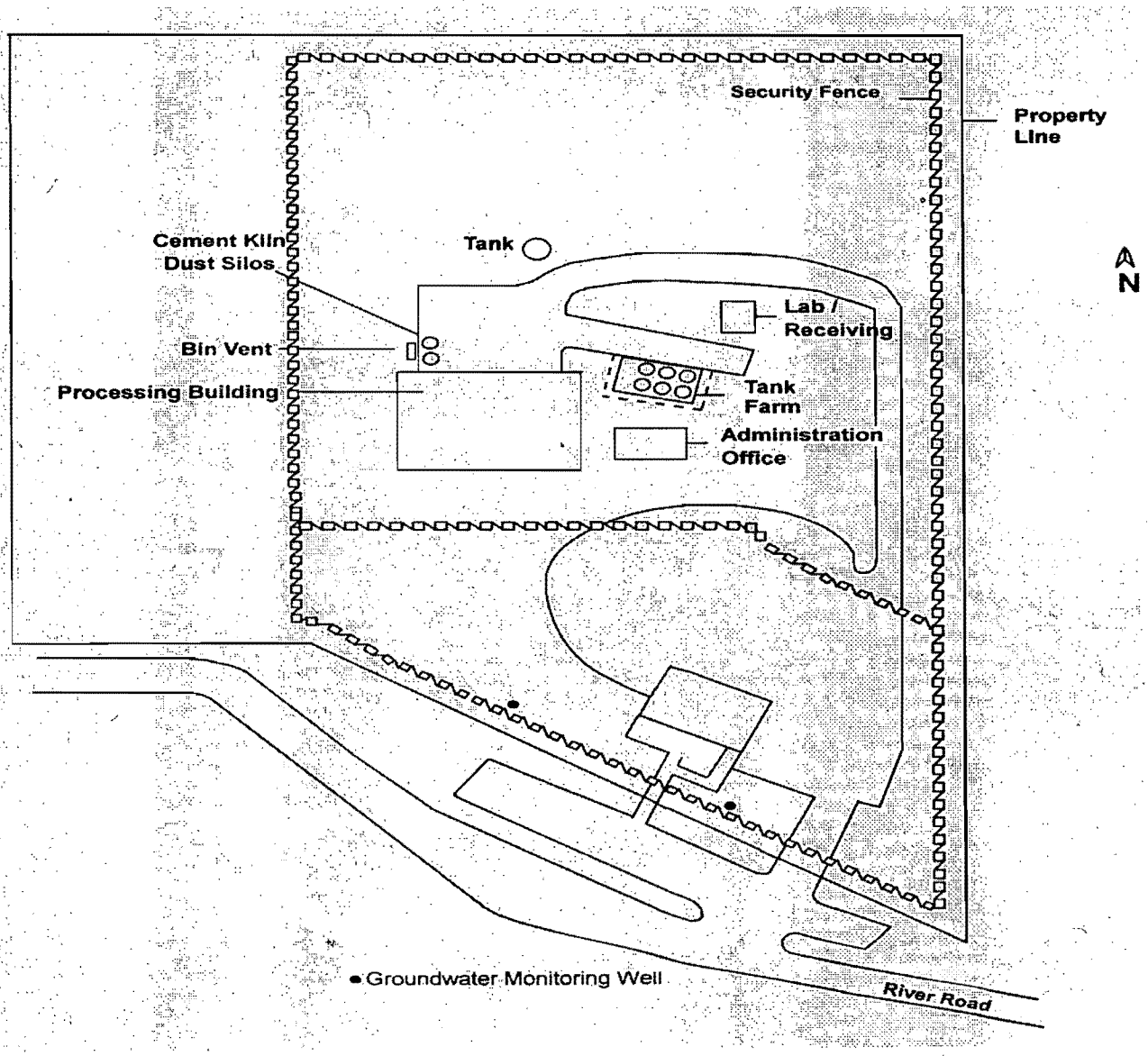
