2002 MASSACHUSETTS LOW - LEVEL RADIOACTIVE WASTE SURVEY REPORT

APRIL 2004

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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).

DPH conducted an annual survey to determine the characteristics of LLRW generated, stored, and transferred for out of state disposal. The less complex 2002 survey differed from past Board surveys as management method 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 questions were eliminated. The definition of long-lived radioactive waste generated needed to be reported was increased from a half-life of 90 days to 120 days. A copy of the 3 page 2002 survey used is shown as figure 29.

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.

This report summarizes data compiled from responses to the "Calendar Year (CY) 2002 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:

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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.

2002 Survey Report Contents

Chapter 1 is an Executive Summary, highlighting volume and activity data on LLRW shipped for disposal in 2002, 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 2002 Survey Results Summary

Waste generators consist of those licensees either transferring or storing LLRW, or both. During 2002 Massachusetts waste generators reported that they generated **63,667 cubic feet** of low-level radioactive waste (LLRW) containing **5,600 curies**. Of this volume and activity, **30,921 cubic feet** containing **877 curies** were transferred and **32,746 cubic feet** containing **4,723 curies** were stored in-state for further treatment and disposal. A total of **55 different isotopes** were reported generated with Tritium (H-3) being the most common and with a total of 110 reports for all classes of waste.

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. The 2002 volume and activity totals have decreased substantially from 1997 results while the number of licensees and number of generators has increased.

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 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 national interstate compacts for low-level waste disposal, our generators 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.

During 2002, 77 Massachusetts generators reported that they shipped or transferred 30,920.68 cubic feet of LLRW containing 876.61 curies of radioactivity to out-of-state disposal facilities.

3,510.7 cf or 80.63% of the volume of LLRW containing 1.275 curies or 0.15% of the activity was shipped to the Clive, Utah facility. The Barnwell, South Carolina facility received only 843.536 cf or 19.37 % of the volume of LLRW, but 841.643 curies or 99.85% of the activity. No

[1] NARM is naturally-occurring and accelerator produced radioactive material and is not regulated by the NRC. This responsibility lies with the individual states.

LLRW was shipped to the Richland, Washington facility during 2002.
Thus the highest activity LLRW goes to Barnwell site and 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 licensees' 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

Seventy seven organizations reported transferring LLRW for disposal in 2002, representing an increase of 22% over 63 reported in 1997. Of the 77 organizations **54** or **70.1**% 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, slightly greater than the number in 1997 which was 53.

Of the 77 organizations **69** generators or **89.6%** shipped 1.000 curie or less and can be classified as "small activity" generators, greater than the number in 1997 which was 53.

Tables 1 and 2 show the distribution by volume and activity of organizations that shipped large amounts of LLRW in 2002. Because the volume of waste transferred does not necessarily correlate with the amount of activity within the transferred waste, the 54 "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 **23 of 139 or 16.5%** 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 which are classified as either LSA, Type A, or Type B.

TABLE 1
LIST OF 23 LARGE GENERATORS THAT TRANSFERRED MORE THAN 100.0
CUBIC FEET OF LLRW IN 2002

FACILITY NAME	VOLUME IN CUBIC FEET
1. Entergy Nuclear Generating Co.	8,814.6
2. Yankee Atomic Electric Co.	6,828.5
3. Perkinelmer Life Sciences, Inc.	4,308.2
4. Bristol - Myers Squibb Med. Img.	2,160.4
5. Harvard University	2,132.7
6. Charles River Laboratories, Inc.	866.0
7. Dana - Farber Cancer Institute	696.0
8. Millennium Pharmaceuticals	517.5
9. Genzyme Corporation	510.0
10. Genetics Institute, LLC	397.5
11. Mass. General Hospital	315.0
12. Phylos, Inc.	277.5
13. Woods Hole Oceanographic Inst.	210.2
14. Boston University Med. Ctr. Hospital	166.0
15. Springborn Smithers Lab., Inc.	151.4
16. Beth Israel Deacon. Med. Center	136.0
17. Epix Medical, Inc.	131.6
18. Framatome ANP DE&S	121.1
19. Geltex Pharmaceutical, Inc.	111.7
20. U Mass / Memorial Clinic Systems	109.1
21. Praecis Pharmaceuticals, Inc.	105.0
22. Biogen, Inc.	105.0
23. Northeastern University	100.3

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 8 LARGE GENERATORS THAT TRANSFERRED MORE THAN 1.000 CURIE OF LLRW IN 2002	
FACILITY NAME	**ACTIVITY IN CURIES**
1. Perkinelmer Life Sciences, Inc.	733.300
2. Entergy Nuclear Generating Company	104.000
3. Yankee Atomic Electric Company	19.240
4. Transkaryotic Therapies Inc.	5.000
5. Harvard University	3.521
6. Dana-Farber Cancer Institute	2.600
7. EGS Gauging Incorporated	1.982
8. Bristol-Myers Squibb Med. Img.	1.610

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

One hundred and eleven organizations reported in-state storage of LLRW in 2002. Of the 111 organizations 100 or 90.1% 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 2002 is shown in Table 3. Because the activity of waste in storage does not necessarily correlate with the amount of volume in storage, the 100 “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 shows the storage by volume and activity of organizations that stored large amounts of LLRW in 2002. Because the volume of waste stored does not necessarily correlate with the amount of activity within the stored waste, the 100 "small quantity" storers by volume are not all the same "small activity" storers.

The same trend exists for the activity of the transferred waste with 8 of 139 or 5.8% of the Massachusetts generators producing greater than 1.000 curie.

Of the 111 generators 104 or 93.6% stored less than 1.000 curie and can be classified as "small quantity" in-state storage generators by activity. The list of generators storing more than 1.000 curie of waste in 2002 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 ½ to5 gallon size and 9-10 cubic feet fiber drums used as temporary containment vessels prior to processing, such as incineration.

Table 3

LIST OF 11 LARGE GENERATORS THAT STORED MORE THAN 100.0 CUBIC FEET OF LLRW IN 2002

Facility Name	Waste Volume in Cubic Feet In Storage
1. Entergy	27,358.2
2. Boston University Med. Ctr. Hospital	669.0
3. Dana Farber Cancer Institute	637.0
4. Genetics Institute, LLC	593.0
5. Millennium Pharmaceuticals	487.5
6. Perkinelmer Life Sciences, Inc.	385.5
7. Bristol-Myers Squibb Med. Img.	161.0
8. AEA Technology QSA, Inc.	150.0
9. Genzyme Corporation	150.0

10. Starmet NMI	150.0
11. Mass. Amherst, Univ. of	135.0

TABLE 4	
LIST OF 7 LARGE GENERATORS THAT STORED 1.000 CURIE OR MORE OF LLRW IN 2002	
Facility Name	**Activity in Curies**
1.Entergy Nuclear Generating Co.	4,490.081
2.Perkinelmer Life Sciences, Inc.	153.120
3.AEA Technology QSA, Inc.	50.000
4.U Mass Memorial Clinical Systems	20.000
5. Dana-Farber Cancer Institute	1.800
6. Radiation Monitoring Devices	1.000
7. RMD, Inc. RMD Inst., LLC	1.000

1.4 Distribution of Isotopes Generated for All Classes of Waste

A total of 55 different radionuclides were reported generated by all licensees. 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 reporting frequency for the top 25 reported isotopes for all classes of waste. Table 5 shows the ten most common isotopes by frequency of reports either transferred or in storage.

The 30 least reported isotopes, with only 1-2 reports by licensees, are in decreasing order: Tc-99m, In-111, Tc-99, U-235, Cl-36, C-11, Y-90, Tm-170, Ir-192, Pb-210, Se-75, Sb-124, Y-91, Pu-241, Po-210, PM-147, Tl-202, Zr-95, Mn-56, Au-198, I-129, Gd-153, Fe-59, Eu-154, Cu-64, Cs-134, Co-56, Cm-244, Ba-133 and Na-24. They are not listed in Figure 20.

Table 5		
LIST OF 10 MOST COMMON ISOTOPES REPORTED TRANSFERRED OR STORED		
Isotope	**Half Life**	**Number of Facilities**
1. H-3	12.3 years	110
2. C-14	**5,730 years**	72
3.1-125	60.14 days	37
4.S-35	87.2 days	35
5.P-32	14.29 days	31
6.P-33	25.4 days	22
7.Cs-137	30.17 years	15
8.Co-60	5.27 years	13
9.Cr-51	27.7 days	12
10.Fe-55	2.73 years	10

1.5 Distribution of Isotopes Transferred for All Classes of Waste

A total of 42 different isotopes were reported transferred by all licensees. 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 same isotope, but not both.
Figure 26 shows the total RAM transferred for the top 24 reported isotopes for all classes of waste in 2002. Table 6 shows the top 10 most common isotopes by frequency transferred for all classes of waste.

The 18 least reported isotopes transferred with only 1 report each by licensees are, in decreasing order: U-235, Tl-202, Se-75, Pu-241, PM-147, Pb-210, Zr-95, In-111, Ba-133, I-129, Gd-153, Fe-59, Eu-154, Cs-134, Cl-36, Cd-109, C-11, and Ir-192. They are not listed in Figure 26.

TABLE 6

LIST OF 10 MOST COMMON ISOTOPES REPORTED TRANSFERRED IN 2002

Isotope	Half Life	Number of Facilities
H-3	12.3 years	65
C-14	5,730 years	42
I-125	60.14 days	18
S-35	87.2 days	16
P-32	14.29 days	14
P-33	25.4 days	10
Co-60	5.27 years	8
Cs-137	30.17 years	8
Fe-55	2.73 years	7
Cr-51	27.7 days	5

1.6 Distribution of Isotopes In Storage for All Classes of Waste

A total of 45 different isotopes were reported in storage or stored by all licensees. 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 24 reported isotopes for all classes of waste in 2002. Table 7 shows the top 10 most common isotopes by frequency in storage for all classes of waste.

The 21 least reported isotopes with only one report each by licensees are: Ir-192, Y-91, Y-90, U-235, Tm-170, Tl-202, Th-232, Sb-124, Po-210, Zr-95, Mn-56, Au-198, In-111, Eu-154, Cu-64, Cs-134, Co-56, Cm-244, Cl-36, C-11, and Na-24. They are not listed in Figure 25.

TABLE 7
LIST OF 10 MOST COMMON ISOTOPES REPORTED STORED IN 2002

Isotope	Half Life	Number of Facilities
H-3	12.3 years	81
C-14	5,730 years	54
I-125	60.14 days	26
S-35	87.2 days	25
P-32	14.29 days	22
P-33	25.4 days	16
Cs-137	30.17 years	10
Co-60	5.27 years	8
Cr-151	27.7 days	8
Fe-55	2.73 years	7

1.7 Distribution of Isotopes Generated for Class A Wastes.

A total of 53 different isotopes or radionuclides were reported generated by all licensees. Figure 21 shows the total RAM reporting frequency for the top 30 reported isotopes for Class A waste. The 23 least reported isotopes with only one report each are: Ir-192, Y-91, Y-90, Tm-170, Tl-202, Se-75, Sb-124, Pu-241, Po-210, PM-147, Zr-95, Mn-56, Au-198, I-129, Gd-153, Fe-59, Eu-154, Cu-64, Cs-134, Co-56, Cm-244, Ba-133, and Na 24. They are not listed in Figure 21.

1.8 Distribution of Isotopes Generated for Class B Wastes.

A total of 7 different isotopes were reported generated by all licensees. Figure 22 shows the total RAM reporting frequency for all reported isotopes for Class B waste. The three most common with two reports each, were Co-60, Cs-137, and Fe-55.

1.9 Distribution of Isotopes Generated for Class C Wastes.

A total of 3 different isotopes were reported generated by all licensees. 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 Pb-210, Ra-226, and U-238.

1.10 Distribution of Isotopes generated for Class HVLA Wastes.

A total of 15 different isotopes were reported generated by all licensees. Figure 24 shows the total RAM reporting frequency for all reported isotopes for Class HVLA waste. The three most common with 2-10 reports were I-125, C-14, and H-3.

Chapter 2
2002 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 radio pharmaceuticals for medical procedures such as cancer and thyroid dysfunction diagnosis and treatment, radio immunoassay, 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, 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 521 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 2002 to use or process source, special nuclear or byproduct material**.**

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 and Table 9 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 and activity generator except for transferred activity in which the commercial category is the leader. 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.

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.

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.

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.

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 burial site under consideration is located 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.

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 separately in Massachusetts so as to allow some licensees a reduced annual LLRW fee of 90% of the proportional assessment.

Figure 2-9 and Table 8 show the volume and activity results for the four various waste classes. The most waste generated in terms of volume and activity were Class A wastes, and the least amounts were Class C wastes.

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 surveys did.

2.6 Licensee LLRW Survey Results

The 2002 Radioactive Waste Survey requested data on LLRW produced during calendar year 2002 or retained in storage from previous years. The survey was mailed in May of 2003 to 521 companies and institutions licensed by the NRC and DPH in any time during 2002 to possess sources of ionizing radiation involving the use of radioactive materials in the Commonwealth; **505**

or 96.9% of licensees returned the 2002 survey form which increased from a 85.2% return rate in 1997 and a 72% in 1996.

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[3] to an authorized recipient, or do not generate any LLRW. Some of the 2002 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. Two licensees were in bankruptcy.

DPH is exploring the possibility of having licensees with an e mail address on file (currently 72%) complete 2004 annual radiation waste surveys **on line** using a DPH assigned password. This would be optional. **Comments regarding this new procedure are encouraged.**

Table 8 shows that 139 licensees (27.5%) of the 505 who responded reported producing LLRW for transfer or in storage during 2002 . The remainder used sealed sources or did not generate any long lived (half- life greater than 120 days) LLRW during 2002.

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Table 8 - 2002 activity and volume summary:

- 63,667.21 cubic feet of LLRW containing 5,599.96 curies were generated during 2002
- 5,236.63 curies (93.51 %) were from Class A LLRW
- 361.2 curies (6.45 %) were from Class B LLRW
- 0.00 curies (0.00%) were from Class C LLRW
- 2.12 curies (0.04%) were from Class HVLA LLRW
- 58,462.38 cubic feet (91.82 %) were Class A LLRW
- 1,785.70 cubic feet (2.80%) were Class B LLRW
- 1.00 cubic foot (0.002 %) was Class C LLRW
- 3,418.14 cubic feet (5.37 %) were Class HVLA LLRW

[3] 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).

- 30,920.68 cubic feet (48.57 %) containing 876.61 curies (15.65 %) of LLRW were transferred to licensed brokers or disposal sites for disposal out of Massachusetts

- 32,746.44 cubic feet (51.43 %) containing 4,723.34 curies (84.35 %) of LLRW were placed in storage in Massachusetts

TABLE 8

Activity and Volume by Class for the Year: 2002

Class	*No. Submitted in the Class*	*Activity(curies)*			*Volume (cu. ft.)*		
		In Storage	*Transferred*	*TOTAL*	*In Storage*	*Transferred*	*TOTAL*
A	131	4,452.27	784.36	5,236.63	30,994.24	27,468.04	58,462.38
B	4	270.00	91.20	361.20	1,518.50	267.20	1,785.70
C	1	0.00	0.00	0.00	0.00	1.00	1.00
HVLA	14	1.07	1.05	2.12	233.70	3,184.44	3,418.14
Grand Totals:	150	4,723.34	876.61	5,599.96	32,746.44	30,920.68	63,667.21

Total number of surveys submitted for 2002 : 505

Number Without Any Waste Generation for 2002 366

Number With Waste Generation for 2002 : 139

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 1994-2002 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, amounts transferred decreased annually from 1,082,172 cf in 1994 to 30,920.68 cf in 2002.

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 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 1994-2002 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.

Since the survey eliminated the questions from licensees of future projections, 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 2002. These totals include high volume low activity (HVLA) wastes shipped out of state.

In terms of ranking Massachusetts with the 49 other states, Massachusetts ranked **27th** in terms of volume generated, and **20th** in terms of activity generated as reported by the Manifest Information Management System (MIMS) in 2002. 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

2002 LLRW VOLUME AND ACTIVITY SUMMARY FROM ALL STATES FROM MIMS

Year Received	State	Volume (ft3)	Activity (curies)
2002	Alabama	18,474.77	1,299.27
2002	Alaska	47,570.30	0.15
2002	Arizona	2,077.91	175.83
2002	Arkansas	1,790.39	13.27
2002	Army Out U.S.	125.80	50.94
2002	California	462,441.86	4,002.14
2002	Colorado	288.86	0.32
2002	Connecticut	27,783.29	3,177.24
2002	Delaware	366.39	0.50
2002	Dist of Columbia	259.93	0.76
2002	Florida	22,497.62	1,258.04
2002	Georgia	7,688.66	1,777.15
2002	Hawaii	251.19	39.62
2002	Idaho	314.62	0.69
2002	Illinois	852,258.46	19,746.90
2002	Indiana	191.78	7.00
2002	Iowa	3,530.80	108.39
2002	Kansas	808.04	2,126.93

2002	Kentucky	40,286.27	1.84
2002	Louisiana	18,191.28	1,598.45
2002	Maine	313,362.17	1,047.61
2002	Maryland	6,692.72	241.32
2002	**Massachusetts**	**4,357.77**	**854.48**
2002	Michigan	8,599.86	243.85
2002	Minnesota	3,696.18	30.49
2002	Mississippi	671.85	279.69
2002	Missouri	26,970.32	358.46
2002	Montana	0.20	0.00
2002	Nebraska	2,083.73	984.95
2002	Nevada	8.74	0.06
2002	New Hampshire	2,674.51	207.94
2002	New Jersey	546,549.69	1,440.52
2002	New Mexico	215.49	0.01
2002	New York	148,934.56	1,365.03
2002	North Carolina	207,555.16	71,948.00
2002	North Dakota	82.84	0.01
2002	Ohio	16,755.40	1,218.53
2002	Oklahoma	671,827.97	1.58
2002	Oregon	13,286.79	0.41
2002	Pennsylvania	55,024.70	6,586.38
2002	Puerto Rico	2211.71	0.32
2002	Rhode Island	0.70	2.02
2002	South Carolina	14,912.86	10,339.69
2002	South Dakota	41.43	0.02
2002	Tennessee	272,845.60	388.47
2002	Texas	70,386.15	1,077.38
2002	Utah	417.64	0.58
2002	Vermont	1,093.40	91.78
2002	Virginia	32,652.07	1,135.39
2002	Washington	51,053.20	127.23
2002	West Virginia	181.09	0.09
2002	Wisconsin	12,584.83	205.46
2002	Wyoming	0.10	1.25
	Total:	**3,992,729.65**	**135,564.44**

Table 10 shows that Barnwell in SC reported that Massachusetts generators shipped some 843.536 cubic feet of LLRW totaling 841.643 curies in 2002 making the average concentration over 1 curie per cubic foot of waste. Envirocare in UT reported receiving some 3,510 cf with 1.27 curies or 1 curie per 2,750 cf.

