

A Guide to the Toxics Release Inventory for Alaska

Reporting Year 2011

Introduction

The Toxics Release Inventory (TRI) is a publicly-accessible database compiled by the U.S. Environmental Protection Agency (EPA) that contains information about disposal and other releases of over 650 chemicals from more than 20,000 industrial facilities. TRI was established by Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA), enacted in 1986, and expanded by the Pollution Prevention Act of 1990. The purpose of TRI is to support informed decision-making by industry, government, other organizations, and the public.

This guide provides a brief overview of the TRI program, summarizes the 2011 TRI data for Alaska, and describes some limitations of the data and factors to consider when using information submitted by Alaska facilities.

Overview of TRI Reporting Requirements

Facilities in specified industries that have ten or more employees and exceed thresholds for use of chemicals on the TRI list must report annually to the EPA the amount of each listed chemical it released into the environment or otherwise managed as waste during the previous calendar year. For most TRI chemicals, a facility must report to TRI if it manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of the chemical in a given year. EPA has set much lower thresholds for Persistent Bioaccumulative and Toxic (PBT) chemicals: 100 pounds for persistent and bioaccumulative chemicals; 10 pounds for highly persistent and highly bioaccumulative chemicals; and 0.1 grams for dioxin and dioxin-like compounds.

The term “release” in the TRI program is very broad and includes permitted emissions and discharges, management of wastes in regulated disposal units, as well as accidental spills and releases. “On-site releases” include TRI chemicals that are emitted to the air, disposed of on land, discharged to surface water, injected underground, treated, recycled or consumed for energy at the reporting facility. “Off-site releases” are comprised of wastes shipped off-site for disposal or other management.

Limitations of TRI Information

Chemicals are placed on the TRI list based on their potential to cause adverse effects to human health or the environment; however, the TRI data alone do not reflect actual exposures to these chemicals or risk posed by releases. Key factors to consider when using the data include: toxicity, which varies widely among TRI chemicals; environmental factors that affect the fate of a chemical and potential routes of exposure; regulatory controls and oversight; and other releases into the receiving environment, including releases from non-TRI sources or below TRI thresholds and releases of non-TRI chemicals.

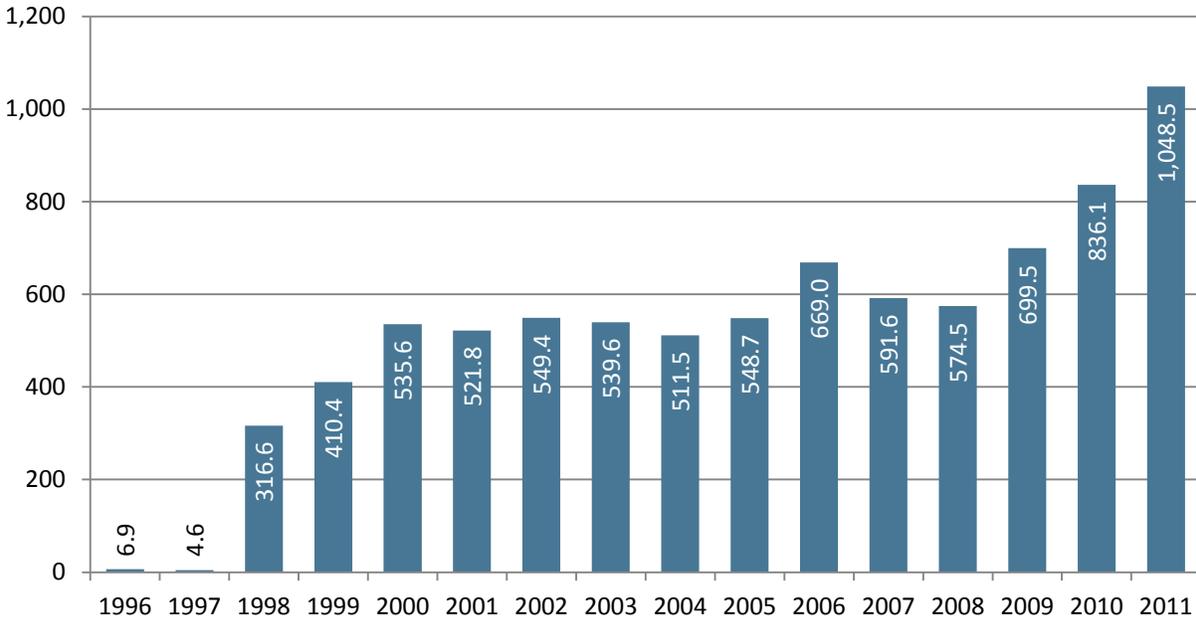
Facilities are not required to conduct monitoring or measurements to determine actual release amounts for TRI, but they must use the best available data. If measured data are not available, facilities may calculate release amounts using a variety of methods. Actual releases may vary from the estimates derived by these computational methods. In addition, while TRI data quantify facilities’ aggregate annual releases, they do not describe the concentration, timing, or duration of releases or the mobility of chemicals in the environment.

