

Recent Enhancements to TOXMAP: an Environmental Health GIS

**2008 ESRI Federal
User Conference
February 21, 2008**

<http://toxmap.nlm.nih.gov>



**National Institutes of Health, U.S. Dept. of Health
and Human Services**



Authors

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National Library of Medicine (NLM)
TOXMAP Project Officer
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Aquilent, Inc.
Technical Lead

National Library of Medicine

Located at the National Institutes of Health in Bethesda, Maryland




National Library of Medicine




Overall Goals

- Organize and provide access to health-related information
- Encourage use of high-quality information by health professionals and the public
- Conduct and support informatics research

www.nlm.nih.gov



United States
National Library of Medicine
National Institutes of Health




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MedlinePlus®
Health and drug information for patients, family and friends
[VISIT SITE](#)
[ESPAÑOL](#)



NIH SeniorHealth
The health Web site for older adults
[VISIT SITE](#)

Current Health News

[Blood Transfusions at Birth Often Unneeded](#)
(11/15/04)

[Paxil Appears to Be Effective for OCD in Kids](#)
(11/15/04)

[Response to Hepatitis C Therapy Can Last for Years](#)
(11/15/04)

[More Health News](#)

NLM News and Press



Tox Town

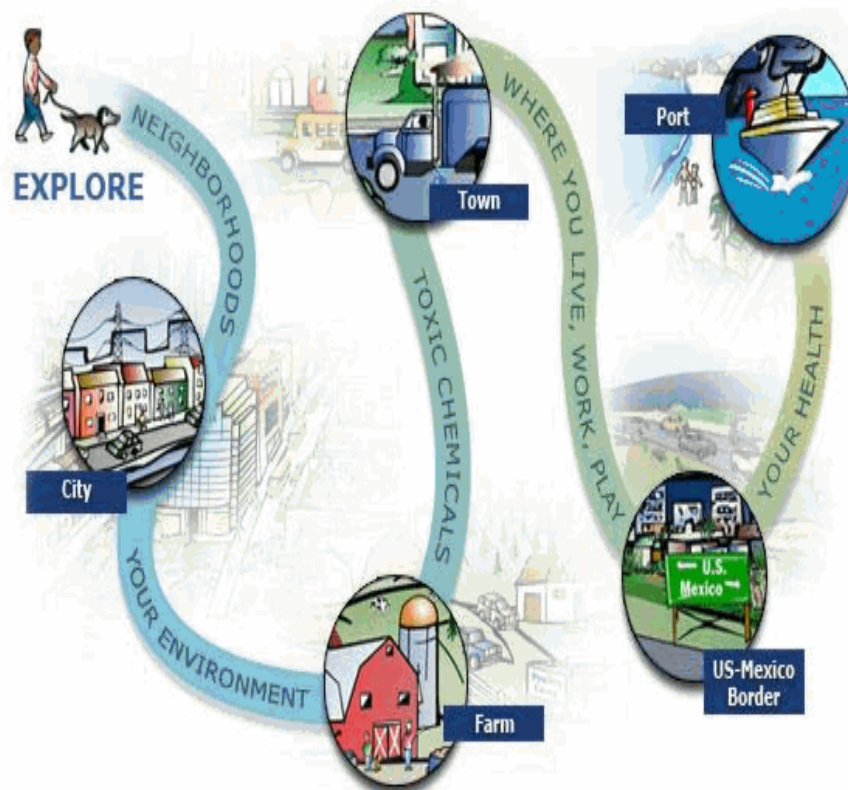
Environmental health concerns and
toxic chemicals where you live, work, and play

Search

Home Text Version Español Neighborhoods Locations Chemicals A-Z Index A-Z Disasters For Teachers What's New Site Map

Browse

- ▼ Brands
- ▼ Active Ingredients
- ▼ Manufacturers



January is National Radon Action Month

- Learn about [radon](#)

I want to...

- Explore Tox Town [neighborhoods](#)
- Find toxic [chemicals](#) and hazardous substances
- Find topics about [health and the environment](#)
- Find [classroom resources](#)

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U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894
1-888-FIND-NLM

[National Institutes of Health](#) [Department of Health & Human Services](#)

Developed by [Specialized Information Services](#), Environmental Health and Toxicology

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We subscribe to the [HONcode principles](#) of the [Health On the Net Foundation](#). Accredited 06/2007.

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TOXNET

toxnet.nlm.nih.gov

**Hazardous
Substances
Databank**

**TOXLINE
Toxicology
Bibliographic
Data**

**Toxics
Release
Information**

The screenshot shows the TOXNET website with the following elements:

- Header:** United States National Library of Medicine (NLM) logo and TOXNET Toxicology Data Network title.
- Navigation:** Links for TOXNET PDA Access, SIS Home, About Us, Site Map & Search, and Contact Us.
- TOXNET Description:** Databases on toxicology, hazardous chemicals, environmental health, and toxic releases.
- Select Database:** A list of databases with checkboxes:
 - ChemIDplus
 - HSDB
 - TOXLINE
 - CCRIS
 - DART
 - GENETOX
 - IRIS
 - ITER
 - Multi-Database
 - TRI
 - Haz-Map
 - Household Products
 - TOXMAP
- Search All Databases:** A search box with the text "Enter term(s) to search all databases." and buttons for Search, Clear, and Help.
- TOXNET Search Options:** A box with instructions:
 - Search all databases: Enter term(s) in box above
 - Search a specific database: Click database at left
 - Database description: Click on the [?] icon
- Env. Health & Toxicology:** A section with a "VISIT SITE" button and text: "Portal to environmental health and toxicology resources."
- Support Pages:** A list of links:
 - Help
 - TOXNET FAQ
 - TOXNET Update Status
 - Fact Sheet
 - Database Description
 - Training Manuals
 - News
- Footer:** Copyright, Privacy, Accessibility; U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894; National Institutes of Health, Health & Human Services.

Annotations on the left side of the slide point to specific databases in the "Select Database" list:

- A yellow arrow points from "Hazardous Substances Databank" to the "HSDB" database.
- A yellow arrow points from "TOXLINE Toxicology Bibliographic Data" to the "TOXLINE" database.
- An orange circle surrounds "Toxics Release Information", with a yellow arrow pointing from it to the "TRI" database.

Toxics Release Inventory (TRI)



Latitude: 29 degrees 53 minutes 6 seconds

Longitude: 95 degrees 24 minutes 42 seconds

TRI2003
1,2,4-TRIMETHYLBENZENE
EXXON MOBIL CORP N HOUSTON TERMINAL
HOUSTON, TX
For other data, click on the Table of Contents

Environmental Release of Chemical:

Non-Point Air Emissions Estimates:

Non-Point Air Release: 14 lbs./rep yr. 2003

Basis of Estimate: (O) Other Approaches

Point Air Emissions Estimates:

Point Air Release: 15 lbs./rep yr. 2003

Basis of Estimate: (O) Other Approaches

Total Air Release: 29 lbs./rep yr. 2003

The screenshot displays the Toxics Release Inventory (TRI) web interface. At the top, there are navigation buttons: "Next Item", "Search Results", "New Search", "Details", "Other Files", "Modify Search", "Previous Item", "Download", "Browse Index", and "Help". A "Toxics Release Inventory TRI2003" banner is on the left. On the right, it says "Item 7 of 801" and "TOXNET Home". Below the banner, there's a "Contents" section with a list of links: "FULL RECORD", "Facility Identification", "Substance Identification", "Environmental Release of Chemical", "Waste Treatment", "Off-Site Waste Transfer", "Source Reduction and Recycling", and "Administrative Information". Each link has a checkbox and a magnifying glass icon. To the right of the "Contents" section, there's a "Map it with TOXMAP" button. The main content area on the right shows the title "TRI2003 1,2,4-TRIMETHYLBENZENE EXXON MOBIL CORP N HOUSTON TERMINAL HOUSTON, TX" and a link to "For other data, click on the Table of Contents". Below this, there's a "Facility Identification:" section with the following information: "Facility Name/Address: EXXON MOBIL CORP N HOUSTON TERMINAL 8700 N FWY HOUSTON, (HARRIS County) TX 77037", "EPA Facility Number: 77037XXNC8700N", "EPA Region: 6", "Federal Facility Status: Commercial", and "Covered Facility: 0". At the bottom left of the screenshot, there's a link to the "U.S. National Library of Medicine" and other related information.



Quick Search

Select Dataset(s):

☒ TRI ☒ Superfund NPL

Chemical Name

City

State ZIP [Lookup]

— ▾

Search

Clear

[Choose a region...](#)

[More search options...](#)

[Search TOXNET TRI](#)

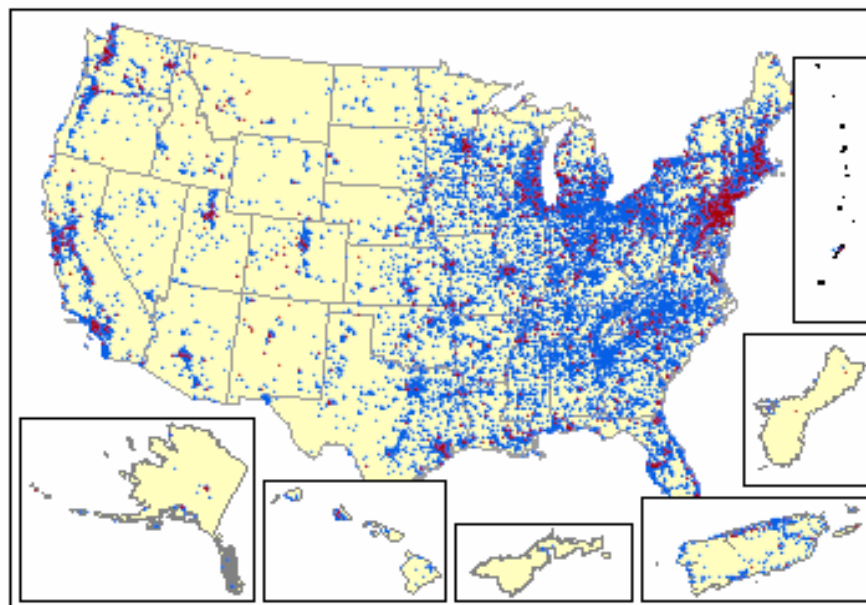
? [What is TOXMAP?](#)

? [What is the Toxics Release Inventory \(TRI\)?](#)

? [What is the "Superfund" Program?](#)
[more...](#)

Enter search terms or click on a map below

to explore data from the [EPA's Toxics Release Inventory \(TRI\)](#) and the [Superfund National Priorities List \(NPL\)](#).



