

U.S. EPA Toxics Release Inventory 2006 Public Data Release

Key Findings

U.S. EPA TRI Program

The United States (U.S.) Environmental Protection Agency (EPA) Toxics Release Inventory (TRI) program collects information on disposal or other releases (and other waste management activities) for over 650 chemicals from industrial sources in all 50 states and the U.S. territories. The information has been collected annually since 1987. For 2006, the latest year for which data are available, disposal or other releases of TRI chemicals totaled almost 4.25 billion pounds from 22,880 U.S. facilities submitting approximately 87,900 chemical forms.

The 2006 TRI data are now available online in a searchable, sortable format at <http://www.epa.gov/triexplorer>. We invite you to visit our web site and explore the data to learn more about toxic chemical releases and waste management activities across the U.S. by state, county or even zip code – and more! Summary tables are also available in a separate document as part of this 2006 Public Data Release. Please read *Background on TRI Data* prior to reviewing these key findings, as that document explains the kinds of data collected under TRI and helps with data analysis and interpretation. The following information reflects the TRI data as of February 2008.

Time Period for the TRI 2006 Public Data Release

The time period covered for this year's data release is January 1 to December 31, 2006. These 2006 data were reported to EPA by July 1, 2007, and were released to the public in February 2008. Data for previous years back to 1988 are also available.

Changes to Reporting Requirements for 2006 Data

There were two changes to reporting requirements for the 2006 data. First, facilities were required to submit appropriate 2002 North American Industry Classification System (NAICS) designations for their facility rather than the 1987 Standard Industrial Classification (SIC) codes previously used (71 Federal Register 32464 June 6, 2006, see <http://www.epa.gov/tri/tridata/naics>). To do trends analysis, EPA assigned NAICS codes to prior years' data. The assignments were done based on the NAICS code reported by the facility for 2006 or, if not available, the SIC code was translated to the NAICS code, where possible.

EPA also expanded Form A eligibility in a rule promulgated on December 18, 2006 (see www.epa.gov/tri/tridata/modrule/phase2/forma.htm). This rule expanded Form A eligibility for

non-PBT chemicals and allows, for the first time, Form A eligibility for PBT chemicals. For 2006, EPA received 12,365 Form A submissions. For 2005, EPA received 10,930 Form A submissions.

Methodology for TRI Analysis

EPA takes the data submitted by facilities, conducts extensive quality assurance reviews and compiles the data into two databases:

- Total Disposal or other Releases, and
- Production-related Waste Managed

Total disposal or other releases addresses the amount of chemicals disposed of or released on-site and off-site during the year and is based on the definition of release in Section 329 of the Emergency Planning and Community Right-to-Know Act (EPCRA). “Disposal or other releases” represent a wide range of management methods, from highly controlled disposal, such as in hazardous waste RCRA landfills, to uncontrolled releases due to accidental leaks or spills. Generally, when EPA analyzes the data on total disposal or other releases, the focus is on final disposition or release of TRI chemicals. The data used in such analyses come from Sections 5 and 6 of the TRI Reporting Form R¹. *Such analyses do not include amounts that are reported as transferred to other TRI facilities.* Receiving TRI facilities report these amounts as on-site disposal or other releases. EPA only counts the on-site disposal or other release to avoid double counting the amount disposed of or released during the year.

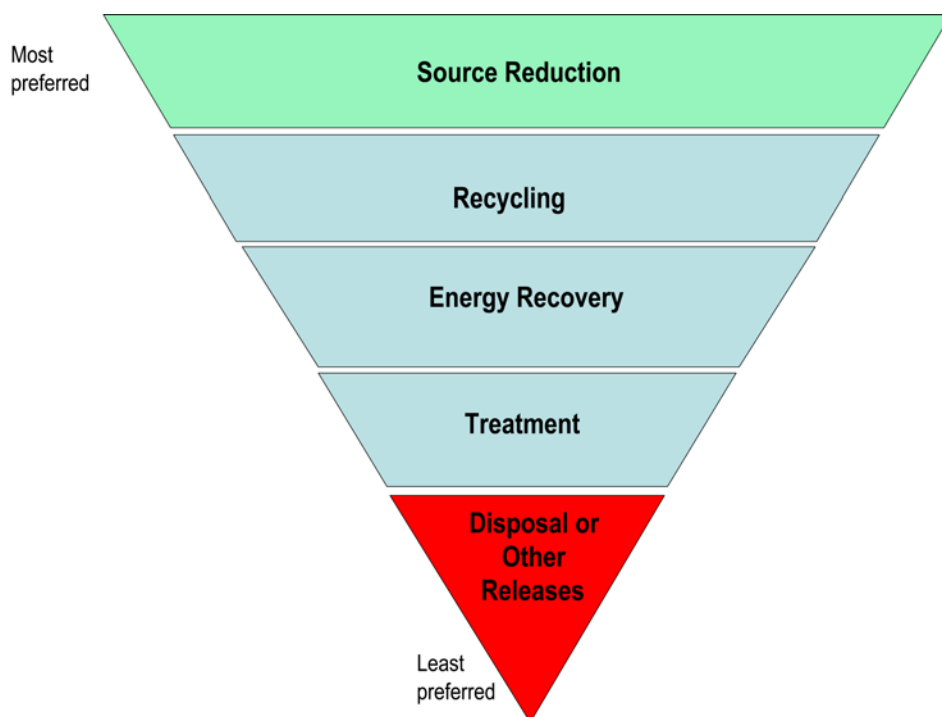
Production-related waste managed addresses the entire amount of waste generated during a year and how it was managed and allows tracking of progress in reducing waste generation and moving towards preferred methods of waste management. The Pollution Prevention Act of 1990 (PPA) requires facilities to report information about the quantities of TRI chemicals they manage in waste, both on-and off-site, including amounts reported as recycled, burned for energy recovery, treated or disposed of or otherwise released. These data show how toxic chemicals in waste were managed by a facility to approximate the quantity amenable to pollution prevention as illustrated by the waste management hierarchy (Figure 1).

The waste management hierarchy shows that source reduction (i.e., preventing the creation of waste) is the preferred approach, followed by recycling. Waste that cannot be prevented or recycled can be used for energy recovery or treated. Disposal or other releases is the least preferred.

Generally, when EPA conducts analysis of TRI chemicals in production-related waste managed, the focus is on the management of waste, and materials may be counted multiple times. For example, if they are recycled multiple times, they are counted each time they are recycled. In a different example, a waste containing a TRI chemical is sent off-site for recycling and then the recycling residue is treated prior to disposal. In this example, the volume of chemical may be counted each time it is managed, including the volume sent off-site, the volume recycled, the volume treated and the volume disposed of. Data used in this analysis come from Section 8 of the TRI Reporting Form R.

¹ TRI reporting Form R can be viewed at <http://www.epa.gov/tri/report/index.htm#forms>

Figure 1. Waste Management Hierarchy

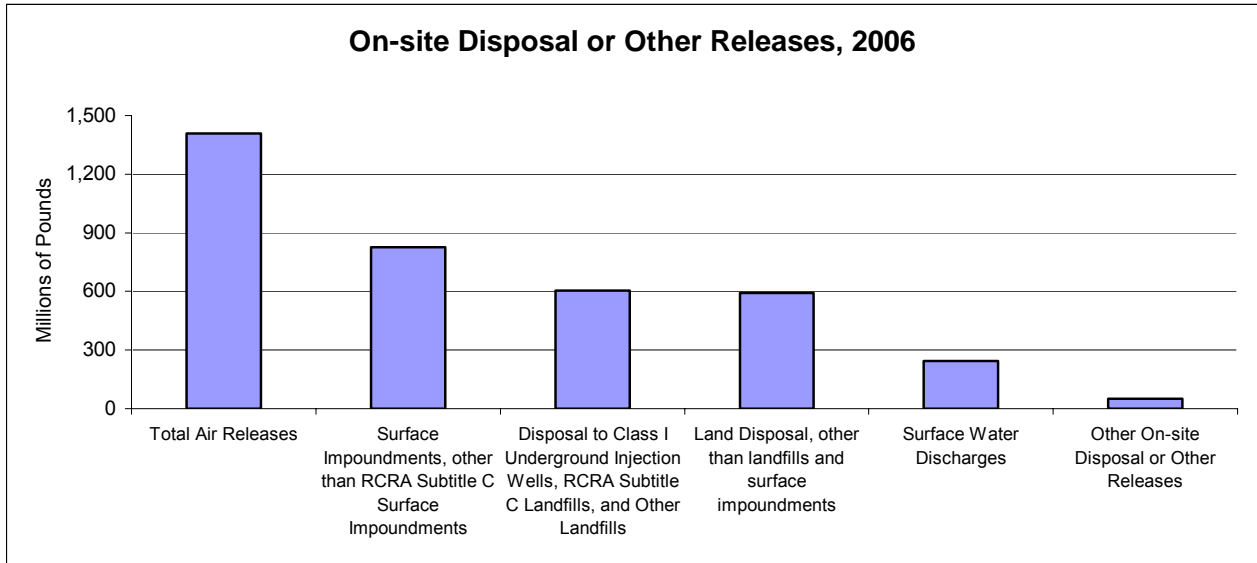


Overview of the TRI 2006 Data

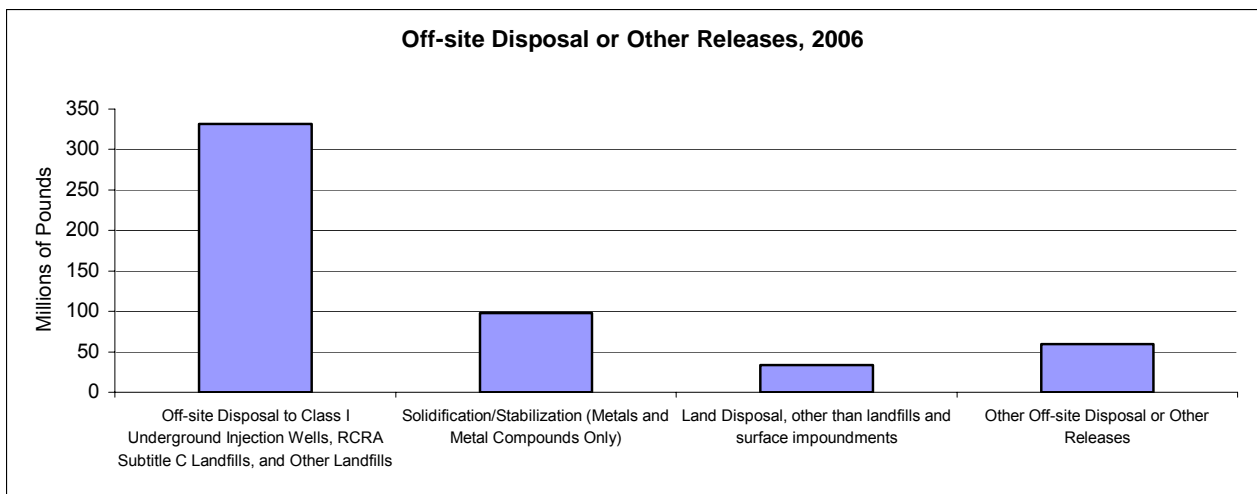
What was the total reported for disposal or other releases for 2006?

Almost 4.25 billion pounds were disposed of or otherwise released in 2006 by facilities that are required to report to EPA under EPCRA section 313. Most of the chemicals are managed on-site.

- 88% (3.73 billion pounds) was disposed of or otherwise released **on-site**, including
 - ▶ 33% (1.41 billion pounds) of air emissions
 - ▶ 19% (827 million pounds) in surface impoundments other than hazardous waste RCRA Subtitle C surface impoundments
 - ▶ 14% (606 million pounds) in Class I underground injection wells, RCRA Subtitle C (hazardous waste) landfills and other landfills
 - ▶ 14% (591 million pounds) of other land disposal, (such as waste piles, spills or leaks)
 - ▶ Surface water discharges (6%), land treatment (0.6%), Class II-V underground injection wells (0.5%), and RCRA Subtitle C surface impoundments (0.1%) make up the remaining 7%.



- 12% (523 million pounds) was sent **off-site** for disposal or other releases, including
 - ▶ 8% (332 million pounds) to Class I underground injection wells, RCRA Subtitle C landfills and other landfills
 - ▶ 2% (98 million pounds) of metals sent for solidification and/or stabilization
 - ▶ 0.8% (34 million pounds) sent for other land disposal (other than landfills and surface impoundments, such as waste piles),
 - ▶ with the remaining 1.4% disposed of or released in other ways (such as land treatment, storage, surface impoundments and wastewater treatment).

