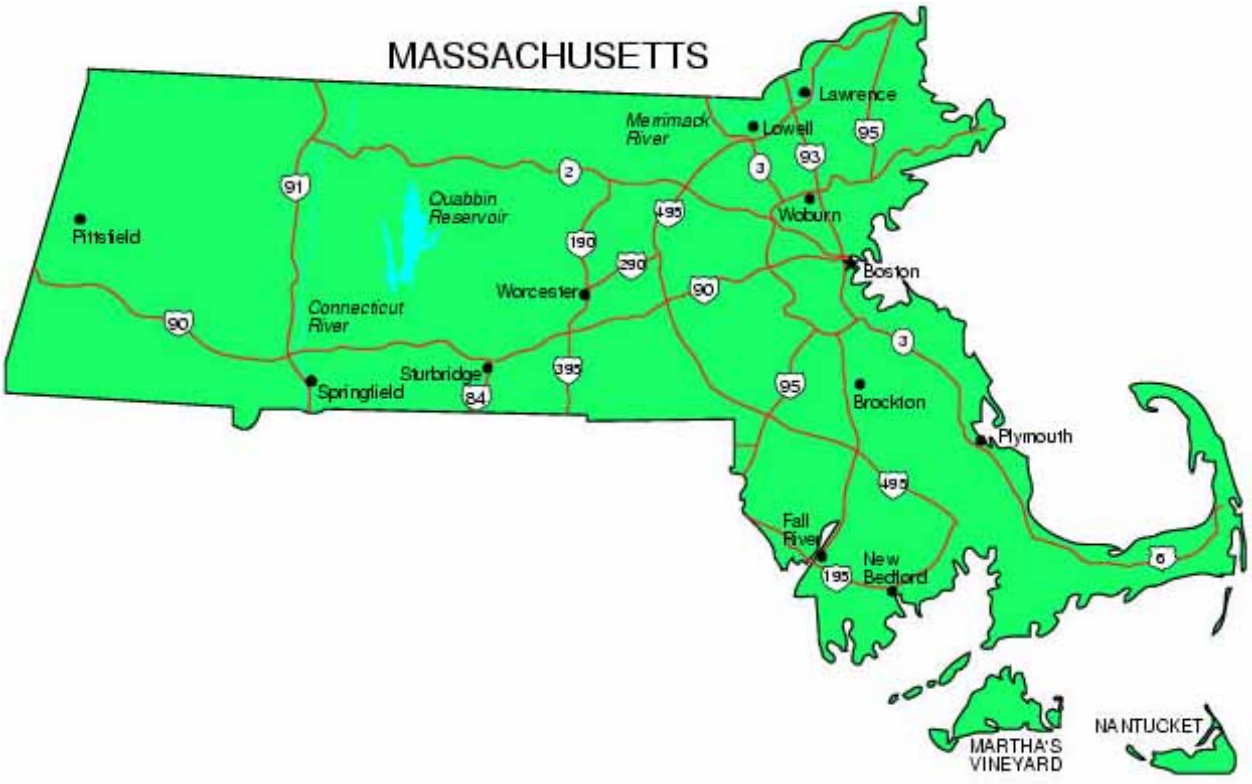
2005 MASSACHUSETTS LOW - LEVEL RADIOACTIVE WASTE SURVEY REPORT



MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BUREAU OF ENVIRONMENTAL HEALTH
RADIATION CONTROL PROGRAM
SCHRAFFT CENTER, SUITE 1M2A
529 MAIN STREET
CHARLESTOWN, MA 02129

2005 MASSACHUSETTS LOW - LEVEL RADIOACTIVE WASTE SURVEY REPORT

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THE COMMONWEALTH OF MASSACHUSETTS

DEVAL L. PATRICK GOVERNOR

TIMOTHY P. MURPHY LIEUTENANT GOVERNOR

EXECUTIVE OFFICE HEALTH AND HUMAN SERVICES
JUDYANN BIGBY, MD SECRETARY

DEPARTMENT OF PUBLIC HEALTH
JOHN AUERBACH COMMISSIONER

BUREAU OF ENVIRONMENTAL HEALTH
SUZANNE CONDON DIRECTOR

RADIATION CONTROL PROGRAM
ROBERT WALKER DIRECTOR

DATA ANALYSIS AND SURVEY REPORT LAYOUT:
FREDERICK P. BARKER JR., P.E., RADIATION CONTROL OFFICER
RADIATION CONTROL PROGRAM

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PREFACE

The Low-Level Radioactive Waste Management Board (Board) was established pursuant to the provisions of section 2 of Chapter 111H of the Massachusetts General Laws, and was the lead state agency responsible for planning and effecting the management of low-level radioactive waste (LLRW) in the Commonwealth. In 2002 the Board was abolished and its powers and duties were transferred to the Department of Public Health (DPH). The Radiation Control Program (RCP) under DPH is the lead agency now responsible.

The Massachusetts Low-Level Radioactive Waste Management Act (Chapter 111H) mandates under section 7 that each person who generates, treats, stores, transports, or disposes of LLRW within the Commonwealth shall annually provide detailed and accurate information concerning the types, volumes, radioactivity, sources, and characteristics of the LLRW produced as well as current and projected LLRW management activities, including source minimization, volume minimization, and on-site storage, treatment, packaging, and transportation practices as the DPH deems necessary.

DPH conducts an annual survey to determine the characteristics of LLRW generated, stored, and transferred for out-of-state disposal. The less complex 2005 survey differed from pre-1997 Board surveys since questions on management methods and characteristics, container and packing methods, storage off or on site, routine or non-routine waste, specific out-of-state disposal sites, and future projection were eliminated. A copy of the 3-page 2005 survey used is shown as figure 29.

This report summarizes data compiled from responses to the Calendar Year (CY) 2005 Radioactive Waste Survey of radioactive materials users licensed in Massachusetts by the U.S. Nuclear Regulatory Commission (NRC) and the Massachusetts Department of Public Health. The data provided by the generators in the annual survey is used in connection with DPH's activities to arrange storage, treatment, and disposal solutions for LLRW generated in Massachusetts and to formulate LLRW policy in the Commonwealth.

Comments on this document and suggestions for future survey reports are welcome and should be addressed to:

MA Department of Public Health
Radiation Control Program
Schrafft Center, Suite 1M2A
529 Main Street
Charlestown, MA 02129
617 – 242 - 3035
Fax 617 – 242-3457

The focus of this report is on the characteristics and management of LLRW in the Commonwealth. The data collected enables DPH to formulate policy on the LLRW storage, treatment, disposal, and other management activities. This survey system is used by DPH to determine which classes of LLRW with relatively short half-lives may be stored for natural radioactive decay, which classes will require disposal, and which classes will require special management procedures during the life of a disposal facility accepting LLRW in the Commonwealth, should such a facility be necessary.

The annual survey also is used with DPH's activities to arrange storage, treatment, and disposal solutions for the LLRW generated in Massachusetts. Both in-state and out-of-state disposal options require the detailed characterization of: (1) the total waste inventory placed in a facility throughout its operating life; and (2) the amounts of activity remaining in the facility during the closure. The annual survey is the primary data source for the facility inventory projections.

2005 Survey Report Contents

Chapter 1 is an Executive Summary, highlighting volume and activity data on LLRW generated for disposal in 2005, and showing the distribution of large and small generators. Chapter 2 presents generator categories, classes, management discussion, and transfer disposal rates past, present, and future. Chapter 3 contains national data with a state-by-state comparison of volume and activity shipped for disposal to the facilities in Barnwell, South Carolina; Clive, Utah; and Richland, Washington. Chapter 4 discusses financial aspects and LLRW billing formula used.

Appendix A contains numerous tables and figures.

Tables and figures in this report present survey responses rounded by standard methods, and therefore totals may not equal 100%.

Chapter 1

Executive Summary

1.1 2005 Survey Results Summary

Waste generators consist of those licensees either transferring or storing LLRW, or both.

During 2005 Massachusetts waste generators reported that they generated **869,121.55 cubic feet** of low-level radioactive waste (LLRW) containing **34,991.58 curies**. Of this volume and activity, **563,726.01 cubic feet** containing **23,376.03 curies** were transferred and **305,397.43 cubic feet** containing **11,616.05 curies** were stored in-state for further treatment and disposal. A total of **43 different isotopes** were reported generated with Tritium (H-3) being the most common and with a total of 111 generator reports for all classes of waste. A map of Massachusetts showing the location of the 111 generators is shown as figure 30. The number of licensees has decreased by 15 from 2004, and the number of waste generators has decreased by 13 from 2004.

The last survey report completed by the Board was in 1999 for calendar year 1997. No formal survey reports were compiled for years 1998-2001 by the Board or DPH. DPH completed a formal survey in 2002 for the first time. The 2002, 2003, and 2004 surveys are available on line at the following link: www.state.ma.us/dph/rcp under the heading **Radiation Control Topics**, then under the heading **Low Level Radioactive Waste.**

The 2005 volume totals have almost quadrupled from the 2004 results while the activity totals have more than quintupled. The main reason for an increase in activity totals is Entergy Nuclear Generating Company, QSA Global, Inc., and PerkinElmer Life & Analytical Sciences Inc increased generation. The main reason for an increase in volume totals is Starmet NMI's and Yankee Atomic Electric Company's increased decommissioning work, and PerkinElmer Life & Analytical Sciences Inc. increased generation.

Massachusetts generators had access to three disposal facilities in the country that accept LLRW: Barnwell, South Carolina; Clive, Utah; and Richland, Washington. Barnwell accepted Class A, B, C and HVLA LLRW, but no waste mixed with, or exhibiting characteristics of, toxic chemical hazardous material (called mixed waste). The Clive site accepted only Class A and HVLA LLRW while Richland facility accepted only Massachusetts waste from naturally-occurring or accelerator-produced radioactive material (NARM).[1] These three disposal sites, however, are a temporary solution to LLRW management in Massachusetts.

Since Massachusetts is classified as an **unaffiliated state** and not a member of any of the ten

[1]NARM is naturally-occurring and accelerator produced radioactive material and is not regulated by the NRC. While this responsibility currently lies with the individual states, it should be noted that the Energy Policy Act of 2005 grants NRC the authority to regulate certain NARM sources. The transition to NRC authority has not yet occurred.

national interstate compacts for low-level waste disposal, generators in Massachusetts are free to dispose of their LLRW to any licensed facility willing to accept it. A national map showing the various compact memberships is shown as figure 1.

Some 627,986 cf or 99.88 % of the volume of LLRW containing 98.333 curies or 0.41 % of the activity was shipped to the Clive, Utah facility. The Barnwell, South Carolina facility received only 772.819 cf or 0.12 % of the volume of LLRW, but 23,602.400 curies or 99.59 % of the activity.

No LLRW was shipped to the Richland, Washington facility during 2005. Thus the highest activity LLRW goes to Barnwell site, and the highest volume LLRW goes to Clive site, according to the disposal site's manifest documents. The reported totals in and out do not match up, and are discussed later in the report in Chapter 3.

Since the survey eliminated the questions regarding licensee's future projections, DPH estimates with some confidence (plus or minus 10%) that total statewide future annual LLRW projections until 2012 will remain constant at 80,000 cubic feet and 20,000 curies. These numbers include both LLRW transferred and stored**.**

1.2 Distribution of Large and Small Generators by Transfers

Eighty nine organizations reported transferring LLRW for disposal in 2005, representing a decrease of 4.3 % from 93 reported in 2004. Of the 89 organizations **71** or **79.8 %** shipped 100 cubic feet or less (100 cubic feet is equivalent to just over thirteen 55-gallon drums) and can be classified as small quantity generators, greater than the number in 2004 which was 75.

Of the 89 organizations **83** generators or **99.3 %** shipped 1.000 curie or less and can be classified as small activity generators, smaller than the number in 2004 which was 88.

Tables 1 and 2 show the distribution by volume and activity of organizations that shipped large amounts of LLRW in 2005. Because the volume of waste transferred does not necessarily correlate with the amount of activity within the transferred waste, the 71 small quantity shippers by volume are not all the same small activity shippers. **In addition, these data show a consistent trend in Massachusetts: that most Massachusetts LLRW generators produce small volumes of waste requiring disposal in licensed LLRW disposal facilities,** and only a small amount **18 of 111 or 16.2 %** of Massachusetts generators produce large volumes (greater than 100 cubic feet) of waste requiring disposal.

Typical transfers by shipping are usually done by rail car, truck, or ship to one of three licensed disposal sites. The US Department of Transportation (DOT) has strict packaging requirements for shipping LLRW using three types of containers that are classified as either LSA, Type A, or Type B.

TABLE 1

LIST OF 18 LARGE GENERATORS THAT TRANSFERRED MORE THAN 100.0 CUBIC FEET OF LLRW IN 2005	
FACILITY NAME	**VOLUME IN CUBIC FEET**
1. Yankee Atomic Electric Company	459,730.0
2. PerkinElmer Life & Analytical Science	43,667.9
3. Starmet NMI	27,803.1
4. Entergy Nuclear Generating Company*	26,630.0
5. Bristol-Myers Squibb Med. Img.	1,031.2
6. Mass. –Amherst, University of	472.2
7. Charles River Laboratories, Inc.	452.0
8. Millennium Pharmaceuticals	397.7
9. Dana-Farber Cancer Institute	293.0
10. Genzyme Corporation	217.0
11. Unitech Services Group, Inc.	210.0
12. Genetics Institute, LLC	202.0
13. Pfizer, Inc.	165.0
14. Children's Hospital, The	157.5
15. Protein Forest, Inc.	150.0
16. UMass/Memorial Clinical Systems	112.5
17. Toxikon Corporation	112.5
18. Brandeis University	112.5

* and was generated in 2005 only

One hundred cubic feet of waste per annum is a threshold in Chapter 111H section 13, since those operations whose waste production exceed that threshold must develop and institute **a waste minimization program** predicated on detailed plans. More information is available in DPH Regulatory Guide No. 1.1 Revision 2.0 dated August 1995 and titled: Regulatory Guidance for Low - Level Radioactive Waste Minimization.

TABLE 2	
LIST OF 6 LARGE GENERATORS THAT TRANSFERRED MORE THAN 1.000 CURIE OF LLRW IN 2005	
FACILITY NAME	**ACTIVITY IN CURIES**
1. PerkinElmer Life & Analytical Science	22,998.210
2. Entergy Nuclear Generating Company (and was generated in 2005 only)	244.600
3. Starmet NMI	68.500
4. Communications & Power Indust.	50.400
5. Yankee Atomic Electric Company	6.750
6. Mass.- Boston, University of	1.915

1.3 Distribution of Large and Small Waste Generators by Storage In-State

Eighty six organizations reported in-state storage of LLRW in 2005. Of the 86 organizations 76 or 88.4 % stored 100 cubic feet or less and can be classified as small quantity in-state storage generators by volume. The list of the largest generators storing more than 100.0 cubic feet of waste in 2005 is shown in Table 3. Because the activity of waste in storage does not necessarily correlate with the amount of volume in storage, the 79 small activity in-state storage generators are not all the same small volume storage generators shippers. **In addition, these data show again a consistent trend in Massachusetts: that most Massachusetts LLRW generators produce small amounts of activity requiring disposal in licensed LLRW disposal facilities.**

Tables 3 and 4 show the storage by volume and activity of organizations that stored large amounts of LLRW in 2005. Because the volume of waste stored does not necessarily correlate with the amount of activity within the stored waste, the small quantity storers by volume are not all the same small activity storers.

Of the 86 in-state storage generators, 79 or 91.9 % stored less than 1.000 curie and may be classified as small quantity in-state storage generators by activity. The list of 7 generators storing more than 1.000 curie of waste in 2005 is shown in Table 4.

Typical storage containers include 55 and 30 gallon steel drums and boxes. Other containers used less frequently are small steel pails or cans in the 2 to 5 gallon size and 9-10 cubic feet fiber drums used as temporary containment vessels prior to processing, such as incineration.

TABLE 3

LIST OF 10 LARGE GENERATORS THAT STORED MORE THAN 100.0 CUBIC FEET OF LLRW IN 2005

FACILITY NAME	WASTE VOLUME IN CUBIC FEET IN STORAGE
1.Yankee Atomic Electric Company	300,000.00
2. Genetics Institute, LLC	833.5
3. Unitech Services Group, Inc.	677.0
4. PerkinElmer Life & Analytical Science	638.9
5. Bristol-Myers Squibb Med. Img.	452.2
6. QSA Global, Inc.	381.8
7. Entergy Nuclear Generating Company (and was generated in 2005 only)	302.0
8. Genzyme Corporation	232.0
9. Novartis Inst. for Biomedical Research	193.7
10. Mass. General Hospital	163.5

TABLE 4

LIST OF 7 LARGE GENERATORS THAT STORED 1.000 CURIE OR MORE OF LLRW IN 2005

FACILITY NAME	ACTIVITY IN CURIES
1. QSA Global, Inc.	11,076.750
2. Entergy Nuclear Generating Company*	394.000
3. PerkinElmer Life & Analytical Science	135.951
4. Yankee Atomic Electric Company	3.000
5. Thermo Electron Corp., Portable Ele.	1.332
6. RMD, Inc. RMD Inst., LLC	1.000
7. Radiation Monitoring Device, Inc.	1.000

***** and was generated in 2005 only

1.4 Distribution of Isotopes Generated for All Classes of Waste

A total of 43 different radionuclides were reported generated by all licensees which is a decrease of fourteen from 2004. The survey requested that responders only report those isotopes with a half life greater than 120 days, and this excludes most medical radionuclides such as I-125 and P-32. However all principal isotopes listed were grouped together with other radionuclides on the survey report in terms of volume and activity.

Figure 20 shows the total RAM (radioactive material) reporting frequency for the top 23 reported isotopes for all classes of waste.

The 20 least reported isotopes, with only 1-2 reports by licensees, are in decreasing order: Gd-153, Cl-36, Co-56, Cr-51, DU, Eu-152, Am-241, Ra-226, I-131, Tc-99m, Si-32, Sb-125, Pm-147, In-111, I-123, U-depl, Eu-156, Eu-155, Eu-154, and Fe-59. They are not listed in Figure 20.

Table 5 shows the ten most common isotopes by frequency of reports either transferred or in storage.

TABLE 5
LIST OF 10 MOST COMMON ISOTOPES REPORTED TRANSFERRED OR STORED IN 2005

ISOTOPE	HALF LIFE	NUMBER OF FACILITIES
1. H-3	12.3 years	102
2. C-14	5,730 years	76
3.I-125	60.14 days	25
4. S-35	87.4 days	18
5. P-32	14.29 days	16
6. Co-60	5.27 years	13
7. P-33	25.4 days	12
8. Cs-137	30.17 years	12
9. Fe-55	2.73 years	12
10. Co-57	271 days	8

1.5 Distribution of Isotopes Transferred for All Classes of Waste

A total of 40 different isotopes were reported transferred by all licensees which is a decrease of ten from 2004. The totals transferred and stored do not necessarily add up to the totals generated since some licensees transfer and store the same isotope, while others either store or transfer the same isotope, but not both. Figure 26 shows the total RAM transferred for the top 17 reported isotopes for all classes of waste in 2005.

The 23 least reported isotopes transferred with only 1-2 reports each by licensees, are in decreasing order: Gd-153, Cd-109, Cl-36, Th-232, Tc-99, DU, Eu-152, Na-22, I-131, Tc-99m, Si-32, Sb-125, Pm-147, In-111, U-depl, Eu-156, Am-241, Eu-155, Eu-154, Cr-51, Co-58, Co-56, and Fe-59. They are not listed in Figure 26.

Table 6 shows the top 10 most common isotopes by frequency transferred for all classes of waste.

TABLE 6		
LIST OF 10 MOST COMMON ISOTOPES REPORTED TRANSFERRED IN 2005		
ISOTOPE	**HALF LIFE**	**NUMBER OF FACILITIES**
1. H-3	12.3 years	76
2. C-14	5,730 years	59
3. I-125	60.14 days	16
4. Co-60	5.27 years	11
5. Fe-55	2.73 years	11
6. Cs-137	30.17 years	10
7. S-35	87.4 days	8
8. P-32	14.29 days	6
9. P-33	25.4 days	6
10. Co-57 Ca-45 Mn-54	271 days 162.7 days 312 days	5 5 5

1.6 Distribution of Isotopes In-Storage for All Classes of Waste

A total of 34 different isotopes were reported in-storage or stored by all licensees which is a decrease of two from 2004. The totals transferred and stored do not necessarily add up to the totals generated since some licensees transfer and store same the isotope, while others either store or transfer same isotope, but not both. Figure 25 shows the total RAM in storage for top 15 reported isotopes for all classes of waste in 2005.

The 19 least reported isotopes with only 1-2 reports each by licensees, are in decreasing order: Tc-99, Co-56, Co-58, Cr-51, Sr-90, Ra-226, Am-241, Na-22, U-238, Eu-154, Th-232, I-123, Fe-59, Eu-155, Eu-152, Cs-134, Cl-36, Ca-45, and Eu-156. They are not listed in Figure 25.

Table 7 shows the top 10 most common isotopes by frequency in storage for all classes of waste.

TABLE 7		
LIST OF 10 MOST COMMON ISOTOPES REPORTED STORED IN 2005		
ISOTOPE	**HALF LIFE**	**NUMBER OF FACILITIES**
1. H-3	12.3 years	71
2. C-14	5,730 years	48
3. I-125	60.14 days	17
4. P-32	14.29 days	12
5. S-35	87.4 days	12
6. P-33	25.4 days	9
7. Co-60	5.27 years	7
8. Cs-137	30.17 years	7
9. Co-57	271 days	6
10. Ni-63	100.1 years	5

1.7 Distribution of Isotopes Generated for Class A Wastes.

A total of 43 different isotopes or radionuclides were reported generated by all licensees which is a decrease of 14 from 2004. Figure 21 shows the total RAM reporting frequency for the top 30 reported isotopes for Class A waste. The 3 most common were: H-3, C-14, and I-125. The 13 least reported isotopes with only one report each are: DU, Eu-154, Eu-155, Eu-156, Fe-59, I-123, In-111, Ir-192, Pm-147, Sb-125, Si-32, Tc-99m, and U-depl. They are not listed in Figure 21.

1.8 Distribution of Isotopes Generated for Class B Wastes.

A total of 9 different isotopes were reported generated by all licensees which is a decrease of 3 reported in 2004. Figure 22 shows the total RAM reporting frequency for all reported isotopes for Class B waste. The most common with three reports was H-3.

1.9 Distribution of Isotopes Generated for Class C Wastes.

A total of 3 different isotopes were reported generated by all licensees in 2005 which is a decrease of 12 from 2004. Figure 23 shows the total RAM reporting frequency for all reported isotopes for Class C waste. The three reported isotopes with one report each were C-14, Ir-192, and Co-60.

1.10 Distribution of Isotopes Generated for Class HVLA Wastes.

A total of 15 different isotopes were reported generated by all licensees which is a decrease of 5 from 2004. Figure 24 shows the total RAM reporting frequency for all reported isotopes for Class HVLA waste. The two most common with 8 and 6 reports each were H-3, and C-14.

Chapter 2
2005 LLRW Management Data Summary

2.1 Sources and Types of LLRW

Low-level radioactive waste (LLRW) is radioactive material that (1) is neither high-level radioactive waste, nor spent fuel, nor uranium mill tailings; and (2) is classified by the U.S. Nuclear Regulatory Commission (NRC) as LLRW. It does not include waste which remains a federal responsibility, such as that owned or generated by the U.S. Department of Energy, the U.S. Navy as a result of decommissioning Navy vessels, or by the federal government as a result of any research, development, testing, or production of any atomic weapon.

LLRW is generated as a by-product of various uses of radionuclides. Typical applications include:

(1) the production of electricity by a nuclear power plant;

(2) the production and end-use of radiopharmaceuticals for medical procedures such as cancer and thyroid dysfunction diagnosis and treatment, radioimmunoassay, and diagnostic imaging examinations;

(3) research and development in the life science and biotechnology industry for the treatment and prevention of various diseases and medical dysfunctions, and in the environmental field to study the effects of chemicals on plant and aquatic life, and for ocean studies:

(4) commercial uses such as within instruments that measure level, thickness, and density or that are used in moisture analysis and quality control; sealed sources that are used for industrial radiography of pressure vessels and other structural welds; smoke detectors and exit signs in buildings and commercial aircraft; and

(5) university education and research in medicine, material science, and biotechnology.

2.2 Regulations Pertaining to Radioactive Materials Licensees

On March 21, 1997 Massachusetts became an **Agreement State** with the NRC. Under the agreement, the NRC transferred to the Commonwealth the responsibility for regulating the use of (1) radioactive materials produced as byproducts of the operation of nuclear reactors; (2) uranium and thorium source materials; and (3) small quantities of fissionable materials. NRC retains jurisdiction over regulation of nuclear reactors, federal agencies that use nuclear materials and companies that distribute certain materials (e.g. smoke detectors) to the public.

Massachusetts radioactive material licensees are regulated by the DPH Radiation Control Program under 105 Code of Massachusetts Regulations (CMR) 120.000 Massachusetts Regulations for the Control Of Radiation and 345 CMR Low Level Radioactive Waste Management Board as amended. Licensees remaining under the jurisdiction of the NRC are regulated under Title 10 of the Code of Federal Regulations (CFR).

2.3 LLRW Generator Categories

In Massachusetts 508 colleges and universities, hospitals, government agencies, biotechnology firms, and other businesses, including two nuclear power plants (one operational and another undergoing decommissioning), held licenses[2] from the U.S. Nuclear Regulatory Commission **(**NRC) and the Massachusetts Department of Public health in 2005 to use or process source, special nuclear or byproduct material**.** This is a decrease of 16 from 2004.

Much of the information in this report is grouped by waste category of generator, of which there are five:

(1) **Academic** (Acad) - universities, colleges, and other research institutions

(2) **Commercial** (Comm) - organizations such as biotechnology, engineering, and construction companies, testing laboratories, radiopharmaceutical manufacturers and suppliers, and companies using radioactive materials for process, quality control, and analysis (also referred to as **industry** by Department of Energy (DOE).