[TRI facilities](#) (blue) and [Superfund NPL sites](#) (red).

- [New health data, roads in TOXMAP](#)

- [New in TOXMAP: more search options, geographic regions](#)

[Does TOXMAP show all sources of toxic](#)

- [chemicals released into or present in the environment?](#)

- [What data sources does TOXMAP use?](#)

- [What are some tips for reading maps critically?](#)



VISIT SITE

Portal to
environmental
health and
toxicology
resources



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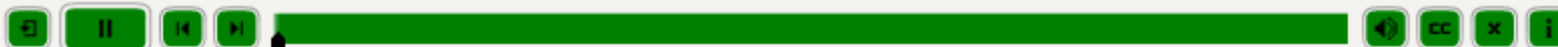
[? Whom do I contact with questions and/or suggest more...](#)

TOXMAP Basics

This movie runs automatically and lasts 12 minutes.

Click the CC button on the green playback bar for closed captioning.

SIS Specialized Information Services



[Home](#)[TRI Facilities](#)[TRI Releases](#)[TRI Trends](#)[Superfund](#)[Combo](#)[Search](#)[Help](#)[Welcome](#)[News](#)[Accessibility](#)[Fact Sheet](#)[For Teachers](#)[Tour](#)[About](#)[Site Map](#)

Quick Search

Select Dataset(s):

☒ TRI ☒ Superfund NPL

Chemical Name

City

State ZIP (Lookup)

— ▾

Search

Clear

[Choose a region...](#)

[More search options...](#)

[Search TOXNET TRI](#)

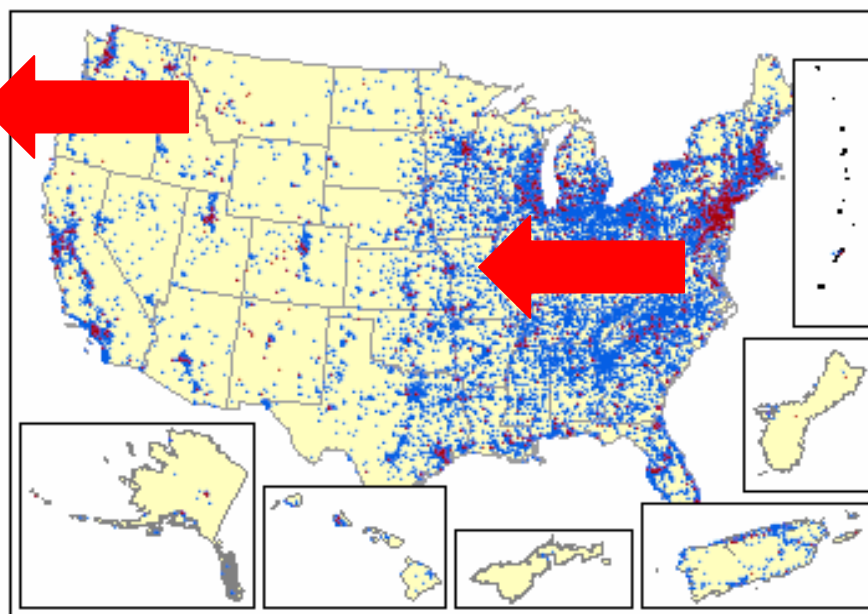
[? What is TOXMAP?](#)

[? What is the Toxics Release Inventory \(TRI\)?](#)

[? What is the "Superfund" Program? more...](#)

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More Chemical Information

- [NLM](#) ?
- [CDC](#) ?

Toxicology Articles for this this Map

[Search TOXLINE](#) ?

- ? [What is the Toxics Release Inventory \(TRI\)?](#)
- ? [What is the "Superfund" Program?](#)
- ? [Does TOXMAP show all sources of toxic chemicals released into or present in the environment?](#)
- ? [What data sources does TOXMAP use?](#)
- ? [Whom do I contact with questions and/or suggestions?](#) [more...](#)

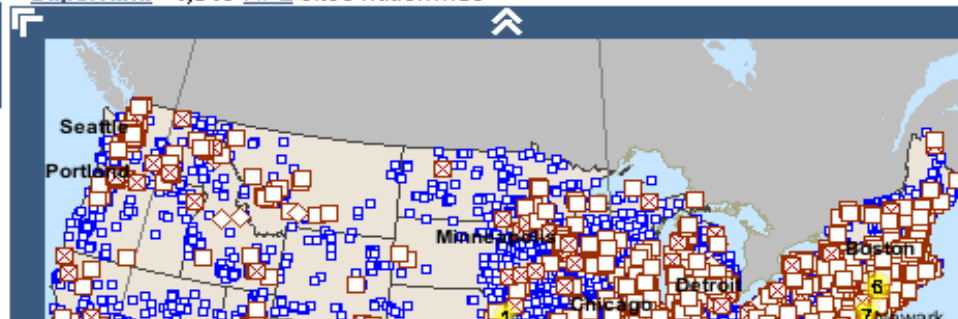
Search Results [\[Edit Search\]](#)

[Start over](#)

All TRI Reporting Facilities: All Chemicals

[TRI](#) - 50,873 TRI facilities reporting nationwide between 1987-2005

All Superfund NPL Sites: All Chemicals

[Superfund](#) - 1,619 [NPL](#) sites nationwide[Print this map](#)**ZOOM**

out

-

in

+

ZOOM TO

Apply to this map

- [U.S. Census Data](#) ?
- [Income Data](#) ?
- [Health Data](#) ?
- [Population Density](#) ?

[See details for this map](#)[Superfund Sites](#) ?

TRI ?

- ☐ None
- ☒ Facilities
- ☐ Releases : 2005
- ☐ Trends

Superfund ?

- ☐ None
- ☒ All NPL
- ☐ NPL Final
- ☐ NPL Deleted
- ☐ NPL Proposed

Demographic ?

- ☒ None
- ☐ Population Density - 2000

[Apply other demographics](#)[Search chemical](#) | [Define a combo map](#) | [Start over](#)

Legend [\[brief | detailed\]](#)

☐ TRI Facility☐ [NPL Final](#)☐ [NPL Deleted](#)☐ [NPL Proposed](#)



United States
National Library
of Medicine

TOXMAP

Environmental Health e-Maps

[Home](#)[TRI Facilities](#)[TRI Releases](#)[TRI Trends](#)[Superfund](#)[Combo](#)[Search](#)[Help](#)[Welcome](#)[News](#)[Accessibility](#)[Fact Sheet](#)[For Teachers](#)[Tour](#)[About](#)[Site Map](#)

Quick Search

Select Dataset(s):

☒ TRI ☐ Superfund NPL

Chemical Name

City

Galveston

State ZIP [Lookup]

TX

Search

Clear

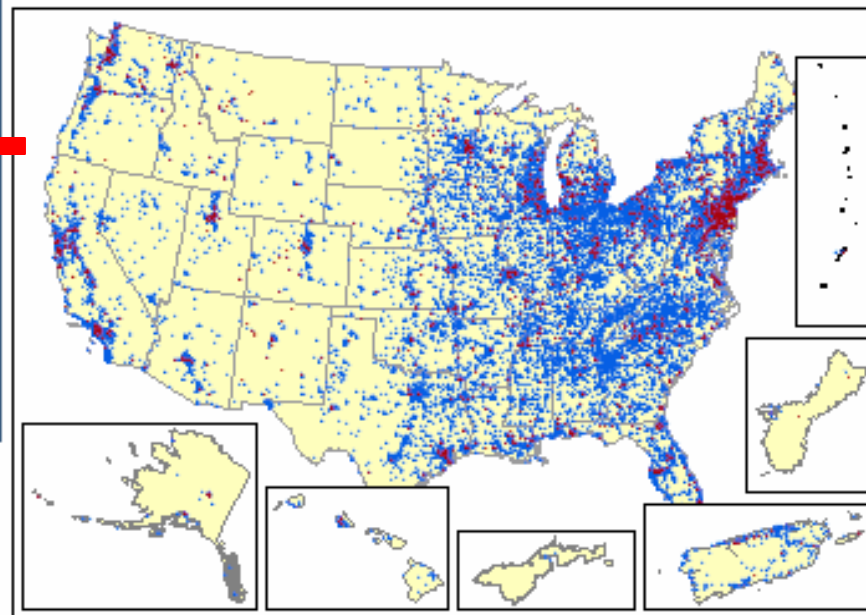
[Choose a region...](#)

[More search options...](#)

[Search TOXNET TRI](#)

Enter search terms or click on a map below

to explore data from the [EPA's Toxics Release Inventory \(TRI\)](#) and the [Superfund National Priorities List \(NPL\)](#).



[TRI facilities](#) (blue) and [Superfund NPL sites](#) (red).

- [New health data, roads in TOXMAP](#)

- [New in TOXMAP: more search options, geographic regions](#)

Does TOXMAP show all sources of toxic

- [chemicals released into or present in the environment?](#)

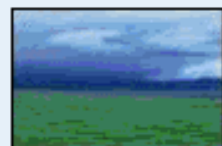
- [What data sources does TOXMAP use?](#)

- [What are some tips for reading maps critically?](#)

? [What is TOXMAP?](#)

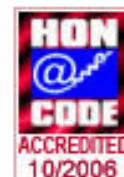
? [What is the Toxics Release Inventory \(TRI\)?](#)

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[more...](#)



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More Chemical Information

- [NLM](#) ?
- [CDC](#) ?

