



PRODUCT STEWARD MANUAL





PRODUCT STEWARD MANUAL

March, 1998

DSW 122447

STLCOPCB4032395

DSW 122448

PRODUCT STEWARD TRAINING

A G E N D A

8:30 - 9:30	Responsible Care and Product Stewardship Overview
9:30 - 10:30	Product Steward Duties
10:30 - 10:45	BREAK
10:45 - 12:00	MSDS Orientation
12:00 - 1:00	LUNCH (on your own)
1:00 - 2:00	RISK ASSESSMENT and ESHA PROCESS
2:00 - 2:15	BREAK
2:15 - 3:15	TSCA
3:15 - 3:45	Contract Manufacturers
3:45 - 4:15	Waste Regulations

DSW 122449

STLCOPCB4032397

**List of
Key Contacts**

DSW 122450

STLCOPCB4032398

CHEMICALS

ESH

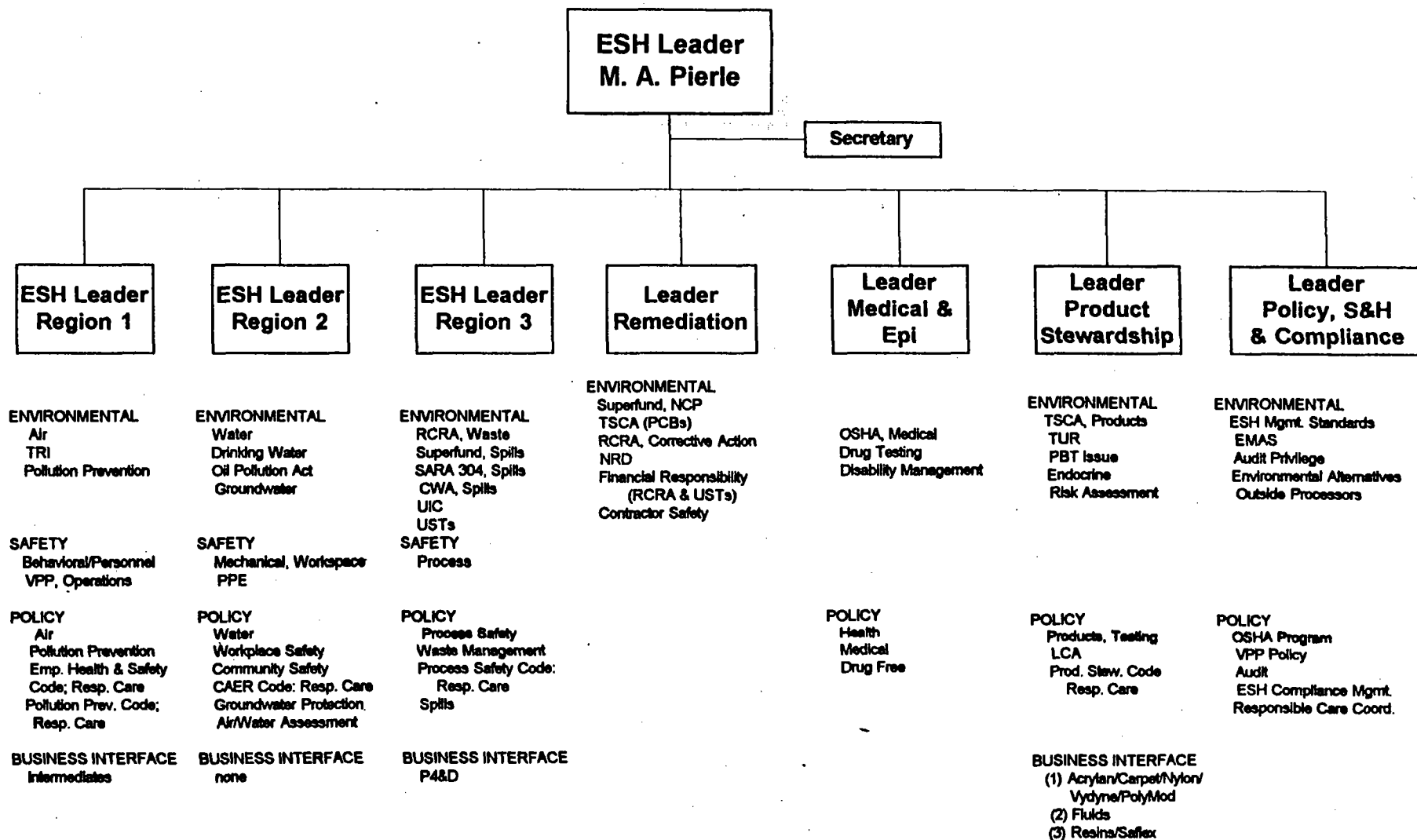
Revised 1/11/97
Draft

ISSUE OWNER ROLES
- Regulatory Management
- Policy Formation/Support

BUSINESS INTERFACE ROLES
(Present DESH Function)

DSW 122451

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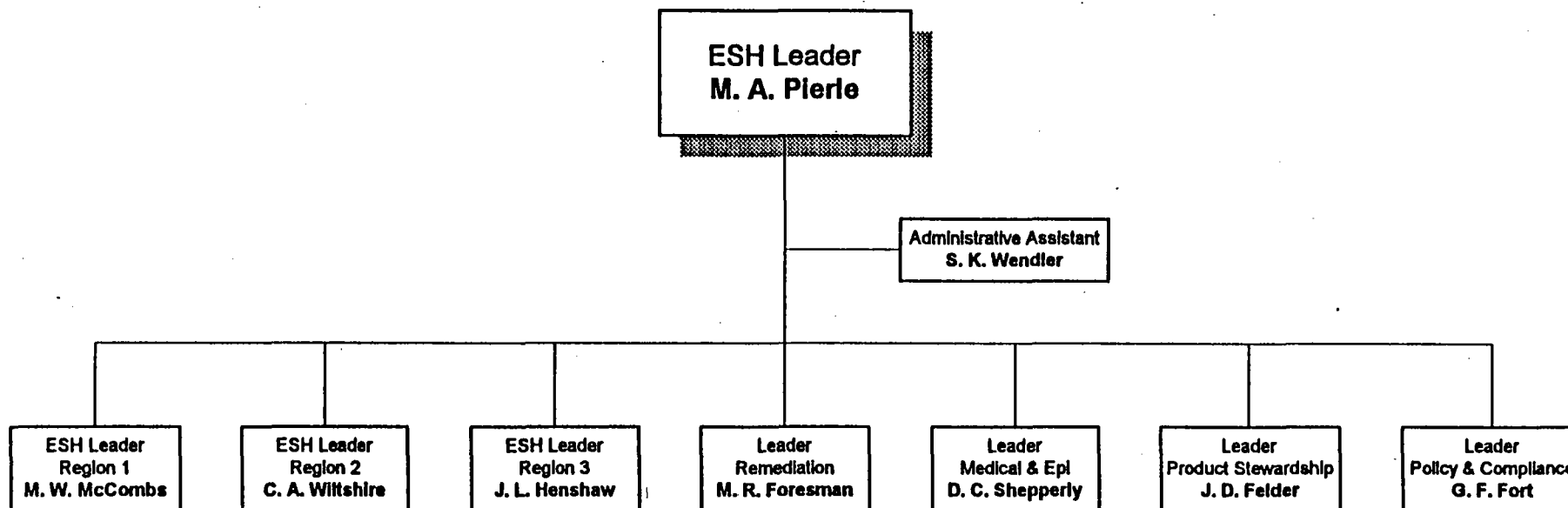


ESH-CHEMICALS ORGANIZATION

December 11, 1997

DSW 122452

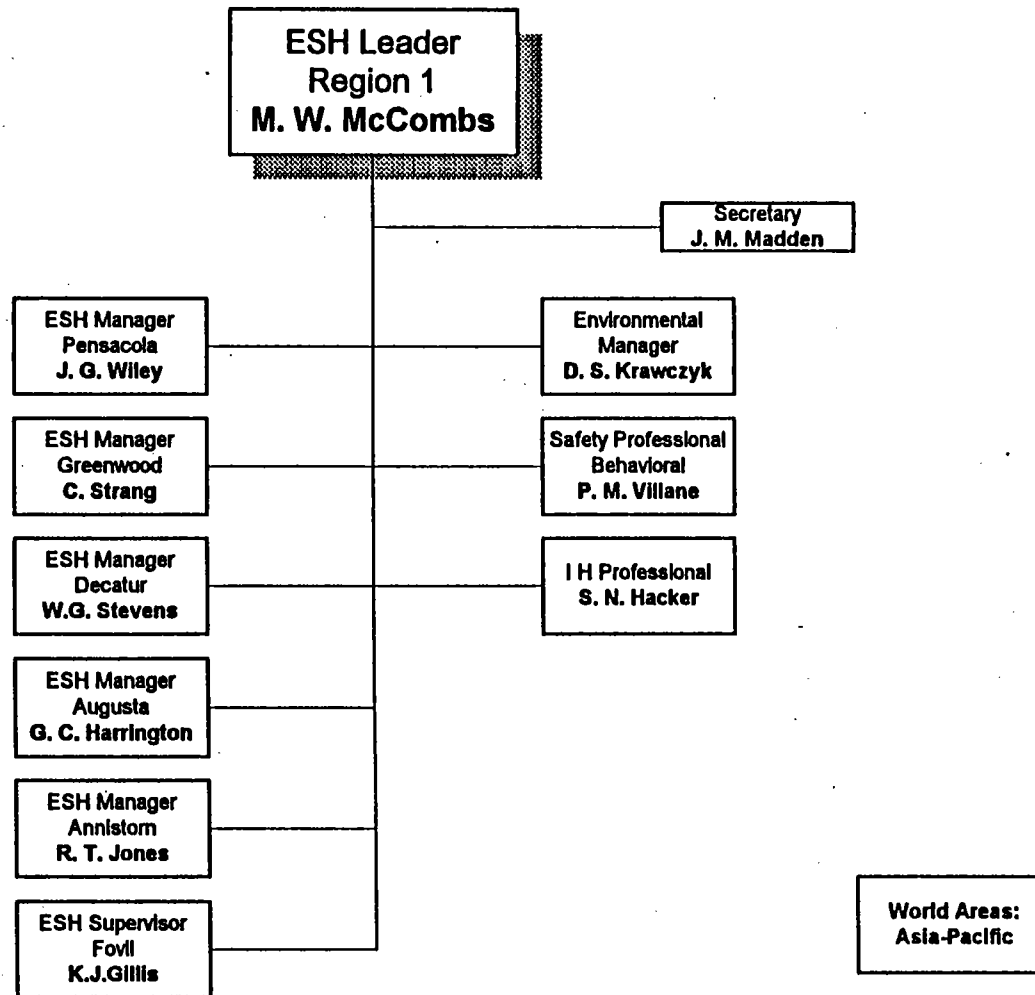
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ESH-CHEMICALS