(3) **Government** (Govt) - local, state, and federal entities. (Federal does not include DOE, US Navy, or atomic weapon productions, and state does not include universities and colleges.)

(4) **Health** - hospitals, clinics, and physicians (also referred to as **medical** by DOE)

(5) **Utility** - companies that operate or are decommissioning nuclear power plants

The categories listed above are convenient for data analysis, but there is an inherent interrelationship among them.

Figures 10-17 show the volumes and activity results for the 5 various waste generator categories according to survey results. The utility category leads the group as top volume generator from Figures 14 and 17 while the commercial category leads as top activity generator as shown in Figures 10 and 13. In storage activity and transferred activity the commercial category leads the group according to Figures 11 and 12. In transferred and in storage volume the utility category is the leader from Figures 15 and 16. The government category generates the least amounts in all activity and volume productions.

[2]The total number of radioactive materials licensees and registrants in Massachusetts varies from time to time due to expiration or terminations of some licenses and registrations, and the issuance of new ones.

2.4 Waste Classification System

Four classes of waste are defined by federal 10 CFR 61 and state DPH 105 CMR 120.299 Appendix E regulations[3].

Class A wastes are characterized by their low concentrations of long lived radionuclides and concentrations of short-lived radionuclides that will decay to acceptable levels within a 100-year institutional control period when a disposal facility is actively maintained after closure. These concentration limits have been calculated on the basis of dose limits to an individual who might inadvertently intrude, occupy the disposal site, and encounter waste after this time. The average concentration is 0.1 curies / cubic foot.

Class B wastes are the next level of wastes that could represent a potential hazard to an inadvertent intruder, without additional protective measures, since they contain higher concentrations of short-lived and long lived radionuclides. They must meet NRC's minimum stability requirements so that the waste forms or containers can "maintain gross physical properties and identity, over 300 years" thus limiting the exposure to a potential intruder. The average concentration is 2 curies /cubic foot.

Class C wastes are wastes that, due to their greater concentrations of long-lived or short-lived radionuclides, must meet more stringent waste form requirements to ensure stability, and must be disposed of in such a way as to protect the inadvertent intruder for a longer period of time. These wastes must meet the stability requirements for form or container (300 years) and must be disposed of in a manner which protects against inadvertent intrusion for at least 500 years. The average concentration is 7 curies /cubic foot.

Greater than Class C (GTCC) wastes are wastes whose larger concentrations of radionuclides make them unacceptable for near-surface land disposal, unlike classes A, B and C. GTCC disposal remain the responsibility of the federal government and their present strategy is deep geological disposal. GTCC is not LLRW. A permanent federal burial site under consideration is located at Yucca Mountain in Nevada.

The fifth class of waste is not defined in NRC or DPH regulations, but only in old Board 345 CMR regulations is **HVLA** (High Volume Low Activity) wastes[4].

HVLA Waste are soils or demolition rubble that have average concentrations less than or equal to the concentrations set forth in 345 CMR 1.13, Table 1.13B and that have been accepted for disposal at a licensed LLRW disposal facility. HVLA is considered as Class A waste, but treated

[3]Website is www.state.ma.us/dph/rcp under heading quick links click on heading regulations, then click on 105 CMR 120.200

[4]Website is www.state.ma.us/dph/rcp click on regulations, then click on 345 CMR

separately in Massachusetts so as to allow some licensees a reduced annual LLRW fee of approximately 10% of the proportional assessment.

Figures 2-9 and Table 8 show the volume and activity results for the four various waste classes. In terms of volume, Class HVLA waste was the biggest class in storage and was the most transferred class. In terms of activity Class C was the biggest class in storage while Class B was the most transferred class.

Some of the licensees generated more than one class of waste so the totals may not equal 100%.

2.5 LLRW Management Method Terms

LLRW management refers to the storage, packing, treatment, transportation, or disposal of LLRW. Some of the terms used in past surveys were:

- **Incineration for disposal** - refers to procedure where LLRW, such as animal carcasses and liquid scintillation fluids, are incinerated per 10 CFR 20 which limits specific activity of waste to 0.05 microcuries of Hydrogen-3 (Tritium) or Carbon-14, per gram of material.

- **mixed waste storage** - radioactive material contaminated by chemical or toxic material. Past surveys classified such waste with the addition of the letter "H" after classification letter A, B, C, or HVLA. (i.e., Class AH, Class BH, etc.).

- **shipped for disposal** - refers to LLRW delivered directly, or via a processor, to one of three NRC-licensed disposal facilities located in SC, UT, and WA.

- **storage** - refers to LLRW that was generated during the survey year or prior years and that was held in storage. The waste may undergo additional radioactive decay prior to final packaging for disposal, and reported volume and activity may not reflect actual disposal properties.

- **storage for decay** - refers to procedure in which LLRW with a relatively short half-life is held for natural radioactive decay (at least 10 half-lives). Storage for decay is a common practice.

- **transfer to an authorized recipient** - refers to transfer of radioactive material for disposal or recycling to another licensee, such as sealed sources returned to the supplier since the energy being emitted is no longer useful.

- **volume reduction** - refers to negative change in LLRW volume from sorting and segregating (the separation of the non-radioactive from the radioactive portion), compaction, incineration, and decontamination.

This survey did not ask the licensees which management method(s) was used as past pre 2001 surveys did.

2.6 Licensee LLRW Survey Results

The 2005 Radioactive Waste Survey requested data on LLRW produced during calendar year 2005 or retained in storage from previous years. The survey was mailed in December of 2005 to 508 companies and institutions licensed by the NRC and DPH in any time during 2005 to possess sources of ionizing radiation involving the use of radioactive materials in the Commonwealth. **501 or 98.6% of licensees returned the 2005 survey form which increased from an 85.2% return rate in 1997 and a 98.1% return rate in 2004.**

Licensees that did not return the form were evaluated by DPH to determine if they typically generate LLRW which requires disposal. Most non-respondents were identified as licensees that manage by storage for decay, or transfer sealed sources[5] to an authorized recipient, or do not generate any LLRW. Some of the 2005 licensees had gone out of business and were unable to receive the survey form as they had no forwarding address. To correct that deficiency in the future DPH is now surveying the licensees as their license is terminated and not waiting to the following year to mail out the survey form. Five out of the eight unresponsive licensees have been terminated, and three will have their license amended to possession only.

DPH is exploring the possibility of having licensees with an e-mail address on file (currently 91.6% and up from 85.6% in 2004) complete the 2005 annual radiation waste surveys **on line** using a DPH assigned password. This would be optional. **Comments regarding this proposed new procedure are encouraged.**

Table 8 shows 111 licensees (22.2%) of the 501 who responded reported producing LLRW for transfer or in storage during 2005. That is a decrease from 24.1% reported in 2004. The remainder used sealed sources or did not generate any long lived (half- life greater than 120 days) LLRW during 2005.

.

Table 8 - 2005 Activity and Volume Summary:

- 869,121.55 cubic feet of LLRW containing 34,991.58 curies were generated during 2005
- 278.84 curies (0.80 %) were from Class A LLRW
- 23,617.00 curies (67.49 %) were from Class B LLRW
- 11,057.07 curies (31.60 %) were from Class C LLRW

[5]Sealed sources are usually returned to the manufacturer for recycling or disposal. The most common sealed source is lead paint detector containing the accelerator-produced radionuclide Cobalt 57 (Co-57).

- 38.67 curies (0.11%) were from Class HVLA LLRW
- 37,930.91 cubic feet (4.36 %) were Class A LLRW
- 1,356.16 cubic feet (0.16 %) were Class B LLRW
- 138.55 cubic feet (0.02 %) were Class C LLRW
- 829,695.93 cubic feet (95.46 %) were Class HVLA LLRW
- 563,726.01 cubic feet (64.86 %) containing 23,376.03 curies (66.80 %) of LLRW were transferred to licensed brokers[6] or disposal sites for disposal out of Massachusetts
- 305,397.43 cubic feet (35.14%) containing 11,616.05 curies (33.20 %) of LLRW were placed in storage in Massachusetts

[6] Website is National Directory of Brokers and Processors http://www.bpdirectory.com for a listing

TABLE 8

ACTIVITY AND VOLUME BY CLASS FOR THE YEAR: 2005

Class	No. Submitted in the Class	Activity(curies)			Volume (cu. ft.)		
		In Storage	Transferred	TOTAL	In Storage	Transferred	TOTAL
A	119	123.29	156.05	278.84	4,829.62	33,103.18	37,930.91
B	4	535.33	23,081.67	23,617.00	330.76	1,025.40	1,356.16
C	2	10,954.23	102.84	11,057.07	33.95	104.60	138.55
HVLA	14	3.20	35.47	38.67	300,203.10	529,492.83	829,695.93
Grand Totals:	139	11,616.05	23,376.03	34,991.58	305,397.43	563,726.01	869,121.55

Total Number of Surveys Submitted for 2005: **501**

Number Without Any Waste Generation for 2005: **390**

Number With Waste Generation for 2005: **111**

Note: Some licensees generated more than one class, and totals may not equal 100%.

2.7 MA Historic, Current and Projected Annual Transfer Disposal Rate Results

Figure 18 shows total cubic feet of LLRW that were transferred from 1994-2005 with the exception of years 1998-2001 for which no published data is available. Although the old LLRW Board was funded until 2002, the last report was for 1997 and printed in 1999. With the exception of 1996, the amounts transferred decreased annually from 1,082,172 cf in 1994 to 30,920.68 cf in 2002, then increased again in 2003 to 127,263.11 cf, and finally increased again in 2005 to 563,726.01 cf.

The 1996 cf transfer spike was influenced by the closure of Barnwell disposal site during 6 months in 1995. During that time many generators placed LLRW in storage until it reopened in 1996, and then shipped it. The 2005 transfer increase in volume was mainly due to increased transfers from decommissioning projects in Rowe and Concord.

The present survey does not distinguish between **routine** and **non-routine** LLRW shipped for disposal. Routine refers to LLRW from process operations that is expected to be generated annually for the foreseeable future. Non-routine refers to LLRW from one time decommissioning or site remediation projects. A non-routine example is a decommissioning project at the former nuclear power plant operated by Yankee Atomic Electric Company in Rowe, and one for site remediation is Starmet NMI (formerly Nuclear Metals, Inc.) in Concord.

Figure 19 shows total activity in curies of LLRW that was transferred from 1994-2005 with the exception of years 1998-2001 for which no published data is available. As discussed above, the figure shows decreasing amounts annually from 140,934 curies in 1994 to 876.61 curies in 2002, then an increase again in 2003 to 26,733.36 curies, a decrease again in 2004 to 229.3 curies, and finally an increase again in 2005 to 23,376.03 curies.

The survey eliminated the questions of licensees regarding future projections. However, DPH Radiation Control Program's staff estimates with some confidence (plus or minus 10%) that total statewide future annual LLRW projections until 2012 will remain constant at 80,000 cubic feet and 20,000 curies. These figures include both storage and transfers.

Chapter 3

NATIONAL DATA

3.1 State-by-State Comparison

Table 9 shows how Massachusetts LLRW volume and activity shipped for disposal compared to other states in 2005. These totals include high volume low activity (HVLA) wastes shipped out-of-state.

In terms of ranking Massachusetts with the 49 other states, Puerto Rico, and District of Columbia , Massachusetts ranked **2 nd** largest in terms of volume generated (ME was largest at #1), and **8 th** largest in terms of activity generated (IL was largest at #1) as reported by the Manifest Information Management System (MIMS) in 2005. No data (ND) was reported for North Dakota, Oklahoma, Puerto Rico, and South Dakota. MIMS is operated by the US Department of Energy, and does not assure quality of information. The totals reported do not agree exactly with DPH LLRW survey results.

TABLE 9

2005 LLRW VOLUME AND ACTIVITY SUMMARY FROM ALL STATES FROM MIMS

State	Volume (ft3)	Activity(curies)
Alabama	16,128.22	49,701.77
Alaska	0.60	0.02
Arizona	24,499.51	111.42
Arkansas	3,993.21	114.66
California	225,490.12	1,349.35
Colorado	634.87	223.44
Connecticut	312,969.58	545.02
Delaware	74.21	31.31
Dist of Columbia	870.08	0.04
Florida	75,765.88	1,307.80
Georgia	9,081.07	839.51
Hawaii	4,282.11	110.44
Idaho	92.85	0.00
Illinois	101,913.92	167,711.45
Indiana	83.90	0.64
Iowa	20,034.79	0.82
Kansas	2,079.83	632.94
Kentucky	52,354.91	2.25
Louisiana	5,894.07	2,677.94
Maine	1,143,129.55	18.24
Maryland	107,956.38	156.80
State	**Volume (ft3)**	**Activity (curies)**

Massachusetts	**631,242.50**	**23,688.11**
Michigan	45,885,49	1,342.57
Minnesota	22,131.37	250.05
Mississippi	1,213.93	80,929.06
Missouri	82,705.78	42.38
Montana	0.67	0.00
Nebraska	34,885.80	23,833.52
Nevada	32.05	0.02
New Hampshire	3,797.14	34.90
New Jersey	46,696.29	60,254.25
New Mexico	622.90	0.04
New York	36,434.79	4,288.69
North Carolina	383,666.60	35,602.39
North Dakota	ND	ND
Ohio	107,011.70	1,154.63
Oklahoma	ND	ND
Oregon	174.50	0.87
Pennsylvania	91,292.64	58,786.18
Puerto Rico	ND	ND
Rhode Island	120.82	5.82
South Carolina	234,133.32	3,144.29
South Dakota	ND	ND
Tennessee	93,390.39	502.60
Texas	2,612.16	592.37
Utah	137.71	0.13
Vermont	2,145.68	205.10
Virginia	48,008.70	708.14
Washington	15,300.07	128.52
West Virginia	2.86	0.62
Wisconsin	12,908.23	387.83
Wyoming	10.73	0.00
Total:	**4,003,893.93**	**521,418.93**
Average:	**83,414.46**	**10,862.89**

ND = No Data Available

Table 10 shows that Barnwell in SC reported that Massachusetts generators shipped some 772.819 cubic feet of LLRW totaling 23,602.400 curies in 2005 making the average concentration over 30.54 curie per cubic foot of waste. Envirocare in Clive, UT reported receiving some 627,986 cubic feet with 98.333 curies or 0.157 millicuries (mCi) per cubic foot of waste.

3.2 Manifest Information Management System (MIMS)

The Manifest Information Management System (MIMS)[7] provides information on waste shipments to 3 commercial disposal facilities located in Barnwell, SC, Clive, UT, and Richland, WA. The Barnwell, SC site is operated by Energy Solutions (formerly Chem-Nuclear Systems), the Clive, UT site is also operated by Energy Solutions (formerly Envirocare of Utah), and the Richland, WA site is operated by American Ecology. The Richland, WA facility is located within United States Department of Energy's (USDOE) Hanford site near Richland, WA.

According to MIMS approximately 30.51 million cf of waste containing some 7.26 million curies of radioactivity were disposed from 1993 to 2005 at commercial disposal sites. The vast majority of the waste activity at 97.74 % came from commercial (industry) class, and nuclear facilities (utility) shipped 92.67% of the waste volume in 2005. The Massachusetts figures are substantially similar with commercial shipping some 98.9% % of the activity and nuclear facilities (utility) shipped some 86.3% of the volume in 2005.

MIMS provides a comparison of the waste generated from Massachusetts waste generators as reported by the 3 commercial waste disposal sites and the DPH LLRW survey summary results. All data is from four different data bases collected by three different agencies.

The DPH survey results from Table 10 showed a total of 23,376.03 curies transferred while MIMS showed 23,688.11 curies transferred. DPH generator results for activity were 98.683 % of total as reported by disposal sites through MIMS. Results were within 1.3 % of each other showing consistency and accuracy which is 5.9 % less than in 2004.

DPH survey results from Table 10 showed a total of 563,726.01 cubic feet of waste transferred while MIMS showed 631,242.50 cubic feet transferred. DPH generator results for volume were 89.30 % of total as reported by disposal sites through MIMS. The percentage in 2004 was 105.64 %. Differences can not be readily explained although 2004 was closer than in 2005. Possible explanations are:

1. LLRW is shipped to the generator's home office out-of-state and is combined with LLRW from other sites. This total is then reported to MIMS.

2. LLRW undergoes a degree of compaction or volume reduction[8]. One utility reports that its waste is shipped to a broker out-of-state where waste is segregated (free release) in order to reduce burial volume. The compaction method is by a glass melting process.

3. Generators estimating the volume of transferred LLRW. The actual volume is inflated by shipping container and packing which is later removed by broker.

4. Some waste held for convenience and deferred expenditures by broker or others, and sometimes for years.

5. Federal and private non licensed LLRW generators located in MA (example is US Food & Drug Administration) do not report to MDPH on waste activities, but are reported by the waste disposal sites.

6. Some waste may be reported shipped during the reporting year, but arrived at the disposal facility after

[7] website is http://mims.apps.em.doe.gov

[8] Volume reduction refers to negative change in LLRW volume that occurs due to processing, either on or off site where waste was generated

December 31st, thus being counted for the following year by the disposal site. Actually the waste should be reported as disposed in the year that it arrives at the disposal site, not the year it was transferred or shipped.

DPH will stress in future surveys to report the volume in cf **actually transferred** to final disposal site.

TABLE 10

3 COMPARISONS OF LLRW TRANSFERRED FROM MASSACHUSETTS FOR 2005

	Richland, WA Database*	Barnwell, SC Database	Clive, UT Database	Totals From The Three Disposal Sites	MIMS Database	DPH Database As Entered and Shown in Tables and Graphs
Volume, CF	0.000	772.819	627,986	628,758.819	631,242.50	563,726.01
Activity, Curies	0.000	23,602.400	98.333	23,700.733	23,688.11	23,376.03

* Richland, WA site last received LLRW from MA generators in 1992.

TABLE 11		
MASSACHUSETTS 2005 WASTE GENERATOR CATEGORY RESULTS FROM MIMS		
Generator Class	**Volume Transferred (CF)**	**Activity Transferred (Curies)**
Academic	0.44(0.00%)	0.00 (0.00%**)**
Government	7.500 (0.00%)	0.98 (0.00%)
Industry	46,552.79 (7.37%)	23,153.86 (97.74%)
Medical	0.00 (0.00%)	0.00 (0.00%)
Utility	584,681.77 (92.62%)	533.27 (2.25%)
Totals	631,242.50 CF	23,688.11 Ci

TABLE 12
MA WASTE CLASSIFICATION AND GENERATOR CLASS FOR 2005 FROM MIMS

Disposal Site	Year Received	Generator Class	Total Volume(cf)	Total Activity (curies)	Class A Volume (cf)	Class B Volume (cf)	Class C Volume (cf)
Barnwell	2005	Academic	0.44	0.00	0.00	0.00	0.44
Barnwell	2005	Government	7.50	0.98	0.00	0.00	7.50
Barnwell	2005	Industry	386.08	23,067.91	43.60	265.20	77.28
Barnwell	2005	Medical	0.00	0.00	0.00	0.00	0.00
Barnwell	2005	Utility	340.72	528.32	48.00	145.27	147.45
Envirocare	2005	Government	0.00	0.00	0.00		
Envirocare	2005	Industry	46,166.71	85.95	46,166.71		
Envirocare	2005	Academic	0.00	0.00	0.00		
Envirocare	2005	Medical	0.00	0.00	0.00		
Envirocare	2005	Utility	584,341.05	4.95	584,341.05		
		Total:	631,242.50	23,688.11	630,599.36	410.47	232.67

MIMS reported that Barnwell received a total of 58 shipments (20 utility, 1 government, 35 industry and 2 academic), while Envirocare received a total of 480 (50 utility and 430 industry) shipments from Massachusetts generators in 2005.

3.3 National Regulatory History For LLRW

1980's

In 1980, the U.S. Congress passed the Low-Level Radioactive Waste Policy Act (P.L. 96-573).

The Act established three major policies:

1. Each state is responsible for the LLRW generated within its boundaries.

2. States may form compacts (or groups of states) to facilitate managing LLRW generated within the boundaries of the compact states.

3. Compacts could not refuse waste from other states until U.S. Congress had ratified the compact.

On 1/1/1986 the Low Level Radioactive Waste Policy Amendments Act (P.L.99-240) was signed into law, making a generator's continued access to the three operating disposal sites contingent on its compact meeting

specified milestones for new site development. The amended Act clarified Congress' intent to require compacts (or individual states not within a compact) to provide disposal capacity for LLRW generated within its boundaries by 1/1/1993.

The chief mandate of these federal statues requires each state to provide for its LLRW disposal by 1/1/1996. If a state fails to do this by this date, it must assume ownership and liability for all LLRW produced within its borders after 1996.

In response to these federal laws, Massachusetts enacted MGL Chapter 111 H in 1987. This 48 section general law as amended in 2002 authorizes the DPH to regulate the management of low level radioactive waste in the Commonwealth. Complete copies of the general law are available on state web site at

http://www.mass.gov/legis/laws/mgl/gl-111h-toc.htm

Effective 6/26/1986 in response to the Low Level Radioactive Waste Policy Amendments Act, the State of Rhode Island created a Rhode Island-Massachusetts Interstate Low-Level Radioactive Waste Management Compact called Title 23 Health and Safety Chapter 23-19.9 Low-Level Radioactive Waste Compact. However, neither Massachusetts nor any other state ever approved or joined the compact. More information is available at the following State of Rhode Island link:

http://www.rilin.state.ri.us/Statutes/TITLE23/23-19.9/INDEX.HTM

1990's

In early 1990's the 9 member Massachusetts Low Level Radioactive Waste Management Board (the board) was established to manage LLRW in Massachusetts and to investigate whether a LLRW disposal site would be located in Massachusetts. In March of 1996 after a thorough investigation, the Board voted **not** to locate a LLRW disposal site in Massachusetts as three out-of-state disposal sites (SC, WA, and UT) were available to Massachusetts generators.

Present

In fall of 2002 the Board was abolished by the Legislature and its powers and duties were transferred to DPH. Massachusetts remains an unaffiliated state and is not a member of any of the ten state LLRW compacts. The other unaffiliated states are: District of Columbia, Maine, Michigan, Nebraska, New Hampshire, New York, North Carolina, Puerto Rico, and Rhode Island.

Figure 1 is map of USA showing Low Level Radioactive Disposal Compact Membership by states and including District of Columbia and Puerto Rico. Membership changes do occur, and Maine has left the Texas Compact.

Future

Barnwell, SC accepts LLRW through brokers or processors or directly from LLRW generators, only until June 30, 2008 as its disposal capacity has almost been reached. After 2008 they will only accept LLRW from Atlantic Compact members (formerly the Northeast Compact) consisting of states of SC, CT, and NJ. There is no immediate crisis to Massachusetts generators as small amounts of class B and C wastes may be stored on site. However, a solution must be found for the disposal of these classes of waste. If Massachusetts were to consider joining the Atlantic Compact, it would be required to become a host state. The Board had rejected that idea back in 1996**.**

Clive, Utah is accepting LLRW Class A including HVLA waste from all states except the 8 states in the Northwest Compact. They do not accept Class B or C wastes from any states.

Richland, WA is not accepting any Class A, B, C, or HVLA LLRW wastes, but will accept NARM and NORM wastes which are not considered LLRW wastes from all 50 states. Richland, WA only serves the Rocky Mountain and Northwest Compact members consisting of 11 states.

Texas has recently passed legislation to allow creation of two privately run LLRW disposal facilities to be licensed as one site by the state. On December 29, 2003 Texas opened up the process to accept applications from July 8-August 6, 2004 from any interested parties to license a LLRW disposal site. One site may dispose of federal facility waste and the other may dispose of commercial low-level radioactive waste. Texas is host state to the Texas Compact of which VT is a member, and Maine formally withdrew in April of 2004.

The Executive Director of the Texas Commission on Environmental Quality (TCEQ) directed staff to conduct a Technical Review on the application submitted on August 4, 2004 by Waste Control Specialists, LLC (WCS) for license authorization for the near-surface disposal of low-level radioactive waste at the company's site in Andrews County, Texas which is near the NM border.

After the technical review of WCS' application is completed, a Notice of the Completion of Technical Review will be published and distributed. It was declared administratively complete as of February 18, 2005. It is available on the internet at:

http://www.wcstexas.com/

http://64.224.191.188/wcs/

Chapter 428 of the MA Acts of 1993 was approved on January 11, 1994 and states in part:

The state treasurer, upon request of the Governor, may issue and sell bonds up to 45 million dollars for a maximum term of 20 years for the purpose of siting LLRW storage, treatment, or disposal facilities. This bond authorization which expires in 2018 could be used to join a compact.

New membership cost is a minimum of $25 million dollars. Massachusetts is currently considering its options.

New generator's fees called reimbursement surcharges would be needed to retire the Commonwealth's bonds including interest charges.

This Low Level Radioactive Waste Bond Authorization was originally filed as House Bill no. 5655 in 1993 regular session. A complete copy of the Act is available at: Commonwealth of MA State Library 442 State House Boston, MA 02133 or by an e-mail request to: reference.department@state.ma.us

A solution must be identified by July 1, 2008 or Massachusetts and 35 other state generators will have no treatment option other than decay on site unless Texas opens a new LLRW site for Class B and C wastes.

