

EPA Federal Facilities Toxic Release and Reduction Initiatives Fact Sheet

Background

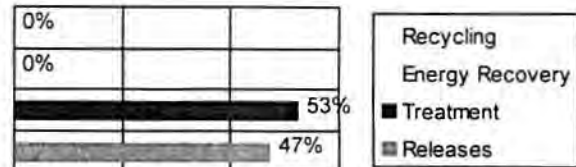
Executive Order 12856, entitled "Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements", was signed by President Clinton on August 3, 1993. The primary objectives of EO 12856 are to encourage Federal facilities to:

- Develop pollution prevention plans to reduce toxic releases by 50%;
- Collect and report data on the quantity of hazardous materials stored, used, and released at the facility;
- Ensure public access to use and release information.

Federal facilities are required to submit annual TRI reports starting in 1995 for data collected in 1994.

NITRATE COMPOUNDS

1995 Waste Management Distribution



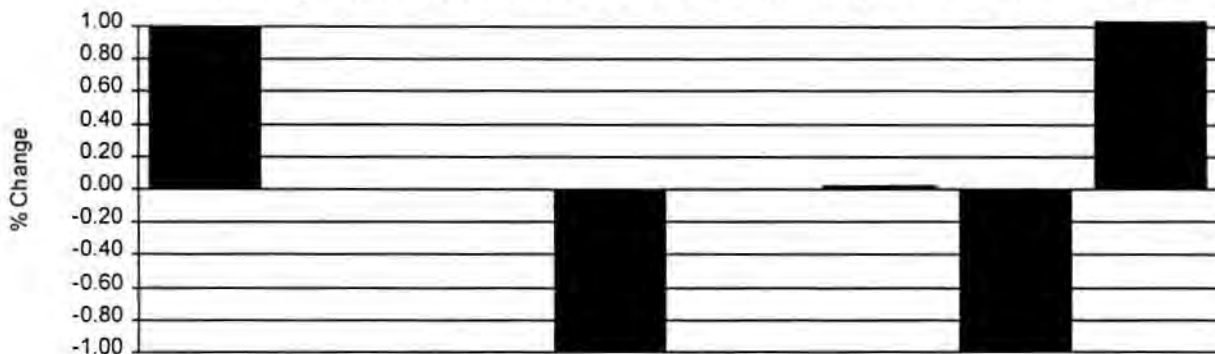
Approach

A study was undertaken to analyze Federal facility TRI data for 1994 and 1995 to: 1) determine the most commonly used and released chemicals; 2) identify currently used pollution prevention (P2) approaches and on-going pollution prevention research and development to lower or substitute the use of a chemical; and 3) identify potential RD/transition needs. As of January 1998, fifteen chemical Fact Sheets have been developed. Please refer to the back page to order Fact Sheets for other chemicals.

This Fact Sheet contains two charts and four main sections:

- The charts represent the waste management distribution and percent change of TRI reported quantities.
- Chemical Profile section.
- Identified and used P2 approaches section.
- On-going P2 research and development section.
- P2 research and development/transition needs section.

TRI Reported Quantities - Percent Change 1994 and 1995



TRI Reporting	Releases	Recycling		Energy Recovery		Treatment		Releases plus Off-site Treatment
		On-Site	Off-Site	On-Site	Off-Site	On-Site	Off-Site	
1994 (lbs)	0	0	0	97	0	340,001	440	440
1995 (lbs)	316,100	0	0	0	0	350,000	0	316,100
% Change	100%	0%	0%	-100%	0%	3%	-100%	71741%

SYNONYMS

BARIUM NITRATE

SODIUM NITRATE

AMMONIUM NITRATE

COMMON USES IN THE U.S.

[#http://mail.odsnet.com/TRIFacts#](http://mail.odsnet.com/TRIFacts#)

- Three facilities reported releases of nitrate compounds in 1995, Holston Army Ammunition Plant in Kingsport, TN accounted for over 80 percent of the total releases. Nitrate compounds were probably released as a result of producing explosives (i.e., HMX and RDX and their components). The USDA research facility in Beltsville, MD accounted for 18 percent. In this case, nitrate compounds were probably the result of fertilizer application.
- Many nitrated products are explosives including DNT, TNT, and nitro-glycerine. Ammonium nitrate is also used as a fertilizer.

ACUTE HEALTH HAZARDS

[#http://mail.odsnet.com/TRIFacts#](http://mail.odsnet.com/TRIFacts#)

- Nitrate compounds are explosive, flammable, and toxic. Ammonium nitrate is an irritant, exposure and direct contact can irritate the eyes, skin, nose, and throat. Overexposure can cause nausea and vomiting, flushing of the head and neck, headaches, weakness, faintness and collapse. Severe overexposure results in methemoglobinemia and possible death.

CHRONIC HEALTH HAZARDS

[#http://mail.odsnet.com/TRIFacts#](http://mail.odsnet.com/TRIFacts#)

- Ammonium nitrate has not been tested for its ability to cause cancer in animals, nor has it been tested for its ability to adversely affect reproduction.

COMMON P2 INITIATIVES

[#http://mail.odsnet.com/TRIFacts#](http://mail.odsnet.com/TRIFacts#)

- Careful storage and handling practices. Careful management practices can reduce accidental releases of fertilizers to the environment.
- Fertilizer
Material substitution. Alternatives to anhydrous ammonia and ammonium nitrate fertilizers are commercially available.
- Explosives production
Improved containment and management practices. Due to its explosive nature, production personnel must follow very strict protocols to prevent accidents from occurring.