TRI in Alaska

Prior to 1998, primary sources of TRI releases in Alaska included chemical production (at the former Agrium fertilizer plant in Kenai), wood pulp manufacturing (at mills in Sitka and Ketchikan) and petroleum refining. Since 1998, when metal mining was added

to the industry sectors required to report TRI releases, the vast majority of Alaska’s reported releases – more than 99% – have consisted of chemicals naturally occurring in waste rock and tailings excavated from mine sites. The more than 6,700% increase in total annual releases in 1998 shown in the graph below is a result of this change in reporting, not the result of changes in environmental management or operating practices at mining facilities.

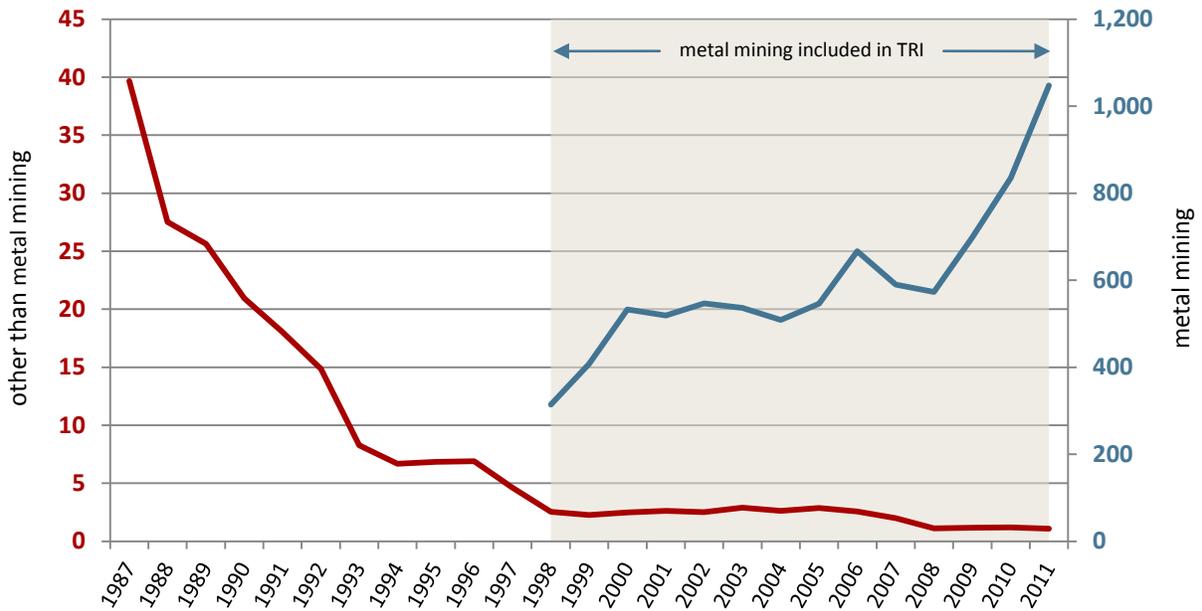
Total Alaska TRI Releases – 1996-2011 (million pounds)



