

**TRANSBOUNDARY MOVEMENT OF MUNICIPAL SOLID WASTE
COMPREHENSIVE INSPECTION REPORT
Final**

Prepared for

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 5**

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3	TCLP REGULATORY LEVELS LISTED IN 40 CFR 261.24

1.0 INTRODUCTION

Tetra Tech EM Inc. (Tetra Tech) received Work Assignment No. R07125 from the U.S. Environmental Protection Agency (EPA) under Contract No. 68-W-02-021 to provide assistance to Resource Conservation and Recovery Act (RCRA) program staff in EPA Region 5. The overall purpose of the work assignment is to support EPA Region 5 in performing inspections at eight municipal solid waste (MSW), construction and demolition (C&D) debris, or industrial landfills in the vicinity of Detroit, Michigan, over a 7-month period. The inspections conducted by Tetra Tech personnel characterized MSW and other solid waste coming into selected landfills, and to document whether waste loads from Canada, states other than Michigan, and local sources appeared to be in accordance with federal, state and local environmental regulations. EPA and the Michigan Department of Environmental Quality (MDEQ) jointly selected the eight landfills based on (1) the amount of Canadian waste they receive and (2) the wide range of U.S. sources for the remaining waste they receive. According to MDEQ's annual landfill report for fiscal year 2005 (FY2005), the eight landfills received 99.7 percent (by volume) of all Canadian solid waste disposed of in Michigan landfills. In addition, these landfills received solid waste generated in 24 Michigan counties and 10 other states.

Section 2.0 of this report describes the inspection program, Section 3.0 presents the findings of the inspections conducted by Tetra Tech personnel, and Section 4.0 provides conclusions. References used to prepare this report are provided in Section 5.0.

2.0 INSPECTION PROGRAM

The purpose of the inspections was to document activities at the eight landfills listed below and determine whether the movement of waste to these landfills is being performed in compliance with federal, state, and local environmental regulations.

- Arbor Hills West, Washtenaw County
- Brent Run Landfill, Genesee County
- Carleton Farms Landfill, Wayne County
- Pine Tree Acres, Macomb County
- Richfield Landfill, Genesee County
- Rockwood Landfill, Monroe County
- Sauk Trail Hills Landfill, Wayne County
- Woodland Meadows, Wayne County

Tetra Tech conducted 246 weekly random inspections at the eight landfills over a period of 7 months. Introductory meetings were held with operators at each landfill at which Tetra Tech personnel described the inspection protocol, health and safety plan (HASP), and project-specific sampling and analysis plan (SAP) requirements. Introductory meetings also included MDEQ inspectors.

It is important to note that the “inspections” that were conducted by Tetra Tech personnel were not conducted as formal compliance inspections on behalf of the Michigan Department of Environmental Quality; in addition, Tetra Tech personnel do not have the authority to issue notices of violation. Rather, the work assignment was designed to allow Tetra Tech personnel during the inspections to characterize the MSW and other solid waste coming into the selected landfills, and to determine, to the extent possible, whether the loads appeared to be in accordance with Michigan’s solid waste regulations. When any problems were noted and documented, the Michigan Department of Environmental Quality and the landfill operator were immediately notified.

2.1 LANDFILL BACKGROUND

This section provides general background information on the eight landfills that were part of the inspection program. The following table summarizes each landfill’s location, owner, operator, and type.

**TABLE 1
 LANDFILL BACKGROUND**

Name	Location (City/Township County)	Owner/Operator	Type
Arbor Hills	Northville Washtenaw County	Onyx Waste Services Inc.	MSW
Brent Run	Montrose Genesee County	Republic Services of Michigan	MSW/C&D
Carleton Farms	Sumpter Twp. Wayne County	Republic Services of Michigan	MSW/C&D
Pine Tree Acres	Lenox Twp. Macomb County	Waste Management	MSW/C&D
Richfield	Davison Genesee County	Richfield Equities	MSW
Rockwood	Berlin Twp. Monroe County	Allied Waste Industries Inc.	C&D/Industrial
Sauk Trail Hills	Canton Wayne County	Allied Waste Industries Inc.	MSW
Woodland Meadows	Canton Wayne County	Waste Management	MSW

Table 2 summarizes the annual volume, source, and type of waste received at the landfills for FY2005. Of the truckload inspections conducted by Tetra Tech personnel, 85 percent occurred in FY2005.

**TABLE 2
 SOLID WASTE SOURCES AND VOLUMES FOR FISCAL YEAR 2005**

Name	Total SW Received in FY2005	SW Generated in Michigan		SW Generated in Other States		SW Generated in Canada	
		Amount (cu.yd.)	Percent of Total for Landfill	Amount (cu.yd.)	Percent of Total for Landfill	Amount (cu.yd.)	Percent of Total for Landfill
Arbor Hills	3,013,644	2,692,614	89.3%	0	0.0%	321,030	10.7%
Brent Run	1,612,796	459,795	28.5%	0	0.0%	1,153,001	71.5%
Carleton Farms	6,329,032	1,977,363	31.2%	78,184	1.2%	4,273,485	67.5%
Pine Tree Acres	7,301,190	1,947,951	26.7%	0	0.0%	5,353,239	73.3%
Richfield	562,759	453,405	80.6%	0	0.0%	109,354	19.4%
Rockwood	1,654,496	624,022	37.7%	759,923	45.9%	270,551	16.4%
Sauk Trail Hills	3,317,343	3,163,879	95.4%	4,056	0.1%	149,408	4.5%
Woodland Meadows	4,211,816	3,998,853	94.9%	1,789	0.0%	211,174	5.0%
Totals =	28,003,076	15,317,882	54.7%	843,952	3.0%	11,841,242	42.3%

Notes:

Data taken from "Report of Solid Waste Landfilled in Michigan: October 1, 2004 – September 30, 2005," Michigan Department of Environmental Quality, January 31, 2006.

SW = Solid waste
 cu. yd. = Cubic yard

2.2 INSPECTION PROTOCOL

This section describes how Tetra Tech personnel conducted inspections at the eight landfills.

At the beginning of the inspection period, MDEQ notified the appropriate landfill and county representatives in writing that Tetra Tech personnel would be conducting the inspections as stated in the approved work assignment work plan dated November 22, 2004. Upon arriving at the landfill, Tetra Tech personnel notified the landfill operator of their presence. On occasion, MDEQ and county inspectors accompanied Tetra Tech personnel during the landfill inspection. The Tetra Tech personnel followed the

EPA- and MDEQ-approved “Transboundary Movement of Municipal Solid Waste Inspection Procedures” (Tetra Tech 2005a).

Once on site, Tetra Tech personnel conducted random inspections to (1) avoid any sampling bias and (2) minimize disruption for the landfill and unloading trucks. When out-of-state trucks were selected, Tetra Tech personnel asked the landfill operators to provide shipping documents for further review. The shipping documents included MDEQ-required documents as well as Michigan Department of Transportation- or U.S. Customs-required documents. Tetra Tech personnel reviewed the shipping documents to obtain information on the origin of the waste, and to check for compliance with Sections 11526a (1)(b) and (c) of Michigan’s Natural Resources and Environmental Protection Act (NREPA), which requires out-of-state solid waste loads to be accompanied by one of the following three documents:

- Solid Waste Manifest Record – to show that the out-of-state waste comes from an approved jurisdiction (<http://www.deq.state.mi.us/documents/deq-whm-stsw-egp5223--solid-waste-manifest-record.pdf>).
- Prohibited Waste Removal Record – to show that the out-of-state truckload has been screened at a transfer, material recovery, or other facility and that (1) it does not contain prohibited items or (2) prohibited items found during the screening have been removed (<http://www.deq.state.mi.us/documents/deq-whm-stsw-prohibited-waste-cert-list.pdf>).
- Uniform Solid Waste Record – to show that the generator and the landfill operator have confirmed that the out-of-state waste is composed of uniform material other than municipal solid waste incinerator ash (<http://www.deq.state.mi.us/documents/deq-whm-stsw-uniform-solid-waste-record-memo-w-forms.pdf>)

Tetra Tech personnel and the landfill operator identified a location where the waste loads could be safely inspected and where potentially prohibited items or loads could be staged and secured for further investigation or further action, if specified by MDEQ. As part of the standard protocol, Tetra Tech personnel requested the operator to spread the waste load for further detailed investigation. After a thorough visual observation of the waste load, selected items/loads were photographed in the field, monitored for organic vapors, and monitored for radiation in accordance with methods listed in the standard operating procedures (SOP) included in the EPA- and MDEQ-approved Sampling and Analysis Plan (SAP) for the project (Tetra Tech 2005b). Over the 7-month period, the inspection location was changed as the location of the working face of the landfill changed.

