Thomas G. Grumbles

VISTA

To Environmental Coordinators Date 6/7

Attached is the latest information on a new Computer Information system sponsored by EPA.

It is a good data base for obtaining Risk #'s, reference doses, etc.

TGG

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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RESEARCH AND DEVELOPMENT

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APR 15 1988

Dear ~~Risk Assessor~~:

~~I am very pleased~~ to announce the availability of the U.S. Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS). IRIS is an on-line database of chemical-specific risk information on the relationship between chemical exposure and estimated human health effects. IRIS was developed for EPA staff and contractors to serve as a guide for EPA risk assessments, but because many other parties have indicated how useful IRIS information would be to them, EPA is making the database available outside the Agency.

IRIS provides chemical-specific risk data that represents an EPA scientific consensus. The database presents a summary of information on chemical hazard identification and dose-response assessment, thus, IRIS is not an exhaustive toxicological database.

IRIS translates chemical health effects data into a form which is useful in taking action to protect public health. Thus, IRIS bridges a significant gap in the transmission of information needed to reduce risks to human health. The database provides quantitative risk values and necessary qualitative health effects information which can act as guidance for deciding what action is necessary to protect the public health. Without this combined quantitative and qualitative information, it is often difficult for a risk manager to make decisions on how to best protect human health.

The information in IRIS is an authoritative interpretation of chemical health effects data. The quantitative risk values and supporting explanation has been reviewed and agreed upon by scientists from across the Agency using available studies on a substance. Thus, the information in IRIS represents an expert Agency consensus. This Agency-wide agreement on risk information is one of the most valuable aspects of IRIS.

Currently, there are risk summaries in IRIS for 260 chemicals. IRIS is regularly updated -- new chemicals are added, and existing information on the chemicals is updated as new scientific data is reviewed. Additional risk information will be included on the chemicals to best meet the needs of EPA users. Thus, to ensure use of the most up-to-date chemical information, IRIS is only available on-line. There are several ways to establish on-line access to IRIS. An enclosure explains how to access the IRIS database and who to contact for IRIS training.

We at EPA are encouraged by the demand for IRIS and hope that you find the database useful as you perform risk assessments.

Sincerely,

William H. Farland, Ph.D.
Acting Director
Office of Health and Environmental Assessment

## ACCESSING IRIS

IRIS is now available on DIALCOM, Inc.'s electronic mail network, the Public Health Foundation's Public Health Network (PHN), and will soon be on the National Library of Medicine's TOXNET system.

IRIS is housed on the network of DIALCOM Inc., a private telecommunications company. In order to access IRIS, you must obtain an account with DIALCOM, Inc., unless you are eligible to use the Public Health Network (PHN). The account is with DIALCOM, Inc. and not EPA. To obtain a DIALCOM Inc. account, contact Mike McLaughlin at (202) 488-0550 or write to: Mike McLaughlin, DIALCOM Inc., 600 Maryland Avenue SW, Suite 307, Washington DC 20024.

The user must pay only for the cost of accessing IRIS. The user will be billed by DIALCOM, Inc. There is a $25.00 monthly minimum which is applied against a usage fee of $25.00 per hour. In addition to the usage fee, there is a $.05 charge per computer screen accessed. There is no EPA charge for using IRIS.

If you are a state or local health department, it may be possible for you to access IRIS through the Public Health Network (PHN) of the Public Health Foundation. Those choosing to access IRIS via the Public Health Network will be charged at the PHN rate. Contact Paul Johnson at the Public Health Foundation, (202) 898-5600, for information on PHN.

Efforts were recently started to make IRIS available through the National Library of Medicine's TOXNET system. IRIS should become part of TOXNET sometime this summer. On-line messages will be posted on IRIS and TOXNET to announce this availability.