3.2 Manifest Information Management System (MIMS)

The Manifest Information Management System (MIMS)[4] 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 Chem-Nuclear Systems, the Clive, UT site is operated by Envirocare of Utah, and the Richland, WA site is operated by US Ecology Inc.

According to MIMS approximately 600,000 cubic meters (21.186 million cf) of waste containing almost 9 million curies of radioactivity were disposed from 1989 to 2001 at commercial disposal sites. The vast majority of the waste, some 85% of the volume and activity came from nuclear facilities (utility). The Massachusetts figures are substantially less with utility shipping some 13-15% of the volume and the activity.

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 three different data bases collected by three different agencies.

The DPH survey results showed a total of 876.61 curies transferred while MIMS showed 854.48 curies transferred. DPH generator results for activity were 102.59% of total as reported by disposal sites through MIMS. Results were within 3% of each other showing consistency and accuracy.

DPH survey results showed a total of 30,920.68 cubic feet of waste transferred while MIMS showed 4,357.77 cubic feet transferred. DPH generator results for volume were 709.55% of total as reported by disposal sites through MIMS. Differences can not be readily explained. 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, and DPH has no way of determining the MA total from this.

2. LLRW undergoes a degree of compaction or volume reduction[5]. 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 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. Other unknown reasons. **Comments are welcome!**

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

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

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

TABLE 10

COMPARISONS OF LLRW TRANSFERRED FROM MASSACHUSETTS FOR 2002

	Richland, WA Database*	Barnwell, SC Database	Clive, UT Database	Totals From The Three Disposal Sites	MIMS Database	DPH Database
Volume, CF	0.000	843.536	3,510.7	4,354.236	4,357.77	30,920.68
Activity, Curies	0.000	841.643	1.275	842.918	854.48	876.61

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

TABLE 11

MASSACHUSETTS 2002 WASTE GENERATOR CATEGORY RESULTS FROM MIMS

Generator Class	**Volume Transferred (CF)**	**Activity Transferred (curies)**
Academic	17.36 (0.40%)	0.42 (0.05%)
Government	9.90 (0.23%)	0.03 (0.01%)
Industry	3,760.68 (86.29%)	719.22 (84.17%)

Medical	1.23 (0.03%)	0.04 (0.01%)
Utility	568.60 (13.05%)	134.77 (15.77%)
Totals	4,357.77CF	854.48 Ci

TABLE 12

MA WASTE CLASSIFICATION AND GENERATOR CLASS FOR 2002 FROM MIMS

Disposal Site	**Year Received**	**Generator Class**	**Total Volume (ft3)**	**Total Activity (curies)**	**Class A Volume (ft3)**	**Class B Volume (ft3)**	**Class C Volume (ft3)**
Barnwell	2002	Academic	17.36	0.42	17.07	0.00	0.29
Barnwell	2002	Government	9.90	0.03	9.70	0.00	0.20
Barnwell	2002	Industry	390.38	709.38	106.40	240.00	43.98
Barnwell	2002	Medical	1.23	0.04	1.05	0.00	0.18
Barnwell	2002	Utility	429.60	134.77	80.90	206.81	141.89
Envirocare	2002	Industry	3,370.30	9.84	3,370.30		
Envirocare	2002	Utility	139.00	0.00	139.00		
		Total:	4,357.77	854.48	3,724.42	446.81	186.54

3.2 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 website at www.state.ma.us/legis/laws/mgl/gl-111H-toc.htm

1990's

In early 1990's the Massachusetts Low Level Radioactive Waste Management Board (consisting of 9 members) 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. The other reasons an in state disposal site was not selected were the politics of siting and the critical need to address potential health, safety, and environmental issues.

2000's

In fall of 2002 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, New York, New Hampshire, Michigan, North Carolina, Rhode Island, and Puerto Rico.

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 currently Maine has notified the Texas Compact of its intentions to withdraw.

Future

Barnwell, SC accepts LLRW through brokers or processors or directly from LLRW generators, only until June 30, 2008. After 2008 they will only accept LLRW from Atlantic Compact members (formerly the Northeast Compact) consisting of states of SC, CT, and NJ. If Massachusetts were to consider joining, then we would have to become a host state. The Board had rejected that idea back in 1996**.**

Clive, Utah is accepting LLRW Class A including HVLA waste. They do not accept Class B or C wastes.

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.

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, which includes ME and VT as members. Maine has given notice of its intent to terminate effective in April 2004. New membership cost is upwards of $25 million dollars if Massachusetts should consider joining and Massachusetts is considering its options.

The Controller's office still has authority under MGL Ch 428 of Acts of 1993 to issue up to $45 million dollars in bonds for the purpose of siting LLRW storage, treatment, or disposal facilities. The authorization expires in 2018. This bond authorization could be used to join a compact with the understanding the monies would be repaid back to the Commonwealth by new LLRW generator's fees.

As a result of the above, on July 1, 2008 Massachusetts generators will have no treatment option other than decay on site unless Texas opens a new LLRW site for Class B and C wastes.

3.3 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 www.llwforum.org
The LLW Forum is a national association of representatives of compacts[6], 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.

[6] 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
Nebraska *
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

Northwest 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
Maine
Texas *
Vermont

Unaffiliated States
District of Columbia
Massachusetts
Michigan
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 funds were transferred to DPH. The balance forward for FY 2003 to DPH was approximately $135,000.

Limited assessment funds were received in FY 2002 as invoices were sent out in fall of 2001 to cover calendar year 2000 assessments. **No invoices were sent out to any licensees to cover calendar year 2001 LLRW assessments,** and none are planned as DPH was not responsible in 2001.

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 507 users were assessed $190,971.47 starting in April of 2004 using the same rates[7] as the Board last used in 2001 for period of calendar year 2002. 16 users were unresponsive and did not submit the survey form. Some could not be found, and some are in process of having their licenses terminated.

The billed amounts range from the regulatory minimum of $75.00 to a maximum of $99,980 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. Eleven municipal licensees are in this category.

One waste generator is in bankruptcy and owes the Commonwealth over $82,000 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)) + ((HVLA (0.1) (PF))

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.

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

[7] 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.

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 2002 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 siting activities in 1996 and remains an unaffiliated disposal state, no funds were received in 2002.