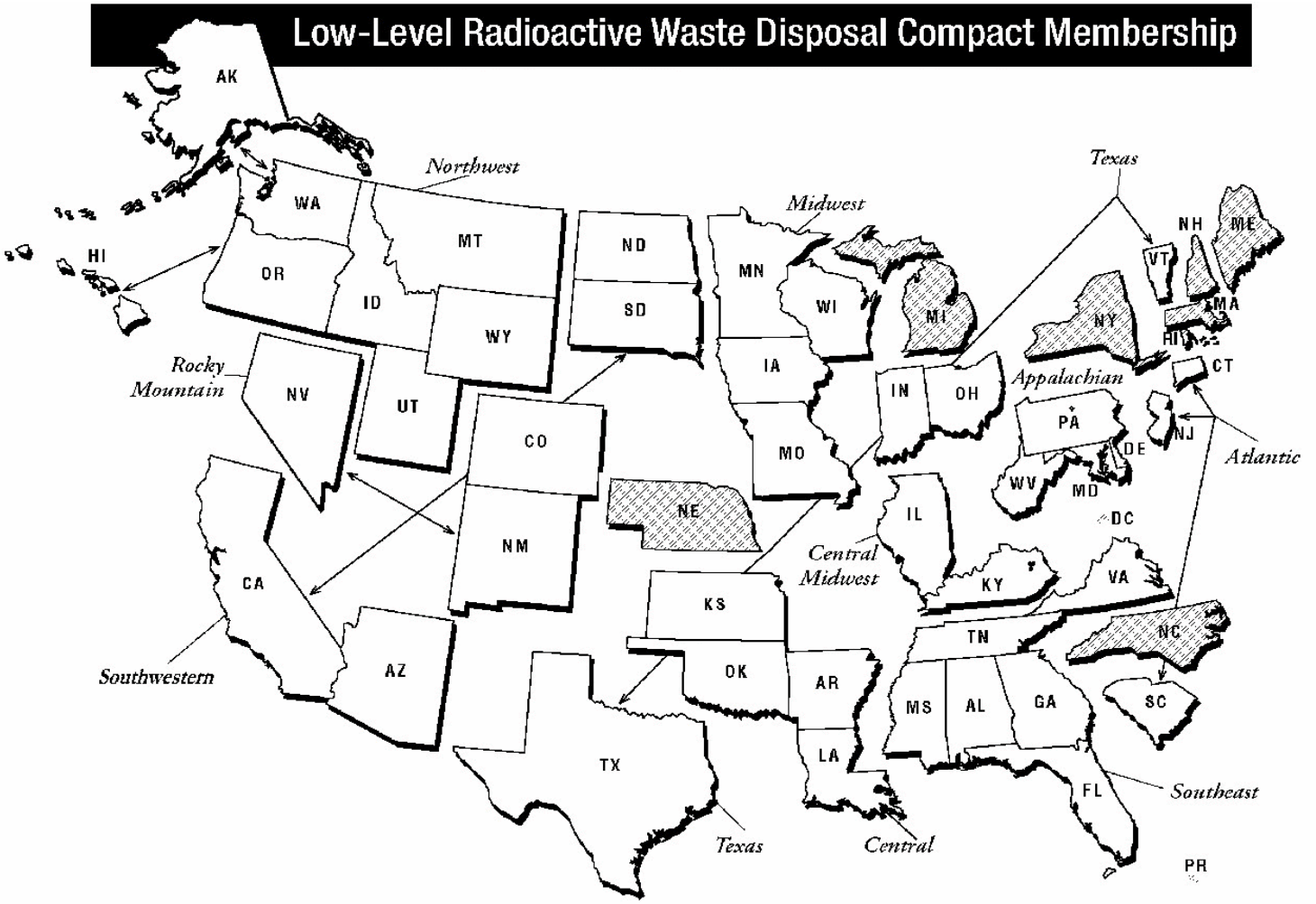
3.4 INTERREGIONAL COOPERATION

DPH continues to participate in the Low-Level Radioactive Waste Forum, Inc. (LLW Forum). Their informative web site which includes useful links is http://www.llwforum.org/

The LLW Forum is a national association of representatives of compacts[9], host states, unaffiliated states, and states with currently operating disposal facilities and established to facilitate the implementation of the 1985 Low-Level Radioactive Waste Policy Amendments Act. The LLW Forum provides an opportunity for states and compacts to share information and exchange views with officials of federal agencies and other interested parties. LLW Forum participants also serve as liaisons to other entities, including the Conference of Radiation Control Program Directors, the Conference of State Legislatures, and the federal Facility Compliance Act Task Force. MA is represented on the LLW Forum by Mr. Robert Walker and Mr. Frederick Barker.

[9]Compact is a formal agreement between two or more states under Article 1, Section 10 of the US Constitution, states may form compacts with the consent of Congress to resolve conflicts or address common problems. More than 120 such compacts have focused on various subjects, including water, education, transportation, fisheries, health, and waste.

FIGURE 1



Appalachian Compact
Delaware
Maryland
Pennsylvania
West Virginia

Atlantic Compact
Connecticut
New Jersey
South Carolina

Central Compact
Arkansas
Kansas
Louisiana
Oklahoma

Central Midwest Compact
Illinois
Kentucky

Northwest Compact
Alaska
Hawaii
Idaho
Montana
Oregon
Utah
Washington
Wyoming

Midwest Compact
Indiana
Iowa
Minnesota
Missouri
Ohio
Wisconsin

Rocky Mountain Compact
Colorado
Nevada
New Mexico

Nothwest accepts Rocky Mountain waste as agreed between compacts

Southeast Compact
Alabama
Florida
Georgia
Mississippi
Tennessee
Virginia

Southwestern Compact
Arizona
California
North Dakota
South Dakota

Texas Compact
Texas
Vermont

Unaffiliated States
District of Columbia
Maine
Massachusetts
Michigan
Nebraska
New Hampshire
New York
North Carolina
Puerto Rico
Rhode Island

Chapter 4

Financial Data

4.1 Financing LLRW Management

In October of 2002 the Board was dissolved, and its remaining funds were transferred to DPH.

Funds to manage the requirements of MGL Ch 111H as amended including the annual survey come from an assessment on radioactive material users and LLRW generators pursuant to MGL Chapter 111H sections 4A and 4B. A total of 482 users were assessed $298,588.50 starting in April of 2006 (using the same rates[10] as the Board last used in 2001) for period of calendar year 2005. This is a decrease of 10 users from the 492 users assessed in 2004. Eight facilities were unresponsive and did not submit the survey form. Some could not be found, and some are in process of having their licenses terminated.

In calendar year 2005 and as of 12/31/05, DPH had collected over $160,000 in LLRW assessments for preceding year using the state MMARS billing system. These fees are deposited into the state LLRW rebate trust fund. Any unpaid assessments are charged interest at 12% per annum on and after the due date which is 90 days from the invoice date. After 180 days any outstanding fee users are issued a collection letter and subject to intercept of any state payments or tax refunds and referral to collection.

The 2005 billed amounts range from the regulatory minimum of $75.00 to a maximum of $152,267.46 per licensee.

Cities and towns are exempt from the annual LLRW fees per MGL Chapter 29, section 27 C, but must still submit the annual LLRW survey when requested. Nine municipal licensees are in this category.

One waste generator is in bankruptcy and owes the Commonwealth over $82,500 in past fees.

The flat assessment charged to all licensees and registrants is $75.00 per year and remains unchanged. In addition, a proportional assessment of $1.96 per cubic foot of the weighted volume is calculated for some licensees or registrants pursuant to 345 CMR 4.03 (2) (c) 3 and an additional assessment of $0.20 per cubic foot of the weighted volume of high volume, low activity waste is calculated for some licensees or registrants pursuant to 345 CMR 4.03 (2) (c) 4.

The total LLRW annual fee charged is based on billing formula below:

$ LLRW ANNUAL FEE = $75.00 + (CRF (PF) (CA + 3CB +5CC)) + $0.20 (HVLA)

PF is proportional fee or proportional assessment currently set at $1.96 per cubic foot of waste. The PF figure formerly was much higher and has been decreasing over time. The PF amount and $75.00 minimum amount remain unchanged since 2001.

[10] According to FY 1997 Board's annual report, a total of 534 radioactive materials users and LLRW generators were assessed $275,872.63 during fiscal year 1997.

$0.20 is considered 10% of the present PF and rounded up to next cent. As a result HVLA waste receives a 90% discount per cubic foot compared to Class A waste assessment.

CRF is classification radioactivity factor varying between 1.0 - 1.3 as shown in **Table 13**.

CA = Class A LLRW waste volume in cubic feet

CB = Class B LLRW waste volume in cubic feet

CC = Class C LLRW waste volume in cubic feet

PF = Proportional assessment set at $1.96 per cubic feet of weighted volume of waste per DPH

HVLA = HVLA waste volume in cubic feet

Table 13	
Classification of Radioactivity Factor (CRF) 345 CMR Table 4.03 B	
Radioactivity of Waste Shipped for Disposal Off Site or Stored for Later Disposal	**Classification of Radioactivity Factor (CRF)**
less than 1.0 curie per year	1.0
1.0 curie per year or more, but less than 10.0 curies per year	1.1
10.0 curies per year or more, but less than 100.0 curies per year	1.2
100.0 curies per year or more	1.3

In summary the billing invoice amount is a function of volume, class, and activity of waste generated per year with all licensees (except cities and towns) paying a $75.00 minimum LLRW fee. The higher the volume and activity and class of LLRW generated, the higher the annual fee payable.

4.2 DOE FUNDING

No funds from US Department of Energy (DOE) were received in 2005 pursuant to the federal Low-Level Radioactive Waste Policy Act, as amended (P.L. 99-240). These funds were collected by certain LLRW disposal sites as a surcharge to use these disposal sites. The funds are held by DOE, and rebated to various states based upon their success in meeting milestones outlined in federal law. Since Massachusetts ceased its disposal sitting activities in 1996 and remains an unaffiliated disposal state, no funds were received in 2005.