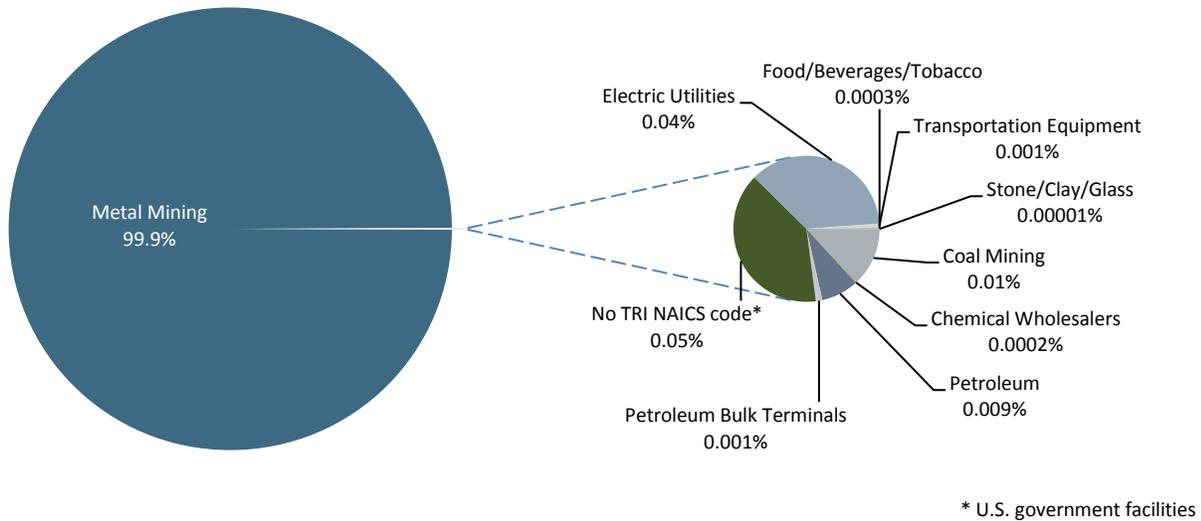
In 1997, the year before metal mining releases were included in TRI reporting, Alaska ranked 43rd among the 50 states in quantity of total on- and off-site TRI discharges. The following year, Alaska went to number five in the ranking, and since 2002, the state has ranked number one.

Total TRI releases from non-mining sources have declined by 97% since TRI reporting began, from approximately 39.7 million pounds in 1987, to 1.33 million pounds in 2011, despite the addition of chemicals to the TRI list and expansion of TRI reporting to more industries during that time. Meanwhile, mining-related releases have roughly tripled since 1998 as new mines have opened and existing mines expanded.

Alaska TRI Trends – Total Releases from Metal Mining vs Other Industries (million pounds)



Total Alaska TRI Releases by Industry – 2011



Mining and TRI

Five Alaska mines were subject to the TRI reporting requirements in 2011. These mines produce gold, silver, zinc and lead from ore extracted from open pits and underground workings. Extracting ore and processing it to concentrate the metals produces several waste streams that contain TRI chemicals: waste rock and tailings disposed of on land and underground, surface water releases, and fugitive and point source air emissions. The federal and state governments review plans to dispose of these wastes and issue permits to ensure that discharges meet environmental quality standards.

