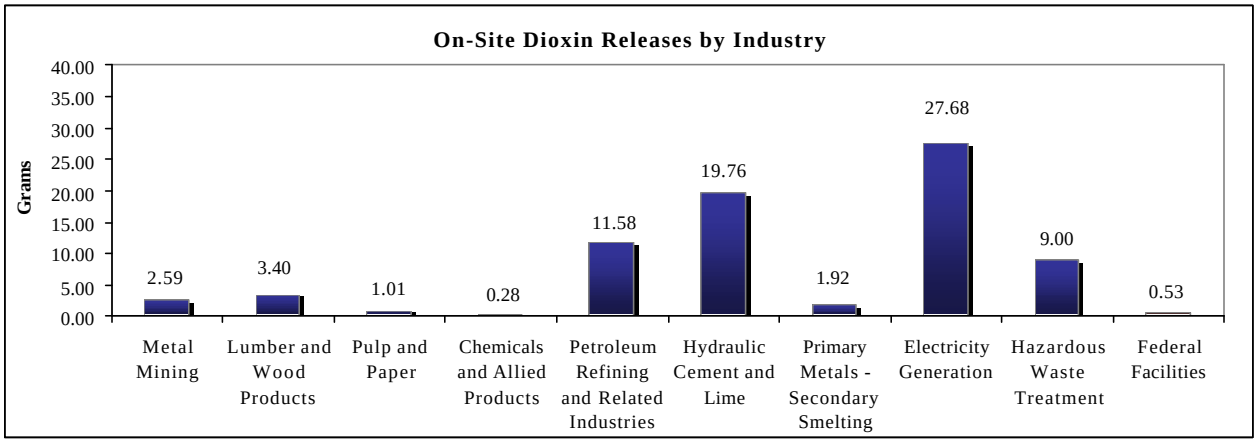
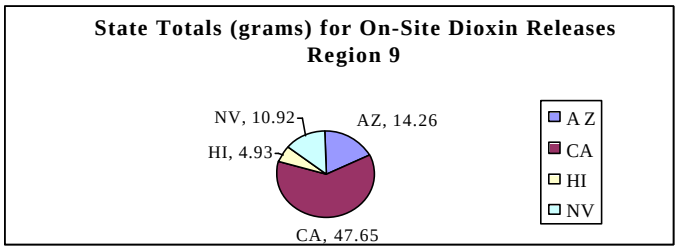
Dioxin Report: 2000 Toxics Release Inventory

U.S. EPA Region 9
Arizona, California, Hawaii, Nevada, and the Pacific Islands

a)



b)



Note: On-site releases include amounts released to the air, water and land at the location of the reporting facility (no dioxin releases were reported to underground injection). In charts **a** and **b**, dioxin releases are given in grams.

Dioxin and the 2000 TRI Data

The U.S. Environmental Protection Agency has just made public its data on toxic chemicals that were released* to the air, water and land within the Pacific Southwest Region (Region 9) during the year 2000. This information comes from the Toxics Release Inventory (TRI), a federal community right-to-know program.

For the year 2000, the TRI was expanded to include additional persistent, bioaccumulative and toxic (PBT) chemicals, and required reporting for these chemicals at lower thresholds. PBT pollutants are chemicals that are toxic, persist in the environment and bioaccumulate in food chains and, thus, pose risks to human health and ecosystems. One of these newly added PBT chemical categories is 'dioxin and dioxin-like compounds.'

Dioxin and Dioxin-like Compounds

Though the term 'dioxin and dioxin-like compounds' refers loosely to a group of several hundred compounds that share similar chemical structure and biological characteristics, under the TRI program this phrase refers to a list of 17 specific compounds that have similar properties and health effects, and only information for these compounds is collected.

Data Characteristics

The data are reported in grams, and in terms of the total mass of the 17 compounds that make up the category. Facilities were given the option of data on the percentage distribution of the 17 compounds, or congeners, that make up their releases, and some

** Release is defined as the amount of a toxic chemical released on-site (to air, water, underground injection, landfills and other land disposal), and the amount transferred off-site for disposal.*

facilities provided this information.

Toxicity and TEQ
Each dioxin and dioxin-like compound has a different toxicity, and the range can differ by a factor of 10,000. Scientists use a shorthand method of assessing the toxicity of different mixtures by comparing them to the most toxic compound, a method called "Toxicity Equivalence," or TEQ. While some dioxin inventories collect data in TEQs, the TRI data is in grams of total dioxin and dioxin-like compounds.

Sources Covered by this Report
Only certain types of facilities are required to report chemical releases to the TRI program. As such, the TRI data on releases of dioxin and dioxin-like compounds are limited to releases from TRI-covered industry sectors, which are manufacturing, metal and coal mining, electricity generation (coal and oil fired only), commercial hazardous waste treatment, solvent recovery, petroleum bulk terminals, and wholesale chemical distributors. The reporting threshold for dioxin is 0.1 grams manufactured, processed, or otherwise used.

A Note on Risk
It is important to note that release should not be directly equated with risk. To evaluate risk, release data must be merged with information about chemical toxicity, site-specific conditions, and exposure. In the case of dioxin and dioxin-like compounds, EPA estimates that most exposure comes through the diet, with over 95% coming through dietary intake of animal fats.

The TRI data does not indicate whether a facility is violating environmental laws. The majority of the major industrial sources of dioxin are subject to strict controls. In this country, there has been an 80% reduction in known emissions from 1987 to 1995, and with existing regulations, a 90% reduction is anticipated by the year 2004.