[List of TRI chemicals](#)

Toxicology Articles for this this Map

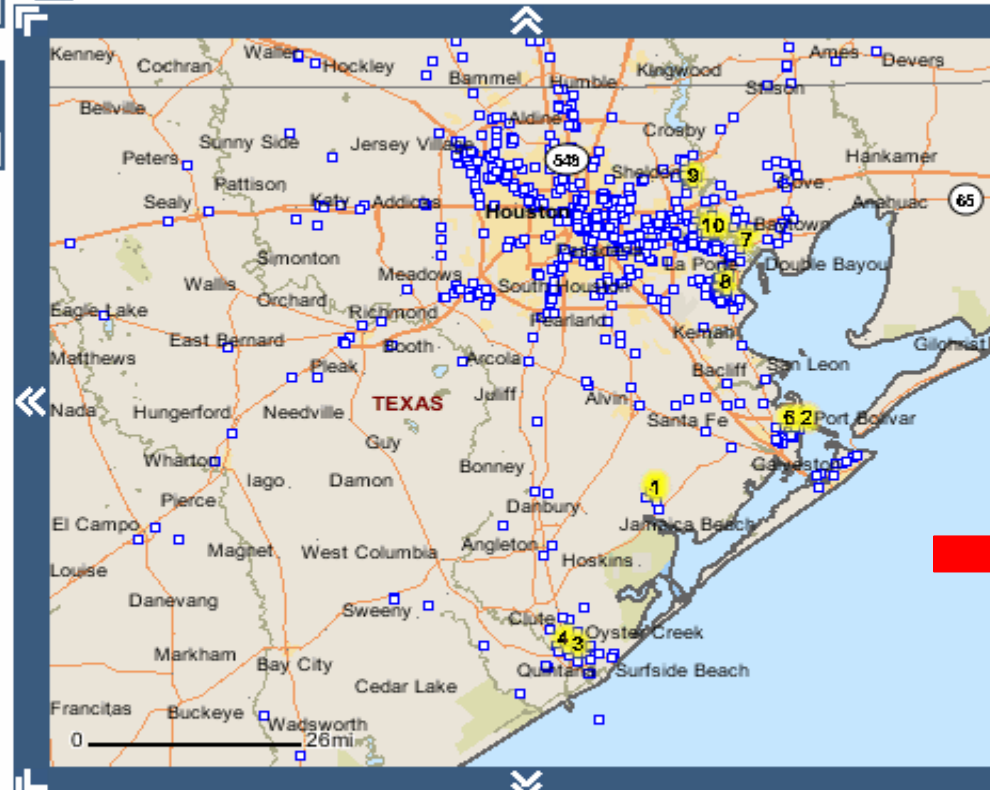
[Search TOXLINE](#) ?

- ? [What is the Toxics Release Inventory \(TRI\)?](#)
- ? [How accurate are TRI locations in TOXMAP?](#)
- ? [Whom do I contact with questions and/or suggestions? more...](#)

Search Results [\[Edit Search\]](#)

All TRI Reporting Facilities: All Chemicals

TRI - Map shows **731** of **50,873** TRI facilities reporting nationwide between 1987-2005

[Start over](#)[Print this map](#)

ZOOM TO
- [dropdown]
Zoom to a place

Switch to
small map

Apply to this map

- [Income Data](#) ?
- [Health Data](#) ?
- [Reference Data](#) ?

See details for this map

Facilities reporting to TRI ?

[Hide list](#)

Page 1 of 74

Go to page [input]

- (731 facilities total)
1. [MONSANTO CHOCOLATE BAYOU](#)
 2. [STERLING CHEMICALS INC.](#)
 3. [DOW CHEMICAL CO FREEPORT FACILITY](#)
 4. [BASF CORP](#)
 5. [SOLUTIA CHOCOLATE BAYOU](#)
 6. [BP TEXAS CITY REFINERY](#)
 7. [EXXONMOBIL REFINING & SUPPLY BAYTOWN REFINERY](#)
 8. [CELANESE LTD. CLEAR LAKE PLANT](#)
 9. [LYONDELL CHEMICAL CO](#)
 10. [ROHM & HAAS TEXAS INC](#)

MAP CONTROLS

TRI ?

- ☐ None
- ☒ Facilities
- ☐ Releases : 2005
- ☐ Trends

Superfund ?

- ☒ None
- ☐ All NPL
- ☐ NPL Final
- ☐ NPL Deleted
- ☐ NPL Proposed

Demographic ?

- ☒ None
- ☐ Population Density - 2000

[Apply other demographics](#)[Define a combo map](#) | [Start over](#)

3. SHELL CHEMICAL CO

5900 HIGHWAY 225
DEER PARK, TX 77536

[Google Maps](#)

TRI Facility ID: 77536SHLLLHIGHW

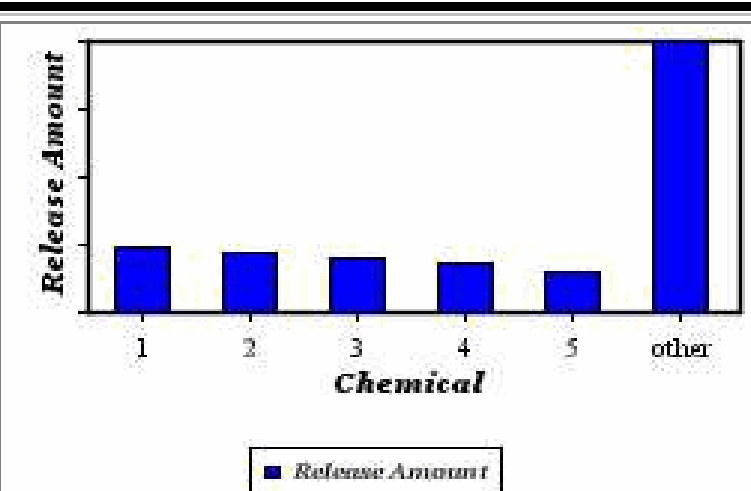
[top](#)

Latitude[?]: 29° 43' 21" N

Longitude: 95° 6' 60" W

Emissions Estimates:

This facility last reported in 2005.

Chemical (summary table)	Release Amount (lbs./all years)	% [*]	Distribution By Chemical ^{**}
1) Toluene	9,066,947	11.7%	
2) Phenol	8,445,341	10.9%	
3) Sodium sulfate (solution)	7,800,000	10.1%	
4) Methyl ethyl ketone	7,088,910	9.2%	
5) Benzene	5,827,008	7.5%	
6) Other chemicals	39,028,741	50.5%	
TOTAL	77,256,947		

^{*} Percents may not add to 100 because of rounding.

^{**} Small values may not be visible on chart. Refer to the Emissions Estimates table. Mouseover bars for release percentages.

[▶ All chemicals reported by this facility](#)

[▶ Releases summary table for this facility](#)



TOXMAP Chemical Page



Benzene (71-43-2) ←

More Chemical Information

NLM ? ←

- [Toxicology Databases](#)
- [Human Health Effects](#)
- [Manufacturing/Use Info](#)
- [Env. Fate / Exposure](#)

CDC ? ←

- [ToxFAQs](#)
- [Public Health Assessments](#)
- [All Documents](#)

[About Chemicals and Toxicity](#)

[close window](#)

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[Start over](#)

More Chemical Information

NLM ?

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- [Human Health Effects](#)
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CDC ?

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List of TRI chemicals

Toxicology Articles for this Chemical and Map

[Search TOXLINE ?](#)

- ? [What TRI chemicals are mapped in TOXMAP?](#)
- ? [Does TOXMAP show all sources of toxic chemicals released into the environment?](#)
- ? [How accurate is TRI data?](#)
- ? [What should I understand about chemicals and toxicity while using TOXMAP?](#)
- ? [Whom do I contact with questions and/or suggestions?](#)
- [more...](#)

Search Results [\[Edit Search\]](#)

Benzene (71-43-2)



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TOXNET

Toxicology Data Network

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[Env. Health & Toxicology](#) |
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TOXNET - Databases on toxicology, hazardous chemicals, environmental health, and toxic releases.

Select Database

- [ChemIDplus](#) ?
- [HSDB](#) ?
- [TOXLINE](#) ?
- [CCRIS](#) ?
- [DART](#) ?
- [GENETOX](#) ?
- [IRIS](#) ?
- [ITER](#) ?
- [LactMed](#) ?
- [Multi-Database](#) ?
- [TRI](#) ?
- [Haz-Map](#) ?
- [Household Products](#) ?
- [TOXMAP](#) ?

Env. Health & Toxicology



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Support Pages

Search All Databases

Benzene

(e.g. asthma, air pollution, ibuprofen fever, vinyl chloride)

[Search](#)

[Clear](#)

[Help](#)

References from Biomedical Literature

TOXLINE	Toxicology Literature Online	24754
DART	Developmental Toxicology Literature	489

Chemical, Toxicological, and Environmental Health Data

ChemIDplus	Chemical Identification/Dictionary	1
HSDB	Hazardous Substances Data Bank	1846
CCRIS	Chemical Carcinogenesis Information	13
GENETOX	Genetic Toxicology Data	352
IRIS	Integrated Risk Information	23
ITER	International Toxicity Estimates for Risk	10
LactMed	Drugs and Lactation Database	0
TRI	Toxics Release Inventory	980
TOXMAP	Environmental Health e-Maps	Map It
Haz-Map	Occupational Exposure/Toxicology	Show me
Household	Health & Safety Information on Household	Show me

TRI Facilities (sorted by release amount)

1. BP TEXAS CITY REFINERY

TRI Facility ID: 77590MCLCM24015

[top](#)

2401 5TH AVENUE SOUTH
TEXAS CITY, TX 77590

[Google Maps](#)

Latitude[?]: 29° 22' 45" N

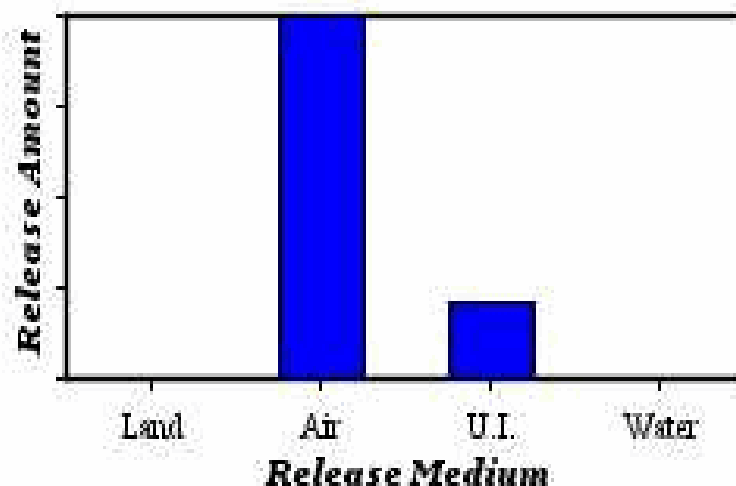
Longitude: 94° 55' 45" W

Emissions Estimates:

Benzene (71-43-2)

Release Medium	Release Amount (lbs./rep yr. 2005)
Air	111,038
Underground Injection	23,082
Water	99
TOTAL	134,219

Distribution By Medium^{*}



■ Release Amount

▶ [Details about this release](#)

▶ [All chemicals reported by this facility](#)

▶ [Releases summary table for this facility](#)

^{*} Small values may not be visible on chart. Refer to the Emissions Estimates table.