Region 1

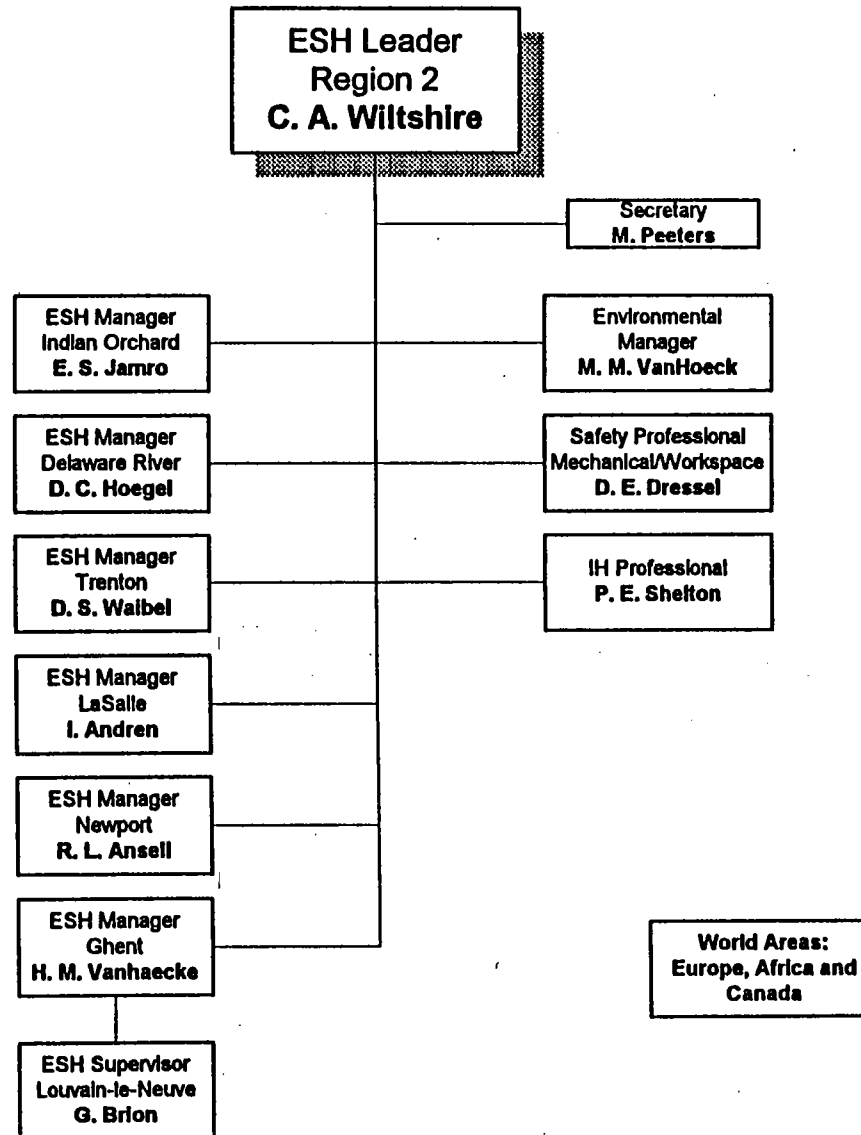
December 11, 1997



ESH-CHEMICALS

Region 2

December 11, 1997

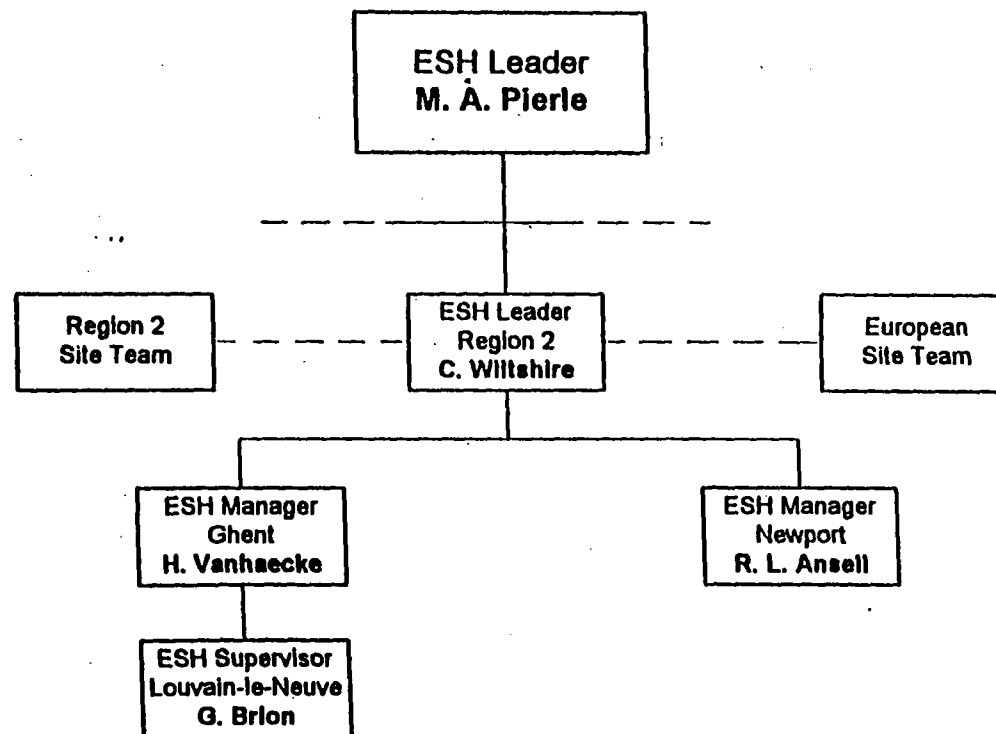


TEAM EUROPE ESH-CHEMICALS

February 14, 1997

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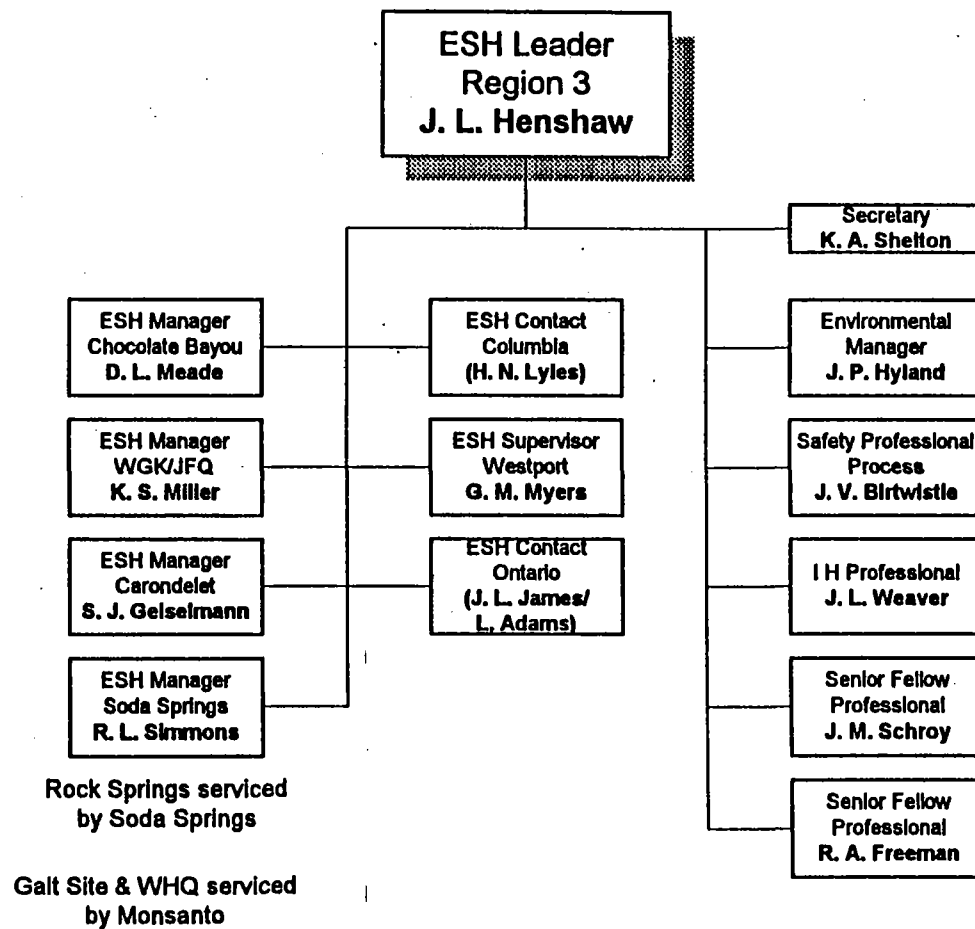


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Region 3

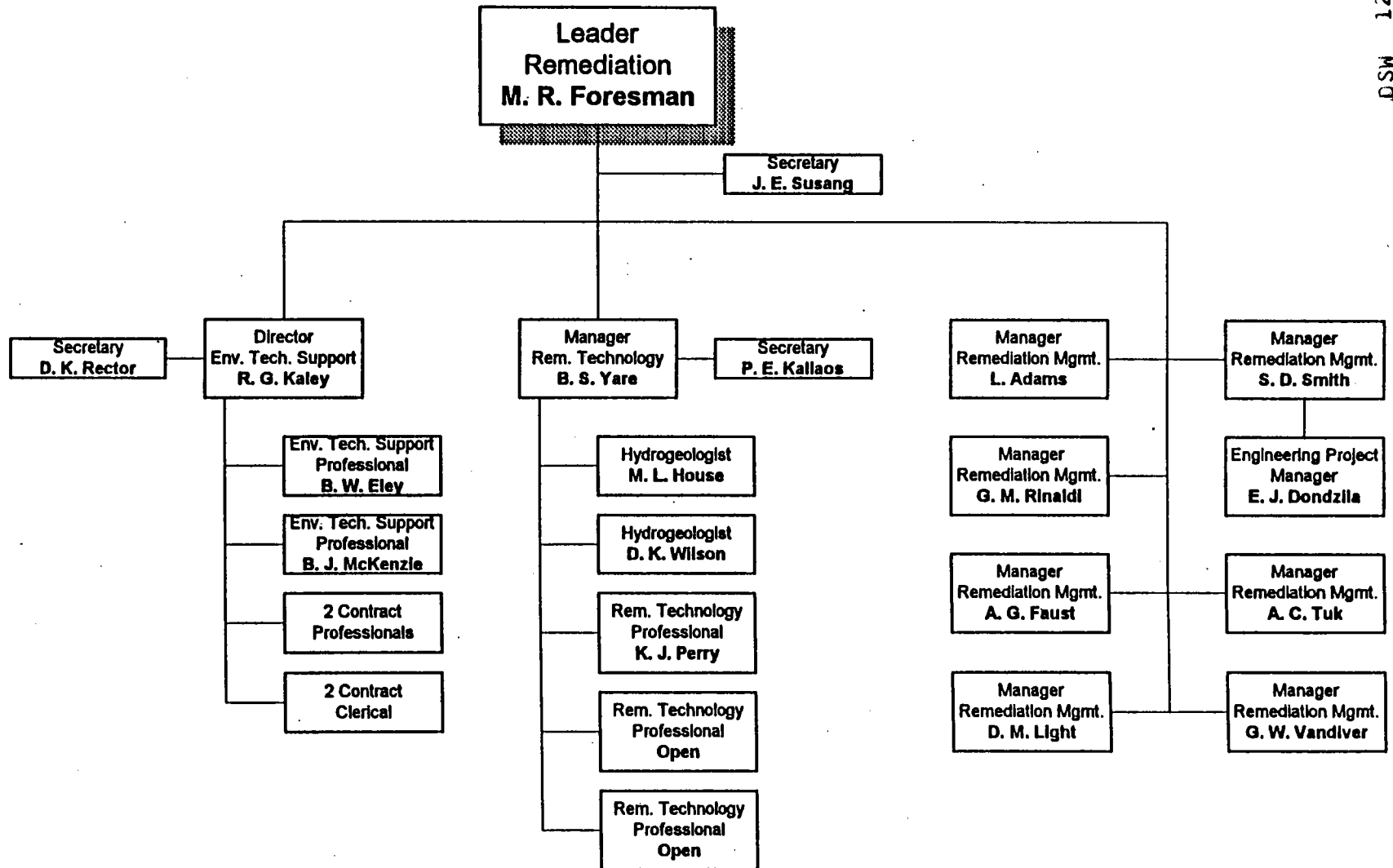
December 11, 1997



World Areas:
Latin and South
America

ESH-CHEMICALS Remediation

December 11, 1997



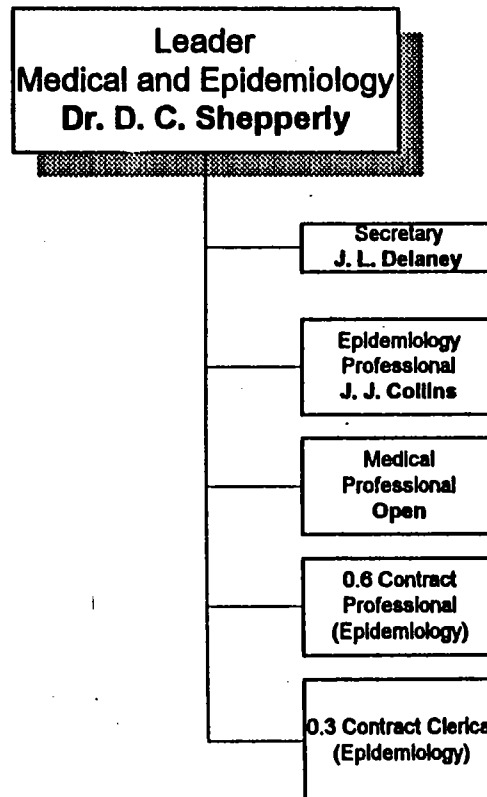
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Medical & Epidemiology

December 11, 1997



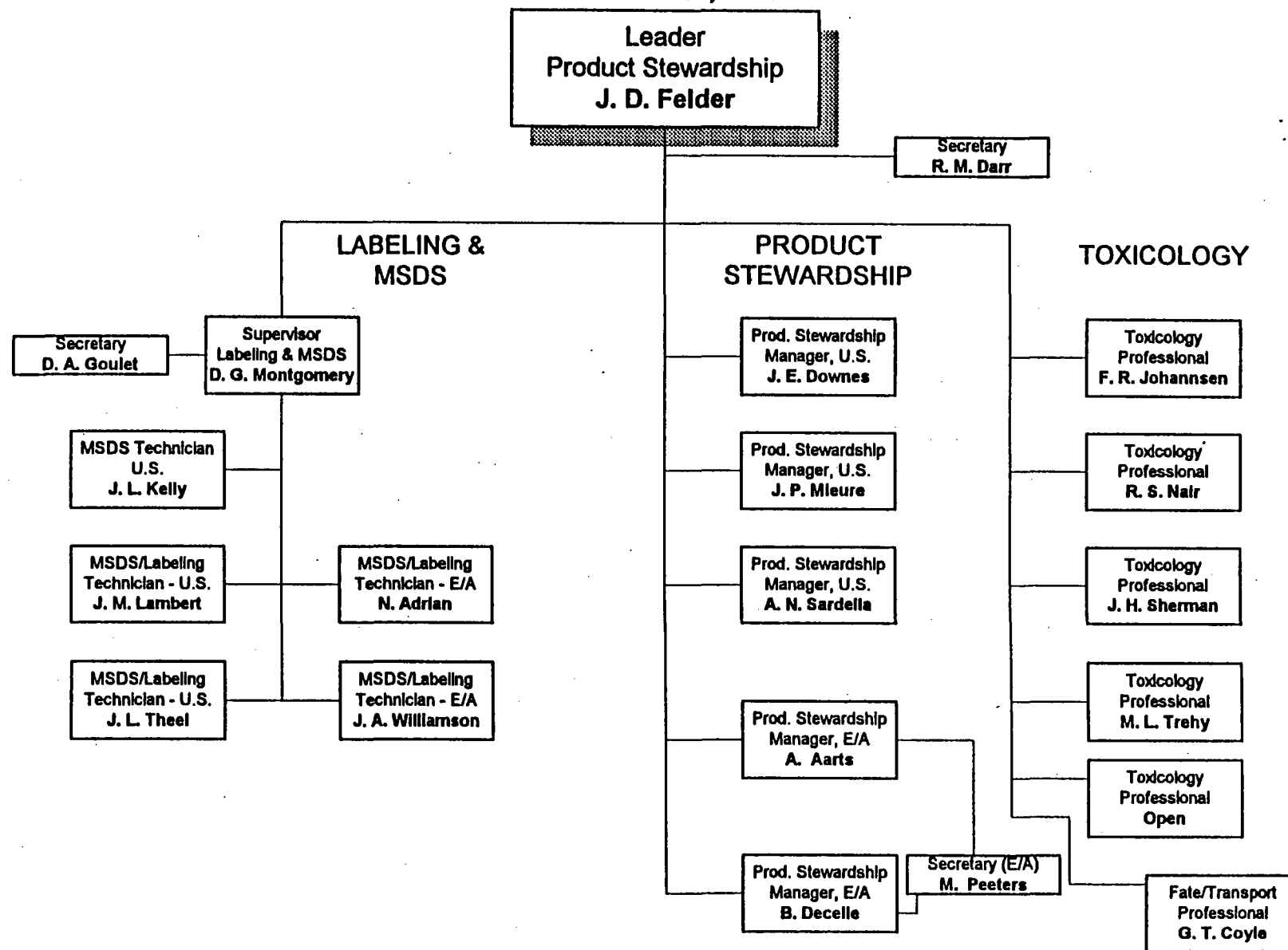
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ESH-CHEMICALS

Product Stewardship

December 11, 1997

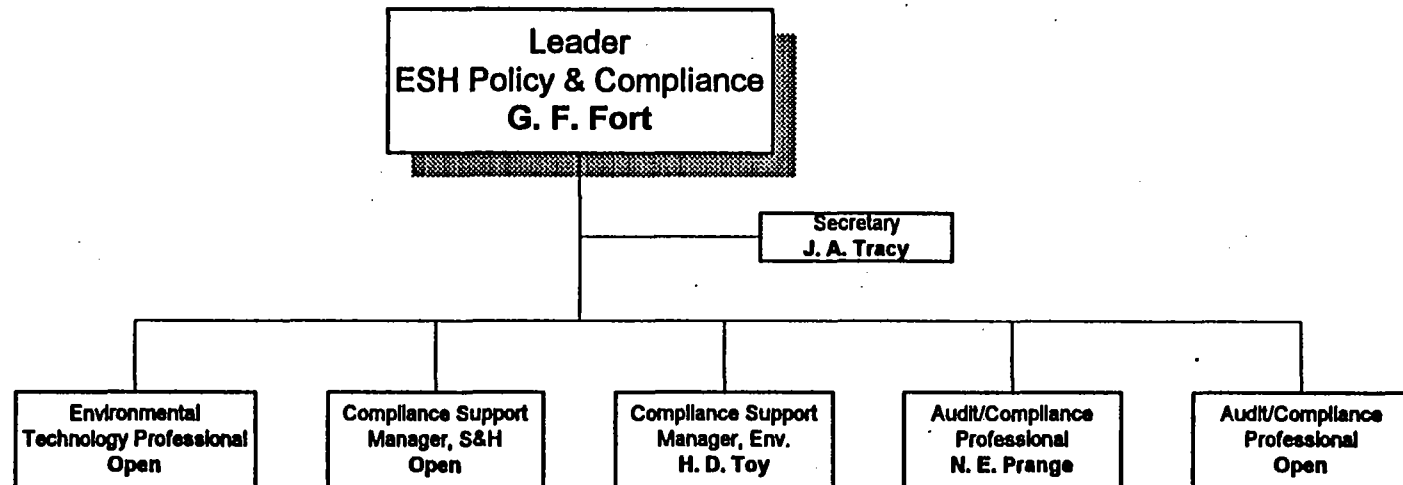


DSW 122459

STLCOPCB4032407

ESH-CHEMICALS Policy & Compliance

December 11, 1997



DSW 122460

STLCOPCB4032408

Product Stewardship Liaison - Assignments by Business Group

Assignments effective 11 August 1997, changes highlighted

<u>Business</u>	<u>Product Stewardship Assignment</u>
Acrilan	Jim Mieure
Carpet	Jim Mieure
Commercial Development (ESH Business Liaison = Jim Mieure)	Jim Mieure
Nylon Industrial	Jim Mieure
Fluids	
Dequest	Andre Aarts
Therminol	Jim Downes
Glacier	Jim Downes
Skydrol/Skykleen	Jim Downes
L-Aspartic Acid	Jim Downes
Intermediates (ESH Business Liaison = Tony Sardella)	
KA, Nitric Acid, Nylon Salt, & Tetrathal	Jim Downes
Chlorobenzenes, Ammonia, & Coke	Jim Downes
AN, HCN, Formalin, NTA, & Santoquin	Tony Sardella
Adiponitrile, HMDA, & Coproducts	Tony Sardella
P4&D	
Fire Safety	Jim Downes
Technical	Jim Mieure
Food Phosphates	Jim Mieure
Phosphoric Acid	Jim Mieure
P4 & Intermediates	Jim Mieure
Polymer Modifiers (ESH Business Liaison = Rashmi Nair)	
Flooring, Santotac	Rashmi Nair ¹
BzCl, Santofoam	Rashmi Nair
Adipates	Rashmi Nair
Phosphate Esters	Rashmi Nair
3GEH	Rashmi Nair
Resins (ESH Business Liaison = Jeff Felder)	
Adhesives & Binders	Rashmi Nair
Resimenes, Modaflow, & DME	Rashmi Nair
Plastic Products	Rashmi Nair
Saflex	
Ethyl Acetate	Tony Sardella
Butvar Resin	Andre Aarts
Saflex Sheet	Andre Aarts

Vydyne

Jim Mieure

Notes:

1. Rashmi Nair will continue to provide toxicology support for this business as well until a fourth toxicologist is on board and is well acquainted with the issues and players.