Land Releases

Rock removed from a mine that does not contain economically recoverable amounts of targeted metals is called “waste rock”. Rock with recoverable quantities of metals – “ore” – is crushed and processed at an on-site mill to concentrate the metals; the material leftover is disposed of as “tailings”. Waste rock may contain trace concentrations of naturally occurring TRI chemicals, while tailings may contain both traces of naturally occurring chemicals and residual amounts of chemicals used to process the ore, any or all of which may be TRI chemicals. Both waste rock and tailings are disposed of in engineered structures either on the land surface or in underground mine workings. The TRI chemicals contained in those waste streams are reported as “on-site disposal or other releases” when disposed of on the surface and as “underground injection, class II-V wells” when used to backfill underground workings.

Fort Knox Mine, the second-highest-producing gold mine in Alaska, as well as a few smaller mines, have used heap leach pads to recover gold and silver from ore. With this method of metals concentration, a cyanide solution is run through an ore or tailings pile and the metals are recovered from the leachate collected at the bottom of the pile. When a heap leach pad is closed, the cyanide solution in the heap is neutralized or treated to safe levels. When a heap leach pad is decommissioned, the trace metals remaining in the pad are reported to TRI as “other” land releases.

Federal and state agencies require that waste rock, tailings and heap leach pads be placed in engineered structures that will contain contaminants. Federal and state land management agencies also require that waste rock and tailings piles and heap leach pads be stabilized and re-vegetated to provide for productive post-mining land use.

Surface Water Releases

TRI chemicals may be present in stormwater runoff and seepage from waste rock and tailings impoundments or other mine components, groundwater drained from open pit or underground workings, process water, or wastewater. Water from all of these sources, treated or untreated, must meet state water quality standards before it enters surface waters, or it must be discharged in compliance with an Alaska Pollutant Discharge Elimination System permit. In either case, TRI chemicals in the released water are reported as “surface water discharges”.

Air Releases

Mines operate under conditions of air permits issued by the state in accordance with provisions of the federal Clean Air Act. For TRI purposes, releases of TRI chemicals to the air are categorized as either “point source” (also “stack”) or “fugitive” air emissions.

Air emissions that come from discrete points at mine facilities, such as stacks, pipes or vents, are reported as point source emissions. These emissions are generally produced by power-generating and other fuel-burning equipment but can also include dust containing metals that is vented from underground mine workings through a shaft or adit (horizontal passage).

Fugitive air emissions are those that are not released through a confined air stream. Dust generated by activities such as construction, blasting, excavating, and ore transfer, as well as dust blown from heap leach pads or stockpiles of waste rock, tailings, or ore, can contain metals or traces of process chemicals that must be reported to TRI. Evaporation of volatile chemicals such as methanol, used to prevent drilling fluids from freezing, may also be reported as fugitive emissions.

Summary of Alaska TRI Releases – 2011

Thirty-five Alaska facilities reported TRI releases for 2011, three more than reported for 2010. The total quantity of Alaska releases was up 25.4% from 2010.¹ Metal mining releases, which increased 25.5% from 2010, accounted for 99.9% of the state’s overall increase. Total releases from industries other than metal mining were down 1% from 2010.

¹ Comparisons to 2010 releases are based on the 2011 National Analysis dataset figures for that year.

Releases by Industry (pounds)

Industry	Air Releases	Surface Water Discharges	Underground Injection	On-site Land Releases	Total On-site Releases	Off-site Releases	Total On and Off-Site Releases
Metal Mining	410,865	153,394	24,546,529	1,022,311,623	1,047,422,411	188	1,047,422,599
No TRI NAICS code* (U.S. Govt. facilities)	47,807	20	-	378,568	426,394	2,242	428,637
Electric Utilities*	5,813	-	-	-	5,813	390,429	396,242
Coal Mining [†]	229	-	-	141,023	141,252	-	141,252
Petroleum	88,627	1,336	-	64	90,027	25	90,052
Petroleum Bulk Terminals	14,890	131	-	118	15,139	319	15,458
Transportation Equipment	9,362	-	-	-	9,362	243	9,605
Food/Beverages/Tobacco	3,200	-	-	-	3,200	-	3,200
Chemical Wholesalers	1,835	-	-	8	1,843	200	2,043
Stone/Clay/Glass	-	-	-	93	93	-	93
TOTAL	582,629	154,881	24,546,529	1,022,831,496	1,048,115,535	393,646	1,048,509,181