Additional information regarding chemical hazards and access to Material Safety Data Sheets can be reached through the Agency for Toxic Substances and Disease Registry web page: <http://atsdr1.atsdr.cdc.gov.8080/> - refer to ToxFAQs.

FEDERAL FACILITIES REPORTING

COMMON USES OF: NITRATE COMPOUNDS

Federal Facilities Reporting in both 1994 and 1995	2	AGRICULTURE	EXPLOSIVES
Federal Facilities Reporting Only in 1994	0		
Federal Facilities Reporting Only in 1995	1		

POLLUTION PREVENTION APPROACHES CURRENTLY IN USE

AGRICULTURE

- All 50 States and several territories have established some form of Farm*A*Syst program through their agricultural extension services offices to educate farmers (and other audiences) on how their activities may affect drinking water quality. Farm*A*Syst is supported through a handshake agreement between the USEPA, USDA's Cooperative State Research Education and Extension Service, and Natural Resource Conservation Service. The program has produced a variety of publications, slide shows, software programs, self-assessment guides, and other tools describing best management practices for crop production. Best management practices for fertilizers include: Inventory control – buy and store as little fertilizer as possible; Storage facility – fertilizer should be stored in a building with a concrete floor that is more than 100 feet away from a well or surface water; Spill prevention – liquid fertilizer should be stored in a building with a curbed containment pad; Security – the storage building should be fenced, locked, and separated from all other activities; Mixing/loading – fertilizer preparation occurs more than 100 ft from a well or surface water; spills should be cleaned up immediately; Mixing/handling equipment – install check valves on mixing/handling systems if the equipment is connected to a water supply to prevent fertilizer from back flowing; Loading – the equipment operator should monitor the process of filling liquid fertilizer application equipment to prevent leaks, spills, or overflows; Buffer zone – maintain a buffer zone of at least 100 ft between fertilizer application areas and a well or surface water; and Packaging wastes – reduce the number of empty containers by using products in mini-bulk or returnable containers or by using custom application. (source: Mississippi State University Extension Service. "Handling and Storing Fertilizers". no date)

POLLUTION PREVENTION APPROACHES CURRENTLY IN USE

AGRICULTURE

- EPA and the USDA have launched several technical assistance programs and voluntary partnership initiatives to promote the adoption of environmentally sound agricultural management practices. Agriculture in Concert with the Environment (ACE) is a joint EPA and USDA grant program to promote the adoption of sustainable agriculture practices and reduce the use of highly toxic herbicides and other pesticides. AgSTAR is a voluntary EPA, USDA, and DOE sponsored program that promotes cost-effective methods for reducing methane emissions through manure management. The main focus is on the swine and dairy industries. The field of sustainable agriculture focuses primarily on developing and disseminating new techniques and management practices to minimize the environmental impacts associated with agriculture and livestock production. Information on alternative crop production methods, fertilizers, pesticides, and other subjects is available in the extensive body of technical literature devoted to sustainable agriculture.

EXPLOSIVES

- Army ammunition plants have taken a number of steps to minimize the environmental impacts associated with explosives production. Holston has already taken steps to reduce nitrate compounds by: improving materials management, selling non-conforming explosives and catch basin/settling tank material, and screening impurities from catch basin material to capture more material as conforming product. (Source: Holston Army Ammunition Plant Pollution Prevention Plan 1997)

ON-GOING POLLUTION PREVENTION RESEARCH AND DEVELOPMENT

AGRICULTURE

Information on current R&D projects related to developing alternatives for commercial fertilizers such as ammonia-based products is available in the sustainable agriculture literature.

EXPLOSIVES

Replace Toxic Igniter Composition (Barium Nitrate)

POC: ARDEC

Design/Use Catalysts to Avoid Red Water TNT Production

POC: ARDEC

Non-Polluting Primary Explosives in M55 Detonation

POC: ARDEC

Pink Water Treatment Technology

POC: AEC/NDCEE

Develop Complete and Clean HCl-free Combustion Propellant

POC: MICOM/NAWC

Develop Lead-free Extrudable and Castable Propellant for Minimum Smoke Systems

POC: MICOM/NSWC/NAWC

Replace DNT in Propellant Compositions

POC: ARDEC

Reuse of Waste Ammonium Nitrate

POC: CERL

Recycling of Nitrocellulose Fines

POC: ARDEC/CERL

POLLUTION PREVENTION RESEARCH AND DEVELOPMENT / TRANSITION NEEDS

AGRICULTURE

- It appears as though USDA's pollution prevention need can be resolved either through current techniques and commercially available products or on-going R&D. No additional R&D seems necessary to resolve the need.

EXPLOSIVES

- The Army needs additional funding for R&D projects related to pollution prevention for explosives production. Additional barriers to reducing nitrate compounds from explosives production are: the time required for certifying new ammunition, contractual issues associated with working with GOCO facilities, and the high cost of upgrading the existing facilities to handle new technologies.

Federal Facilities Which Reported for Both 1994 and 1995

Facility	1994 Release+ Off-site Treatment	1995 Release+ Off-site Treatment	Percent Change
U.S.D.A. BELTSVILLE, BELTSVILLE, MD	0	55,800	100%
U.S. ENRICHMENT CORP., PIKETON, OH	0	0	0%
U.S. DOE SAVANNAH RIVER SITE, AIKEN, SC	440	7,300	1559%
U.S. ARMY, KINGSPORT, TN	0	253,000	100%

If you have additional information regarding an identified or used P2 approach, on-going P2 research and development, or any P2 research and development/transition needs, please notify Will Garvey, US EPA, 1200 Pennsylvania Avenue, NW, Ariel Rios Building, 3rd Floor, Washington, DC 20004-2403, or fax (202) 501-0069.