DSW 122462

STLCOPCB4032410

Subject: Product Stewardship Plant Support Assignments - Rev 1.0
Author: JEFFREY D FELDER at MONSL505
Date: 11/5/97 4:54 PM

Product Stewardship has plant as well as product issues (e.g., TSCA Inventory updates, 8(d) studies, etc.) so that we align our Product Stewardship Managers to support particular plants as well as businesses.

The previous assignment list showed Ron Hogue. Switches have been made as a result of Ron's retirement with the following results.

Anniston - Jim Downes

Antwerp Guest - Andre Aarts

Augusta - Jim Mieure

Carondolet - Jim Mieure

Chocolate Bayou - Tony Sardella

Columbia - Jim Mieure

Decatur - Jim Mieure

Delaware River - Rashmi Nair

Fovil - Jim Mieure

Ghent - Andre Aarts

Greenwood - Jim Mieure

Indian Orchard - Rashmi Nair

Krummrich - Jim Downes

LaSalle - Tony Sardella

LLN- Andre Aarts

Newport - David Tucker

Ontario - Jim Downes

Pensacola - Jim Mieure

Queeny - Jim Downes

Soda Springs/Rock Springs - Jim Mieure

Trenton - Jim Mieure

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STLCOPCB4032411

Westport - Jeff Felder

WHQ - Jeff Felder

DSW - 122464

STLCOPCB4032412

MSDS AND LABEL GROUP CONTACTS

Don Montgomery - lead 4-7136 F2EB

Existing MSDS's:

Jackie Kelly 4-3221 F2EB

Debbie Goulet 4-2517 F2EB

New MSDS's:

**See the Product Stewardship Manager
ESHA Review**

Labels:

Jerry Lambert 4-5662 F2EB

Joanne Theel 4-3481 F2EB

**List of
Product Stewards**

DSW 122466

<u>BUSINESS UNIT</u>	<u>PS MANAGER</u>	<u>PRODUCT STEWARD</u>	<u>MAIL CODE</u>	<u>PHONE</u>
Acrilan	Jim Mieure	Bret Bement	1260	628-2711
Industrial Products				
Therminol/DPO/Polyphenyls	Jim Downes	Jerry Brown	1060	621-8406
Skydrol	Jim Downes	Joe Giardina	T4M	4-3954
SkyKleen	Jim Downes	Frank Jakse	T4M	4-4546
Dequest	Andre Aarts	Tom Christ	T1D	4-4593
Glacier/I-Aspartic Acid	Jim Downes	Andrew Waller	T3W	4-5740
Intermediates				
NTA	Tony Sardella	Chad Starr	1200	522-4283
AN/HCN/Formalin	Tony Sardella	Robert Cordingley	1200	522-4774
Santoquin	Tony Sardella	Mark Halstead	1670	550-4458
Adiponitrile/HMDA/Co-products	Tony Sardella	Pamela Brown	1690	634-7397
Chlorobenzenes	Jim Downes	Elizabeth Lee	1740	537-6584
Ammonia	Jim Downes	Tim Strehl	G5WT	4-8706
KA/Nitric Acid/Nylon Salt	Jim Downes	Tonya Mattix	1690	634-8602
Tetrathal	Jim Downes	John Peduzzi	1740	537-6423
Phenol	Jim Downes	Wendy Kramer	1690	634-7706
Commercial Development	Jim Mieure	Tom Waldman	G5NR	4-5983
Nylon Industrial	Jim Mieure	Max Yeh	1070	622-7640
Polymer Modifiers	Beatrice Decelle (except Benzyl Phthalates)	David Moore	1730	4-7078
Resins				
Coatings/DME		Tim Golden	1870	731-2858
Adhesives and Binders		Phil Emery	1870	731-2754
Plastics Products		Jim Holtrop	1793	314-997-8622
Nylon Plastics	Jim Mieure	Monika Crear	6781 Winterberry Ridge Dr. Stone Mountain, GA 30087	770-465-7493

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STLCOPCB4032415

Carpet	Jim Mieuse	Larry Haeger	1070	622-1652
Phosphorus and Derivatives				
Fire Safety:Wildfire	Jim Downes	Larry Vandersall	Lawdon Fire Services 2137 Albright Ave. Upland, CA 91786	909-985-2653
Fire Safety:Phos Chek P/30	Jim Downes	Ray Mount	T1D	4-2940
Technical Phosphates	Jim Mieuse	Joe Witkowski(T)	T1D	4-7487
Phosphoric Acid	Jim Mieuse	Joe Witkowski(T)	T1D	4-7487
P4	Jim Mieuse	Terry Wollin	1850	557-1339
Phos. Pentasulfide	Jim Mieuse	Rick Bosch	T1D	4-5400
Food Phosphates	Jim Mieuse	Karen Linck	T1D	4-1643
Saflex				
Saflex Sheet	Andre Aarts	Dick Michelsen	1870	731-3223
Ethyl Acetate	Tony Sardella	Kim Gingras	G3ND	4-4681

Status: 9/15/98

DSW 122468

STLCOPCB4032416

**Product Stewardship
Overview**

DSW 122469

Solutia Inc.

CMA Responsible Care®

Responsible Care® :

A Public Commitment

DSW 122470

Product Stewardship

Background

- **Adopted in 1988**
- **Response to negative perceptions**
- **Outgrowth of:**
 - **CAER (1985 Community Awareness and Emergency Response Initiative)**
 - **Canadian Chemical Producers Association's Responsible Care Program**

DSW 122471

Intent

- **A way of doing business:**
 - Implementation will never be complete
 - Not a checklist of activities
- **Continuous Improvement**
 - New Information
 - New Technology
 - New Expectations
 - Constant Reassessment

DSW 122472

Goals

- **Improve chemical processes**
- **Enhance practices and procedures**
- **Reduction of every kind of waste, accident, incident and emission**
- **Reliable communication and dialogue**
- **Heighten public involvement and input**

DSW 122473

Important Elements

- **Guiding principles**

- A statement of philosophy and commitment by companies regarding responsibilities for the management of chemicals.

- **Codes of management practices**

- Delineate six specific areas of manufacturing, transport, and handling that CMA companies will work to improve.

- **Public advisory panel**

- Third party group formed to assist in identifying and developing programs responsive to public concerns.

- **Member self-evaluations**

- Internal management tool for measuring program implementation and documenting progress.

- **Executive leadership groups**

- Senior industry representatives meet periodically to review progress toward improved performance.

Guiding Principles

- 1.) To respond to community concerns**
- 2.) To develop safe chemicals and handling practices**
- 3.) To make health, safety, and the environment a high priority**
- 4.) To report all hazards and recommend protective measures**
- 5.) To counsel on the safe use of chemicals**
- 6.) To operate in a manner that protects the environment**
- 7.) To measure the effects of chemicals on the environment**
- 8.) To correct problems caused by past mistakes**
- 9.) To create responsible laws, regulations, and standards**
- 10.) To promote Responsible Care through open dialogue**

Codes of Management Practices

- **1.) Community Awareness and Emergency Response Code (CAER):**
 - Communication with public and emergency response teams
- **2.) Process Safety Code**
 - Prevention of in-plant fire, explosions, and accidental chemical releases\
- **3.) Employee Health and Safety Code**
 - Addresses traditional worker health and occupational safety issues
- **4.) Pollution Prevention Code**
 - Addresses processes to a.) properly handle and b.) minimize waste
- **5.) Distribution Code**
 - Reduce risks to the public, carriers, contractor, company employees, and the environment during transportation and storage
- **6.) Product Stewardship**
 - Ensures the completion of the other five codes of management practices

Product Stewardship

Common themes

- **Accountability**
 - Expands beyond the point of sale
- **Dialogue**
 - Stakeholders: suppliers, regulators, lawmakers, public, employees, competitors, transporters, customers, shareholders
- **Teamwork**
- **Continuous improvement**

CMA Responsible Care®



Product Stewardship

Related Activities

● Responsible Care Partnership:

- makes the Responsible Care initiative available to non-CMA companies

● Public Outreach:

- publicizes the commitment and efforts of the chemical industry and to build momentum for the industry to improve performance

● International Outreach:

- Encourage the use of Responsible Care outside of North America
- Responsible Care has been introduced in the United Kingdom (1989), Australia (1989), France (1990), the Netherlands (1991), New Zealand (1991), and Germany (1991)

Code of management practices:

Management Leadership and Commitment

- **1.) Leadership**
 - Demonstrates senior management leadership
- **2.) Accountability and Performance Measurement**
 - Establishes goals and responsibilities for implementing product stewardship
- **3.) Resources**
 - devotes resources (eg. training, coordinator) necessary to implement and maintain product stewardship practices

Code of management practices:

Information and Characterization

● 4.) HSE Information

- creates information on hazards and reasonably foreseeable exposures (eg., spills, releases) on existing and new chemicals

● 5.) Product Risk Characterization

- Characterizes new and re-evaluates existing products with respect to their risks

Code of management practices:

Risk Management

- **6.) Risk Management System**
 - Creates a system to list and use actions appropriate to the product risk
- **7.) Product/Process Design and Improvement**
 - Creates a system that makes HSE a key consideration in the design, development, and/or improvement of our products and processes.
- **8.) Employee Education and Product Use feedback**
 - Educates employees (based on job function) on the proper use of our products
 - Implements a system encouraging employee feedback on new uses, misuses, or other adverse effects of our materials

Code of management practices:

Risk Management (continued)

● 9.) Contract Manufacturers

- Foster proper handling, use, recycling, and disposal of our products and processes used by toll manufacturers

● 10.) Suppliers

- Requires suppliers to provide HSE information and guidance on their products

● 11.) Distributors

- Encourages distributors to foster responsible handling of our products to downstream users

● 12.) Customers

- Creates partnerships with our customers to foster the responsible use and disposal of our products through training, bulletins, MSDSs, and other means of communication

SECOND DRAFT

GUIDELINES FOR PRODUCT STEWARDSHIP SELF EVALUATION

1. PP = Champion appointed at vice-presidential level and playing a highly visible role in implementing Product Stewardship. Written policy in place for the Chemical Group and well understood by General Managers.

DP = Routine recognition by senior management, and clear guidance on timing for implementation.

2. PP = Product Stewards actively involved in business teams and Product Stewardship fully incorporated into business plans and individual goals. Business directors and managers knowledgeable and supportive of Product Stewardship.

DP = Product Stewards in place, trained and active in business units.

3. PP = Product Stewardship properly resourced with people and funding resulting in no delays to programs.

DP = No more than one year delay in implementing any programs.

4. PP = Information available on all products to satisfaction of health and environmental scientists to permit assessment of risk to employees, customers and the environment throughout each product's life cycle. This includes information on exposures resulting from use and disposal.

DP = Information available as above on all high and medium priority (based on perception of risk) products, with plans approved for obtaining information on remaining products.

5. PP = Current risk assessments (evaluated by health and environmental specialists), exist for all products or product lines, and procedures are in place to assure periodic re-evaluation. (Complete MSDS assessments, when conducted using well documented exposure data, fulfill this requirement.)

DP = Current risk assessments exist on all products, based on available or estimated exposure data.

6. PP = All risks not clearly de minimus, identified in 5. above, are reduced to acceptable levels. Program in place to provide special in-depth review of use, risk evaluation and risk management for selected products.

DP = All unacceptable risks identified in 5. above are reduced to acceptable levels.

7. PP = Technology and technical service groups follow procedures designed to make environmental protection, including health and environmental safety, energy conservation and waste minimization/safe disposal key considerations in the development of new products and new and modified processes. These parameters are audited in all product/process safety reviews.

DP = Technology and technical service groups follow procedures designed to make health and environmental safety key considerations in new product and process development.

8. PP = All employees who have potential to come into contact with products, raw materials or intermediates are thoroughly trained on the hazards and proper handling procedures and precautions of those materials. Procedure in place to verify training and to initiate retraining. All sales, marketing and marketing technical services personnel trained similarly for products, and in how to recognize and feed back information about how our products are used, and about potential misuse or adverse effects.

DP = All employees trained as above. Sales and MTS trained to recognize and feed back uses and misuses.

9. PP = Assessments of all contract manufacturers are current and manufacturers have satisfactorily addressed any concerns. Handling, use, recycling and disposal information to manufacturers is routinely updated to reflect regulatory or other changes.

DP = Current health, safety and environmental assessments (including communication of any concerns) have been approved for most contract manufacturers, and a schedule to complete the remainder has been developed. The need to provide product and process specific information on handling, use, recycling and disposal to each manufacturer is under evaluation.

10. PP = All suppliers of chemical products are following health, safety and environmental practices consistent with CMA Responsible Care Codes. Chemical Group purchasing agents are familiar with Product Stewardship principles, factor adherence to these principles into purchasing decisions and require appropriate health and environmental safety data from suppliers.

DP = Purchasing agents briefed and functioning as above.

11. PP = All distributors confirmed as following health, safety and environmental practices consistent with CMA Responsible Care Codes.

DP = All distributors reviewed and notified of deviations from these practices, with suggestions for compliance.

12. PP = We know and approve of all uses of our products, and we have verification that all product receivers have received and understand our MSDS.

DP = Employees with direct contact with customers and transporters are trained in Product Stewardship principles and we have an active program to determine how our products are used and to look for potential misuse. We are working to improve customers or receivers who have questionable programs.



Responsible Care®

A Public Commitment

PRODUCT STEWARDSHIP CODE OF MANAGEMENT PRACTICES

Purpose and Scope

The purpose of the Product Stewardship Code of Management Practices is to make health, safety and environmental protection an integral part of designing, manufacturing, marketing, distributing, using, recycling and disposing of our products. The code provides guidance as well as a means to measure continuous improvement in the practice of product stewardship.

The scope of the code covers all stages of a product's life. Successful implementation is a shared responsibility. Everyone involved with the product has responsibilities to address society's interest in a healthy environment and in products that can be used safely. All employers are responsible for providing a safe workplace, and all who use and handle products must follow safe and environmentally sound practices.

The code recognizes that each company must exercise independent judgment and discretion to successfully apply the code to its products, customers and business.

Relationship to Responsible Care® and Guiding Principles

Implementation of the code promotes achievement of several of the Responsible Care® Guiding Principles:

- ☐ to make health, safety and environmental considerations a priority in our planning for all existing and new products and processes;
- ☐ to develop and produce chemicals that can be manufactured, transported, used and disposed of safely;
- ☐ to extend knowledge by conducting or supporting research on the health, safety and environmental effects of our products, processes and waste materials;
- ☐ to counsel customers on the safe use, transportation and disposal of chemical products;
- ☐ to report promptly to officials, employees, customers and the public, information on chemical-related health or environmental hazards and to recommend protective measures;

- ❑ to promote the principles and practices of Responsible Care® by sharing experiences and offering assistance to others who produce, handle, use, transport or dispose of chemicals.

Management Practices

Each company shall have an ongoing product stewardship process that:

Management Leadership and Commitment

1. **LEADERSHIP:** Demonstrates senior management leadership through written policy, active participation and communication.
2. **ACCOUNTABILITY and PERFORMANCE MEASUREMENT:** Establishes goals and responsibilities for implementing product stewardship throughout the organization. Measures performance against these goals.
3. **RESOURCES:** Commits resources necessary to implement and maintain product stewardship practices.

Information and Characterization

4. **HEALTH, SAFETY and ENVIRONMENTAL INFORMATION:** Establishes and maintains information on health, safety and environmental hazards and reasonably foreseeable exposures from new and existing products.
5. **PRODUCT RISK CHARACTERIZATION:** Characterizes new and existing products with respect to their risk using information about health, safety and environmental hazards and reasonably foreseeable exposures. Establishes a system that initiates re-evaluation.