APPENDIX A

FIGURE 2

PERCENT OF TOTAL ACTIVITY BY WASTE CLASS FOR 2005

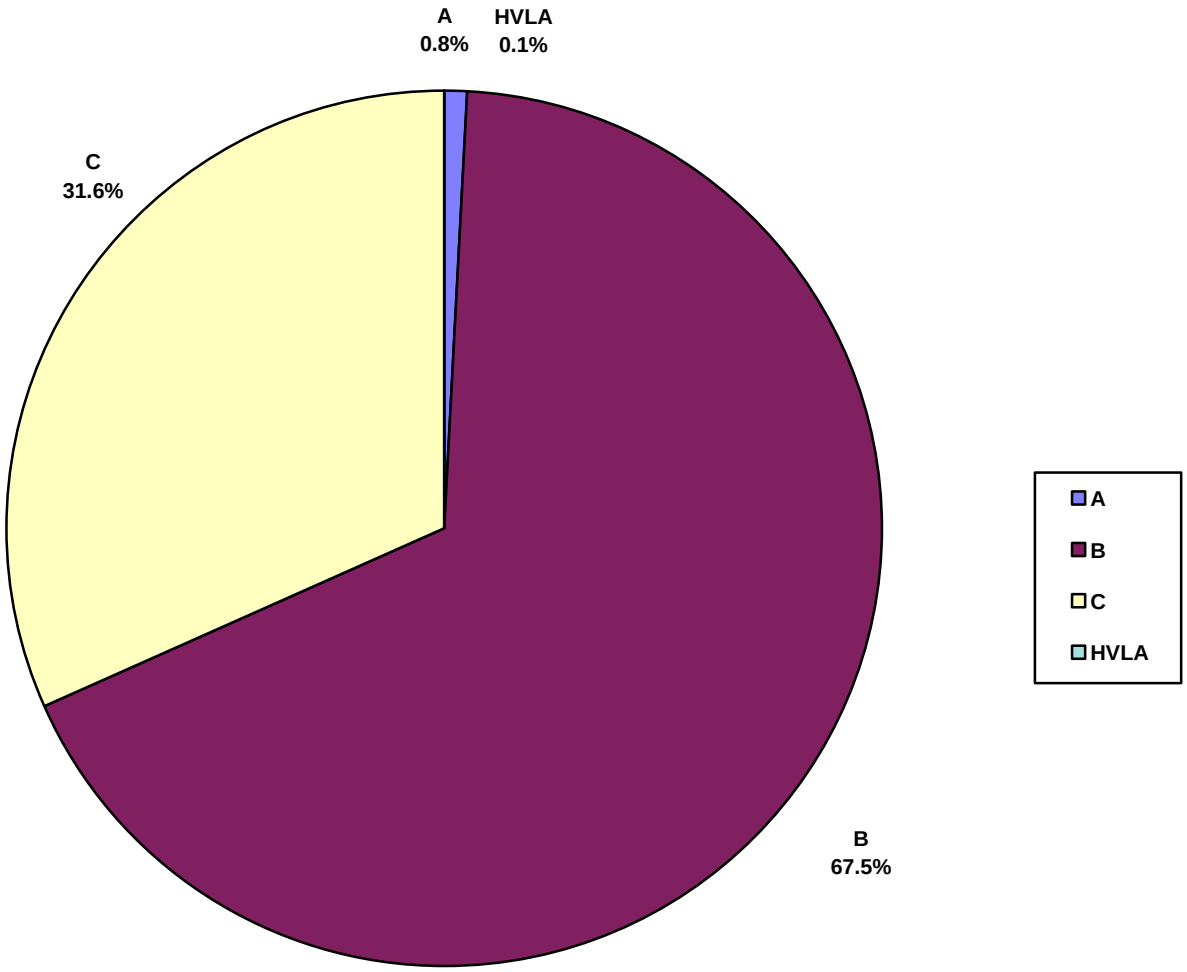


FIGURE 3

PERCENT ACTIVITY PLACED IN STORAGE BY WASTE CLASS FOR 2005

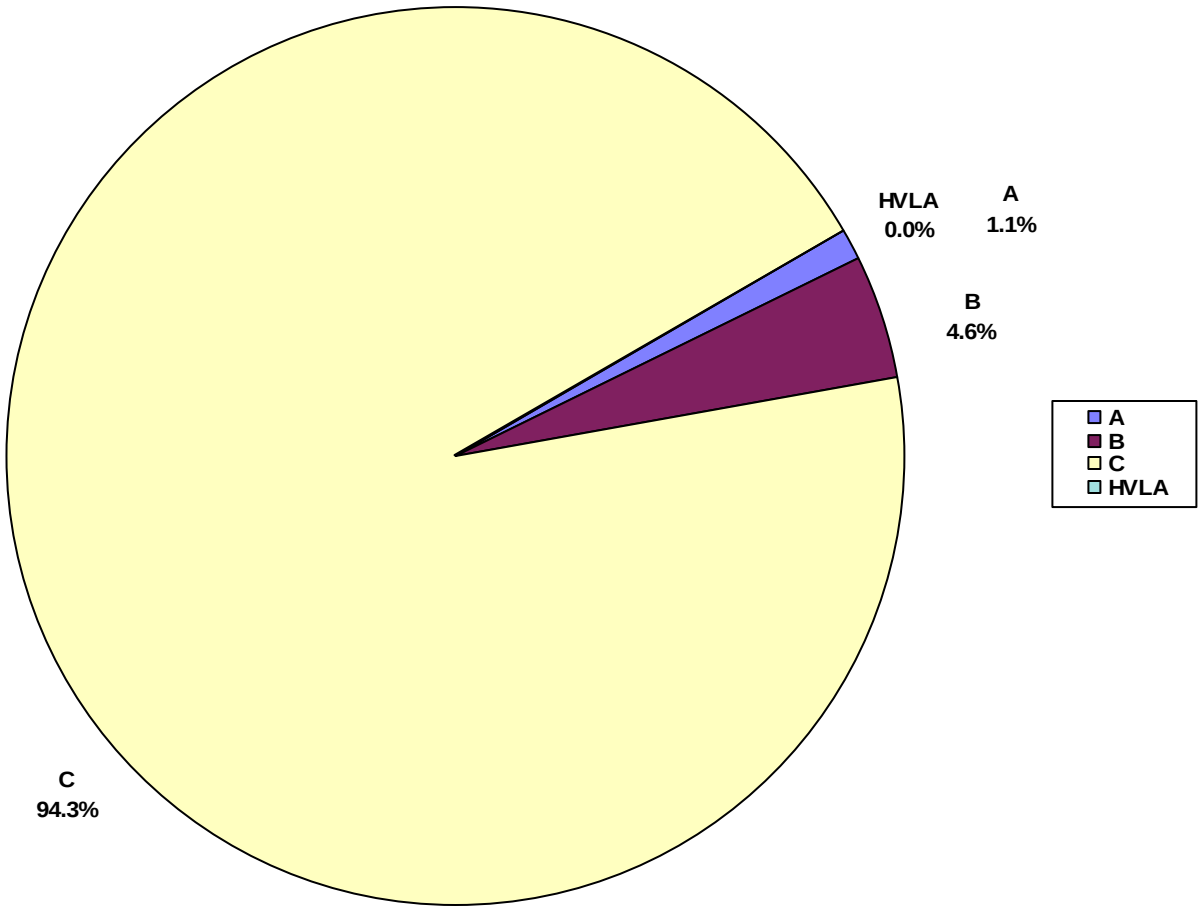


FIGURE 4

PERCENT ACTIVITY TRANSFERRED BY WASTE CLASS FOR 2005

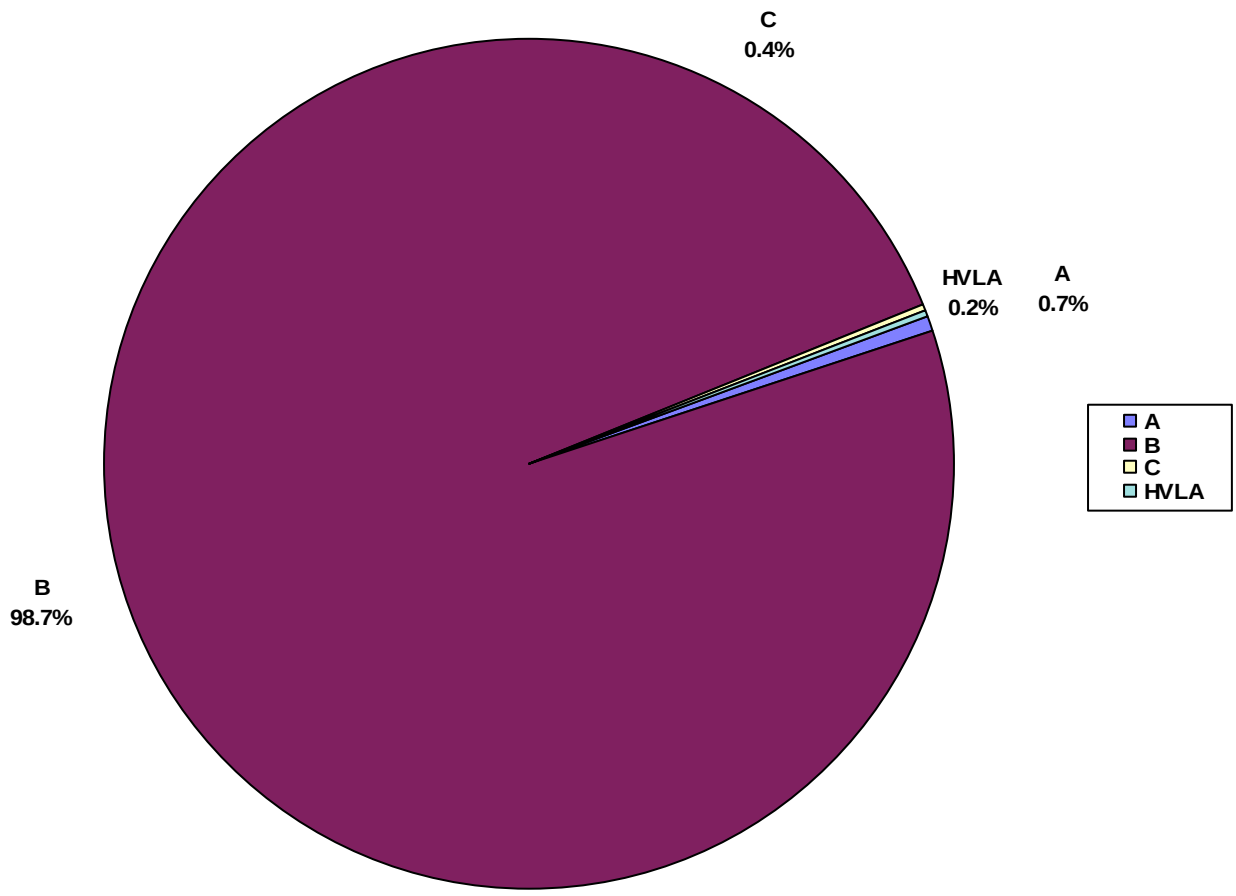


FIGURE 5

PERCENT TOTAL VOLUME BY WASTE CLASS FOR 2005

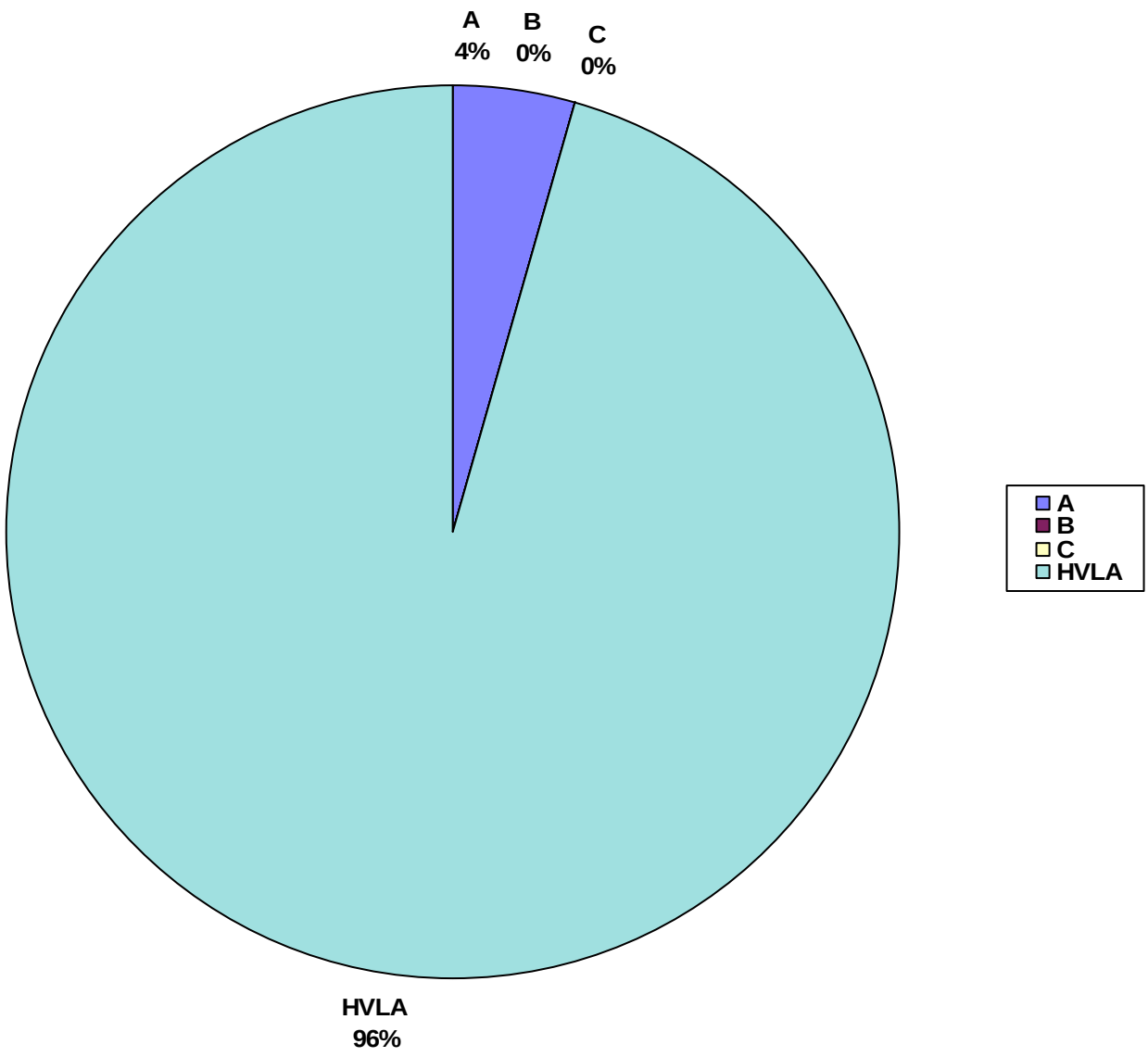


FIGURE 6

PERCENT VOLUME IN STORAGE BY WASTE CLASS FOR 2005

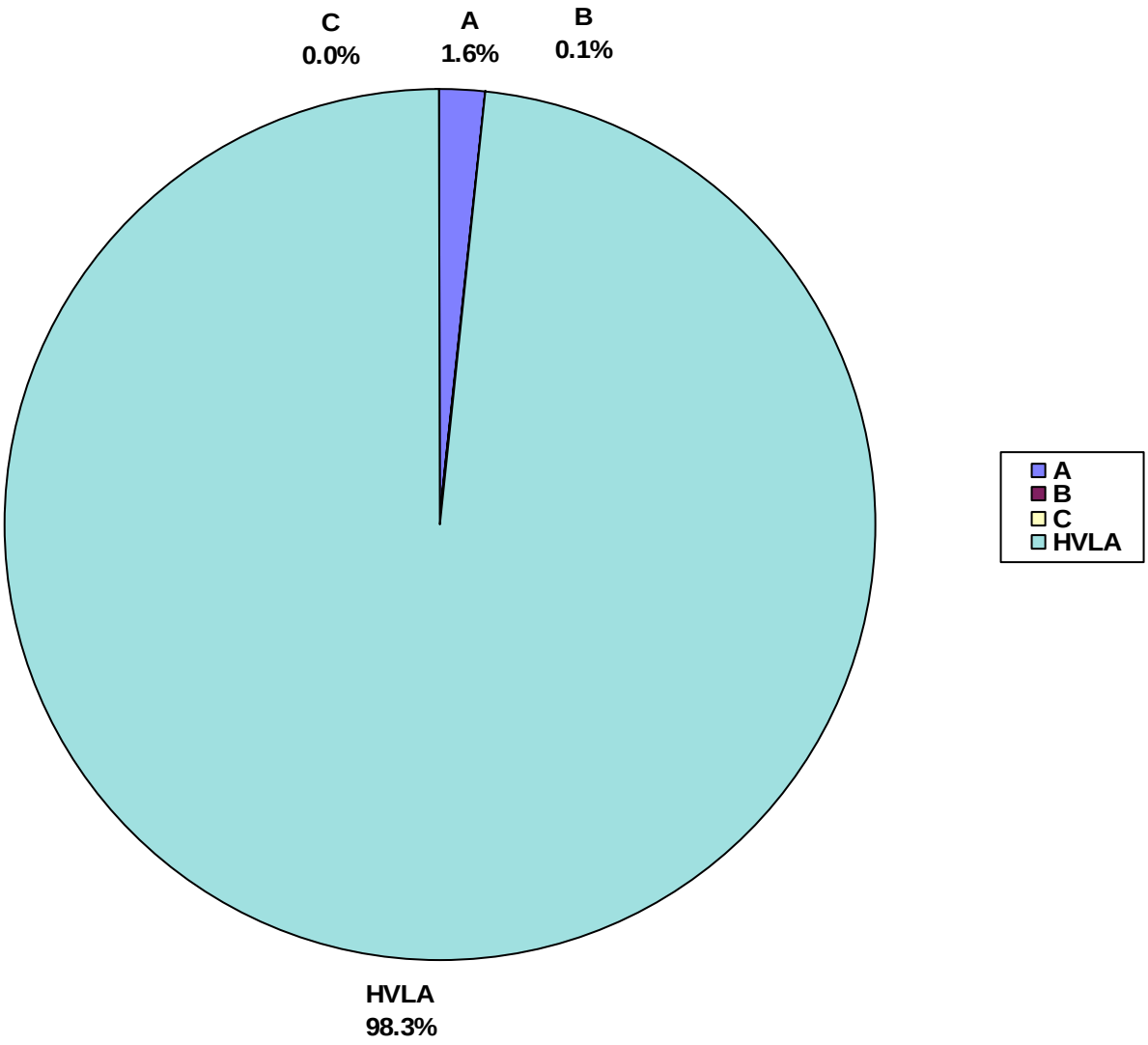


FIGURE 7

PERCENT VOLUME SHIPPED BY WASTE CLASS FOR 2005

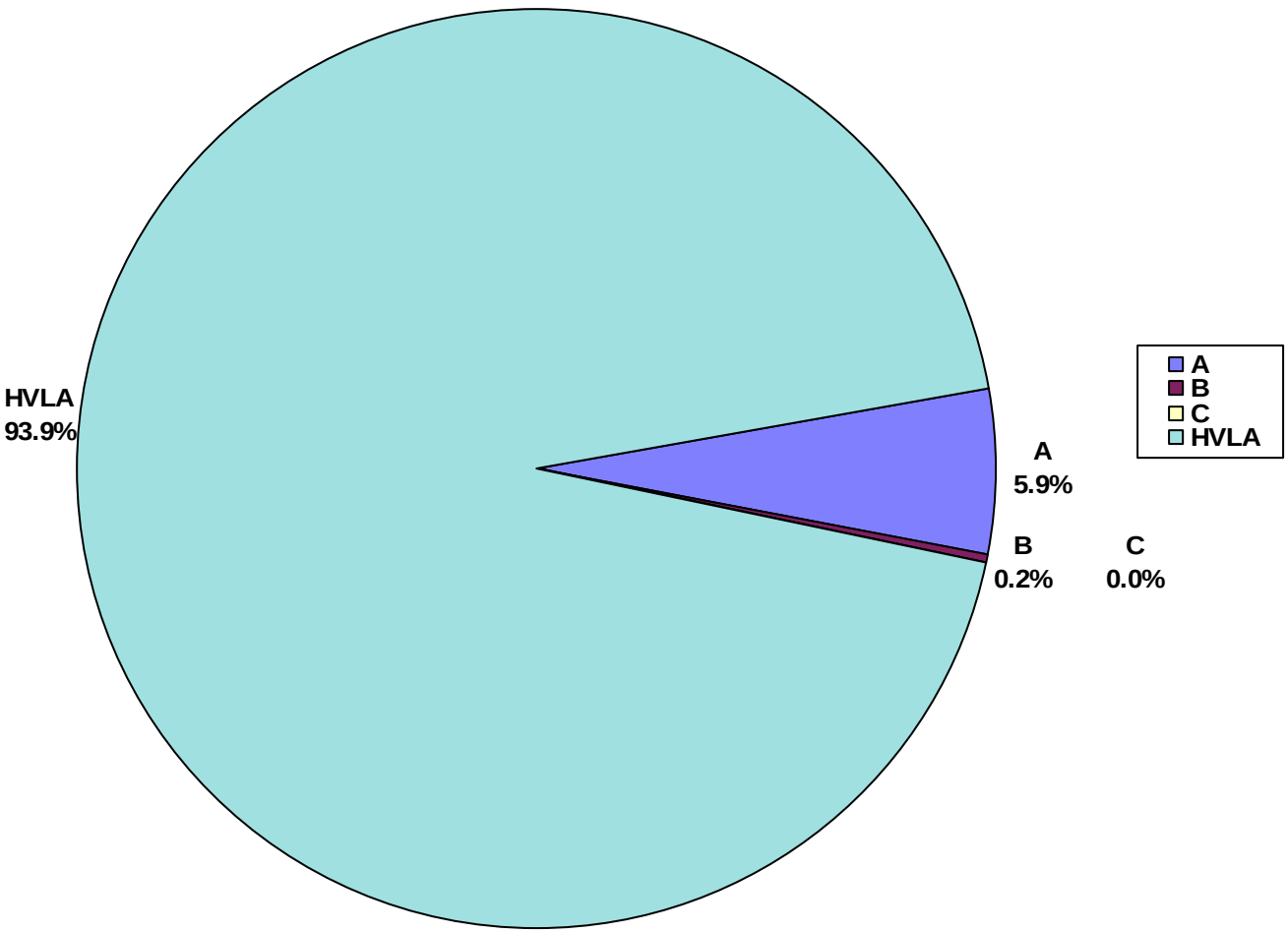
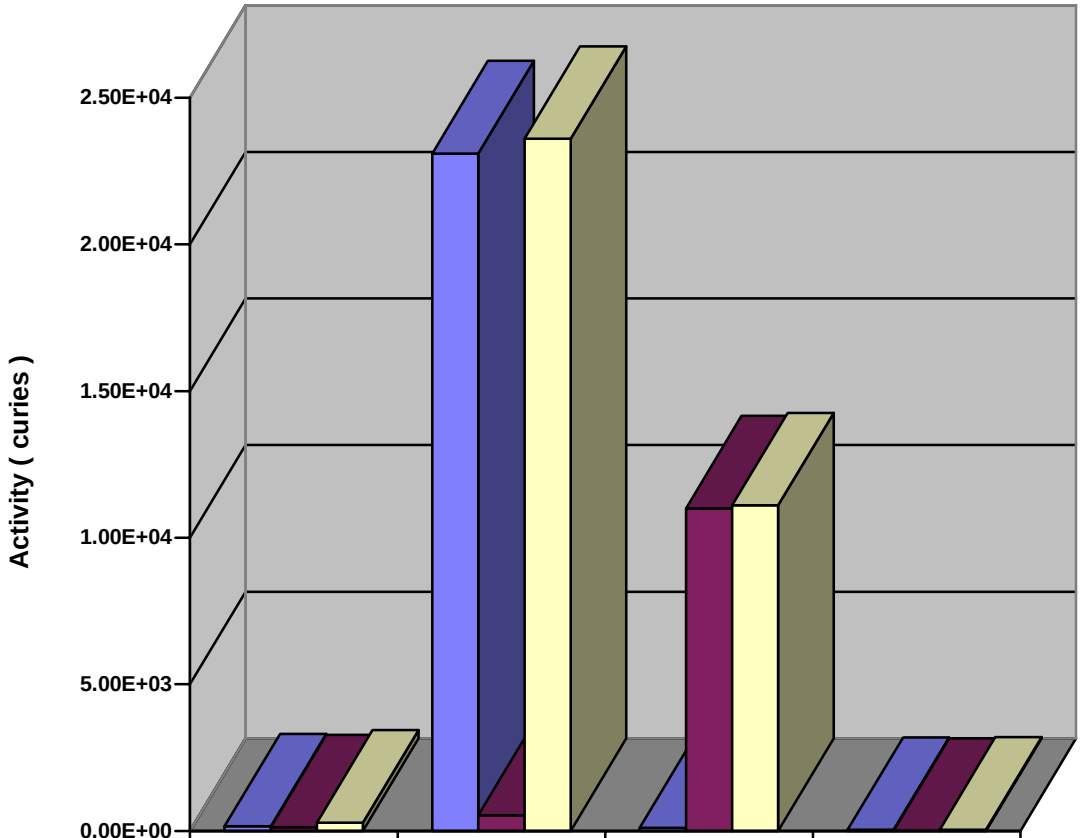


FIGURE 8

COMPARISON OF WASTE ACTIVITIES BY WASTE CLASS FOR 2005

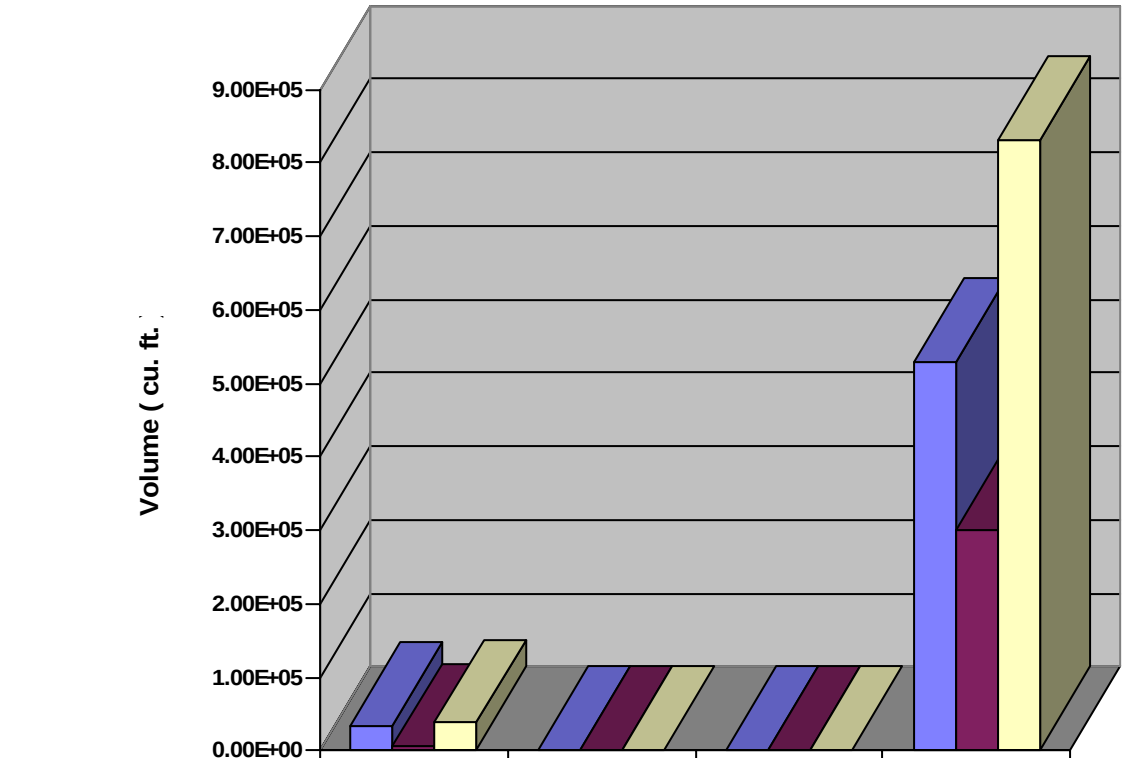


	A	B	C	HVLA
Activity Transferred	1.56E+02	2.31E+04	1.03E+02	3.55E+01
Activity Placed In Storage	1.23E+02	5.35E+02	1.10E+04	3.20E+00
Activity Total	2.79E+02	2.36E+04	1.11E+04	3.87E+01

Waste Class

FIGURE 9

COMPARISON OF WASTE VOLUMES BY WASTE CLASS FOR 2005



	A	B	C	HVLA
Volume Transferred	3.31E+04	1.03E+03	1.05E+02	5.29E+05
Volume Placed In Storage	4.83E+03	3.31E+02	3.39E+01	3.00E+05
Volume Total	3.79E+04	1.36E+03	1.39E+02	8.30E+05

Waste Class

FIGURE 10

PERCENT OF TOTAL ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2005

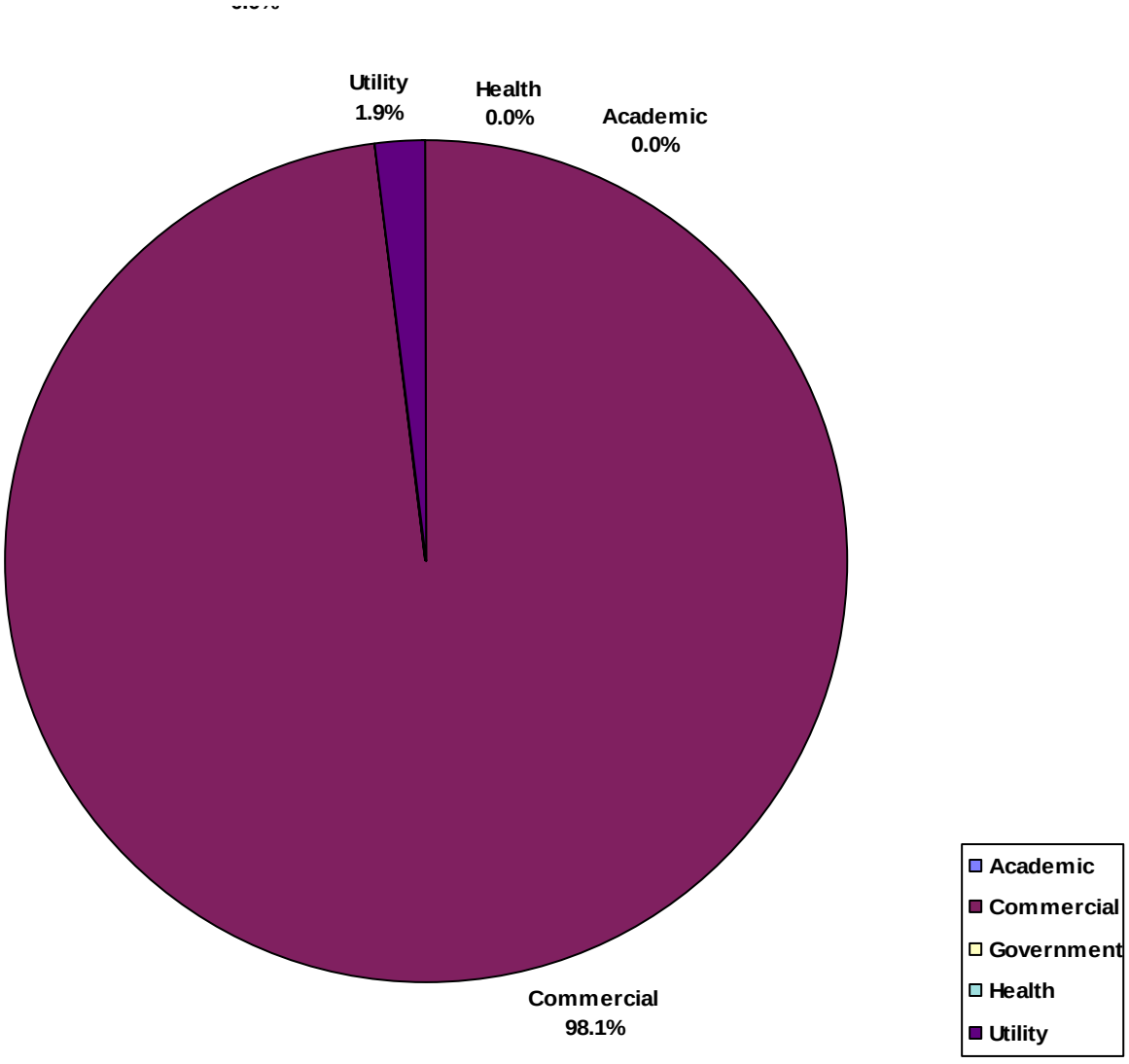


FIGURE 11

PERCENT OF IN - STORAGE ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2005

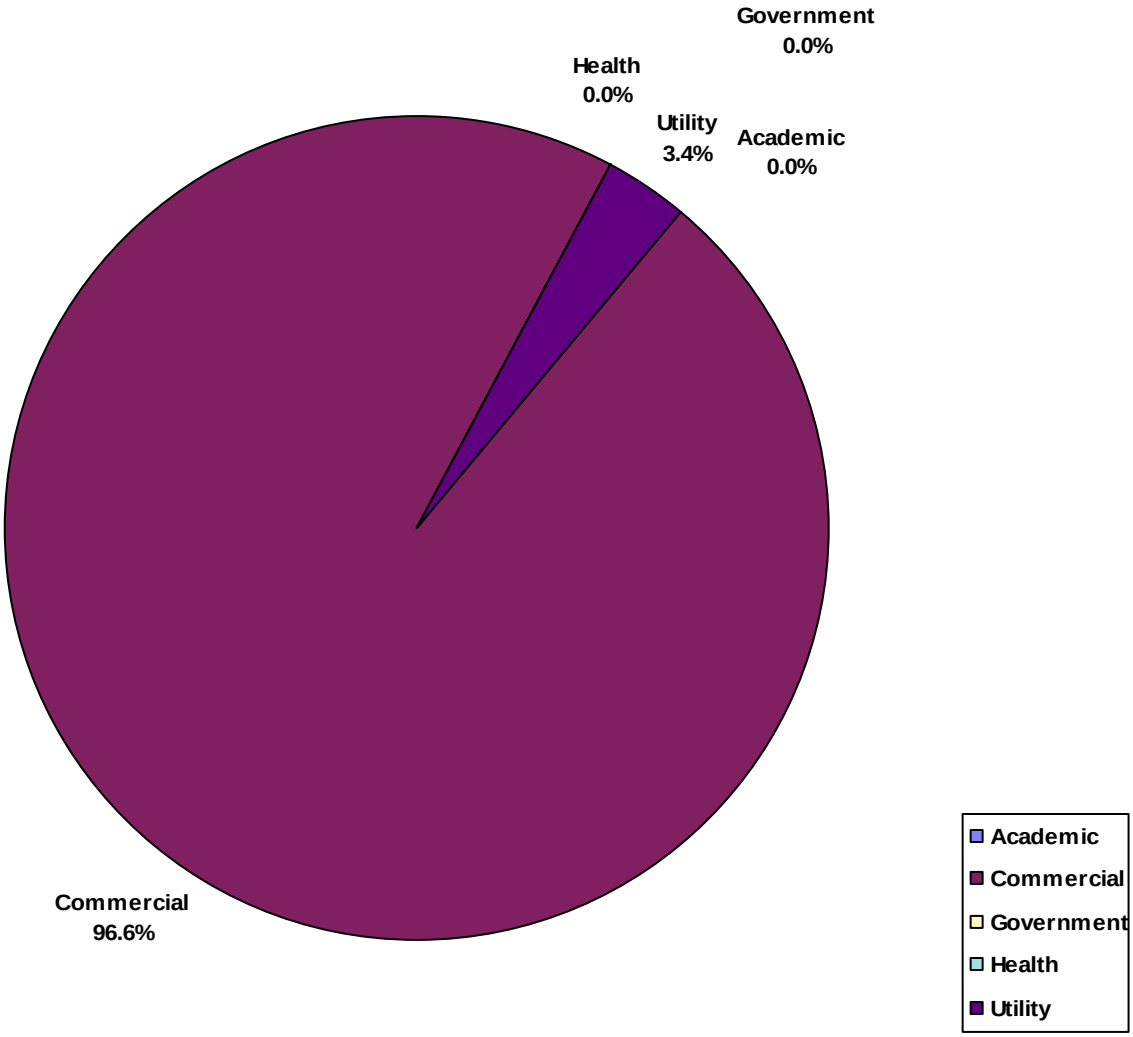


FIGURE 12

PERCENT OF TRANSFERRED ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2005

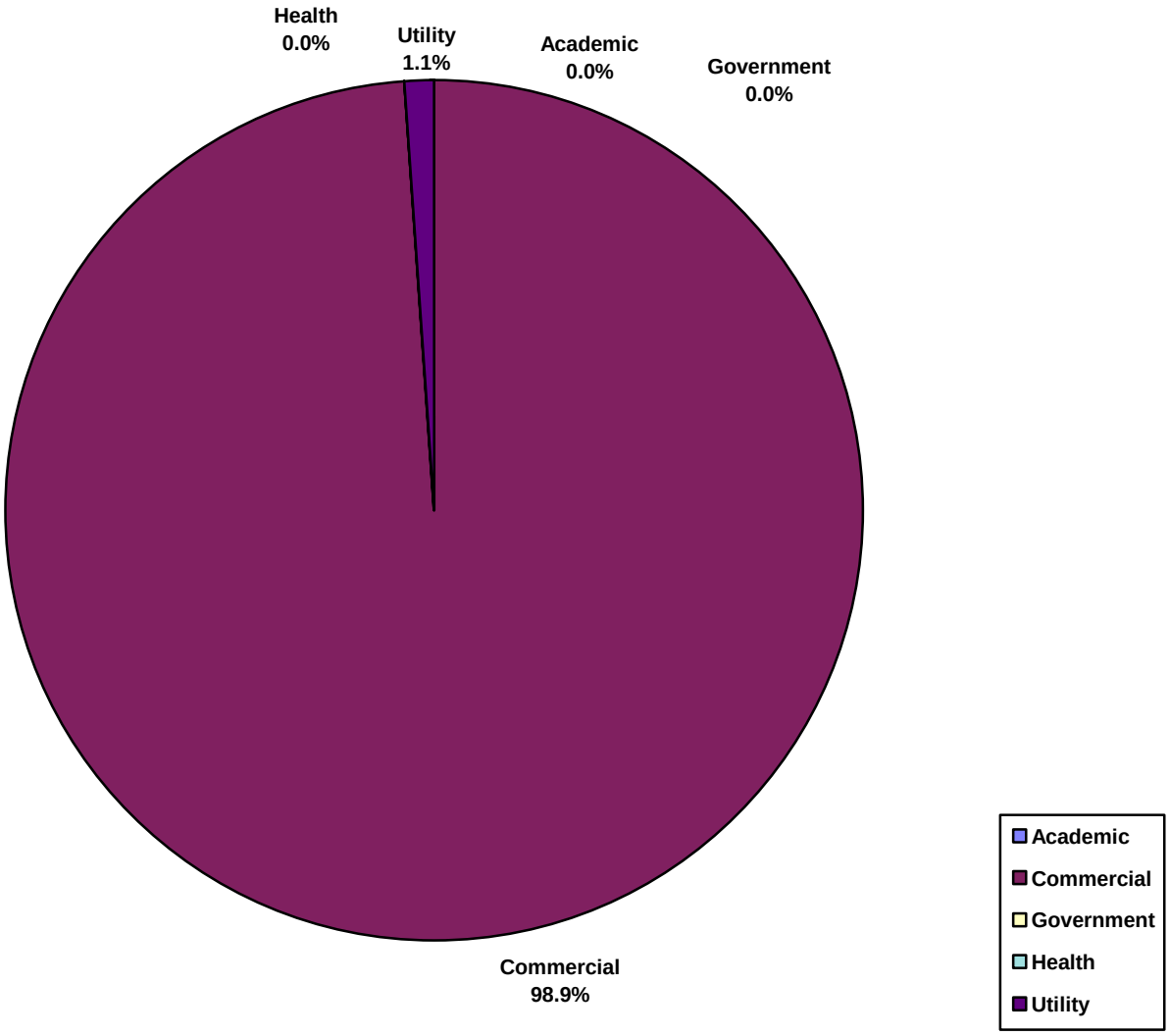
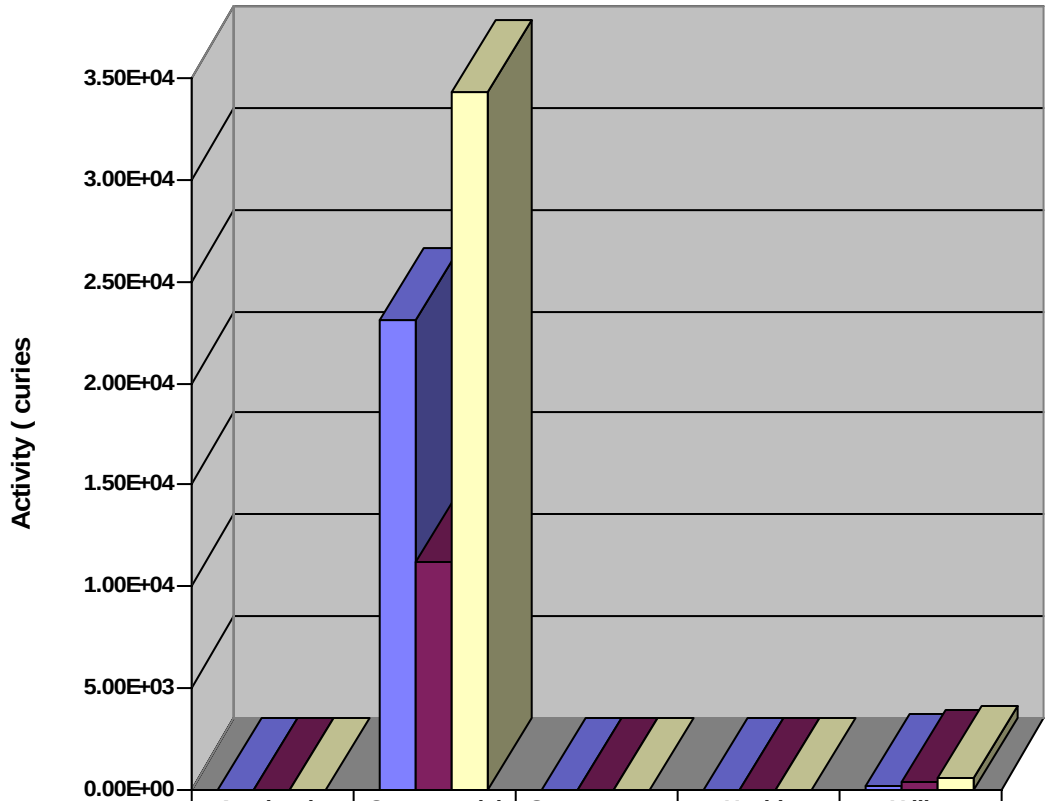