## HOW TO GET IRIS TRAINING

Training in using IRIS is being arranged through the ten EPA Regions. This training is for both EPA staff and the public. The Regions are scheduling IRIS training to fit the risk assessment training needs of each particular Region. Thus, IRIS training schedules will vary among the Regions. The following EPA Regional staff are coordinating IRIS training at their Regional offices:

| EPA REGION | | IRIS CONTACTS |
|---|---|---|
| I | Boston | Tom D'Avanzo<br>(617) 565-3222<br>FTS 835-3222 |
| II | New York | Marian Olson<br>(212) 264-5682<br>FTS 264-5682 |

| | | |
|---|---|---|
| III | Philadelphia | Roy Smith<br>(215) 597-9857<br>FTS 597-9857 |
| IV | Atlanta | Gayle Alston<br>(404) 347-4216<br>FTS 257-4216 |
| V | Chicago | David Dolan<br>(312) 886-6195<br>FTS 886-6195 |
| VI | Dallas | Fred Reitman<br>(214) 655-2235<br>FTS 255-2235 |
| | | Jill Lyons<br>(214) 655-7208<br>FTS 255-7208 |
| VII | Kansas City | Bob Fenemore<br>(913) 236-2970<br>FTS 757-2970 |
| VIII | Denver | Jim Baker<br>(303) 293-1524<br>FTS 564-1524 |
| IX | San Francisco | Arnold Den<br>(415) 974-0906<br>FTS 454-0906 |
| X | Seattle | Dave Tetta<br>(206) 442-2138<br>FTS 399-2138 |
| | | Dana Davoli<br>(206) 442-2135<br>FTS 399-2135 |

**If you have any questions about IRIS, call IRIS User Support at (513) 569-7254 or FTS 684-7254.**

# IRIS

## INTRODUCTION

OVERVIEW OF IRIS

The Integrated Risk Information System (IRIS), prepared and maintained by the U.S. Environmental Protection Agency (EPA), is an electronic data base containing health risk and EPA regulatory information on specific chemicals. IRIS was developed for EPA staff in response to a growing demand for consistent risk information on chemical substances for use in decision-making and regulatory activities. Although IRIS is designed for EPA staff, it is also accessible to state and local environmental health agencies. IRIS is available to libraries, private citizens, and other organizations by means of Dialcom, Inc.'s Electronic Mail telecommunications system. The information in IRIS is intended for EPA staff without extensive training in toxicology, but with some knowledge of health sciences.

The heart of the IRIS system is its collection of computer files covering individual chemicals. These chemical files contain descriptive and quantitative information in the following categories:

- o Oral and inhalation reference doses (RfDs) for chronic noncarcinogenic health effects
- o Oral and inhalation slope factors and unit risks for chronic exposures to carcinogens
- o Drinking water health advisories from EPA's Office of Drinking Water
- o EPA regulatory action summaries
- o Supplementary data on acute health hazards and physical/chemical properties

To aid users in accessing and understanding the data in the IRIS chemical files, the following supportive documentation is provided:

1. Hazard identification,

2. Dose-response assessment,

3. Exposure assessment, and

4. Risk characterization,

with risk characterization being the transitional step to risk management.

The following discussion of the four steps of risk assessment was excerpted from "Principles of Risk Assessment: A Nontechnical Review" (U.S. EPA, 1985).

> Hazard identification involves gathering and evaluating data on the types of health injury or disease that may be produced by a chemical and on the conditions of exposure under which injury or disease is produced. It may also involve chararacterization of the behavior of a chemical within the body and the interactions it undergoes with organs, cells, or even part of cells. Data of the latter types may be of value in answering the ultimate question of whether the forms of toxicity known to be produced by a substance in one population group or in experimental settings are also likely to be produced in humans. Hazard identification is not risk assessment; we are simply determining whether it is scientifically correct to infer that toxic effects observed in one setting will occur in other settings (e.g., whether substances found to be carcinogenic or teratogenic in experimental animals are likely to have the same results in humans).
>
> Dose-response assessment involves describing the quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease. Data are derived from animal studies, or less frequently, from studies in exposed populations. There may be many different toxic effects under different conditions of exposure.
>
> The risks of a substance cannot be ascertained with any degree of confidence unless dose-response relationships are quantified, even if the substance is known to be toxic.
>
> Exposure assessment involves describing the nature and size of the population exposed to a substance and the magnitude and duration of their exposure. The evaluation could concern past or current exposures, or exposures anticipated in the future.
>
> Risk characterization generally involves the integration of the

# LIMITATIONS OF IRIS INFORMATION

The information in the Integrated Risk Information System (IRIS) is most useful if applied in the larger context of risk assessment as outlined by the National Academy of Sciences. IRIS supports the first two steps of the risk assessment process [as summarized in Service Code (menu option) 4]; namely, the hazard identification and dose-response assesssment steps. The primary qualitative and quantitative risk data in IRIS, the reference doses (RfDs) and carcinogen assessments, can serve as guides in evaluating potential health hazards and selecting a response to alleviate a potential risk to human health.