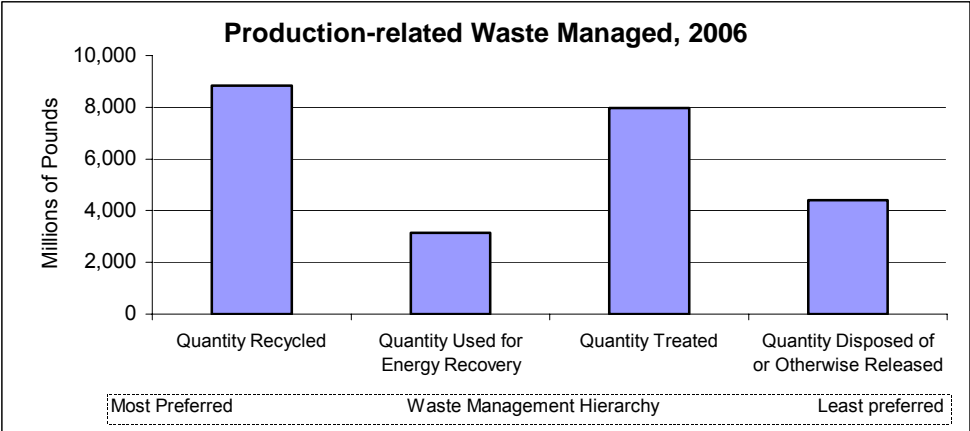


As noted above, 14% of total disposal or other releases were in on-site Class I wells, RCRA Subtitle C and other landfills and 8% were in off-site Class I wells, RCRA Subtitle C and other landfills. These facilities may limit contamination and human exposure by using engineering controls. For example, disposal of harmful materials in Class I Underground Injection wells located in isolated formations beneath the lowermost underground source of drinking water limits potential for contamination. Similarly, disposal to landfills that are designed with liners, covers, leak detection systems, and groundwater monitoring systems also limits the potential for human exposure and contamination.

How much total production-related waste was managed during 2006?

Total production-related waste managed was 24.4 billion pounds in 2006:

- 36% (8.84 billion pounds) was recycled on- and off-site.
- 33% (7.97 billion pounds) was treated on- and off-site.
- 18% (4.40 billion pounds) was the quantity disposed of or otherwise released on- and off-site.
- 13% (3.15 billion pounds) was combusted for energy recovery on- and off-site.



***Total Production-related Waste Management**, which includes the quantity disposed of or otherwise released, focuses on waste management and, includes counting a waste as many times as it is managed during the year. On the other hand, total disposal or other releases focuses on the ultimate disposition of a chemical. In analyses of total disposal or other releases, chemicals are counted only once rather than each time they are managed. For example, a waste that is managed by facility A by being sent to facility B for disposal may be reported by both facilities. In another example, waste that is recycled several times is counted each time to calculate the total quantity recycled during the year. Also, total disposal or other releases may include amounts reported as non-production-related waste managed (i.e., waste due to remedial, catastrophic and one-time events).*

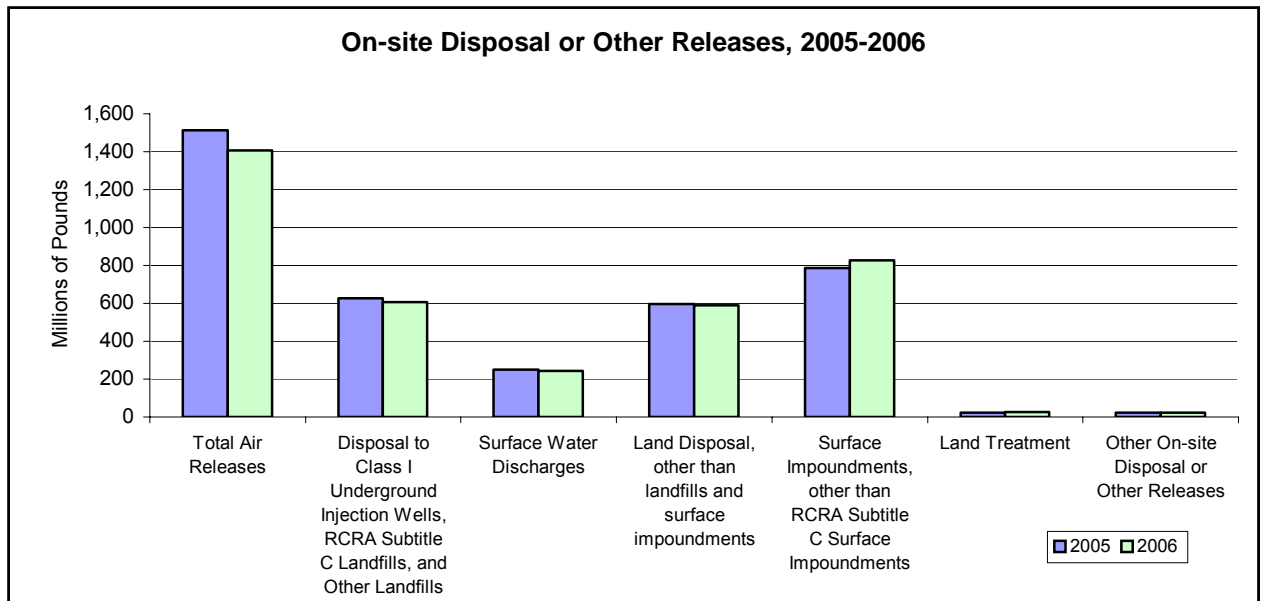
The numbers may also be different due to the differences in reporting requirements for Section 5 and 6 and Section 8 of the TRI Reporting Form R.

How do the 2006 TRI data compare to the 2005 TRI data?

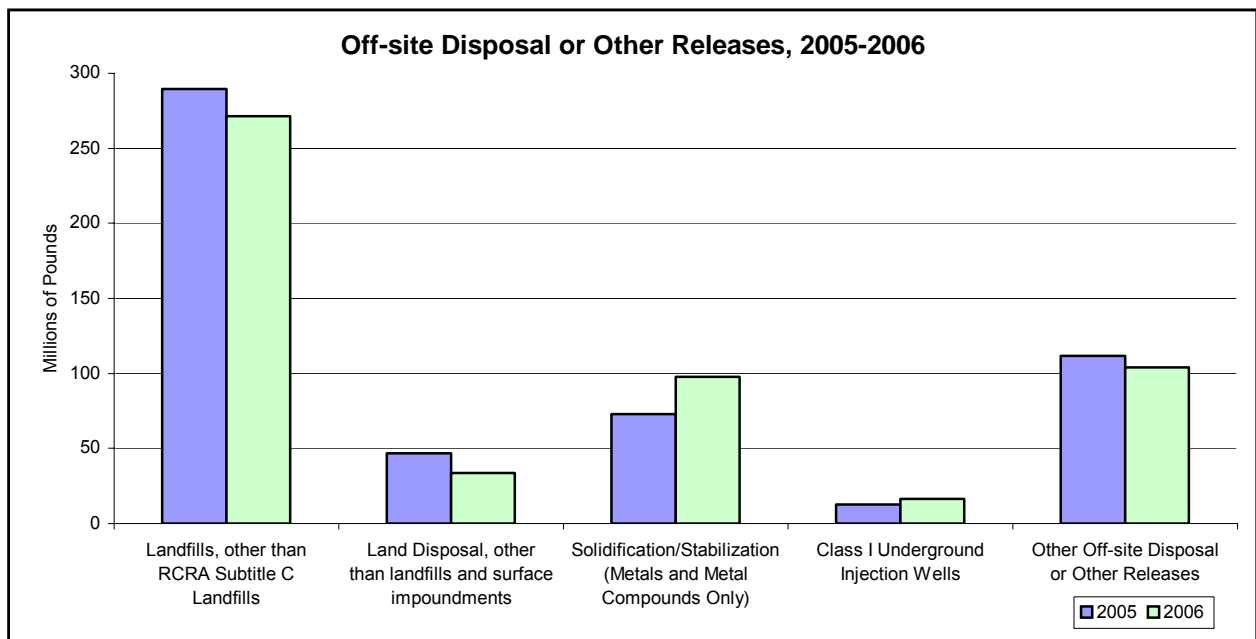
In this section, we present both net changes from 2005 to 2006, and underlying shifts in management methods.

Overall, when compared to quantities reported for the previous year (2005), total disposal or other releases of TRI chemicals showed a **decrease** of 2% (105 million pounds).

- On-site disposal or other releases **decreased** by 2% (95 million pounds).
 - ▶ Air emissions **decreased** by 7% (104 million pounds)
 - ▶ Class I underground injection wells, RCRA Subtitle C (hazardous waste) landfills and other landfills **decreased** by 3% (20 million pounds)
 - ▶ Surface water discharges **decreased** by 3% (7 million pounds),
 - ▶ Land disposal other than landfills and surface impoundments (such as waste piles, spills and leaks) **decreased** by 1% (6 million pounds),
 - ▶ However, surface impoundments other than RCRA Subtitle C surface impoundments **increased** by 5% (40 million pounds), and
 - ▶ Land treatment **increased** by 13% (3 million pounds).



- Off-site disposal or other releases **decreased** by 2% (10 million pounds).
 - ▶ Landfills other than RCRA Subtitle C landfills **decreased** by 6% (18 million pounds), and
 - ▶ Land disposal other than landfills and surface impoundments (such as waste piles, spills and leaks) **decreased** by 27% (13 million pounds).
 - ▶ However, solidification/stabilization of metals and metal compounds **increased** by 35% (25 million pounds),
 - ▶ Underground injection in Class I wells **increased** by 29% (4 million pounds).

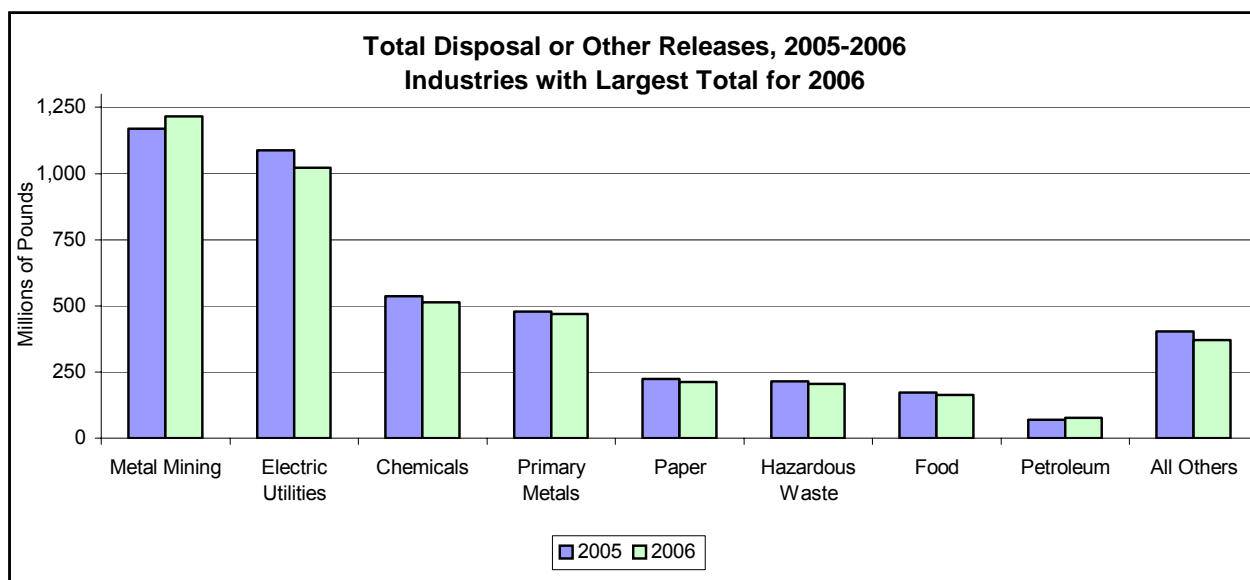


Which industry sectors reported the largest decreases in disposal or other releases, 2005-2006?

- Electric utilities reported the second largest total disposal or other releases in 2006 (1.02 billion pounds), and the largest **decrease** from 2005: 65 million pounds (6%).
- The chemical manufacturing sector reported 514 million pounds in 2006, a **decrease** of 22 million pounds (4%) from 2005.
- The paper sector reported 212 million pounds in 2006, a **decrease** of 12 million pounds (5%) from 2005.

Which industry sectors reported the largest increases in disposal or other releases, 2005-2006?

- The metal mining sector reported the largest total disposal or other releases in 2006 (1.22 billion pounds) and the largest **increase** in disposal or other releases from 2005: 47 million pounds (4%).
- The petroleum sector reported 76 million pounds in 2006, an **increase** of 6 million pounds (8%) from 2005.



How did total production-related waste managed change from 2005 to 2006?

There was a shift in how TRI chemicals were managed from 2005 to 2006.

Total production-related waste **decreased** by 2% (417 million pounds) from 2005 to 2006. This included an overall **decrease** in the quantity disposed of or otherwise released of 1% (65 million pounds) and **decreases** in some other types of waste managed.



- Treatment on-site and off-site **decreased** by 7% (642 million pounds).
- Energy recovery off-site **decreased** by 10% (61 million pounds).
- However, recycling on-site and off-site **increased** by 2% (156 million pounds) and
- Energy recovery on-site **increased** by 8% (195 million pounds).