FIGURE 13

COMPARISON OF WASTE ACTIVITIES BY WASTE GENERATOR CATEGORY FOR 2005



	Academic	Commercial	Government	Health	Utility
Activity Transferred	2.75E+00	2.31E+04	0.00E+00	1.26E+00	2.51E+02
Activity Placed In Storage	1.46E-01	1.12E+04	1.00E-02	1.35E-01	3.97E+02
Activity Total	2.89E+00	3.43E+04	1.00E-02	1.40E+00	6.48E+02

Generator Category

FIGURE 14

PERCENT OF TOTAL VOLUME BY WASTE GENERATOR CATEGORY FOR 2005

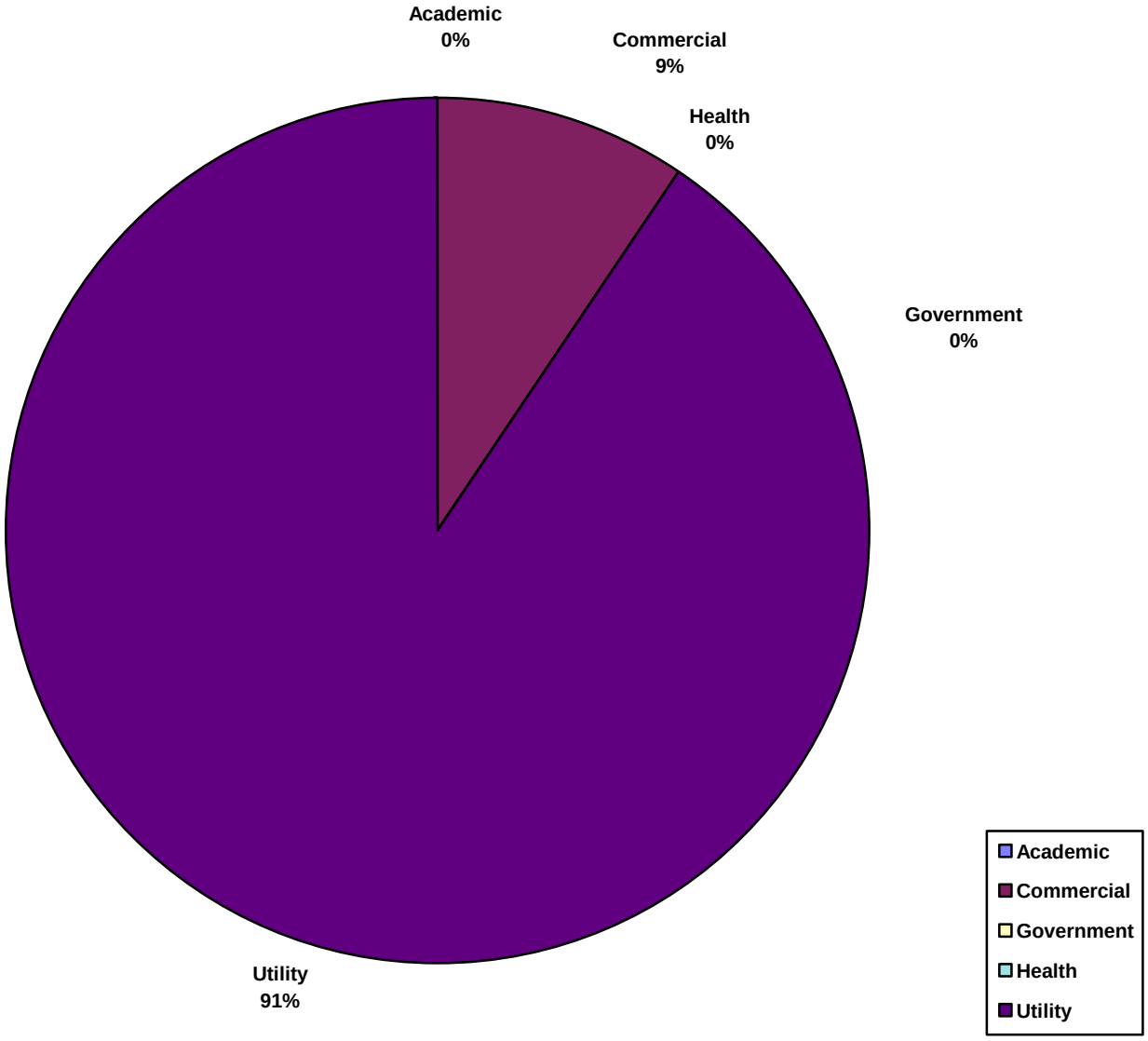


FIGURE 15

PERCENT OF IN-STORAGE VOLUME BY WASTE GENERATOR CATEGORY FOR 2005

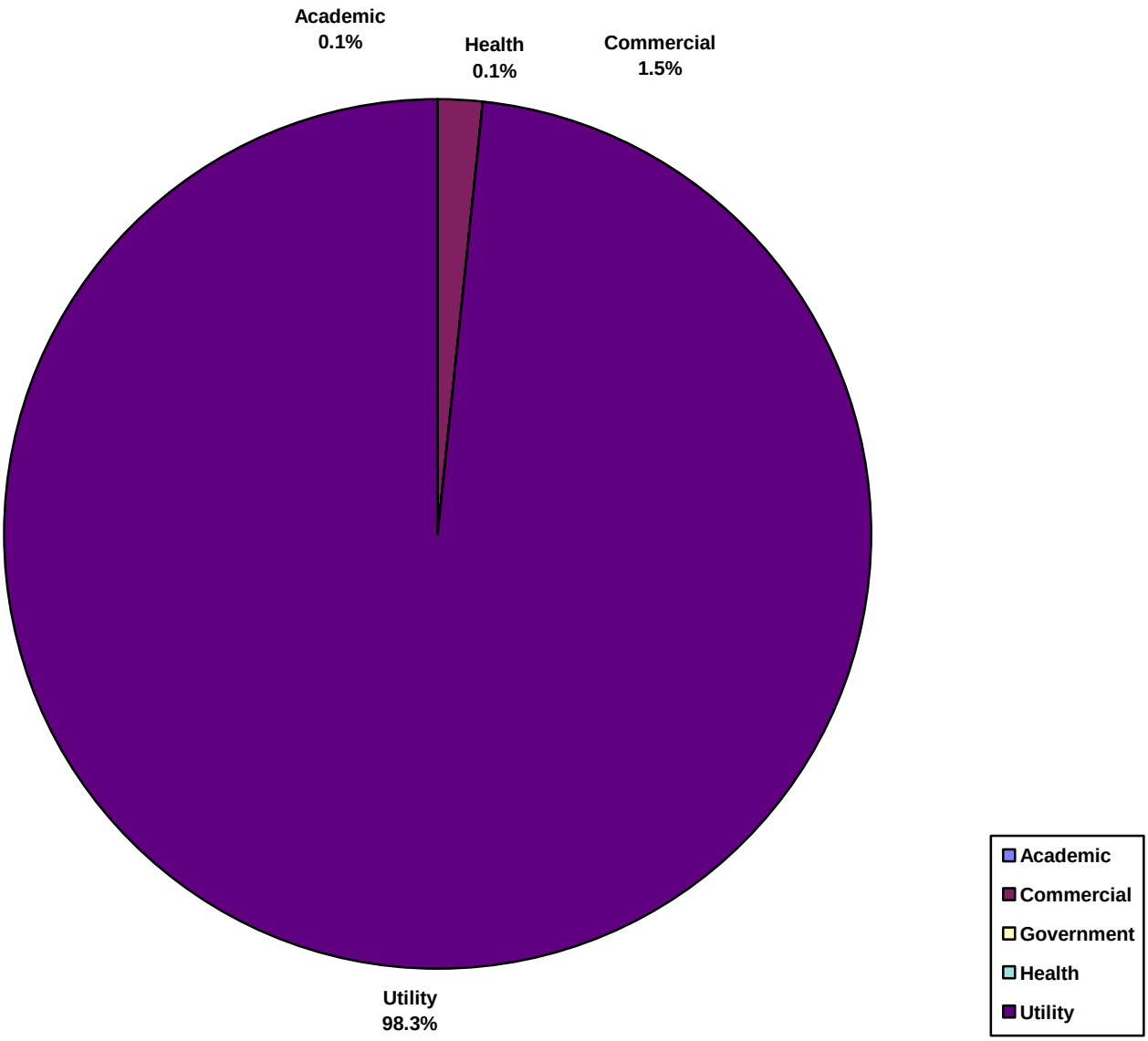


FIGURE 16

PERCENT OF TRANSFERRED VOLUME BY WASTE GENERATOR CATEGORY FOR 2005

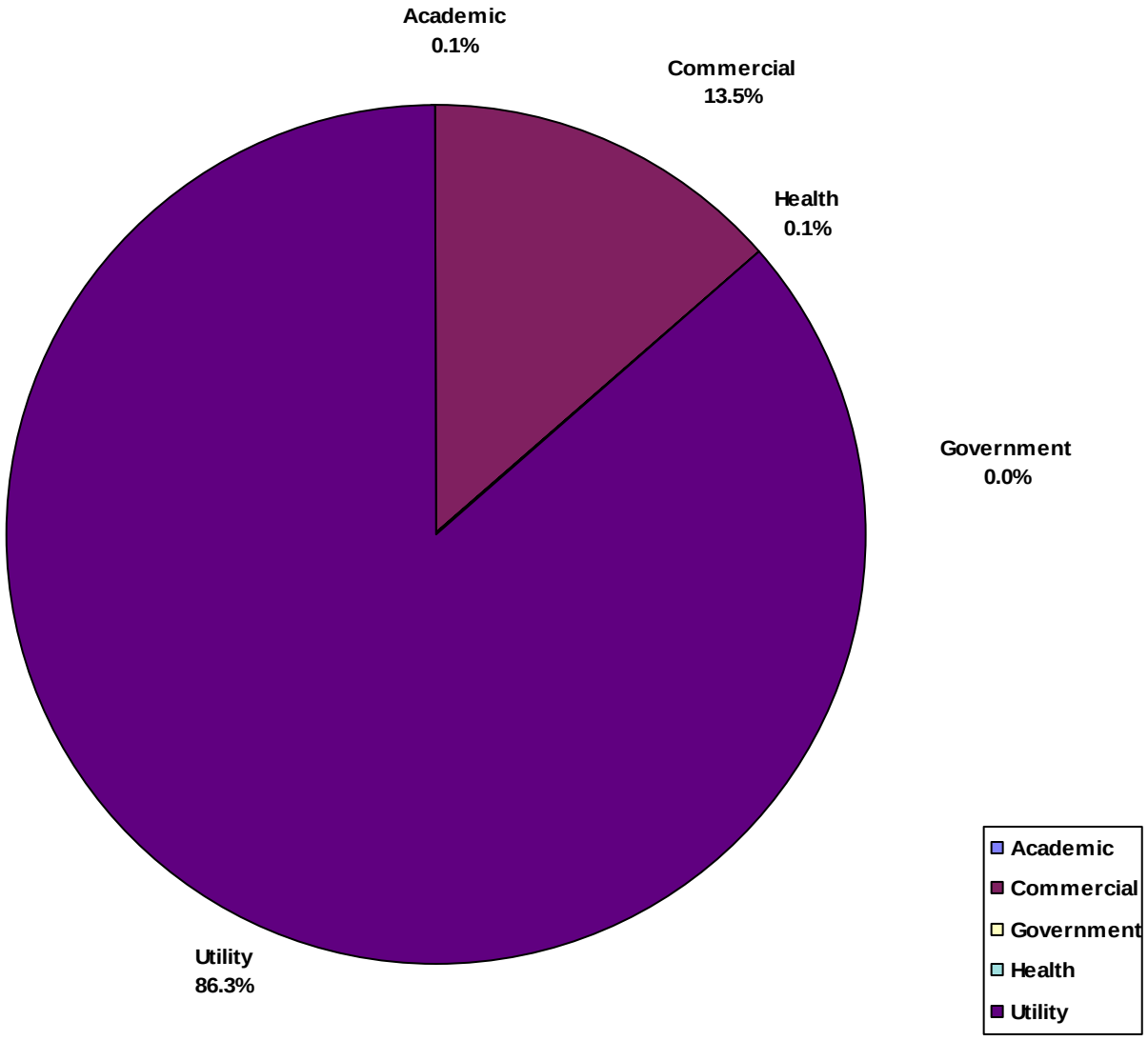


FIGURE 17

COMPARISON OF WASTE VOLUMES BY WASTE GENERATOR CATEGORY FOR 2005

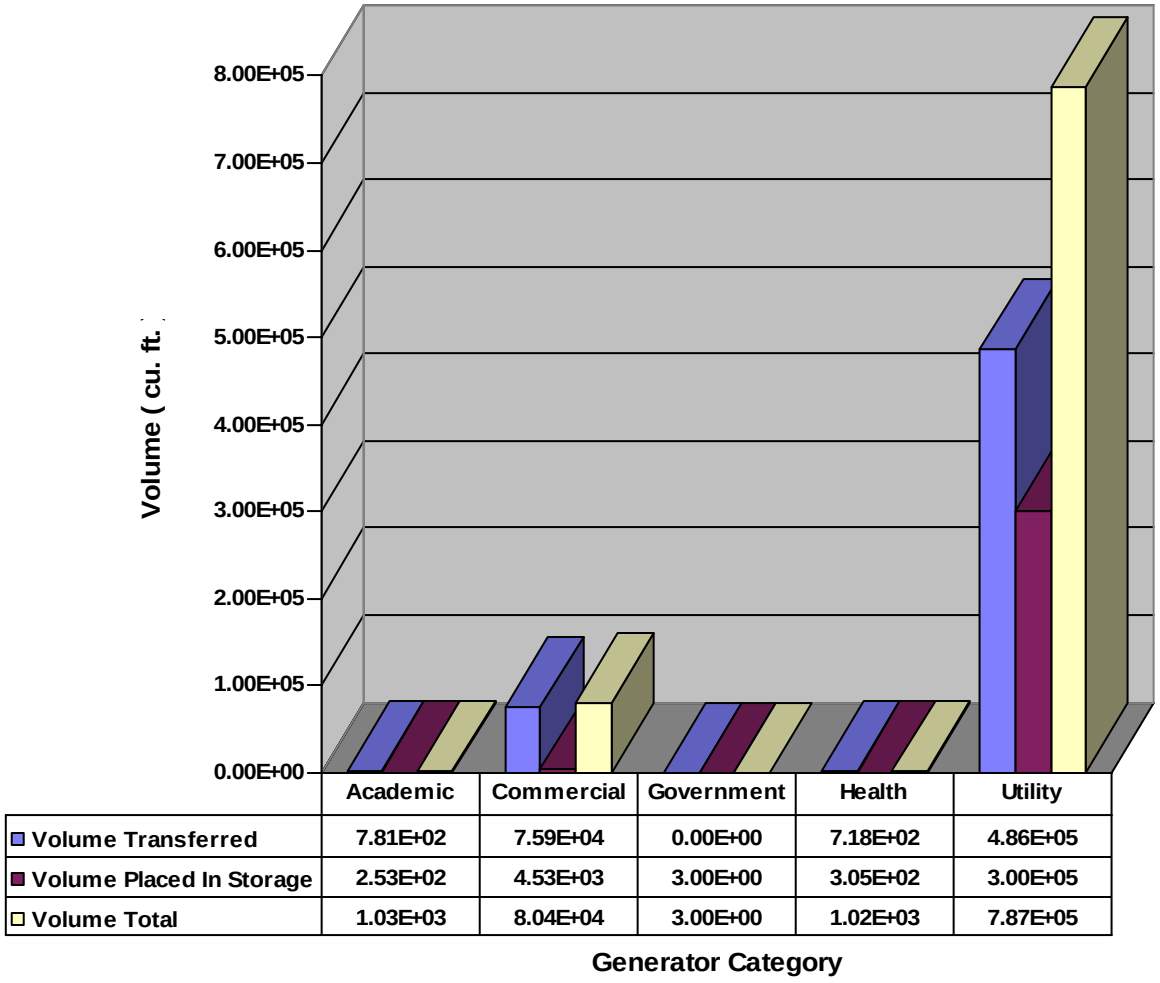


TABLE 14

Activity and Volume by Waste Generator Category For 2005

Waste Generator Category	Activity (curies)			Volume (Cu. ft.)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
Academic	2.75	0.15	2.89	781.49	253.18	1,034.67
(Percent)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Commercial	23,120.66	11,218.76	34,338.92	75,866.37	4,534.75	80,399.23
(Percent)	98.9%	96.6%	98.1%	13.5%	1.5%	9.3%
Government	0.00	0.01	0.01	0.00	3.00	3.00
(Percent)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Health	1.26	0.14	1.40	718.15	304.50	1,022.65
(Percent)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Utility	251.35	397.00	648.35	486,360.00	300,302.00	786,662.00
(Percent)	1.1%	3.4%	1.9%	86.3%	98.3%	90.5%
Grand Total	**23,376.03**	**11,616.05**	**34,991.58**	**563,726.01**	**305,397.43**	**869,121.55**

FIGURE 18

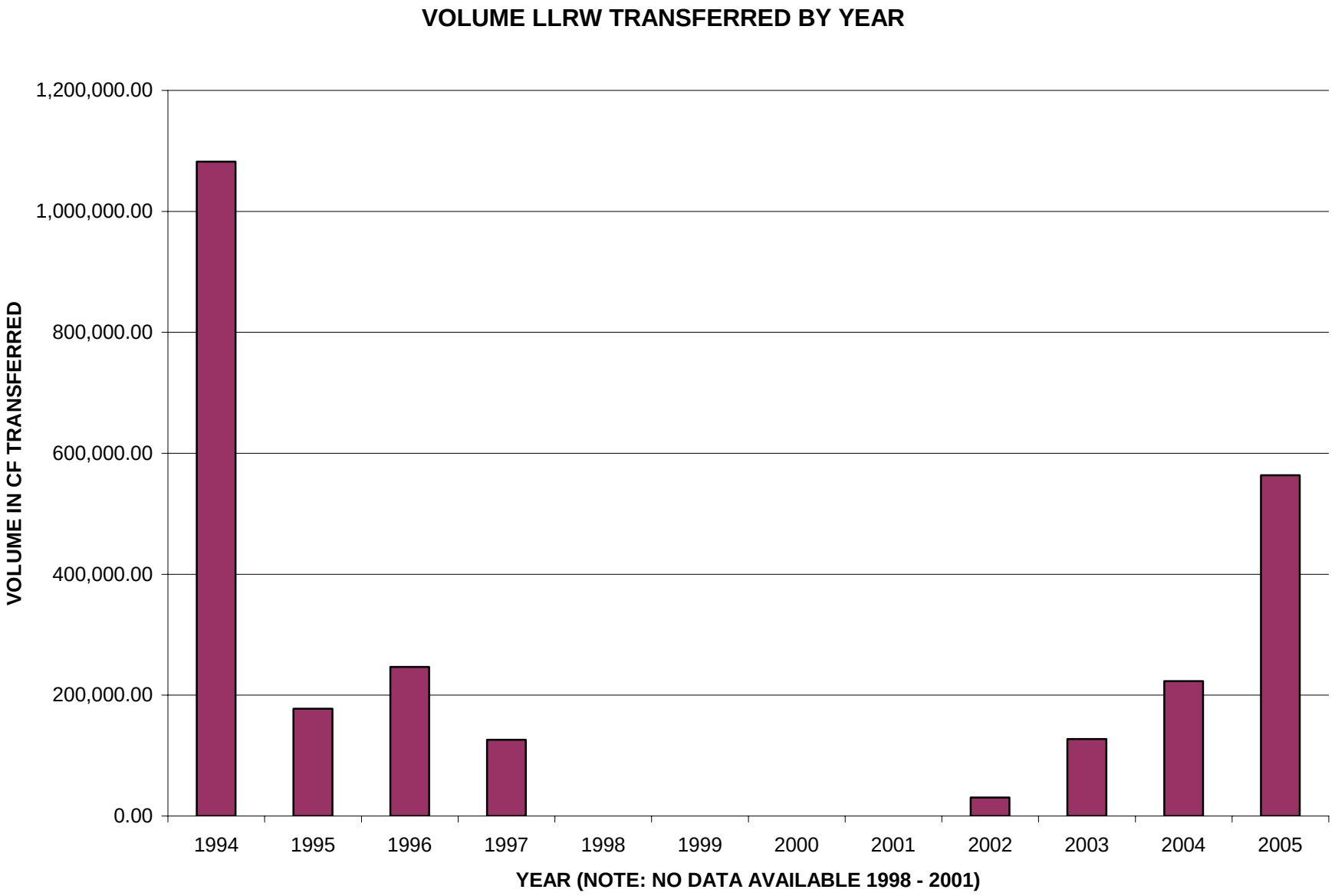

VOLUME LLRW TRANSFERRED BY YEAR
1,200,000.00
1,000,000.00
800,000.00
600,000.00
400,000.00
200,000.00
0.00
VOLUME IN CF TRANSFERRED
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
YEAR (NOTE: NO DATA AVAILABLE 1998 - 2001)

FIGURE 19

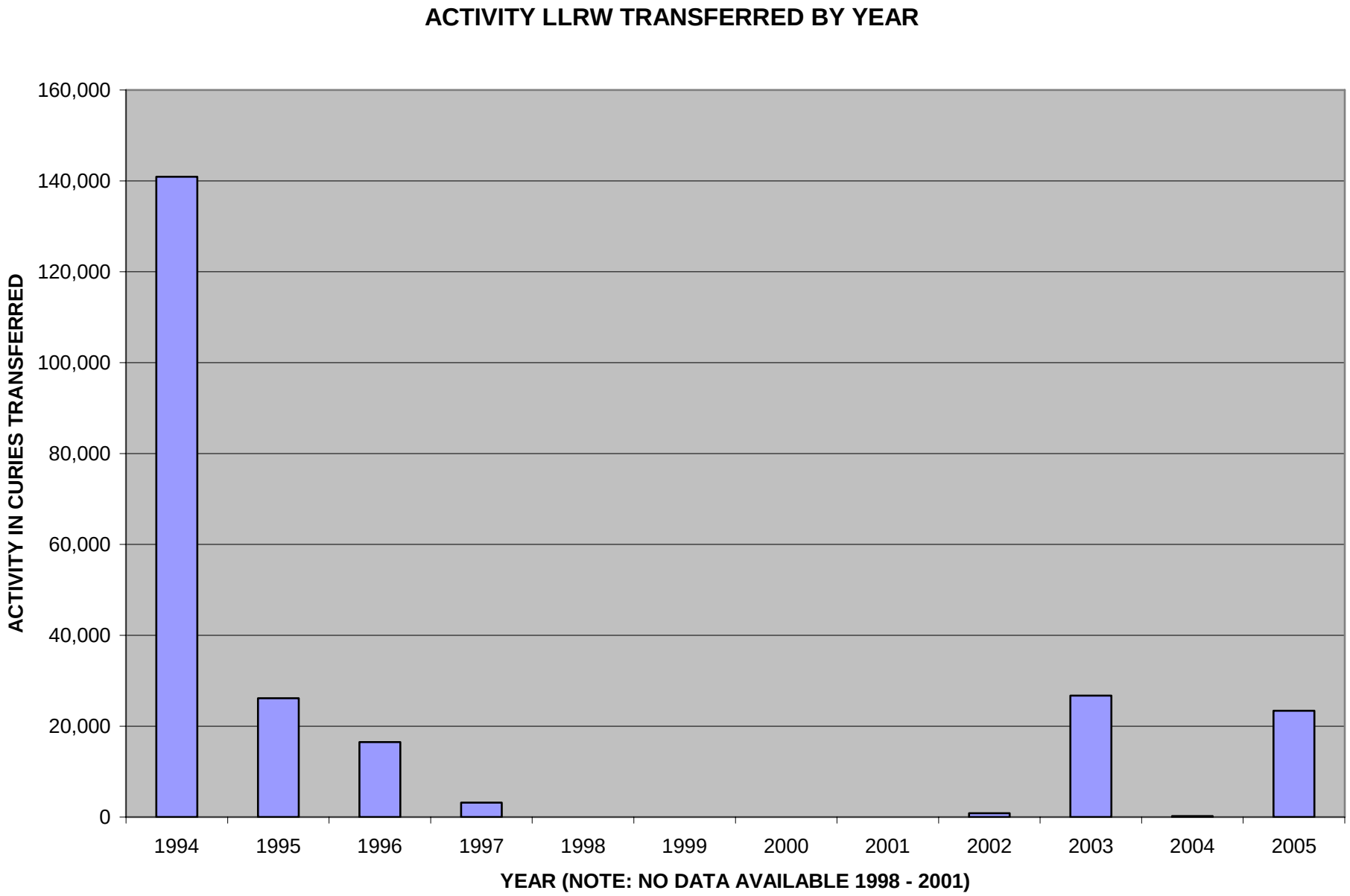

ACTIVITY LLRW TRANSFERRED BY YEAR
ACTIVITY IN CURIES TRANSFERRED
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
YEAR (NOTE: NO DATA AVAILABLE 1998 - 2001)