The **reference dose (RfD)** can be used to estimate a level of environmental exposure at or below which no adverse effect is expected to occur. The RfD is an **estimate** (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime. RfDs are based on an assumption of lifetime exposure and may not be appropriately applied to less-than-lifetime exposure situations. RfDs are also derived for the noncarcinogenic effects of chemicals that are carcinogenic.

The **carcinogen assessments** in IRIS begin with a qualitative weight-of-evidence judgment in the form of a classification as to the likelihood that a chemical may be a carcinogen for humans. This judgment is made independent of consideration of the agent's potency. A quantitative assessment, including slope factor and unit risk, is then presented. The slope factor is an upper-bound **estimate** of the human cancer risk per mg of agent/kg body weight/day. The unit risk, which is calculated from the slope factor, is an **estimate** in terms of either risk per ug/L drinking water, or risk per ug/cu.m air concentration.

In general, risk values, such as those in IRIS, cannot be validly used to predict the incidence of human disease or the type of effects that chemical exposures may have on humans. This is due to the numerous **uncertainties** involved in risk assessment, including those associated with extrapolations from animal data to humans and from high experimental doses to lower environmental exposures. The organs affected and the type of adverse effect resulting from chemical exposure may differ between study animals and humans. In addition, many factors besides exposure to a chemical influence the occurrence and extent of human disease.

Any change to an RfD, slope factor or unit risk as they appear in IRIS (for example, the use of more or fewer uncertainty factors than were applied to arrive at an RfD) invalidates and distorts their application in estimating the potential health risk posed by chemical exposure.

Each reference dose and carcinogen assessment is derived by an interdisciplinary work group of EPA scientists using consistent chemical hazard identification and dose-response assessment methods. These methods are outlined in Background Documents 1 and 2 (Service Code 5). It is important to note that the risk information in IRIS will be revised by these work groups when additional health effects data become available and new developments in risk assessment methods arise.

# Chemicals on the Integrated Risk Information System
(April 15, 1988)

Sections Available:
RfD = Chronic noncarcinogenic assessment (Reference Dose)
CAR = Chronic carcinogenicity assessment
HA = Drinking Water Health Advisories

Acetone; 67-64-1 ....RfD
Acetonitrile; 75-05-8 ....RfD
Acrylic Acid; 79-10-7 ....RfD
Acrylonitrile; 107-13-1 ....CAR
Alachlor; 15972-60-8 ....RfD, HA
Aldicarb; 116-06-3 ....RfD, HA
Aldrin; 309-00-2 ....RfD, CAR
Allyl Alcohol; 107-18-6 ....RfD
Aluminum Phosphide; 20859-73-8 ....RfD
Amdro; 67485-29-4 ....RfD
Ametryn; 834-12-8 ....RfD
Ammonium Sulfamate; 7773-06-0 ....RfD
Antimony; 7440-36-0 ....RfD
Apollo; 74115-24-5 ....RfD
Arsenic, inorganic; 7440-38-2 ....CAR
razine; 1912-24-9 ....RfD

Barium; 7440-39-3 ....RfD
Barium Cyanide; 542-62-1 ....RfD
Baygon; 114-26-1 ....RfD
Bayleton; 43121-43-3 ....RfD
Baythroid; 68359-37-5 ....RfD
Benefin; 1861-40-1 ....RfD
Benomyl; 17804-35-2 ....RfD
Bentazon; 25057-89-0 ....RfD
Benzene; 71-43-2 ....CAR, HA
Benzidine; 92-87-5 ....CAR
Benzo[a]pyrene (BaP); 50-32-8 ....CAR
Beryllium; 7440-41-7 ....RfD
Bidrin; 141-66-2 ....RfD
1,1-Biphenyl; 92-52-4 ....RfD
Bis(2-ethylhexyl)phthalate (BEHP); 117-81-7 ....RfD
Bis(chloroethyl)ether (BCEE); 111-44-4 ....CAR
Bromodichloromethane; 75-27-4 ....RfD
Bromoform; 75-25-2 ....RfD
Bromomethane; 74-83-9 ....RfD
Bromoxynil Octanoate; 1689-99-2 ....RfD
1,3-Butadiene; 106-99-0 ....CAR
n-Butanol; 71-36-3 ....RfD
Butylate; 2008-41-5 ....RfD
tylphthalyl Butylglycolate (BPBG); 85-70-1 ....RfD