TOXNET

Toxicology Data Network



Home | Site Map & Search | Contact Us

Health & Toxicology > TOXNET > TOXLINE

TOXLINE Search Results

Benzene Texas Houston "

For chemicals, add synonyms and

More Chemical Information

NLM ?

- [Toxicology Databases](#)
- [Human Health Effects](#)
- [Manufacturing/Use Info](#)
- [Env. Fate / Exposure](#)

CDC ?

- [ToxFAQs](#)
- [Public Health](#)
- [Assessments](#)
- [All Documents](#)

List of TRI chemicals

Toxicology Articles

for this Chemical and Man

[Search TOXLINE ?](#)

limits

Yes ☐ No ☐

Query:

texas houston dallas "oklahoma tulsa "oklahoma national wildlife refuge "lower rio grande valley national seashore" "toxics release inventory" superfund npl "national priorities list" AND (mexico" OR mexico) AND (benzene OR pyrobenzole OR pyrobenzol OR "phenyl hydride" OR phene OR fenzen OR cyclohexatriene OR "coal naphtha" OR benzolo OR benzole OR benzol OR benzen OR benzeen OR 71-43-2 [m]) AND (austin OR 61103-89-7 [m])

th" "el paso" arlington
uerque "brazoria
national wildlife refuge"
"padre island
superfund npl

Save
Checked Items

Sort

Details

History

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Modify Search

Basic Search

Browse Index

Help

TOXNET Home

More Chemical Information

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- [Human Health Effects](#)
- [Manufacturing/Use Info](#)
- [Env. Fate / Exposure](#)

CDC ?

- [ToxFAQs](#)
- [Public Health Assessments](#)
- [All Documents](#)

List of TRI chemicals

Toxicology Articles for this Chemical and Map

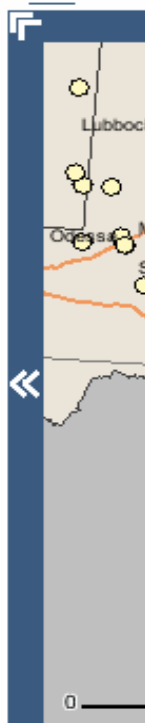
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- [What should I understand about chemicals and toxicity while using TOXMAP?](#)
- [Whom do I contact with](#)

Search Results [\[Edit Search\]](#)

Benzen

[TRI](#) - Map



TRI ?

- ☐ None
- ☐ Facilities
- ☒ Releases
- ☐ Trends

1. BP TEXAS CITY REFINERY

2401 5TH AVENUE SOUTH
TEXAS CITY, TX 77590

[Google Maps](#)

TRI Facility ID: 77590MCLCM24015

[top](#)

Latitude: 29° 22' 45" N

Longitude: 94° 55' 45" W

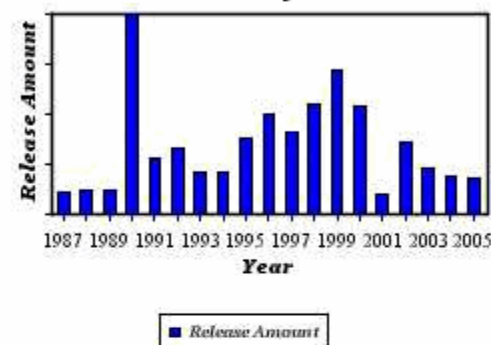
Emissions Estimates:

Benzen (71-43-2)

Year	Release Amount (lbs./rep yr.)
1987	80,025
1988	84,395
1989	86,980
1990	746,695
1991	204,410
1992	246,240
1993	155,817
1994	155,411
1995	282,040
1996	367,001
1997	306,000
1998	406,000
1999	536,000
2000	397,000
2001	75,862
2002	266,333
2003	169,065
2004	140,464
2005	134,219
Release Amount Change	127,211 decrease

- [All chemicals reported by this facility](#)
- [Releases summary table for this facility](#)

Distribution By Year*



* Small values may not be visible on chart. Refer to the Emissions Estimates table. Mouseover bars for release percentages.

More Superfund Information

- [EPA Superfund](#) ?
- [NIEHS Superfund](#) ?

List of Superfund contaminants

[Toxicology Articles for this Chemical and Map](#)
[Search TOXLINE](#) ?

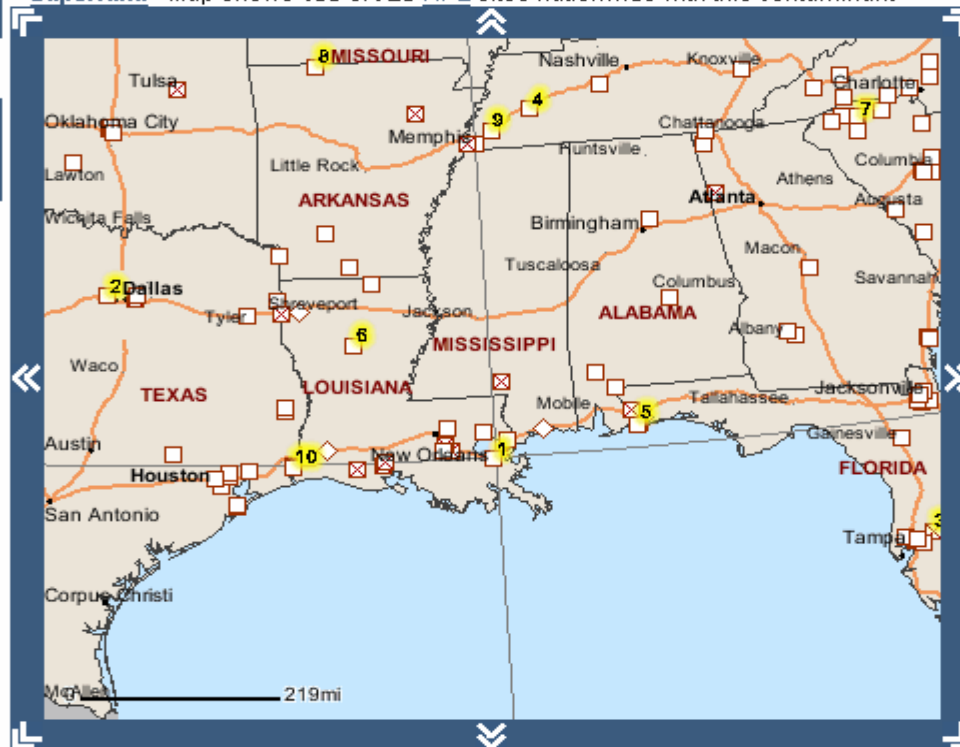
- ? [What is the "Superfund" Program?](#)
- ? [What kinds of chemicals are found at Superfund sites?](#)
- ? [What is the "National Priorities List" \(NPL\)?](#)
- ? [Whom do I contact with questions and/or suggestions? more...](#)

Search Results [\[Edit Search\]](#)

Benzene (71-43-2)

Superfund - Map shows **103** of **720** NPL sites nationwide with this contaminant

[Print this map](#)



ZOOM
 out
 in
 +
 -

ZOOM TO
 -
 Zoom to a place

Switch to small map

Apply to this map

- [U.S. Census Data](#) ?
- [Income Data](#) ?
- [Health Data](#) ?
- [Reference Data](#) ?

See details for this map

Superfund Sites ?

[Hide list](#)

Page 1 of 11

Go to page

(103 sites total)

1. [AGRICULTURE STREET LANDFILL](#)
2. [AIR FORCE PLANT #4 \(GENERAL DYNAMICS\)](#)
3. [ALPHA CHEMICAL CORP.](#)
4. [AMERICAN CREOSOTE WORKS, INC. \(JACKSON PLANT\)](#)
5. [AMERICAN CREOSOTE WORKS, INC. \(PENSACOLA PLANT\)](#)
6. [AMERICAN CREOSOTE WORKS, INC. \(WINNFIELD PLANT\)](#)
7. [AQUA-TECH ENVIRONMENTAL INC \(GROCE LABS\)](#)
8. [ARKWOOD, INC.](#)
9. [ARLINGTON BLENDING & PACKAGING](#)
10. [BAILEY WASTE DISPOSAL](#)

MAP CONTROLS

TRI ?

- ☒ None
- ☐ Facilities
- ☐ Releases : 2005
- ☐ Trends

Superfund ?

- ☐ None
- ☒ All NPL
- ☐ NPL Final
- ☐ NPL Deleted
- ☐ NPL Proposed

Demographic ?

- ☒ None
- ☐ Population Density - 2000

[Apply other demographics](#)

[Search chemical](#) | [Define a combo map](#) | [Start over](#)

Legend [brief | [detailed](#)]

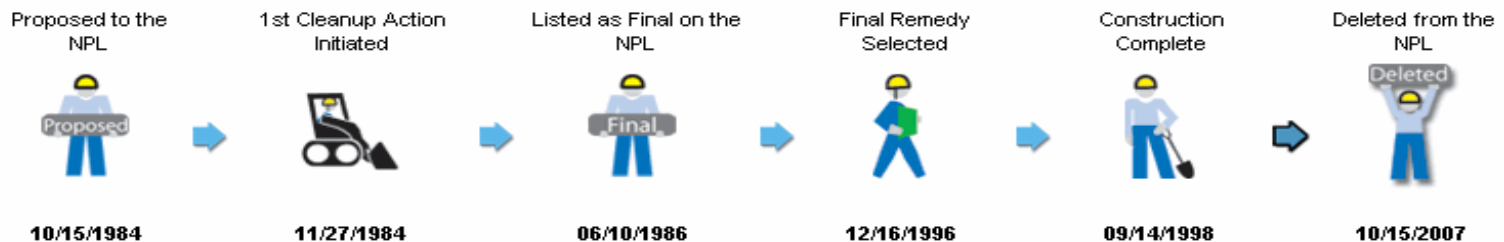
☐ NPL Final
 ☒ NPL Deleted
 ☐ NPL Proposed

Superfund Sites (sorted alphabetically)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 1		06/28/1988	02/19/1992	05/04/1998	
OU 0	12/11/1984				

Complete
 Underway

[view activities details >>](#)
[view OU details >>](#)
[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

[plans so that they can be actively involved in site cleanup decisions. Learn more about community involvement at this site >>](#)