FIGURE 20
TOTAL RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2005

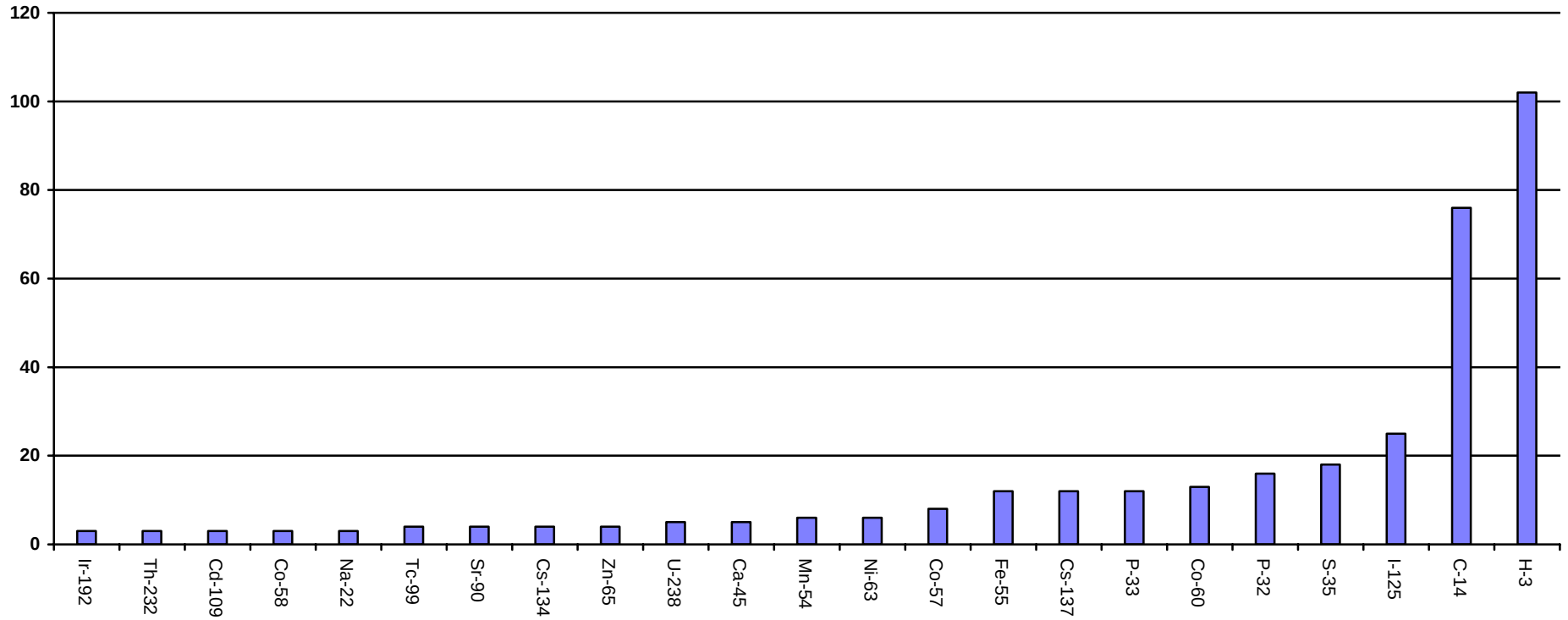


FIGURE 21
TOTAL RAM REPORTING FREQUENCY FOR CLASS A WASTE IN 2005

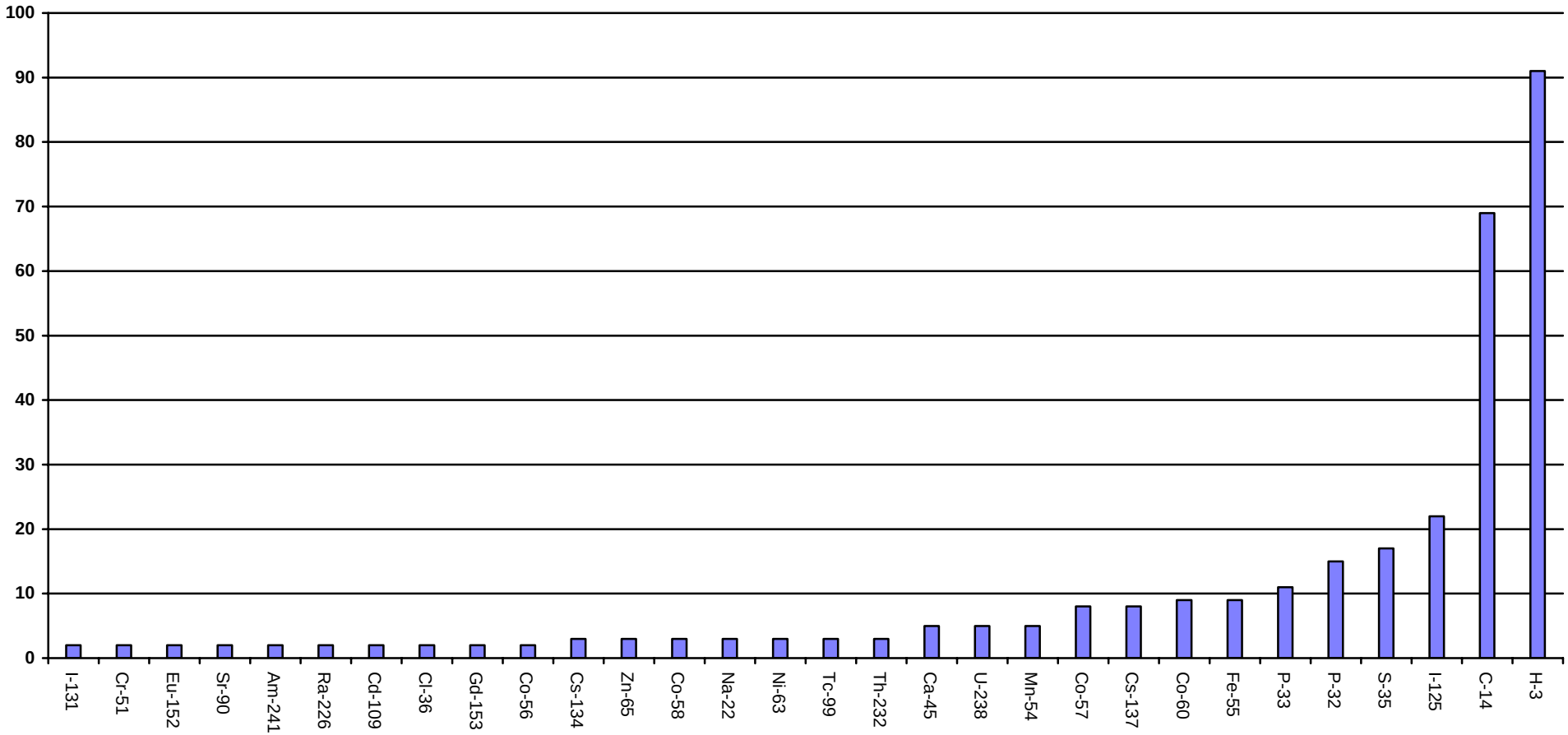


FIGURE 22
TOTAL RAM REPORTING FREQUENCY FOR CLASS B WASTE IN 2005

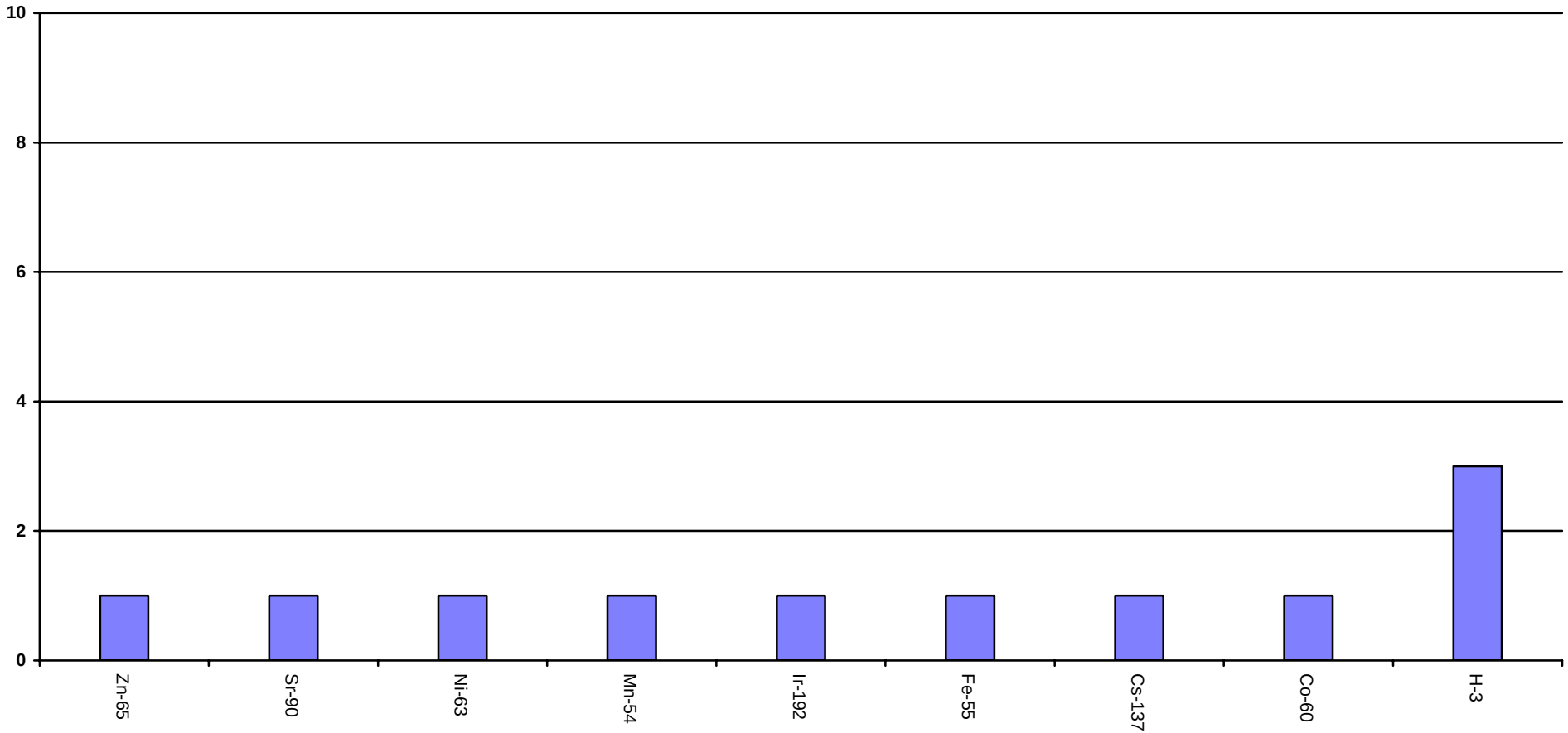


FIGURE 23
TOTAL RAM REPORTING FREQUENCY FOR CLASS C WASTE IN 2005

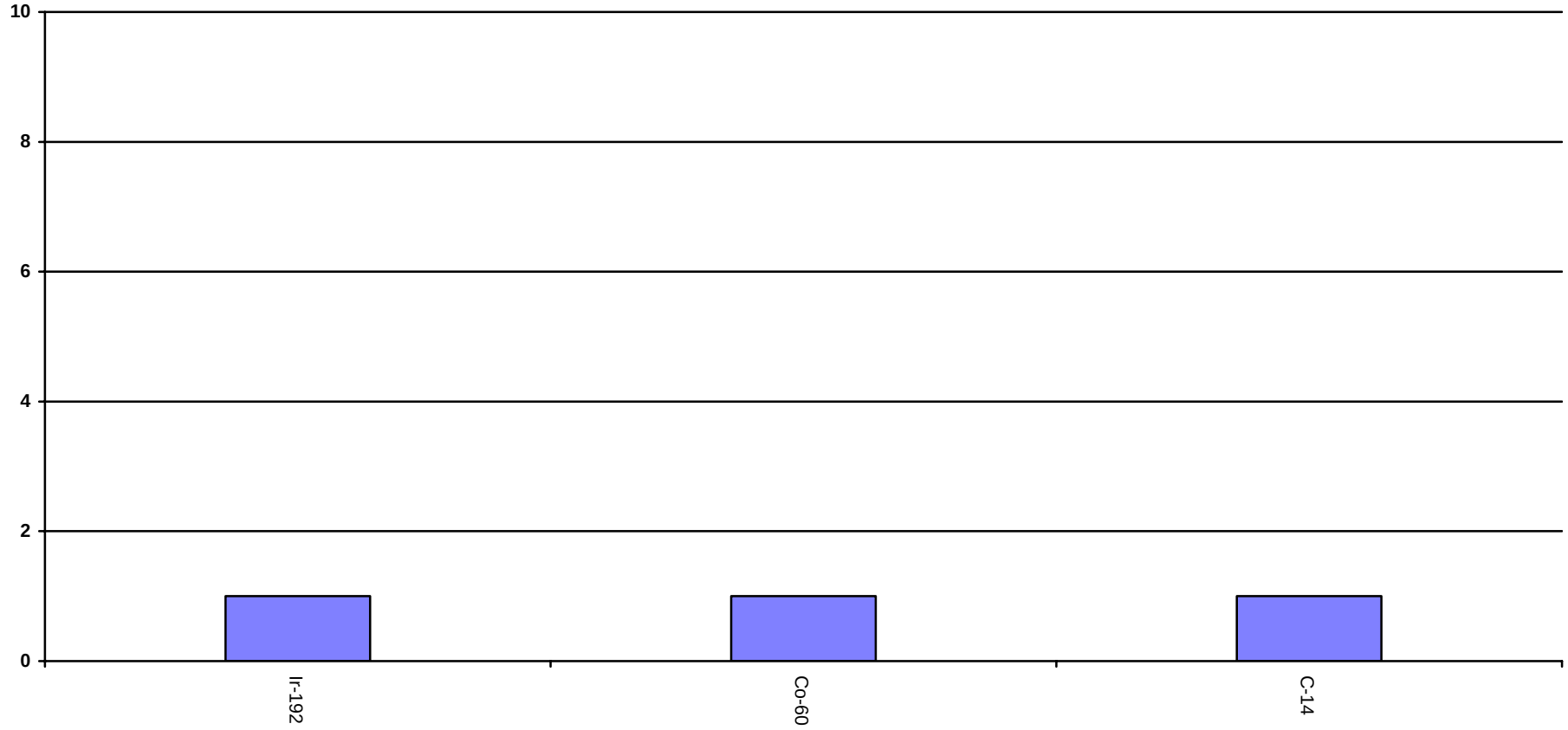


FIGURE 24
TOTAL RAM REPORTING FREQUENCY FOR HVLA WASTE IN 2005

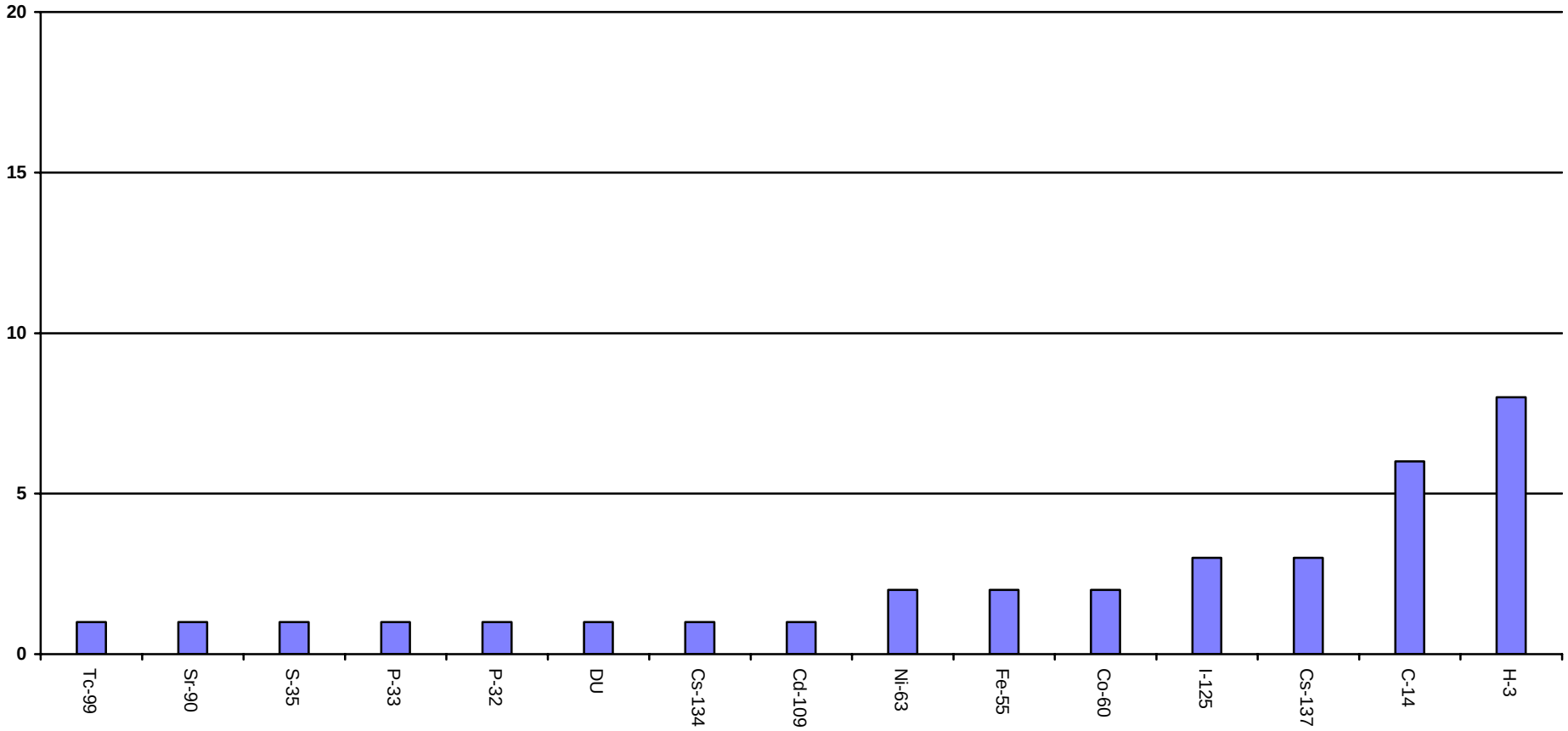


FIGURE 25
IN-STORAGE RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2005

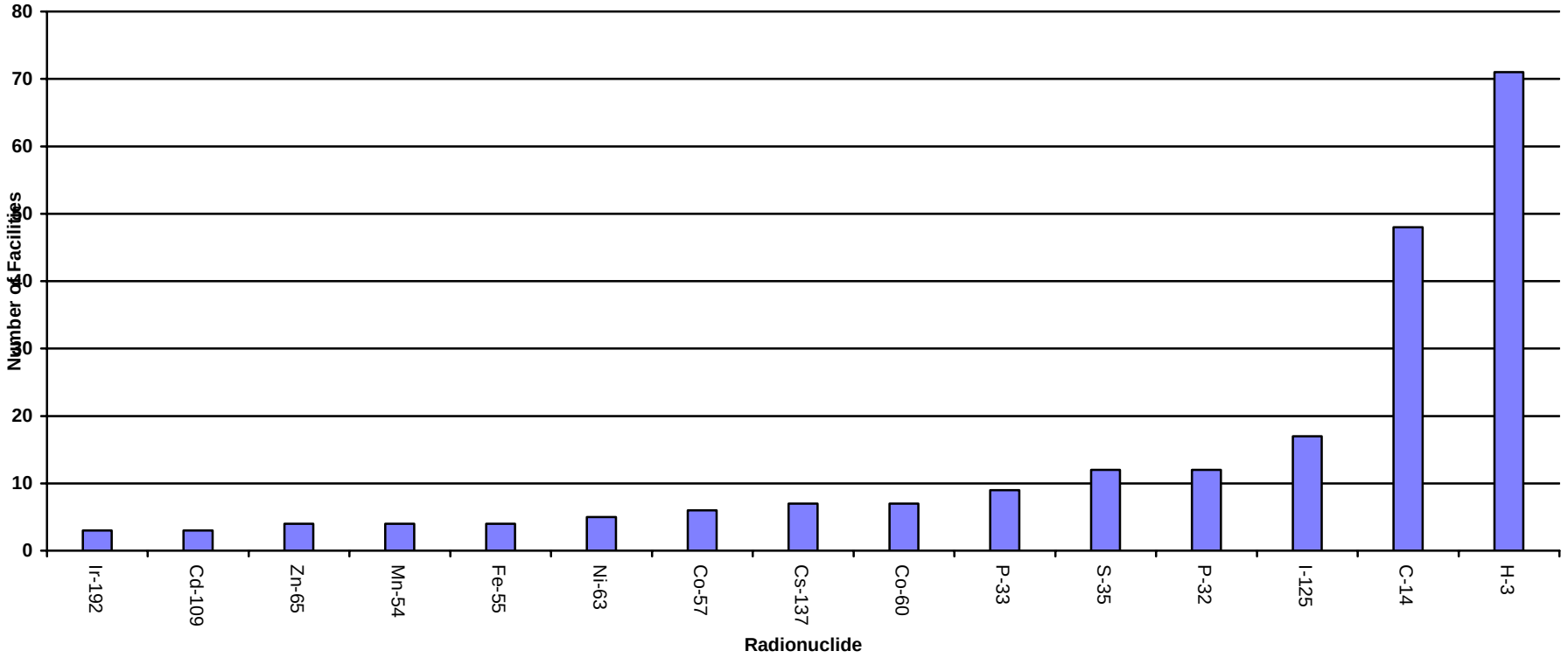


FIGURE 26
TRANSFERRED RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2005

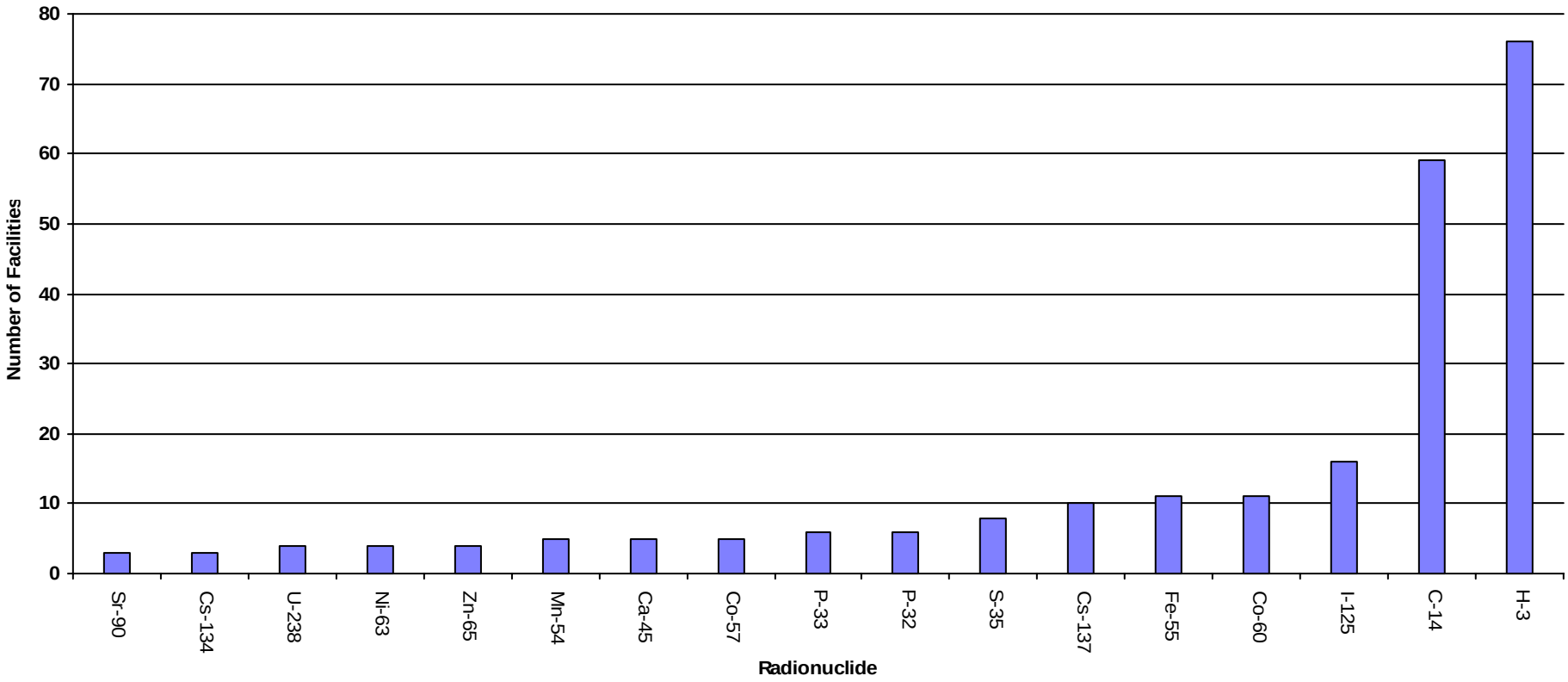


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FIGURE 27
DISTRIBUTION OF ORGANIZATIONS THAT GENERATED WASTE IN 2005 - BY ACTIVITY