APPENDIX A

FIGURE 2

PERCENT OF TOTAL ACTIVITY BY WASTE CLASS FOR 2002

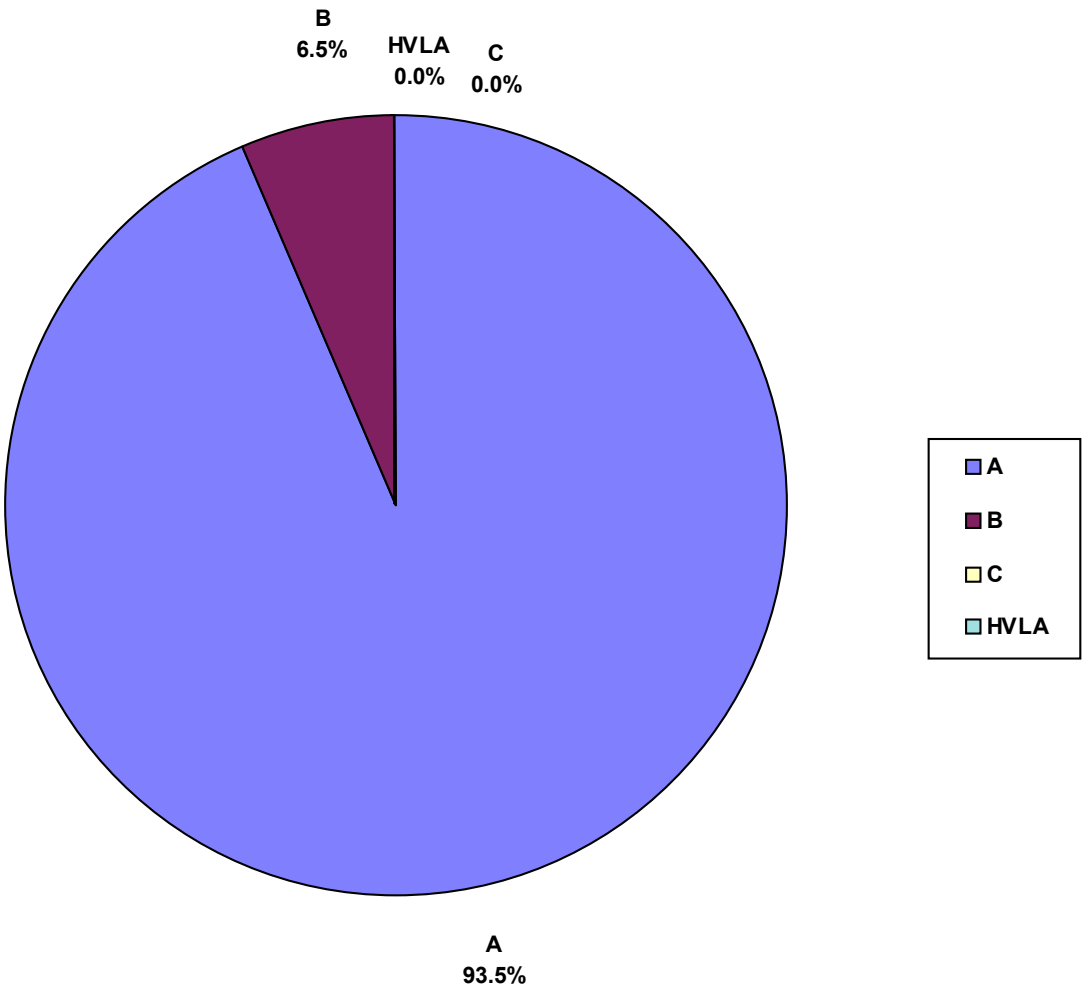


FIGURE 3

PERCENT ACTIVITY PLACED IN STORAGE BY WASTE CLASS FOR 2002

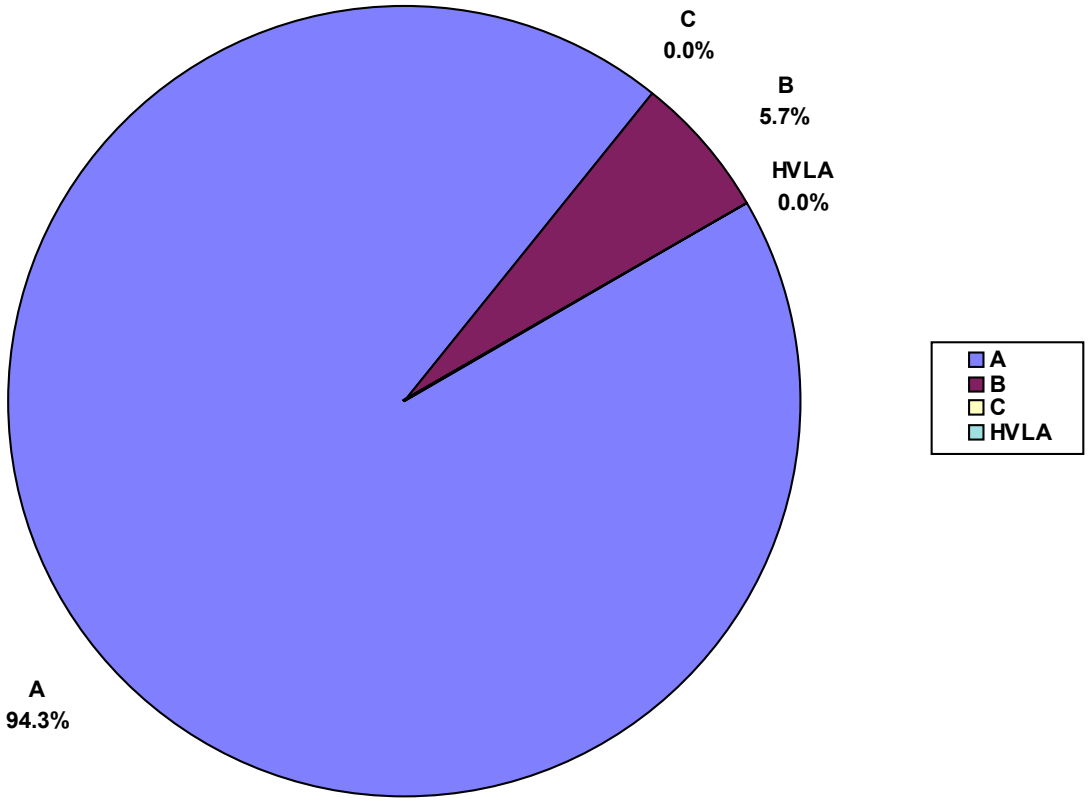


FIGURE 4

PERCENT ACTIVITY TRANSFERRED BY WASTE CLASS FOR 2002

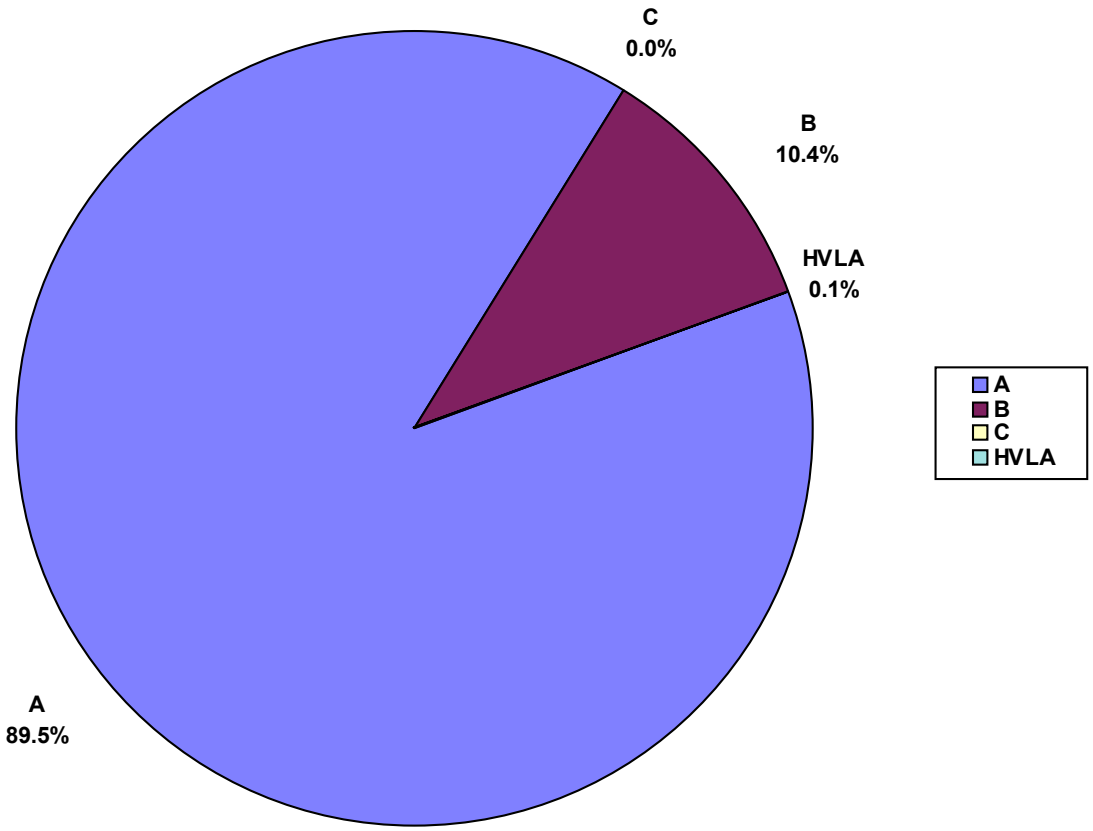


FIGURE 5

PERCENT TOTAL VOLUME BY WASTE CLASS FOR 2002

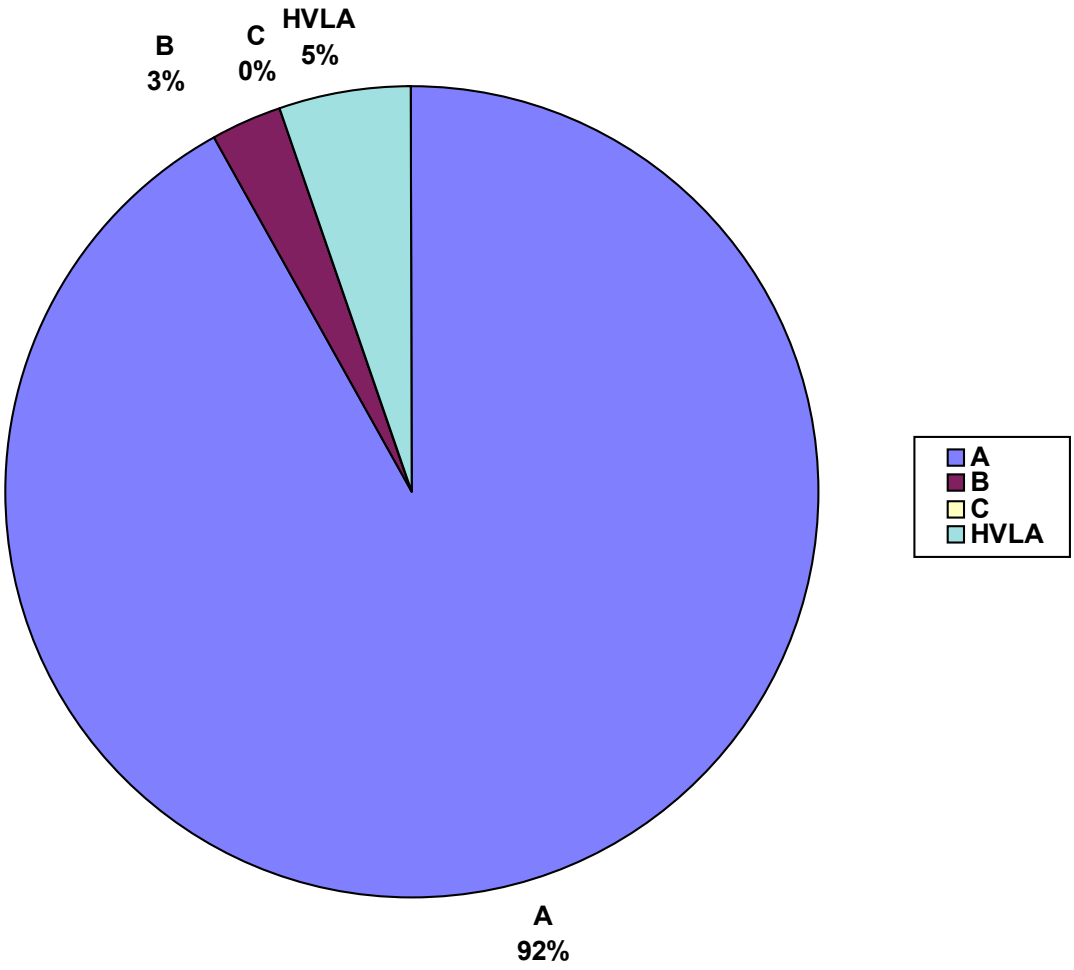


FIGURE 6

PERCENT VOLUME IN STORAGE BY WASTE CLASS FOR 2002

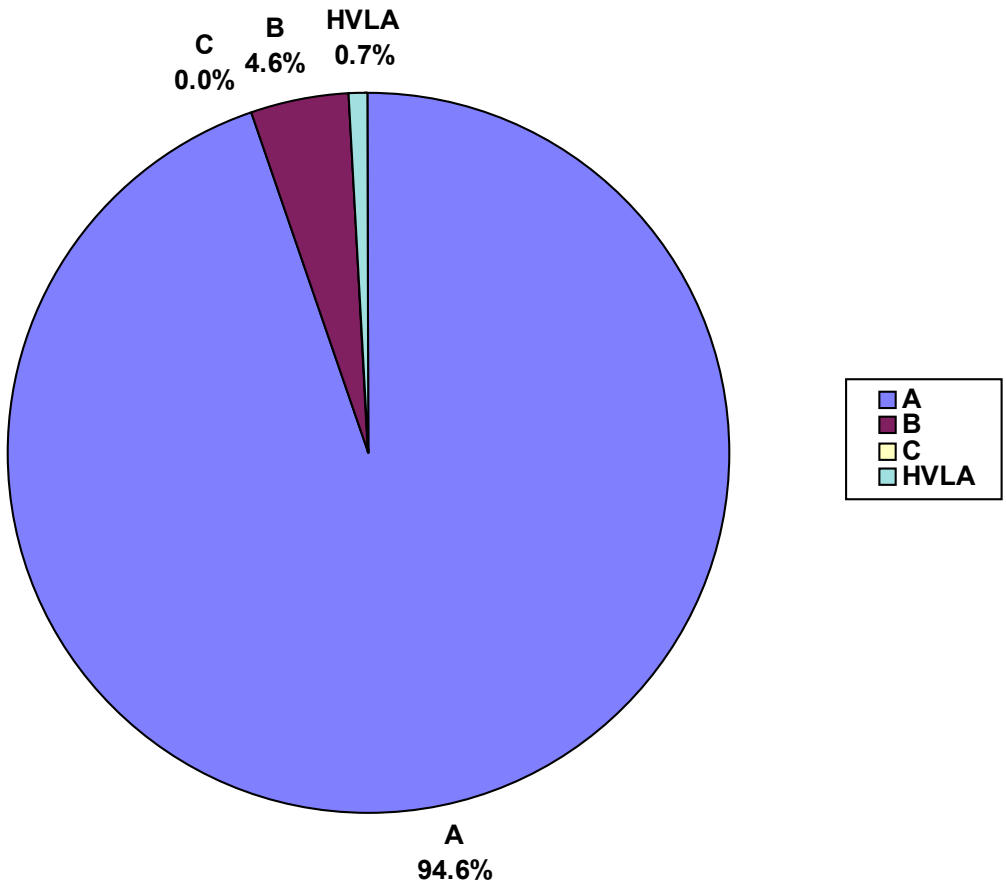


FIGURE 7

PERCENT VOLUME SHIPPED BY WASTE CLASS FOR 2002

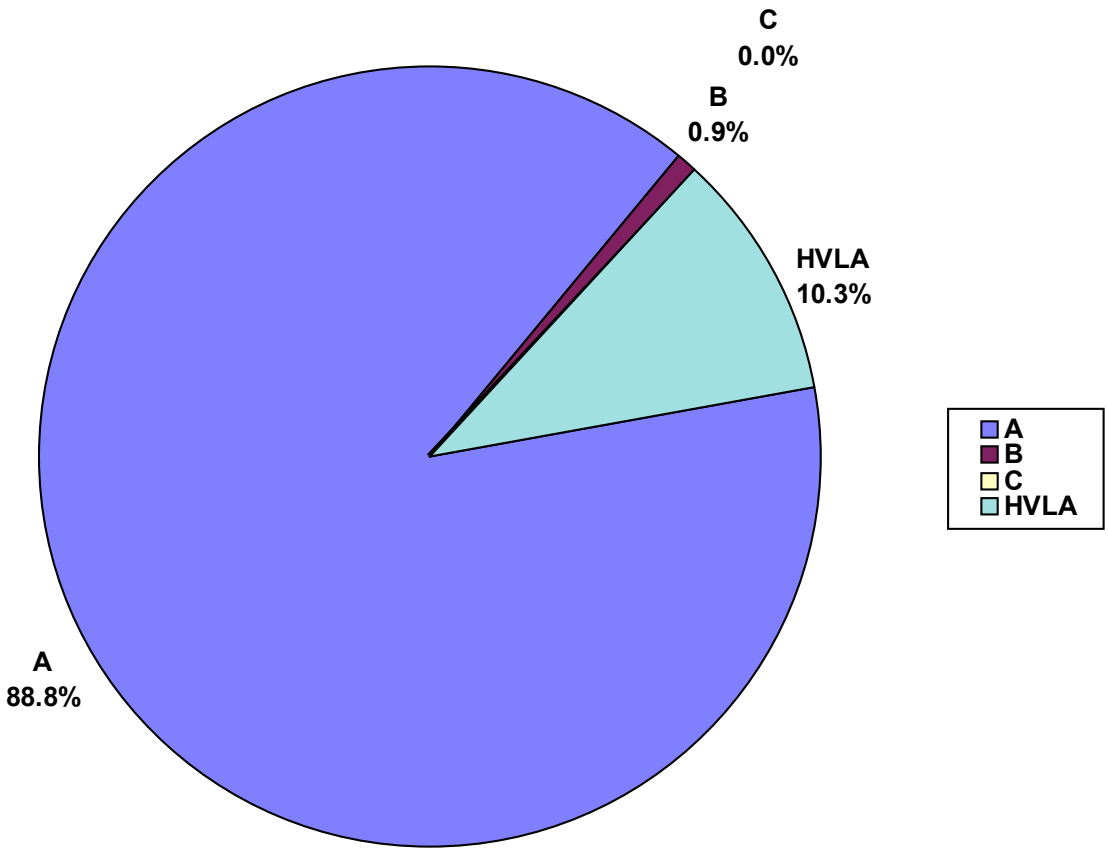
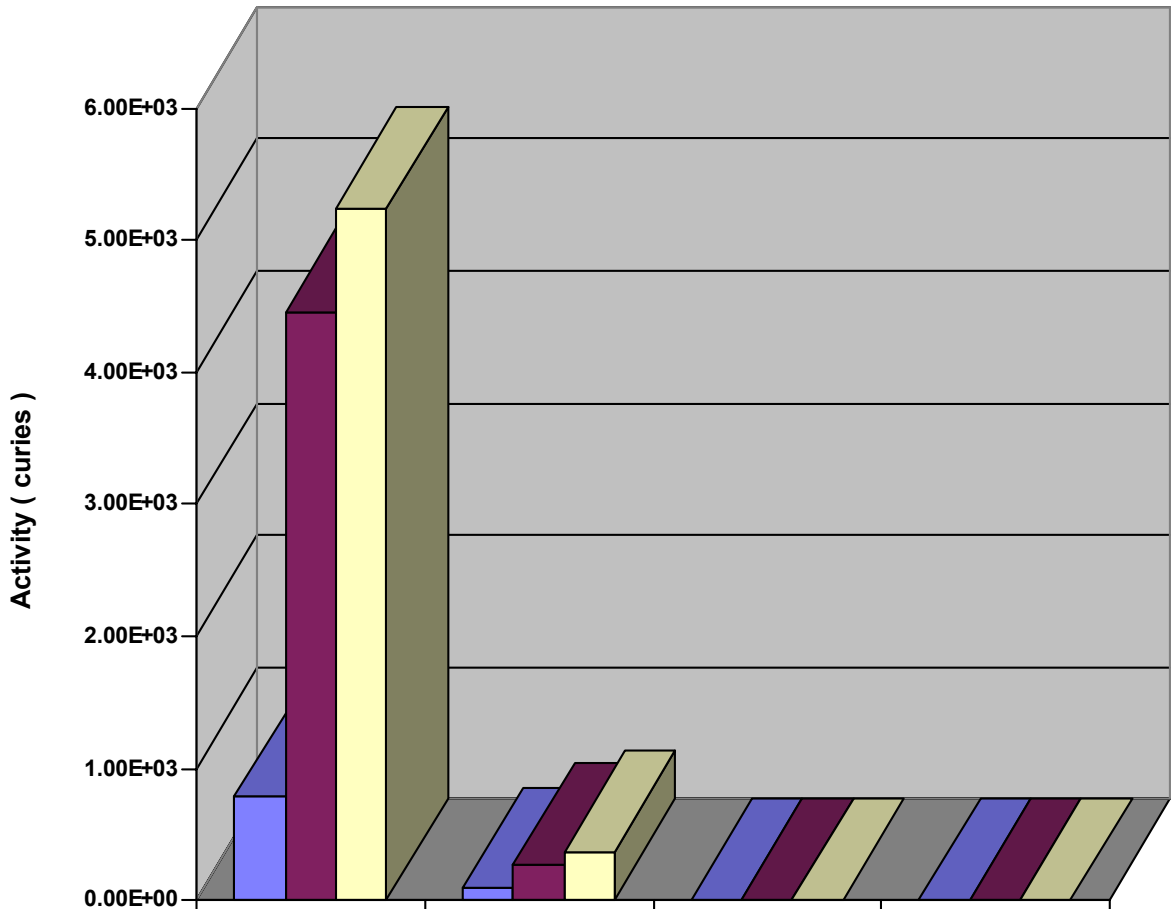


FIGURE 8

COMPARISON OF WASTE ACTIVITIES BY WASTE CLASS FOR 2002

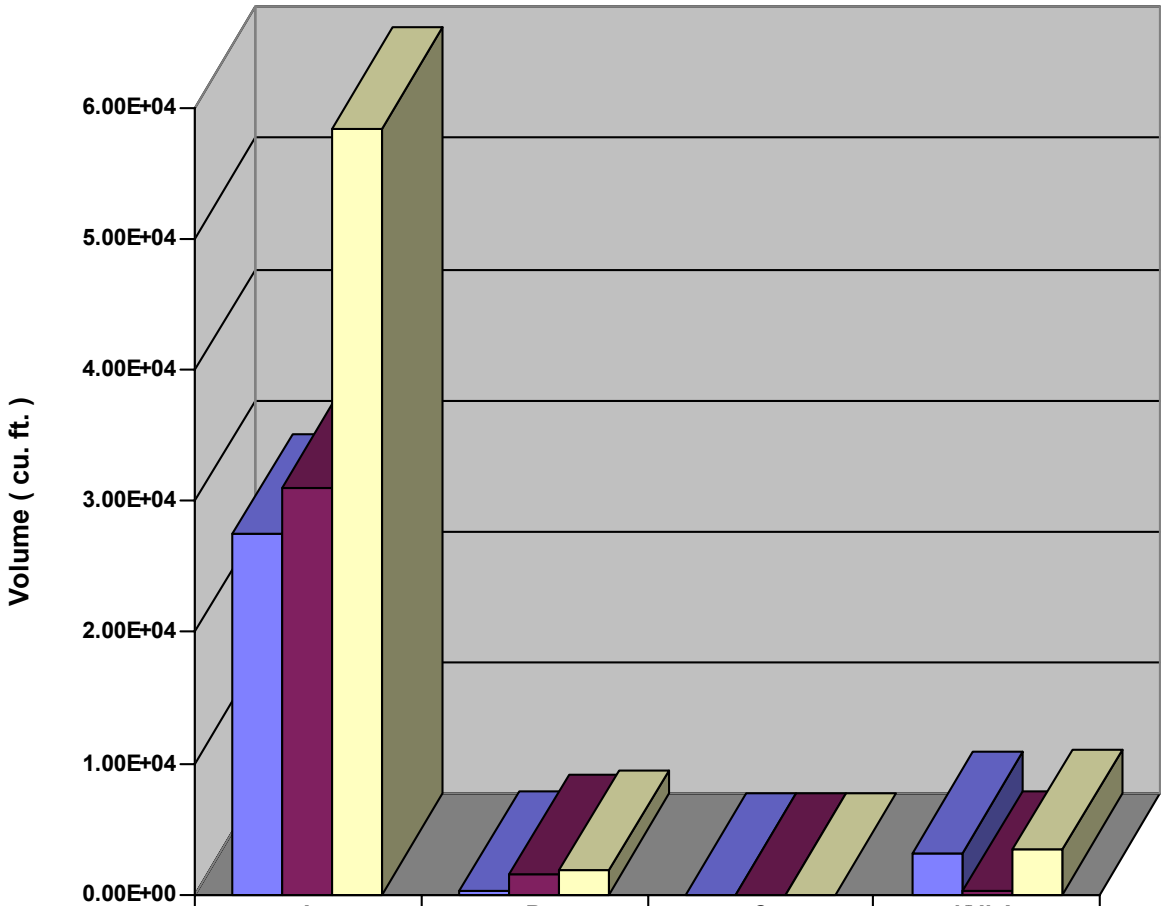


	A	B	C	HVLA
Activity Transferred	7.84E+02	9.12E+01	3.00E-03	1.05E+00
Activity Placed In Storage	4.45E+03	2.70E+02	0.00E+00	1.07E+00
Activity Total	5.24E+03	3.61E+02	3.00E-03	2.12E+00

Waste Class

FIGURE 9

COMPARISON OF WASTE VOLUMES BY WASTE CLASS FOR 2002



	A	B	C	HVLA
Volume Transferred	2.75E+04	2.67E+02	1.00E+00	3.18E+03
Volume Placed In Storage	3.10E+04	1.52E+03	0.00E+00	2.34E+02
Volume Total	5.84E+04	1.79E+03	1.00E+00	3.42E+03

FIGURE 10

PERCENT OF TOTAL ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2002

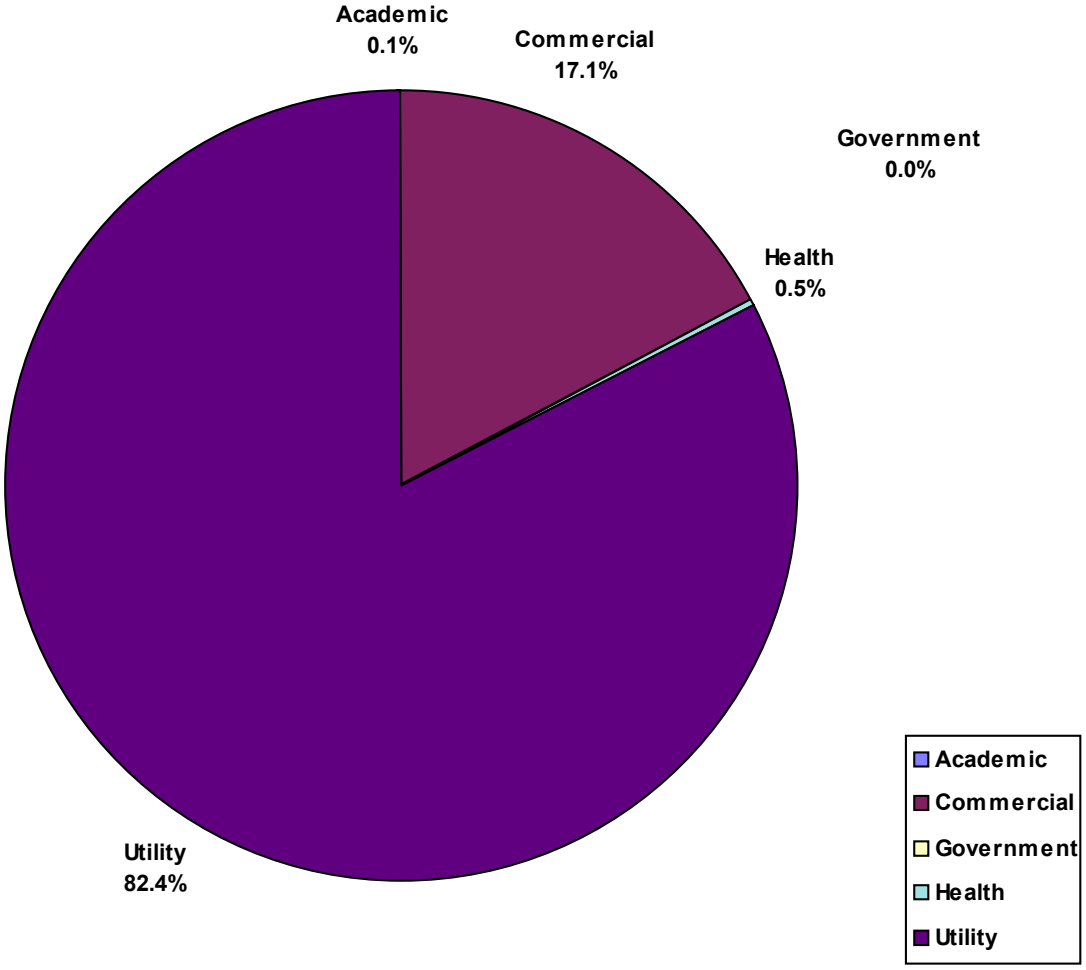


FIGURE 11

PERCENT OF IN - STORAGE ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2002