More Chemical Information

NLM [?](#)

- [Toxicology Databases](#)
- [Human Health Effects](#)
- [Manufacturing/Use Info](#)
- [Env. Fate / Exposure](#)

CDC [?](#)

- [ToxFAQs](#)
- [Public Health Assessments](#)
- [All Documents](#)

List of TRI chemicals

Toxicology Articles for this Chemical and Map

[Search TOXLINE \[?\]\(#\)](#)

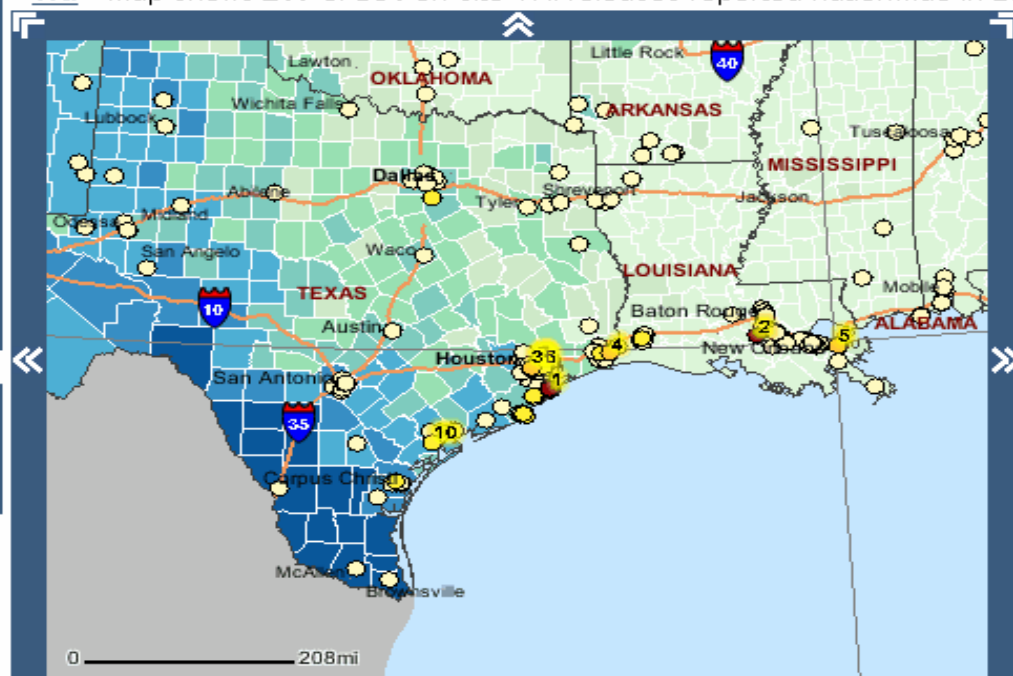
- [What TRI chemicals are mapped in TOXMAP?](#)
 - [Does TOXMAP show all sources of toxic chemicals released into the environment?](#)
 - [How accurate is TRI data?](#)
 - [What should I understand about chemicals and toxicity while using TOXMAP?](#)
 - [Whom do I contact with questions and/or suggestions?](#)
- more

Search Results [\[Edit Search\]](#)

Benzene (71-43-2)

[TRI](#) - Map shows **217** of **864** on-site TRI releases reported nationwide in 2002

[Print this map](#)



ZOOM

out
—
in
+

ZOOM TO

Zoom to a place

Switch to small map

Apply to this map

- [U.S. Census Data \[?\]\(#\)](#)
- [Income Data \[?\]\(#\)](#)
- [Health Data \[?\]\(#\)](#)
- [Reference Data \[?\]\(#\)](#)

See details for this map

Facilities reporting to TRI [?](#)

[Hide list](#)

Page 1 of 22

Go to page

(217 releases total)

- [BP TEXAS CITY REFINERY](#)
- [CLEAN HARBORS PLAQUEMINE LLC](#)
- [LYONDELL-CITGO REFINING LP](#)
- [NAFTA REGION OLEFINS COMPLEX](#)
- [CHALMETTE REFINING LLC](#)
- [EXXONMOBIL BAYTOWN CHEMICAL PLANT](#)
- [LYONDELL CHEMICAL CO](#)
- [EQUISTAR CHEMICALS](#)
- [SHELL CHEMICAL CO](#)
- [UNION CARBIDE CORP SEADRIFT PLANT](#)

MAP CONTROLS

TRI [?](#)

- ☐ None
- ☐ Facilities
- ☒ Releases : [2002](#)
- ☐ Trends

Superfund [?](#)

- ☒ None
- ☐ All NPL
- ☐ NPL Final
- ☐ NPL Deleted
- ☐ NPL Proposed

Demographic [?](#)

- ☐ None
- ☒ Hispanic or Latino Origin - All Races - 2000

[Apply other demographics](#)

[Search chemical](#) | [Define a combo map](#) | [Start over](#)

Legend [brief | [detailed](#)]



Surveillance Research

Cancer Control and Population Sciences

[Cancer Control and
Population Sciences Home](#)

[Surveillance Research](#)

Branches

[Cancer Statistics Branch](#)

[Statistical Research &
Applications Branch](#)



Need Help?

Contact us by phone,
Web, and e-mail
1-800-4-CANCER

> [Areas of Research](#)

- > [Surveillance, Epidemiology, and End Results \(SEER\)](#)
- > [SEER Expansion](#)
- > [Methods & Software for Population-Based Cancer Statistics](#)
- > [Geographic Information Systems](#)
- > [International Cancer Surveillance Activities](#)

> [About Surveillance Research](#)

- > [What is Cancer Surveillance?](#)
- > [Mission Statement](#)
- > [Program Advisory Reviews](#)
- > [Staff](#)
- > [Contact Information](#)

> [Current Research](#)

- > [Active Grant Portfolio](#)

> [Finding Cancer Statistics](#)

- > [What type of statistic do you need?](#)
- > [Statistical Tables, Graphs, and Maps](#)
- > [Reports on Cancer](#)
- > [Research Tools](#)
- > [Data Sources](#)

> [Health Disparities](#)

- > [The Network for Cancer Control Research Among American Indian/Alaska Natives Populations](#)
- > [Socioeconomic Status and Cancer](#)
- > [Native American Initiatives](#)
- > [Status of Cancer Surveillance in Minority and Underserved Populations](#)

> [Funding Opportunities](#)

- > [Apply for Grants](#)
- > [Application Information](#)
- > [Funding Archive](#)

> [Information & Resources](#)

- > [Related Links](#)
- > [Cancer Surveillance Research Implementation Plan](#)
- > [Studying Emerging Trends in Cancer](#)
- > [The Nation's Investment in Cancer Research: Plans and Priorities](#)

Search:

GO

News

[SRP Bulletins \(HTML and PDF\)](#)

[Job Opportunities](#)

[Administrative Supplements for
Dissemination of Surveillance
Research](#)

New Reports

[United States Cancer Statistics:
2004 Incidence and Mortality
1975-2004 Report to the Nation
on the Status of Cancer](#)

Data and Software

[SEER Data, 1973-2004](#)

[Statistics and Software
Releases with the SEER Data](#)

Key Initiatives

[Surveillance, Epidemiology, and
End Results \(SEER\)](#)

[Native American Initiatives](#)

[Cancer Intervention and
Surveillance Modeling Network
\(CISNET\)](#)

[Rapid Response Surveillance
Studies](#)

Mortality, Cancer 2000-2004

- All Malignant Cancers
- Bladder Cancer
- Brain and Other Nervous System Cancer
- Breast Cancer (Female only)
- Cancer of the Cervix Uteri (Female only)
- Colon and Rectum Cancer
- Cancer of the Esophagus
- Cancer of the Kidney and Renal Pelvis/Ureter/Other Urinary
- Leukemia
- Liver, Gallbladder, and Other Biliary Tract Cancer
- Cancer of the Lung and Bronchus
- Non-Hodgkin Lymphoma
- Cancer of the Oral Cavity and Pharynx
- Ovarian Cancer (Female only)
- Pancreatic Cancer
- Prostate Cancer (Male only)
- Cancer of the Rectum and Rectosigmoid Junction
- Stomach Cancer
- Cancer of the Uterus Corpus and Uterus NOS (Female only)
- Other and Unspecified Cancer

Mortality, Various Causes 2000-2004

- All Causes of Death
- All Malignant Cancers
- Diabetes
- Heart Disease
- HIV
- Liver Disease
- Pneumonia and Influenza
- Stroke

[Search](#)[Help](#)[r Data](#)[Download](#)

ot by itself imply an effect

More Chemical Information

NLM ?

- [Toxicology Databases](#)
- [Human Health Effects](#)
- [Manufacturing/Use Info](#)
- [Env. Fate / Exposure](#)

CDC ?

- [ToxFAQs](#)
- [Public Health](#)
- [Assessments](#)
- [All Documents](#)

List of TRI chemicals

**Toxicology Articles
for this Chemical and Map**
[Search TOXLINE ?](#)

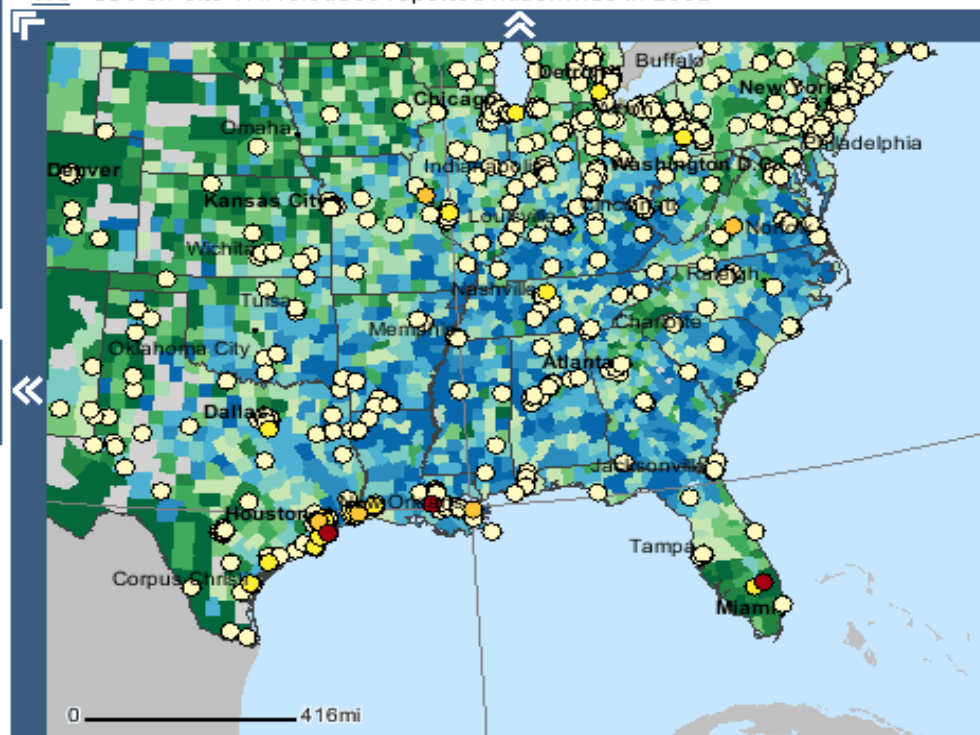
- ? [What TRI chemicals are mapped in TOXMAP?](#)
- ? [Does TOXMAP show all sources of toxic chemicals released into the environment?](#)
- ? [How accurate is TRI data?](#)
- ? [What should I understand about chemicals and toxicity while using TOXMAP?](#)
- ? [Whom do I contact with questions and/or suggestions? more...](#)