Releases by Borough or Census Area (pounds)

Borough/Census Area	Air Releases	Surface Water Discharges	Underground Injection	On-site Land Releases	Total On-site Releases	Off-site Releases	Total On and Off-Site Releases
Northwest Arctic	379,196	2,323	-	989,010,992	989,392,511	38	989,392,549
Juneau	22,267	267	24,546,529	22,487,417	47,056,479	-	47,056,479
Fairbanks North Star*	88,123	150,808	-	11,113,493	11,352,424	390,556	11,742,980
Denali*	4,959	-	-	141,445	146,404	73	146,477
Kenai Peninsula	57,507	1,332	-	177	59,016	25	59,041
Anchorage Municipality	14,090	131	-	39,015	53,236	2,489	55,725
Southeast Fairbanks (Ft. Greeley)	26	-	-	38,870	38,896	-	38,896
Ketchikan Gateway	9,362	-	-	-	9,362	243	9,605
Aleutians West	3,893	-	-	-	3,893	165	4,058
Aleutians East	3,200	-	-	-	3,200	-	3,200
Kodiak Island	7	20	-	87	113	58	171

(See table footnotes on the following page.)

Releases by Facility (pounds)

Industry	Facility	Location	On-site Releases	Off-site Releases	Total On and Off-Site Releases
Metal Mining	Red Dog Operations	Kotzebue	989,392,511	38	989,392,549
Metal Mining	Hecla Greens Creek Mining Co	Juneau	47,043,742	-	47,043,742
Metal Mining	Pogo Mine	Delta Junction	8,362,278	150	8,362,428
Metal Mining	Fort Knox Mine	Fairbanks	2,611,142	-	2,611,142
Metal Mining	Coeur Alaska Inc. Kensington Gold Project	Juneau	12,737	-	12,737
No TRI NAICS code	U.S. Army Fort Wainwright Cantonment	Fort Wainwright	177,113	-	177,113
No TRI NAICS code*	Doyon Utilities Fort Wainwright	Fort Wainwright	41,260	3	41,263
No TRI NAICS code	U.S. DOD USAF Eielson Air Force Base	Eielson AFB	125,744	-	125,744
No TRI NAICS code	U.S. DOD Joint Base Elmendorf-Richardson	Elmendorf AFB	38,949	1,970	40,919
No TRI NAICS code	U.S. Army Donnelly Training Area	Delta Junction	38,896	-	38,896
No TRI NAICS code	U.S. DOD USAF Eareckson Air Station	Shemya Island	3,893	165	4,058
No TRI NAICS code	Denali National Park & Preserve	Denali Nat'l Park	236	-	236
No TRI NAICS code	U.S. DOD USAF Clear Air Force Station	Clear	189	47	236
No TRI NAICS code	U.S. Coast Guard Base Kodiak	Kodiak	113	58	171
No TRI NAICS code	Doyon Utilities Fort Greely	Fort Greely	1	-	1
Electric Utilities	Aurora Energy LLC	Fairbanks	1,009	390,403	391,412
Electric Utilities*	Golden Valley Electric Association Healy Power Plant	Healy	4,726	26	4,752
Electric Utilities	Golden Valley Electric Association North Pole Power Plant	North Pole	78	-	78
Coal Mining [‡]	Usibelli Coal Mine Inc.	Healy	141,252	-	141,252
Petroleum	Tesoro Alaska - Kenai Refinery	Kenai	56,228	25	56,253
Petroleum	Flint Hills Resources Alaska LLC	North Pole	33,782	-	33,782
Petroleum	Emulsion Products Co - North Pole Facility	North Pole	17	-	17
Petroleum	Petro Star Inc North Pole Refinery	North Pole	-	-	-
Petroleum	Petro Star Valdez Refinery	Valdez	-	-	-
Petroleum Bulk Terminals	Flint Hills Resources Alaska LLC Anchorage Terminal	Anchorage	9,499	-	9,499
Petroleum Bulk Terminals	Tesoro Logistics Group LLC Anchorage Terminal	Anchorage	2,852	319	3,171
Petroleum Bulk Terminals	Kenai Pipeline Co - KPL Facility	Kenai	1,924	-	1,924
Petroleum Bulk Terminals	Tesoro Alaska Co - Nikiski Terminal	Kenai	864	-	864
Transportation Equipment	Alaska Ship & Drydock	Ketchikan	9,362	-	9,362
Transportation Equipment	U.S. Coast Guard BSU Ketchikan	Ketchikan	-	243	243
Food/Beverages/Tobacco	Trident Seafoods Corp Akutan Shore Plant	Akutan	3,200	-	3,200
Food/Beverages/Tobacco	Unisea Inc	Dutch Harbor	-	-	-
Chemical Wholesalers	Univar USA Inc	Anchorage	1,843	200	2,043
Chemical Wholesalers	Brenntag Pacific Inc	Fairbanks	-	-	-
Stone/Clay/Glass	Anchorage Sand & Gravel Co Inc	Anchorage	93	-	93