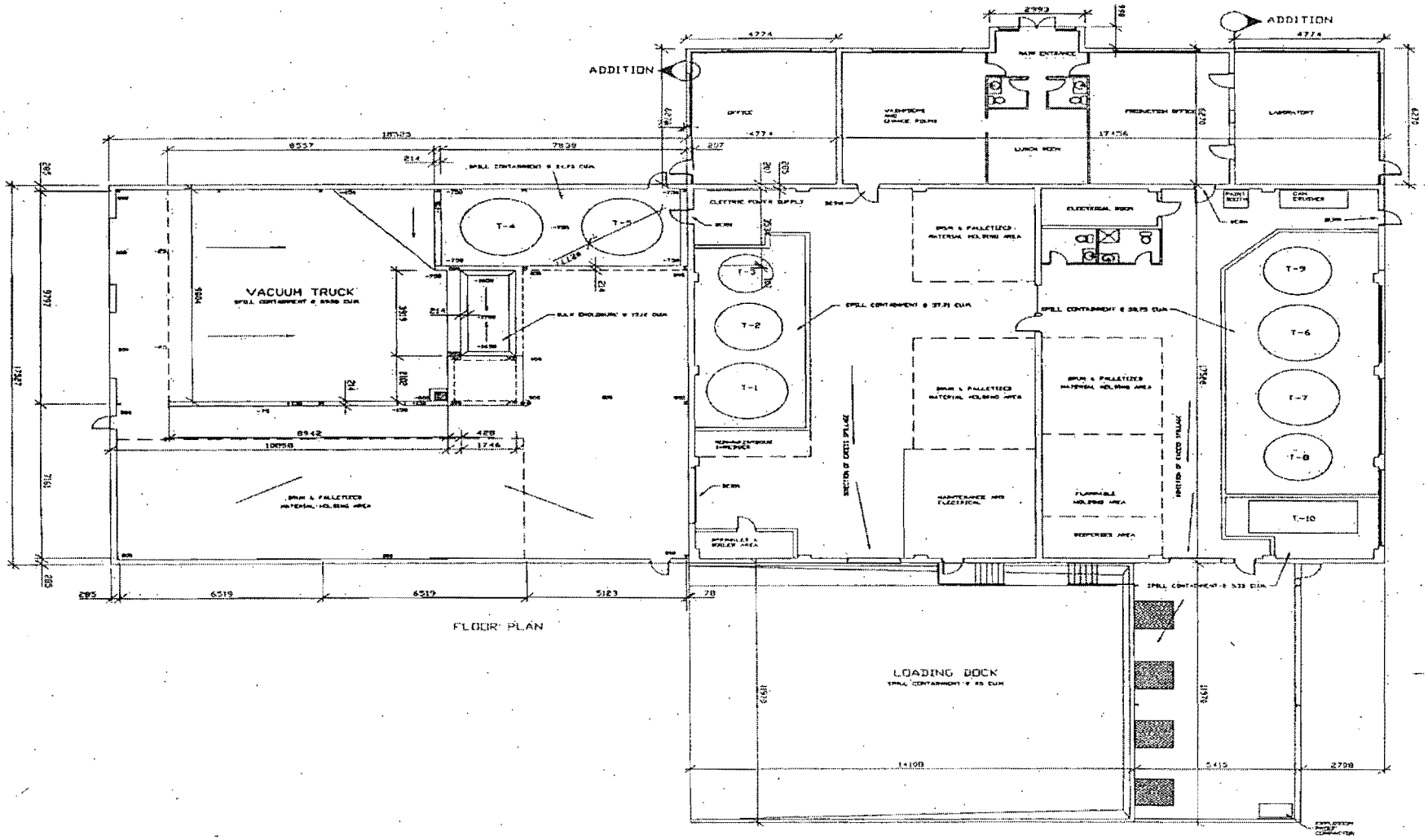