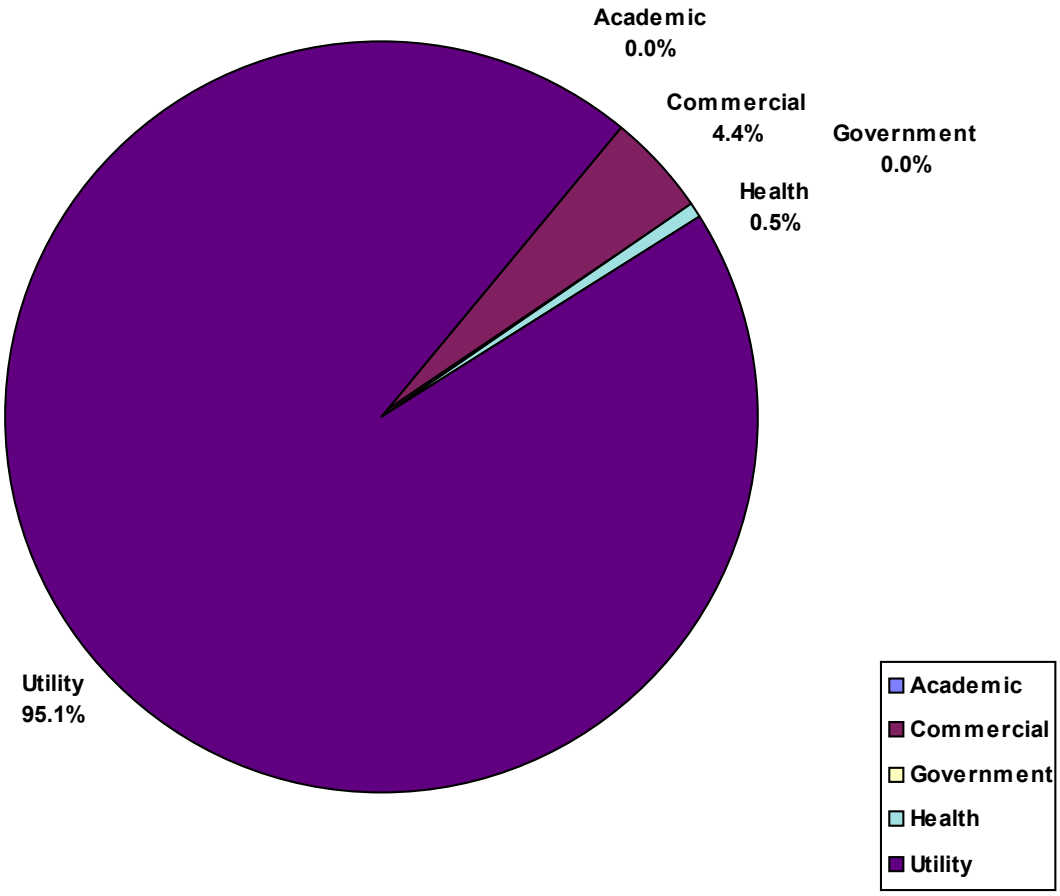


FIGURE 12

PERCENT OF TRANSFERRED ACTIVITY BY WASTE GENERATOR CATEGORY FOR 2002

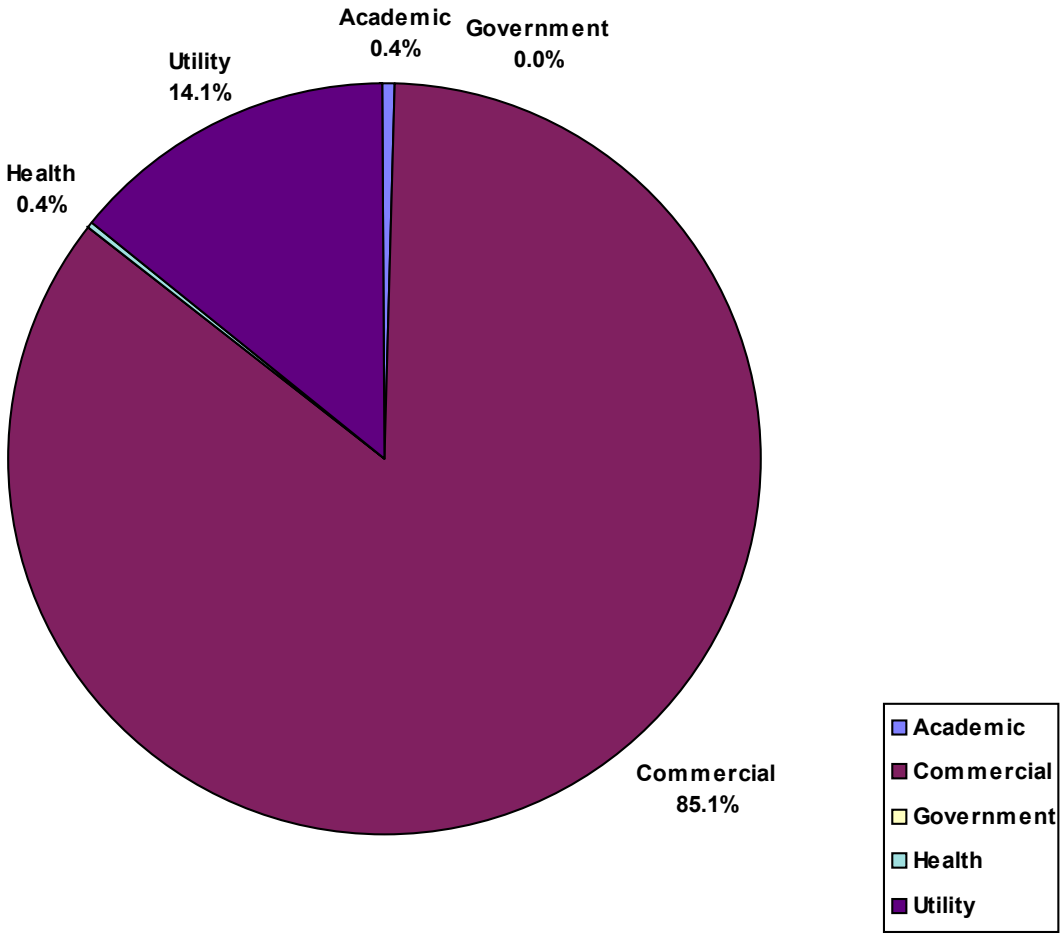
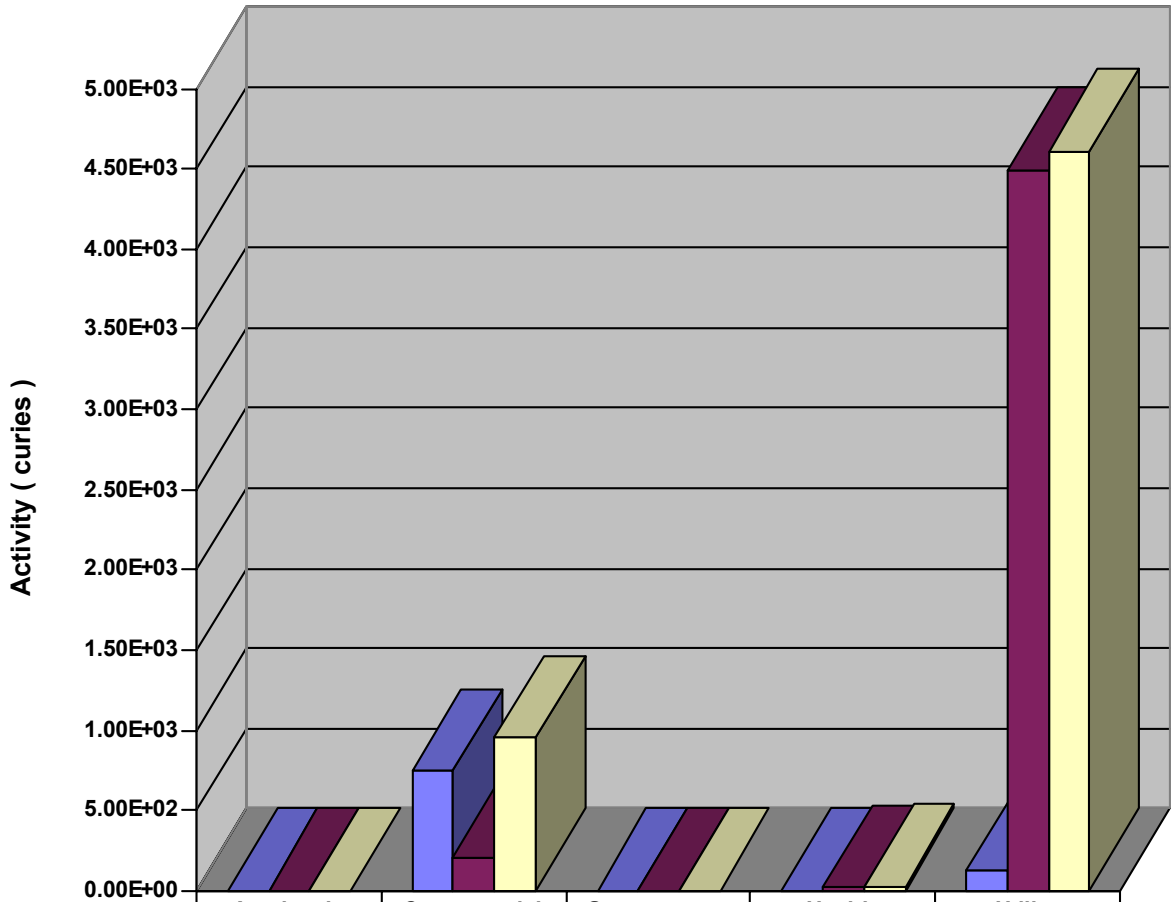


FIGURE 13

COMPARISON OF WASTE ACTIVITIES BY WASTE GENERATOR CATEGORY FOR 2002



	Academic	Commercial	Government	Health	Utility
Activity Transferred	3.69E+00	7.46E+02	2.00E-01	3.85E+00	1.23E+02
Activity Placed In Storage	8.16E-01	2.10E+02	1.00E-02	2.24E+01	4.49E+03
Activity Total	4.50E+00	9.56E+02	1.00E-02	2.63E+01	4.61E+03