Search Results [\[Edit Search\]](#)

Benzene (71-43-2)

TRI - 864 on-site TRI releases reported nationwide in 2002

[Print this map](#)



Switch to small map

Apply to this map

- [U.S. Census Data ?](#)
- [Income Data ?](#)
- [Health Data ?](#)
- [Reference Data ?](#)

See details for this map

[Identify TRI releases](#)

Click on the Identify link above to see details for this map.

MAP CONTROLS

TRI ?

- ☐ None
- ☐ Facilities
- ☒ Releases : [2002](#)
- ☐ Trends

Superfund ?

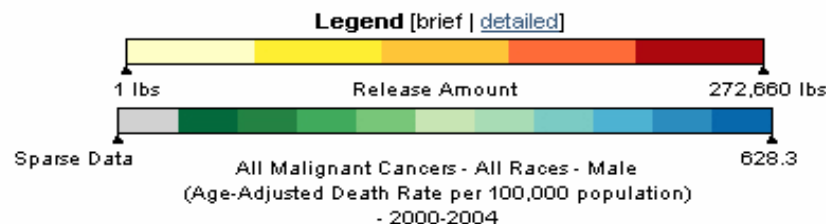
- ☒ None
- ☐ All NPL
- ☐ NPL Final
- ☐ NPL Deleted
- ☐ NPL Proposed

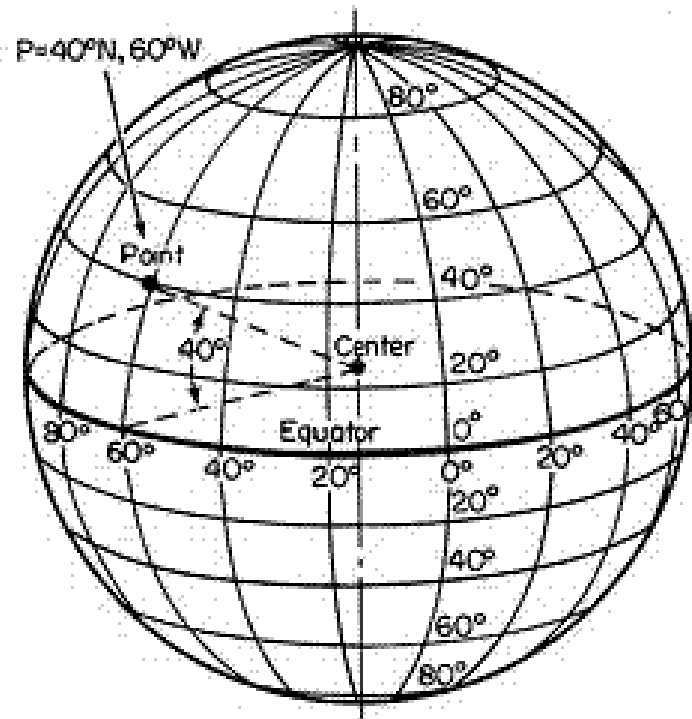
Demographic ?

- ☐ None
- ☒ All Malignant Cancers - All Races - Male - 2000-2004

[Apply other demographics](#)

[Search chemical](#) | [Define a combo map](#) | [Start over](#)





Geographic Regions

Quick Search

Select Dataset(s):
☒ TRI ☐ Superfund NPL

Chemical Name

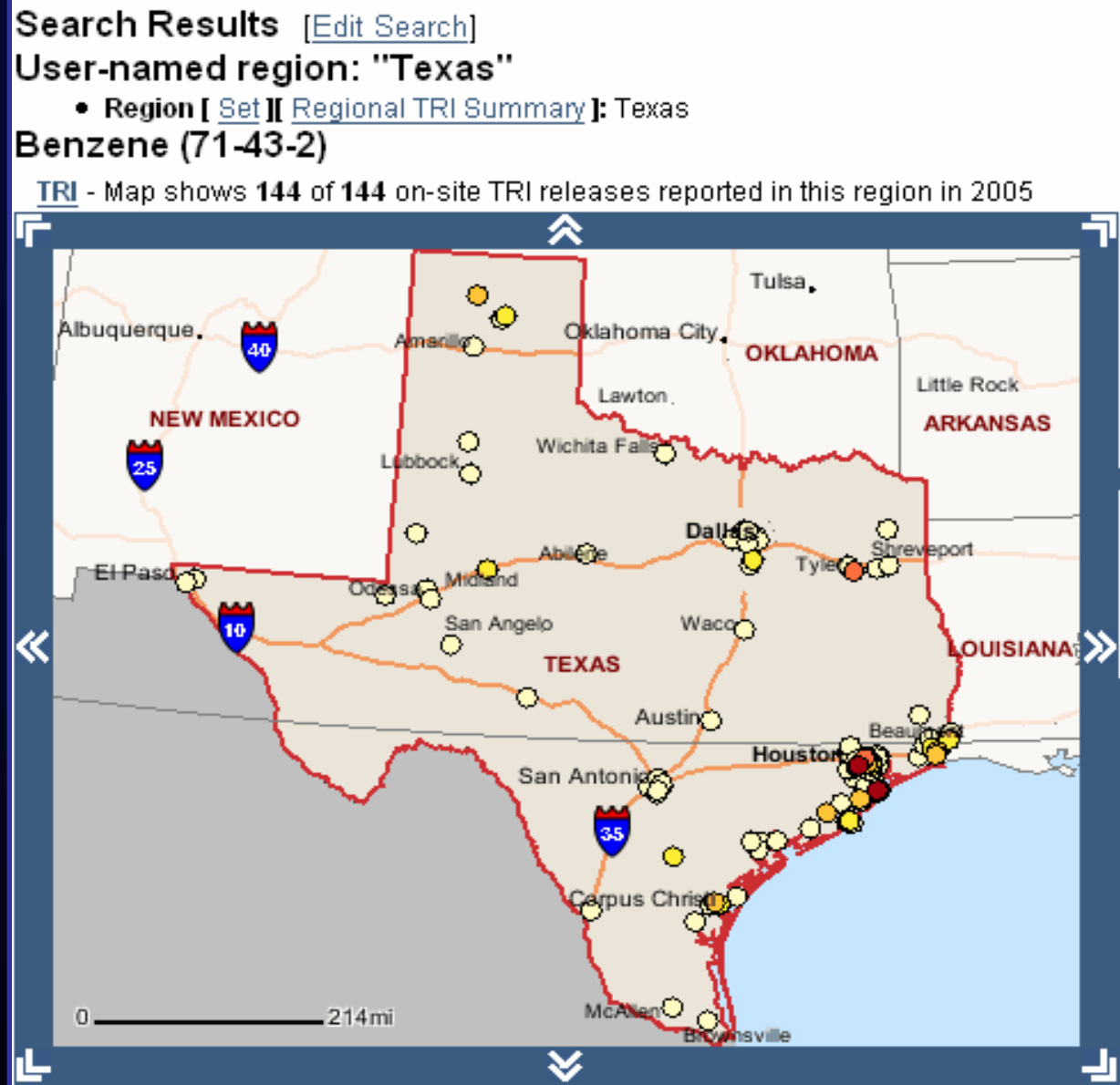
City

State ZIP [Lookup]
TX

Choose a region...

More search options...

Filter



User-Defined Region

Search Results [\[Edit Search\]](#)

User-named region: "Harris County, TX"

- **Region [[Set](#)] [Regional TRI Summary](#):** Harris County, TX

Benzene (71-43-2)

TRI - Map shows 36 of 37 on-site TRI releases reported in this region in 2005



Search Results [\[Edit Search\]](#)

User-named region: "DC Metro Area"

- Region [\[Set\]](#) [\[Regional TRI Summary\]](#): District of Columbia; plus 7 other counties

All TRI Reporting Facilities: All Chemicals

[TRI](#) - Map shows 97 of 97 TRI facilities reporting in this region between 1987-2005

All Superfund NPL Sites: All Chemicals

[Superfund](#) - Map shows 4 of 4 NPL sites in this region



[Home](#)[TRI Facilities](#)[TRI Releases](#)[TRI Trends](#)[Superfund](#)[Combo](#)[Search](#)[Help](#)[Search](#)[2005](#)[2004](#)[2003](#)[2002](#)[2001 & Earlier](#)[► Set Region](#)[Other Data](#)[Download](#)

? [What TRI chemicals are mapped in TOXMAP?](#)

? [Does TOXMAP show all sources of toxic chemicals released into the environment?](#)

? [How accurate is TRI data?](#)

? [What should I understand about chemicals and toxicity while using TOXMAP?](#)

? [Whom do I contact with questions and/or suggestions? more...](#)

Choose a Region?

TOXMAP will only show TRI and Superfund results inside the specified geographic region.

☐ U.S. and territories

☐ User-defined region ?

Harris County TX [E370D9355E_3]
Texas [E370D9355E_1]

☒ Pre-defined region ?

EPA Region 1
EPA Region 2
EPA Region 3
EPA Region 4
EPA Region 5
EPA Region 6
EPA Region 7
EPA Region 8
EPA Region 9
EPA Region 10

► [Create a new region](#)

► [Restore a saved region from a previous TOXMAP session \(requires Region ID\)](#)

► [Edit](#) the selected user-defined region

► [Delete](#) the selected user-defined region

Region Description

Each Environmental Protection Agency (EPA) Regional Office is responsible within its states for the execution of the Agency's programs. Region 3: The Mid-Atlantic Region - serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia.