FIGURE 5.4: TYPICAL SITE LAYOUT OF WASTE TRANSFER FACILITY
Large transfer station dealing with many types of liquid wastes.



Typically waste transfer stations have the following infrastructure:

- Waste receiving area;
- Waste Processing Building;
- Waste storage area including tank farm;
- Administrative block including a laboratory;

Depending on the type of waste transfer station, operations conducted fall under the following headings:

5.2.2.1 Waste Receiving and Storage

Liquid Wastes: Liquid waste is received either in bulk containers or in smaller containers such as drums and totes. The receiving area is designed based on type of material handled. For example in case of liquid material transfer the floor of the receiving area is designed to contain any material spills. The loading and unloading of liquids is accomplished by means of either the facilities pumping capabilities or the vehicles capabilities. The truck port often has drive through capabilities with access to any processing facilities. In some facilities, liquid is unloaded outside the facility into facility pipeline and is conveyed to the processing / storage area.

Solid Wastes (Including Sludge, soils, other): Solids are received in bulk in lugger boxes and roll off containers or in smaller packages in drums, super sacs. The wastes received are manually inspected and a sample of every load is also sent to an on-site or off-laboratory for verifying if the waste characteristics are as per C of A conditions. Waste manifesting formalities are completed at this stage as per requirement of the provincial regulations. Waste loads are ticketed and tracked further with the ticket identification number.

The received liquid wastes are stored in tanks and solid wastes are stored in storage buildings or in other appropriate covered areas for further processing and/or transfer. Liquid storage tanks or tank farms have dykes for containment of spills.

5.2.2.2 Waste Processing

As described earlier there is wide variation between operations conducted in transfer facilities. The operations could be only waste storage and transfer or there could be varying degrees of waste processing and transfer.

Some of waste loads received could have preliminary processing including consolidation and bulking to make the waste suitable for final disposal or for recycling. Typical processing operations conducted are as follows:

Bulking, Blending, Mixing, Filtration - This is mainly carried out small quantity material in drums or totes. The bulking process deals with the transfer and mixing of small quantities of compatible material to a common tank, lugger or mixing vessel. This process creates batches of material with consistent composition which is then taken for further processing either in the same facility or in another facility. Material compatibility testing and determination of the mixing recipe is done in the laboratory.

Liquid processing often includes mechanical mixing and filtering. This mixing may result from the bulking of smaller containers into holding tanks or by direct agitation by means of agitation equipment. Bulking recipes are often established in the laboratory. Depending upon the type of material reagents such as lime, water is added for neutralization or other reactions to occur. The processed liquid waste could be then filtered to remove the solids.

Sludge and other similar solid material are subjected to blending in a blending pit often located inside a building. Compatible solid waste are unloaded into the pit and mixed using a mechanical mixer or by a dozer. Depending upon the type of material, reagents are added for consolidation of the waste material.

5.2.2.3 Waste Transfer

The stored and / or processed wastes are transferred to a licensed facility for further processing / disposal or recycling, as the case maybe.

If material is received in metal drums, the empty drums are either sent directly to a drum reclaimer, or is cleaned and crushed on site and sent for metal recycling. Similarly empty waste plastic drums are either shredded on site or sent out directly for further recycling.

6.0 STATUS OF ENVIRONMENTAL MANAGEMENT AT TRANSFER STATIONS AND COMPARISON WITH ESM REQUIREMENTS

6.1 OBLIGATIONS OF WASTE TRANSFER STATIONS AS REQUIRED BY ESM

Basel Convention

An underling principle of the Basel Convention is "environmentally sound management" (ESM). ESM is specifically discussed in the text of the Convention and is also the subject of a separate declaration, the "Basel Declaration on Environmentally Sound Management" (1999). The Declaration on ESM contains statements regarding waste minimization. The applicable statements include:

- prevention, minimization, recycling, recovery and disposal of hazardous wastes subject to the Basel Convention;
- active promotion and use of cleaner technologies with the aim of prevention and minimization of hazardous and other wastes subject to the Basel Convention;
- enhancement of information exchange, education and awareness-raising in all sectors of society;
- cooperation and partnership at all levels between countries, public authorities, international organizations, the industry sector, non-governmental organizations and academic institutions; and
- development of mechanisms for compliance with the monitoring and effective implementation of the Convention and its amendments.