Which types of facilities had the largest disposal or other releases in 2006?

As part of the annual PDR, EPA has historically provided a list of facilities that have the largest disposal or other releases of TRI chemicals to the environment. It is important to note that these facilities do not necessarily pose the greatest potential risk to the environment. As explained in detail in the EPA report, *Factors to Consider When Using TRI Data* (available at www.epa.gov/tri/tridata), total quantities of TRI chemicals released or otherwise disposed of is one important factor among several that determine the potential risk that may be posed.

EPA presents the “Top 50” facilities with largest disposal or other releases in charts that are available on this web site (www.epa.gov/tri/tridata/tri06/index.htm). It is important to note that there is a huge variation in the amounts of TRI chemicals released per facility. In 2006, the range of TRI disposal or other releases is from 0 to 615 million pounds. The average disposal or other releases of TRI chemicals per facility is approximately 191,228 pounds. The reason some facilities have disposal or other releases far in excess of the average are several:

- Certain industry sectors, such as mining and primary metals, and electric utilities, handle large volumes of material and, not surprisingly, the totals for TRI chemicals are also larger than average. Also, from year-to-year constituent concentrations in raw materials can change.
- Even within a given sector, certain facilities are simply larger (in terms of economic parameters such as production levels, sales, employment, etc.) and so they handle relatively large amounts of input material to produce large amounts of output material (product).
- Facilities differ in their relative efficiency in handling material, i.e., for a given unit of output, facilities differ in the amount of release or waste that is produced.

Facilities with the largest disposal or other releases are mining facilities. The top 4 facilities, which each had over 56 million pounds of total on and off-site disposal or other releases, are mining operations. Other facilities in the Top 50 represent a variety of industries, including hazardous waste management facilities, chemical manufacturers, primary metals facilities, and electric utilities. These top facilities reported disposal-or-other-release totals ranging from 12 million to 53 million pounds for 2006. Note that an increase in the amount of toxic chemicals managed at hazardous waste sites can represent a generally positive environmental trend because these facilities are in the business of managing hazardous waste and do so under strict controls.

EPA also presents facility rankings taking into account the management methods used for the TRI chemicals. In addition to presenting the Top 50 facilities with largest total on- and off-site disposal or other releases, we also present the Top 50 facilities with total disposal or other releases, subtracting out the totals that are managed in Class I underground injection wells, Subtitle C landfills, and other landfills. This second group of rankings is perhaps a better, although still imperfect, indication of the amount of TRI chemicals that may be available to the environment. In this second group of rankings, a limited number of facilities that manage TRI chemicals mostly or totally in Class I wells or landfills drop down in the rankings, or drop out of the Top 50 altogether. (The top 4 mining facilities mentioned above remain the top 4 in these rankings, however.)

Finally, for similar reasons, EPA has provided two sets of rankings (top 20) of US counties with the largest releases. One set of rankings shows total disposal or other releases, and the second shows total disposal or other releases, adjusted to subtract out quantities in Class I wells and landfills. As with facilities, the very top (in this case 7) counties do not change, but there is some shifting in the next 13 to reflect that some counties are home to Class I wells or landfills, and when those totals are not counted, they are no longer among the counties with the most TRI chemical releases.

Generally, national total and trends tend to reflect reporting by facilities with the largest total disposal or other releases but may not necessarily reflect state and local totals and trends. Over the longer term, 2001-2006, total disposal or other releases decreased by 24%. However, an analysis of facilities reporting in both 2001 and 2006 found that the total disposal or other releases for group of “smaller reporting” facilities (those reporting less than 100,000 pounds and representing over 85% of TRI facilities) **increased** while the total for the group of facilities reporting larger amounts **decreased**.

Federal Facilities

All federal facilities, whether operated by federal agencies or contractors (e.g. some military bases), that meet the chemical thresholds are required to report to EPA’s TRI Program.

- For 2006, 306 federal facilities reported 106 million pounds of total on- and off-site disposal or other releases and 255 million pounds of total production-related waste managed.
- Disposal or other releases by federal facilities **decreased** by almost 624,000 pounds (1%) from 2005 to 2006.
- Total production-related waste managed at federal facilities **increased** by 15 million pounds (6%) from 2005 to 2006. On-site treatment increased by 16 million pounds and on-

site recycling increased by 5.5 million pounds, while off-site recycling decreased by 7.0 million pounds.

What are some of the reasons for the decrease in disposal or other releases from 2005 to 2006?

The Tennessee Valley Authority utilities, which reported almost two-thirds of the total disposal or other releases from federal facilities for 2006 showed a decrease in total disposal or other releases of 6 million pounds (8%) from 2005 to 2006.

2006 Chemical Snapshots

PERSISTENT BIOACCUMULATIVE TOXIC (PBT) CHEMICALS

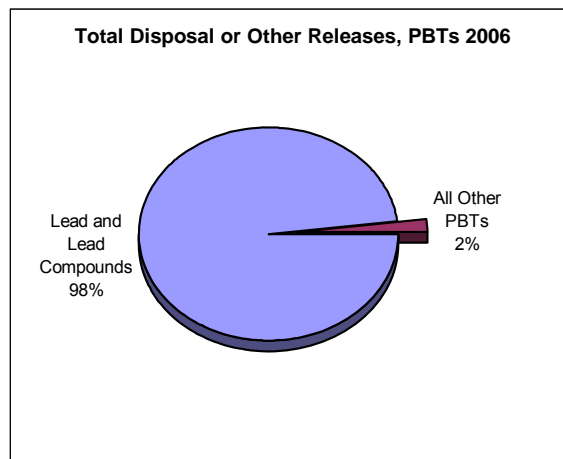
Since 2000 TRI includes data, at reduced reporting thresholds, on PBT chemicals such as dioxins, mercury, and polychlorinated biphenyls (PCBs). TRI includes data for lead and lead compounds at reduced thresholds since 2001.

Why is there particular concern for PBT chemicals?

PBT chemicals are of particular concern not only because they are toxic, but also because they remain in the environment for long periods of time and are not readily destroyed (they persist) and build up or accumulate in body tissues (they bioaccumulate).

What were the top PBT chemicals disposed of or otherwise released for 2006?

- 98% (446 million pounds) of total disposal or other releases of PBT chemicals in 2006 was accounted for by lead and lead compounds.
- Disposal or other releases of other PBT chemicals in 2006 included:
 - ▶ 5.1 million pounds of mercury and mercury compounds,
 - ▶ 1.5 million pounds of polycyclic aromatic compounds (PACs), and
 - ▶ 1.5 million pounds of polychlorinated biphenyls (PCBs).
- 130,277 **grams** (approximately 287 pounds) of total disposal or other releases of PBT chemicals in 2006 were accounted for by dioxin and dioxin-like compounds.



What was the total PBT disposal or other releases for 2006?

Total disposal or other releases of PBT chemicals reported was 455 million pounds in 2006.

- 94% (427 million pounds) were disposed of or otherwise released **on-site**, including
 - ▶ 51% (230 million pounds) in other land disposal, other than landfills and surface impoundments (such as waste piles).
 - ▶ 35% (161 million pounds) in on-site surface impoundments other than RCRA Subtitle C surface impoundments.
 - ▶ 6% (27 million pounds) to Class I wells, RCRA Subtitle C landfills and other landfills.
- 6% (28 million pounds) were disposed of or otherwise released **off-site**.
 - ▶ 3% (15 million pounds) of **off-site** disposal or other releases were to Class I wells, RCRA Subtitle C landfills and other landfills.
 - ▶ 2% (9 million pounds) were metals sent off-site for solidification/stabilization.

How do the 2006 PBT data compare to the 2005 PBT data?

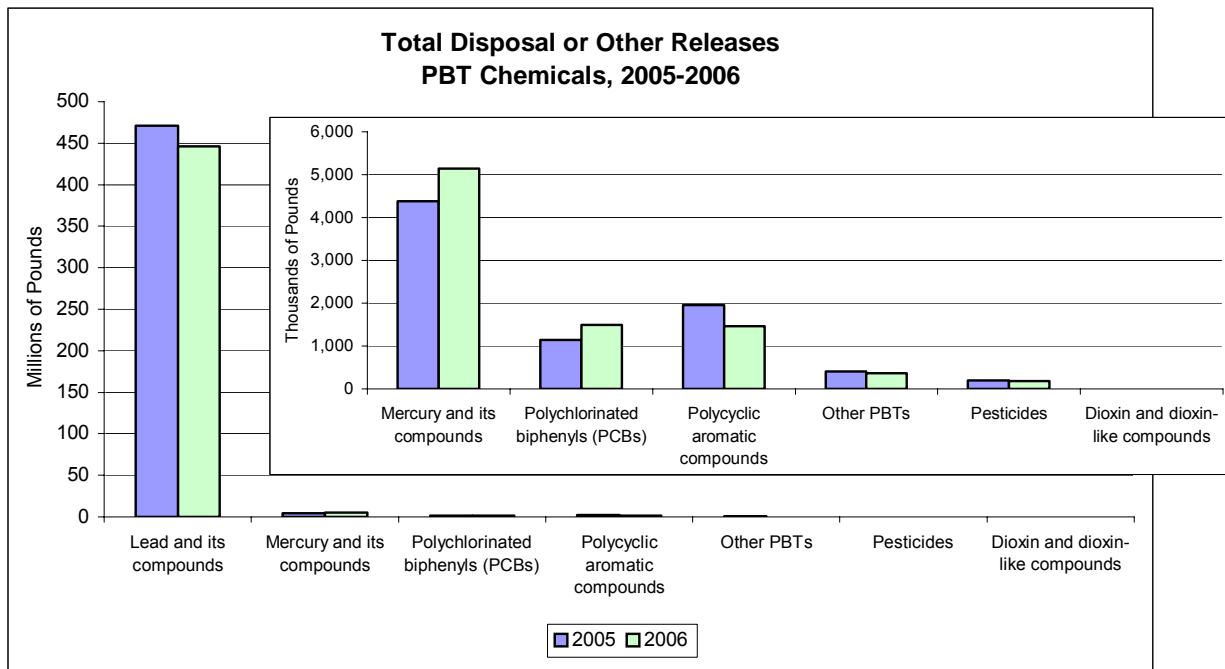
Overall, when compared to quantities reported for the previous year (2005), total disposal or other releases of persistent bioaccumulative and toxic (PBT) chemicals **decreased** by 24 million pounds or 5% from 2005 to 2006.

- Lead and lead compounds **decreased** by 25 million pounds (5%) and
- Polycyclic aromatic compounds **decreased** by almost 487,000 pounds (25%).
- However, Mercury and mercury compounds **increased** by over 755,000 pounds (17%) and
- Polychlorinated biphenyls (PCBs) **increased** by over 360,000 pounds (32%).

On- and off-site disposal or other releases of PBT chemicals in RCRA Subtitle C landfills, other landfills and Class I underground injection wells totaled 42 million pounds in 2006 (9% of total disposal or other releases). They **decreased** by 7 million pounds (15%) from 2005 to 2006.

- On-site RCRA Subtitle C landfills **decreased** by over 335,000 pounds (2%)
- Other on-site landfills **decreased** by 5.5 million pounds (35%)
- Off-site RCRA Subtitle C landfills **increased** by almost 319,000 pounds (13%)
- Other off-site landfills **decreased** by 1.6 million pounds (12%)

Air releases of PBT chemicals **decreased** by over 75,000 pounds (4%).



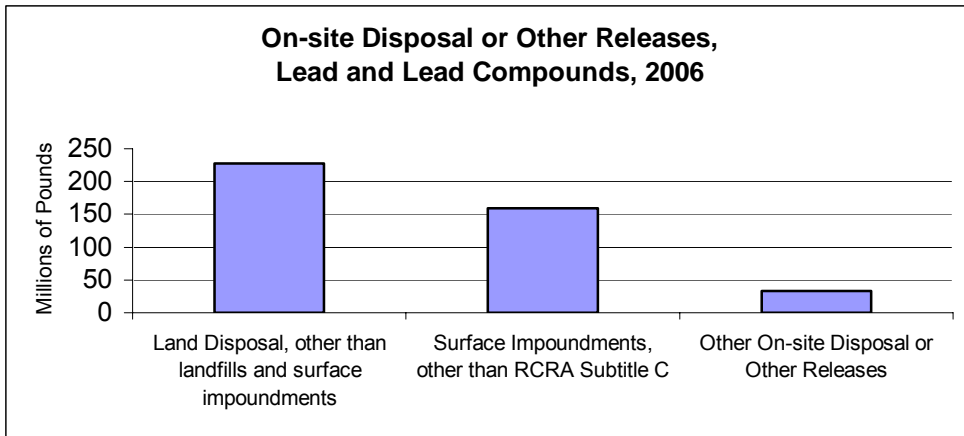
LEAD AND LEAD COMPOUNDS

The reporting threshold for lead (except for lead contained in steel, brass or bronze alloys) and lead compounds was lowered to 100 pounds beginning with 2001.