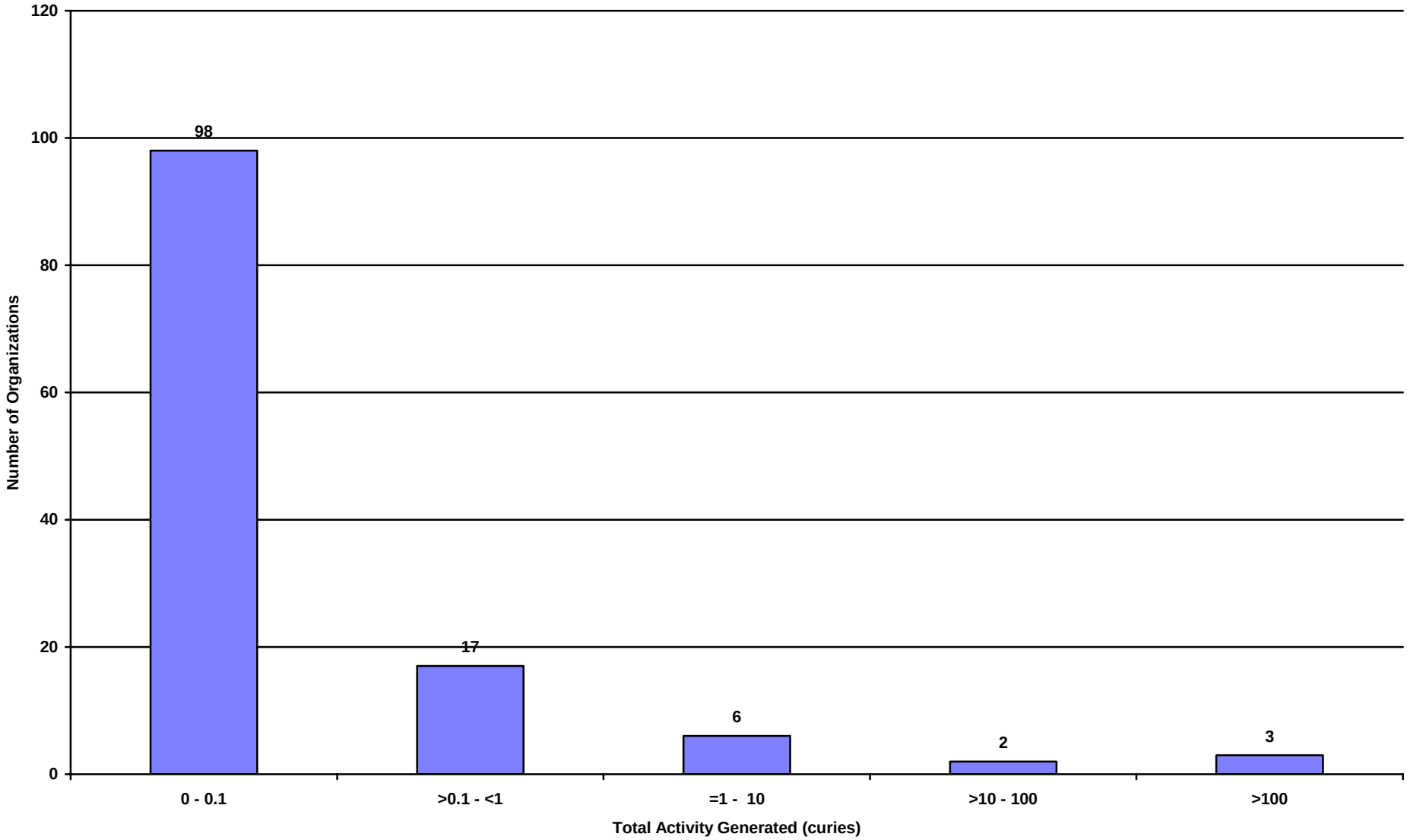


FIGURE 28
DISTRIBUTION OF ORGANIZATIONS THAT GENERATED WASTE IN 2005 - BY VOLUME

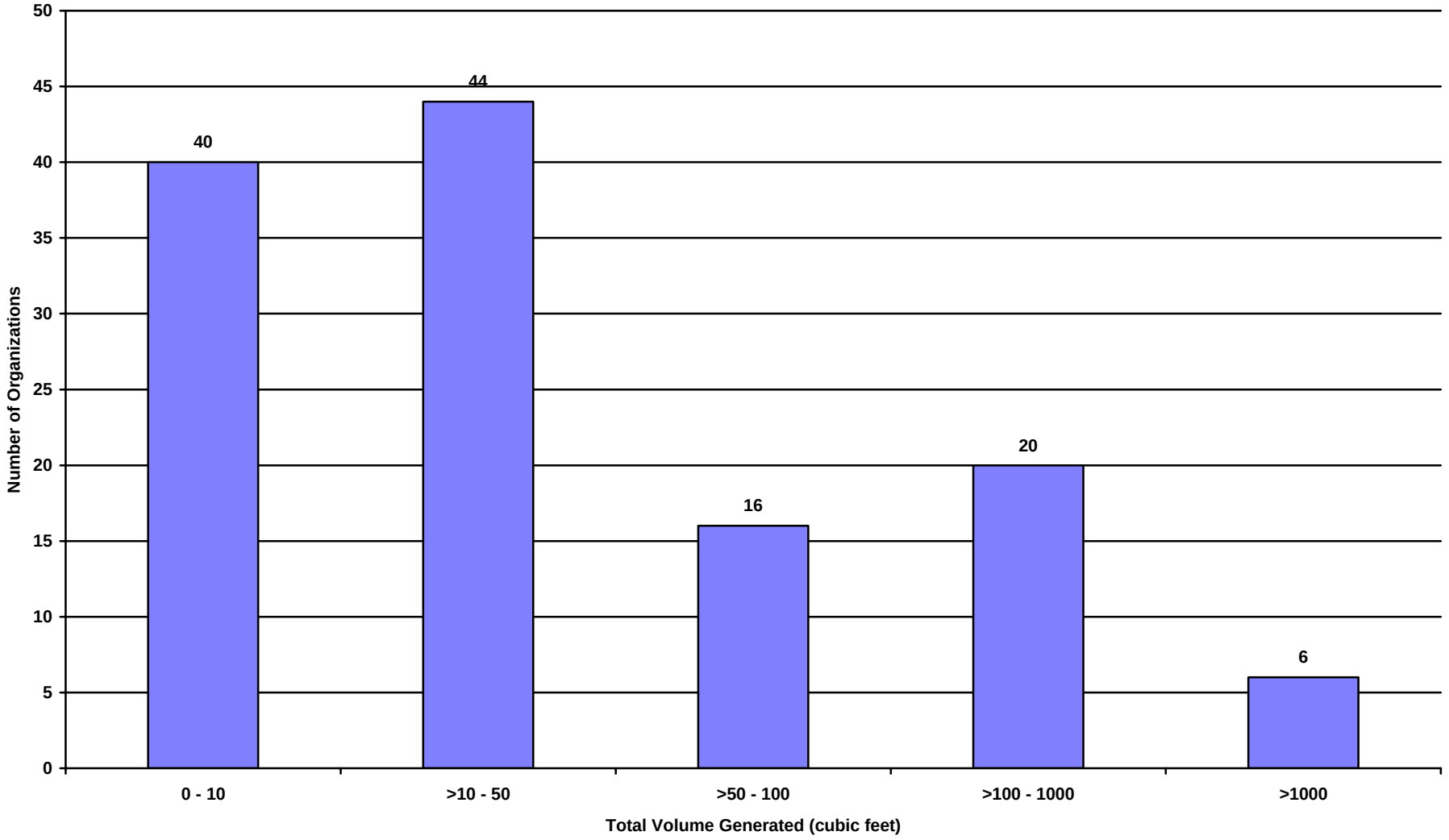


TABLE 15
List of Facilities Activities and Volumes Produced in 2005

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
ABBOTT BIORESEARCH CENTER, INC	67.5	0.0	67.5	0.031	0.000	0.031
ABC TESTING INC.	0.0	0.0	0.0	0.000	0.000	0.000
ACLIN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ACTIVBIOTICS, INC.	16.4	0.0	16.4	0.001	0.000	0.001
ADAPTIVE OPTICS ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ADDISON GILBERT HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED MAGNETICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED TESTING COMPANY, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AGGREGATE INDUSTRIES-NORTHEAST	0.0	0.0	0.0	0.000	0.000	0.000
ALG ENVIRONMENTAL CONSULTING, LLC	0.0	0.0	0.0	0.000	0.000	0.000
ALKERMES, INC.	8.2	2.0	10.2	0.113	0.347	0.460
ALL STATE SERVICES ENVIRON.	0.0	0.0	0.0	0.000	0.000	0.000
ALLEGHENY RODNEY	0.0	0.0	0.0	0.000	0.000	0.000
ALLIANCE IMAGING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALLIANCE IMAGING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALLIED TESTING LABS., INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALNYLAM PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALPHA ANALYTICAL LAB., INC	0.0	0.0	0.0	0.000	0.000	0.000
ALTANA RESEARCH INSTITUTE	0.0	0.0	0.0	0.000	0.000	0.000
ALTRAN CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
AMERICAN ENG. & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AMERICAN RED CROSS BLOOD SERV.	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
AMGEN, INC.	15.0	0.0	15.0	0.003	0.000	0.003
AMHERST COLLEGE	15.0	0.0	15.0	0.004	0.000	0.004
AMPTEK, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ANALYTICAL ANSWERS, INC	0.0	0.0	0.0	0.000	0.000	0.000
ANGELL ANIMAL MEDICAL CENTER - BOSTON	0.0	0.0	0.0	0.000	0.000	0.000
ANNA JAQUES HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ANTIGENICS INC.	0.0	8.0	8.0	0.000	0.002	0.002
APPLIED BIOSYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
ARCHEMIX CORP.	33.0	58.5	91.5	0.023	0.009	0.032
AREVA NP, INC.	41.0	90.0	131.0	0.020	0.001	0.021
ARIAD PHARMACEUTICALS, INC.	7.0	0.0	7.0	0.014	0.000	0.014
ARQULE, INC.	25.9	7.5	33.4	0.007	0.001	0.008
ASAP ENVIRONMENTAL INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
ASSURANCE TECHNOLOGY CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
ASTRAZENECA PHARMACEUTICALS LP	75.4	38.9	114.3	0.017	0.011	0.028
ATC ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ATC ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ATC GROUP SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ATHENA DIAGNOSTICS, INC.	0.0	37.5	37.5	0.000	0.001	0.001
ATLANTIC NUCLEAR CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
AVANT IMMUNOTHERAPUTICS, INC.	0.0	10.5	10.5	0.000	0.006	0.006
AVEO PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
AXIOM PARTNERS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
B.J. EDGE & ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
BAKER TESTING SERVICES INC.	0.0	0.0	0.0	0.000	0.000	0.000
BARTLETT NUCLEAR, INC.	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
BASCOM, SCOTT A.	0.0	0.0	0.0	0.000	0.000	0.000
BAYER HEALTHCARE LLC	22.5	0.0	22.5	0.002	0.000	0.002
BAYSTATE HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
BEAUDETTE, MARC	0.0	0.0	0.0	0.000	0.000	0.000
BECHTEL/PARSONS BRINCKERHOFF	0.0	0.0	0.0	0.000	0.000	0.000
BERKSHIRE MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
BETH ISRAEL DEACON. MED. CTR.	0.9	0.0	0.9	0.058	0.000	0.058
BETH ISRAEL DEACON.MED CENTER	0.0	0.0	0.0	0.000	0.000	0.000
BETH ISRAEL DEACONESS HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
BEVERLY HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
BIO PROCESSORS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
BIOGEN IDEC MA, INC.	64.0	37.5	101.5	0.015	0.009	0.024
BIOMEASURE, INC.	8.0	0.0	8.0	0.000	0.000	0.000
BIOMEDICAL RESEARCH MODELS, INC	0.0	0.0	0.0	0.000	0.000	0.000
BIOMEDICAL TECHNOLOGIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
BIOVEST INTERNATIONAL INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
BLACKMAN, MEL	0.0	0.0	0.0	0.000	0.000	0.000
BOSTON BIOMEDICAL RES. INST.	0.1	0.0	0.1	0.006	0.000	0.006
BOSTON CHILDHOOD LEAD PAINT POISON PREV.	0.0	0.0	0.0	0.000	0.000	0.000
BOSTON COLLEGE	52.5	15.0	67.5	0.009	0.000	0.009
BOSTON SCIENTIFIC	4.0	0.0	4.0	0.000	0.000	0.000
BOSTON UNIV. CHARLES RIVER CAM	0.0	3.3	3.3	0.000	0.001	0.001
BOSTON UNIVERSITY MED CTR HOSP	52.5	0.0	52.5	0.020	0.000	0.020
BRANDEIS UNIVERSITY	112.5	67.5	180.0	0.201	0.106	0.307
BRIDGEWATER GODDARD PARK MED	0.0	0.0	0.0	0.000	0.000	0.000
BRIDGEWATER STATE COLLEGE	1.0	0.0	1.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
BRIGHAM & WOMEN'S HOSPITAL	0.0	76.5	76.5	0.000	0.085	0.085
BRISTOL-MYERS SQUIBB MED. IMG.	1,031.2	452.2	1,483.4	0.587	0.893	1.480
BROCKTON BOARD OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
BROCKTON CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
BROCKTON HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
BROWN AND CALDWELL	0.0	0.0	0.0	0.000	0.000	0.000
BRUKER DALTONICS NBC DETECTION CORP.	0.0	0.0	0.0	0.000	0.000	0.000
CAMBREX BIO SCIENCE HOPKINTON, INC.	33.9	20.8	52.8	0.004	0.003	0.007
CAMBRIDGE PUB. HEALTH ALLIANCE	0.0	0.0	0.0	0.000	0.000	0.000
CAMP DRESSER & MCKEE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CAPE COD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CAPFILM / ELECTRONIC CONCEPTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CAPITAL CARDIOLOGY ASSOC., P.C	0.0	0.0	0.0	0.000	0.000	0.000
CARDINAL HEALTH	0.7	0.2	0.9	0.000	0.000	0.000
CARDINAL HEALTH NUCLEAR PHARMACY SERVICE	0.0	0.0	0.0	0.000	0.000	0.000
CARDIOLOGY CONSULT.OF CENTRAL MASS., LLP	0.0	0.0	0.0	0.000	0.000	0.000
CARDIOVASCULAR SPECIALISTS, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS CARNEY HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS GOOD SAMARITAN MED CENTER	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS HOLY FAMILY HOSPITAL AND MED CTR	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS NORWOOD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS PET IMAGING, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CARITAS ST. ELIZABETH'S MED. CNTER OF BO	0.0	2.0	2.0	0.000	0.001	0.001
CAT HOSPITAL, THE	0.0	0.0	0.0	0.000	0.000	0.000
CATALDO, JOSEPH P.	0.0	0.0	0.0	0.000	0.000	0.000
CAULFIELD ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
CBR INSTITUTE FOR BIOMED. RESEARCH, INC.	0.0	24.1	24.1	0.000	0.009	0.009
CELL SIGNALING TECHNOLOGY	0.0	0.0	0.0	0.000	0.000	0.000
CHADWICK MEDICAL ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
CHARLES RIVER LABORATORIES,INC	452.0	56.0	508.0	0.036	0.000	0.036
CHARLES RIVER PHARMSERVICES	0.0	0.0	0.0	0.000	0.000	0.000
CHARLES STARK DRAPER LAB., INC	0.0	0.0	0.0	0.000	0.000	0.000
CHARM SCIENCES INC.	0.0	22.0	22.0	0.000	0.004	0.004
CHEMIC LABORATORIES, INC.	4.5	0.0	4.5	0.010	0.000	0.010
CHILD SAFE LEAD PAINT	0.0	0.0	0.0	0.000	0.000	0.000
CHILDREN'S HOSPITAL, THE	157.5	30.0	187.5	0.059	0.008	0.067
CIS-US, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CITY OF FITCHBURG	0.0	0.0	0.0	0.000	0.000	0.000
CLARK UNIVERSITY	0.0	0.0	0.0	0.000	0.000	0.000
CLINICAL SCIENCE LAB., INC.	0.0	0.0	0.0	0.000	0.000	0.000
CLIPPER CARDIOVASCULAR ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
COLLEGE OF OUR LADY OF ELMS	0.0	0.0	0.0	0.000	0.000	0.000
COLLEGE OF THE HOLY CROSS	0.0	0.0	0.0	0.000	0.000	0.000
COMBINATORX, INC.	3.4	18.2	21.6	0.003	0.002	0.005
COMMUNICATIONS & POWER INDUST.	45.0	0.0	45.0	50.400	0.000	50.400
COMPOUND THERAPEUTICS, INC.	4.0	10.0	14.0	0.007	0.004	0.011
CONAM INSPECTION	0.0	0.0	0.0	0.000	0.000	0.000
COOLEY DICKINSON HOSPITAL, INC	0.0	0.0	0.0	0.000	0.000	0.000
COVINO ENVIRON. ASSOC. INC.	0.0	0.0	0.0	0.000	0.000	0.000
CRANE & CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
CRANE ENVIRONMENTAL CONSULTANTS, LLC	0.0	0.0	0.0	0.000	0.000	0.000
CRITICAL THERAPEUTICS, INC,	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
CUBIST PHARMACEUTICALS, INC.	26.0	0.0	26.0	0.003	0.000	0.003
CURIS, INC.	0.0	4.0	4.0	0.000	0.000	0.000
CYTRX LABORATORIES, INC.	23.2	4.0	27.2	0.017	0.006	0.023
DAIICHI ASUBIO MED.RESEARCH LAB., LLC.	15.0	0.0	15.0	0.002	0.000	0.002
DANA-FARBER CANCER INSTITUTE	293.0	0.0	293.0	0.382	0.000	0.382
DAVID & SON LEAD INSPECTIONS	0.0	0.0	0.0	0.000	0.000	0.000
DIGIRAD IMAGING SOLUTIONS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
DILLARD, ANNETTE	0.0	0.0	0.0	0.000	0.000	0.000
DISCOVERY LABWARE, INC.	43.3	16.7	60.0	0.002	0.015	0.017
DIVERSIFIED ENVIRONMENTAL CORP	0.0	0.0	0.0	0.000	0.000	0.000
DOMINION ENERGY BRAYTON POINT, LLC	0.0	0.0	0.0	0.000	0.000	0.000
DOMINION ENERGY SALEM HARBOR, LLC	0.0	0.0	0.0	0.000	0.000	0.000
DOSITEC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
E.T. & L. CORP.	0.0	0.0	0.0	0.000	0.000	0.000
EASTERN ISOTOPES	0.0	0.0	0.0	0.000	0.000	0.000
EGS GAUGING INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
EISAI RESEARCH INSTITUTE	7.3	11.7	19.0	0.001	0.001	0.001
ELIXIR PHARMACEUTICALS, INC.	0.0	4.0	4.0	0.000	0.000	0.000
EMD LEXIGEN RESEARCH CENTER CORPORATION	0.0	21.7	21.7	0.000	0.005	0.005
EMERALD LEAD TESTING CO.	0.0	0.0	0.0	0.000	0.000	0.000
EMERSON HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ENANTA PHARMACEUTICALS	0.0	0.0	0.0	0.000	0.000	0.000
ENRIGHT, JOHN J.	0.0	0.0	0.0	0.000	0.000	0.000
ENSR INTERNATIONAL	0.0	0.0	0.0	0.000	0.000	0.000
ENTERGY NUCLEAR GENERATING COMPANY	26,630.0	302.0	26,932.0	244.600	394.000	638.600
ENVIRONMENTAL AND LEAD PT INSP	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
ENVIRONMENTAL CHEMICAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL COMPLIANCE SERV	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL HEALTH & ENGINEERING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL LEAD DETECTION, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL PARTNERS GROUP, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL STRATEGIES & MANAGE. INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL TESTING SVCS.INC	0.0	0.0	0.0	0.000	0.000	0.000
ENVIROSCIENCE CONSULTANTS, INC	0.0	0.0	0.0	0.000	0.000	0.000
ENVIROSENSE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIROTEST LABORATORY	0.0	0.0	0.0	0.000	0.000	0.000
EPIC THERAPEUTICS, INC.	60.0	0.0	60.0	0.000	0.000	0.000
EPIX PHARMACEUTICALS, INC.	66.1	0.0	66.1	0.009	0.000	0.009
ERM	0.0	0.0	0.0	0.000	0.000	0.000
EUKARION, INC.	0.0	0.0	0.0	0.000	0.000	0.000
EXACT SCIENCES CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
EYETECH (OSI)	0.0	12.5	12.5	0.000	0.002	0.002
F. H. PETERSON MACHINE CORP.	0.0	0.0	0.0	0.000	0.000	0.000
F.X. MASSE ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
FAIRVIEW HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
FALLON CLINIC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
FALMOUTH HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
FAULKNER HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
FITCHBURG BOARD OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
FITCHBURG STATE COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
FORSYTH INSTITUTE THE	7.5	0.0	7.5	0.001	0.000	0.001
FRANKLIN ANALYTICAL SERVICES	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
FSL ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GAETA, NEIL A.,	0.0	0.0	0.0	0.000	0.000	0.000
GAF MATERIALS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
GALANEK, MITCHELL S.	0.0	0.0	0.0	0.000	0.000	0.000
GALENEA CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
GALEOTA ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GE HEALTHCARE BIO-SCIENCES CORP.	0.0	0.0	0.0	0.000	0.000	0.000
GE ION TRACK	0.0	18.4	18.4	0.000	0.160	0.160
GEI CONSULTANTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GEM ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
GENE LOGIC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GENERAL DYNAMICS DEFENSE SYS.	0.0	0.0	0.0	0.000	0.000	0.000
GENERAL ELECTRIC COMPANY D/B/A GE HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
GENETICS INSTITUTE, LLC	202.0	833.5	1,035.5	0.097	0.065	0.162
GENVEC, INC.	15.0	0.0	15.0	0.012	0.000	0.012
GENZYME BIOSURGERY	0.0	0.0	0.0	0.000	0.000	0.000
GENZYME CORPORATION	217.0	232.0	449.0	0.000	0.350	0.350
GEOSYNTEC CONSULTANTS	0.0	0.0	0.0	0.000	0.000	0.000
GEOTECHNICAL CONSULTANTS, INC	0.0	0.0	0.0	0.000	0.000	0.000
GEOTECHNICAL GROUP INC.(TGG)	0.0	0.0	0.0	0.000	0.000	0.000
GEOTECHNICAL SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GEOTESTING EXPRESS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GILLETTE TECHNICAL CENTER	0.0	2.5	2.5	0.000	0.000	0.000
GOLDMAN ENVIRONMENTAL CONSULT.	0.0	0.0	0.0	0.000	0.000	0.000
GPC BIOTEC, INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
GRANGER-LYNCH CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
GRANITE MEDICAL GROUP	0.0	0.0	0.0	0.000	0.000	0.000
GREATER BOSTON LEAD PAINT TESTING	0.0	0.0	0.0	0.000	0.000	0.000
GUNTLOW & ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
GWATHMEY, INC.	34.0	0.0	34.0	0.001	0.000	0.001
GZA GEOENVIRONMENTAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HALEY & ALDRICH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HALLMARK HEALTH SYSTEM, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HAMILTON THORNE BIOSCIENCES	0.0	0.0	0.0	0.000	0.000	0.000
HARBOR MEDICAL ASSOCIATES, PC	0.0	0.0	0.0	0.000	0.000	0.000
HARDIN-KIGHT ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HARRINGTON MEMORIAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
HARRIS, JEFFRERY W.	0.0	0.0	0.0	0.000	0.000	0.000
HARTIN, ROBERT	0.0	0.0	0.0	0.000	0.000	0.000
HARVARD ENVIRONMENTAL SERVICE	0.0	0.0	0.0	0.000	0.000	0.000
HARVARD UNIVERSITY	3.0	0.0	3.0	0.362	0.000	0.362
HARVARD VANGUARD MED. ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HAWTHORN MEDICAL ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
HEART CENTER, THE	0.0	0.0	0.0	0.000	0.000	0.000
HEARTSAFE	0.0	0.0	0.0	0.000	0.000	0.000
HEMMILA, FREDERIC J.	0.0	0.0	0.0	0.000	0.000	0.000
HERLEY NEW ENGLAND	0.0	12.5	12.5	0.000	0.000	0.000
HEYWOOD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
HIGGINS ENVIRONMENTAL ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
HOLYOKE MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
HOMEINEX CORP.	0.0	0.0	0.0	0.000	0.000	0.000
HOPEDALE CARDIOLOGY, LLP	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
HORNE, DAVID C.	0.0	0.0	0.0	0.000	0.000	0.000
HOUSING ENVIRONMENTAL SERV.	0.0	0.0	0.0	0.000	0.000	0.000
HUSTON, GERALD F., SR.	0.0	0.0	0.0	0.000	0.000	0.000
HYGIENETICS ENVIRON. SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
IDENIX (MASSACHUSETTS) INC.	13.6	2.0	15.6	0.003	0.000	0.003
IDERA PHARMACEUTICALS, INC.	16.4	4.1	20.5	0.007	0.003	0.011
IEL SERVICE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
IMAGING ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
IMMUNOGEN, INC.	20.5	9.6	30.1	0.060	0.013	0.074
IMPERIAL INSPECTION SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
IMPLANT SCIENCES CORP.	0.0	0.0	0.0	0.000	0.000	0.000
INDUSTRIAL NUCLEAR COMPANY,INC	0.0	0.0	0.0	0.000	0.000	0.000
INFINITY PHARMACEUTICALS, INC	6.4	6.4	12.7	0.023	0.073	0.096
INNOV-X SYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
INOTEK PHARMACEUTICAL CORPORATION	15.0	10.0	25.0	0.000	0.000	0.000
INSIGHT HEALTH CORP.	0.0	0.0	0.0	0.000	0.000	0.000
INTER MED ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
INTERLEUKIN GENETICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
INTERNAL MEDICINE & CARDIOLOGY ASSOC.	0.0	0.0	0.0	0.000	0.000	0.000
J & M INSPECTIONAL SVCS. INC.	0.0	0.0	0.0	0.000	0.000	0.000
JACOBS CIVIL INC.	0.0	0.0	0.0	0.000	0.000	0.000
JAY CASHMAN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
JGI EASTERN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
JHR CONTRACTING	0.0	0.0	0.0	0.000	0.000	0.000
JOHNSON FOILS	0.0	0.0	0.0	0.000	0.000	0.000
JORDAN HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
JOSLIN DIABETES CENTER, INC.	45.0	37.5	82.5	0.004	0.053	0.057
KANE, JACK	0.0	0.0	0.0	0.000	0.000	0.000
KEVILLE ENTERPRISES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
KIDDE-FENWAL, INC.	0.0	0.1	0.1	0.000	0.020	0.020
LAHEY CLINIC FOUNDATION	0.0	0.0	0.0	0.000	0.000	0.000
LANE CONSTRUCTION CORP. THE	0.0	0.0	0.0	0.000	0.000	0.000
LAWRENCE GENERAL HOSPITAL	0.7	0.0	0.7	0.000	0.000	0.000
LAWRENCE PUMPS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
LEADSAFE ENVIRONMENTAL SVCS.	0.0	0.0	0.0	0.000	0.000	0.000
LEVINSON HARRIS MEDICAL GROUP	0.0	0.0	0.0	0.000	0.000	0.000
LFR INC.	0.0	0.0	0.0	0.000	0.000	0.000
LOVELY, PAUL	0.0	0.0	0.0	0.000	0.000	0.000
LOWELL GENERAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
LOWN CARDIOVASCULAR GROUP, PC	0.0	0.0	0.0	0.000	0.000	0.000
LYNCH, BERNARD	0.0	0.0	0.0	0.000	0.000	0.000
M&M LEAD INSPECTIONAL SVCS.	0.0	0.0	0.0	0.000	0.000	0.000
M/A-COM INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
MALDEN REDEVELOPMENT AUTHORITY	0.0	0.0	0.0	0.000	0.000	0.000
MALLINCKRODT, INC.	0.0	46.1	46.1	0.000	0.000	0.000
MARINE BIOLOGICAL LABORATORY	30.0	10.0	40.0	0.000	0.100	0.100
MASS. -AMHERST, UNIVERSITY OF	472.2	0.0	472.2	0.016	0.000	0.016
MASS. BIOMEDICAL INITIATIVES	0.0	0.0	0.0	0.000	0.000	0.000
MASS. -BOSTON, UNIVERSITY OF	1.8	0.0	1.8	1.915	0.000	1.915
MASS. COLLEGE OF PHARMACY	0.0	4.0	4.0	0.000	0.000	0.000
MASS. -DARTMOUTH, UNIV. OF	3.0	0.0	3.0	0.001	0.000	0.001
MASS. DEPT OF PUBLIC HEALTH	0.0	3.0	3.0	0.000	0.010	0.010