Cadmium; 7440-43-9 ....CAR
Calcium Cyanide; 592-01-8 ....RfD

iptafol; 2425-06-1 ....RfD
Captan; 133-06-2 ....RfD
Carbaryl; 63-25-2 ....RfD
Carbofuran; 1563-66-2 ....RfD, HA
Carbon Disulfide; 75-15-0 ....RfD
Carbon Tetrachloride; 56-23-5 ....RfD, CAR, HA
Carbosulfan; 55285-14-8 ....RfD
Carboxin; 5234-68-4 ....RfD
Chloramben; 133-90-4 ....RfD
Chlordane; 57-74-9 ....RfD, CAR, HA
Chlorine Cyanide; 506-77-4 ....RfD
Chloroform; 67-66-3 ....RfD
Chloromethyl Methyl Ether (CMME); 107-30-2. ....CAR
Chlorothalonil; 1897-45-6 ....RfD
Chlorpyrifos; 2921-88-2 ....RfD
Chlorsulfuron; 64902-72-3 ....RfD
Chromium(III); 16065-83-1 ....RfD, HA
Chromium(VI); 7440-47-3 ....RfD, CAR, HA
Copper Cyanide; 544-92-3 ....RfD
Cyanazine; 21725-46-2 ....RfD
Cyanide, free; 57-12-5 ....RfD, HA
Cyanogen; 460-19-5 ....RfD
Cyclohexanone; 108-94-1 ....RfD
Cyromazine; 66215-27-8 ....RfD

lapon; 75-99-0 ....RfD
Danitol; 39515-41-8 ....RfD
Decabromodiphenyl Ether (DBDPE); 1163-19-5 ....RfD
Demeton; 8065-48-3 ....RfD
1,4-Dibromobenzene; 106-37-6 ....RfD
Dibromochloromethane; 124-48-1 ....RfD
Dibutyl Phthalate; 84-74-2 ....RfD
Dicamba; 1918-00-9 ....RfD
Dichlorodifluoromethane; 75-71-8 ....RfD
p,p'-Dichlorodiphenyltrichloroethane (DDT); 50-29-3 ....RfD
1,2-Dichloroethane; 107-06-2 ....CAR, HA
1,1-Dichloroethylene; 75-35-4 ....RfD, CAR
Dichloromethane; 75-09-2 ....RfD, CAR, HA
2,4-Dichlorophenol; 120-83-2 ....RfD
4-(2,4-Dichlorophenoxy)butyric acid (2,4-DB); 94-82-6 ....RfD
2,4-Dichlorophenoxyacetic acid (2,4-D); 94-75-7 ....RfD
1,3-Dichloropropene (Telone II); 542-75-6 ....RfD
Dichlorvos; 62-73-7 ....RfD
Diethyl Phthalate; 84-66-2 ....RfD
Diflubenzuron; 35367-38-5 ....RfD
Dimethipin; 55290-64-7 ....RfD
Dimethoate; 60-51-5 ....RfD
Dimethyl Terephthalate (DMT); 120-61-6 ....RfD
N-N-Dimethylaniline; 121-69-7 ....RfD
4-Dinitrophenol; 51-28-5 ....RfD
noseb; 88-85-7 ....RfD
Diphenamid; 957-51-7 ....RfD
Diphenylamine; 122-39-4 ....RfD
1,2-Diphenylhydrazine; 122-66-7 ....CAR

iquat; 85-00-7 ....RfD
isulfoton; 298-04-4 ....RfD
Diuron; 330-54-1 ....RfD
Dodine; 2439-10-3 ....RfD

Endosulfan; 115-29-7 ....RfD
Endothall; 145-73-3 ....RfD
Epichlorohydrin; 106-89-8 ....RfD, CAR, HA
Ethion; 563-12-2 ....RfD
Ethyl Acetate; 141-78-6 ....RfD
S-Ethyl dipropylthiocarbamate (EPTC); 759-94-4 ....RfD
Ethyl p-nitrophenyl phenylphosphorothioate (EPN); 2104-64-5 ....RfD
Ethylbenzene; 100-41-4 ....RfD, HA
Ethylene Glycol; 107-21-1 ....RfD
Ethylphthalyl Ethylglycolate (EPEG); 84-72-0 ....RfD