Risk Management

6. **RISK-MANAGEMENT SYSTEM:** Establishes a system to identify, document and implement health, safety and environmental risk-management actions appropriate to the product risk.
7. **PRODUCT and PROCESS DESIGN and IMPROVEMENT:** Establishes and maintains a system that makes health, safety and environmental impacts—including the use of energy and natural resources—key considerations in designing, developing and improving products and processes.
8. **EMPLOYEE EDUCATION and PRODUCT USE FEEDBACK:** Educates and trains employees, based on job function, on the proper handling, recycling, use and disposal of products and known product uses. Implements a system that encourages employees to feed back information on new uses, identified misuses or adverse effects for use in product risk characterization.
9. **CONTRACT MANUFACTURERS:** Selects contract manufacturers who employ appropriate practices for health, safety and environmental protection for the operations under contract, or works with contract manufacturers to help them implement such practices. Provides information and guidance appropriate to the product and process risk to foster proper handling, use, recycling and disposal. Periodically reviews performance of contract manufacturers.

10. **SUPPLIERS:** Requires suppliers to provide appropriate health, safety and environmental information and guidance on their products. Factors adherence to sound health, safety and environmental principles, such as those contained in Responsible Care®, into procurement decisions.
11. **DISTRIBUTORS:** Provides health, safety and environmental information to distributors. Commensurate with product risk, selects, works with and periodically reviews distributors to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the distributor to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures—up to and including termination of the business relationship. This Management Practice should be implemented in conjunction with the Distribution Code of Management Practices.
12. **CUSTOMERS AND OTHER DIRECT PRODUCT RECEIVERS:** Provides health, safety and environmental information to direct product receivers. Commensurate with product risk, works with them to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the product receiver to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures—up to and including termination of product sale.

Relationship to Other Codes of Management Practices

This code complements, and should be implemented in conjunction with, current and future Codes of Management Practices.

CMA
BD-4/14/92

Product Stewardship Code Of Management Practices

Management Practice 1

LEADERSHIP: Demonstrates senior management leadership through written policy, active participation and communication.

The objective of this management practice is to set the driving force for the Product Stewardship Code. To this end, senior management must first adopt a policy that reflects the company's vision of product stewardship. This policy should state clearly how senior management expects product stewardship to be managed within the company.

To be effective, the policy should emphasize that product stewardship, like quality and safety, must be woven into the company's culture. It also should be clear that the commitment is an ongoing, long-term part of the company's operations and business.

Finally, if the new policy represents a change in the way of doing business, it should be clear that a change in behavior is expected. In some companies, a separate written product stewardship policy may be effective. In others, a broader health, safety and environmental (H,S&E) policy that incorporates the principles of product stewardship may be more appropriate.

However, a policy alone is not enough. The words of a policy must be reinforced by actions and behaviors that continuously reaffirm the goals senior management has set. Senior management is responsible for conveying throughout the organization its involvement with, and support of, product stewardship—especially to the next level of management and encouraging it to do the same. (Management Practices 2 and 3 focus on some of the visible signals—for example, goals, performance measurement and resource allocation).

Management Practice 2

ACCOUNTABILITY and PERFORMANCE MEASUREMENT: Establishes goals and responsibilities for implementing product stewardship throughout the organization. Measures performance against these goals.

One of the key ways senior management can convey the importance of product stewardship is by establishing it as a priority in business planning and individual performance planning. The objective is to develop a process that will result in continuous improvement through goals that are well-defined, achievable and measurable. Similarly, individual responsibilities should be clear and consistent.

Management Practice 3

RESOURCES: Commits resources necessary to implement and maintain product stewardship practices.

The commitment of resources, both human and financial, is a critical signal that management can send to show its commitment to product stewardship practices and is a vital component for some implementation activities. Undoubtedly, resources will vary from company to company. However, in all cases, the commitment of resources should be consistent with product stewardship implementation plans and sufficient to support continuous improvement.

Management Practice 4

HEALTH, SAFETY and ENVIRONMENTAL INFORMATION: Establishes and maintains information on health, safety and environmental hazards and reasonably foreseeable exposures from new and existing products.

Just as Management Practice 1 is the driving force for the Product Stewardship Code, Management Practice 4 is the foundation. The objective of Management Practice 4 is to establish a knowledge base of human and environmental hazards and reasonably foreseeable exposures and, once established, to maintain it. Under this practice, companies gather information to support the system that characterizes a product's risk (Management Practice 5) and, ultimately, the system that develops the methods to manage that risk (Management Practice 6).

Initially, some companies may establish their knowledge base by developing information; others may do so by collecting and compiling available information. However, all companies should have a process to continuously gather relevant product information and to review existing information to determine if it is accurate, current and complete.

Sources of information may include published, unpublished and/or internally generated scientific reports on health, safety and environmental effects and exposures. Generally, the types of information could cover animal or human toxicity, ecotoxicity and chemical and physical properties that affect exposure or the environmental impact. In many cases, exposure information is not directly available but may be estimated with product use information.

Information on a product's handling, use and reasonably foreseeable exposures in research, development, manufacturing, transport, storage, packaging and disposal may be obtained by a number of means. These could include surveys of customers and other product receivers, technical reviews or visits to customers, and/or observations reported by sales and marketing personnel.

Management Practice 5

PRODUCT RISK CHARACTERIZATION: Characterizes new and existing products with respect to their risk using information about health, safety and environmental hazards and reasonably foreseeable exposures. Establishes a system that initiates re-evaluation.

This practice has two objectives. The first is to use the information gathered in Management Practice 4 to develop a thorough understanding of the product's risk. This characterization may be either quantitative or qualitative. The second objective is to establish a system that triggers re-evaluation, whether upon receipt of new information or upon periodic, scheduled review.

A product may be characterized as a single entity or it may be characterized in a group of products based on similar uses, compositions or physical properties. Product risks may vary with different uses or exposures.

The time frame for re-evaluation may vary from product to product. Triggers for such re-evaluations might include significant new hazard or exposure data, significant new use or misuse information as it becomes known or a substantial increase in sales volume, suggesting new uses or markets.

Management Practice 6

RISK-MANAGEMENT SYSTEM: Establishes a system to identify, document and implement health, safety and environmental risk-management actions appropriate to the product risk.

The objective of Management Practice 6 is to establish a system for identifying and implementing risk-management actions. Risks involved in the production and use of chemicals can be managed and controlled if each company takes the basic information on a product's risk (Management Practice 4), characterizes it (Management Practice 5) and then implements a series of risk management actions (Management Practice 7 through 12). These risk management actions are a result of a conscious weighing of technical, ethical, societal and business issues surrounding a product. Actions taken as a result can range from no action, to providing MSDSs and labels, to product reformulation or repackaging, to removal of the product from a market.

The management practices that follow, Management Practices 7 through 12, are specific areas of company operations that warrant discussion and special emphasis.

Management Practice 7

PRODUCT and PROCESS DESIGN and IMPROVEMENT: Establishes and maintains a system that makes health, safety and environmental impacts—including the use of energy and natural resources—key considerations in designing, developing and improving products and processes.

Designing products and processes (or redesigning existing products and processes) with a system to identify health, safety and environmental impacts throughout the product lifecycle is one of the most effective ways of managing the product risks identified in Management Practice #5. One objective of this Practice is attainment of the preferred environmental hierarchy: source reduction; reuse; recycling; and disposal. Source reduction includes equipment or technology modifications, process or procedure changes, product reformulation or design, substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control.

This Practice also addresses the need for proper energy and natural resource utilization—important considerations for reducing potential adverse environmental impacts and achieving sustainable development.

The health, safety and environmental attributes of the product throughout its entire life cycle should be addressed at the beginning, during the concept and design (or redesign) phases. Re-evaluation should occur on a periodic basis or whenever changes to the product or process are contemplated.

Insights and contributions from employees in all functional areas that may affect health, safety and the environment should be incorporated into the review. These functional areas include research and development, manufacturing, distribution, sales and marketing and regulatory personnel.

Management Practice 8

EMPLOYEE EDUCATION and PRODUCT USE FEEDBACK: Educates and trains employees, based on job function, on the proper handling, recycling, use and disposal of products and known product uses. Implements a system that encourages employees to feed back information on new uses, identified misuses or adverse effects for use in product risk characterization.

This practice has two parts. The first is to ensure that all employees who are involved with products have the training and education necessary to understand product (and packaging) hazards, proper use, handling, reuse, recycling and disposal procedures. The second is to help ensure that any new information that may alter the way risk is being managed is factored into the risk characterization process on a timely basis (Management Practice 5).

The training and education of employees should be tailored to specific job functions. For example, marketing and sales personnel are in a unique position to know how customers are using products and must be aware of product hazards, reasonably foreseeable exposures, appropriate uses and proper handling

procedures. They should be able to identify product deviations and to recognize adverse health or environmental effects. These personnel should be alert to the customer's and the public's comments or perceptions.

It is essential that there be timely feedback of this safety, health or environmental information or concerns into the risk characterization process (Management Practices 4 and 5). This feedback may change the risk management actions (Management Practice 6).

Management Practice 9

CONTRACT MANUFACTURERS: Selects contract manufacturers who employ appropriate practices for health, safety and environmental protection for the operations under contract, or works with contract manufacturers to help them implement such practices. Provides information and guidance appropriate to the product and process risk to foster proper handling, use, recycling and disposal. Periodically reviews performance of contract manufacturers.

The objective of this Management Practice is to encourage the use of contract manufacturers who have sound health, safety and environmental practices for the specific operations under contract.

Companies are responsible for assessing the capabilities of each contract manufacturer and for supplementing their expertise with enough guidance to foster proper handling (including storage), use and disposal. If contract manufacturers are unwilling to implement appropriate controls, a company may decide to cease doing business with them. While companies are committed to working with contract manufacturers to help them improve performance, improvement to meet appropriate H,S&E standards should occur within a reasonable time frame.

The level of a company product's involvement and review will vary according to the degree of product risk. "Working with" may include providing detailed H,S and E product information, providing technical assistance on product handling techniques and waste minimization and management, and possibly visiting the contract manufacturer's facilities. These actions will vary according to the individual contract manufacturer and operation. Because of the greater degree of company control, much closer interaction will be appropriate with contract manufacturers than compared to distributors and customers. All contract manufacturers should be subject to periodic performance reviews.

Along with Management Practices 10 and 11, this management practice constitutes an important outreach component of the product stewardship code. The long-term result of implementing this practice, like the other outreach management practices, should be better health, safety and environmental performance — not just for CMA companies but for the entire chemical industry.

Management Practice 10

SUPPLIERS: Requires suppliers to provide appropriate health, safety and environmental information and guidance on their products. Factors adherence to sound health,

safety and environmental principles, such as those contained in Responsible Care[®], into procurement decisions.

The objective of this management practice is to extend product stewardship practices to suppliers. Where appropriate, health, safety and environmental factors should be an integral part of the procurement process, including product exchange. For some companies, this management practice may mean close cooperation within the purchasing, manufacturing, health and loss prevention functions to determine how the supplier can contribute to a safer environment. Other companies may opt to make these health, safety and environmental considerations part of their supplier quality reviews or to factor them into contractual decisions. Suppliers should describe health, safety and environmental programs and goals.

Along with Management Practices 9 and 11, this management practice constitutes an important outreach component of the product stewardship code. The long-term result of implementing this practice, like the other outreach management practices, should be better health, safety and environmental performance — not just for CMA companies but for the entire chemical industry.

As with customers, reviews of suppliers will be commensurate with product risk. However, it is appropriate to expect companies to make a continuous effort to extend the principles of product stewardship beyond the CMA membership and Responsible Care[®] partners.

Management Practice 11

DISTRIBUTORS: Provides health, safety and environmental information to distributors. Commensurate with product risk, selects, works with and periodically reviews distributors to foster proper use, handling, recycling, disposal, and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the distributor to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures—up to and including termination of the business relationship. This Management Practice should be implemented in conjunction with the Distribution Code of Management Practices.

The objective of this management practice is to encourage distributors to establish and implement proper health, safety and environmental practices involving our products. It should be implemented in conjunction with Management Practice 4.6 of the Distribution Code, which focuses on the inbound/outbound and storage aspects of distributor operations. The emphasis in the Product Stewardship Code is on working with distributors to help them achieve an appropriate level of performance on other aspects of their operations, such as recycling, handling, storage, use, disposal, waste minimization and management and the transmittal of information to downstream users. As with customers and other direct product receivers, a company may decide to terminate the business relationship with those unwilling to implement corrective actions appropriate for limiting risks and otherwise achieving the health, safety and environmental objectives of Product Stewardship.

The level of involvement with a distributor will vary according to the product's risk. That risk should also trigger the frequency of the periodic performance reviews mandated in the Distribution Code. These

reviews may be used as a forum to share accumulated knowledge that will elevate health, safety and environmental performance — and product stewardship practices.

It is recognized that distributors perform a broad range of functions, from repackaging the original product to reformulating it into a new product with new health, safety and environmental characteristics. The "transmittal of appropriate" information acknowledges that while we expect distributors to pass along H,S&E information, product changes made by the distributor may mean that the information originally supplied with the product no longer applies. In these cases, the distributor needs to issue information that reflects the current H,S&E information.

As with customers and suppliers, reviews of distributors will be commensurate with product risk. It is appropriate to expect companies to make a continuous effort to extend the principles of product stewardship beyond the CMA membership and Responsible Care® partners.

Management Practice 12

CUSTOMERS AND OTHER DIRECT PRODUCT RECEIVERS: Provides health, safety and environmental information to direct product receivers. Commensurate with product risk, works with them to foster proper use, handling, recycling, disposal, and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the product receiver to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures—up to and including termination of product sale.

The objective of this management practice is to encourage customers to establish proper health, safety and environmental practices involving our products. While the emphasis is on providing information to customers, other assistance may be appropriate where the product risk requires it. This management practice recognizes that if those efforts are unsuccessful, a company has a range of actions that it can take. Possible actions include, in the exercise of the company's independent judgement, not selling a given product to the customer.

The level of involvement will vary according to the product's risk. Activities could include reinforcement of previously provided health, safety and environmental information, additional training, etc. At a minimum, both parties should share any accumulated knowledge that would enhance health, safety and environmental protection.

The "transmittal of appropriate information" acknowledges that while we want customers to pass along H,S&E information, product changes made by the customer may mean that the information originally supplied with the product no longer applies. In these cases, the customer needs to issue information that reflects the current H,S&E information.

Along with Management Practices 9, 10 and 11, this management practice constitutes an important outreach component of the Product Stewardship Code. The long-term result of implementing this practice, like the other outreach management practices, should result in improved health, safety and environmental performance — not just for CMA member companies but the entire chemical industry.

As with distributors and suppliers, reviews of customers will be commensurate with product risk. However, it is appropriate to expect companies to extend the principles of product stewardship beyond the CMA membership and Responsible Care® partners.

CMA
BD-4/14/92

Product Stewardship

Question and Answer Document

The following questions and answers are intended to provide brief explanations of the Product Stewardship Code of Management Practices.

(1) How is product stewardship different from "traditional" health, safety and environmental practices?

Today's concept of Product Stewardship is a natural outgrowth of various programs that have developed in the U.S. chemical industry. These practices and programs go by many different names, including product safety, product integrity and product responsibility.

Many of the more "traditional" health, safety and environmental (H,S&E) programs or practices tended to focus on regulatory compliance issues. Product stewardship strengthens and broadens the focus to include such concepts as customer interaction and dialogue on how to foster proper use, handling, recycling and disposal of products. It is a comprehensive integration of health, safety and environmental considerations into each aspect of a company's operations, from design and initial manufacture to distribution, sale and ultimate disposal. This code will affect nearly every segment of a company's operations.

(2) How do we know when we've achieved an adequate level of implementation or, in other words, how much improvement is needed?

These issues are similar. Both imply a clearly defined end point in the implementation process...which is not the case.

The Product Stewardship Code, along with the other codes of Responsible Care®, are based on a continuous improvement process. Each company will need to establish a base-line — where you are today — and then determine what steps are necessary to move towards "code-in-place." Once you are at "code-in-place," the management practice should be reviewed annually to determine if there are any additional activities that might contribute to continuous improvement.

There will be a number of examples of activities in the Product Stewardship Resource Guide.

(3) Why are distributors discussed in the Distribution Code and the Product Stewardship Code?