TOXMAP Regional TRI Summary Table

Name: EPA Region 3

Region: Mid-Atlantic: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia



More Chem
Informatic

- NLM ?
- CDC ?

List of TRI chemi

Toxicology Ar
for this this

Search TOXLINE

- ? What is the Tox
Release Invent
(TRI)?
- ? How accurate
TRI locations in
TOXMAP?
- ? Whom do I con
with questions
and/or suggest
more...

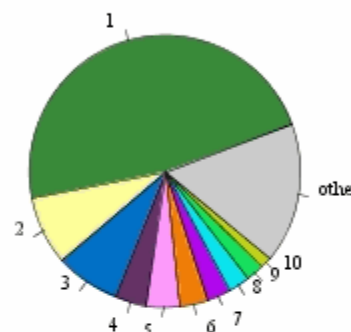
☐ Show all years

☒ Show last 5 years

Regional Chemical Releases Table

Chemical [See all chemicals]		Environmental Releases (lbs./2001-2005)	
1) Hydrochloric acid (1995 and after "acid aerosols" only)	MapIt	756,410,740	47.6%
2) Nitrate compounds	MapIt	131,639,529	8.3%
3) Sulfuric acid (1994 and after "acid aerosols" only)	MapIt	120,641,132	7.6%
4) Hydrogen fluoride	MapIt	61,609,037	3.9%
5) Methanol	MapIt	60,961,296	3.8%
6) Ammonia	MapIt	55,534,284	3.5%
7) Barium compounds	MapIt	42,390,463	2.7%
8) Manganese compounds	MapIt	39,708,009	2.5%
9) Toluene	MapIt	35,869,772	2.3%
10) Zinc compounds	MapIt	21,413,131	1.3%
OTHER		263,966,799	16.6%
TOTAL		1,590,144,191	

Distribution by Chemical*



* Small values may not be visible on chart. Refer to the Regional Chemical Releases Table. Mouseover bars for release percentages.

All chemicals reported by facilities in this region

TRI Facility

Start
over

sylvania,

Print this
map

Apply to this map

Census Data ?

ne Data ?

th Data ?

rence Data ?

details for this map

Identify TRI facilities

on the Identify link above
re details for this map.



TOXMAP Regional TRI Summary Table

Name: EPA Region 3

Region: Mid-Atlantic: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia



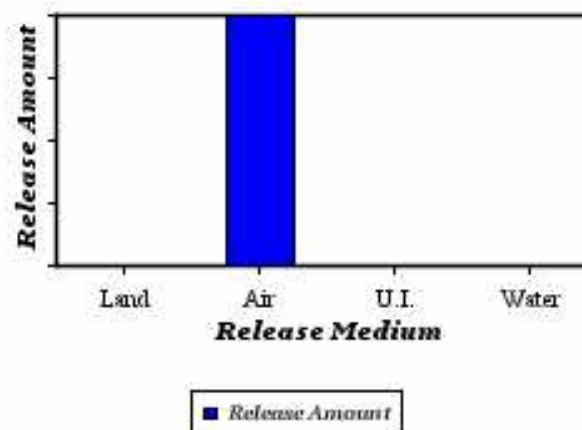
☒ Show all years
 ☐ Show last — years

Regional Chemical Releases Table

Hydrochloric acid (1995 and after "acid aerosols" only)
(7647-01-0)

Release Medium	Release Amount (lbs./1987-2005)	
Land	355,133	<0.1%
Air	1,330,793,035	99.9%
Underground Injection	260	<0.1%
Water	835,709	<0.1%
TOTAL	1,331,984,137	

Distribution by Medium*



* Small values may not be visible on chart. Refer to the Regional Chemical Releases Table. Mouseover bars for release percentages.

[close window](#)

[U.S. National Library of Medicine](#), [National Institutes of Health](#)
[Department of Health & Human Services](#)

8 lbs Release Amount 16,000,005 lbs

Geographic Regions

- Filter your search results, not just zoom
- Use predefined regions, or create your own
 - EPA Regions, USGS Hydrologic regions, and common geographic regions (e.g., “Midwest”)
- Save, edit, and restore your regions
 - Requires keeping your “RegionID”
- Saved in list of places (“Zoom to a place”)
- Enables release summaries of all chemicals or of a selected chemical

Advanced Search

- Filters data based on more criteria than region, chemical name, and year
- Accessed via Search Tab
 - or Quick Search “More Search Options...”
- Auto-zooms map to search results
- Works independently of geographic region
- User interface recently re-designed

- ? [What is the "Superfund" Program?](#)
- ? [What kinds of chemicals are found at Superfund sites?](#)
- ? [What is the "National Priorities List" \(NPL\)?](#)
- ? [Whom do I contact with questions and/or suggestions?](#)
- [more...](#)

Search

Results will only be shown for your current region. Click the "Set Region" tab to change your region. ?

- **User-named Region:** "Texas": Texas

CHOOSE A CHEMICAL ?

- ☒ Chemical: ☐ CAS RN ?
- ☐ TRI Chemical ?
- ☐ Recently Searched Chemical

CHOOSE A DATASET

Toxics Release Inventory (TRI) ?

- ☐ Search all TRI facilities
- ☒ Search only facilities with the selected chemical
- ☐ Do not search TRI facilities

TRI Facility Name

TRI Facility ID ?

Release Medium ? ☐ Any Medium
☐ Water
☐ Air
☐ Land
☒ Underground Injection

Release Years ? to

Release Exceeds ? lbs.

Superfund National Priorities List (NPL) ?

- ☐ Search all Superfund sites
- ☐ Search only NPL sites with the selected chemical
- ☒ Do not search Superfund sites

NPL Site Name

EPA ID ?

NPL Status ? ☐ All
☐ Final
☐ Proposed
☐ Deleted

Hazard Ranking

System Score ? to

Search

Clear

[Return to map](#)



More Chemical Information

NLM

- [Toxicology Databases](#)
- [Human Health Effects](#)
- [Manufacturing/Use Info](#)
- [Env. Fate / Exposure](#)

CDC

- [ToxFAQs](#)
- [Public Health Assessments](#)
- [All Documents](#)

Toxicology Articles for this Chemical and Map

[Search TOXLINE](#)

- [What is the "Superfund" Program?](#)
- [What kinds of chemicals are found at Superfund sites?](#)
- [What is the "National Priorities List" \(NPL\)?](#)
- [Whom do I contact with questions and/or suggestions?](#)

Search Results [\[Edit Search\]](#)

[Start over](#)

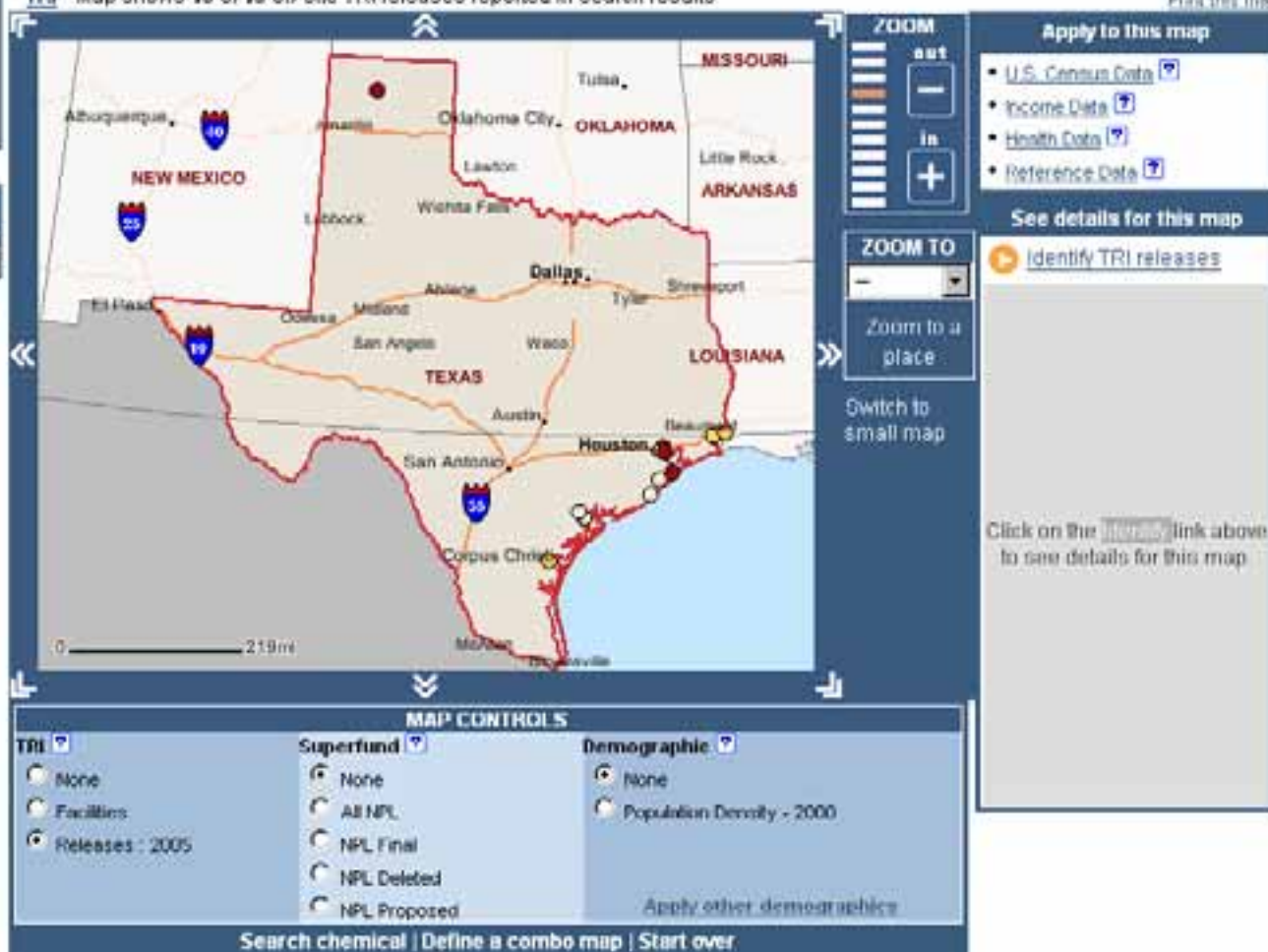
[Hide search details](#)