Tetra Tech personnel surveyed all items in the waste load. They looked for items prohibited from disposal in an MSW landfill under Section 11514 of Part 115 of NREPA, freon-containing items, and other items generally considered to be non-uniform by Tetra Tech personnel. These items are as follows:

- Hazardous waste from regulated generators (40 *Code of Federal Regulations* [CFR] 261)
- Polychlorinated biphenyls (PCB) (40 CFR 761.3)
- Uncontained asbestos (40 CFR 61.154)
- Liquid waste (except household waste or liquids in small containers)
- Low-level radioactive waste
- Regulated medical waste
- Used oil
- Lead-acid batteries
- Sewage
- Beverage containers (non-*de minimis* quantities)
- Whole motor vehicle tires (“whole tires”) (non-*de minimis quantities*)
- Yard clippings (non-*de minimis* quantities)
- Appliances and other freon-containing items (unless the item has been properly evacuated as required under Section 608 of the Clean Air Act)

Further detailed descriptions and information on the proper handling of these items are provided in Attachments 1 and 2.

For those items having a *de minimis* threshold, Tetra Tech personnel used the MDEQ operational memo 115-27, Revision 1, (MDEQ, 2004) (<http://www.deq.state.MI.us/documents/deq-whm-opmemo-115-27r1-10-19-04.pdf>) to determine whether or not the quantities in question would be considered *de minimis*. This operational memo states that in order for quantities of beverage containers, whole tires or yard clippings to be considered *de minimis*, they must satisfy all of the following three criteria:

- Commingled with other waste in the truckload – It cannot be readily separated from the other waste
- Small in quantity –Typical of what a single household would generate
- Be present in an incidental manner as an unpredictable or minor accompaniment

Tetra Tech personnel looked for “non-uniform” characteristics when they examined the loads, because in their past professional experience, such characteristics often indicated the presence of potentially prohibited items. In general, Tetra Tech personnel considered a solid waste load to be “non-uniform” if it contained any of the following items or characteristics:

- Hazardous material placards or markings
- Hazardous waste labels or markings
- Drums or commercial-size containers (30 to 85 gallons or more)
- Sludges, powders, or dusts
- Liquids (except household waste or liquids in small containers)
- Bright or unusual colors of waste
- Chemical odors
- More than household quantities of batteries, neon lights, PCB ballasts, mercury switches, pesticides, or herbicides

These criteria were specified based on the professional experience of Tetra Tech personnel conducting the inspections.

Inspection forms developed for MDEQ’s general use were downloaded to a personal digital assistant (PDA) and completed for each inspected load by Tetra Tech personnel in the field. When any potentially prohibited or non-uniform items/loads were identified, the Tetra Tech personnel immediately notified the landfill operator. Upon notifying the landfill operator, Tetra Tech informed them that the load would be photographed and that MDEQ would be notified of the findings. After completing their documentation and photographs of the items in question, Tetra Tech personnel informed MDEQ about the potentially prohibited items. This notification enabled MDEQ to come to the landfill to view the potentially prohibited items in a timely manner (when MDEQ deemed it necessary). Occasionally, samples were collected by Tetra Tech personnel and analyzed by Tetra Tech’s subcontractor, RTI Laboratories in Livonia, Michigan, for hazardous and selected prohibited waste characteristics. Further details on sampling activities are provided in Section 3.6.

In most cases, the landfill operator chose to (1) segregate the problematic part of the load until MDEQ could confirm whether it was prohibited, (2) instruct the truck driver to take the problematic items away, or (3) follow MDEQ guidance on how to properly dispose of the items (see Attachment 2 for more details). Tetra Tech personnel sometimes provided advice on how the operator could safely segregate and store the waste in question until further action could be taken.

3.0 INSPECTION FINDINGS

Tetra Tech personnel conducted weekly inspections at eight landfills listed in Section 2.1 from March 28 through October 28, 2005. A total of 1,481 truckloads and 75,550 cubic yards (yd³) of waste were inspected. Figure 1 depicts the number and volumes of truckloads inspected at each landfill throughout the 7-month inspection period. The number of truckloads inspected ranged from 154 to 213 truckloads per landfill, while the total cubic yards of waste inspected ranged from 6,435 to 15,872 yd³ per landfill.

Tetra Tech personnel inspected truckloads of waste generated in the state of Michigan, as well as truckloads of waste generated in Canada or from domestic out-of-state sources. Figure 2 provides the breakdown of truckloads and volumes of waste from Michigan, Canada, and domestic out-of-state sources. The Canadian truckloads originated from several municipalities, and domestic out of state truckloads originated from several other states, as shown in Table 3. As shown on Figure 2, Canada accounted for roughly 44 percent (by volume) of the solid waste in the inspected loads, Michigan accounted for about 51 percent, and other U.S. states accounted for roughly 5 percent. Given that 85 percent of the inspected loads were received during FY2005, these percentages were compared to data for the individual landfills tabulated in MDEQ's annual landfill report for FY2005. From MDEQ's report, in FY2005 Canada accounted for roughly 42 percent (by volume) of the total solid waste shipped to the eight landfills, Michigan accounted for 55 percent, and other U.S. states accounted for 3 percent (see Table 2 for more details). This is consistent with the inspected load volumes, suggesting that the inspected volumes were representative of the larger volumes received during the entire fiscal year.

A total of 21 truckloads or 2,400 yd³ of Canadian waste were accompanied by Solid Waste Manifest Records, identifying them as having come from the MDEQ-approved jurisdictions of Durham and Toronto/Peel. An MDEQ-approved jurisdiction has landfill disposal prohibitions that are comparable to those in Michigan. Twelve truckloads (1,380 yd³) from Durham were received at Pine Tree Acres, and nine truckloads (1,020 yd³) from Toronto/Peel were received at Carleton Farms. All other out-of-state truckloads either came from jurisdictions that were not approved by MDEQ or from commercial sources not eligible for such MDEQ approval. As discussed previously, out-of-state truckloads that are not generated and collected by MDEQ-approved jurisdictions are required to either (1) be composed of waste that is uniform in nature (and not municipal solid waste ash), or (2) be screened for prohibited items at a transfer, material recovery, or other facility prior to arrival at the landfill.

FIGURE 1
NUMBERS AND VOLUMES OF SOLID WASTE TRUCKLOADS
INSPECTED BY TETRA TECH PERSONNEL FROM MARCH 28 2005, TO OCTOBER 28, 2005