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
MASS. DEPT. ENVIRONMENTAL PROT	0.0	0.0	0.0	0.000	0.000	0.000
MASS. DPH CHILD LEAD POIS PREV	0.0	0.0	0.0	0.000	0.000	0.000
MASS. EMERG. MGT. AGENCY	0.0	0.0	0.0	0.000	0.000	0.000
MASS. EYE & EAR INFIRMARY	0.0	0.0	0.0	0.000	0.000	0.000
MASS. GENERAL HOSPITAL	77.0	163.5	240.5	0.021	0.040	0.062
MASS. HIGHWAY DEPARTMENT	0.0	0.0	0.0	0.000	0.000	0.000
MASS. INSTITUTE OF TECHNOLOGY	15.0	52.5	67.5	0.214	0.010	0.224
MASS. -LOWELL, UNIVERSITY OF	0.0	7.0	7.0	0.000	0.002	0.002
MASSACHUSETTS MOBILE PET, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
MCARDLE GANNON ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MEDCATH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MEDI-PHYSICS, INC. DBA GE HEALTHCARE	0.0	0.0	0.0	0.000	0.000	0.000
MERCK & CO., INC.	0.0	41.0	41.0	0.000	0.005	0.005
MERCURY THERAPEUTICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MERCY HOSPITAL, INC., THE	0.0	0.0	0.0	0.000	0.000	0.000
MERRIMACK COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
MERRIMACK VALLEY CARD. ASSOC.	0.0	0.0	0.0	0.000	0.000	0.000
MERRIMACK VALLEY HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
METROWEST MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
MGI PHARMA BIOLOGICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MICROBIA, INC.	2.6	25.3	28.0	0.014	0.005	0.019
MICROCHIPS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MICROTEST LABORATORIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MID-CITY SCRAP IRON & SALVAGE CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
MILFORD WHITINSVILLE HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
MILLENNIUM PHARMACEUTICALS	379.7	15.0	394.7	0.347	0.008	0.355

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
MILLER ENGINEERING & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MILLER, P. TERRY	0.0	0.0	0.0	0.000	0.000	0.000
MILLIPORE CORPORATION	30.0	11.3	41.3	0.007	0.004	0.011
MILTON HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
MINUTEMAN ENVIRONMENTAL SEVICES INC.	0.0	0.0	0.0	0.000	0.000	0.000
MOL	0.0	0.0	0.0	0.000	0.000	0.000
MOLECULAR INSIGHT PHARMACEUTICALS, INC.	38.0	0.0	38.0	0.060	0.000	0.060
MOMENTA PHARMACEUTICALS	0.0	0.0	0.0	0.000	0.000	0.000
MORTON HOSPITAL & MED. CENTER	0.0	0.0	0.0	0.000	0.000	0.000
MOUNT AUBURN HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
MOUNT HOLYOKE COLLEGE	0.0	0.9	0.9	0.000	0.000	0.000
NASHOBA VALLEY MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
NAVIX DIAGNOSTIX, INC (FIXED)	0.0	0.0	0.0	0.000	0.000	0.000
NAVIX DIAGNOSTIX, INC (MOBILE)	0.0	0.0	0.0	0.000	0.000	0.000
NEUROLOGICA CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
NEUROPHYSICS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
NEW BEDFORD HEALTH DEPARTMENT	0.0	0.0	0.0	0.000	0.000	0.000
NEW BEDFORD MEDICAL ASSOCIATE	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENG. COLLEGE OF OPTOMETRY	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENG.PET OF GREATER LOWELL	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND BAPTIST HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND BIOLABS, INC.	30.0	15.0	45.0	0.015	0.010	0.025
NEW ENGLAND CARDIOLOGY, LLC	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND MEDICAL SPECIALISTS	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND PET IMAGING SYSTM	0.0	0.0	0.0	0.000	0.000	0.000
NEWTON HEALTH DEPT., CITY OF	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
NEWTON HOUSING REHAB./CITY OF	0.0	0.0	0.0	0.000	0.000	0.000
NITROMED, INC.	0.0	0.0	0.0	0.000	0.000	0.000
NOBLE HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NORFOLK COUNTY CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
NORFOLK LEAD INSPECTION	0.0	0.0	0.0	0.000	0.000	0.000
NORFOLK RAM GROUP, LLC	0.0	0.0	0.0	0.000	0.000	0.000
NORTH ADAMS REGIONAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE CARDIOVASCULAR ASSOCIATES,	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE LEAD PAINT TEST SERVICE	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE MEDICAL CENTER	4.1	0.0	4.1	0.616	0.000	0.616
NORTH SHORE MEDICAL CENTER-UNI. HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
NORTHAMPTON CARDIOLOGY ASSOC., PC	0.0	0.0	0.0	0.000	0.000	0.000
NORTHEAST GENERATION SERVICES	0.8	0.0	0.8	0.717	0.000	0.717
NORTHEASTERN UNIVERSITY	28.1	32.0	60.1	0.000	0.002	0.003
NORWICH LABORATORIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
NOVA CHEMICALS INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
NOVARTIS INST. FOR BIOMEDICAL RESEARCH	90.2	193.7	283.9	0.073	0.048	0.121
NUCLEAR INSTRUMENT CO.	0.0	0.0	0.0	0.000	0.000	0.000
OMNIGENE BIOPRODUCTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ORGANON RESEARCH CENTER, USA	0.0	0.0	0.0	0.000	0.000	0.000
OST SERVICES LLC	0.0	0.0	0.0	0.000	0.000	0.000
P.E.T. NET PHARMACEUTICALS, INC.	1.0	0.1	1.1	0.060	0.050	0.110
P.J. KEATING COMPANY, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PALMER PAVING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PANTHER ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
PARATEK PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
PARE ENGINEERING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PELLETIER, LEO H.	0.0	0.0	0.0	0.000	0.000	0.000
PEPTIMMUNE, INC.	20.0	0.0	20.0	0.002	0.000	0.002
PERKINELMER LIFE & ANALYTICAL SCIENCES, INC.	43,667.9	638.9	44,306.8	22,998.210	135.951	23,134.162
PERKINELMER OPTOELECTRONICS	0.0	0.0	0.0	0.000	0.000	0.000
PFIZER, INC.	165.0	97.5	262.5	0.069	0.099	0.167
PHARMA MAR USA, INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
PHOTODETECTION SYSTEMS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PHOTOVAC, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PHYLOGIX, INC	1.0	0.0	1.0	0.000	0.000	0.000
PINE & SWALLOW ASSOCIATES, INC	0.0	0.0	0.0	0.000	0.000	0.000
PIONEER VALLEY CARDIOLOGY, PC	0.0	0.0	0.0	0.000	0.000	0.000
PK ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PLEXUS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PLYMOUTH RUBBER CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
POLAROID CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PRAECIS PHARMACEUTICALS, INC.	42.3	7.5	49.8	0.006	0.122	0.128
PRIMA CARE, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
PRIME ENGINEERING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PROFESSIONAL SERV. INDUSTRIES	0.0	0.0	0.0	0.000	0.000	0.000
PROSCAN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PROTEIN FOREST, INC.	150.0	0.0	150.0	0.005	0.000	0.005
PROTZE CONSULTING ENGINEERS	0.0	0.0	0.0	0.000	0.000	0.000
QSA GLOBAL, INC.	0.0	381.8	381.8	0.000	11,076.750	11,076.750
QUALITY ASSURANCE LAB, INC.	0.0	0.0	0.0	0.000	0.000	0.000
QUEST DIAGNOSTICS LLC	0.0	0.0	0.0	0.000	0.000	0.000

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
QUINCY MEDICAL CENTER, INC.	0.0	0.0	0.0	0.000	0.000	0.000
QUINLAN, MICHAEL A.	0.0	0.0	0.0	0.000	0.000	0.000
R. P. HOLMES ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
RADIATION MONITORING DEVICE, INC.	0.0	0.1	0.1	0.000	1.000	1.000
RADIOCAT	0.0	0.0	0.0	0.000	0.000	0.000
RADIOMED CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
RADIUS HEALTH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
RAYTHEON COMPANY	0.0	0.0	0.0	0.000	0.000	0.000
RCS LEAD PAINT DETECTION	0.0	0.0	0.0	0.000	0.000	0.000
READING CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
REMSERV, INC.	0.0	0.0	0.0	0.000	0.000	0.000
REPLIGEN CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
RIVER BEND MEDICAL GROUP	0.0	0.0	0.0	0.000	0.000	0.000
RMD, INC., RMD INST., LLC	0.0	0.1	0.1	0.000	1.000	1.000
ROCKBESTOS-SUPRENANT	0.0	0.0	0.0	0.000	0.000	0.000
ROXBURY COMMUNITY COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
RSP ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
S.V. HOSPITAL, L.L.C.	0.0	0.0	0.0	0.000	0.000	0.000
SAINTS MEMORIAL MED. CENTER	0.0	0.0	0.0	0.000	0.000	0.000
SANBORN, HEAD & ASSOCIATES,	0.0	0.0	0.0	0.000	0.000	0.000
SANOFI-AVENTIS U.S., INC.	0.0	1.0	1.0	0.000	0.000	0.000
SATORI PHARMACEUTICALS INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
SCHEPENS EYE RESEARCH INST.	0.0	0.0	0.0	0.001	0.000	0.001
SCHERING CORPORATION	34.1	0.0	34.1	0.003	0.000	0.003
SCINTITECH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
SEA CONSULTANTS	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
SEAHORSE BIOSCIENCE	0.0	0.0	0.0	0.000	0.000	0.000
SELECTX PHARMACEUTICALS, INC.	0.0	3.0	3.0	0.000	0.001	0.001
SEPRACOR, INC.	0.0	26.3	26.3	0.000	0.031	0.031
SERONO REPRODUCT. BIOLOGY INST.	0.0	57.5	57.5	0.000	0.073	0.073
SEVERN TRENT LABORATORIES, INC	0.0	0.0	0.0	0.000	0.000	0.000
SHARED DIAGNOSTIC SERVICES,INC	0.0	0.0	0.0	0.000	0.000	0.000
SHIELDS IMAGING OF MASS., LLC	0.0	0.0	0.0	0.000	0.000	0.000
SHIRE HUMAN GENETIC THERAPIES, INC.	23.2	38.2	61.4	0.005	0.007	0.012
SIEMENS MEDICAL SYSTEMS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
SIMMONS COLLEGE	0.0	11.0	11.0	0.000	0.003	0.003
SIONEX CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
SIRTRIS PHARMACEUTICALS	0.0	0.0	0.0	0.000	0.000	0.000
SMITH AND WESSEL ASSOC. INC.	0.0	0.0	0.0	0.000	0.000	0.000
SMITH COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
SMITHSONIAN INSTITUTE	0.0	0.0	0.0	0.000	0.000	0.000
SOLUTIA, INC.	0.0	0.0	0.0	0.000	0.000	0.000
SOUTH SHORE CARDIOLOGY, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
SOUTH SHORE HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
SOUTH SHORE LEAD PAINT TESTING	0.0	0.0	0.0	0.000	0.000	0.000
SOUTHCOAST HOSPITAL GROUP	0.0	0.0	0.0	0.000	0.000	0.000
SPAULDING REHAB HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
SPINCRAFT	0.0	0.0	0.0	0.000	0.000	0.000
SPRINGBORN SMITHERS LAB., INC.	76.4	32.1	108.5	0.036	0.052	0.089
SPRINGFIELD HOUSING AUTHORITY	0.0	0.0	0.0	0.000	0.000	0.000
SPRINGFIELD NEIGHBORHOOD HOUSING SERVICE	0.0	0.0	0.0	0.000	0.000	0.000
SPRUCE ENVIRONMENTAL TECHNOLOGIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
ST. ANNE'S HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
STARMET NMI	27,803.1	0.0	27,803.1	68.500	0.000	68.500
STERIS ISOMEDIX SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
STOWE AND WOODWARD	0.0	0.0	0.0	0.000	0.000	0.000
STURDY MEMORIAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
SUMMIT LTD.	0.0	0.0	0.0	0.000	0.000	0.000
SURFACE LOGIX, INC.	16.0	8.0	24.0	0.016	0.001	0.017
SYNTA PHARMACEUTICAS CORPORATION	0.0	7.5	7.5	0.000	0.002	0.002
SYNTONIX PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TAMFELT, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TGA SCIENCES INC.	0.0	0.0	0.0	0.000	0.000	0.000
THERION BIOLOGICS CORPORATION	8.2	0.0	8.2	0.001	0.000	0.001
THERMO ELECTRON CORP., PORTABLE ELEMENTA	1.4	1.2	2.6	0.829	1.332	1.661
THERMO ELECTRON CORP., THERMO ENVIRONMEN	0.0	0.0	0.0	0.000	0.000	0.000
THESEUS IMAGING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
THOMPSON & LICHTNER CO., INC.	0.0	0.0	0.0	0.000	0.000	0.000
THRASOS	0.0	0.0	0.0	0.000	0.000	0.000
TIAX LLC	0.0	0.2	0.2	0.000	0.002	0.002
TOLAN, RICHARD E.	0.0	0.0	0.0	0.000	0.000	0.000
TOLERRX, INC.	0.0	10.0	10.0	0.000	0.001	0.001
TOXIKON CORPORATION	112.5	22.5	135.0	0.014	0.005	0.019
TRANXENOGEN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TRC ENVIRONMENTAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
TRUESDALE CARDIOLOGY ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
TUFTS UNIVERSITY	0.0	15.0	15.0	0.000	0.009	0.009
TUFTS UNIVERSITY, SCH. OF MED.	70.0	45.0	115.0	0.024	0.013	0.037

	VOLUME (cu. ft.)			ACTIVITY (curies)		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
TUFTS-NEW ENGLAND MEDICAL CENTER	20.0	10.0	30.0	0.001	0.000	0.001
TURBOCARE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TW ENVIRONMENTAL SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TYCO SAFETY PRODUCTS WESTMINSTER	0.0	0.0	0.0	0.000	0.000	0.000
U.S. GENOMICS	0.0	0.0	0.0	0.000	0.000	0.000
UCB RESEARCH, INC.	0.0	0.0	0.0	0.000	0.000	0.000
UMASS MEMORIAL HEALTHALLIANCE LEOMINSTER	0.0	0.0	0.0	0.000	0.000	0.000
UMASS MEMORIAL/MARLBOROUGH HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
UMASS/MEMORIAL CLINICAL SYSTEMS	112.5	22.5	135.0	0.107	0.001	0.108
UNITECH SERVICES GROUP, INC.	210.0	677.0	887.0	0.036	0.019	0.055
UTS OF MASSACHUSETTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
V.I. TECHNOLOGIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
VALLEY SAFETY SERVICES ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
VANASSE, HANGEN, BRUSTLIN, INC	0.0	0.0	0.0	0.000	0.000	0.000
VERTEX PHARMACEUTICALS, INC.	5.6	22.5	28.1	0.011	0.005	0.016
VISEN MEDICAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WALSH, JOHN	0.0	0.0	0.0	0.000	0.000	0.000
WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH)	0.0	0.0	0.0	0.000	0.000	0.000
WARNER BROS., INC.	0.0	0.0	0.0	0.000	0.000	0.000
WELLESLEY COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
WESTON & SAMPSON ENGINEERS, I	0.0	0.0	0.0	0.000	0.000	0.000
WESTON SOLUTIONS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WHITEHEAD INST. FOR BIOMED RES	45.0	7.5	52.5	0.004	0.006	0.010
WILLIAM C. FINN ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WILLIAM F. SULLIVAN & COMPANY, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WILLIAMS COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
WINCHESTER HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
WING MEMORIAL HOSPITAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
WOODARD & CURRAN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
WOODS HOLE OCEANOGRAPHIC INSTITUTION	94.0	0.0	94.0	0.081	0.000	0.081
WORCESTER DEPT. OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
WORCESTER POLYTECHNIC INST.	0.0	0.0	0.0	0.000	0.000	0.000
WTE RECYCLING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
XRF CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
YANKEE ATOMIC ELECTRIC COMPANY	459,730.0	300,000.0	759,730.0	6.750	3.000	9.750
YANKEE ENG. & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
YEE CONSULTING GROUP, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GRAND TOTALS:	**563,726.0**	**305,397.4**	**869,121.5**	**23,376.027**	**11,616.049**	**34,991.577**

FIGURE 29

Commonwealth of Massachusetts
DPH Radiation Control Program
Calendar Year (CY) 2005 Radioactive Waste Survey
Part One : General Information

Licensee Name	
Radiation Safety Officer	
Street Address	
City / State / Zip Code	/ /
E-Mail Address	
Radioactive Materials License Number	__ __ - __ __ __ __

Person Completing Survey / Title	/
Telephone / Telefax	/
Certifying Official / Title	/
Signature / Telephone	/
Date of Survey Completion	

	YES	NO
In 2005, did you generate any long-lived **(half-life greater than 120 days)** radioactive waste? Do not include sealed sources stored for future return to manufacturer or supplier.		
In 2005, did you transfer any licensed material for disposal at a licensed low-level radioactive waste disposal facility?		
Did your organization have any long-lived radioactive waste requiring disposal in storage either on or off site on 12/31/05 that was generated in 2005?		

If you answered YES to any of the above questions, complete all applicable sections of Part Two. If you answered NO to all questions, **STOP HERE** and return this form.

Return Address:

Massachusetts DPH Radiation Control Program
90 Washington Street
Dorchester, MA 02121
Fax 617- 427-2925
ATT: Fred Barker 617-427-2944 X 2047
Please return this survey by March 1, 2006 by mail or fax

License # __ __ - __ __ __ __

Commonwealth of Massachusetts DPH Radiation Control Program
CY 2005 Radioactive Waste Survey

Part Two: Waste Generation, Storage and Disposal Information

Section A : Radioactive Waste Generated in Calendar Year 2005

Class A (other than HVLA*)	Transferred for Disposal in CY 2005	In Storage as of 12/31/05	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

Class B (other than HVLA*)	Transferred for Disposal in CY 2005	In Storage as of 12/31/05	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

Class C (other than HVLA*)	Transferred for Disposal in CY 2005	In Storage as of 12/31/05	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

High Volume, Low Activity Waste	Transferred for Disposal in CY 2005	In Storage as of 12/31/05	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

License # __ __ - __ __ __ __

Commonwealth of Massachusetts DPH Radiation Control Program
CY 2005 Radioactive Waste Survey

Part Two : Waste Generation, Storage and Disposal Information

Section B : Radioactive Waste Generated Prior to Calendar Year 2005
That Requires Disposal AND Was Not Reported on Previous Surveys

	Transferred for Disposal	In Storage as of 12/31/05	Total
Calendar Year(s) of Generation			
Class (A, B, C or HVLA)			
Volume, ft3			
Activity, curies			
Principal Isotopes			

Part Three : Waste Minimization Statement / Plan

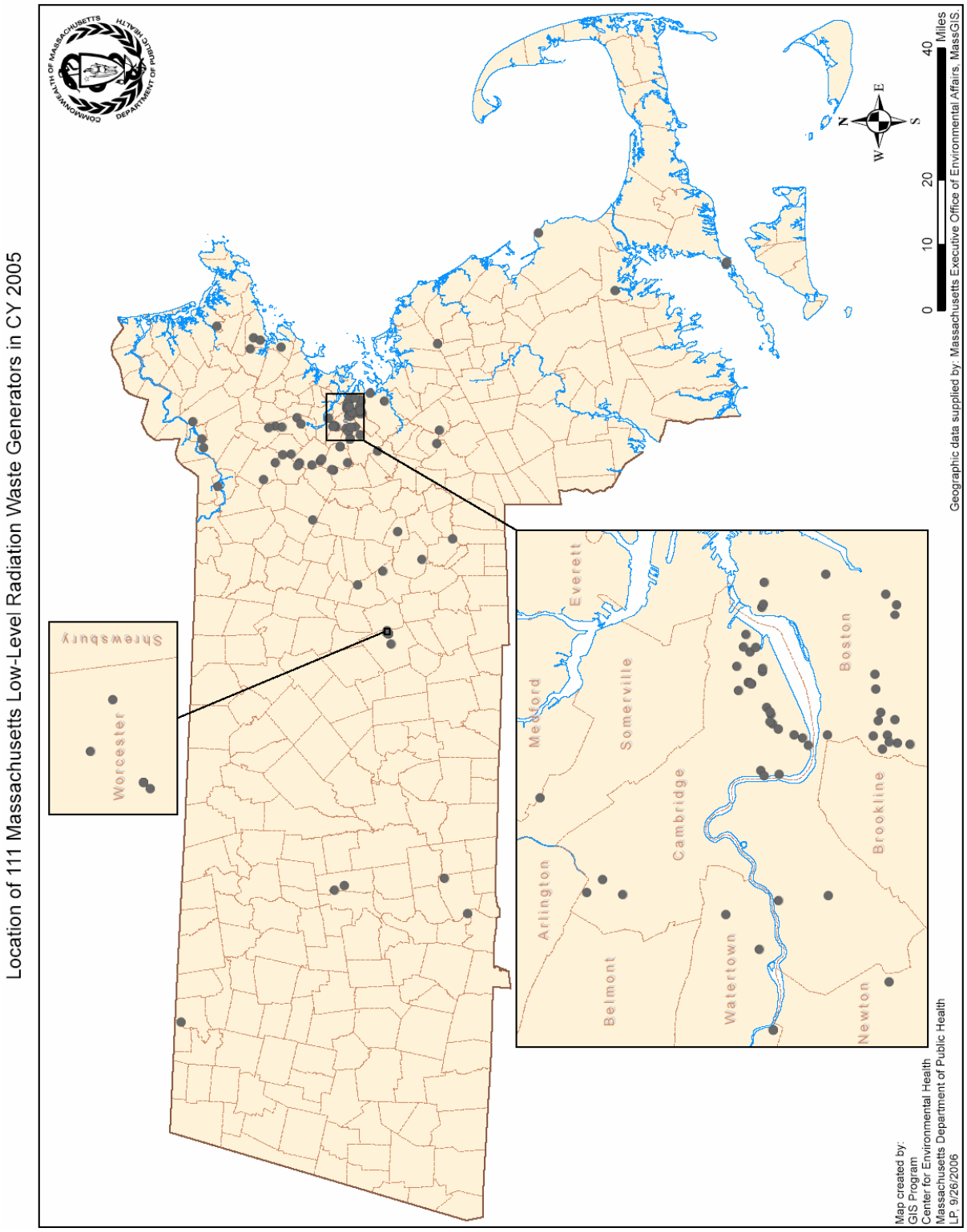
Has your waste minimization statement or plan, which is on file with the Massachusetts DPH Radiation Control Program, changed since last year? If you answered YES, please include your updated statement and/or plan with this survey.	YES	NO

Many pertinent 105 CMR 120 regulations may be found on the Massachusetts DPH Radiation Control Program's web page at www.state.ma.us/dph/rcp including Class A, B and C definitions in section 105 CMR 120.299

High Volume, Low Activity Waste. Definition - Soils, demolition rubble or other LLRW that has average concentrations of radioactive material less than or equal to the concentrations set forth in 345 CMR 1.13, Table 1.13B, and has been or would be accepted by a licensed low-level radioactive waste disposal facility.

If you need assistance completing this survey, please contact the Radiation Control Program staff at (617) 427-2944 x 2047, att: Fred Barker

FIGURE 30


Location of 111 Massachusetts Low-Level Radiation Waste Generators in CY 2005
Shrewsbury
Worcester
Everett
Medford
Somerville
Cambridge
Boston
Brookline
Arlington
Belmont
Watertown
Newton
N
S
E
W
0
10
20
40
Miles
Geographic data supplied by: Massachusetts Executive Office of Environmental Affairs, MassGIS
Map created by:
GIS Program
Center for Environmental Health
Massachusetts Department of Public Health
LP, 9/26/2006