Generator Category

FIGURE 14

PERCENT OF TOTAL VOLUME BY WASTE GENERATOR CATEGORY FOR 2002

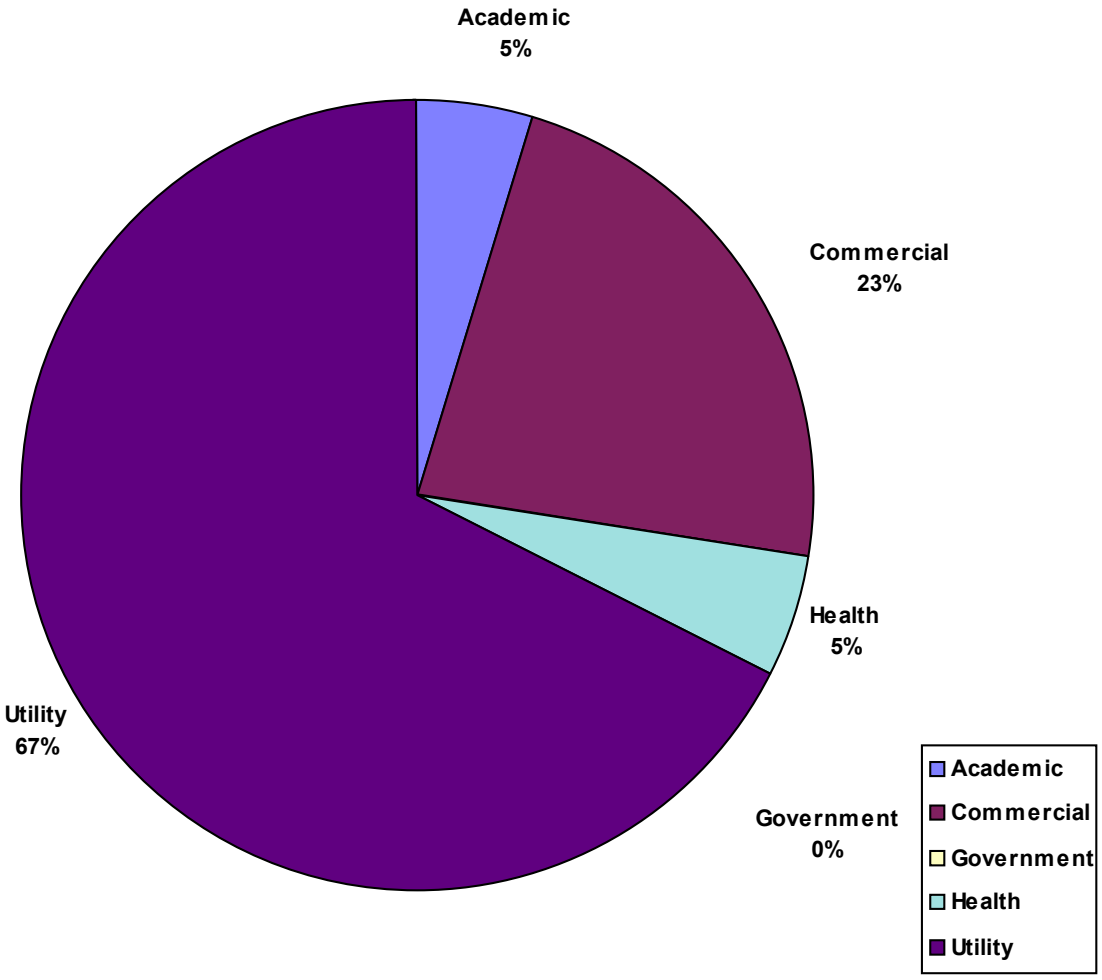


FIGURE 15

PERCENT OF IN-STORAGE VOLUME BY WASTE GENERATOR CATEGORY FOR 2002

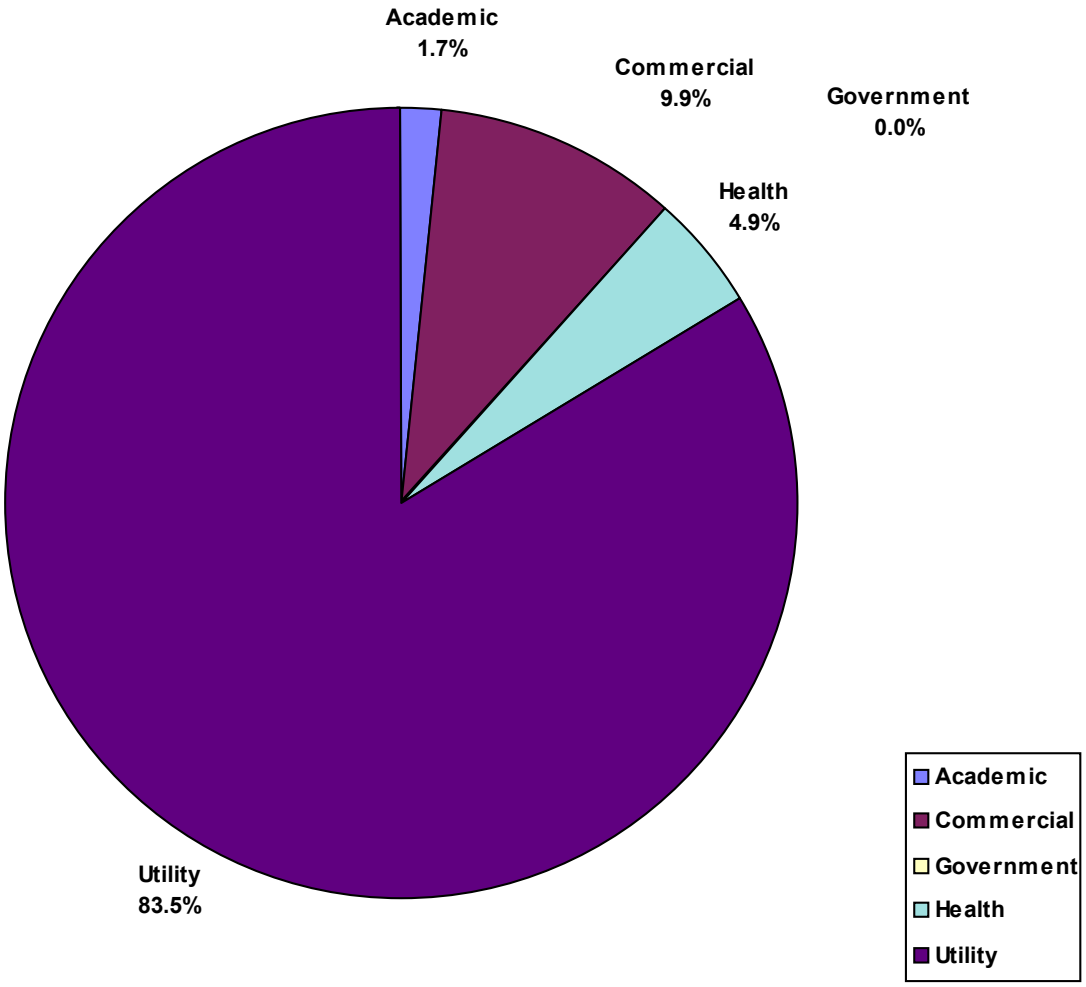


FIGURE 16

PERCENT OF TRANSFERRED VOLUME BY WASTE GENERATOR CATEGORY FOR 2002

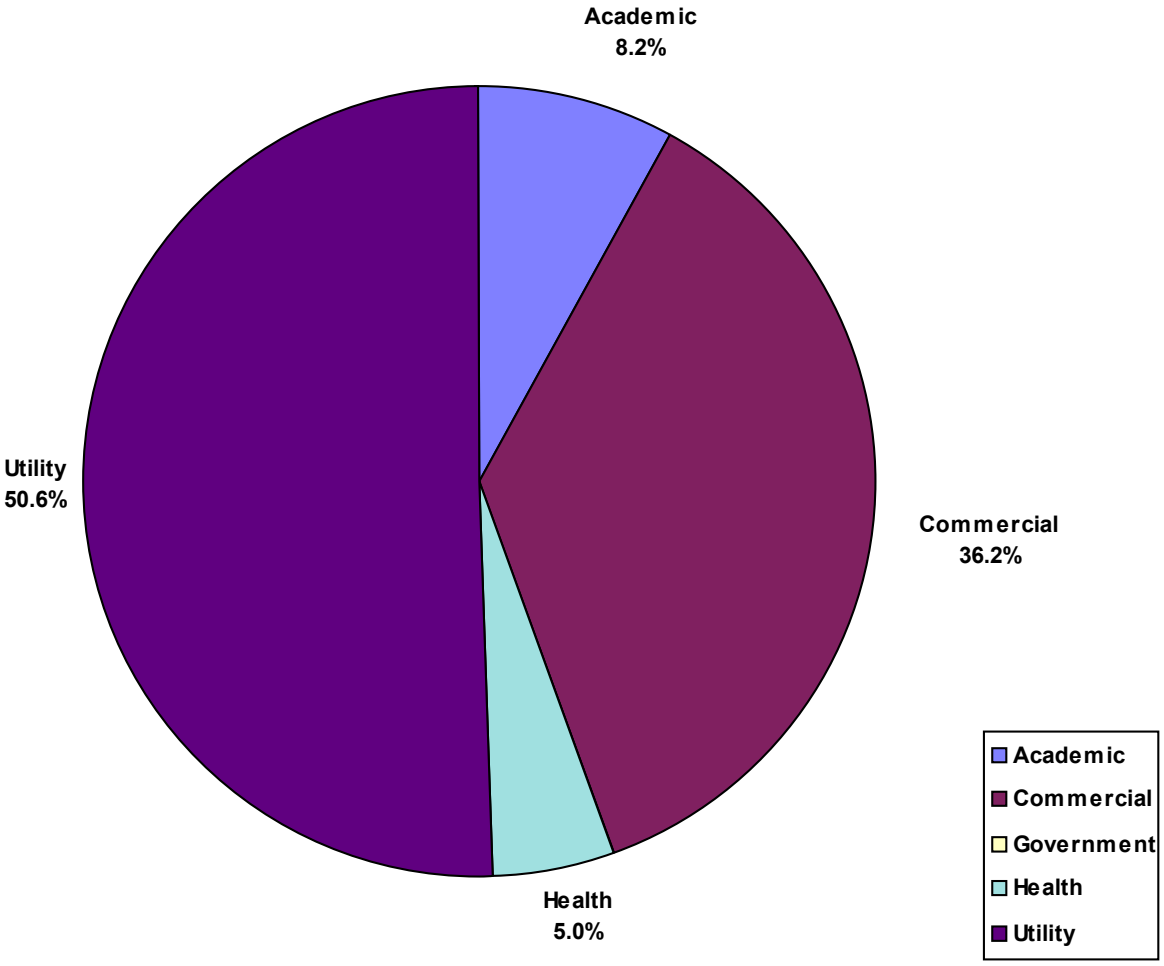
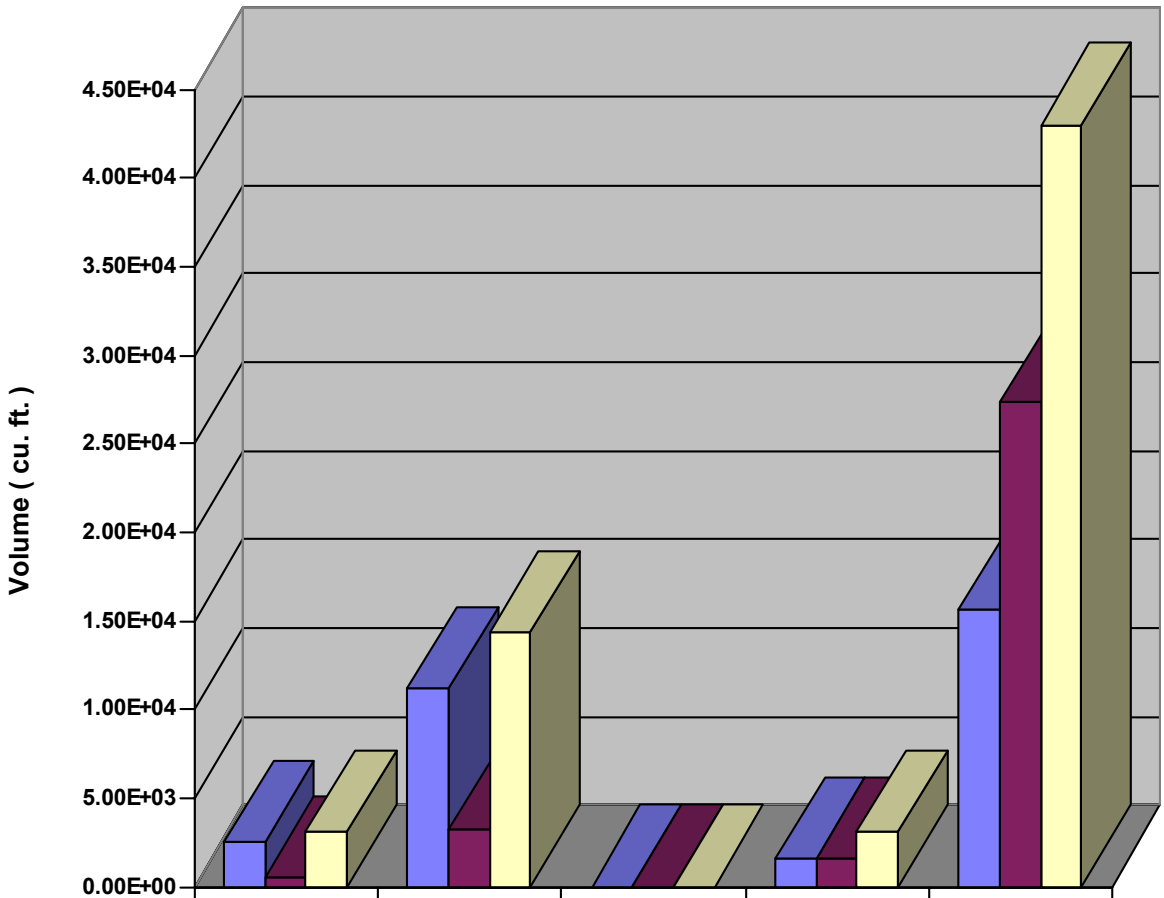


FIGURE 17

COMPARISON OF WASTE VOLUMES BY WASTE GENERATOR CATEGORY FOR 2002



	Academic	Commercial	Government	Health	Utility
Volume Transferred	2.53E+03	1.12E+04	4.10E+00	1.55E+03	1.56E+04
Volume Placed In Storage	5.41E+02	3.24E+03	3.00E+00	1.60E+03	2.74E+04
Volume Total	3.07E+03	1.44E+04	3.00E+00	3.15E+03	4.30E+04

Generator Category

TABLE 14

Activity and Volume by Waste Generator Category For 2002

Waste Generator Category	Activity (curies)			Volume (Cu. ft.)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
Academic	3.69	0.82	4.50	2,531.25	540.57	3,071.82
(Percent)	0.4%	0.0%	0.1%	8.2%	1.7%	4.8%
Commercial	745.64	210.02	955.66	11,191.19	3,241.11	14,432.39
(Percent)	85.1%	4.4%	17.1%	36.2%	9.9%	22.7%
Government	0.20	0.01	0.21	4.10	3.00	7.10
(Percent)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Health	3.85	22.42	26.27	1,551.04	1,603.56	3,154.60
(Percent)	0.4%	0.5%	0.5%	5.0%	4.9%	5.0%
Utility	123.24	4,490.08	4,613.32	15,643.10	27,358.20	43,001.30
(Percent)	14.1%	95.1%	82.4%	50.6%	83.5%	67.5%
Grand Total	**876.61**	**4,723.34**	**5,599.96**	**30,920.68**	**32,746.44**	**63,667.21**

FIGURE 18

Note: No data available for 1998-2001 from DPH as no survey reports were printed.

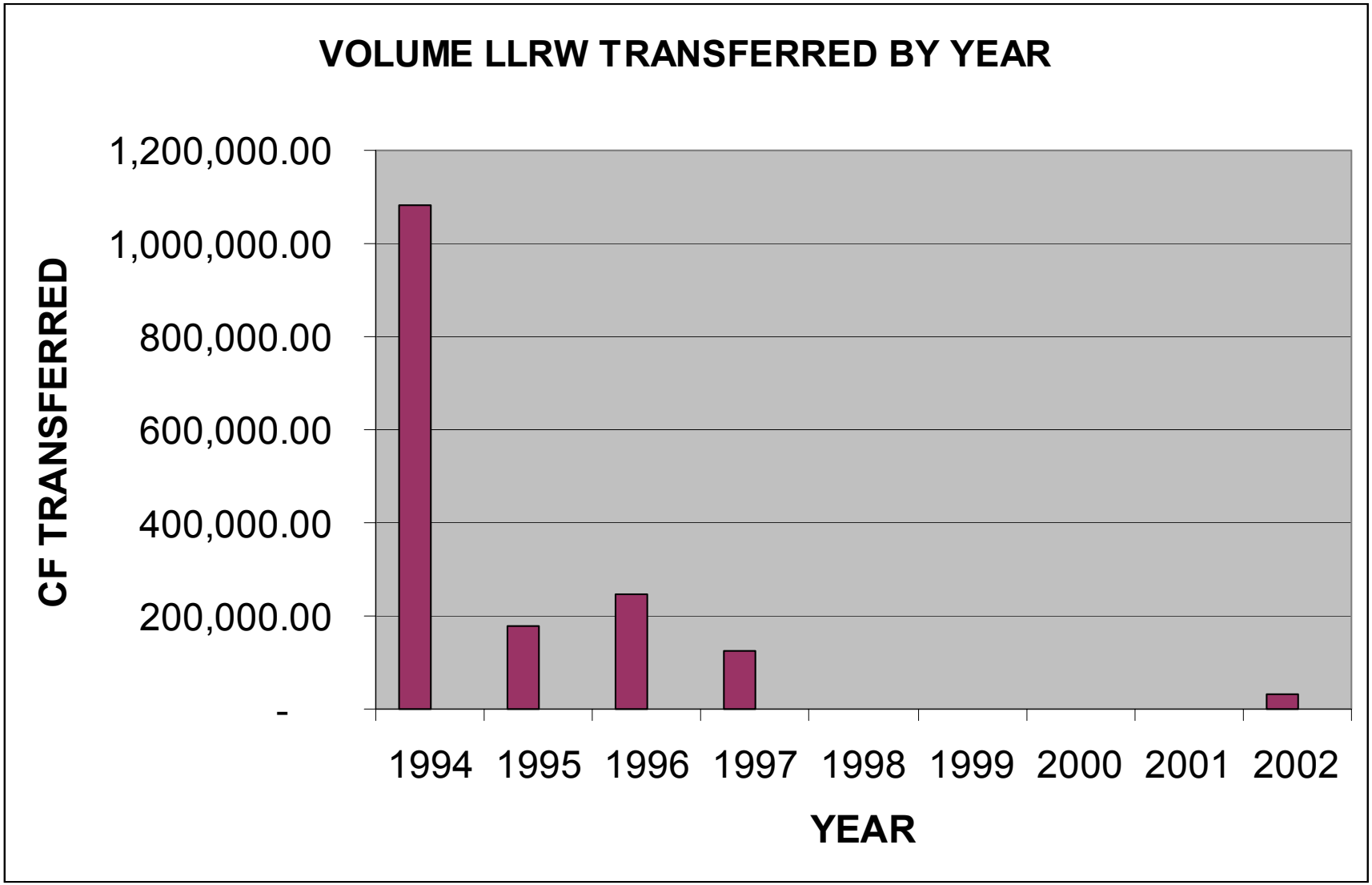


FIGURE 19

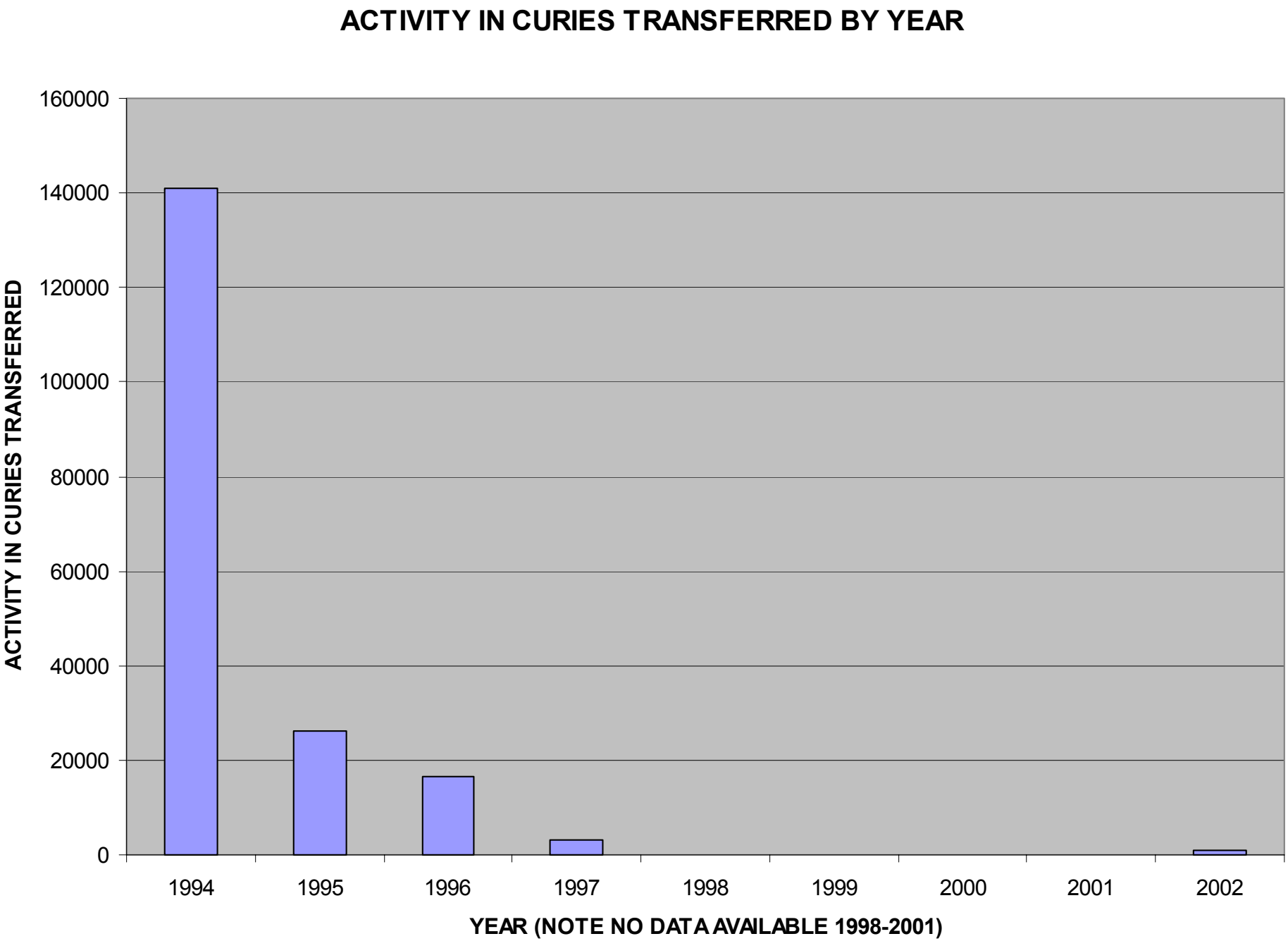

ACTIVITY IN CURIES TRANSFERRED BY YEAR
160000
140000
120000
100000
80000
60000
40000
20000
0
ACTIVITY IN CURIES TRANSFERRED
1994
1995
1996
1997
1998
1999
2000
2001
2002
YEAR (NOTE NO DATA AVAILABLE 1998-2001)