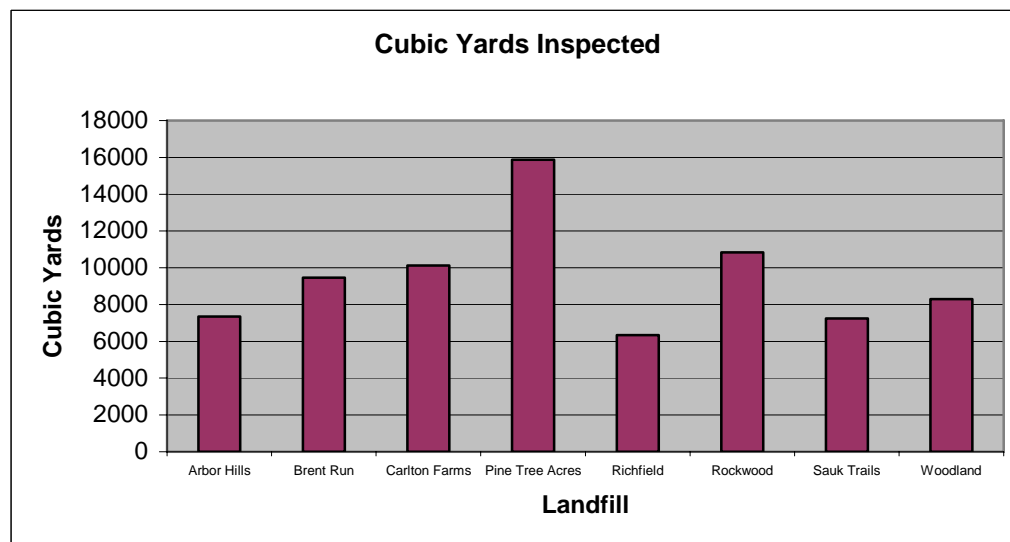
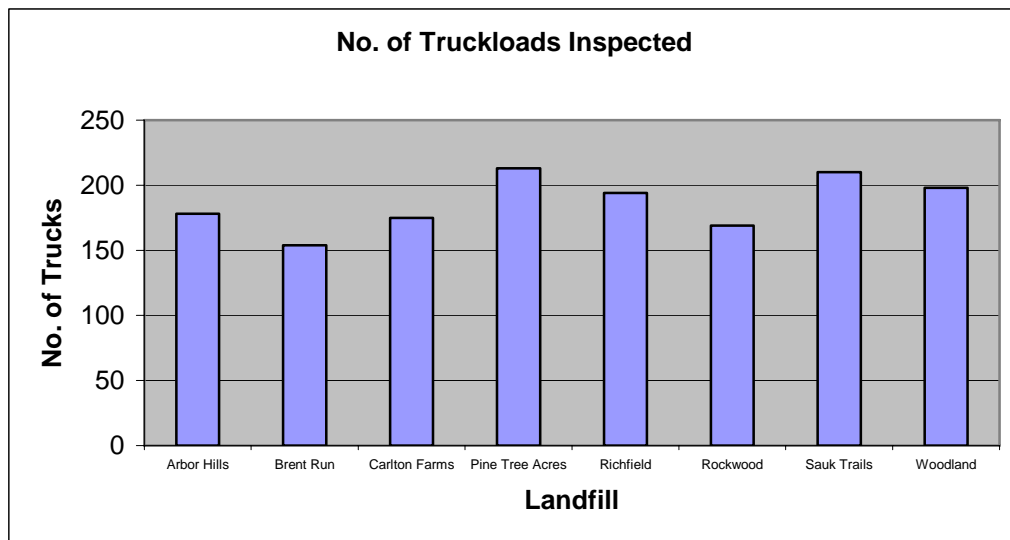
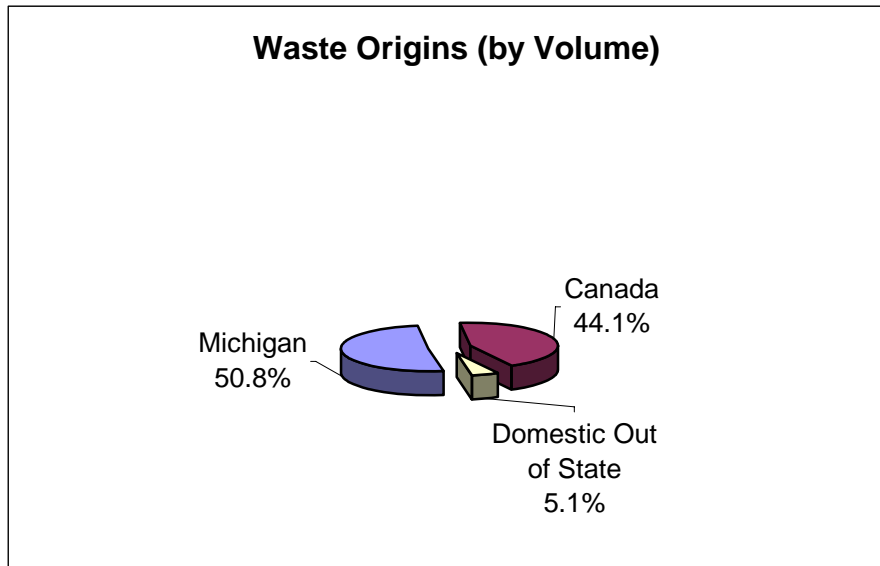
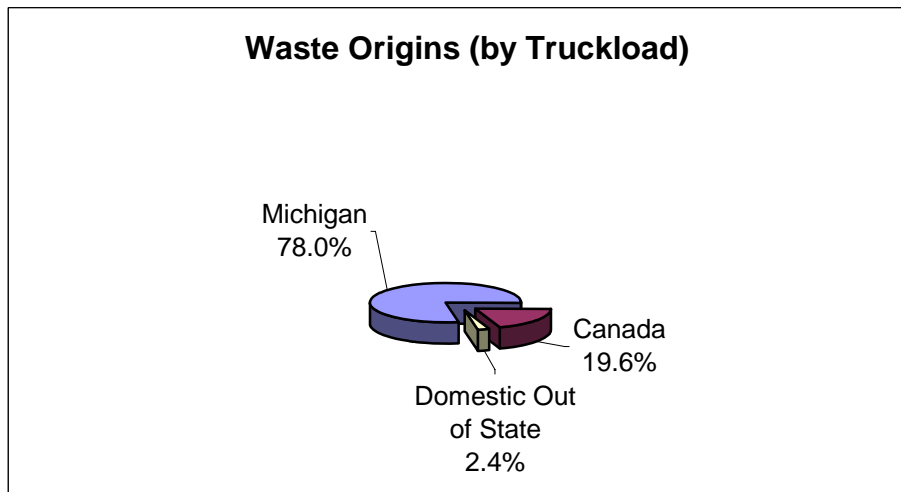


FIGURE 2
ORIGINS OF WASTE INSPECTED BY TETRA TECH PERSONNEL
FROM MARCH 28, 2005, TO OCTOBER 28, 2005
BY TRUCKLOAD AND VOLUME TOTALS



Note: Total volume of waste inspected = 75,550 yd³



Note: Total truckloads of waste inspected = 1,481

**TABLE 3
 CANADIAN AND DOMESTIC ORIGINS OF OUT-OF-STATE WASTE
 INSPECTED BY TETRA TECH PERSONNEL
 FROM MARCH 28, 2005, TO OCTOBER 28, 2005**

Location	Total No. of Inspected Loads	Total Volume of Inspected Loads (in yd³)
Barrie	3	360
Brampton	11	1,300
Cedar Valley	8	940
Clarington	1	120
Concord	11	1,212
Courtice	4	460
Durham (Approved Jurisdiction)	13	1,500
Elmira	2	220
Etobicoke	9	1,060
Geulph	3	320
Hamilton	14	1,640
Kitchner	2	240
Klienburg	17	1,980
London	5	600
Maidstone	5	540
Markham	14	1,640
Midhurst	1	120
Minesing	2	240
Mississauga	8	960
Oakville	5	600
Orangeville	1	120
Oshawa	3	360
Pickering	1	100
Port Berry	1	120
Sarnia	1	120
Toronto	56	6,560
Toronto/Peel (Approved Jurisdiction)	9	1,020
Waterloo	2	240
Weston	4	480
Whitby	9	1,080
Windsor	10	1,140
York	1	120
Connecticut	3	360
Indiana	1	25
New Jersey	14	1,630
New York	4	400
Ohio	12	1,330
Wisconsin	1	100

Notes: This table was generated for municipalities or states identified on shipping documents that accompanied the trucks. This table was also generated by tabulating the locations identified on shipping documents that accompanied the solid waste trucks inspected by Tetra Tech personnel. In the cases where a specific, MDEQ-approved municipal government was clearly identified as the generator of the inspected truckload, the specific municipal governments were separately noted (e.g., Toronto/Peel and Durham). But in most cases, the shipping documents simply identified the location the truck started from, such as a private transfer station, and not the individual companies or local governments that generated the waste.

Yd³ = Cubic yard

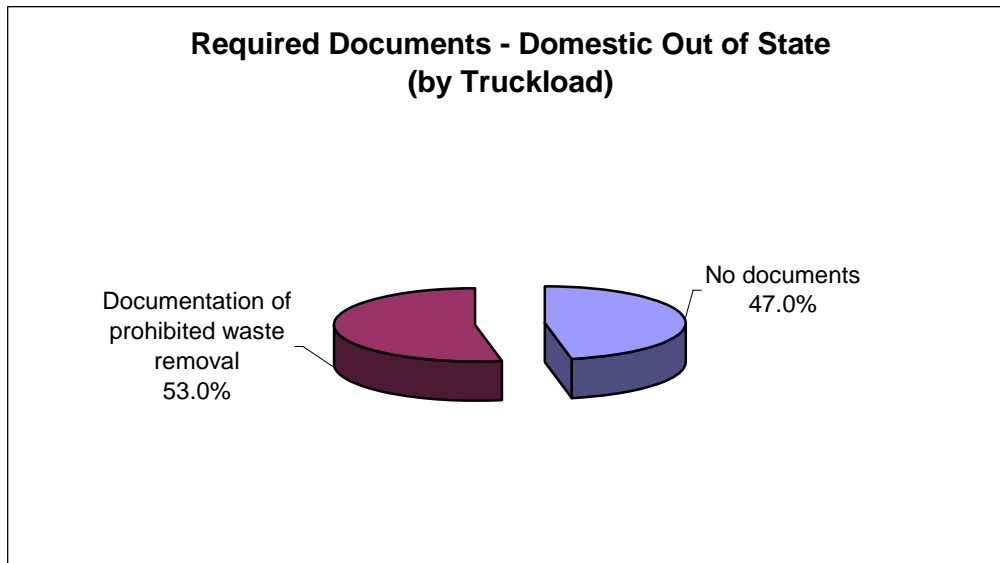
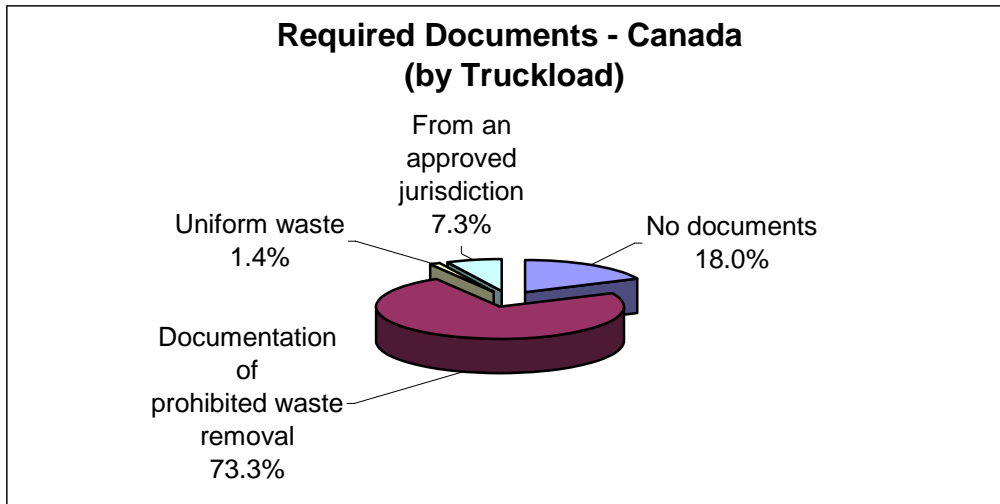
3.1 REQUIRED DOCUMENTS