OECD

The OECD Working Group on Waste Prevention and Recycling has proposed the core performance elements (CPE) of ESM guidelines applying to waste recovery facilities, including preceding collection, transport, treatment and storage, and subsequent storage, transport, treatment and/or disposal of pertinent residues.

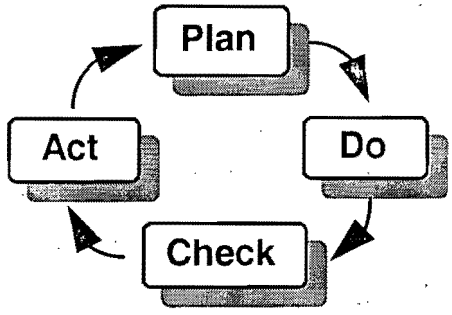
The draft recommended Core Performance Elements are:

- The facility should have an applicable Environmental Management System (EMS) in place.
- The recovery facility should take sufficient measures to safeguard occupational and environmental health and safety.
- The facility should have an adequate monitoring, recording and reporting programme.
- The facility should have an appropriate and adequate training programme for personnel.

- The facility should have an adequate emergency plan
- The facility should have an adequate plan for closure and after-care

ISO 14001

Most EMS models (including the ISO 14001 Standard) are built on the "Plan, Do, Check, Act" model. This model endorses the concept of continual improvement.



In the ISO 14001 EMS Standard, these "plan, do, check, act" steps have been expanded into seventeen EMS elements. The key elements for ISO 14001, 1996 is given in Table 6.1.

The ISO 14001 clearly addresses the core elements of ESM and also has several additional requirements.
Section 6 presents the review, analysis and assessment of facility profiles collected over the course of the study.

The results of the survey questionnaire that was sent to Hazardous Waste Transfer Facilities (defined as transfer facilities involved in the generation, transport, handling or disposal of hazardous waste destined for disposal operations) are presented in this section. Note that most respondents replied only to selected questions. When the responses were received, it was found that some of the respondents were recyclers, rather than SMEs for disposal. The results from these questionnaires were not considered here. They are, however, included in the SMEs for Recycling project that is also currently being completed.

6.2 ESM Conformance Status of Surveyed Transfer Facilities

The earlier sections have described that out of the 105 respondents, 60 facilities had an EMS. An EMS addresses several issues as discussed in Table 6.1 – Requirements of ISO 14001. These requirements are addressed as documented procedures, records, policies and so on.

As mentioned earlier, SENES has had an opportunity to carry out site audits of numerous hazardous waste transfer stations, as part of its contract with other clients. These audits also included review of EMS aspects on site by way of document reviews and personnel interviews.

Based on the above, Table 6.2 has been developed which describes the quality of implementation of EMS / ESM related requirements. Table 6.2 describes the existing status of implementation at transfer facilities for the applicable ISO 14001 elements. Elements which are proposed ESM criteria are also indicated.