FIGURE 20
TOTAL RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2002

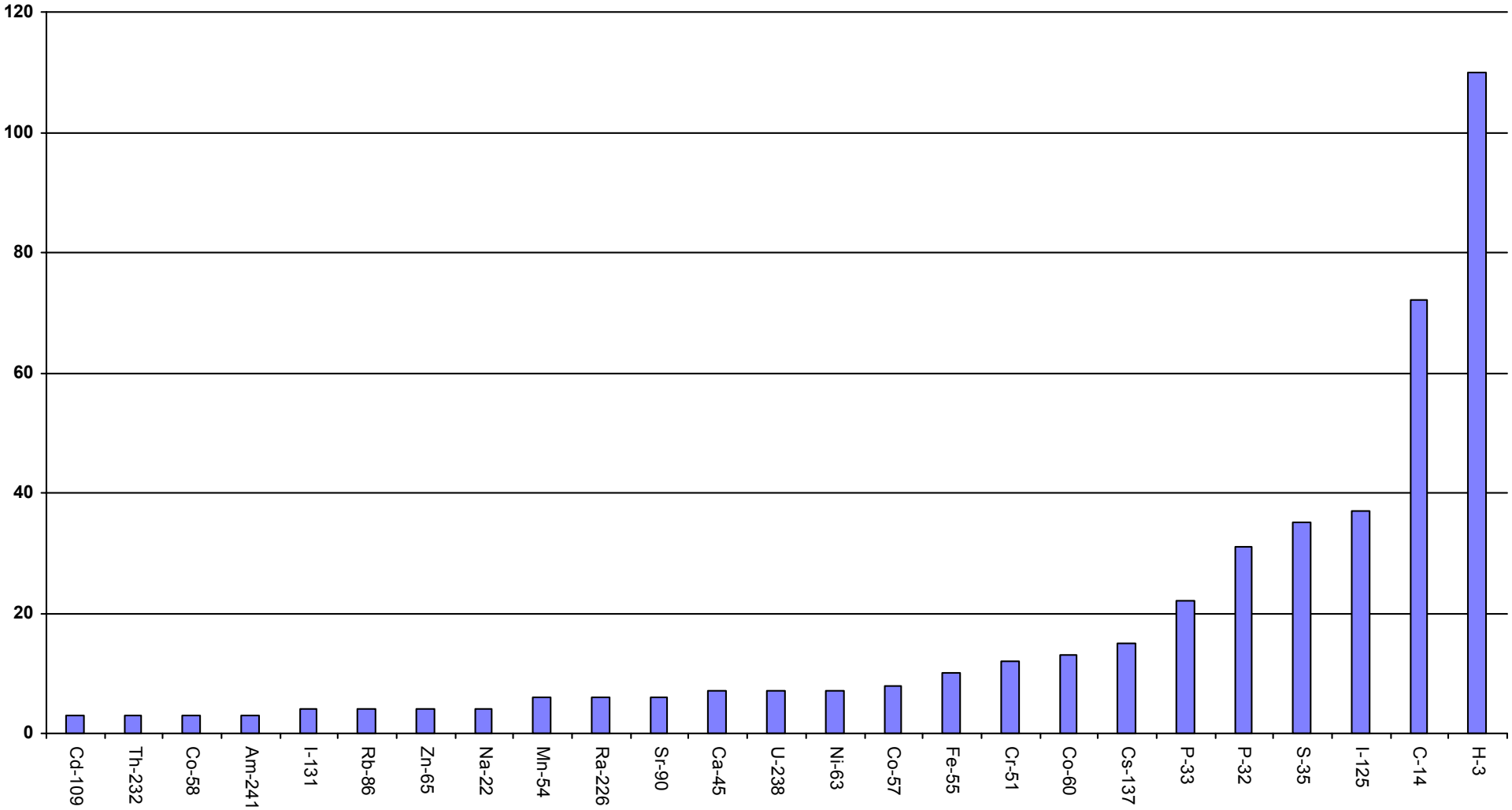


FIGURE 21
TOTAL RAM REPORTING FREQUENCY FOR CLASS A WASTE IN 2002

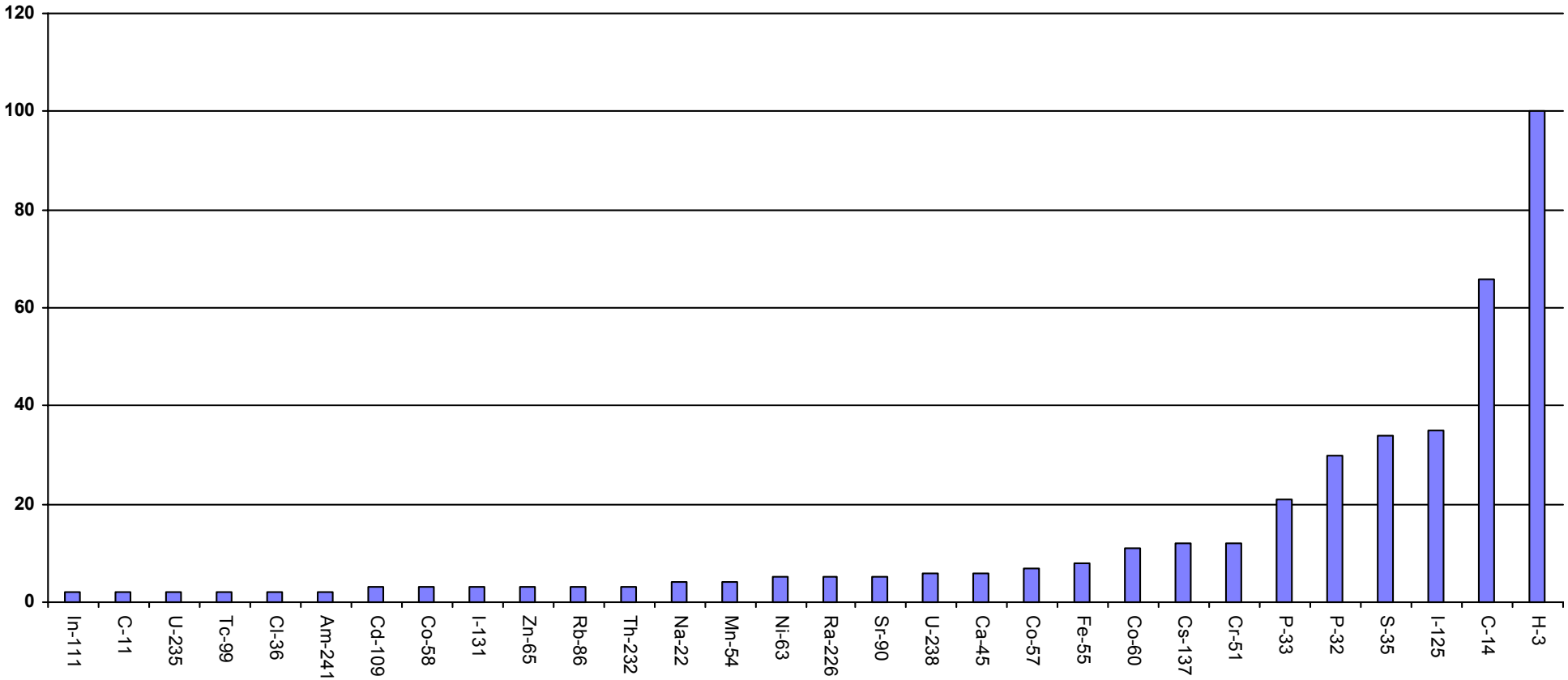


FIGURE 22
TOTAL RAM REPORTING FREQUENCY FOR CLASS B WASTE IN 2002

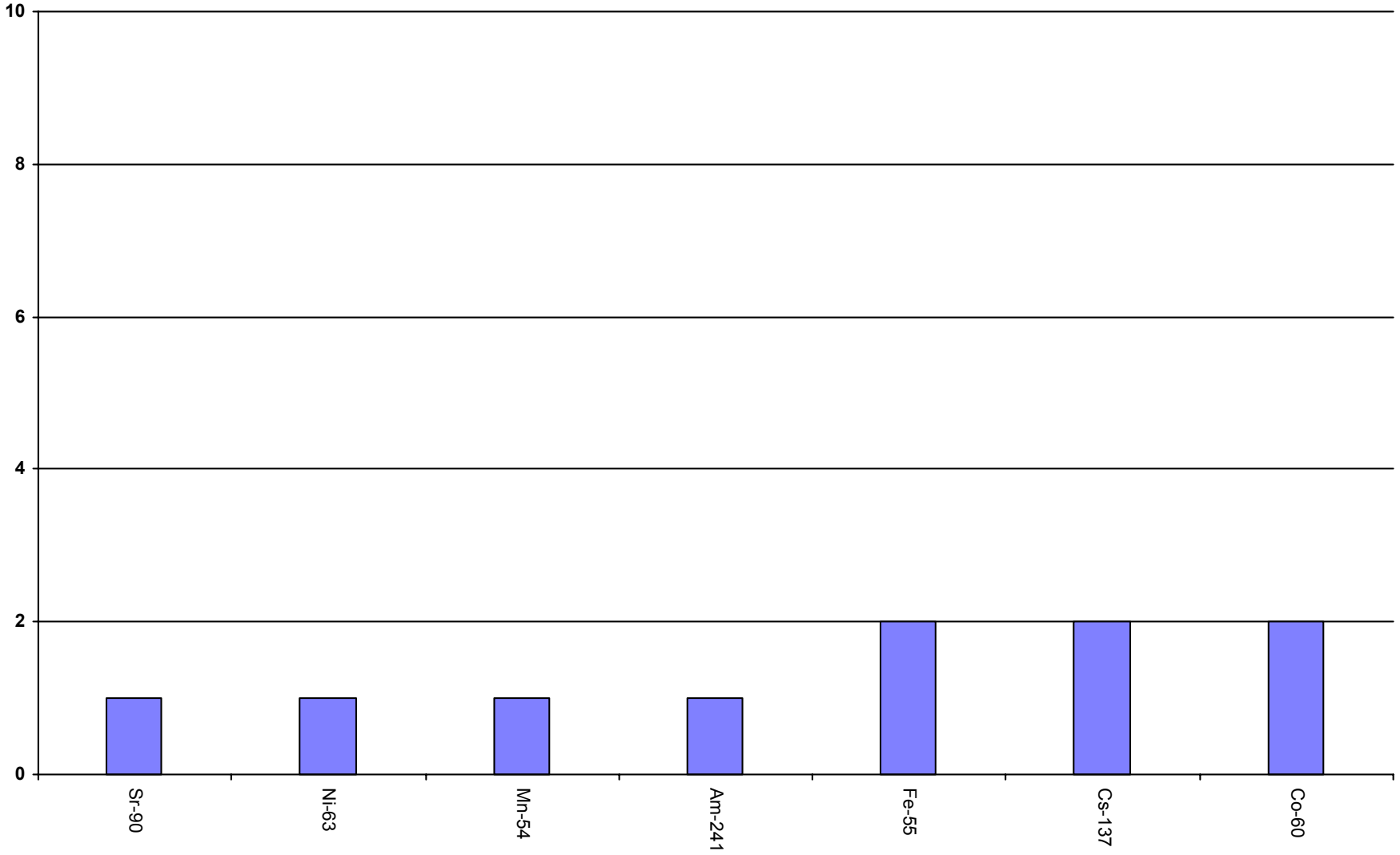


FIGURE 23
TOTAL RAM REPORTING FREQUENCY FOR CLASS C WASTE IN 2002

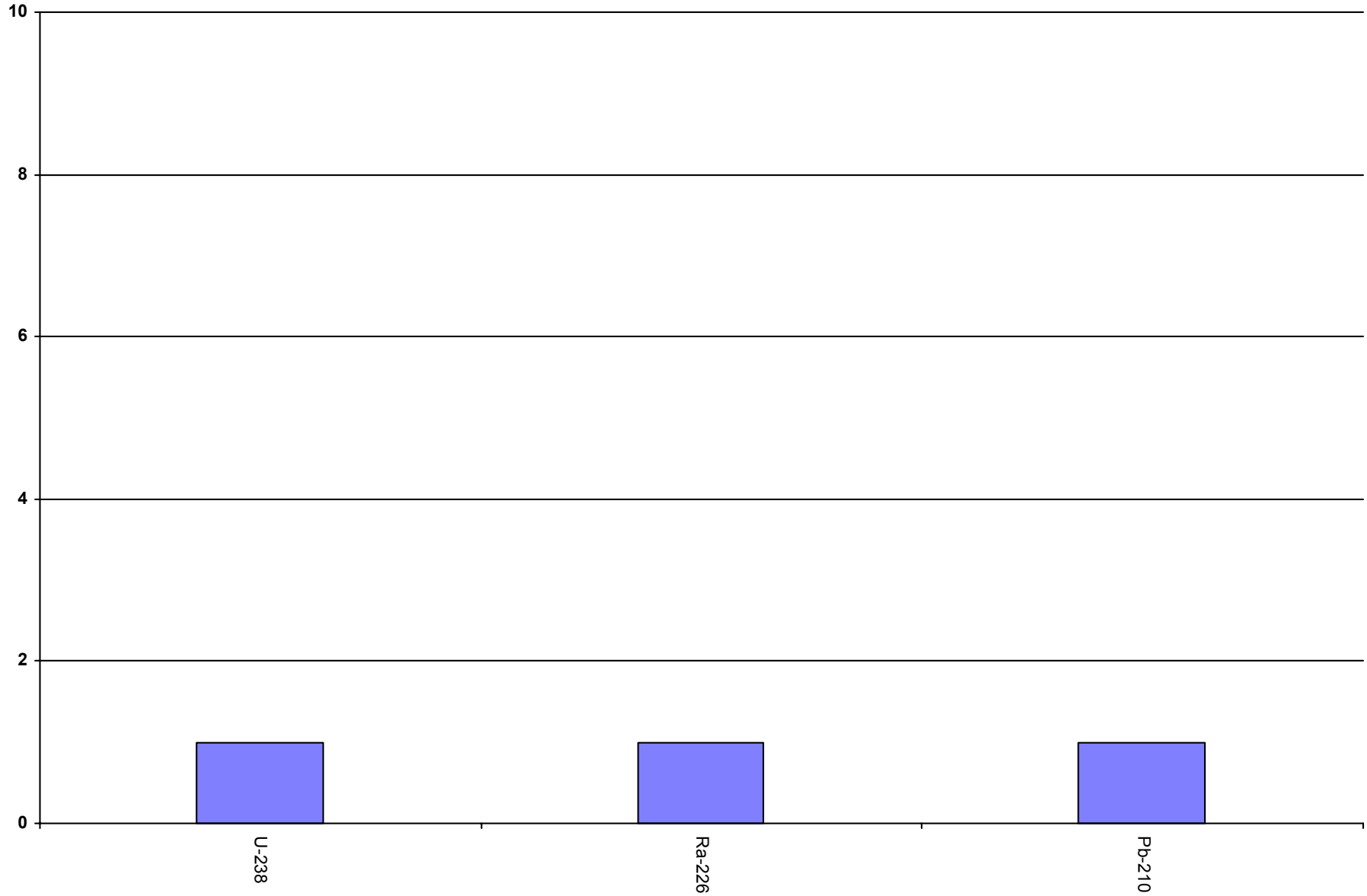


FIGURE 24
TOTAL RAM REPORTING FREQUENCY FOR HVLA WASTE IN 2002

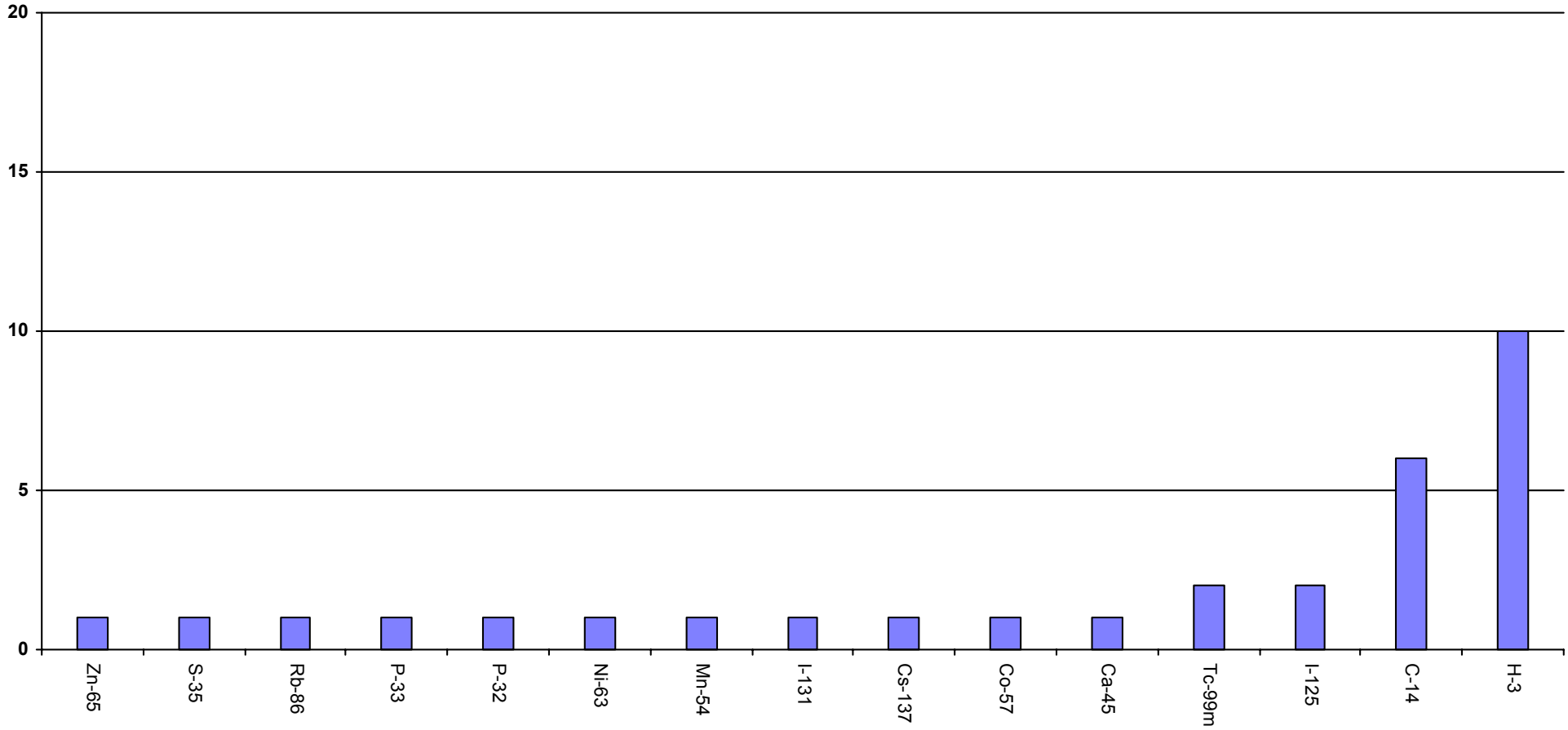


FIGURE 25
IN-STORAGE RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2002

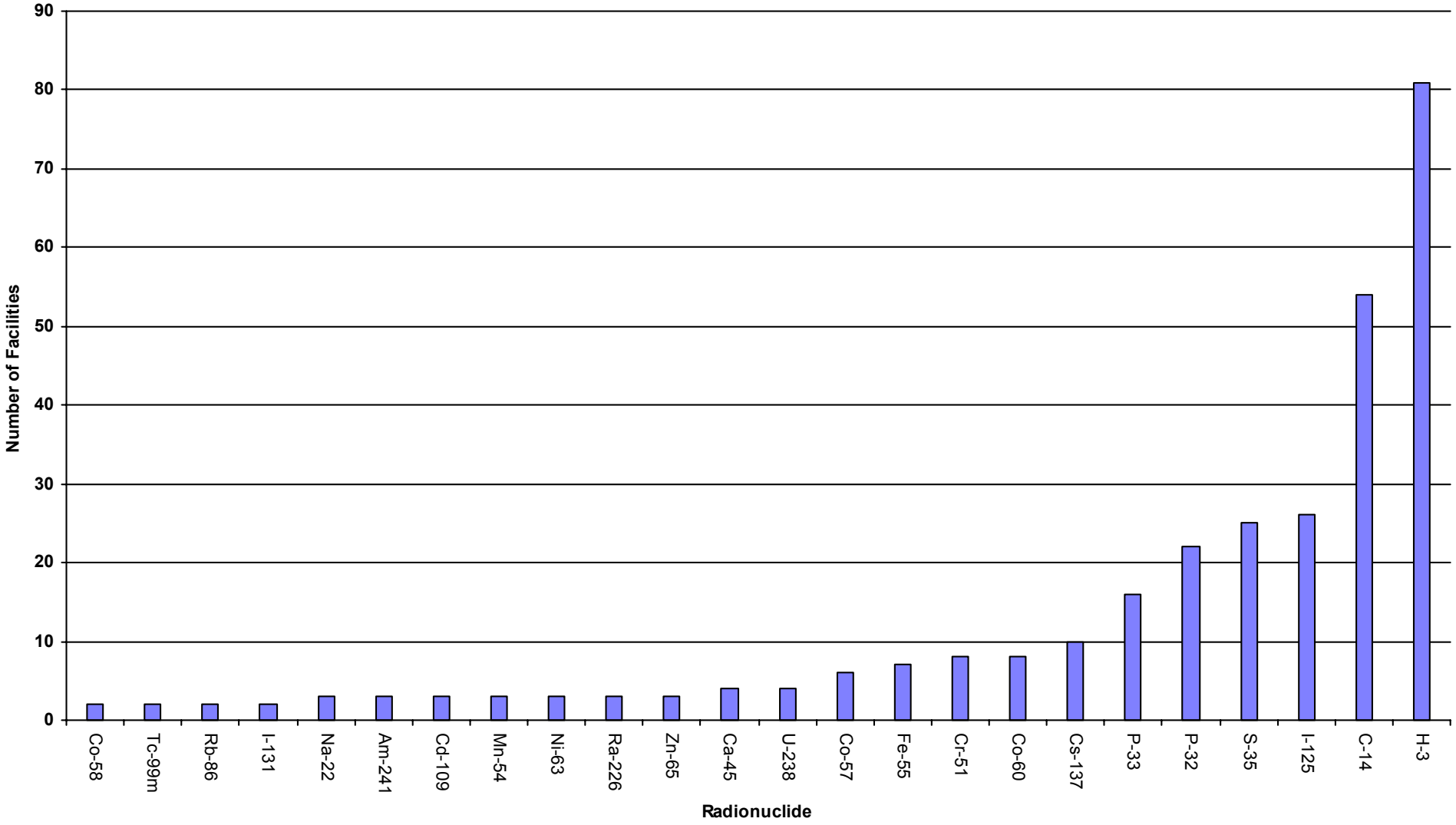


FIGURE 26
TRANSFERRED RAM REPORTING FREQUENCY FOR ALL CLASSES OF WASTE IN 2002

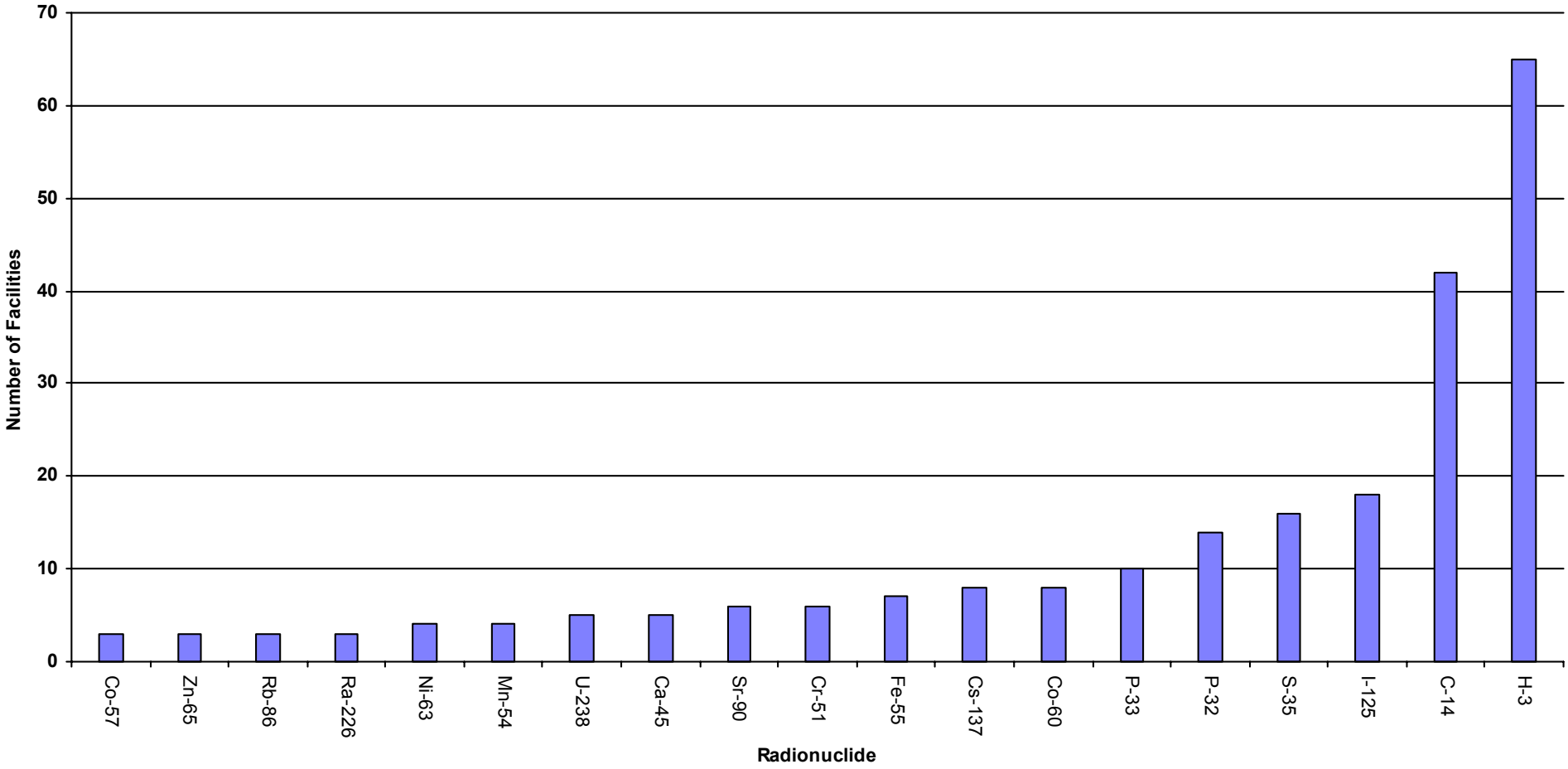


FIGURE 27
DISTRIBUTION OF ORGANIZATIONS THAT GENERATED WASTE IN 2002 - BY ACTIVITY

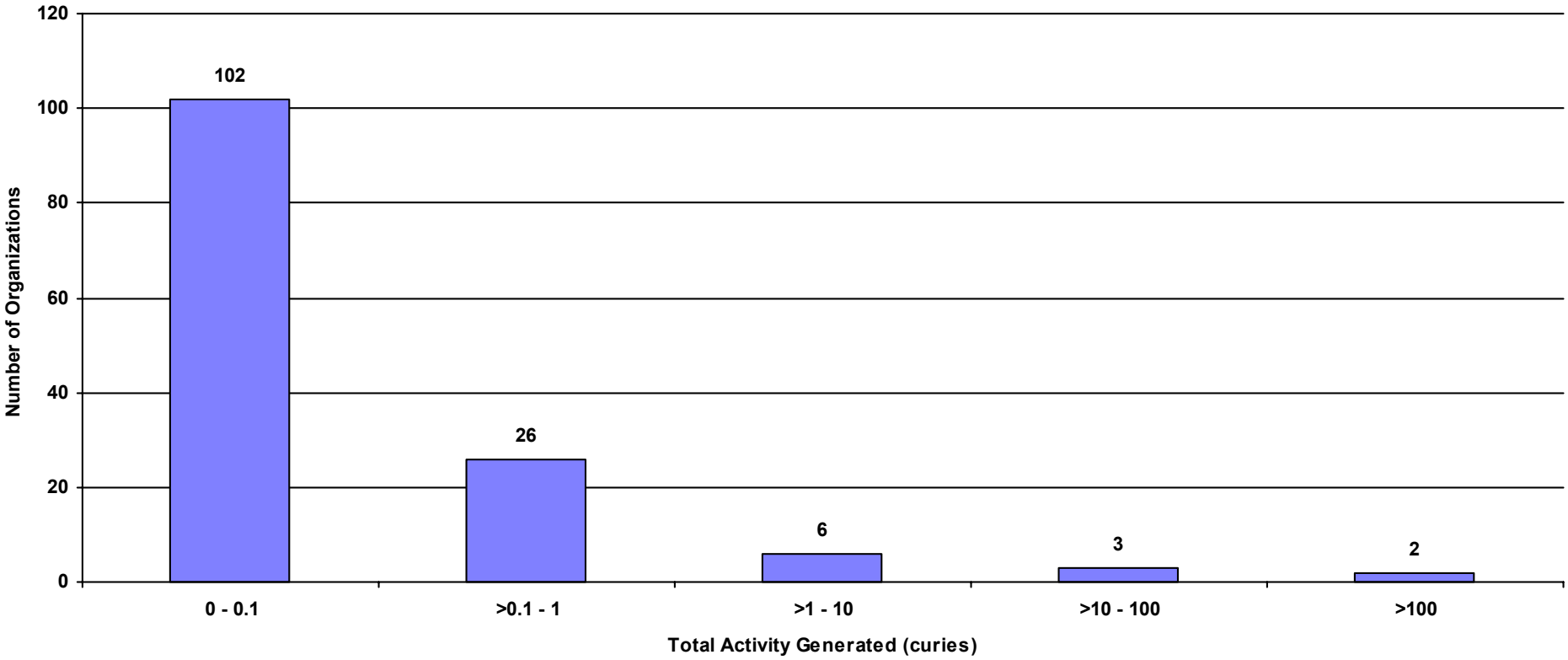


FIGURE 28
DISTRIBUTION OF ORGANIZATIONS THAT GENERATED WASTE IN 2002 - BY VOLUME

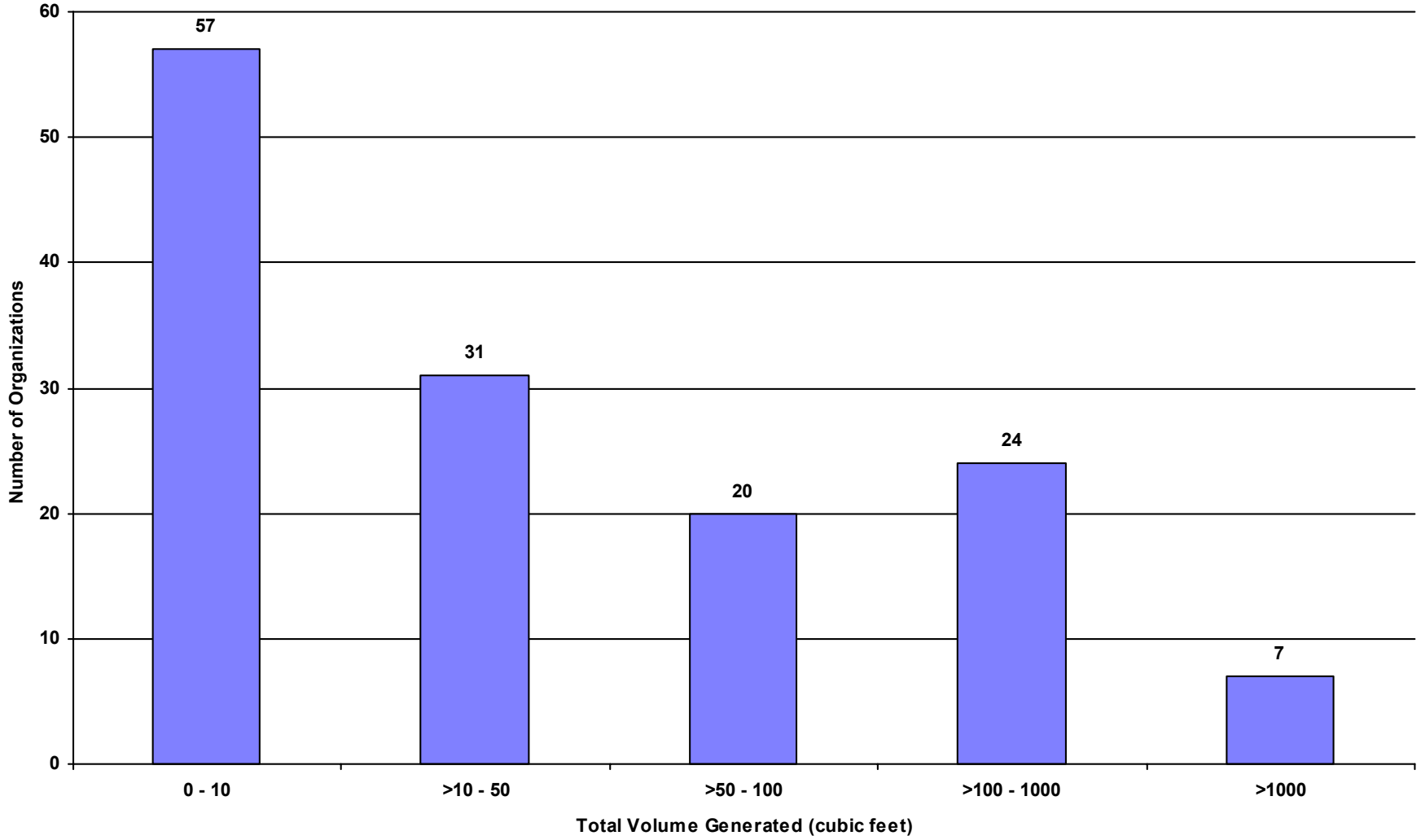


TABLE 15

List of Facilities Activities and Volumes Produced in 2002

	VOLUME (cu. ft.)			*ACTIVITY (curies)*		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
A-PAINTING & LEAD DETECT. SERV	0.0	0.0	0.0	0.000	0.000	0.000
AA & K DELEADING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ABBOTT BIORESEARCH CENTER, INC	0.0	22.5	22.5	0.000	0.033	0.033
ABC TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ACAMBIS, 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
ACTION ENVIRONMENTAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
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
ADVANCE TESTING CO. INC.	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED CARE PHARMACY	0.0	0.0	0.0	0.000	0.000	0.000
ADVANCED CELL TECHNOLOGY	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
AEA TECHNOLOGY QSA, INC.	90.0	150.0	240.0	0.520	50.000	50.520
AGGREGATE INDUSTRIES-NORTHEAST	0.0	0.0	0.0	0.000	0.000	0.000
ALC ENVIRONMENTAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ALKERMES, INC.	0.0	7.5	7.5	0.000	0.021	0.021
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	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	

	VOLUME (cu. ft.)			*ACTIVITY (curies)*		
Facility Name	**Transferred**	**In Storage**	**Total**	**Transferred**	**In Storage**	**Total**
ALPHA ANALYTICAL LAB., INC	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 LEAD PAINT INSPECTORS	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
AMGEN, INC.	9.2	13.8	23.0	0.001	0.005	0.006
AMHERST COLLEGE	0.0	3.0	3.0	0.000	0.004	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 MEMORIAL ANIMAL HOSP.	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.	3.0	2.0	5.0	0.006	0.010	0.016
ANTIGENICS INCORPORATED	0.0	1.5	1.5	0.000	0.019	0.019
APPLIED BIOSYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
ARCHEMIX	0.0	50.0	50.0	0.000	0.004	0.004
ARIAD PHARMACEUTICALS, INC.	0.0	0.7	0.7	0.000	0.764	0.764
ARQULE, INC.	14.0	21.0	35.0	0.057	0.001	0.058
ASAP LEAD PAINT INSPECTIONS	0.0	0.0	0.0	0.000	0.000	0.000
ASPEN SQUARE MANAGEMENT	0.0	0.0	0.0	0.000	0.000	0.000
ASTRAZENECA PHARMACEUTICALS LP	58.8	0.0	58.8	0.001	0.000	0.001
ASTRAZENECA PHARMACEUTICALS LP	0.0	34.1	34.1	0.000	0.004	0.004
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	16.3	16.3	0.000	0.000	0.000
AVANT IMMUNOTHERAPUTICS, INC.	0.0	10.0	10.0	0.000	0.001	0.001

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
AVENTIS 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	50.0	50.0	0.000	0.001	0.001
BAYER HEALTHCARE LLC	0.0	0.7	0.7	0.000	0.000	0.000
BAYSTATE HEALTH SYSTEMS, INC.	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
BECTON DICKINSON AND COMPANY	0.0	7.5	7.5	0.000	0.006	0.006
BERKSHIRE MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
BETH ISRAEL DEACON.MED CENTER	136.0	24.8	160.8	0.047	0.042	0.089
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
BIOGEN, INC.	105.0	0.0	105.0	0.011	0.000	0.011
BIOMEASURE, INC.	4.0	0.0	4.0	0.000	0.000	0.000
BIOMEDICAL TECHNOLOGIES, INC.	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.	18.7	0.0	18.7	0.005	0.000	0.005