The Distribution Code was developed prior to the Product Stewardship Code and focuses on the "transportation, storage and handling" of products as they move from manufacturer to end user. The Product Stewardship Code goes beyond these activities. It focuses on additional aspects of the distributors' operation, such as transmission of H,S&E information to downstream users, recycling and disposal practices and how distributors interface with customers. Together, the two codes provide a comprehensive structure for the manufacturer and distributor relationship.

(4) Does the Product Stewardship Code apply to international operations? How does it apply to suppliers from other countries?

The CMA Product Stewardship Code "officially" applies only to the member company operations and locations in the United States. Because their materials are used domestically, foreign suppliers should be treated the same as U.S. suppliers.

However, there are two practical factors that should be kept in mind. First, major efforts are underway to implement either the Responsible Care® initiative or similar programs worldwide. As of January 1992, close to two dozen countries have either adopted, or are proposing to adopt the principles which are the foundation for Responsible Care®. Secondly, many multi-national companies are implementing the Responsible Care® initiative throughout their worldwide operations on a voluntary basis.

(5) What type of information should be provided to customers, distributors and other third parties? How can this information be provided?

Information that would help protect health, safety, and the environment should be provided. In addition to MSDSs and label information, a company may choose to provide additional information through bulletins, videos, instructional workshops or seminars, training programs or site visits. The appropriate actions and communication media will vary with each company and with the product risk.

(6) How does the Product Stewardship Code relate to the other Responsible Care® codes?

The Product Stewardship Code is the most comprehensive of all the codes. As with the Distribution Code, Product Stewardship addresses third parties. A major portion of the code is focused on a company's interactions with suppliers, distributors, contract manufacturers and customers. Another portion addresses the gathering and characterization of H,S&E information. These practices overlap with both the Employee Health & Safety and the Distribution Code. Another practice, Contract Manufacturers, overlaps the Pollution Prevention Code.

(7) Will I be required to carry out a customer audit?

Audits of customers are not required. The need for audits or other appropriate risk management actions will be determined by the company.

(8) What is meant by the term "work with?"

Although responsibility for proper manufacture, handling, use, recycling and disposal rests with each party in the chain, the concept of product stewardship includes a willingness to assist where requested or where a need is apparent.

"Working with" may include providing detailed health, safety and environmental product information, or technical assistance on product handling techniques or visiting facilities.

The risk associated with a product will help determine the appropriate response in each individual case. In addition, certain parties may require more assistance than others. The response remains a judgment call in each individual case by the company involved.

(9) What is the appropriate unit of measurement for evaluation (i.e., by business unit, product line, plant site)?

The Product Stewardship Code presents a challenge because the code focuses on activities involving a company's products rather than a company's facilities. The traditional measurement units used by other codes may not apply. In addition, no uniform measurement is recommended for every company in conducting self-evaluations against the management practices. Each company will determine what works best for its particular circumstances. Some companies may choose to evaluate each individual product, while others may choose product lines or business units.

The most important point is that each company must establish some unit of measurement and remain consistent year-to-year. Since the self-evaluation process aims to measure each member company's annual progress against the code practices, and since results are not absolute, the scores are relevant only to the company's progress measured in subsequent years. The focus is on continuous improvement, regardless of the unit of measurement.

(10) How far down the chain of commerce does the code apply? Does it apply through the first point-of-sale or beyond?

The Product Stewardship Code covers all stages of a product's life. It is intended to cover as much of the chain of commerce as necessary to help prevent misuse, mishandling or other activities that might result in harm to people or the environment from our products. The word "help" is key because it acknowledges that to be successful, product stewardship must be a cooperative effort.

The main focus of the management practices is on distributors, customers and other direct product receivers, or those with whom there is a close business relationship. Responsibility lies with the next party in the chain to practice product stewardship and encourage its downstream users to do the same.

CMA
BD-4/14/92

DSW 122501

Solutia's Commitments to Environment, Safety & Health

- We will ensure that our operations and distribution systems are safe for our employees, site contractors, communities and the environment.
- We will make products that are safe when used responsibly.
- We will keep our operations open to our communities, and foster open communications with all of our stakeholders.
- We will continuously improve our raw material and energy utilization efficiencies to reduce our impact on the environment and improve the sustainability of our businesses.
- We will encourage active participation in and positive contributions to safety, health, and environmental stewardship by our employees.
- We will search worldwide for new technologies that bring environmental, safety and health value to all of our stakeholders.



Solutia's Environment, Safety and Health Commitments are based on strong convictions that continuous improvement in these areas is critical to creating value for all stakeholders. These commitments are drivers for a better future.

Commitment #1

We will ensure that our operations and distribution systems are safe for our employees, site contractors, communities and the environment.

Commitment #1 - 1998 Focus

- Embrace proactive, behavior-based approach to bolster commitment to safety and health.
- Meet or better annual KPI targets for injuries, contractor injuries, and accidental releases.
- Achieve and maintain VPP/Merit status for all sites except Foley (1999 target) by end of 1997.
- Develop and implement new “risk based” approach to Process Safety Management.
- Continue implementation of new “Compliance Process”.
- Analyze EPA’s Risk Management Program requirements and develop appropriate plans.

Commitment #2

- We will make products that are safe when used responsibly.

Commitment #2 - 1998 Focus

- Have plan in place to implement Responsible Care Product Stewardship Code by end of 1999.
- Expand outreach effort by providing counsel to customers and distributors on the safe processing, use, handling, recycling, and disposal of our products.
- Meet all ESH requirements of New Product and Process Development (NPPD) discipline.



Commitment #3

**We will keep our operations open to our communities,
and foster open communications with all of our
stakeholders.**

Commitment #3 - 1998 Focus

- Continue to bolster active community advisory panels.
- Develop specific communication proposals for sites covered by EPA Risk Management Program.
- Publish environmental annual report.
- Incorporate Responsible Care “messages” with employee, customer and community communications.
- Identify specific external organizations for routine proactive communication/participation.

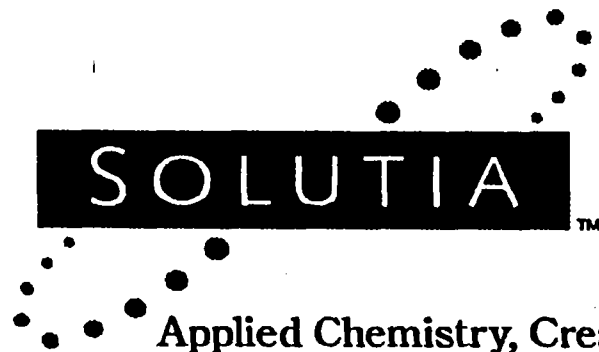


Commitment #4

We will continuously improve our raw material and energy utilization efficiencies to reduce our impact on the environment and improve the sustainability of our businesses.

Commitment #4 - 1998 Focus

- Establish baselines for raw material yields and energy usage for our processes.
- Identify opportunities to improve energy and environmental efficiencies by partnering with suppliers and customers.
- Each business will develop their own performance tracking measures and preliminary improvement plans leading to the establishment of an enterprise goal by year's end.



Commitment #5

We will encourage active participation in and positive contributions to safety, health, and environmental stewardship by our employees.

Commitment #5 - 1998 Focus

- Develop “special enterprise recognition programs” which encourage strategic ESH behavior.
 - Continue “Safety Awards” Program 1998 - unchanged.
 - Major overhaul of “Pledge Award Program”.
- Assess potential for Solutia charitable fund to support this commitment.
- Assess opportunities to improve management of corporate real estate to benefit nature and surrounding community.



Commitment #6

We will search worldwide for new technologies that bring environmental, safety and health value to all of our stakeholders.

Commitment #6 - 1998 Focus

- Actively seek out partnerships, alliances, and collaborative agreements that will leverage technical resources.
- Develop master list of ESH enterprise opportunities and threats.

Program 4

Product Stewardship

OVERVIEW

Introduction	This program describes the policies, goals, standards and procedures necessary to fulfill the product responsibilities implicit in the Solutia Commitments.
Policy	The company will research, develop, design, assess, manufacture, market and dispose of its products so that they • meet ever-increasing societal expectations, and • do not pose undue risks to human health or the environment during all stages of their life cycles. The company will work with product stakeholders (suppliers, employees, distributors, customers, consumers and disposers) to understand and reduce risks over the life cycle of the company's products.
Goals	The following specific goals must be integrated into the company's product stewardship plans. • Practice the principles and the elements of Product Stewardship, as specified in appropriate programs around the world, in all the company's global operations and markets. • Provide appropriate safety and handling information, including Material Safety Data Sheets (MSDSs), to potentially exposed employees, contract employees and product receivers. NOTE: Materials Safety Data Sheets (MSDSs) and Safety Data Sheets (SDSs) are interchangeable terms and refer to similar requirements in different countries. • Work toward the goal of no undue risk through systematic risk reduction throughout a product's life cycle. • Incorporate concepts of eco-efficiency into product and process evaluations to improve their sustainability. • Gain a competitive advantage by applying product stewardship principles that add value to the company's product offerings.

Continued on next page

DSW 122515

OVERVIEW, Continued

Measuring Progress

To measure progress against these goals, the following indicators will be used:

- Demonstrated progress in meeting internal and external requirements for all new product introductions (i.e., NPPD process, ESHA approvals, and governmental approvals);
 - Demonstrated progress in determining product hazards;
 - Visible growth in knowledge of the use of company products and the resultant exposures to people and the environment;
 - Availability of adequate environmental, safety and health data to the ultimate product receiver;
 - Increased understanding and diminution of the risks and environmental impacts associated with a product throughout its life cycle; and
 - Differentiation of company products in the marketplace.
-

For Further Information

When further information or clarification is required, you may contact the following:

ISSUE OWNER

Jeffrey D. Felder, Product Stewardship, E2EC
(314)674-4489

Program Approval

The content of this program was approved by

In This Program

This program contains the following procedures.

Procedures		See Page
P4.1	ESH INFORMATION AND RISK CHARACTERIZATION	P4-3
P4.2	RISK MANAGEMENT SYSTEM	P4-5
P4.3	PRINCIPLES AND KEY ELEMENTS	P4-6
P4.4	PRODUCT HAZARD EVALUATION	P4-8

DSW 122516

P4.1 ESH INFORMATION AND RISK CHARACTERIZATION

P4.1.1 Introduction

This section describes procedures to be used to accomplish the company's specific goals regarding environmental, safety and health information and risk characterization.

P4.1.2 Definitions

Terms are used in this program as defined in the following table.

Term	Definition
Product	Chemical substances and mixtures, materials and equipment, articles, licensed technology and services related to product use that are • sold, • distributed in commerce, or • otherwise provided.
Product Receiver	An entity (not an individual) to whom the company transfers product. This includes product receivers such as brokers or transporters who may not fall into the traditional customer category.

P4.1.3 Product Risk Characterization

A preliminary product risk characterization (ESHA Level 1 to 3, as appropriate, and an R&D MSDS) with adequate supporting environmental, safety and health exposure information will be prepared for

- new chemical products
- new isolated process intermediates, and
- significant new uses for existing chemical products.

An MSDS will be furnished

- at the earliest practical stage of R&D, and
- prior to off-site shipment.

A product risk characterization (including an ESHA Level 4 or equivalent, a final MSDS and a shipping classification) will be completed before new product commercialization.

P4.1.4 MSDS Program

The company's process for generating, reviewing, and maintaining an MSDS is comprehensive and, when coupled with human experience and professional judgment, fulfills the requirement for a product risk characterization for most products. For products with significant inherent hazard, an ESHA Level 5 is required.

Significant new information will be reviewed in a timely fashion as part of the MSDS program to satisfy regulatory and product risk characterization requirements.

An MSDS review/product risk characterization or an ESHA Level 5 is periodically performed commensurate with product risk. Revisions are performed, at a minimum, every five years, unless waived by the VP, ESH based on a consideration of lack of inherent hazard.

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DSW 122517

P4.1 ESH INFORMATION AND RISK CHARACTERIZATION, Continued

P4.1.5 Product Files or Information Systems

- Product files or information systems will be maintained for all products or product families, and will contain the data necessary to fulfill regulatory requirements and perform product risk characterizations and assessments as appropriate. The data need not be in a single file or system but must be readily available to all likely users (e.g. Product Stewardship and other ESH staff). The data will include:
 - Relevant information on composition, CAS name and number, common name and synonyms, physical properties, raw materials, manufacturing processes, principal byproducts, protective measures, exposure information, energy requirements, wastes and disposal practices,
 - References to relevant literature or internal reports dealing with health and safety (toxicology, epidemiology, industrial hygiene, flammability, reactivity, etc.),
 - Material Safety Data Sheets,
 - Information on product use, including handling, transport, packaging and storage, which will either be
 - estimated (typically for new products), or
 - obtained by visits or reviews of customer, distributor and consumer practices,
 - A critical review of health and environmental effects and exposure information, such as
 - ESH Level 1 or 3, as appropriate,
 - ESHA Level 4,
 - ESHA Level 5,
 - *Solutia Workplace Permissible Exposure Guideline (SWPEG) Reviews,*
 - Health Effect Reviews, and
 - Toxicology Reviews,
 - Technology Risk Reviews, and
 - Allegations of health concerns of customers, employees or the public.

DSW 122518

P4.2 RISK MANAGEMENT SYSTEM

P4.2.1 Introduction	This section describes procedures to be used to accomplish the company's specific goals regarding systematic risk reduction.
P4.2.2 Approach	A systematic approach to risk management will be implemented and maintained for new products. Existing products will be managed on a case-by-case basis.
P4.2.3 Options	Risk management options, where needed, will be an integral part of the follow-up to each phase of a product risk characterization (as detailed in section 4.1, <i>ESH Information and Risk Characterization</i>).
P4.2.4 Product Labeling	All products will be appropriately labeled for hazard or risk and will conform at a minimum to pertinent governmental requirements and appropriate consensus standards (e.g. OSHA, EU, ANSI, ISO, etc.).
P4.2.5 Documented Actions	Documented risk management actions will be recorded in product files. (Examples of specific risk management actions are detailed in section P4.3, <i>Principles and Key Elements</i> .)

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DSW 122519

P4.3 PRINCIPLES AND KEY ELEMENTS

P4.3.1 Introduction

This section describes procedures used to accomplish the company's specific goals regarding the principles and key elements of Product Stewardship, including

- product and process design and improvement,
 - employee education,
 - product use feedback,
 - information provided to contract manufacturers, distributors, customers and other direct product receivers,
 - information received from suppliers, and
 - responsibilities involved.
-

P4.3.2 Product and Process Design and Improvement

R&D materials used in the laboratory will be handled under Prudent Laboratory Practices (as outlined in TSCA Section 5) or equivalent guidance.

Pollution prevention principles (see Program 1, *Pollution Prevention*) will be included as review criteria in technology risk reviews for new and existing chemicals and will be incorporated into the ESHA, NPPD and equivalent assessments. This includes opportunities for improving energy and resource (e.g. water) efficiency of our products and processes and seeking to replace existing products with those that are more environmentally friendly, as measured by scientifically valid indices that are developed.

P4.3.3 Employee Education

Employee education in the safe handling and use of chemicals is addressed in Program 2, *Employee and Community Safety and Health*.

P4.3.4 Product Use Feedback

Employees with significant customer interaction will be trained to recognize and feed back to the company's ESH network, information about product use and misuse.

Feedback systems are appropriate to listen to stakeholders, including commercial and technical service liaisons with customers, product hotlines, poison control centers, etc.

P4.3.5 Information Provided to Contract Manufacturers

In addition to items covered in Program 7, *Outside Processors*, the company will provide guidance and information to contractor personnel on the safe handling and transportation of company products.

Continued on next page

DSW 122520

P4.3 PRINCIPLES AND KEY ELEMENTS, Continued

P4.3.6 Information Provided to Direct Product Receivers

- As appropriate, the company will
 - ensure that MSDSs and other appropriate safety documents are provided to all direct product receivers,
 - actively involve product receivers in dialogue and outreach regarding appropriate risk characterization, management and reduction,
 - work with the product receiver, when improper practices involving company products are identified, to improve the practices,
 - take appropriate action, including termination of sale if necessary, to obtain adequate improvement, and
 - actively seek product receiver involvement in the continuous improvement of company products and as a means of differentiating those products in the marketplace on the basis of ESH stewardship.