As discussed in Section 2.2 of this report, Sections 11526a (1)(b) and (c) of Michigan's NREPA require out-of-state solid waste loads to be accompanied by one of the following three documents:

- Solid Waste Manifest Record –to show that the out-of-state waste comes from a county, state, province, or local jurisdiction approved by MDEQ.
- Prohibited Waste Removal Record – to show that the out-of-state truckload has been screened at a transfer, material recovery, or other facility and that (1) it does not contain prohibited items or (2) prohibited items found during the screening have been removed by employees of the transfer, material recovery, or other facility.
- Uniform Solid Waste Record – to show that the generator and the landfill operator have confirmed that the out-of-state waste is composed of uniform material, other than municipal solid waste incinerator ash.

Figure 3 illustrates the percentage of Canadian and domestic out-of-state truckloads that were accompanied by the required documents, as well as truckloads that did not have any documents. In general, most Canadian truckloads (73.3 percent) had Prohibited Waste Removal Records, several (7.3 percent) had Solid Waste Manifest Records, and very few (1.4 percent) had Uniform Solid Waste Records. The remainder (18.0 percent) had no documentation. On the other hand, only 53.0 percent domestic out-of-state truckloads had Prohibited Waste Removal Records, while the remainder (47 percent) had no documentation. If a truckload of waste did not have documentation showing that it came from an approved jurisdiction or if it was not screened at a transfer station, material recovery, or other facility, then the lack of documentation would indicate that no further screening was conducted on the waste before the waste arrived at the landfill. The frequency of Canadian and domestic out-of-state trucks having no documentation was higher in the first half of the inspection program than in the second half, with 57 Canadian and domestic out of state trucks (about 17 percent) having no documentation from March through June and 12 Canadian and domestic out-of-state trucks (about 4 percent) having no documentation from July through October. When out-of-state trucks did not have the required documentation, the truckloads were accepted by the landfill provided that no prohibited items were found. Tetra Tech personnel noted this lack of documentation during the inspections and forwarded this information to MDEQ.

FIGURE 3
REQUIRED DOCUMENTATION ACCOMPANYING DOMESTIC AND CANADIAN
OUT-OF-STATE SOLID WASTE TRUCKS INSPECTED BY TETRA TECH PERSONNEL
FROM MARCH 28, 2005, TO OCTOBER 28, 2005



3.2 POTENTIALLY PROHIBITED AND NON-UNIFORM ITEMS (WITHOUT *DE MINIMIS* THRESHOLDS) FOUND DURING INSPECTIONS

Figures 4 and 5 illustrate the occurrence of potentially prohibited items without *de minimis* thresholds that were noted in truckloads from Michigan and Canada, respectively. These occurrences are identified as “potentially prohibited” because in many cases additional information is needed regarding the item before a final determination can be made by MDEQ regarding whether an item is actually prohibited. For example, PCBs and asbestos have threshold limits below which they are not regulated. In the case of medical waste, the regulatory status depends partly on the source of the waste. The total number of incidents reported in the following figures are based on the initial identification of the items. Upon further investigation, it was sometimes discovered that the item would not likely be prohibited. As discussed in Section 2.2, Tetra Tech personnel informed MDEQ of any such items in a given load after completing the documentation for that load.

Michigan Truckloads

Potentially prohibited items without *de minimis* thresholds were found in 98 (8.5 percent) of the 1,156 truckloads carrying solid waste generated in Michigan that were inspected by Tetra Tech personnel.

Items most frequently detected included the following:

- Liquid waste occurred in 40 (3.5 percent) of the truckloads
- Freon appliances occurred in 29 (2.50 percent) of the truckloads

Other less frequently detected items included lead-acid batteries, potentially hazardous wastes, potential asbestos-containing materials, used oil, potential PCB-containing materials, potentially regulated medical wastes, and radioactive materials. In most cases, the potentially prohibited items were a small percentage of the total truckload volume.

FIGURE 4.
POTENTIALLY PROHIBITED ITEMS (WITHOUT DE MINIMIS THRESHOLDS) FOUND IN 1,156 MICHIGAN SOLID WASTE TRUCKLOADS INSPECTED BY TETRA TECH PERSONNEL FROM MARCH 28, 2005, TO OCTOBER 28 2005

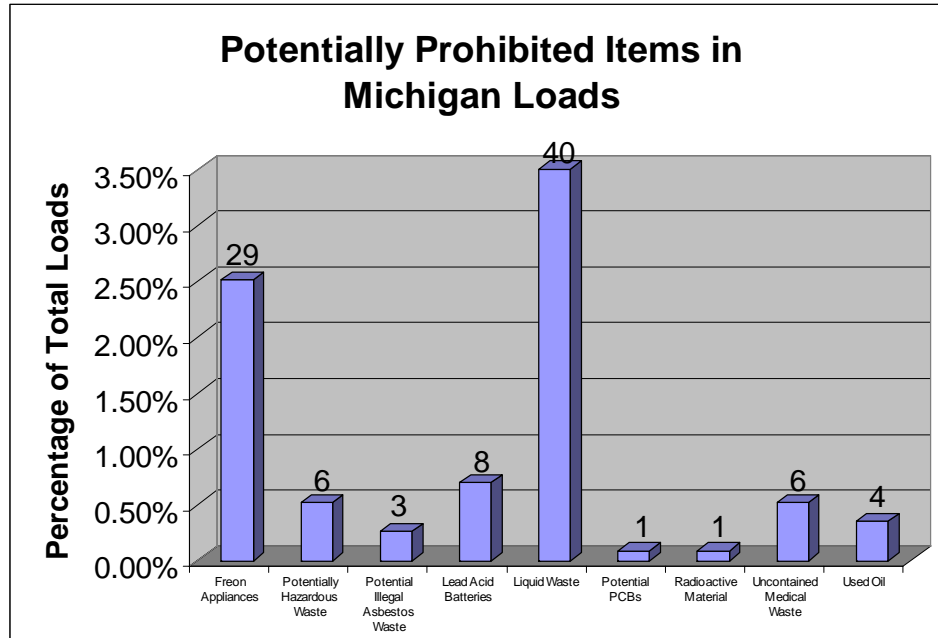
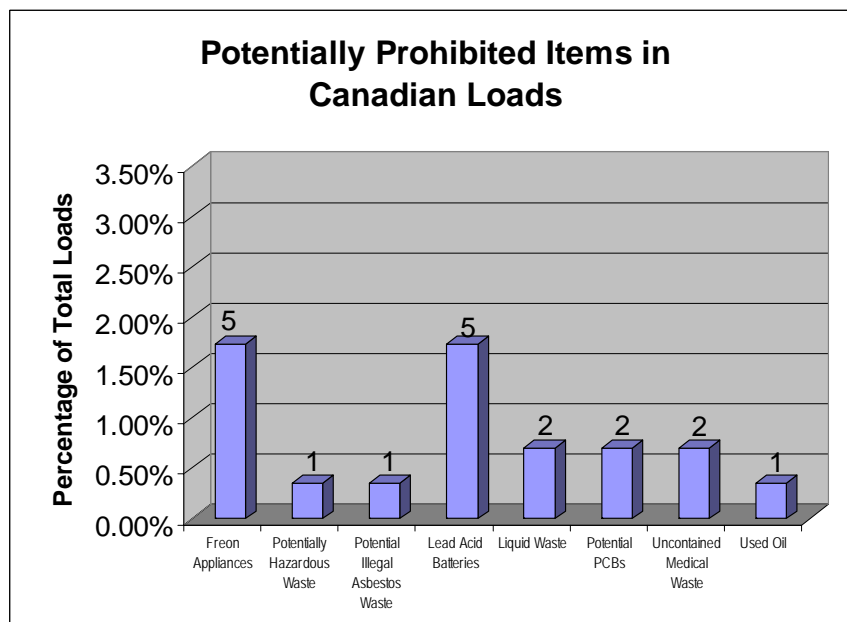


FIGURE 5.
POTENTIALLY PROHIBITED ITEMS (WITHOUT DE MINIMIS THRESHOLDS) FOUND IN 289 CANADIAN SOLID WASTE TRUCKLOADS INSPECTED BY TETRA TECH PERSONNEL FROM MARCH 28, 2005, TO OCTOBER 28, 2005



Note: In each figure, the number at the top of each column indicates the number of loads found to contain the prohibited item.