* Certain electricity-generating facilities transfer coal ash to other facilities for disposal. That disposal is reported both as off-site releases by the generating facilities and on-site releases by the receiving facilities. To avoid double counting of these releases, off-site disposal quantities have been reduced for the marked industry, area or facility. Corresponding quantities in EPA's TRI database will be larger because they have not been similarly adjusted.

‡ These releases are associated with coal ash produced by an electric utility (GVEA - Healy) and disposed of in a landfill on a coal mining facility (Usibelli). They are not directly associated with coal mining.

FOR MORE INFORMATION

Public Data Releases

Each year, the EPA releases the prior calendar year's TRI data to the public in the form of a national analysis, regional reports, state fact sheets, and updates to online databases. These resources provide summaries, analyses, raw data, and a variety of tools for exploring patterns and trends in TRI releases by geography, industry sector, facility, chemical, and type of release or other waste management.

The annual TRI National Analysis presents EPA's interpretation of the year's data, providing national-scale information on how toxic chemicals were managed, where they ended up, and how the year compares to previous years. EPA's electronic State Fact Sheets summarize the reporting year's TRI data for each state by type of release, disposal, and waste management. An interactive map links to details about reporting facilities and industry sectors, chemicals released, and census data. The 2011 national analysis and state fact sheets, as well as other analyses, raw data files, and online tools for viewing and analyzing TRI data, are available at:

www.epa.gov/tri/tridata/tri11/nationalanalysis/index.htm

EPA's Pacific Northwest regional office (EPA Region 10) publishes a State Report for Alaska that offers a look at recent trends in TRI releases and identifies the largest releases by facility, industry and chemical. The report, along with TRI information for the broader Pacific Northwest region, is available at:

yosemite.epa.gov/R10/owcm.nsf/TRI/tri

Contacts

EPA Region 10 TRI Program Manager

Gabriela Carvalho
USEPA Region 10
1200 6th Avenue, Suite 900, OCE-164
Seattle, WA 98101
phone: (206) 553-4016
fax: (206) 553-7176
Carvalho.Gabriela@epa.gov

State of Alaska TRI Coordinator

Camille Stephens
Department of Environmental Conservation
410 Willoughby Ave, Ste 303
PO Box 111800
Juneau, AK 99811-1800
phone: (907)465-5242
fax: (907) 465-2237
Camille.Stephens@alaska.gov

Online Access

The entire Toxics Release Inventory database is published by EPA and is available on the web at:

www.epa.gov/tri/tridata/index.htm

For information concerning environmental regulatory programs administered by the Alaska Department of Environmental Conservation, visit the DEC website at:

www.dec.alaska.gov