BOSTON CHILD. LEAD POISON PRE.	0.0	0.0	0.0	0.000	0.000	0.000
BOSTON COLLEGE	22.5	87.5	110.0	0.016	0.091	0.107
BOSTON HEART FOUNDATION AND	0.0	0.0	0.0	0.000	0.000	0.000
BOSTON UNIV. CHARLES RIVER CAM	10.8	90.7	101.5	0.000	0.019	0.019
BOSTON UNIVERSITY MED CTR HOSP	166.0	669.0	835.0	0.120	0.145	0.265
BRANDEIS UNIVERSITY	75.0	97.5	172.5	0.018	0.500	0.518
BRIDGEWATER GODDARD PARK MED	0.0	0.0	0.0	0.000	0.000	0.000
BRIDGEWATER STATE 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
BRIGHAM & WOMEN'S HOSPITAL	0.0	48.0	48.0	0.000	0.069	0.069
BRISTOL-MYERS SQUIBB MED. IMG.	2,160.4	161.0	2,321.4	1.610	0.477	2.090
BROCKTON BOARD OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
BROCKTON CARDIOLOGY ASSOCIATE	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, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CAMBREX BIO SCIENCE MA, INC.	45.0	7.5	52.5	0.016	0.002	0.019
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
CAPITAL CARDIOLOGY ASSOC.,P.C	0.0	0.0	0.0	0.000	0.000	0.000
CARDINAL HEALTH 414, INC.	0.0	1.0	1.0	0.000	0.010	0.010
CARDINAL HEALTH 420, LLC	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	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 CT.	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 SOUTHWOOD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
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
CBR INSTITUTE FOR BIOMED. RESEARCH, INC.	0.0	64.7	64.7	0.000	0.220	0.220
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

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
CHARLES RIVER LABORATORIES,INC	866.0	34.0	900.0	0.042	0.001	0.043
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
CHARLTON MEMORIAL HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
CHARM SCIENCES INC.	64.6	0.5	65.1	0.014	0.002	0.016
CHEM SHARED SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CHEMGENOMICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
CHEMIC LABORATORIES, INC.	0.0	8.0	8.0	0.000	0.005	0.005
CHILDREN'S HOSPITAL, THE	45.0	41.3	86.2	0.038	0.247	0.285
CIANO, DIANE C.	0.0	0.0	0.0	0.000	0.000	0.000
CIS-US, INC.	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
CLINOMICS LABORATORIES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
COASTAL ENGINEERING CO., INC.	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.	0.0	0.0	0.0	0.000	0.000	0.000
COMMUNICATIONS & POWER INDUST.	7.5	0.0	7.5	0.008	0.000	0.008
CONAM INSPECTION	0.0	0.0	0.0	0.000	0.000	0.000
COOLEY DICKINSON HOSPITAL, INC	0.0	6.0	6.0	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
CRITICAL THERAPEUTICS, INC,	0.0	0.0	0.0	0.000	0.000	0.000
CUBIST PHARMACEUTICALS, INC.	86.0	8.0	94.0	0.016	0.001	0.018
CURIS, INCORPORATED	38.5	15.0	53.5	0.014	0.005	0.019

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
CYCLIS PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
DANA-FARBER CANCER INSTITUTE	696.0	637.0	1,333.0	2.600	1.800	4.400
DAVID & SON LEAD INSPECTIONS	0.0	0.0	0.0	0.000	0.000	0.000
DELTA AIR LINES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
DENTCH, EDWARD R.	0.0	0.0	0.0	0.000	0.000	0.000
DIGIRAD IMAGING SOLUTIONS, IN	0.0	0.0	0.0	0.000	0.000	0.000
DIGITAL SCINTIGRAPHICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
DISCOVERY LABWARE, INC.	52.5	5.0	57.5	0.001	0.000	0.002
DIVERSIFIED ENVIRONMENTAL CORP	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
DYAX CORP./PROTEIN ENGINEERING	0.0	0.0	0.0	0.000	0.000	0.000
E.T. & L. CONSTRUCTION CORP.	0.0	0.0	0.0	0.000	0.000	0.000
EASTERN NAZARENE COLLEGE	0.0	0.0	0.0	0.000	0.000	0.000
EGS GAUGING INCORPORATED	4.1	0.0	4.1	1.982	0.000	1.982
EISAI RESEARCH INSTITUTE	27.0	7.5	34.5	0.013	0.001	0.014
ELECTRONIC CONCEPTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ELIXIR PHARMACEUTICALS, INC.	0.0	4.0	4.0	0.000	0.005	0.005
EMCON	0.0	0.0	0.0	0.000	0.000	0.000
EMD LEXIGEN RESEARCH CENTER CORPORATION	0.0	20.9	20.9	0.000	0.003	0.003
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	0.2	0.4	0.6	0.001	0.000	0.001
ENSR INTERNATIONAL	0.0	0.0	0.0	0.000	0.000	0.000
ENTERGY NUCLEAR GENERATING COMPANY	8,814.6	27,358.2	36,172.8	104.000	4,490.081	4,594.081
ENVIRONMENTAL AND LEAD PT INSP	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