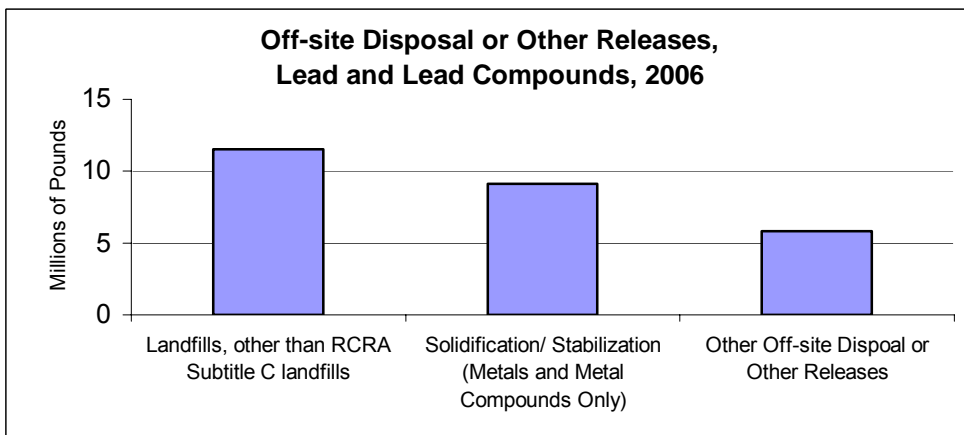
What was the total reported disposal or other releases of lead and lead compounds for 2006?

Total disposal or other releases of lead and lead compounds was 446 million pounds for 2006.

- 94% (420 million pounds) was disposed of or otherwise released **on-site**, including:
 - ▶ 51% (227 million pounds) of land disposal other than landfills and surface impoundments (such as waste piles, spills or leaks);
 - ▶ 36% (159 million pounds) to surface impoundments, other than RCRA Subtitle C surface impoundments; and
 - ▶ 0.2% (over 1.0 million pounds) of air emissions.



- 6% (27 million pounds) were **off-site** disposal or other releases, including
 - ▶ 3% (12 million pounds) to landfills other than RCRA subtitle C landfills
 - ▶ 2% (9 million pounds) of metals sent to solidification/stabilization.

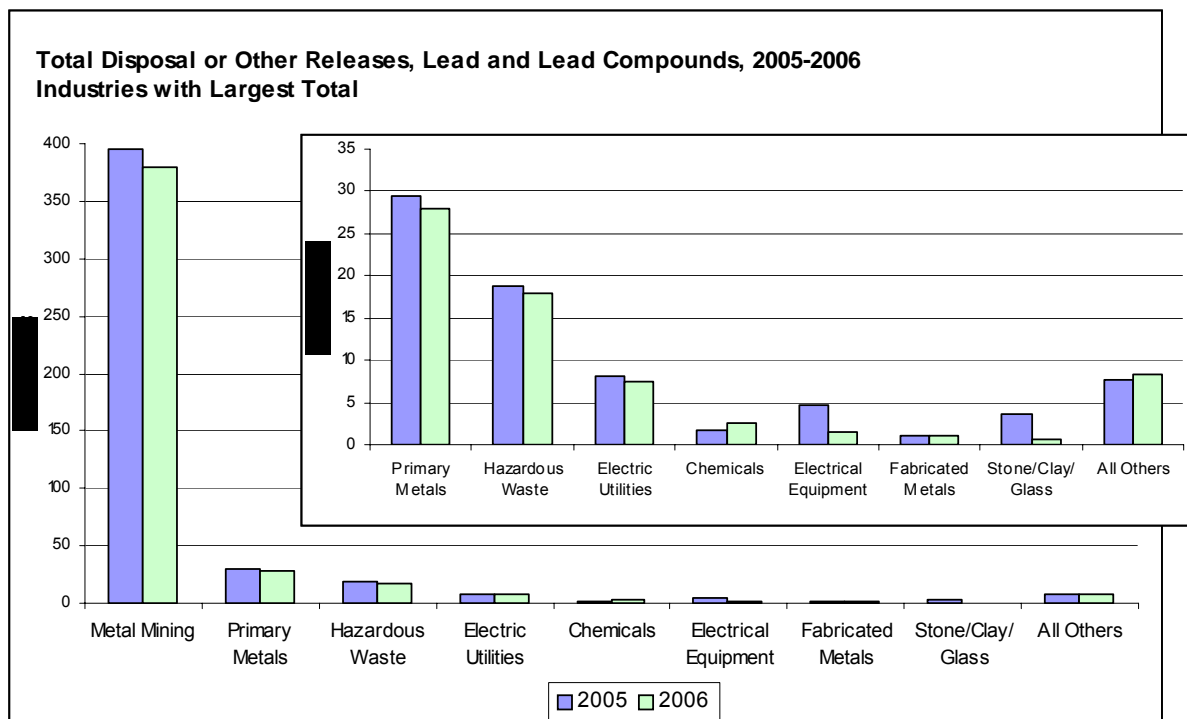


How do the 2006 data compare to 2005 data for lead and lead compounds?

From **2005 to 2006** disposal or other releases for lead and lead compounds **decreased** by 25 million pounds or 5%, although air releases **increased** by almost 31,000 pounds (3%).

- The metal mining sector accounted for 84% (379 million pounds) of the total disposal or other releases in 2006. The mining sector had a **decrease** of 4% (17 million pounds) from 2005 to 2006.
- Without the metal mining sector, total on- and off-site disposal or other releases of lead and lead compounds **decreased** by 10% (7.7 million pounds) from 2005 to 2006, including.
 - ▶ **Decrease** of 70% (3.3 million pounds) from electrical equipment sector
 - ▶ **Decrease** of 83% (3.0 million pounds) from stone/clay/glass, and
 - ▶ **Decrease** of 5% (1.4 million pounds) from primary metals.

- ▶ Chemical manufacturing sector had an **increase** of about 790,000 pounds (45%) from 2005 to 2006.



On- and off-site disposal or other releases of lead and lead compounds in RCRA Subtitle C landfills, other landfills and Class I underground injection wells totaled 39 million pounds in 2006 (9% of total disposal or other releases for lead and lead compounds), a **decrease** of 7 million pounds (16%) from 2005 to 2006.

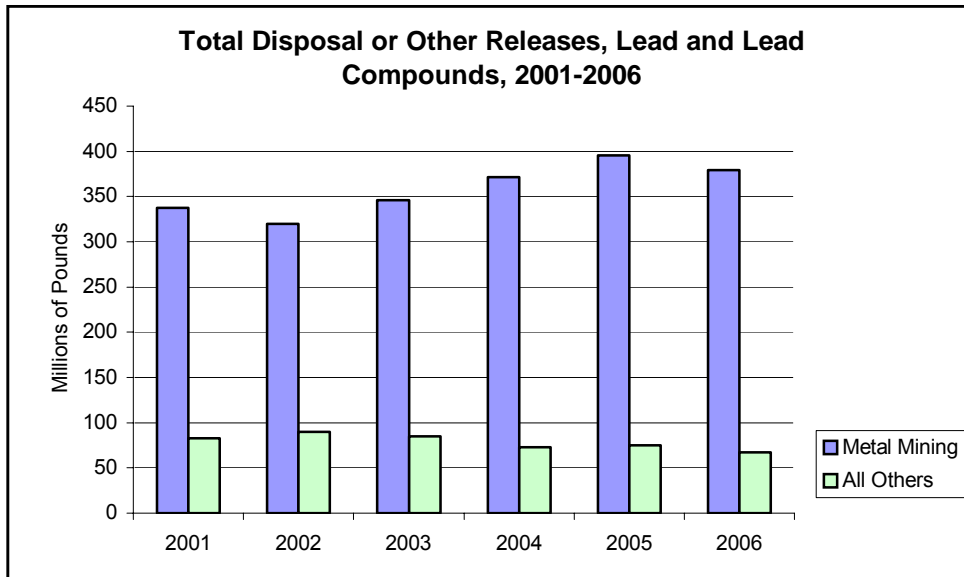
- On-site RCRA Subtitle C landfills **decreased** by over 386,000 pounds (3%)
- Other on-site landfills **decreased** by 5.5 million pounds (35%)
- Other off-site landfills **decreased** by 1.5 million pounds (12%)
- Class I wells on-site **decreased** by over 92,000 pounds (25%)
- Off-site Class I wells decreased by over 49,000 pounds (54%).
- However, off-site RCRA Subtitle C landfills **increased** by over 377,000 pounds (20%).

How do the 2006 data compare to 2001 (first year of reporting under the lowered threshold) data for lead and lead compounds?

From **2001 to 2006**, lead and lead compounds disposal or other releases **increased** by 26 million pounds or 6%.

- The metal mining sector had an **increase** of 41 million pounds (12%) from 2001 to 2006.
- Without the metal mining sector total disposal or other releases of lead and lead compounds **decreased** by 16 million pounds (19%) from 2001 to 2006.
- Other sectors reported **decreases**, including:
 - ▶ Primary metals facilities, with a **decrease** of 7.2 million pounds (20%) from 2001 to 2006; and

- ▶ Hazardous waste management facilities, with a **decrease** of 6.3 million pounds (26%) from 2001 to 2006.



How much lead and lead compounds in total production-related waste was managed in 2006?

For 2006, total production-related waste managed for lead and lead compounds was 1.12 billion pounds. Almost two-thirds of the lead waste was recycled.

- 60% (670 million pounds) was recycled on- and off-site.
 - ▶ 163 million pounds was recycled on-site by primary metals facilities
 - ▶ 148 million pounds was recycled off-site and an additional 164 million pounds was recycled on-site by electrical equipment manufacturers.
- 40% (453 million pounds) was the quantity of lead and lead compounds managed by disposal or other releases.
 - ▶ Metal mining, 379 million pounds
 - ▶ Primary metals facilities, 34 million pounds
 - ▶ Hazardous waste management facilities, 19 million pounds.

Why is the quantity disposed of or otherwise released here (453 million pounds) different from total disposal or other releases above (446 million pounds)?

When looking at total production-related waste, the quantity disposed of or otherwise released includes all reported disposal or other releases except those due to remedial, catastrophic or one-time releases. For lead and lead compounds, this was 1.8 million pounds for 2006. On the other hand, total disposal or other releases, discussed above, excludes amounts that were sent to other TRI facilities and reported as disposed or otherwise released (to avoid double-counting). That amount was 7.8 million pounds for 2006.

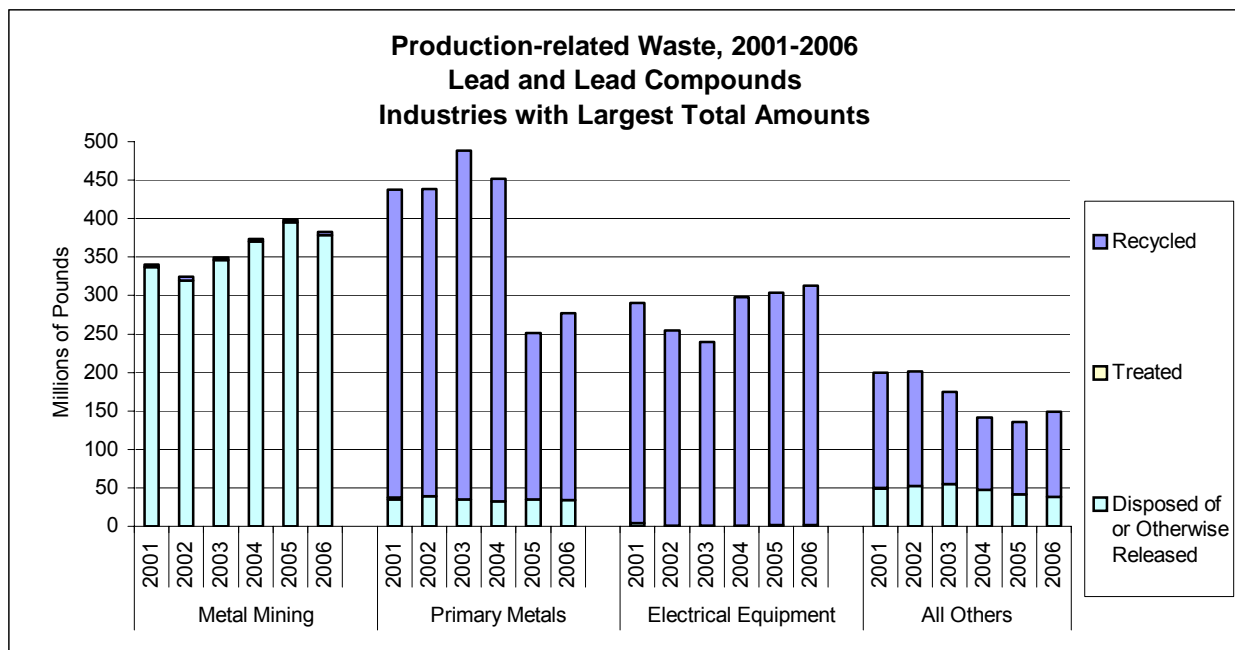
How do 2006 data on production-related waste managed compare to 2005 and to 2001 for lead and lead compounds?