P4.3.7 Information Received From Suppliers

Up-to-date product information, sufficient to allow risk management decisions including, as appropriate, composition data and MSDSs, will be obtained from suppliers for all new materials.

In addition, suppliers will be engaged as necessary in assessing environmental, safety and health impacts of raw materials, commensurate with raw material risks.

P4.3.8 Responsibilities

Product stewardship responsibilities are shared among ESH Product Stewardship staff and product stewards in each business and world area..

DSW 122521

P4.4 PRODUCT HAZARD EVALUATION

P4.4.1 Introduction

Solutia's products will not present an unreasonable risk of harm to human life or health or the environment when they are properly handled, transported or used.

P4.4.2 Responsibility

ESH Product Stewardship has the responsibility for assessing hazards, if any, of chemicals that Solutia produces or imports. This includes evaluating the adequacy of data developed to assure the safety and environmental aspects of products and intermediates produced in Solutia workplaces and shipped to Solutia customers.

P4.4.3 Safety and Environmental Compatibility Assessment

Each new chemical or proposed new use of an existing chemical will undergo a safety and environmental compatibility assessment. Established products will be periodically reviewed to assure that their characteristics have been adequately assessed and classified and that a Material Safety Data Sheet (MSDS) exists with health and safety information. Final approval of physical and health hazard assessments will be rendered by the Leader, Product Stewardship (L,PS) or designee. The L,PS will inform the Leader, Medical & Epidemiology of all assessments.

P4.4.4 Hazard Assessment

Solutia products and chemicals will be carefully evaluated for potential for human injury and environmental damage. As appropriate, ESH Product Stewardship will consider the following in performing hazard assessments:

- Product and Chemical Name
 - CAS number (if available)
 - Common names and synonyms
 - Trade names
 - Molecular weight
 - Physical property data
 - Composition including known or expected impurities
 - Expected major areas of use and volume
 - Toxicity known
 - Expected environmental impact from manufacturing process wastes and from product use and disposal
 - Molecular and structural formula
 - Countries of production and sales
-

P4.4.5 Hazard Determination

The Hazard Assessment will be used to make the hazard determination required by the appropriate Hazard Communication Standard and regulations (Table I). Professional judgement will be required in defining the scope of the assessment review. Computer data bases such as MSHI.MSDSARIEL Query will be used to determine the applicable regulatory requirements for Solutia products and components of Solutia products.

Continued on next page

DSW 122522

**P4.4.6
Material Safety
Data Sheets
(MSDSs)**

Product Stewardship will update Solutia product and intermediate MSDSs when it becomes aware of significant new information. Supplier-provided MSDSs will be accepted as factual and will be used for employee training and for developing MSDSs for products containing these materials.

**P4.4.7
Other Existing
Legal
Requirements**

In addition to the MSDS effort described above, some products may also be evaluated under other applicable laws such as FIFRA, TSCA, FFDCA, CEPA, EU Dangerous Substances Directives, EU Existing Substances Regulations, etc. These may require different approaches to support regulatory approval and compliance.

Table 1

Country or Region / MSDS standard or regulation	Requirement
USA / OSHA Hazard Communication Standard (29 CFR 1910.1200)	Appendices A and B
EU / Commission Directive 93/112/EC	Annex

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DSW 122523

Product Stewardship
Solutia Criteria for "Practice in Place"
3/31/98

1. Leadership
CEO serves as champion and plays a highly visible role in implementing Product Stewardship. Written corporate policy in place and supported by business General Managers.
2. Accountability and Measurement
Product Stewards actively involved in business teams and Product Stewardship fully incorporated into business plans and goals. Business management knowledgeable and supportive of Product Stewardship.
3. Resources
Product Stewardship properly resourced with people and funding, resulting in no delays to programs.
4. Health, Safety & Environmental Information
Information available on all products to the satisfaction of corporate health and environmental scientists to permit assessment of risk to employees, customers and the environment throughout each product's life cycle. This includes information on exposures resulting from manufacture, use and disposal.
5. Product Risk Characterization
Current risk assessments (prepared by health and environmental scientists) exist for all products or product lines, and procedures are in place to assure periodic re-evaluation. (MSDS assessments, when conducted using well-documented exposure data, fulfill this requirement.)
6. Risk Management System
All risks identified in Practice 5 above are reduced to acceptable levels. A system is in place to identify changes which signal the need for in-depth review of an existing product's risk characterization and management.
7. Product and Process Design and Improvement
Technology, marketing and manufacturing personnel follow procedures designed to make environmental protection, including health and environmental safety, energy conservation and waste minimization/safe disposal, key considerations in the development of new products and new and modified processes. These parameters are reviewed in all product/process safety reviews.
8. Employee Education and Product Use Feedback
All employees who have potential to come in contact with products, raw materials or intermediates are thoroughly trained on the hazards and proper handling procedures and precautions of these materials. All sales and marketing technical services personnel are similarly trained for products, and in how to recognize and feedback information about how our products are used, and about potential misuse or adverse effects. We have a procedure in place to verify training and to initiate retraining.

DSW 122524

9. Contract Manufacturers

Assessments of all contract manufacturers are current and manufacturers have satisfactorily addressed any concerns. Handling, use, recycling and disposal information is updated as appropriate and provided promptly to manufacturers.

10. Suppliers

All suppliers of chemical products are following health, safety and environmental practices consistent with CMA Responsible Care Codes. Solutia purchasing agents are familiar with Product Stewardship principles, factor adherence to these principles into purchasing decisions and require appropriate health and environmental safety data from suppliers.

11. Distributors

All distributors are confirmed as following health, safety and environmental practices consistent with CMA Responsible Care Codes, the National Association of Chemical Distributors Product Stewardship Code, or an equivalent program.

12. Customers and Other Direct Product Receivers

We approve all known uses of our products and have in place a process to identify unapproved uses. We provide health, safety and environmental information to direct product receivers, and work with them, commensurate with product risk, to foster proper use, handling, recycling, disposal, and transmittal of appropriate information to downstream receivers.

SOLUTIA INC.
RESPONSIBLE CARE®

PRODUCT STEWARDSHIP SELF EVALUATION
1998

BUSINESS UNIT _____

PRODUCT STEWARD _____

DATE _____

- Category NA - No action. If no action taken because the management practice is not applicable, please explain.
- Category EV - Evaluating existing company practices against the Management Practice.
- Category DP - Developing plan to implement Management Practice.
- Category IA - Implementing action plan.
- Category PP - Management Practice in place.
- Category RI - Reassessing Management Practice implementation.

DSW 122526

STLCOPCB4032474

MANAGEMENT PRACTICE 1:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

1. **LEADERSHIP:** Demonstrate senior management leadership through written policy, active participation and communication.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

1. PP = CEO serves as champion and plays a highly visible role in implementing Product Stewardship. Written corporate policy in place and supported by business General Managers.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 2:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

2. ACCOUNTABILITY and PERFORMANCE MEASUREMENT:
Establish goals and responsibilities for implementing product stewardship throughout the organization. Measures performance against these goals.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

2. PP = Product Stewards actively involved in business teams and Product Stewardship fully incorporated into business plans and goals. Business management knowledgeable and supportive of Product Stewardship.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 3:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

3. **RESOURCES:** Commit resources necessary to implement and maintain product stewardship practices.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

3. PP = Product Stewardship properly resourced with people and funding, resulting in no delays to programs.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 4:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

4. HEALTH, SAFETY, and ENVIRONMENTAL INFORMATION:

Establishes and maintains information on health, safety and environmental hazards and reasonably foreseeable exposures from new and existing products.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

4. PP = Information available on all products to the satisfaction of corporate health and environmental scientists to permit assessment of risk to employees, customers and the environment throughout each product's life cycle. This includes information on exposures resulting from manufacture, use and disposal.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 5:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

5. **PRODUCT RISK CHARACTERIZATION:** Characterizes new and existing products with respect to their risk using information about health, safety and environmental hazards and reasonably foreseeable exposures. Establishes a system that initiates re-evaluation.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

5. PP = Current risk assessments (prepared by health and environmental scientists), exist for all products or product lines, and procedures are in place to assure periodic re-evaluation. (MSDS assessments, when conducted using well documented exposure data, fulfill this requirement.)

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 6:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

6. **RISK-MANAGEMENT SYSTEM:** Establishes a system to identify, document and implement health, safety and environmental risk-management actions appropriate to the product risk.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

6. PP = All risks identified in Practice 5 above, are reduced to acceptable levels. A system is in place to identify changes which signal the need for in-depth review of an existing product's risk characterization and management.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 7:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

7. PRODUCT and PROCESS DESIGN and IMPROVEMENT:

Establishes and maintains a system that makes health, safety and environmental impacts--including the use of energy and natural resources--key considerations in designing, developing and improving products and processes.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

7. PP = Technology, marketing and manufacturing personnel follow procedures designed to make environmental protection, including health and environmental safety, energy conservation and waste minimization/safe disposal key considerations in the development of new products and new and modified processes. These parameters are audited in all product/process safety reviews.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 8:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

8. EMPLOYEE EDUCATION and PRODUCT USE FEEDBACK:

Educates and trains employees, based on job function, on the proper handling, recycling, use and disposal of products and known product uses. Implements a system that encourages employees to feed back information on new uses, identified misuses or adverse effects for use in product risk characterization.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

8. PP = All employees who have potential to come in contact with products, raw materials or intermediates are thoroughly trained on the hazards and proper handling procedures and precautions of these materials. All sales and marketing technical services personnel are similarly trained for products, and in how to recognize and feed back information about how our products are used, and about potential misuse or adverse effects. We have a procedure in place to verify training and to initiate retraining.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 9:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

9. **CONTRACT MANUFACTURERS:** Selects contract manufacturers who employ appropriate practices for health, safety and environmental protection for the operations under contract, or works with contract manufacturers to help them implement such practices. Provides information and guidance appropriate to the product and process risk to foster proper handling, use, recycling and disposal. Periodically reviews performance of contract manufacturers.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

9. PP = Assessments of all contract manufacturers are current and manufacturers have satisfactorily addressed any concerns. Handling, use, recycling and disposal information is updated as appropriate and provided promptly to manufacturers.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 10:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

10. **SUPPLIERS:** Requires suppliers to provide appropriate health, safety and environmental information and guidance on their products. Factors adherence to sound health, safety and environmental principles, such as those contained in Responsible Care®, into procurement decisions.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

10. PP = All suppliers of chemical products are following health, safety and environmental practices consistent with CMA Responsible Care Codes. Solutia purchasing agents are familiar with Product Stewardship principles, factor adherence to these principles into purchasing decisions and require appropriate health and environmental safety data from suppliers.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

DSW 122536

STLCOPCB4032484

MANAGEMENT PRACTICE 11:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

11. **DISTRIBUTORS:** Provides health, safety and environmental information to distributors. Commensurate with product risk, selects, works with and periodically reviews distributors to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the distributor to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures--up to and including termination of the business relationship. This Management Practice should be implemented in conjunction with the Distribution Code of Management Practices.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

11. PP = All distributors are confirmed as following health, safety and environmental practices consistent with CMA Responsible Care Codes, the National Association of Chemical Distributors Product Stewardship Code, or an equivalent program.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 12:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

12. CUSTOMERS AND OTHER DIRECT PRODUCT RECEIVERS:

Provides health, safety and environmental information to direct product receivers. Commensurate with product risk, works with them to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the product receiver to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures--up to and including termination of product sales.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

12. PP = We approve all known uses of our products and have in place a process to identify unapproved uses. We provide health, safety and environmental information to direct product receivers, and work with them, commensurate with product risk, to foster proper use, handling, recycling, disposal, and transmittal of appropriate information to downstream receivers.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

**Responsibilities
of Stewards**

DSW 122539

June 6, 1998

Product Stewardship

Responsibilities and Duties of a Product Steward

General: Maintain an effective product stewardship program which is responsive to customer needs for the product or product line and provides people involved with sufficient information and training to manufacture, store, use and dispose of the product without harm to human health or the environment.

LEADERSHIP:

Understand Solutia commitment to product stewardship and ESH policy and practices

ACCOUNTABILITY:

Establish personal goals for the product stewardship program

Encourage establishment of business team goals for product stewardship

Guide the business team in product stewardship matters

RESOURCES:

Make budget proposals as appropriate for product stewardship needs

Help obtain necessary agreement and funding for unexpected off budget items

DSW 122540

STLCOPCB4032488

ESH INFORMATION:

Solicit information from customers on uses, possible misuses, disposal, and adverse effects for incorporation into the risk characterization process

Understand product allegation and adverse effects reporting requirements and help assure that corporate policy for compliance is followed

RISK CHARACTERIZATION:

Understand the ESHA process

Participate in product ESH reviews

Be aware of and transmit new information on product use or possible adverse effects which would initiate reassessment

6. RISK MANAGEMENT:

Participate in the development of a product risk management plan

Participate in the review of product literature, MSDS, and labels

Implement customer oriented portions of the risk management plan

Participate in product incident investigations

PRODUCT AND PROCESS DESIGN:

Understand the NPPD process and the manufacturing process improvement processes

Help implement product stewardship activities where appropriate

EMPLOYEE EDUCATION AND FEEDBACK:

Conduct training on the principles of, and Solutia's commitment to product stewardship for Solutia customer contact people

Conduct customer HazCom training where appropriate

Solicit feedback on product uses and possible adverse effects from employees and customers

Train other customer contact people on product uses and how to recognize misuses and possible adverse effects

CONTRACT MANUFACTURERS:

Understand Solutia policy and practices regarding contract manufacturers

Provide product stewardship advice to business teams on contracting decisions

SUPPLIERS:

Work with suppliers if necessary to obtain product stewardship information

DISTRIBUTORS:

Make sure distributors understand our product stewardship commitment, policy, and practices

Provide product ESH information to distributors, and encourage them to pass on to their employees and customers

Evaluate distributor performance with respect to product stewardship principles

CUSTOMERS:

Make sure customers understand our product stewardship commitment, policy, and practices

Provide ESH information to customers and encourage them to pass on to their employees and any downstream users of our product.

Work with customers to foster proper use, handling, and disposal of our products.

Evaluate customers ability to handle our product properly

Evaluate and implement corrective action if improper product stewardship practices are identified and not rectified

Solutia's Commitment to Product Stewardship

Resourcing Product Stewards for all of our businesses in order to support our customers and markets in which they participate

Making available information on all products concerning health, safety and environmental hazards and reasonably foreseeing exposures from new and existing products

Characterizing and making available risk assessments for all products and product lines

Improving our products and processes using key health, safety and environmental considerations

Procuring raw materials only from suppliers whose health, safety and environment practices are consistent with Responsible Care

Partnering with distributors and contract manufacturers only when they operate according to health, safety and environmental guidelines that are consistent with Responsible Care and formally approved by Solutia

Making Material Safety and Data Sheets available and all other health, safety and environment information

Understanding where our products go to assure they are used responsibly through their entire life cycle

Product Stewardship

RESPONSIBILITIES

1. The Product Safety Manager now oversees or performs:
 - Development of Health and Environmental Data Base
 - Product Risk Management
 - New Product Risk Assessment (ESHA Process)
 - Continuous Risk Assessment for Existing Products
 - Customer and Employee Outreach
 - Prepare and Disseminate MSDSs
 - Answer Questions
 - Health, Safety and Environmental
 - Regulatory Compliance
 - Visits on case-by-case basis
 - Regulatory Compliance
 - OSHA Hazard Communications (MSDSs)
 - TSCA
 - FDA
 - FIFRA

Product Stewardship

- Regulatory Compliance (continued)
 - State Right-To-Know Laws
 - Miscellaneous Chemical Regulation Programs
- Product Specific Issue Management
- Represents Monsanto on Trade Associations
- Interaction with Regulatory Contractors
 - UL
 - NSF
 - NFPA
 - ASTM

Product Stewardship

2. The Product Stewardship Program demands more:

- Employee education
- Outreach to:
 - Contract Manufacturers
 - Suppliers
 - Distributors
 - Customers
- Feedback from customers

Product Stewardship

3. Product Stewards will increase our ability to contact or educate:

- Employees
- Distributors
- Customers

Extend our culture to those who receive our products.