TABLE 6.1
ELEMENTS OF AN ISO 14001 EMS: A SNAPSHOT

- **Environmental policy** — Develop a statement of your organization's commitment to the environment. Use this policy as a framework for planning and action.
- **Environmental aspects** — Identify environmental attributes of your products, activities and services. Determine those that could have significant impacts on the environment.
- **Legal and other requirements** — Identify and ensure access to relevant laws and regulations (and other requirements to which your organization adheres).
- **Objectives and targets** — Establish environmental goals for your organization, in line with your policy, environmental impacts, views of interested parties and other factors.
- **Environmental management program** — Plan actions to achieve objectives and targets.
- **Structure and responsibility** — Establish roles and responsibilities and provide resources.
- **Training, awareness and competence** — Ensure that your employees are trained and capable of carrying out their environmental responsibilities.
- **Communication** — Establish processes for internal and external communications on environmental management issues.
- **EMS documentation** — Maintain information on your EMS and related documents.
- **Document control** — Ensure effective management of procedures and other system documents.
- **Operational control** — Identify, plan and manage your operations and activities in line with your policy, objectives and targets.
- **Emergency preparedness and response** — Identify potential emergencies and develop procedures for preventing and responding to them.
- **Monitoring and measurement** — Monitor key activities and track performance.
- **Nonconformance and corrective and preventive action** — Identify and correct problems and prevent recurrences.
- **Records** — Keep adequate records of EMS performance.
- **EMS audit** — Periodically verify that your EMS is operating as intended.
- **Management review** — Periodically review your EMS with an eye to continual improvement.

TABLE 6.2 – ESM/ISO 14001 Requirements and Current Implementation Status

ISO 14001 Requirements (including proposed ESM criteria)*	Applicable Transfer Station Activity Area and EHS issues	Specific ESM / ISO 14001 Compliance Plans	Current Status
Defining environmental policy, significant environmental aspects, environmental objectives and targets for continual improvement, creating formalised structure and responsibility framework, creating procedures for communication channels and for document control.	All activity areas	Develop EMS on the lines of ISO 14001, 1996.	These elements were found mainly in facilities with an established EMS geared towards ISO certification or some facilities having a corporate environmental management department. In most other facilities, some elements were implemented (e.g. some facilities had an Environmental Health and Safety policy).
Operation Control Procedures for activities linked to significant environment, health and safety (EHS) issues.	All activity areas.	Typical activities or incidences which require operation control procedures include: • Operation and maintenance of critical equipment such as process reactors including blenders, pollution control equipment, and incinerators. • Operations such as Loading and unloading of waste material, Laboratory	Facilities with an established EMS (on lines of ISO 14001) or having a corporate environmental division, have well defined operation control procedures, which are identified and formulated after review of activities that can pose significant environmental risks. Majority of the facilities, however, do not have adequate mechanisms to evaluate the need of operation control procedures. The procedures available are ad-hoc. Critical procedures for operation of equipment are not well defined. Equipment is often operated based on hands-on training given by management.

ISO 14001 Requirements (including proposed ESM criteria)*	Applicable Transfer Station Activity Area and EHS issues	Specific ESM / ISO 14001 Compliance Plans	Current Status
Emergency Response Plans	All areas – especially needed for waste storage and processing areas	Emergency response plans should include: • Identification of hazards (e.g. fire, explosion, major spills) that can create an emergency situation • Determination of probable environmental and community impacts that can occur if the hazard occurs. • Hazard control procedure including infrastructure requirement. • Personnel evacuation procedure • Internal and external communication procedures • Reporting procedure. Periodic testing (drills) of emergency response plans should be carried out.	Most facilities were observed to posses documented fire response / spill response plans. Most plans reviewed included standard precautions in case of spills / fire. However, documented response plans geared towards hazards specific to the facility were not available. Response equipment such as fire extinguishers, spill kits were available in all applicable facilities. Testing of emergency response plans is often not done or is ad-hoc and is not scheduled in advance. Documentation of such drills is normally not available.
Personnel Training	All personnel carrying out activities, which have a potential to create significant environmental aspects.	• Identify training needs for personnel after reviewing regulatory requirements. • Provide adequate periodic training.	Actual training was provided in most facilities. The training provided was mainly geared towards regulatory requirements such as Workplace Hazardous Materials Information System and TDGR. Facilities also provide spills response