Total production-related waste managed for lead and lead compounds **increased** by 3% (33 million pounds) from 2005 to 2006 and had an overall **decrease** of 11% (145 million pounds) from 2001 to 2006.

- Recycling **increased** by 9% from 2005 to 2006 and **decreased** by 20% from 2001 to 2006.
- Quantity disposed of or otherwise released **decreased** by 4% from 2005 to 2006 but **increased** by 6% from 2001 to 2006.

Of the industry sectors reporting the largest amounts of lead and lead compounds in production-related waste managed:

- The metal mining sector reported a **decrease** of 4% from 2005 to 2006 but an **increase** of 12% from 2001 to 2006.
- Primary metals reported an **increase** of 10% from 2005-2006 but a **decrease** of 37% from 2001-2006.
- Electrical equipment reported an **increase** of 3% from 2005-2006 and 8% from 2001-2006.



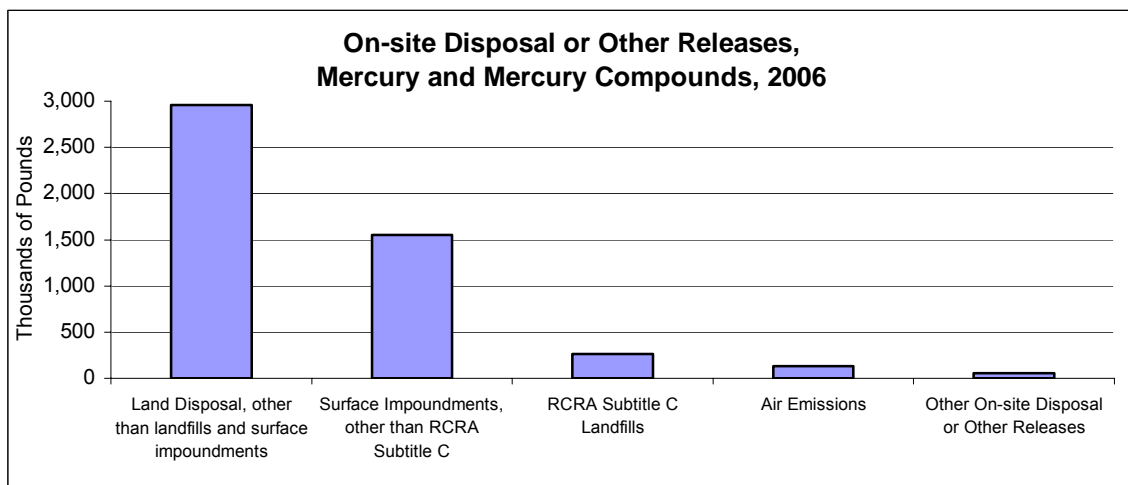
MERCURY AND MERCURY COMPOUNDS

The reporting threshold for mercury and mercury compounds was lowered to 10 pounds beginning with reporting year 2000.

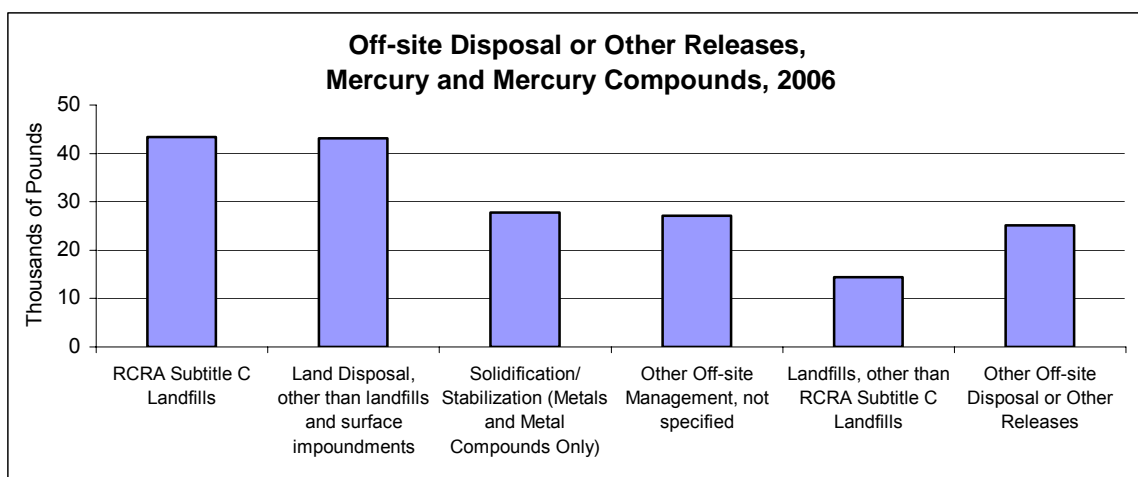
What was the total mercury and mercury compounds disposal or other releases for 2006?

Total disposal or other releases of mercury and mercury compounds was 5.1 million pounds in 2006.

- 96% (5.0 million pounds) was **on-site** disposal or other releases, including
 - ▶ 58% (3.0 million pounds) was land disposal other than landfills and surface impoundments (such as waste piles, spills or leaks)
 - ▶ 30% (1.6 million pounds) was surface impoundments, other than RCRA Subtitle C surface impoundments
 - ▶ 5% (almost 263,000 pounds) of RCRA Subtitle C landfills
 - ▶ 3% (almost 135,000 pounds) of air emissions



- Two metal mining facilities accounted for 71% (3.6 million pounds) of the total on- and off-site disposal or other releases of mercury and mercury compounds for 2006.
 - ▶ These facilities reported disposal or other releases mainly to on-site land disposal other than landfills (such as waste piles) and to surface impoundments, other than RCRA Subtitle C surface impoundments.
- 4% (180,996 pounds) were **off-site** disposal or other releases.
 - ▶ 1% (43,400 pounds) went to RCRA Subtitle C landfills
 - ▶ 1% (43,179 pounds) went to land disposal, other than landfills and surface impoundments
 - ▶ 0.5% (27,732 pounds) were metals sent for stabilization/solidification
 - ▶ 0.5% (27,160 pounds) were other off-site management, not specified, and
 - ▶ 0.3% (14,434 pounds) went to landfills, other than RCRA Subtitle C landfills.



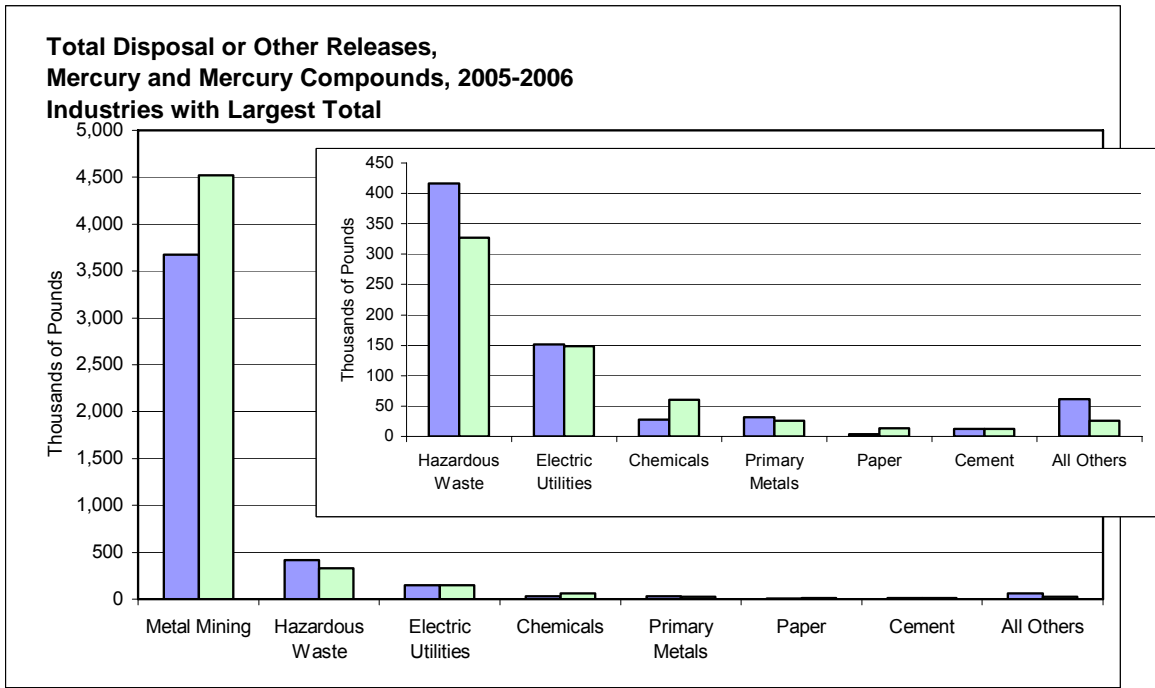
Which industry sectors reported the largest disposal or other releases of mercury and mercury compounds in 2006?

- The metal mining industry reported the largest disposal or other releases of mercury and mercury compounds (88% or 4.5 million pounds of the total mercury and mercury compounds disposal or other releases).
- Electric utilities reported the largest air emissions of any industry sector, with 69% (93,267 pounds) of all air emissions of mercury and mercury compounds.
- Hazardous waste/solvent recovery facilities reported the largest off-site disposal or other releases (off-site transfers to disposal) of mercury and mercury compounds with 35% (63,027 pounds) of all off-site disposal or other releases.

How do the 2006 data compare to data for 2005 for mercury and mercury compounds?

From **2005 to 2006**, total disposal or other releases for mercury and mercury compounds **increased** by 17% (over 755,000 pounds).

- However, without the two largest metal mining facilities, total on- and off-site disposal **decreased** 0.4% (over 6,500 pounds).
- Total on-site disposal or other releases **increased** by 18% (almost 749,000 pounds), including
 - ▶ An **increase** of over 491,000 pounds (20%) in other land disposal, other than landfills and surface impoundments (waste piles, spills and leaks), and almost 327,000 pounds (27%) in surface impoundments, other than RCRA Subtitle C surface impoundments.
 - ▶ However, without the two largest metal mining facilities, on-site disposal or other releases **decreased** 1% (over 13,000 pounds).
 - ▶ On-site air emissions **decreased** by 5,871 pounds (4%).
- Total off-site disposal or other releases **increased** by 4% (6,479 pounds).



Air emissions of mercury and mercury compounds.
Electric utilities reported 69% of all air emissions of mercury and mercury compounds in 2006. Air emissions from electric utilities decreased by over 3% (3,100 pounds) from 96,411 pounds in 2005 to 93,267 pounds in 2006.

On- and off-site disposal or other releases of mercury and mercury compounds in RCRA Subtitle C landfills, other landfills and Class I underground injection wells totaled over 362,000 pounds in 2006 (7% of total disposal or other releases of mercury and mercury compounds). They **decreased** by almost 71,000 pounds (16%) from 2005 to 2006.

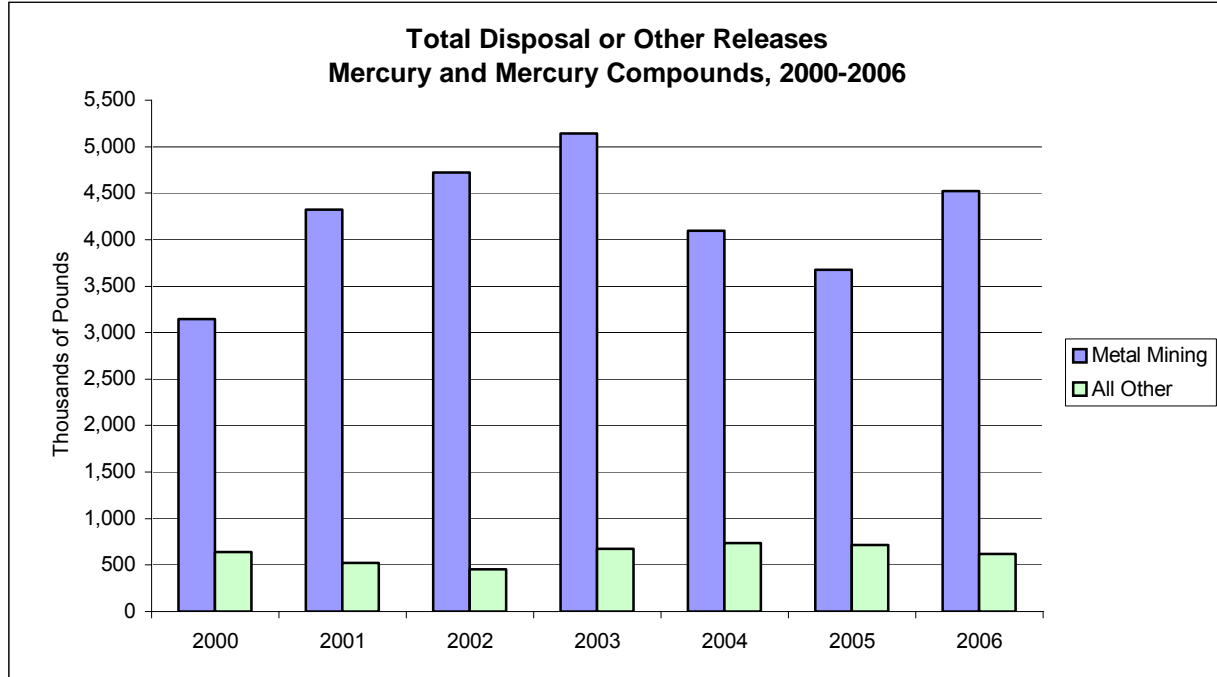
- On-site RCRA Subtitle C landfills **decreased** by almost 66,000 pounds (20%).
- However, off-site RCRA Subtitle C landfills **increased** by almost 1,000 pounds (2%)

How do the 2006 data compare with the 2000 (the first year of reporting under the lowered threshold) data for mercury and mercury compounds?