Releases

The TRI data for 2000 suggests that releases of dioxin and dioxin-like compounds from TRI-regulated industries are lower for Region 9 states than for most other states in the U.S. In a state-by-state comparison California, Arizona, Nevada and Hawaii ranked 29, 41, 43 and 47, respectively for total on- and off-site releases. (no dioxin releases were reported in Region 9's Pacific island territories).

Releases by State

	On-Site Air	*On-Site Water*	*On-Site Land*	*Off-Site Disposal*	*Total On- and Off-Site*
AZ	14.24	0.00	0.02	0.00	14.26
CA	34.58	4.08	9.00	27.21*	74.86
HI	4.93	0.00	0.00	0.96	5.89
NV	10.92	0.00	0.00	0.00	10.92

In grams, not weighted by Toxicity Equivalents (TEQ)
*Light Metals, of City of Industry, CA, may have incorrectly reported 26.42 grams.

Reporting Industry Sectors–the 2000 Data

A review of the TRI data suggests that among the TRI-regulated industry sectors, electricity generation and the primary metals industry are the largest contributors of dioxin releases in the Region. Stone, clay, glass and concrete products (principally Portland cement manufacturing and lime production) and petroleum refining are the third and fourth largest contributors, respectively. Together, these four industry sectors account for 84% of the Region 9 total.

Dioxin Releases by Industry Sector

Industry	***Air***	***Water***	***Land***	***Off-Site Disposal***	***Total On- and Off-Site***
Electricity Generation	27.68	0.00	0.00	0.96	28.64
Primary Metal Industries-Secondary Smelting	1.92	0.00	0.00	26.42*	28.34
Hydraulic Cement and Lime	19.76	0.00	0.00	0.00	19.76
Petroleum Refining and Related Industries	10.91	0.67	0.00	0.40	11.98
Hazardous Waste Treatment	0.00	0.00	9.00	0.00	9.00
Lumber and Wood Products	0.28	3.12	0.00	0.00	3.40
Metal Mining	2.59	0.00	0.00	0.00	2.59
Pulp and Paper	0.71	0.28	0.02	0.39	1.40
Federal Facilities	0.53	0.00	0.00	0.00	0.53
Chemicals and Allied Products	0.28	0.00	0.00	0.00	0.28

Releases reported in Arizona, California, Hawaii, and Nevada, in total grams, not weighted for TEQ.
*Light Metals, of City of Industry, CA, may have incorrectly reported 26.42 grams.

Electricity Generating Facilities
In this industry, dioxins and dioxin-like compounds can be formed as unwanted byproducts during the combustion process. Only facilities that combust coal or oil to generate electricity for distribution in commerce are required to report to the Toxics Release Inventory. In the Pacific Southwest Region, 24 electricity generating facilities reported 28.64 grams of dioxin releases, or 27% of the regional total.

Primary Metals Industry - Secondary Smelting
In the primary metals industry, dioxin and dioxin-like compounds may be generated as an unwanted byproduct during the high temperature process of secondary smelting. Another potential dioxin source is on-site fossil fuel combustion. In the Region, five secondary smelters and one iron foundry reported 28.34 grams of dioxin releases (one secondary aluminum smelter, Light Metals, may have incorrectly reported 26.42 grams, and is recalculating release estimates). All but 1.92 grams were reported to off-site disposal.

Petroleum Refineries
Dioxin and dioxin-like compounds may be formed in petroleum refining from the combustion of fossil fuels and during certain catalyst regeneration processes. Refineries that utilize continuous catalyst regeneration are more likely to exceed the reporting threshold for dioxin and dioxin-like compounds than facilities using semi-continuous catalyst regeneration processes. In Region 9, eight facilities in the petroleum refining and related industries reported 11.98 grams of dioxin releases.

Concrete Products
The heating of raw materials used in the manufacture of cement may result in the formation of dioxins. In the Region, eleven hydraulic cement facilities and four lime facilities reported 19.76 grams of dioxin and dioxin-like compounds.

Top Facilities for Releases

The top 10 facilities for on-site releases in Arizona, California, Hawaii, and Nevada are:

1: Southdown California Cement LLC (9.399 grams), Victorville, California
2: Safety-Kleen (Buttonwillow) Inc. (9 grams), Buttonwillow, California.
3: San Joaquin Refining, Co. (6.8 grams), Bakersfield, California.
4: Springerville Generating Station (4.8 grams), Springerville, Arizona
5: J.H. Baxter & Co (3.12 grams) Long Beach, California
6: Cabrillo Power LLC Encina Power Plant (3.1 grams) Carlsbad, California
7: Nevada Power Reid Gardner Station Moapa, Nevada (3 grams)
8: Riverside Cement Co. Crestmore, (2.8 grams) Riverside, California
9: North Valmay Station (2.72 grams) Valmay, Nevada
10: Hawaiian Electric Inds, Inc. (2.7 grams) Kapolei, Hawaii

On-line Access

For national information on data release, see:
http://www.epa.gov/tri

The TRI data is available through the Envirofacts Warehouse, EPA's premier Internet site for distributing environmental information at:
http://www.epa.gov/enviro

or the TRI Explorer tool:
http://www.epa.gov/triexplorer

For general information on the Toxics Release Inventory, including reporting requirements for businesses, go to: http://www.epa.gov/region09/toxic/tri

For additional information on dioxin and associated risk, go to:
www.epa.gov/ncea/dioxin.htm

Information and Assistance

We will be more than happy to answer your questions and assist you in learning more about the Toxics Release Inventory program in Region 9.

U.S. EPA Region 9 TRI Coordinator
Adam Browning, (415) 947-4178