Fenamiphos; 22224-92-6 ....RfD
Fluometuron; 2164-17-2 ....RfD
Fluorine (soluble fluoride); 7782-41-4 ....RfD
Fluridone; 59756-60-4 ....RfD
Folpet; 133-07-3 ....RfD
Fonofos; 944-22-9 ....RfD
Formic Acid; 64-18-6 ....RfD
Fosetyl-al; 39148-24-8 ....RfD
Furan; 110-00-9 ....RfD

lufosinate-ammonium; 77182-82-2 ....RfD
Glyphosate; 1071-83-6 ....RfD

Heptachlor; 76-44-8 ....RfD, CAR, HA
Heptachlor Epoxide; 1024-57-3 ....RfD, CAR, HA
Hexabromobenzene; 87-82-1 ....RfD
Hexachlorobutadiene; 87-68-3 ....RfD, CAR
alpha-Hexachlorocyclohexane (alpha-HCH); 319-84-6 ....CAR
beta-Hexachlorocyclohexane (beta-HCH); 319-85-7 ....CAR
delta-Hexachlorocyclohexane (delta-HCH); 319-86-8 ....CAR
epsilon-Hexachlorocyclohexane (epsilon-HC); 6108-10-7 ....CAR
gamma-Hexachlorocyclohexane (gamma-HCH); 58-89-9 ....RfD, HA
technical Hexachlorocyclohexane (t-HCH); 00-01-0 ....CAR
Hexachlorocyclopentadiene (HCCPD); 77-47-4 ....RfD
Hexachlorodibenzo-p-dioxin, mixture (HxCDD); 19408-74-3 ....CAR
Hexachloroethane; 67-72-1 ....RfD, CAR
Hexazinone; 51235-04-2 ....RfD
Hydrogen Cyanide; 74-90-8 ....RfD, HA
Hydrogen Sulfide; 7783-06-4 ....RfD

Imazalil; 35554-44-0 ....RfD
Imazaquin; 81335-37-7 ....RfD
Isobutyl Alcohol; 78-83-1 ....RfD
Isophorone; 78-59-1 ....RfD
opropalin; 33820-53-0 ....RfD

Lead; 7439-92-1 ....RfD
Linuron; 330-55-2 ....RfD

ɔndax; 83055-99-6 ....RfD

Malathion; 121-75-5 ....RfD
Maleic Hydrazide; 123-33-1 ....RfD
Metalaxyl; 57837-19-1 ....RfD
Methamidophos; 10265-92-6 ....RfD
Methomyl; 16752-77-5 ....RfD
Methyl Ethyl Ketone (MEK); 78-93-3 ....RfD
Methyl Isobutyl Ketone (MIBK); 108-10-1 ....RfD
Methyl Mercury; 22967-92-6 ....RfD
Methyl Parathion; 298-00-0 ....RfD
2-Methyl-4-chlorophenoxy acetic acid (MCPA); 94-74-6 ....RfD
2-(2-Methyl-4-chlorophenoxy)propionic acid (MCPP); 93-65-2 ....RfD
Metolachlor; 51218-45-2 ....RfD
Metribuzin; 21087-64-9 ....RfD
Mirex; 2385-85-5 ....RfD

Naled; 300-76-5 ....RfD
Nickel Carbonyl; 13463-39-3 ....CAR
Nickel Refinery Dust; 00-02-0 ....CAR
Nickel Subsulfide; 12035-72-2 ....CAR
Nickel, soluble salts; 7440-02-0 ....RfD
Nitrapyrin; 1929-82-4 ....RfD
Nitrate; 14797-55-8 ....RfD, HA
`tric Oxide; 10102-43-9 ....RfD
..trite; 14797-65-0 ....RfD, HA
Nitrobenzene; 98-95-3 ....RfD
Nitrogen Dioxide; 10102-44-0 ....RfD
N-Nitroso-di-n-butylamine; 924-16-3 ....CAR
N-Nitroso-N-methylethylamine; 10595-95-6 ....CAR
N-Nitrosodi-N-propylamine; 621-64-7 ....CAR
N-Nitrosodiethanolamine; 1116-54-7 ....CAR
N-Nitrosodiethylamine; 55-18-5 ....CAR
N-Nitrosodimethylamine; 62-75-9 ....CAR
N-Nitrosodiphenylamine; 86-30-6 ....CAR
N-Nitrosopyrrolidine; 930-55-2 ....CAR
Norflurazon; 27314-13-2 ....RfD