Medical waste, as defined in Michigan's Medical Waste Regulatory Act (MWRA), generally consists of the following wastes that have not originated from a household, farm, agricultural business, home for the aged, or home healthcare agency: (1) infectious agent cultures and stocks; (2) human or animal bodily fluids; (3) pathological waste such as tissues, organs, and body parts; (4) uncontained sharps; and (5) human or animal waste contaminated with infectious agents.

Potentially regulated medical waste occurred in six of the truckloads carrying waste generated in Michigan. Of the six Michigan truckloads, MDEQ determined that two were not regulated because they did not meet the definition of medical waste in the Michigan Medical Waste Regulatory Act. The non-regulated solid materials from these two trucks were subsequently buried in the landfills that had received the truckloads for disposal.

The other four truckloads originated from hospitals and contained significant amounts of vials, tubing, and bags with blood and other fluids, as well as sharp items. Two of these truckloads were taken off site by the hauler who had brought the waste to the landfill. The medical wastes found in the other two truckloads were shipped to a medical waste treatment facility.

Radioactive material occurred in one truckload from Michigan. A representative of the MDEQ Radiological Protection and Medical Waste Section conducted a follow-up inspection of the truckload. It was determined that the material was naturally occurring radioactive material, and MDEQ gave permission for the material to be disposed of in the landfill.

Canadian Truckloads

Potentially prohibited items without *de minimis* thresholds were found in approximately 19 (6.6 percent) of the 289 inspected truckloads carrying solid waste generated in Canada. Items most frequently detected included the following:

- Freon appliances occurred in five (1.70 percent) of the truckloads
- Lead-acid batteries occurred in five (1.70 percent) of the truckloads

Other less frequently detected items included potentially hazardous waste, PCB-containing material, asbestos containing material, liquid waste, used oil, and potentially regulated medical waste. In most cases, the potentially prohibited items were a small percentage of the total truckload volume.

For the 21 truckloads from MDEQ-approved jurisdictions, 2 truckloads (9.5%) contained potentially prohibited items without *de minimis* thresholds. One load from the MDEQ-approved jurisdiction of Toronto/Peel contained potentially regulated medical waste, and one load from the approved jurisdiction of Durham contained freon appliances. Of the 268 truckloads from jurisdictions not approved by MDEQ or commercial transfer stations, 17 truckloads (6.3%) contained prohibited items without *de minimis* thresholds.

Potentially regulated medical waste occurred in two Canadian truckloads. One truckload originated from the approved jurisdiction of Toronto/Peel. The other truckload originated from a commercial transfer station located in the municipality of Whitby. MDEQ determined that the Toronto/Peel waste was not regulated because it did not meet the MWRA definition of medical waste. The truckload from Toronto/Peel was taken off site by the hauler before MDEQ made this determination. The load from Whitby was buried in the landfill .

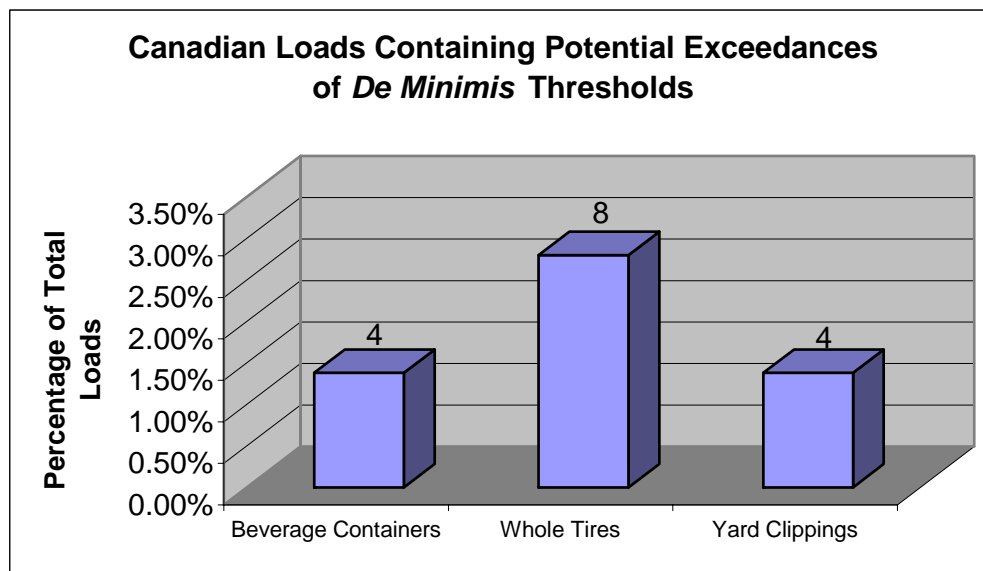
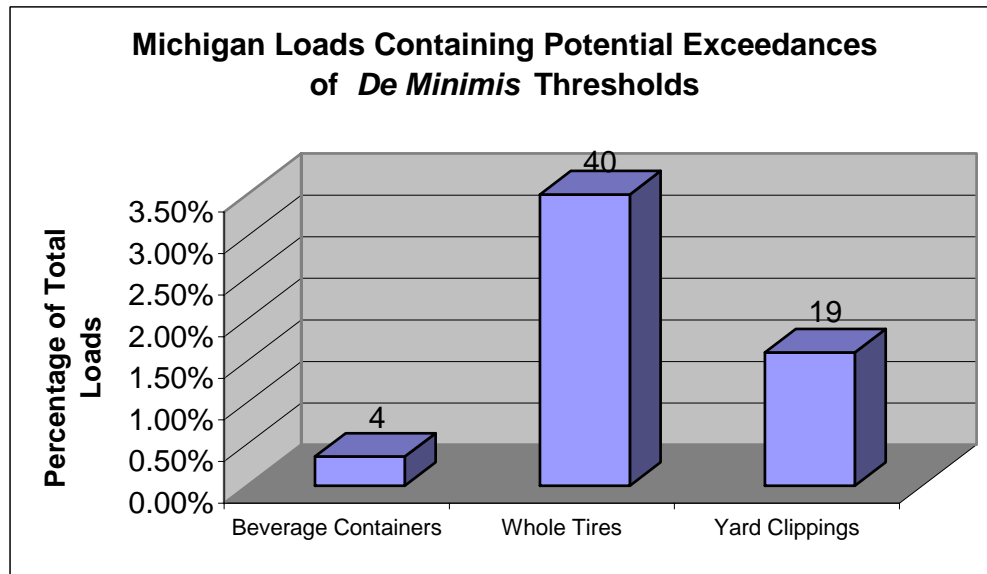
Domestic Out-of State Truckloads

Potentially prohibited items without a *de minimis* threshold were found in only 2 of 36 (5.5 percent) inspected domestic out-of-state loads. Freon appliances were found in a load from Ohio. One load from Indiana was identified as having potential asbestos-containing material, but subsequent analysis of a sample of this material showed that it did not contain asbestos at levels above regulatory limits and therefore, was not prohibited.

3.3 POTENTIALLY PROHIBITED ITEMS (WITH *DE MINIMIS* THRESHOLDS) FOUND DURING INSPECTIONS

According to Section 11514, Part 115, of NREPA, more than *de minimis* quantities of beverage containers, whole tires, and yard clippings are also prohibited from disposal in Michigan MSW landfills. Figure 6 illustrates the potential occurrence of more than *de minimis* quantities of beverage containers, whole tires, and yard clippings in truckloads from Michigan and Canada that were inspected by Tetra Tech personnel from March 28, 2005, to October 28, 2005.

FIGURE 6
MICHIGAN AND CANADIAN SHIPMENTS CONTAINING ITEMS THAT POTENTIALLY EXCEED DE MINIMIS THRESHOLDS IN LOADS INSPECTED BY TETRA TECH PERSONNEL FROM MARCH 28, 2005, TO OCTOBER 28, 2005



Note: In each figure, the number at the top of each column indicates the number of loads found to contain the prohibited item.

Michigan Truckloads

More than *de minimis* quantities of beverage containers, whole tires, or yard clippings were potentially found in 63 (5.4 percent) of the 1,156 truckloads carrying solid waste generated in Michigan. Whole tires occurred most frequently—in 40 (3.50 percent) of the truckloads. Yard clippings occurred in 19 (1.6 percent) of the truckloads, and beverage containers occurred in four (0.35 percent).

Canadian Truckloads

More than *de minimis* quantities of beverage containers, whole tires, or yard clippings were potentially found in 16 (5.5 percent) of the 289 truckloads carrying solid waste generated in Canada. Whole tires occurred most frequently—in eight (2.8 percent) of the truckloads. Yard clippings occurred in four (1.4 percent) of the truckloads, and beverage containers occurred in four (1.4 percent).