From **2000 to 2006**, disposal or other releases for mercury and mercury compounds **increased** by 37% (1.4 million pounds).

- Total on-site disposal or other releases **increased** by 43% (1.5 million pounds)
- Total off-site disposal or other releases **decreased** by 37% (over 106,000 pounds)
- Two metal mining facilities reported a combined **increase** of 1.5 million pounds from 2000 to 2006.
 - ▶ Without reporting by these two facilities, disposal or other releases of mercury and mercury compounds **decreased** by 7% (almost 109,000 pounds) from 2000 to 2006.

- ▶ On-site air emissions of mercury and mercury compounds **decreased** by over 26,000 pounds (16%) from 2000 to 2006.



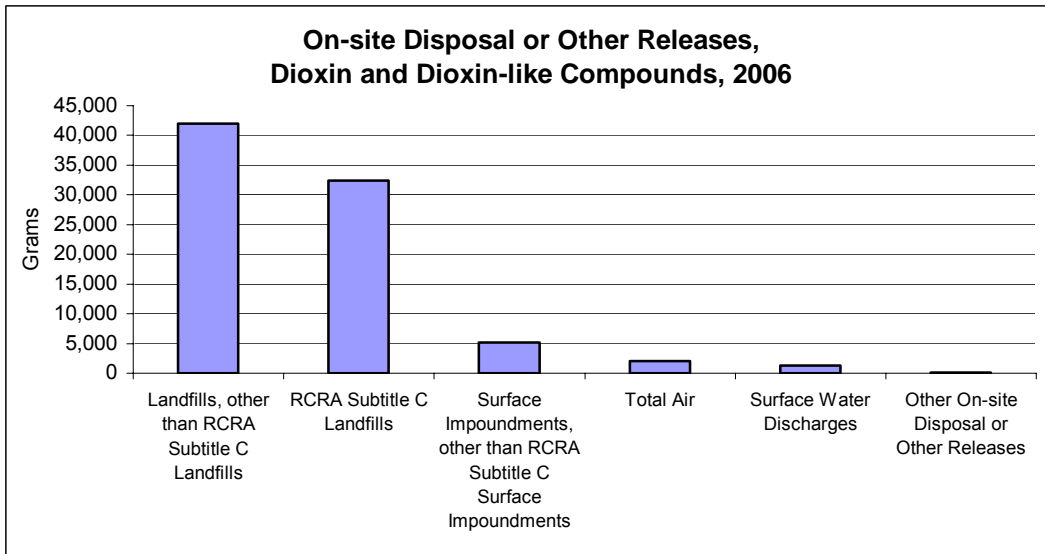
DIOXIN AND DIOXIN-LIKE COMPOUNDS

Dioxin and dioxin-like compounds were added to the TRI list for 2000 at a reporting threshold of 0.1 grams.

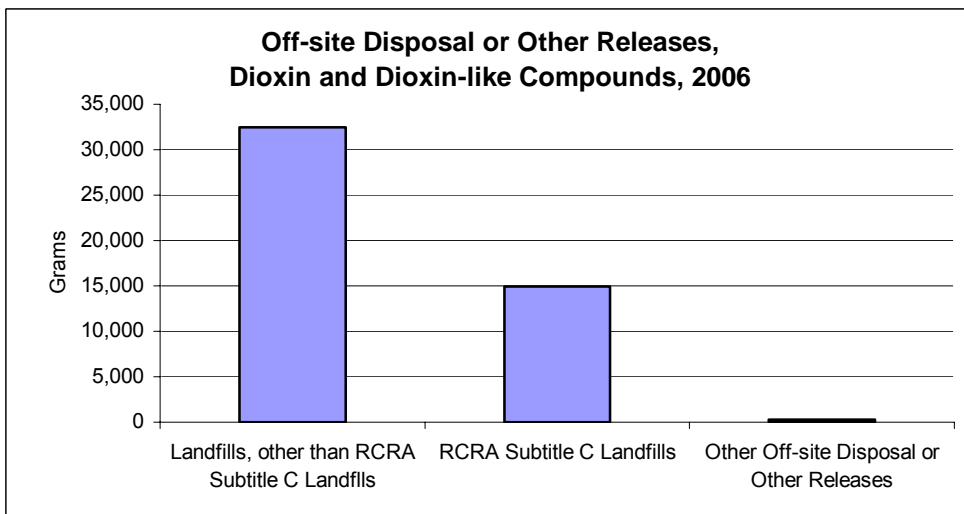
What was the total disposal or other releases for dioxin and dioxin-like compounds for 2006?

Total disposal or other releases for dioxin and dioxin-like compounds was 130,277 grams (approximately 287 pounds) in 2006.

- 63% (82,592 grams or 182 pounds) were **on-site** disposal or other releases, including:
 - ▶ 32% (42,039 grams or 93 pounds) in landfills, other than RCRA Subtitle C landfills
 - ▶ 25% (32,367 grams or 71 pounds) in RCRA Subtitle C landfills
 - ▶ 4% (5,188 grams or 11 pounds) in surface impoundments, other than RCRA Subtitle C surface impoundments
 - ▶ 1% (1,555 grams or 3.4 pounds) of air emissions
 - ▶ 1% (1,316 grams or 2.9 pounds) of surface water discharges



- 36% (47,685 grams or 105 pounds) were **off-site** disposal or other releases, including
 - ▶ 25% (32,434 grams or 72 pounds) of disposal in off-site landfills other than RCRA Subtitle C landfills
 - ▶ 11% (14,953 grams or 33 pounds) in off-site RCRA Subtitle C landfills



How do the 2006 data compare to data for 2005 data for dioxins and dioxin-like compounds?

From **2005 to 2006**, total disposal or other releases of dioxin and dioxin-like compounds **increased** by 44,779 grams or 99 pounds (52%).

What are some of the reasons for the increase in total disposal or other releases of dioxin and dioxin-like compounds from 2005 to 2006?

Three chemical manufacturers reported increases totaling 37,938 grams from 2005-2006. These three facilities accounted for over half of the total for 2005 and almost two-thirds of the total for 2006.

- On-site disposal or other releases **increased** by 60% (30,921 grams or 68 pounds), including an increase of 27,193 grams reported by two chemical manufacturers.
 - ▶ On-site air emissions **increased** by 23% (291 grams or 0.6 pounds) from 2005 to 2006.

Air emissions of dioxin and dioxin-like compounds.

Two electric utilities reported 20% of all air emissions of dioxin and dioxin-like compounds in 2006. The two electric utilities have changed to a fuel blend that includes wood.

- Off-site disposal or other releases **increased** by 41% (13,858 grams or 31 pounds).

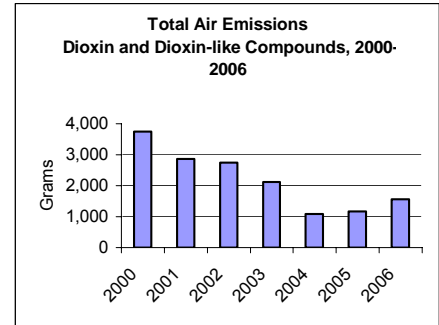
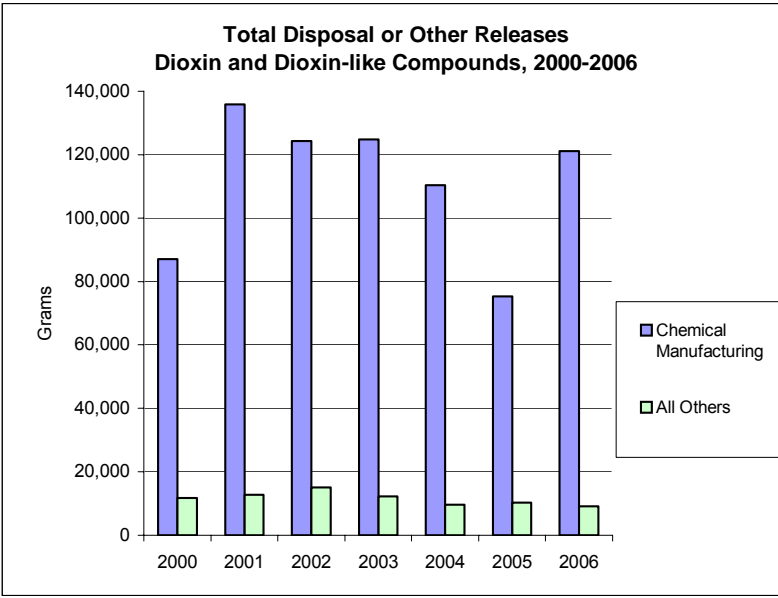
On- and off-site disposal or other releases of dioxins and dioxin-like compounds in RCRA Subtitle C landfills, other landfills and Class I underground injection wells totaled 121,814 grams or 269 pounds in 2006 (93% of total disposal or other releases). They **increased** by 59% (45,393 grams or 100 pounds) from 2005 to 2006.

- On-site landfills other than RCRA Subtitle C landfills **increased** by 67% (16,810 grams or 37 pounds)
- Off-site landfills other than RCRA Subtitle C landfills **increased** by 44% (9,895 grams or 22 pounds)
- On-site RCRA Subtitle C landfills **increased** by 77% (14,105 grams or 31 pounds)
- Off-site RCRA Subtitle C landfills **increased** by 45% (4,676 grams or 10 pounds).

How do the 2006 data compare to data for 2000 (the first year of reporting) for dioxins and dioxin-like compounds?

From **2000 to 2006**, total disposal or other releases of dioxin and dioxin-like compounds **increased** by 32% (31,426 grams or 69 pounds).

- On-site air emissions **decreased** by 58% (2,190 grams or 4.8 pounds) from 2000 to 2006.



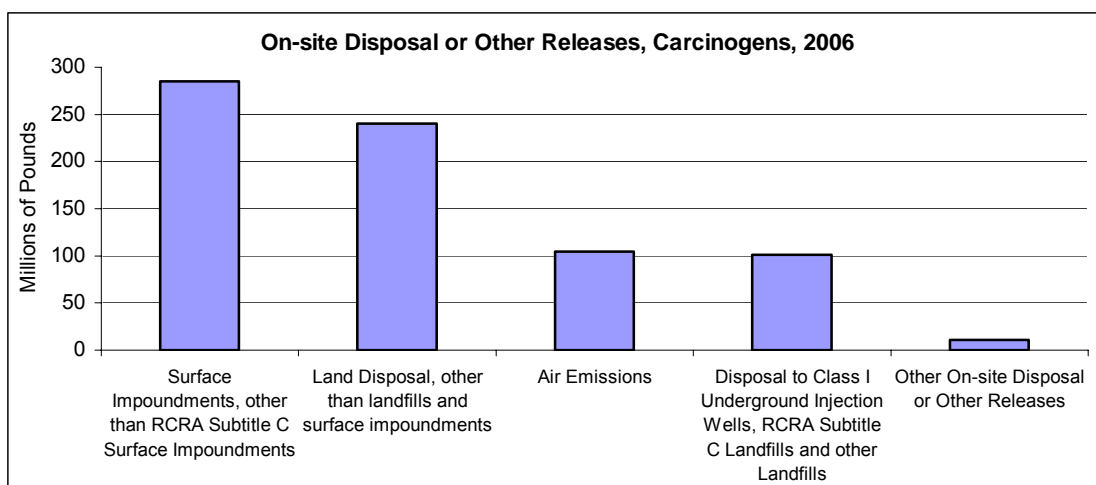
CARCINOGENS

EPA has separated carcinogens for additional analysis in 2006. For this analysis, EPA included all TRI chemicals that appear as known or suspected carcinogens in one of three sources: National Toxicology Program (NTP), International Agency for Research on Cancer (IARC) and/or 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Hazardous Safety and Health Administration (OSHA). There were 179 on the TRI list for 2006; 32 of the 179 carcinogens were not reported for 2006.