Product Stewardship

4. Product Stewards will need a basic knowledge of:

- Goals of the Product Stewardship Program
- Regulations
 - TSCA
 - OSHA Haz Com/State RTK
 - FIFRA
 - FDA
- Fundamentals of preparing and interpreting an MSDS and label
- Understanding of Monsanto's risk assessment process
- What resources are available to help
- Potential hazards of assigned products
- Issues involving assigned products

Product Stewardship

5. Product Stewards will need to know how our customers and distributors:

- Use our products
- Handle our products in their plant
- Dispose of our product
- Comply with regulations

Product Stewardship

DSW 122551

STLCOPCB4032499

6. Product Stewards will provide:

- Assistance to customers and distributors on risk management practices and compliance issues:

Comfortable with customers' use of our products

Ambassador to our customers

Tailored to business, hazards, exposure of product

- Input to Product Safety on:

Health and safety reviews

MSDS preparation

New applications of products

Product misuse

Product Stewardship

DSW 122552

STLCOPCB4032500

RESPONSIBILITIES/DUTIES OF PRODUCT STEWARD

1. Maintain an effective stewardship program for the product and provide people (internal and external) involved with the product, with sufficient information and training to manufacture, store, use, and dispose of the product without harm to human health or the environment.
2. Participate in appropriate product health, safety and environmental reviews (product risk characterization) and initiate recommended follow-up action (risk management).
3. Participate in the review of product literature, MSDSs, and labels.
4. Work with field sales to foster reporting of information on new uses and identified misuses or adverse effects of our products for incorporation into the risk characterization process.

Product Stewardship

DSW 122553

RESPONSIBILITIES/DUTIES OF PRODUCT STEWARD (Cont.)

5. Commensurate with product risk, work with customers, distributors, and other product receivers to foster proper use, handling, recycling, and disposal practices.
6. Participate in the selection of contract manufacturers and work with them to foster their meeting Monsanto health, safety and environmental standards relevant to the operations under contract.
7. Coordinate with Purchasing and R&D to require chemical suppliers to provide appropriate health, safety and environmental information and guidance on their products.
8. Participate in the investigation of product-related health, safety and environmental incidents and initiation of appropriate corrective action.

SOLUTIA INC.
RESPONSIBLE CARE®

PRODUCT STEWARDSHIP SELF EVALUATION
1997

BUSINESS UNIT _____

PRODUCT STEWARD _____

DATE _____

- Category NA - No action. If no action taken because the management practice is not applicable, please explain.
- Category EV - Evaluating existing company practices against the Management Practice.
- Category DP - Developing plan to implement Management Practice.
- Category IA - Implementing action plan.
- Category PP - Management Practice in place.
- Category RI - Reassessing Management Practice implementation.

DSW 122554

STLCOPCB4032502

MANAGEMENT PRACTICE 1:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

1. **LEADERSHIP:** Demonstrate senior management leadership through written policy, active participation and communication.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

1. PP = Champion appointment at vice-presidential level and playing a highly visible role in implementing Product Stewardship. Written policy in place for Solutia and well understood by General Managers.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 2:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

2. **ACCOUNTABILITY and PERFORMANCE MEASUREMENT:**
Establish goals and responsibilities for implementing product stewardship throughout the organization. Measures performance against these goals.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

2. PP = Product Stewards actively involved in business teams and Product Stewardship fully incorporated into business plans and individual goals. Business directors and managers knowledgeable and supportive of Product Stewardship.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 3:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

3. **RESOURCES:** Commit resources necessary to implement and maintain product stewardship practices.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

3. PP = Product Stewardship properly resourced with people and funding resulting in no delays to programs.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 4:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

4. HEALTH, SAFETY, and ENVIRONMENTAL INFORMATION:

Establishes and maintains information on health, safety and environmental hazards and reasonably foreseeable exposures from new and existing products.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

4. PP = Information available on all products to satisfaction of health and environmental scientists to permit assessment of risk to employees, customers and the environment throughout each product's life cycle. This includes information on exposures resulting from use and disposal.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 5:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

5. **PRODUCT RISK CHARACTERIZATION:** Characterizes new and existing products with respect to their risk using information about health, safety and environmental hazards and reasonably foreseeable exposures. Establishes a system that initiates re-evaluation.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

5. PP = Current risk assessments (evaluated by health and environmental specialists), exist for all products or product lines, and procedures are in place to assure periodic re-evaluation. (Complete MSDS assessments, when conducted using well documented exposure data, fulfill this requirement.)

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 6:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

6. **RISK-MANAGEMENT SYSTEM:** Establishes a system to identify, document and implement health, safety and environmental risk-management actions appropriate to the product risk.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

6. PP = All risks not clearly de minimus, identified in 5. above, are reduced to acceptable levels. Program in place to provide special in-depth review of use, risk evaluation and risk management for selected products.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 7:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

7. PRODUCT and PROCESS DESIGN and IMPROVEMENT:

Establishes and maintains a system that makes health, safety and environmental impacts--including the use of energy and natural resources--key considerations in designing, developing and improving products and processes.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

7. PP = Technology and technical service groups follow procedures designed to make environmental protection, including health and environmental safety, energy conservation and waste minimization/safe disposal key considerations in the development of new products and new and modified processes. These parameters are audited in all product/process safety reviews.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

DSW 122561

STLCOPCB4032509

MANAGEMENT PRACTICE 8:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

8. EMPLOYEE EDUCATION and PRODUCT USE FEEDBACK:

Educates and trains employees, based on job function, on the proper handling, recycling, use and disposal of products and known product uses. Implements a system that encourages employees to feed back information on new uses, identified misuses or adverse effects for use in product risk characterization.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

8. PP = All employees who have potential to come into contact with products, raw materials or intermediates are thoroughly trained on the hazards and proper handling procedures and precautions of those materials. Procedure in place to verify training and to initiate retraining. All sales, marketing and marketing technical services personnel trained similarly for products, and in how to recognize and feed back information about how our products are used, and about potential misuse or adverse effects.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 9:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

9. **CONTRACT MANUFACTURERS:** Selects contract manufacturers who employ appropriate practices for health, safety and environmental protection for the operations under contract, or works with contract manufacturers to help them implement such practices. Provides information and guidance appropriate to the product and process risk to foster proper handling, use, recycling and disposal. Periodically reviews performance of contract manufacturers.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

9. PP = Assessments of all contract manufacturers are current and manufacturers have satisfactorily addressed any concerns. Handling, use, recycling and disposal information to manufacturers is routinely updated to reflect regulatory or other changes.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 10:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

10. **SUPPLIERS:** Requires suppliers to provide appropriate health, safety and environmental information and guidance on their products. Factors adherence to sound health, safety and environmental principles, such as those contained in Responsible Care®, into procurement decisions.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

10. PP = All suppliers of chemical products are following health, safety and environmental practices consistent with CMA Responsible Care Codes. Solutia purchasing agents are familiar with Product Stewardship principles, factor adherence to these principles into purchasing decisions and require appropriate health and environmental safety data from suppliers.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 11:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

11. **DISTRIBUTORS:** Provides health, safety and environmental information to distributors. Commensurate with product risk, selects, works with and periodically reviews distributors to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the distributor to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures--up to and including termination of the business relationship. This Management Practice should be implemented in conjunction with the Distribution Code of Management Practices.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

11. PP = All distributors confirmed as following health, safety and environmental practices consistent with CMA Responsible Care Codes.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

MANAGEMENT PRACTICE 12:

Stage Of Implementation					
NA	EV	DP	IA	PP	RI

12. CUSTOMERS AND OTHER DIRECT PRODUCT RECEIVERS:

Provides health, safety and environmental information to direct product receivers. Commensurate with product risk, works with them to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the product receiver to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures--up to and including termination of product sales.

Comments on Category NA: _____

CRITERIA FOR MANAGEMENT PRACTICE IN PLACE (PP):

12. PP = We know and approve of all uses of our products, and we have verification that all product receivers have received and understand our MSDS.

Business-Specific Definition Of Practice In Place

Rationale For Rating

Highlights Of 1997 Results

Action Plans For 1998

**MARKETING THE
ADDED VALUE OF
PRODUCT
STEWARDSHIP**



RESPONSIBLE CARE

A Public Commitment

PRODUCT STEWARDSHIP CODE

DSW 122567

STLCOPCB4032515

WHAT *is this all about?*

Sales no longer depend on just the price of the product. Changing customer needs and expectations about health, safety and the environment have opened the door for sales and marketing professionals to become more than just the people who sell the product. You have an opportunity to become an indispensable information resource to your customers and, at the same time, a critical link in helping the chemical industry improve its performance related to health, safety and the environment. This is Responsible Care®'s Product Stewardship Code.

WHO *is responsible for Product Stewardship?*

Everyone involved with the product. That includes sales and marketing professionals and others who have direct customer contact and have the unique responsibility of helping ensure that end users—distributors and customers—understand the proper use, handling, storage, transport and disposal of products. You aren't expected to be the expert on everything, but as the principle link to customers, you are the eyes and ears of your company.

WHY *is Product Stewardship so important?*

It's good business. When sales and marketing professionals help their customers meet safety, health and environmental needs and regulations, they bring added value to the product sale. And you will reap the personal satisfaction of playing a direct role in the proper management of a product.

HOW *do you put Product Stewardship into action?*

That's what this booklet will tell you. Read on . . .

Marketing the Added Value of Product Stewardship

Consider the possibilities. As sales and marketing professionals, you are the key link between your company and your customer. You are the conduit for information—going both ways. You have a vital role in ensuring that the chemical industry's commitment to safety, health and environment gets put into action at every stage in the product lifecycle. And the Responsible Care® Product Stewardship Code gives you the tools you need to make it happen.

Communication is key to leadership in the Information age.

In today's economy, communication is a valuable resource—sometimes as precious as the product itself. And your customers know it. They need a sales person who can serve as a reliable information resource: someone who can tell them how the product should be used, handled, stored and disposed of. That's what your role in Product Stewardship is about: effective, two-way communication. Smart customers understand the value of such communication. It helps them anticipate problems. It helps them avoid regulatory compliance snags. Product Stewardship gives them—and you—a competitive edge in a tough market.

But one-way communication—where all the information goes from your company to your customer—is only half of what communication can do. Part of Product Stewardship is to help sales and marketing professionals facilitate two-way communications—to help you learn from your customers, listen to your distributors and relay that information back to your company so that products can be tailored to fit real-world uses.

Two-way communication helps your company make products that are safer, more protective of the environment and more customized. It helps to ensure that end users handle your product responsibly. Two-way communication creates responsibilities, but it also creates opportunities and opens doors.

It all comes down to Added Value for the customer.

In the end, Product Stewardship makes your company more responsive and your customer more responsible. It allows sales and marketing professionals to offer clients a broader range of services and a better understanding of their needs—all for the same cost. And that's value added.

Product Stewardship How Do You Start?

Here's a 3-Point Plan:



1. Get Educated . . .

Know your products. Know your customers. Then bridge the gap. Expertise will allow you to provide outstanding service to your customers and useful feedback to research and development (R&D) and health, safety and environmental (HSE) staff at your company.



2. Keep an Eye Out . . .

Safety is money in the bank—for everyone. Help customers avoid health and environmental incidents and costly accidents by looking for signs and warnings of unsafe practices and product uses. Careful observation will tell you when your customers and distributors may need additional guidance or when your company needs to re-evaluate product use and associated risks.



3. Close the Feedback Loop . . .

Relay important observations and information to the right people in your company. With up-to-date information, your company's R&D and HSE staff can respond to potential problems by improving products and product information. Better products and better customer service mean increased sales.

Some specifics . . .

A breakdown of the 3-Point Plan

Step 1. Get Educated



Education starts with a keen understanding of your own company and products, then expands to learning about the operations of your customers. At first, your customers and distributors may be sensitive about sharing the

information that effective Product Stewardship requires. Be considerate of this. Work closely with your contacts or their management to ensure they understand the goals and importance of Product Stewardship. It takes partnership, but it adds value.

Do you know your product inside and out?

- Know your products. Understand their labels, MSDS information and intended use. Be sure you can discuss hazards, warnings and precautionary measures with your customers. Are your distributors passing this information on to their customers?
- Ask company experts to fill you in on proper uses, foreseeable exposures and appropriate handling, storage and disposal methods of the products you sell.
- Make sure your marketing materials are accurate, easy to read, consistent with the MSDS, and relevant to customer needs. Have them reviewed by your company's HSE and legal departments.
- Know the names of company experts so you can pass them on to customers with questions you cannot answer.

Do you know how customers and distributors use your products?

- Product misuse could lead to health, safety, environmental and regulatory problems for your customer. You can help them avoid trouble with proper information.
- New uses can mean new opportunities – or new problems. Let your company's experts know about new or previously unknown uses of a product so they can re-evaluate safety procedures, or possibly modify the product to better suit the customer's needs.
- Some uses need high-priority attention. For example, when a product is associated with human consumption, implants, direct food contact or extended environmental contact, let company experts know so they can study potential risks and proper management.
- You *do* have some control over end uses. If you become aware that a customer is unwilling or unable to use your product safely, your company can take corrective action – up to and including termination of product sale. You may help your company avoid serious incidents or liability issues.
- Listen for problems. Learn if your customers and distributors have encountered problems in handling, use or disposal of your products. Listen carefully and respond appropriately.
- Be aware of your customers' and distributors' normal product volume – changes in volume may indicate changes in use patterns.

DSW 122570

Can you bridge the gap?

- Ask if customers would like special training in working with your products.
- Consider bringing company experts with you on sales calls. They can answer questions and gather important information.
- You can play a role in determining whether your customers are receiving the safety information and MSDS materials.
- Customers and distributors may repackage the product. Be sure the new labeling accurately reflects your company's product information.
- A survey can be an effective sales tool. Conduct a survey or hold a focus group to find out more about your customers' information needs. Customers recognize this as a commitment to serving their needs.
- Help out your distributors. Do they need guidance on providing information to their customers? Consider asking your company experts to develop a training course for your distributor.

Step 2. Keep an Eye Out



A visit to the customer is an opportunity to learn, not just to sell. If you see signs of unsafe practices, discuss it with the customer. If necessary, alert company experts in your company so they can reevaluate the safety and risk information you give customers when they purchase products.

Some examples of questionable practices include . . .

- Health allegations or reportable injuries resulting from using your products.
- Spills left unattended, scattered drums or pails or reckless forklift operations near chemical containers.
- Use of flammable products near an ignition source.
- Employees working in conditions that might lead to overexposure or signs of overexposure such as rashes, dizziness, etc.
- Employees ignoring warnings and safety precautions.

Step 3. Close the feedback loop



Information is useless unless it's in the right hands at the right time. That's where you come in. Consider doing the following:

- Find out what information company experts want you to gather when you visit customers.
- Develop a system for collecting and documenting complaints and information on improper uses and relaying them to the right staff member in your company.
- Participate in regular product reviews and provide your insights on customer needs and market trends.
- Tell company experts about customer safety concerns, pass on suggestions for new products and uses, relay customer requirements for handling and storage. Such input can improve product design and decrease HSE impacts of the product.

If you get the right information to the right people, you ensure better service for your customer. That's added value for them. And increased sales for you.

Use Your Available Resources . . .

If you have any questions about how your company is implementing the Product Stewardship Code, please contact your Responsible Care® Coordinator. You may also wish to contact your marketing management.

Additionally, CMA staff would be happy to help you with contacts of other member company representatives, so that you can talk with them about your experiences with Product Stewardship in the marketplace.

Just call (202) 887-1279

RESPONSIBLE CARE®

A Public Commitment

In 1988, the Chemical Manufacturers Association (CMA) launched Responsible Care® to respond to public concerns about the manufacture and use of chemicals. This initiative is an effort to continuously improve the industry's responsible management of chemicals.

Implementing Responsible Care's Codes of Management Practices helps companies continually improve their performance in health, safety and environmental quality. The Codes outline actions that cover every aspect of chemical operations.

The six Codes are Community Awareness and Emergency Response (CAER), Pollution Prevention, Process Safety, Distribution, Employee Health and Safety, and Product Stewardship.

For more information about Responsible Care® or for a copy of the Product Stewardship Code of Management Practices, write to the Chemical Manufacturers Association.