None of the 21 truckloads from MDEQ-approved jurisdictions appeared to potentially contain more than *de minimis* quantities of beverage containers, whole tires, or yard clippings. Of the 268 truckloads from jurisdictions not approved by MDEQ or commercial transfer stations, 16 truckloads (6.0 percent) potentially contained more than *de minimis* quantities of beverage containers, whole tires, or yard clippings.

Domestic Out-of State Truckloads

None of the 36 inspected truckloads carrying solid waste generated from domestic out-of-state sources appeared to potentially contain more than *de minimis* quantities of beverage containers, whole tires, and yard clippings.

Table 4 summarizes the temporal variations in the incidents from all sources (Canadian, Michigan, and domestic out-of state) potentially containing more than *de minimis* quantities of beverage containers, whole tires, and yard clippings. In general, potential exceedances of threshold levels for beverage containers, whole tires, and yard clippings were found most frequently in truckloads inspected during the month of May 2005.

TABLE 4
POTENTIAL EXCEEDANCES OF PROHIBITED ITEMS WITH DE MINIMIS THRESHOLDS
FOUND IN 1,481 SOLID WASTE TRUCKLOADS INSPECTED FROM
MARCH 28, 2005, TO OCTOBER 28, 2005

Month	Loads With Beverage Containers	Loads With Whole Tires	Loads With Yard Clippings
April	1	6	8
May	4	14	10
June	2	6	3
July	0	4	1
August	0	7	0
September	0	5	1
October	0	5	0

3.4 REJECTED LOAD SUMMARY

When Tetra Tech personnel identified potentially prohibited items, the landfill operators were immediately notified and the items were removed and placed back on the truck or segregated from the rest of the truckload for further investigation. Occasionally, the landfill operators rejected entire truckloads if the potentially prohibited material could not be segregated from the rest of the load. For example, during an inspection of Rockwood Landfill on May 9, 2005, the operators rejected an entire truckload of waste because it potentially contained more than *de minimis* quantities of yard clippings that could not be effectively removed from the rest of the waste.

At the Rockwood Landfill (which is licensed for C&D and industrial waste), waste that appeared to be MSW was frequently mixed with C&D and industrial wastes. The volume of MSW was recorded as percent by volume. The findings prompted MDEQ personnel to discuss appropriate types and sources of waste with landfill management. As a result, three loads were subsequently rejected during Tetra Tech inspections for having an excessive amount of MSW.

3.5 SAMPLES COLLECTED

Throughout the inspection period, Tetra Tech personnel collected samples from truckloads suspected of containing hazardous waste or other potentially prohibited items such as asbestos or PCB-containing materials. During the 7-month inspection period, samples were collected from 14 Michigan, 4 Canadian, and 1 domestic out-of-state truckloads. In general, Tetra Tech personnel used field screening results for volatile organic compounds (VOC), pH, and radioactivity, as well as written waste profiles (when available) and visual observation of the waste to determine analytes for laboratory analysis. The specific rationale for collecting each individual sample, as well as target analytes, are provided in Table 5. One grab sample was collected from each truckload identified for sampling by Tetra Tech personnel. The samples and required quality control samples were collected in accordance with Tetra Tech's EPA- and MDEQ-approved project-specific SAP (Tetra Tech 2005b). The samples were analyzed by RTI Laboratories in Livonia, Michigan. All analytical data received from RTI Laboratories were validated by Tetra Tech personnel, and data validation reports were submitted to EPA and MDEQ. Table 5 summarizes samples collected and the results. Regulatory levels used to evaluate sample results are provided in Table 6.

Two liquid waste samples collected from the Michigan truckloads were found to exhibit hazardous waste characteristics. One sample was toxic for benzene (D018), and the other was both ignitable (D001) and toxic for benzene (D018). The liquid hazardous waste was found in nonresidential quantities, but it could not be determined whether the waste came from a conditionally exempt small quantity hazardous waste generator (CESQG) or a regulated generator. If the waste came from a CESQG, it is not prohibited from disposal in the landfill.

Two other liquid waste samples collected from Michigan truckloads were designated as possibly above regulatory limits because the high level of nontarget analytes required that the sample be diluted. This consequently raised detection limits for some toxicity characteristic leaching procedure (TCLP) constituents to above regulatory limits. Therefore, no determination could be made concerning whether the samples exhibited the toxicity characteristic. However, because the waste was liquid, it was already considered prohibited. In addition, three solid waste samples collected from Michigan truckloads and one solid waste sample collected from a Canadian truckload were designated as possibly above regulatory levels because matrix interference caused sample results to be biased low. Therefore, no determination could be made concerning whether the samples exhibit the toxicity characteristic.

**TABLE 5
 TRANSBOUNDARY SAMPLE COLLECTION SUMMARY**

Landfill	Sample Number	Date	Source, Entity	Rationale for Sampling	Analytes	Final Findings
Sauk Trails	ST-1	3/29/2005	MI Truck, Sauk Trails 3	liquid waste (labeled "hydraulic fluid") possibly hazardous	TCLP Ignitability	hazardous (D001, D018)
Richfield	Richfield-1	3/30/2005	OS Truck, richfield-1	solid material (insulation) possibly asbestos containing material	Asbestos	below regulatory limits
Brent Run	BR2	4/6/2005	CA Truck, br2	solid material (ballast) possibly PCB containing material	PCBs	below regulatory limits
Woodland Meadows	Woodland-1	4/5/2005	MI Truck, Woodland 5	solid material (insulation), possibly asbestos containing material	Asbestos	below regulatory limits
Woodland Meadows	Woodland-2	4/5/2005	MI Truck, Woodland 5	solid material (insulation), possibly asbestos containing material	Asbestos	below regulatory limits
Arbor Hills	AH5	4/7/2005	MI Truck, ah5	soil in a roll-off box, possibly hazardous	TCLP PCBs	below regulatory limits
Arbor Hills	AH2	4/7/2005	MI Truck, ah2	non-uniform (blue powder), possibly hazardous	TCLP	below regulatory limits
Pine Tree Acres	PTA 3	4/7/2005	MI Truck pta3	solid material (construction material), possibly asbestos containing material	Asbestos	below regulatory limits
Brent Run	BR1	4/11/2005	CA Truck, BR1	solid material (insulation) possibly asbestos containing material	Asbestos	below regulatory limits
Richfield	RF3-1	4/11/2005	MI Truck, RF3	liquid waste (in paint cans), possibly hazardous	TCLP Ignitability	hazardous (D018)
Richfield	RF3-2	4/11/2005	MI Truck, RF3	liquid waste (in paint cans), possibly hazardous	TCLP	possibly above regulatory limits ^a
Pine Tree Acres	PTA6	4/13/2005	MI Truck, PTA6	liquid waste (labeled liquid smoke) possibly hazardous	Ignitability	possibly above regulatory limits ^a
Woodland Meadows	WM0524	5/24/2005	CA Truck	solid material (black sand in a polybag) possibly hazardous	TCLP	possibly above regulatory limits ^b
Woodland Meadows	Woodland Meadows 6/29/05	6/29/2005	MI Truck	soil in drums, possibly hazardous solid material (foundry sand)	TCLP	possibly above regulatory limits ^b
Rockwood	Rockwood 1	10/6/2005	MI Truck	verification of waste authorization ^c solid material (foundry sand)	TCLP	below regulatory limits
Carleton Farms	Carleton Farms 1	10/6/2005	MI Truck	verification of waste authorization ^c solid material (sludge)	TCLP	below regulatory limits
Woodland Meadows	Woodland Meadows 1A	10/10/2005	MI Truck	verification of waste authorization ^c solid material (grinding sludge)	TCLP	possibly above regulatory limits ^d
Pine Tree Acres	Pine Tree Acres 1	10/11/2005	MI Truck	verification of waste authorization ^c solid material (fly ash)	TCLP	possibly above regulatory limits ^d
Carleton Farms	Carleton Farms 2	10/13/2005	CA Truck	verification of waste authorization ^c	TCLP	below regulatory limits

Notes:

CA = Canada

MI = Michigan

OS = Out of State

PCB = Polychlorinated biphenyl

TCLP = Toxicity characteristic leaching procedure

- a Sample is possibly hazardous. Sample dilution caused detection limits for some VOCs and SVOCs to be elevated above the regulatory limit. Therefore determination of whether the samples exhibit the toxicity characteristic could not be made.
- b Sample is possibly hazardous. Matrix interference caused sample results for metals to be biased low. Therefore determination of whether the samples exhibit the toxicity characteristic for metals could not be made.
- c Landfills were authorized to accept these materials as nonhazardous waste. The samples were collected to verify that they were nonhazardous.
- d Sample is possibly hazardous. Matrix interference caused sample results for SVOCs to be biased low. Therefore determination of whether the samples exhibit the toxicity characteristic for SVOCs could not be made.