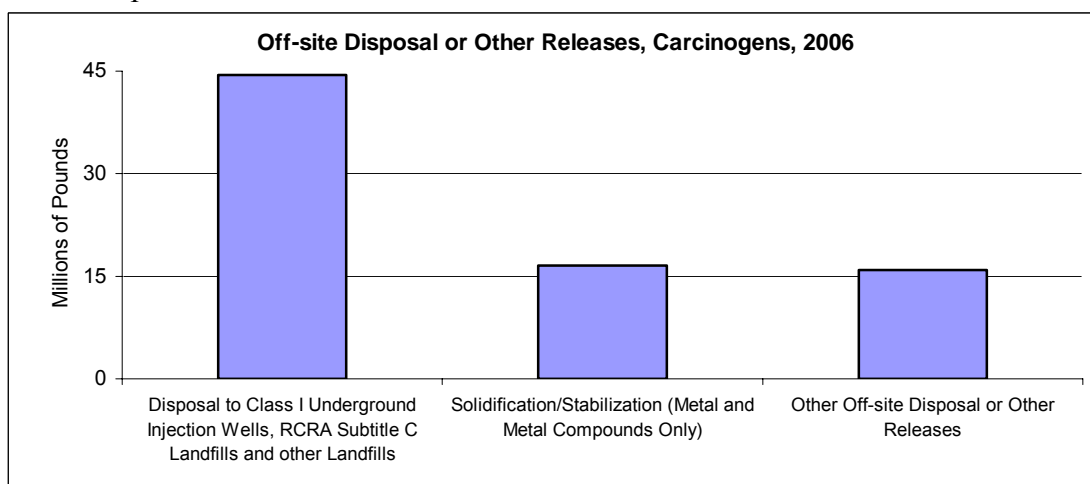
What was the total carcinogen disposal or other releases for 2006?

Total disposal or other releases of carcinogens reported was 820 million pounds in 2006. Most releases were to some form of land disposal.

- 91% (743 million pounds) were disposed of or otherwise released **on-site**, including
 - ▶ 35% (285 million pounds) in on-site surface impoundments other than RCRA Subtitle C surface impoundments
 - ▶ 29% (241 million pounds) in other land disposal, other than landfills and surface impoundments (such as waste piles, spills or leaks)
 - ▶ 13% (105 million pounds) in on-site air emissions and
 - ▶ 12% (101 million pounds) to Class I wells, RCRA Subtitle C landfills and other landfills.



- 9% (77 million pounds) were disposed of or otherwise released **off-site**.
 - ▶ 5% (44 million pounds) of **off-site** disposal or other releases were to Class I wells, RCRA Subtitle C landfills and other landfills
 - ▶ 2% (17 million pounds) was sent off-site for solidification/stabilization of metals and metal compounds.



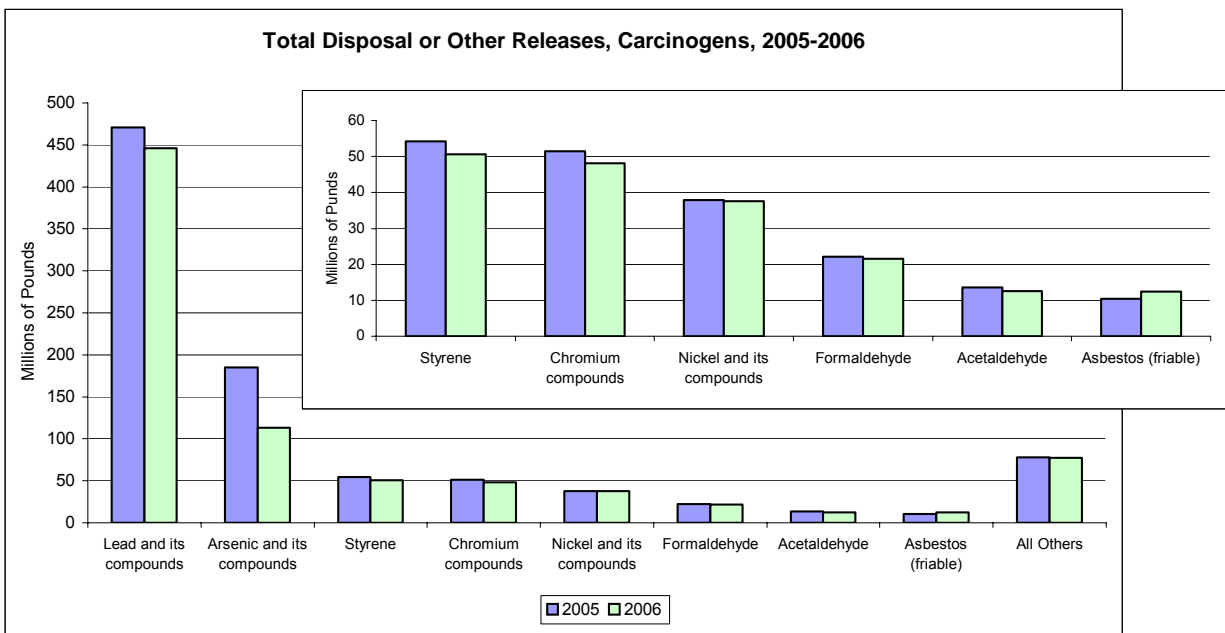
What were the top carcinogens disposed of or otherwise released in 2006?

- 54% (446 million pounds) of total disposal or other releases of carcinogens in 2006 was accounted for by lead and lead compounds.
- 14% (113 million pounds) was arsenic and arsenic compounds.
- Other disposal or other releases of carcinogens in 2006 included:
 - ▶ 51 million pounds of styrene (with 47 million pounds of that as air releases),
 - ▶ 48 million pounds of chromium compounds.

How do the 2006 carcinogen data compare to the 2005 carcinogen data?

Overall, when compared to quantities reported for the previous year (2005), total disposal or other releases of carcinogens **decreased** by 104 million pounds or 11% from 2005 to 2006. Air releases **decreased** by 7 million pounds or 7%.

- Arsenic and arsenic compounds **decreased** by 72 million pounds (39%),
- Lead and lead compounds **decreased** by 25 million pounds (5%), although air releases **increased** by almost 31,000 pounds (3%),
- Chromium compounds **decreased** by 3.3 million pounds (6%),
- Styrene air releases **decreased** by 3.4 million pounds (7%), and
- Acetaldehyde air releases **decreased** by 1.0 million pounds (8%).



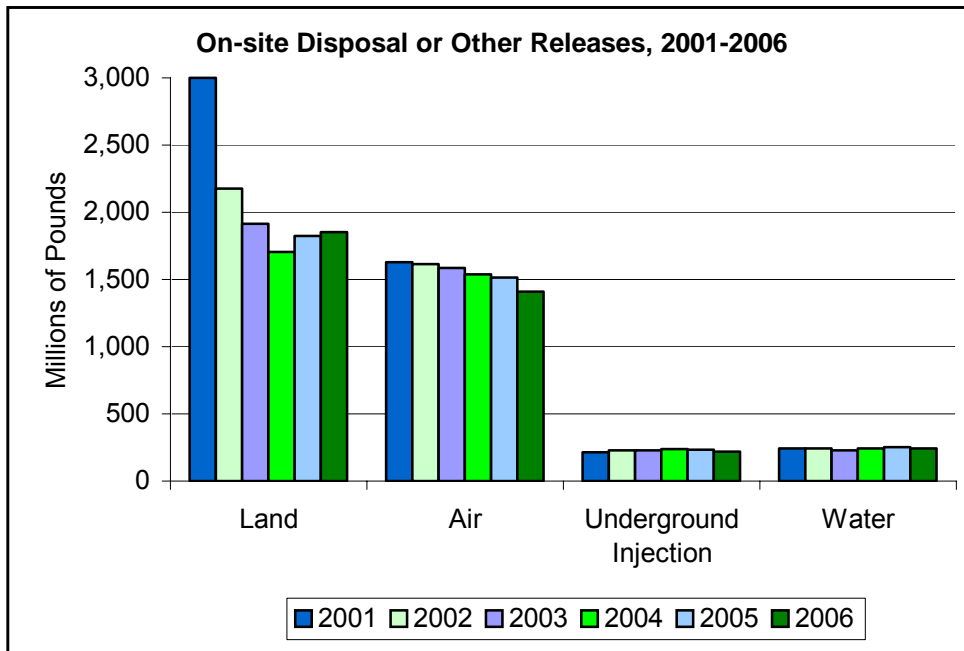
Looking at TRI data over the years

TRI DATA, 2001-2006

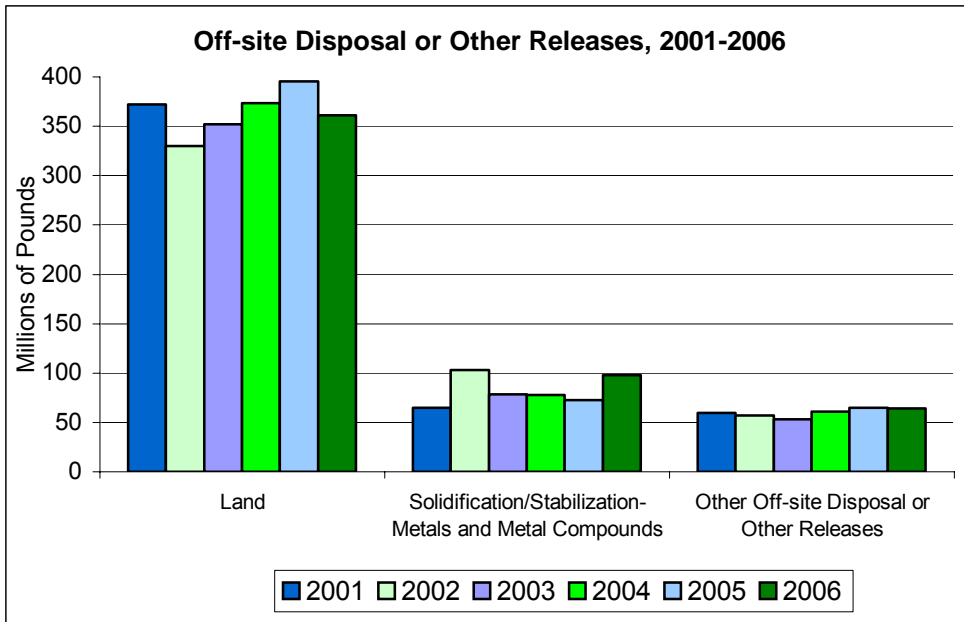
Over the five years from 2001 to 2006, total on- and off-site disposal or other releases of TRI chemicals **decreased** by 24% (by 1.34 billion pounds). The number of facilities reporting **decreased** by 11%.

- The metal mining sector reported an overall **decrease** of 1.06 billion pounds (47%).
- Without the metal mining sector, total disposal or other releases **decreased** by 8% (by 278 million pounds).
- On-site disposal or other releases **decreased** by 1.36 billion pounds (27%).
 - ▶ Land disposal **decreased** by 1.15 billion pounds (38%), with metal mining accounting for a **decrease** of 1.11 billion pounds.
 - ▶ Total air emissions **decreased** by 222 million pounds (14%), with chemical manufacturing accounting for a **decrease** of 51 million pounds, electric utilities with a **decrease** of 42 million pounds and plastics products accounting for a **decrease** of 21 million pounds.

- ▶ However, underground injection **increased** by 4 million pounds (2%), with chemical manufacturing accounting for an **increase** of 13 million pounds, but hazardous waste facilities had a **decrease** of 7 million pounds in underground injection.
- ▶ Surface water releases **decreased** by over 206,000 pounds (0.1%), with the food products industry accounting for an **increase** of 14 million pounds and chemical manufacturing accounting for a **decrease** of 19 million pounds.



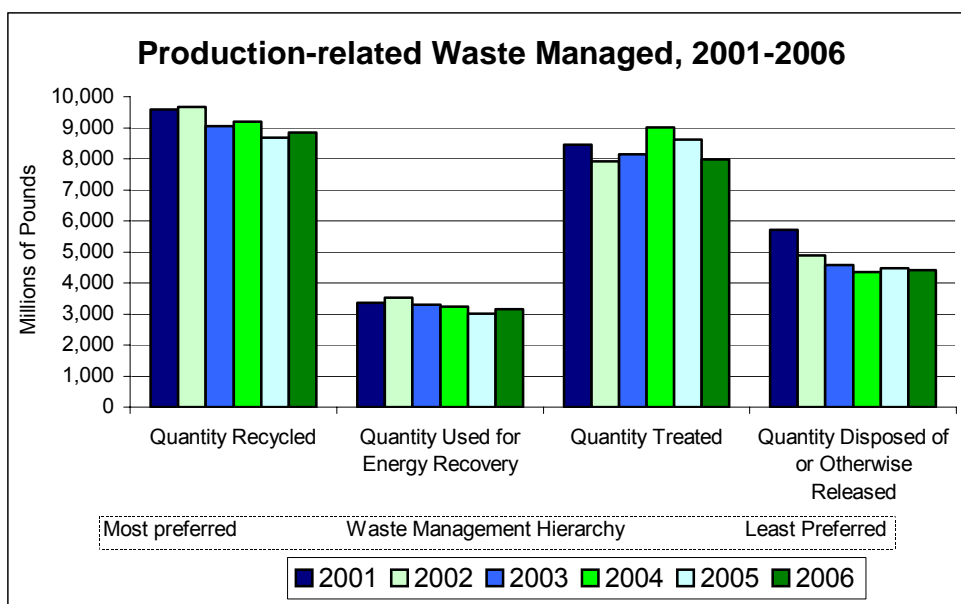
- Off-site disposal or other releases **increased** by 27 million pounds (5%).
 - ▶ Land disposal **decreased** by 11 million pounds (3%), with hazardous waste management facilities a **decrease** of 20 million pounds and primary metals accounting for an **increase** of 24 million pounds
 - ▶ Solidification/stabilization of metals and metal compounds **increased** by 33 million pounds (52%), with primary metals accounting for an **increase** of 40 million pounds



What are some of the reasons for the overall decrease in disposal or other releases from 2001 to 2006?
The metal mining sector had a decrease of 47% (1.06 billion pounds) from 2001 to 2006. This sector may have been adjusting their reporting to conform to a court case, Barrick v. EPA. The decrease could also be due other factors, such as changes in composition of the ore.