ISO 14001 Requirements (including proposed ESM criteria)*	Applicable Transfer Station Activity Area and EHS issues	Specific ESM / ISO 14001 Compliance Plans	Current Status
			and fire fighting training. Except the facilities with a defined EMS, most units do not have a training needs identification program. The schedule of training provided is also ad-hoc. Such facilities often employ only certified and experienced staff only, as there is no training infrastructure available in-house. Training records are seldom available at such facilities.
Monitoring, record keeping and reporting.	• For activities which have a potential to create significant environmental aspects. • Regulatory requirements	Identify parameters / activities that need monitoring, reporting and records. Monitoring needs are often governed by regulatory requirements. Typical monitoring that is carried out at transfer facilities include: • Quality and quantity of pollution discharge (e.g. air, wastewater, solid / hazardous waste) • Process parameters (e.g. temperature, pH, flow rate) of critical equipment such as pollution control equipment, and reactor vessels. • Environmental monitoring	Almost all facilities comply with monitoring, records keeping and reporting requirements as prescribed by the regulatory authorities. The requirements are defined in the certificate of approvals. However, requirement of monitoring and record keeping is not holistically studied with respect to the significant environmental aspects (risks) existing on site.

ISO 14001 Requirements (including proposed ESM criteria)*	Applicable Transfer Station Activity Area and EHS issues	Specific ESM / ISO 14001 Compliance Plans	Current Status
		such as ambient air, surface and groundwater, and noise. Typical records and reporting that are needed include: • Environmental and process parameter monitoring records • Waste throughput records / logs (including manifests) • Training records • Incident reporting and complaints received records • Regulatory correspondence and permits. • Inspection or audit reports • Regulatory or Corporate division of facilities often require reporting of monitored values.	
Environmental Audits	All activity areas	• Carry out periodic internal environmental audits as per defined frequency and methodology. • Prepare and implement corrective action plans for non-conformances identified.	Most facilities do not carry out systematic internal environmental audits, which are based on a defined methodology and frequency. They do however, carry out daily / weekly walk-through inspections which includes visual observation or checks of critical parameters (e.g. looking for any material spills, visual inspection of pipes

ISO 14001 Requirements (including proposed ESM criteria)*	Applicable Transfer Station Activity Area and EHS issues	Specific ESM / ISO 14001 Compliance Plans	Current Status
			/ tanks, inspection of storm drains for oil sheen). Inspection records may or may not be kept. Systematic environmental audits with defined frequency, methodology and reporting requirements are mainly carried out by facilities with an implemented EMS as per ISO 14001 or equivalent standard; by facilities with a corporate environmental division which carries out third party or corporate environmental audits; and by facility clients as a part of their own internal sub-contractor audit requirement.

* *Refer Table 6.1 - for explanation of individual elements.*

7.0 CONCLUSIONS

Environmentally Sound Management (ESM) of hazardous wastes is one of the underlining principles under the Basel Convention on the Transboundary Movement of Hazardous Waste and Their Disposal and Organization for Economic Co-operation and Development (OECD) Council Acts regarding the transboundary movement of wastes.

SENES carried out a study over the past few months on the operation of hazardous waste transfer stations in Canada. The inventory and a profile of such facilities that manage hazardous wastes, including those that are involved in movement of such wastes is presented in the previous sections of this report.

SENES carried out an extensive survey for this study and covered over 105 Transfer Stations across the country. Some interesting comments were noted when the respondents were contacted over the course of the survey.

- The survey results lead to the conclusion that the knowledge of ESM was not routinely identified as bearing significance upon the operations managers of Transfer Facilities in Canada, and that there was confusion in differentiating between ESM and EMS. The process and aspects of the incorporation of ESM into EMS were also not well understood.

- EMS or ISO 14001 are well understood terminologies but it is felt that most operators do not realise the effort and systems required to get certified and to keep the certificate active.

- While the larger companies routinely participated in EMS programs, it was found that the cost of such programs ($40,000 - $60,000) was prohibitive for the smaller companies. The ongoing costs of Continuous Improvement as required to renew the ISO certification were also deterring factors.

- The results of the survey indicated that while over half of the respondents indicated they had some type of (internal) EMS program in place, and approximately 10% were formally certified to ISO 14001.