Octabromodiphenyl ether; 32536-52-0 ....RfD
Oryzalin; 19044-88-3 ....RfD
Oxadiazon; 19666-30-9 ....RfD
Oxamyl; 23135-22-0 ....RfD, HA
Oxyfluorfen; 42874-03-3 ....RfD

Paclobutrazol; 76738-62-0 ....RfD
Paraquat; 1910-42-5 ....RfD
Pentabromodiphenyl ether; 32534-81-9 ....RfD
Pentachlorobenzene; 608-93-5 ....RfD
Pentachloronitrobenzene (PCNB); 82-68-8 ....RfD
ıtachlorophenol; 87-86-5 ....RfD, HA
ɾermethrin; 52645-53-1 ....RfD
Phenol; 108-95-2 ....RfD
m-Phenylenediamine; 108-45-2 ....RfD
Phenylmercuric Acetate; 62-38-4 ....RfD

hosmet; 732-11-6 ....RfD
Phosphine; 7803-51-2 ....RfD
Picloram; 1918-02-1 ....RfD
Pirimiphos-methyl; 29232-93-7 ....RfD
Potassium Cyanide; 151-50-8 ....RfD, HA
Potassium Silver Cyanide; 506-61-6 ....RfD
Prometon; 1610-18-0 ....RfD
Prometryn; 7287-19-6 ....RfD
Pronamide; 23950-58-5 ....RfD
Propachlor; 1918-16-7 ....RfD
Propanil; 709-98-8 ....RfD
Propazine; 139-40-2 ....RfD
Propham; 122-42-9 ....RfD
Pydrin; 51630-58-1 ....RfD
Pyridine; 110-86-1 ....RfD

Quinalphos; 13593-03-8 ....RfD

Radon 222; 14859-67-7 ....CAR

Selenious Acid; 7783-00-8 ....RfD
Selenourea; 630-10-4 ....RfD
Sethoxydim; 74051-80-2 ....RfD
Silver; 7440-22-4 ....RfD
Silver Cyanide; 506-64-9 ....RfD
mazine; 122-34-9 ....RfD
Sodium Acifluorfen; 62476-59-9 ....RfD
Sodium Azide; 26628-22-8 ....RfD
Sodium Cyanide; 143-33-9 ....RfD, HA
Sodium Diethyldithiocarbamate (Dithiocarb); 148-18-5 ....RfD
Strychnine; 57-24-9 ....RfD
Styrene; 100-42-5 ....RfD

Tebuthiuron; 34014-18-1 ....RfD
Terbacil; 5902-51-2 ....RfD
1,2,4,5-Tetrachlorobenzene; 95-94-3 ....RfD
1,1,1,2-Tetrachloroethane; 630-20-6 ....RfD
1,1,2,2-Tetrachloroethane; 79-34-5 ....CAR
Tetrachloroethylene; 127-18-4 ....RfD, HA
2,3,4,6-Tetrachlorophenol; 58-90-2 ....RfD
Tetrachlorovinphos; 961-11-5 ....RfD
Tetraethyl Lead; 78-00-2 ....RfD
Thallic Oxide; 1314-32-5 ....RfD
Thallium Acetate; 563-68-8 ....RfD
Thallium Carbonate; 6533-73-9 ....RfD
Thallium Chloride; 7791-12-0 ....RfD
Thallium Nitrate; 10102-45-1 ....RfD
Thallium Selenite; 12039-52-0 ....RfD
Thallium(I) Sulfate; 7446-18-6 ....RfD
Thiobencarb; 28249-77-6 ....RfD
Thiophanate-methyl; 23564-05-8 ....RfD
Thiram; 137-26-8 ....RfD
Toluene; 108-88-3 ....RfD
Triallate; 2303-17-5 ....RfD