- User named region:** "Texas" [\[Set\]](#) [Regional TRI Summary](#) Texas
- Release Medium:** Underground Injection releases
- TRI release year:** 2005
- Reported on-site release amount:** exceeds 500.0 pounds

Benzene (71-43-2)

TRI - Map shows 13 of 13 on-site TRI releases reported in search results

[Print this map](#)



Linking to TOXMAP

- “MapIt”
 - Used by TOXNET/TRI
 - Specify city, state, ZIP, chemical name/RN, TRI submission numbers, RegionID, “other place,” or nothing at all
 - Specify TRI, Superfund, or both via URL
 - See FAQ for details
- Links to facility details and releases summary tables
 - Undocumented other than mention in FAQ

GIS Notes

- Built with ArcIMS 4.x, now using 9.1
- Windows, Apache w/mod_jk, Tomcat
- ESRI JavaConnector API
 - originally MapBeans
- Migrating to ArcIMS 9.2 (Q207)
 - first, software update
 - later, new 9.2 features
 - then, investigate ArcGIS Server

GIS Architecture

- No ArcSDE
 - No \$\$\$ for Oracle or SQL Server license
- Data in shapefile or MySQL database
 - 680 MB
- Construct maps via
 - hide/show shapefile layers
 - MySQL query, then acetate layer
 - SpatialFilter on shapefile layer
 - truncate acetate-based queries at 5,000
- One mortality layer dynamically updated

Next Steps

- TRI 2006 data
- NCI 2005 mortality data
- New search criteria
 - lat/long, etc.
- Download search results
- New data sets or ref. data
 - hospitals, schools
- UI improvements



Summary

- <http://toxmap.nlm.nih.gov>
- Health-centric GIS for TRI and Superfund data
- Links to NLM, EPA, and CDC
- Usable by and useful to a variety of users
- Several ways to link to maps and data
- Focus on area of interest via reusable regions
- Overlay demographic data
 - cancer/disease mortality, census, income
- Co-occurrence \neq causation
 - Limitations to TRI data

For More Information

<http://toxmap.nlm.nih.gov>

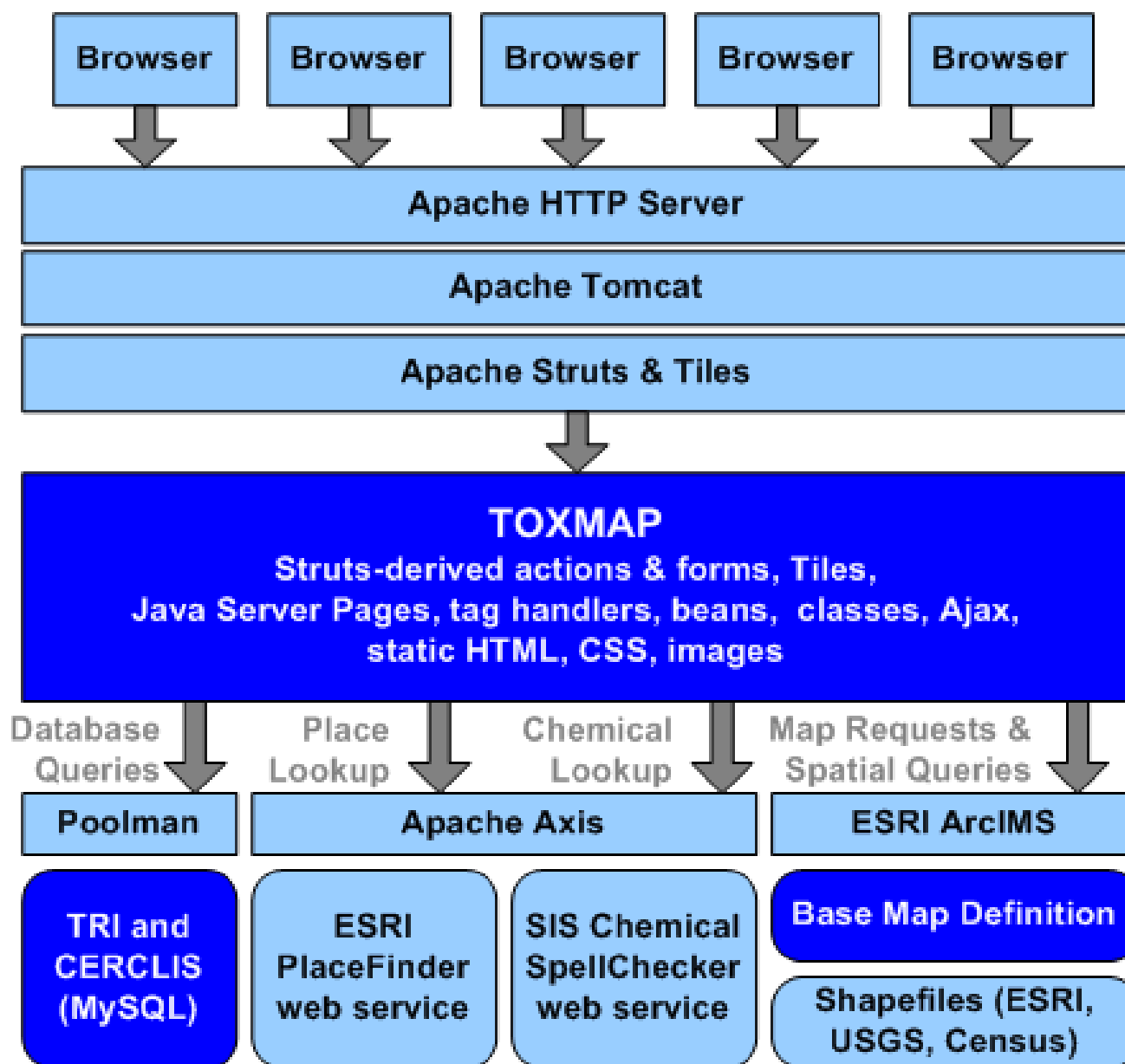
Colette Hochstein
colette@nlm.nih.gov

General Questions
tehip@teh.nlm.nih.gov



A screenshot of the TOXMAP website. The header includes the NLM logo and the title "TOXMAP Environmental Health e-Maps". A navigation bar contains links like Home, TRI Facilities, TRI Releases, TRI Trends, Superfund, Combo, Search, and Help. Below this is a "Quick Search" section with fields for "Select Dataset(s)" (with checkboxes for TRI and Superfund NPL), "Chemical Name", "City", and "State". There are "Search" and "Clear" buttons. To the right of the search section is a map of the United States with blue and red dots indicating TRI facilities and Superfund sites. Text below the map reads "TRI facilities (blue) and Superfund NPL sites (red)". On the far right, there is a list of links or FAQs. At the bottom, there is a "Portal to environmental health and toxicology resources" section and a "HONOLULU" logo with text about subscribing to the HONOLULU principles of the Health On the Net Foundation.

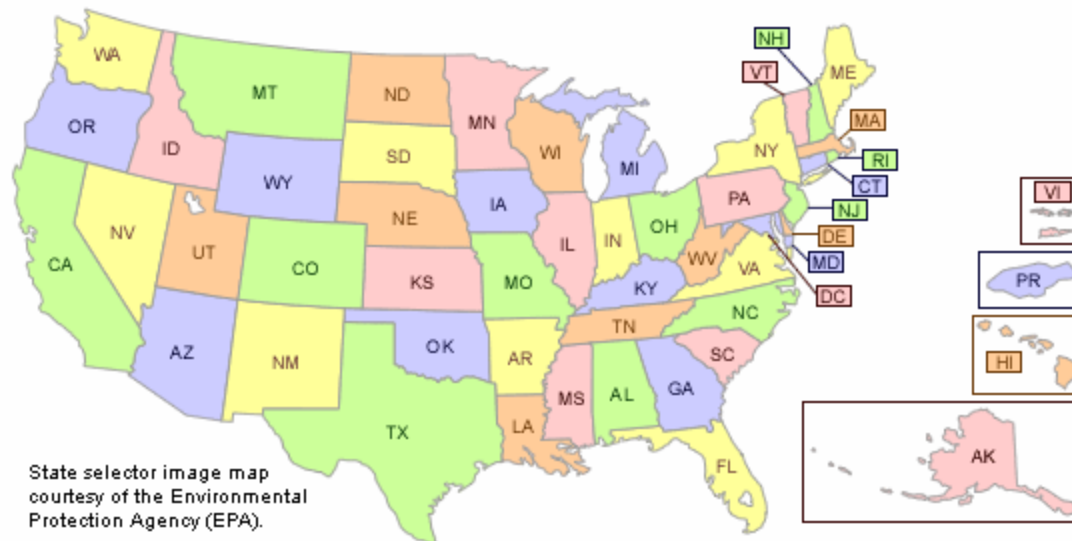
TOXMAP Architecture



- ? [What TRI chemicals are mapped in TOXMAP?](#)
- ? [Does TOXMAP show all sources of toxic chemicals released into the environment?](#)
- ? [How accurate is TRI data?](#)
- ? [What should I understand about chemicals and toxicity while using TOXMAP?](#)
- ? [Whom do I contact with questions and/or suggestions?](#)
[more...](#)

Create a Region ?

Choose states and/or counties from the map or lists, then add them to the Region County List.



State selector image map
courtesy of the Environmental
Protection Agency (EPA).

US States and Territories

Texas

[Find county by city](#)

Counties [\[Lookup\]](#)

(ctrl-click to select more than one)

Hardeman County
Hardin County
Harris County
Harrison County
Hartley County

[Add selected >>](#)

[Remove selected <<](#)

Region County List - maximum 100
states/counties [\[Remove all\]](#)

Harris County, Texas

Region Name (optional) - maximum 30 characters

Harris County, TX

Region Description (optional) - maximum 500 characters

Harris County, TX

Linking to TOXMAP

- “MapIt” Examples
 - All start with <http://toxmap.nlm.nih.gov/toxmap/>
- All TRI Facilities and Superfund sites in Green Bay, WI
 - Add [main/mapIt.do?city=green+bay&state=WI](#)
- All Region 4 Releases of Mercury Cmpds
 - Add [tri/mapIt.do?chemicalName=mercury+compounds®ionID=EPARegion04](#)
- All Superfund NPL sites in your custom region
 - Add [superfund/mapIt.do?regionID=E370D93555E_1](#)