TABLE 6
REGULATORY LIMITS USED TO EVALUATE SAMPLES
COLLECTED FROM MARCH 28, 2005, TO OCTOBER 28, 2005

Prohibited Item	Constituent	Regulatory Limits	Hazardous Waste Code
Hazardous Waste	Ignitability	Flash Point < 140 °F	D001
Hazardous Waste	Corrosivity	pH \leq 2 or \geq 12.5	D002
Hazardous Waste	Reactivity	See 40 CFR 261.23	D003
Hazardous Waste	Toxicity	See 40 CFR 261.24 (Attachment 3)	D004 through D043
Asbestos-Containing Material	Asbestos	> 1%	NA
PCB-Containing Material	PCBs	50 ppm	NA

Notes:

- CFR = Code of Federal Regulations
- °F = Degrees Fahrenheit
- PCB = Polychlorinated biphenyl
- ppm = Parts per million
- TCLP = Toxicity characteristic leaching procedure
- < = Less than
- > = Greater than

Three samples of potential asbestos wastes were collected from Michigan trucks. One sample of potential asbestos waste was also collected from one Canadian truck and one domestic out-of-state truck. All asbestos sample results were below the regulatory limits.

One sample of possible PCB waste was collected from a Canadian truck. The sample results were below the regulatory limit.

EPA also requested that Tetra Tech personnel collect samples to verify that certain wastes that were authorized for acceptance at the landfills were indeed nonhazardous. Five truckloads of authorized wastes were sampled. All sample results were below the regulatory limits for hazardous waste.

4.0 CONCLUSIONS

The following conclusions are based on the data collected during the 7-month inspection period:

- A higher percentage of potentially prohibited items without *de minimis* thresholds were found in Michigan truckloads than in Canadian or out-of-state domestic truckloads (8.5 versus 6.6 and 5.5 percent, respectively).
- Liquid wastes and freon appliances were the most frequently found potentially prohibited items (without a *de minimis* threshold) noted in Michigan truckloads. Although only small amounts of this liquid waste exhibited hazardous waste characteristics, the source of the waste could not be determined.
- Lead acid batteries and freon appliances were the most frequently found potentially prohibited items (without a *de minimis* threshold) noted in Canadian truckloads.
- Regulated medical waste was found in four of the inspected Michigan truckloads. Although the frequency was quite low (less than 1 percent of the inspected truckloads) and federal regulations allow disposal of medical waste at solid waste landfills, there are specific Michigan requirements that must be followed to minimize possible hazards that such medical waste may pose if it is not managed appropriately by generators, transporters, and landfill personnel. These concerns can be addressed through additional follow-up and outreach activities by MDEQ.
- Potential exceedances of *de minimis* quantities of beverage containers, whole tires, and yard clippings occurred more frequently in spring months than in summer or fall months.
- Yard clippings occurred in the inspected truckloads from Michigan at a slightly greater frequency than in inspected loads from Canada (1.6 and 1.4 percent, respectively).

- The frequency for potential exceedances of beverage containers was very small in the inspected truckloads from both Michigan and Canada (0.35 and 1.4 percent, respectively). The frequency was greater in Canadian truckloads, possibly because the Canadian province from which the waste originated does not have a “bottle bill.”
- Although landfill operators stated that procedures were in place and annual training was conducted regarding proper operating procedures at their landfills, Tetra Tech personnel observed that landfill operators did not consistently implement screening procedures for prohibited items.
- As the Tetra Tech inspection program progressed, there were fewer Canadian or domestic out-of-state truckloads without the required documents. This is likely attributed to improved communications between landfill operators, haulers, and generator facilities regarding documentation requirements.

5.0 REFERENCES

Michigan Department of Environmental Quality (MDEQ). 2004. Enforcement of Prohibited Waste Restrictions. Operational Memo 115-27, Revision 1. October 19.

Tetra Tech EM Inc. (Tetra Tech). 2005a. “Transboundary Movement of Municipal Solid Waste Inspection Procedures, Final.” March 3.

Tetra Tech. 2005b. “Transboundary Movement of Municipal Solid Waste Sampling and Analysis Plan, Final.” March 28.

ATTACHMENT 1
MDEQ MUNICIPAL SOLID WASTE LANDFILL DISPOSAL PROHIBITIONS
(Two Sheets)

Attachment 1

Municipal Solid Waste Landfill Disposal Prohibitions

Items “banned” or otherwise prohibited from disposal in Type II **Municipal Solid Waste (MSW) Landfills** per Michigan or federal law:

- (1) Yard clippings (Section 11521 of Part 115, Solid Waste Management, of the NREPA; Rule 430)

“Yard clippings” means leaves, grass clippings, vegetable or other garden debris, shrubbery, or brush or tree trimmings, less than four feet in length and two inches in diameter, that can be converted to compost humus. Yard clippings do not include stumps, agricultural wastes, animal waste, roots, sewage sludge, or garbage.

NOTE: Operational Memorandum GEN-13 provides for the use of compost produced from yard clippings as daily cover in an MSW landfill. The DEQ has stated that ban does not apply to Christmas trees and wreaths.

- (2) Lead acid batteries (Rule 430 and Part 171, Battery Disposal, of the NREPA)

“Lead acid battery” means a storage battery, that is used to start an internal combustion engine or as the principal electrical power source for a vehicle, in which the electrodes are grids of lead containing lead oxides that change in composition during charging and discharging, and the electrolyte is dilute sulfuric acid.

NOTE: Prohibition applies regardless of source (household or otherwise).

- (3) Liquid waste (Rule 430)

“Liquid waste” means bulk or noncontainerized liquid waste or waste that contains free liquids and containers that hold liquid waste (other than containers normally found in household waste).

- (4) Hazardous waste (Rule 430)

“Hazardous waste” means regulated hazardous waste under Part 111, Hazardous Waste Management, of the NREPA. This does not include household hazardous waste or hazardous waste generated by conditionally exempt small quantity generators.

- (5) Sewage (Rule 430)

“Sewage” is not defined under Part 115. However, rules under Part 31, Water Resources Protection, of the NREPA define “sanitary sewage” as treated or untreated wastes that contain only human metabolic wastes or wastes generated and discharged as a result of domestic or restaurant activities.

- (6) PCBs and PCB items (40 CFR §761.3 and Rule 430)

“PCB Items” are defined in 40 CFR §761.3 as any PCB article, PCB article container, PCB equipment, or anything that deliberately or unintentionally contains or has as a part of it any PCB or PCBs. This definition has been considered to include only PCB waste that is subject to the disposal requirements of 40 CFR, Part 761, Subpart D, and does not include household PCB waste, certain small capacitors, etc.

(7) Materials that would adversely affect the liner or leachate system (Rule 430)

Materials that would adversely affect the liner are most commonly wastes that could puncture the liner during initial fill activities, such as certain kinds of demolition waste. These could also be chemical wastes incompatible with liner materials.

(8) Asbestos waste, unless the landfill complies with 40 CFR §61.154 (Rule 430)

“Asbestos waste” means mill tailings or any waste that contains commercial asbestos and is generated by a source subject to 40 CFR, Part 61. This includes filters from control devices, friable asbestos waste material, and bags or similar packing contaminated with commercial asbestos.

(9) Empty drums, unless crushed to eliminate voids (Rule 430)

Part 115 and its rules do not define “empty.” Any drum accepted should be crushed to eliminate voids.

(10) Used oil (Section 16704 of NREPA)

“Used Oil” is defined in Part 167, Used Oil Recycling, of the NREPA as petroleum based oil, which through use, storage, or handling has become unsuitable for its original purpose due to the presence of impurities or loss of original properties. Part 167 provides no exemptions for oil generated from households.

(11) Medical wastes, unless disposal complies with the Medical Waste Regulatory Act (333.13801 to 333.13831 of the Michigan Compiled Laws)

“Medical waste” is defined by the Medical Waste Regulatory Act (MWRA) as certain waste not generated from a household, farm operation, home for the aged, or home health care agency. These include cultures of infectious agents, liquid human and animal waste, pathological waste, sharps, and infectious waste from animals. The MWRA prohibits these from a landfill in liquid form and requires that sharps be placed in rigid, puncture resistant, and appropriately labeled containers.

(12) Radioactive material

Radioactive waste regulated by the U.S. Nuclear Regulatory Commission (NRC) may be prohibited for disposal at an MSW landfill under 10 CFR, Part 20. Medical waste containing radioactive isotopes and naturally occurring radioactive material (NORM) waste are not regulated by the NRC. For NORM waste, the DEQ has established recommended upper limits on this material for disposal in MSW landfills.

(13) Appliances containing refrigerant

Appliances still containing a refrigerant, such as refrigerators, freezers, and air conditioners, must be evacuated to a recovery or recycling machine before disposal under Section 608 of the federal Clean Air Act.

ATTACHMENT 2
MDEQ FACT SHEET – LANDFILL PROHIBITED MATERIALS
AND APPROPRIATE DISPOSAL OPTIONS
(Two Sheets)

The following wastes are also prohibited from landfills, but not normally generated by households.