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
ENVIRONMENTAL LEAD DETECTION, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ENVIRONMENTAL STRATEG.&MANAGE	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
ENZYME CENTER (THE)	0.0	0.0	0.0	0.000	0.000	0.000
EPIC THERAPEUTICS, INC.	0.0	56.3	56.3	0.000	0.000	0.000
EPIX MEDICAL, INC.	131.6	0.0	131.6	0.009	0.000	0.009
ERM	0.0	0.0	0.0	0.000	0.000	0.000
ESSENTIAL THERAPEUTICS	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
EXALPHA BIOLOGICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
EYETECH PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
F. H. PETERSON MACHINE CORP.	0.0	0.0	0.0	0.000	0.000	0.000
F.J. STORCH BUILDING INSP. SER	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
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	0.0	35.0	35.0	0.000	0.008	0.008
FRAMATOME ANP DE&S	121.1	67.0	188.1	0.010	0.010	0.020
FRANKLIN ANALYTICAL SERVICES	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
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
GALEOTA ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GANNETT FLEMING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GE ION TRACK	0.0	3.0	3.0	0.000	0.150	0.150
GEI CONSULTANTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GELTEX PHARMACEUTICALS, INC.	111.7	19.2	131.0	0.012	0.009	0.022
GEM ENVIRONMENTAL	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
GENETICA, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GENETICS INSTITUTE, LLC	397.5	593.0	990.5	0.125	0.409	0.534
GENETIX PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GENOME THERAPEUTICS CORP.	7.5	7.5	15.0	0.092	0.029	0.121
GENPATH PHARMACEUTICALS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GENVEC, INC.	0.0	28.1	28.1	0.000	0.012	0.012
GENZYME BIOSURGERY	0.0	0.0	0.0	0.000	0.000	0.000
GENZYME CORPORATION	510.0	150.0	660.0	0.000	0.300	0.300
GEODESIGN, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GEORGE, DAVID R.	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 COMPANY, THE	0.0	30.5	30.5	0.000	0.010	0.010

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
GMP GENETICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
GOLDMAN ENVIRONMENTAL CONSULT.	0.0	0.0	0.0	0.000	0.000	0.000
GPC BIOTEC, INCORPORATED	66.6	23.9	90.5	0.060	0.085	0.145
GRANGER-LYNCH CORPORATION	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.	0.0	0.0	0.0	0.000	0.000	0.000
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
HARRINGTON MEMORIAL HOSPITAL	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	2,132.7	0.0	2,132.7	3.521	0.000	3.521
HAWTHORN MEDICAL ASSOCIATES	0.0	0.0	0.0	0.000	0.000	0.000
HEALTHALLIANCE HOSPITALS, INC.	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	7.5	7.5	0.000	0.500	0.500
HEYWOOD HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
HOLY FAMILY HOSP. & MED. CTR	0.0	0.0	0.0	0.000	0.000	0.000
HOLYOKE HOSPITAL, INC.	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
HORNE, DAVID C.	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
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
HYBRIDON, INC.	4.1	2.0	6.1	0.001	0.000	0.001
HYGIENETICS ENVIRON. SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
IDENIX (MASSACHUSETTS) INC.	34.8	7.5	42.3	0.014	0.001	0.015
IEL SERVICE, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ILEX ONCOLOGY 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.	0.0	0.0	0.0	0.000	0.000	0.000
IMPERIAL INSPECTION SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
IMPLANT SCIENCES CORP.	0.0	4.0	4.0	0.000	0.024	0.024
INDUSTRIAL NUCLEAR COMPANY,INC	0.0	0.0	0.0	0.000	0.000	0.000
INFINITY PHARMACEUTICALS, INC	0.0	4.0	4.0	0.000	0.000	0.000
INNOV-X SYSTEMS	0.0	0.0	0.0	0.000	0.000	0.000
INOTEK CORP.	26.4	0.0	26.4	0.001	0.000	0.001
INTERLEUKIN GENETICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
INTERNAL MEDICINE & CARDIOLOG	0.0	0.0	0.0	0.000	0.000	0.000
ITI QUALITEK, INC.	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
JAWORSKI GEOTECH, 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
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
JOSLIN DIABETES CENTER, INC.	60.0	0.0	60.0	0.029	0.000	0.029

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
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	0.0	0.0	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	0.0	0.0	0.0	0.000	0.000	0.000
LAWRENCE PUMPS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
LEAD PAINT TESTING CO., THE	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
LENOX INSTITUTE OF WATER TECH.	0.0	0.0	0.0	0.000	0.000	0.000
LESSARD ENVIRONMENTAL, INC.	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
LITTLETON LIGHT & WATER DEPT.	4.1	0.0	4.1	0.200	0.000	0.200
LOCKHEED MART. SYSTEMS SUPPORT	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
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
MACLARY, RICHARD	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	12.6	12.6	0.000	0.010	0.010
MARCHI, KIRBY D.	0.0	0.0	0.0	0.000	0.000	0.000
MARINE BIOLOGICAL LABORATORY	0.0	8.5	8.5	0.000	0.010	0.010
MASS. -AMHERST, UNIV. OF	0.0	135.0	135.0	0.000	0.159	0.159
MASS. -BOSTON, UNIVERSITY OF	0.0	0.7	0.7	0.000	0.010	0.010

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
MASS. -DARTMOUTH, UNIV. OF	0.0	3.0	3.0	0.000	0.001	0.001
MASS. -LOWELL, UNIVERSITY OF	0.0	7.0	7.0	0.000	0.002	0.002
MASS. BIOMEDICAL INITIATIVES	1.4	0.0	1.4	0.000	0.000	0.000
MASS. COLLEGE OF PHARMACY-	0.0	0.0	0.0	0.000	0.000	0.000
MASS. DEPT OF PUBLIC HEALTH	0.0	3.0	3.0	0.000	0.010	0.010
MASS. DEPT. ENVIRONMENTAL PROT	0.0	0.0	0.0	0.000	0.000	0.000
MASS. DEPT. OF LABOR & WORKFORCE DEV.	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. EMERGENCY MGT. AGENC	0.0	0.0	0.0	0.000	0.000	0.000
MASS. EYE & EAR INFIRMARY	75.2	0.0	75.2	0.018	0.000	0.018
MASS. GENERAL HOSPITAL	315.0	64.0	379.0	0.031	0.009	0.040
MASS. HIGHWAY DEPARTMENT	0.0	0.0	0.0	0.000	0.000	0.000
MASS. INSTITUTE OF TECHNOLOGY	40.0	0.0	40.0	0.079	0.000	0.079
MASSACHUSETTS MOBILE PET, P.C.	0.0	0.0	0.0	0.000	0.000	0.000
MATRITECH, INCORPORATED	0.0	0.0	0.0	0.000	0.000	0.000
MEDI-PHYSICS, INC., DBA AMERSHAM HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
MERCURY THERAPEUTICS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
MERCY HOSPITAL, INC., THE	0.0	3.0	3.0	0.000	0.001	0.001
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
METABOLIX, INC.	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
MICROBIA, INC.	8.8	0.0	8.8	0.006	0.000	0.006
MICROCHIPS, INC.	71.2	2.5	73.6	0.001	0.000	0.001
MILFORD WHITINSVILLE HOSPITAL	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**
MILLENNIUM PHARMACEUTICALS	517.5	487.5	1,005.0	0.495	0.072	0.566
MILLER ENGINEERING & TEST 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	0.0	1.0	1.0	0.000	0.000	0.000
MILLIPORE CORPORATION	0.0	51.4	51.4	0.000	0.008	0.008
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
MOLECULAR INSIGHT PHARMACEUTICALS, INC.	30.0	0.0	30.0	0.002	0.000	0.002
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	7.5	3.0	10.5	0.003	0.001	0.004
MUSEUM OF FINE ARTS (BOSTON)	0.0	0.0	0.0	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
NEOGENESIS PHARMACEUTICALS,INC	30.1	0.0	30.1	0.007	0.000	0.007
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	1.0	1.0	0.000	0.000	0.000
NEW ENG. P.E.T.NET DIST.CENTER, LLC	0.0	0.1	0.1	0.000	0.400	0.400
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.	21.5	7.5	29.0	0.090	0.033	0.123
NEW ENGLAND CARDIOLOGY, LLC	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
NEW ENGLAND MEDICAL SPECIALIS	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
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
NEWTON HOUSING REHAB./CITY OF	0.0	0.0	0.0	0.000	0.000	0.000
NITON CORPORATION	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 CARDIO. ASSOC	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 A.	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE LEAD PAINT TEST CO	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE MEDICAL CENTER	0.0	0.0	0.0	0.000	0.000	0.000
NORTH SHORE MEDICAL CENTER-UNI	0.0	0.0	0.0	0.000	0.000	0.000
NORTHEAST GENERATION SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
NORTHEASTERN UNIVERSITY	100.3	8.0	108.3	0.009	0.000	0.009
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
NUCLEAR INSTRUMENT CO.	0.0	0.0	0.0	0.000	0.000	0.000
NUVELO	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
ORGANOGENESIS, INC.	75.0	15.0	90.0	0.027	0.000	0.028
OST SERVICES LLC	0.0	0.0	0.0	0.000	0.000	0.000
OXFORD INSTRUM. AMERICA, INC.	0.0	1.0	1.0	0.000	0.054	0.054
PALMER PAVING CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
PANAMETRICS, 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
PANTHER ENVIRONMENTAL	0.0	0.0	0.0	0.000	0.000	0.000
PARATEK PHARMACEUTICALS, INC.	0.0	9.9	9.9	0.000	0.001	0.001
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
PENNONI ASSOCIATES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PERKINELMER LIFE SCIENCES, INC	4,308.2	385.5	4,693.7	733.300	153.120	886.420
PERKINELMER OPTOELECTRONICS	0.0	1.5	1.5	0.000	0.026	0.026
PFIZER, INC.	0.0	75.0	75.0	0.000	0.102	0.102
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
PHYLOS, INC.	277.5	30.0	307.5	0.285	0.115	0.400
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
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
POLYGENYX, INC.	0.0	0.0	0.0	0.000	0.000	0.000
PRAECIS PHARMACEUTICALS, INC.	105.0	15.0	120.0	0.032	0.005	0.037
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
PROTZE CONSULTING ENGINEERS	0.0	0.0	0.0	0.000	0.000	0.000
Q-ONE BIOTECH, INC.	2.1	1.0	3.2	0.896	0.680	1.576
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

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	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
R.J. INSPECTIONS	0.0	0.0	0.0	0.000	0.000	0.000
RADIATION MONITORING DEVICES	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 CORP.	0.0	0.0	0.0	0.000	0.000	0.000
RAYTHEON COMPANY	0.0	5.5	5.5	0.000	0.001	0.001
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	7.5	7.5	0.000	0.001	0.001
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
ROADS CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
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
SCHEPENS EYE RESEARCH INST.	28.8	0.0	28.8	0.020	0.000	0.020
SEA CONSULTANTS	0.0	0.0	0.0	0.000	0.000	0.000
SEQUEGEN, COMPANY	0.0	0.0	0.0	0.000	0.000	0.000
SERONO REPRODUCT.BIOLOGY INST.	0.0	75.0	75.0	0.000	0.040	0.040
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

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
SHIELDS IMAGING OF MASS., LLC	0.0	0.0	0.0	0.000	0.000	0.000
SIEMENS MEDICAL SYSTEMS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
SIMMONS COLLEGE	11.6	6.5	18.1	0.003	0.002	0.005
SIONEX CORPORATION	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	2.7	2.7	0.000	0.004	0.004
SMITHSONIAN INSTITUTE	0.0	0.0	0.0	0.000	0.000	0.000
SOLID STATE TESTING, INC.	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 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
SOUTHPORT INC.	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
SPIRE CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
SPRINGBORN SMITHERS LAB., INC.	151.4	7.5	158.9	0.001	0.000	0.001
SPRINGFIELD HOUSING AUTHORITY	0.0	0.0	0.0	0.000	0.000	0.000
SPRINGFIELD WATER & SEWER COMM	0.0	0.0	0.0	0.000	0.000	0.000
SPRUCE ENVIRONMENTAL TECH.	0.0	0.0	0.0	0.000	0.000	0.000
ST. ANNE'S HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
ST. ELIZABETH'S MEDICAL CENTER	0.0	70.0	70.0	0.000	0.101	0.101
ST. LUKE'S HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
STARMET NMI	0.0	150.0	150.0	0.000	0.100	0.100
STERIS-ISOMEDIX SERVICES	0.0	0.0	0.0	0.000	0.000	0.000
STONE & WEBSTER, Inc.	0.0	0.0	0.0	0.000	0.000	0.000
STOWE WOODWARD, LLC	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

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
SUFFOLK UNIVERSITY	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
SUNTORY PHARMA. RESEARCH LAB.	0.0	1.0	1.0	0.000	0.000	0.000
SURFACE LOGIX, INC.	0.0	4.0	4.0	0.000	0.002	0.002
SYNTA PHARMACEUTICAS CORPORATION	0.0	10.0	10.0	0.000	0.006	0.006
SYNTONIX PHARMACEUTICALS, INC.	36.5	9.4	45.9	0.043	0.015	0.059
T.R. WILBURY LABORATORIES, INC	0.0	0.0	0.0	0.000	0.000	0.000
TECTONIC ENGINEERING CONSULTANS	0.0	0.0	0.0	0.000	0.000	0.000
TEI BIOSCIENCES, 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	0.0	7.5	7.5	0.000	0.006	0.006
THERMO ENVIRONMENTAL INSTRUM.	1.0	0.0	1.0	0.200	0.000	0.200
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
TIAX LLC	0.2	0.0	0.2	0.001	0.000	0.001
TOBEY HOSPITAL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TOLAN, RICHARD E.	0.0	0.0	0.0	0.000	0.000	0.000
TOLERRX, INC.	7.3	0.0	7.3	0.006	0.000	0.006
TOXICON CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
TRANSKARYOTIC THERAPIES, INC.	15.0	0.0	15.0	5.000	0.000	5.000
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
TRC ENVIRONMENTAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
TUFTS UNIVERSITY	0.0	3.0	3.0	0.000	0.010	0.010
TUFTS UNIVERSITY, SCH. OF MED.	96.0	42.0	138.0	0.022	0.004	0.026
TUFTS-NEW ENGLAND MEDICAL CENTER	84.0	40.0	124.0	0.013	0.006	0.019

Facility Name	VOLUME (cu. ft.)			ACTIVITY (curies)		
	Transferred	In Storage	Total	Transferred	In Storage	Total
TW ENVIRONMENTAL SERVICES, INC.	0.0	0.0	0.0	0.000	0.000	0.000
TYCO ELECTRONIC PRODUCT GROUP	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.	0.1	0.0	0.1	0.004	0.001	0.005
UMASS MEMORIAL/MARLBOROUGH HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
UMASS/MEMORIAL CLINICAL SYSTEMS	109.1	0.5	109.6	0.999	20.000	20.999
UNITECH SERVICES GROUP, INC.	18.7	7.6	26.3	0.049	0.019	0.068
UNIVERSAL METAL CORPORATION	0.0	0.0	0.0	0.000	0.000	0.000
USGEN NEW ENGLAND, INC.	0.0	0.0	0.0	0.000	0.000	0.000
USGEN NEW ENGLAND, INC.	0.0	0.0	0.0	0.000	0.000	0.000
UTS OF MASSACHUSETTS, INC.	0.0	0.0	0.0	0.000	0.000	0.000
V.I. TECHNOLOGIES, INC.	7.5	0.0	7.5	0.273	0.000	0.273
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
VENEGAS INDUSTRIAL TESTING LAB	0.0	0.0	0.0	0.000	0.000	0.000
VERTEX PHARMACEUTICALS, INC.	56.5	9.5	66.0	0.010	0.001	0.010
VIACELL, INC.	0.0	0.0	0.0	0.000	0.000	0.000
VICAM	0.0	15.0	15.0	0.000	0.006	0.006
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
WALTHAM HOSPITAL	0.0	0.0	0.0	0.000	0.000	0.000
WAMPANOAG TRIBE OF AQUINNAH	0.0	0.0	0.0	0.000	0.000	0.000
WARATAH PHARMACEUTICALS, INC.	8.9	0.0	8.9	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	3.0	3.0	0.000	0.000	0.000
WESTON & SAMPSON ENGINEERS, I	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
WHEATON COLLEGE	31.9	0.0	31.9	0.005	0.000	0.005
WHITEHEAD INST. FOR BIOMED RES	0.0	52.5	52.5	0.000	0.005	0.005
WILLIAMS COLLEGE	0.0	2.0	2.0	0.000	0.000	0.000
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 INST.	210.2	45.0	255.2	0.200	0.010	0.210
WORCESTER DEPT. OF HEALTH	0.0	0.0	0.0	0.000	0.000	0.000
WORCESTER POLYTECHNIC INST.	3.0	10.0	13.0	0.012	0.000	0.012
WORCESTER, PUBLIC WORKS	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	6,828.5	0.0	6,828.5	19.240	0.000	19.240
YANKEE ENG. & TESTING, INC.	0.0	0.0	0.0	0.000	0.000	0.000
ZYCOS, INC.	0.0	0.5	0.5	0.000	0.005	0.005
GRAND TOTALS:	**30,920.7**	**32,746.4**	**63,667.2**	**876.614**	**4,723.342**	**5,599.958**

Figure 29
Commonwealth of Massachusetts
DPH Radiation Control Program
Calendar Year (CY) 2002 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 2002, did you generate any long-lived **(half-life greater than 120 days)** radioactive waste?		
In 2002, 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 12/31/02?		

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
174 Portland Street, 5th Floor
Boston, MA 02114-1714

Please return this survey by June 16, 2003

License # __ __ - __ __ __ __

Commonwealth of Massachusetts DPH Radiation Control Program
CY 2002 Radioactive Waste Survey

Part Two : Waste Generation, Storage and Disposal Information

Section A : Radioactive Waste Generated in Calendar Year 2002

Class A (other than HVLA*)	Transferred for Disposal in CY 2002	In Storage as of 12/31/02	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

Class B (other than HVLA*)	Transferred for Disposal in CY 2002	In Storage as of 12/31/02	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

Class C (other than HVLA*)	Transferred for Disposal in CY 2002	In Storage as of 12/31/02	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

High Volume, Low Activity Waste	Transferred for Disposal in CY 2002	In Storage as of 12/31/02	Total
Volume, ft3			
Activity, curies			
Principal Isotopes			

License # __ __ - __ __ __ __

Commonwealth of Massachusetts DPH Radiation Control Program
CY 2002 Radioactive Waste Survey

Part Two : Waste Generation, Storage and Disposal Information

Section B : Radioactive Waste Generated Prior to Calendar Year 2002
That Requires Disposal AND Was Not Reported on Previous Surveys

	Transferred for Disposal in CY 2002	In Storage as of 12/31/02	Total
Years 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.

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) 727-6214.