Total production-related waste managed decreased by 10% (2.73 billion pounds) from 2001 to 2006.

- Quantity disposed of or otherwise released **decreased** by 23% (1.31 billion pounds)
- Recycling on- and off-site **decreased** by 8% (741 million pounds)
- Energy recovery on- and off-site **decreased** by 6% (202 million pounds)
- Treatment on- and off-site **decreased** by 6% (480 million pounds)



Average per facility, 2001, 2005 and 2006

	2001	2005	2006	Change 2005-2006	Change 2001-2006
	Pounds/facility	Pounds/facility	Pounds/facility	Percent	Percent
Total Disposal or Other Releases					
All Industry Sectors	221,500	187,400	191,228	2%	-14%
Without metal mining	133,672	138,688	138,478	-0.2%	4%
Total Production-Related Waste Managed					
All Industry Sectors	1,052,053	1,041,544	1,065,044	2%	1%
Without metal mining	963,608	991,282	1,010,414	2%	5%

TRI CHEMICAL HAZARD

For the first time this year, in an attempt to look at chemical hazards, EPA has used the Risk Screening Environmental Indicators (RSEI) “toxicity-weighted-pounds” methodology to conduct additional analysis.² The idea is to provide additional insights that go beyond simple pounds analysis and reflect some basic measure of chemical toxicity. This analysis does not address fate

² For additional information on RSEI, please see <http://www.epa.gov/oppt/rsei/>

and transport of chemicals or specific containment methods, populations, non-TRI chemical burdens or other factors that would be addressed in in-depth risk assessments.

The RSEI toxicity weighting method uses a proportional system of numeric weights that reflect the relative toxicities of chemicals. RSEI toxicity weights use calculated human health values from various EPA toxicity data sources that generally are considered protective of human health.

For this analysis, EPA included all TRI chemicals that have RSEI hazard weights and addresses total disposal or other releases to all media. The analysis does not address dioxin and some other chemicals where relative toxicity weightings were not available.

Methodology Used:

Toxicity Weighted Pounds is total air releases times inhalation toxicity weight plus surface water discharges times oral toxicity weight plus maximum of inhalation/oral times all other disposal or other releases.

Major Caveats to RSEI Toxicity Weights Analysis:

- *Approach does not address containment (such as landfill liners, etc.) or fate and transport of chemicals*
- *Does not address dioxin or certain other chemicals*
- *Must consider unique caveats for 23 chemicals, including chromium (e.g., only hexavalent fraction of chromium used).*
- *Assigned toxicity weights include uncertainty factors depending on the amount and quality of data that is available for a particular chemical (i.e., toxicity weights may be high due to lack of information on a chemical as well as due to proven high toxicity).*
- *Toxicity weighted pounds depends on relative assignment of hazard and can only be used for comparison purposes from year to year and chemical to chemical. Toxicity weighted pounds should not be viewed as any kind of a single stand-alone measure.*

Are there specific chemicals that appear to drive the nationally aggregated values?

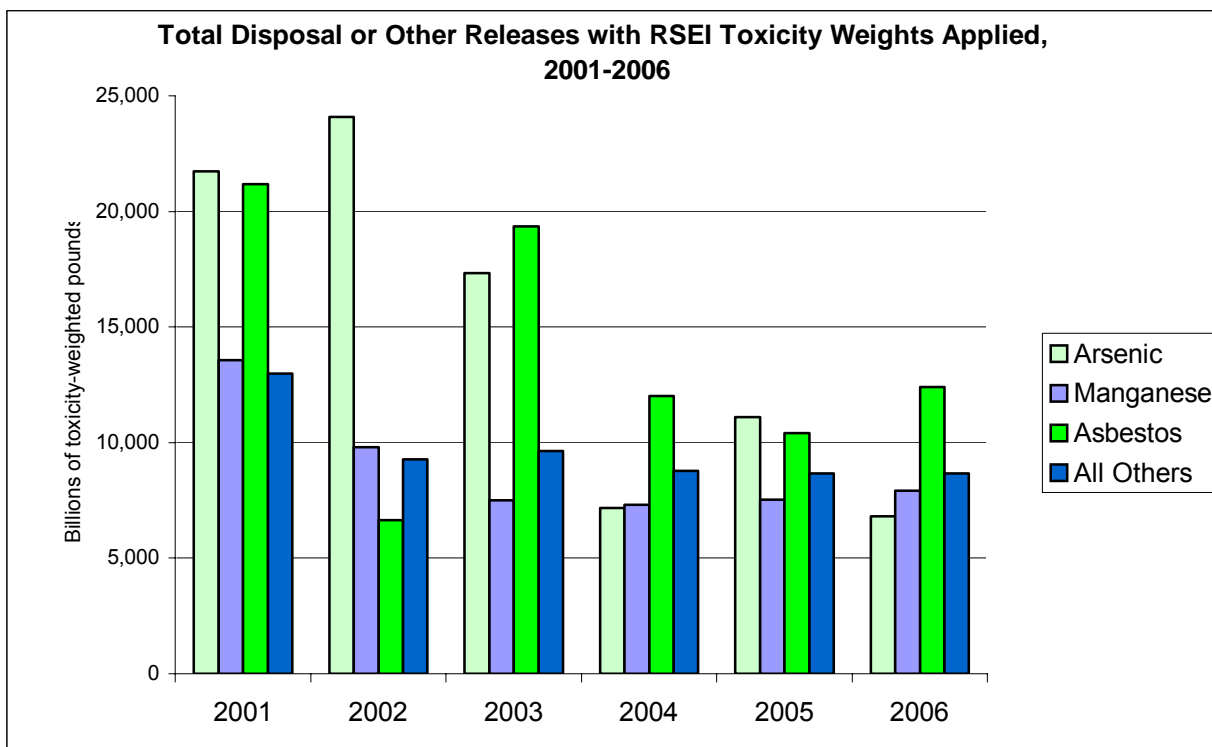
Three chemicals, when RSEI Toxicity weights are applied, account for over three-quarters of the total. For 2006, asbestos accounted for 35%, manganese and its compounds for 22%, and arsenic and its compounds for 19%. Asbestos has a high value due to an assigned toxicity weighting of 1,000,000, the largest of all TRI chemicals with RSEI toxicity weights. Most asbestos is landfilled, with 45% going to on-site non-RCRA Subtitle C landfills, 41% to on-site RCRA Subtitle C landfills and 12% to off-site non-RCRA Subtitle C landfills in 2006. Manganese and arsenic and their compounds have relatively high toxicity weights (36,000 and 60,000, respectively) but also have large amounts reported. For 2006, manganese and its compounds ranked sixth for total disposal or other releases (not weighted) and arsenic and its compounds ranked eleventh, among TRI chemicals with RSEI toxicity weights. In 2006, for manganese and its compounds disposal or other releases consisted of 27% in on-site and 21% in off-site non-RCRA Subtitle C landfills on-site and 20% in non-RCRA Subtitle C surface impoundments. Over 87% of arsenic and its compounds were disposed of in surface impoundments, other than RCRA Subtitle C surface impoundments, in 2006.

What were the changes in toxicity weighted pounds from 2005 to 2006?

In comparing the nationally aggregated total toxicity weighted pounds released for 2005 to 2006, there was a decrease by 5 % using RSEI toxicity weighted pounds, for TRI chemicals with RSEI toxicity weights. The decrease in pounds for the same group of TRI chemicals (those with RSEI toxicity weights) was 3%.

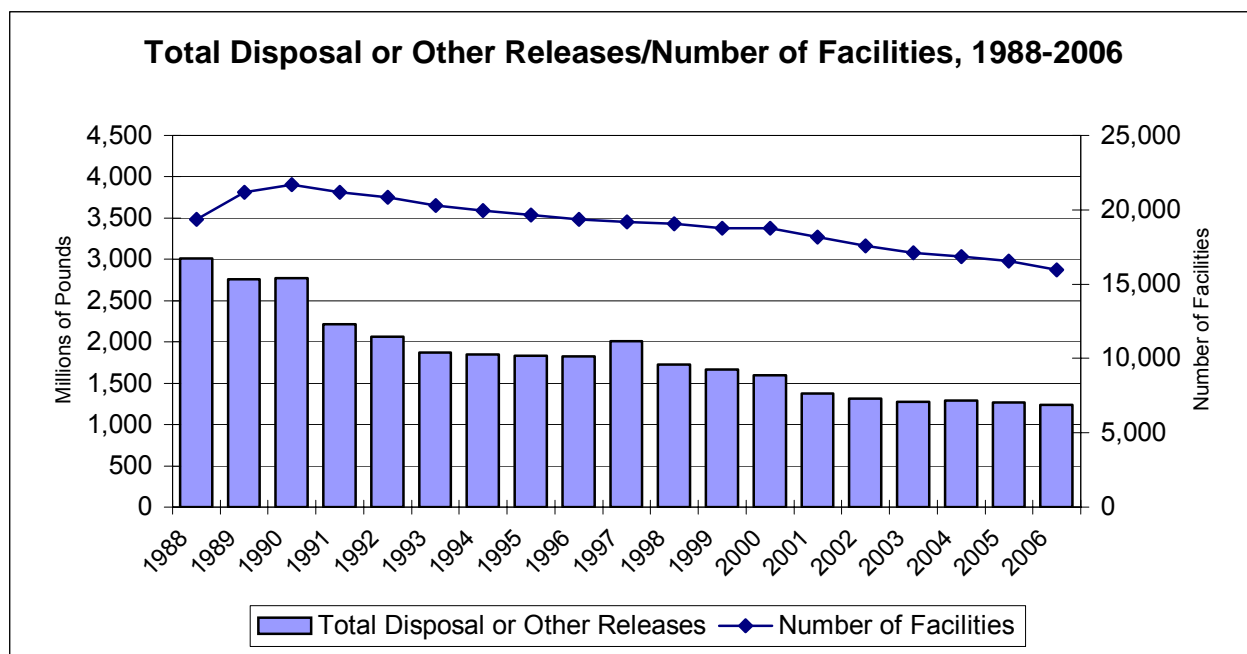
What were the changes in RSEI toxicity weighted pounds from 2001 to 2006?

From 2001 to 2006, RSEI toxicity weighted pounds decreased by 47% for those chemicals that have toxicity weightings. The decrease in pounds for the same group of chemicals was 24%. However, there were yearly fluctuations due in part to amounts reported for three chemicals: Arsenic and its compounds, asbestos, and manganese and its compounds. As with the large decrease in total pounds over this period, much of this decrease could be due to the change in reporting by mining facilities, particularly for arsenic and its compounds. The metal mining sector reported 95% of total disposal or other releases of arsenic and its compounds for 2001 and a decrease of over 70% from 2001 to 2006. The primary metals sector reported the largest total disposal or other releases of manganese and its compounds during this period and the hazardous waste management facilities had the largest total disposal or other releases of asbestos.



TRI DATA, 1988-2006

Looking at trends in the industries and chemicals that have been consistently reported since that time, over the eighteen years from 1988 to 2006, total on- and off-site disposal or other releases of TRI chemicals **decreased** by 59% (by 1.77 billion pounds). The number of facilities reporting to TRI **decreased** by 18% over that same time period. This decrease only takes into consideration the 1988 core set of chemicals and industry sectors (i.e., those chemicals/industry sectors that have been on the TRI list 1988 and have had the same reporting definition since 1988).



Note: Data are from TRI Form, Sections 5 (all parts) and 6.1 (metals and metal compounds only) and 6.2 (Disposal codes only and metals and metal compounds reported under codes M40 and M61). Does not include delisted chemicals, chemicals added in 1990, 1994 and 1995, aluminum oxide, ammonia, hydrochloric acid, PBT chemicals, sulfuric acid, vanadium and vanadium compounds. For the years 1998 and after, does not include industries, other than manufacturing industries, that are required to report for 1998 and later years only. Data as of February 2008.