Empty drums – Unless crushed to eliminate voids. Check with the landfill if they accept drums.

Liquid waste that is not from a household – Go to www.michigan.gov/deqwaste and select "Hazardous & Liquid Industrial Waste." Contact the DEQ Waste and Hazardous Materials Division District Office for more information.

Low-level radioactive waste – Go to www.michigan.gov/deqwaste and select "Radiological Protection," contact the DEQ at 517-335-2690 or E-mail radioactivematerial@michigan.gov for information. You can also contact the U.S. Nuclear Regulatory Commission, Region III office, at 630-829-9500 or www.nrc.gov.

Regulated hazardous waste – Go to www.michigan.gov/deqwaste and select "Hazardous & Liquid Industrial Waste." Contact the DEQ Waste and Hazardous Materials Division District Office for more information.

NEED HELP FINDING YOUR DEQ DISTRICT OFFICE? A district office map can be found at www.michigan.gov/deq and select "Inside DEQ" and "Contact DEQ."

Or call the Environmental Assistance Center at **800-662-9278**, Monday thru Friday 8:00 a.m. to 5:00 p.m. for additional information.

For more recycling information, contact your local recycling program. For a list, go to (www.deq.state.mi.us/documents/deq-whm-stsw-recyclingcontacts.pdf), or go to www.earth911.org, or call 1-800-CLEANUP.

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TALKING TRASH

LANDFILL PROHIBITED MATERIALS AND APPROPRIATE DISPOSAL OPTIONS FOR RESIDENTIAL CUSTOMERS



Jennifer M. Granholm, Governor
Steven E. Chester, Director

Landfill Prohibited Materials and Appropriate Disposal Options for Residential Customers

Under Michigan solid waste law, the following items are not allowed to be disposed of in landfills:

Beverage containers – 1 gallon or less in size and are either a:



- soft drink,
- soda water, carbonated natural or mineral water, or other nonalcoholic carbonated drink,
- beer, ale, or other malt drink of whatever alcoholic content, or
- mixed wine drink or mixed spirit drink.

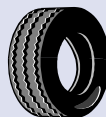
This prohibition does not apply to green glass containers before June 1, 2007, but recycling of green glass is encouraged. If a deposit was paid on a beverage container, it can be returned for a refund, to any retailer where that beverage is sold. If a deposit was not paid on the container because it was purchased out-of-state, the container should be recycled through a local recycling program. Frequently asked questions concerning the Deposit Law can be found at www.deq.state.mi.us/documents/deq-wmd-swp-mibottlededepositlawFAQ1.pdf.

Used oil – Many oil change locations and local recycling programs will accept used oil. Keep the used oil separate from other liquids. Contact your local recycling program for other options.



Whole motor vehicle tires – Whole scrap tires may be accepted at a landfill, but are prohibited from disposal in a landfill. Prior to

landfill disposal, the tire must be cut or otherwise processed into pieces. Most tire retailers accept old tires for a fee when you purchase new tires. Check with the retailer to see if they will accept old tires that may be lying around your home or garage. Some communities hold special waste collection days. Contact your local recycling program for more information. Scrap tires can also be taken to a registered end-user, scrap tire processor, or scrap tire recycler that is in compliance with the scrap tire law. For a list of scrap tire haulers and additional information, go to www.michigan.gov/deq/waste and select “Scrap Tires.”



Lead acid battery – Return spent lead acid batteries to the retailer when purchasing a new battery. Any place that sells lead acid batteries is required to accept at least the same amount of batteries sold. Contact your local recycling program for other options.



Yard clippings – Yard clippings are defined as leaves, grass clippings, vegetable or other garden debris, shrubbery, or brush or tree trimmings, less than 4 feet in length and 2 inches in diameter, that can be converted to compost humus. It does not include diseased or infected yard waste. Use yard clippings as mulch or practice backyard composting if possible. Contact your county MSU Extension office (list at www.msue.msu.edu) for more information. If on-site management is not possible, the yard clippings should be sent to a:



- composting facility, or
- farm to be used to grow agricultural products.

Medical waste – Some medical waste may not be landfilled. Contact the landfill to see if they will accept needles and syringes if packaged and labeled properly. See the publication “The Point is Needles Hurt” at www.deq.state.mi.us/documents/deq-ead-tas-newsharps.pdf.

For example, put sharps in a:

- purchased sharps container;
- an empty coffee can,
- a laundry detergent bottle, or
- an empty bleach bottle.



When the container is full, tape the lid down with heavy duct or packing tape. Label the container with the words “MEDICAL WASTE” or “SHARPS CONTAINER” and let your waste hauler know you are placing the waste with your regular trash. A list of Medical Waste Disposal Services is at www.michigan.gov/deq/waste and select “Medical Waste.”

Sewage – Go to www.michigan.gov/deq and select “Water” “Surface Water” “Septage” for a list of licensed septage waste haulers and for links on proper management of septic tanks.

Polychlorinated Biphenyls (PCBs) – If you have fluorescent light ballasts or other devices containing PCBs, contact the landfill to find out if they can accept the waste. Contact the U.S. Environmental Protection Agency, Region 5 office, at 312-886-7061 or go to www.epa.gov/pcb for more information.

Asbestos – If doing remodeling or demolition projects that involve asbestos, contact the landfill to find out if they can accept the waste or if they have special labeling or packaging requirements. Homeowners may remove asbestos from their own residences, but precautions need to be taken and the waste must go to a licensed disposal site. Go to www.cpsc.gov/cpsc/pub/pubs/453.html for information about removing asbestos by homeowners. For information about friable asbestos regulations, see the Asbestos NESHAP publication at www.michigan.gov/aq and select “Compliance” “Asbestos NESHAP Program.”

ATTACHMENT 3
TCLP REGULATORY LEVELS LISTED IN 40 CFR 261.24
(Three Sheets)

§24. Toxicity characteristic

(a) A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, as incorporated by reference in §260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

(b) A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

Table 1_Maximum Concentration of Contaminants for the Toxicity
Characteristic

EPA HW No. \1\	Contaminant	CAS No. \2\	Regulatory Level (mg/L)
D004	Arsenic.....	7440-38-2	5.0
D005	Barium.....	7440-39-3	100.0
D018	Benzene.....	71-43-2	0.5
D006	Cadmium.....	7440-43-9	1.0
D019	Carbon tetrachloride.....	56-23-5	0.5
D020	Chlordane.....	57-74-9	0.03
D021	Chlorobenzene.....	108-90-7	100.0
D022	Chloroform.....	67-66-3	6.0
D007	Chromium.....	7440-47-3	5.0

D023	o-Cresol.....	95-48-7	\4\	200.0
D024	m-Cresol.....	108-39-4	\4\	200.0
D025	p-Cresol.....	106-44-5	\4\	200.0
D026	Cresol.....	\4\	200.0
D016	2,4-D.....	94-75-7		10.0
D027	1,4-Dichlorobenzene.....	106-46-7		7.5
D028	1,2-Dichloroethane.....	107-06-2		0.5
D029	1,1-Dichloroethylene.....	75-35-4		0.7
D030	2,4-Dinitrotoluene.....	121-14-2	\3\	0.13
D012	Endrin.....	72-20-8		0.02
D031	Heptachlor (and its epoxide).	76-44-8		0.008
D032	Hexachlorobenzene.....	118-74-1	\3\	0.13
D033	Hexachlorobutadiene.....	87-68-3		0.5
D034	Hexachloroethane.....	67-72-1		3.0
D008	Lead.....	7439-92-1		5.0
D013	Lindane.....	58-89-9		0.4
D009	Mercury.....	7439-97-6		0.2
D014	Methoxychlor.....	72-43-5		10.0
D035	Methyl ethyl ketone.....	78-93-3		200.0
D036	Nitrobenzene.....	98-95-3		2.0
D037	Pentachlorophenol.....	87-86-5		100.0
D038	Pyridine.....	110-86-1	\3\	5.0
D010	Selenium.....	7782-49-2		1.0
D011	Silver.....	7440-22-4		5.0
D039	Tetrachloroethylene.....	127-18-4		0.7
D015	Toxaphene.....	8001-35-2		0.5
D040	Trichloroethylene.....	79-01-6		0.5
D041	2,4,5-Trichlorophenol.....	95-95-4		400.0

D042	2,4,6-Trichlorophenol.....	88-06-2	2.0
D017	2,4,5-TP (Silvex).....	93-72-1	1.0
D043	Vinyl chloride.....	75-01-4	0.2

\1\ Hazardous waste number.

\2\ Chemical abstracts service number.

\3\ Quantitation limit is greater than the calculated regulatory level.

The quantitation limit therefore becomes the regulatory level.

\4\ If o-, m-, and p-Cresol concentrations cannot be differentiated, the

total cresol (D026) concentration is used. The regulatory level of

total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993; 67 FR 11254, Mar. 13, 2002]