CHEMICAL
MANUFACTURERS
ASSOCIATION

2501 M Street, N.W.
Washington, DC 20037

202-887-1100



DSW 122573

STLCOPCB4032521



THE POWER OF PRODUCT STEWARDSHIP

For Sales and Marketing Professionals

CM
A
CHILMARK
KROGER PARTNERS
IN RESPONSIBILITY

PRODUCT STEWARDSHIP

A CRITICAL MESSAGE FOR CRITICAL TIMES:

T

here's a new buzz in the chemical industry. It's not a bell or a whistle. It's not a rebate program or a sale. It's an integral part of the Responsible Care® Initiative called Product Stewardship. Product Stewardship seeks to improve the health and safety of people and the environment. It is industry's commitment to making considerations of health, safety and environmental protection part of every product's lifecycle — from design to disposal. This commitment goes beyond the fence line — from our suppliers, to our distributors and to our customers.

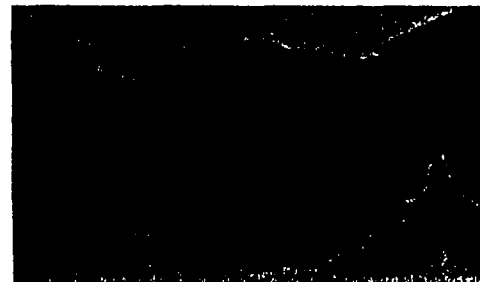
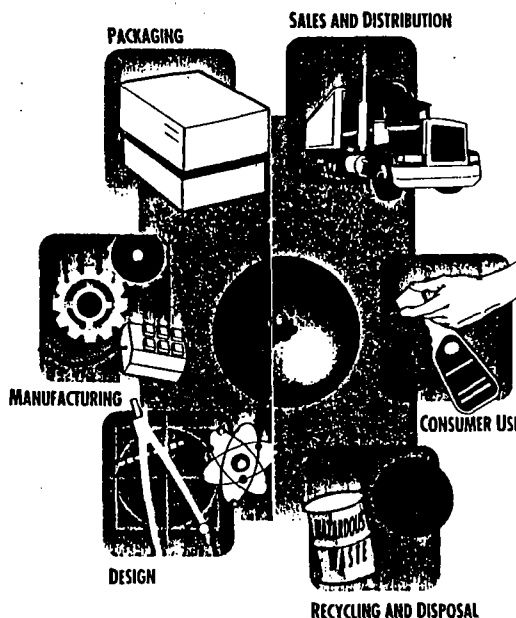
It is also the most critical message our chemical industry has ever sent to its customers and communities.

And you're the messenger.

That's because as a sales or marketing professional, you're the vital link between your company and the customer.

In the past, that link was built on your expertise in product representation and customer service.

But today that link also serves as a means to inform your customer regarding the proper handling and use of your company's products. That link also gives your company the field information it needs to implement risk management.



The Benefits of Product Stewardship

By helping your customers understand how to properly use, handle, store, transport and dispose of your products, you provide benefits far beyond the feature list or a specific product selling point.

It's called responsiveness. Meeting new and changing customer needs and expectations about health, safety and the environment.

A new entree to product discussion and comparison.

Customers will remember the rep who talked with them about safety first,

price second.

As you begin, you'll run into the skeptics. Some who won't listen. Some who won't believe. But like everything worth knowing and having, Product Stewardship is a concept worth the doubt of a few. In the long run, it makes a difference to the many. Product Stewardship is also good business for the long term.

- ▼ Best way to preserve customer's longevity and ability to meet regulations.
- ▼ Provides a "value added" to doing business with your company.

This booklet will introduce you to the concepts of Product Stewardship. To learn more, contact the Chemical Manufacturers Association at (202)-887-1277.

DSW 122575

STLCOPCB4032523

PRODUCT STEWARDSHIP

EXAMINING THE PRODUCT LIFECYCLE:



T

he Product Stewardship Code reflects the holistic nature of product development. It examines a product's lifecycle from inception to final disposal.

Comprised of 12 separate Management Practices, at its most basic level

Product Stewardship asks that companies:

- ▼ Make health, safety and the environment key considerations in designing new products;
- ▼ Provide customers with information on proper product use and disposal; and
- ▼ Develop positive relationships with customers and maintain customer contact to identify their needs.

To achieve these goals, you must help by

- ▼ Learning about proper product use,
- ▼ Working closely with distributors, and
- ▼ Informing your customers.

PRODUCT STEWARDSHIP CODE

PURPOSE AND SCOPE

The purpose of the Product Stewardship Code of Management Practices is to make health, safety and environmental protection an integral part of designing, manufacturing, marketing, distributing, using, recycling and disposing of our products. The code provides guidance as well as a means to measure continuous improvement in the practice of product stewardship.

The scope of the code covers all stages of a product's life. Successful implementation is a shared responsibility. Everyone involved with the product has responsibilities to address society's interest in a healthy environment and in products that can be used safely. All employers are responsible for providing a safe workplace, and all who use and handle products must follow safe and environmentally sound practices.

The code recognizes that each company must exercise independent judgment and discretion to successfully apply the code to its products, customers and business.

Each company shall have an ongoing product stewardship process that:

LEADERSHIP

Demonstrates senior management leadership through written policy, active participation and communication.

ACCOUNTABILITY AND PERFORMANCE MEASUREMENT

Establishes goals and responsibilities for implementing product stewardship throughout the organization. Measures performance against these goals.

RESOURCES

Commits resources necessary to implement and maintain product stewardship practices.

HEALTH, SAFETY AND ENVIRONMENTAL INFORMATION

Establishes and maintains information on health, safety and environmental hazards and reasonably foreseeable exposures from new and existing products.

PRODUCT RISK CHARACTERIZATION

Characterizes new and existing products with respect to their risk using information about health, safety and environmental hazards and reasonably foreseeable exposures. Establishes a system that initiates re-evaluation.

RISK-MANAGEMENT SYSTEM

Establishes a system to identify, document and implement health, safety and environmental risk-management actions appropriate to the product risk.

PRODUCT AND PROCESS DESIGN AND IMPROVEMENT

Establishes and maintains a system that makes health, safety and environmental impacts—including the use of energy and natural resources—key considerations in designing, developing and improving products and processes.

PRODUCT STEWARDSHIP

WHAT YOU CAN DO:

BECOME KNOWLEDGEABLE:

- ▼ Learn about the hazards, proper handling, use, recycling and disposal of your company's products.
- ▼ As you are trained, be sensitive to how your customers might react to your product's handling information. Are warning messages simple, clear and strongly worded? Is handling and use information easy to find and understand? Is the typeface bold enough to send a message of importance? Can you see ways in which your customer may deviate from standard practice?
- ▼ Pass concerns and suggestions for improvement directly back to your management.

WORK WITH YOUR DISTRIBUTORS:

- ▼ Help distributors by providing up-to-date health, safety and environmental information. Be prepared for questions they might have. Ask your distributors what they need from you.
- ▼ Work with your distributors to improve their practices and help them keep pace with changing technology.
- ▼ Encourage your distributors to pass health, safety and environmental information on to their customers.
- ▼ Gather valuable feedback about their knowledge of end-user problems or misuse. Pass this information directly on to your management.

HELP YOUR CUSTOMERS:

- ▼ When visiting customer facilities, take time to tell your customers about proper handling, use, recycling, disposal and storage.
- ▼ Help prevent accidents before they happen by warning your customers of the hazards of product misuse.
- ▼ Take note of their personal experience with the product, and as always, make sure this information is relayed to your company's risk assessment and R&D personnel.

These activities can help improve your offering to your customers.

PRODUCT STEWARDSHIP CODE

EMPLOYEE EDUCATION AND PRODUCT USE FEEDBACK

Educates and trains employees, based on job function, on the proper handling, recycling, use and disposal of products and known product uses. Implements a system that encourages employees to feed back information on new uses, identified misuses or adverse effects for use in product risk characterization.

CONTRACT MANUFACTURERS

Selects contract manufacturers who employ appropriate practices for health, safety and environmental protection for the operations under contract, or works with contract manufacturers to help them implement such practices. Provides information and guidance appropriate to the product and process risk to foster proper handling, use, recycling and disposal. Periodically reviews performance of contract manufacturers.

SUPPLIERS

Requires suppliers to provide appropriate health, safety and environmental information and guidance on their products. Factors adherence to sound health, safety and environmental principles, such as those contained in Responsible Care[®], into procurement decisions.

DISTRIBUTORS

Provides health, safety and environmental information to distributors. Commensurate with product risk, selects, works with and periodically reviews distributors to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the distributor to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures—up to and including termination of the business relationship. This Management Practice should be implemented in conjunction with the Distribution Code of Management Practices.

CUSTOMERS AND OTHER DIRECT PRODUCT RECEIVERS

Provides health, safety and environmental information to direct product receivers. Commensurate with product risk, works with them to foster proper use, handling, recycling, disposal and transmittal of appropriate information to downstream users. When a company identifies improper practices involving a product, it will work with the product receiver to improve those practices. If, in the company's independent judgment, improvement is not evident, then the company should take further measures—up to and including termination of product sale.

DSW 122577

In 1988, CMA's Board of Directors adopted an Initiative called Responsible Care®: A Public Commitment. Responsible Care®, an obligation of CMA membership, calls for continuous improvement by the chemical industry in health, safety and environmental performance and increased dialogue with the public.

Responsible Care® includes six Codes of Management Practices that provide specific objectives for emergency response, community dialogue, pollution prevention, process safety, distribution safety, worker health and product stewardship.

For more information on the Product Stewardship Code
or the Responsible Care® Initiative, contact
the Chemical Manufacturers Association
2501 M Street, NW
Washington DC 20037
(202) 887-1157



DSW 122578

STLCOPCB4032526

**Solutia Risk
Assessment**

DSW 122579

STLCOPCB4032527

Policy: **No Undue Risk of Harm to:**

Employees
Customers
Consumers
Environment

During the Products Life Cycle

Definition of Life Cycle:

Research
Development
Manufacture
Processing
Use
Recycle
Disposal

Goal:

Work toward negligible risk

Obey all laws and regulations



DSW 122582

STLCOPCB4032530

Premises:

Nothing is without risk.

Careful evaluation is required.

Process is never complete.

Risk assessment is required for
good business decisions.

Factors determining risk:

- a. Product quantity
- b. Number of people exposed
- c. Routes of exposure
- d. Releases to environment
- e. Persistence in environment
- f. Mammalian toxicity
- g. Ecotoxicity
- h. Ultimate fate
- i. Potential misuse

**RESPONSIBILITY AND
ACCOUNTABILITY:**

**BUSINESS GROUPS are
ACCOUNTABLE**

**PRODUCT SAFETY &
PRODUCT STEWARDS
are RESPONSIBLE**

ULTIMATE JUDGE -- SENIOR CORPORATE MEDICAL DIRECTOR



DSW 122586

STLCOPCB4032534

Solutia ESHA Process

- Formal assessment of product safety
- Prompts creation or update of MSDS
- Consists of 5 levels consistent with product/process development process

Level 1 - very similar to known reference

Level 2 - limited scale R&D evaluation

Level 3 - undergoing commercialization

Level 4 - final approval for commercialization

Level 5 - reapproval of existing product

ESHA Level 1

- Determine if new or modified product is sufficiently similar to existing reference material that no additional assessment needed
- Prompts creation of commercial MSDS equivalent to reference material
- Review and approval:
 - manager, product stewardship

ESHA Level 2

- Approval for R&D evaluation of limited quantities of new or modified product (new ingredient) outside synthesizing laboratory; begins the identification of testing needs
- Prompts creation of R&D MSDS
- Review and approval:
 - toxicologist
 - manager, product stewardship

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ESHA Level 3

- Approval to proceed with commercial development of novel product and to define comprehensive ESH data needs (testing may require several months)
- May prompt creation of commercial MSDS
- Review and approval:
 - toxicologist
 - environmental scientist
 - manager, product stewardship

ESHA Level 4

- Final approval for full-scale product commercialization, including MSDS
- Review and approval:
 - toxicologist
 - environmental scientist
 - manager, product stewardship
 - other ESH professional if appropriate
- May be waived if Level 3 assessment answers all questions

ESHA LEVEL 5

- Assessment of existing product after several years of sales and use, to confirm validity of previous approvals
- For many products the 3-5 year MSDS review process qualifies as ESHA 5; in any case includes update of MSDS
- Review and approval - formal ESHA 5:
 - same as level 4 plus various director-level ESH and commercial representatives

ESHA Form
(E-mail Compatible Word Document)

- Administrative/sign off page
- Product identity and composition
- Physical and chemical properties
- Product manufacture and use
- Regulatory information
- ESH test result summaries
- Ingredient MSDS

Final Comments on ESHA

- Approvals are limited to requested countries/regions
- Product developer should forwarn commercial reps in applicable countries
- Product developer encouraged to have early and frequent dialog with manager, product stewardship
- Plants have independent review and approval process for new raw materials

Measurement of Success of ESHA Process:

Reduction of impact on ESH from
Solutia products

Improved documentation and
recordkeeping:

Compliance with internal policy and
legal requirements

Exposure potential

Availability of adequate ESH data to ultimate product receiver.

Early review and identification of products that do not meet ESH standards.

Understanding of ESH impacts of products throughout life cycle and related to business decisions.

Timely commercialization via a well orchestrated ESHA process.

Differentiation of Solutia products in the marketplace because of superior ESH characteristics or information.

Clarity in assignments and accountability.

Solutia

ENVIRONMENTAL SAFETY & HEALTH ASSESSMENT (ESHA)

SECTION 1 - COMPLETE BY INITIATOR:

TO (PSM or ESHA Coord.) _____ (Date) _____

Check Level (Extent) 1 Minor 2 Limited 3 Extended 4 Decision 5 Existing
of Review Required: ☐ Mod. ☐ Samples ☐ Sampling ☐ on Comm. ☐ Prod Review

PRODUCT/PROCESS TO BE ASSESSED _____

Synonyms: _____

Locations: Lab/Plant _____ I. H. Dept/Area _____

Division / Business Group: _____

Product Classification (check): New Product ___ New Component ___ New Use ___

Isolated Intermediate ___ Significant Modification ___ New Process ___ By-Product ___

Submitted by: _____ Loc./Phone _____

SECTION 2: COMPLETE BY PRODUCT SAFETY

ESHA No.: _____

Reviewed by (PSM): _____ Date Forwarded: _____

DISTRIBUTION for LEVEL 1 :

MSDS Preparation : _____
Computer Entry : _____
Regulatory Review : _____ (if necessary)
Europe : _____ (if appropriate)
Canada : _____ (if appropriate)
Other world areas : _____ (if appropriate)

DISTRIBUTION for LEVEL 2 (Level 1 plus):

Toxicologist : _____ Approved: _____

DISTRIBUTION for LEVEL 3 or 4 (Level 2 plus):

Environ. Scientist : _____ Approved: _____

Environ. Prot. Mgr. (if necessary): _____ Approved: _____

Safety Manager (if necessary): _____ Approved: _____

Approved by (PSM) : _____ Level ___ Date: _____

Recommended for "Existing Product Review" no later than: _____

Memo to Initiator; Date: _____

SOLUTIA COMPANY CONFIDENTIAL

This document contains confidential information which is the property of Solutia, Inc. Only those portions of the document relevant to a duly authorized individual's need to know may be excerpted for him. The document must not be sent outside the Company without written approval and the authorized recipient is accountable for its safe keeping, excerpting or otherwise disclosing of its contents and for its proper disposal.

DSW 122592

Rev. 5/6/96

STLCOPCB4032540

Complete by Initiator
PRODUCT CHARACTERIZATION

I. PRODUCT IDENTITY

- A. Product name _____
- B. Name product being modified and ECA No. of reference similar product _____
- C. Composition of product as sold (if modified product, attach additional page 2 with previous formulation).

ATTACH MSDSs FOR ALL COMPONENTS

**IF ISSUE DATE IS OLDER THAN 2 YEARS, OBTAIN UPDATED VERSION FROM SUPPLIER
AND FORWARD WHEN RECEIVED.**

Common/Trade Name	Chemical Name	Type*	Empirical Formula	CAS/M-Number	%

* Active Ingredient, Solvent, etc.

DSW 122593

Rev. 5/6/96

STLCOPCB4032541

D. IF PRODUCT IS THE RESULT OF A CHEMICAL REACTION, LIST ALL REACTANTS. IF NOT APPLICABLE CHECK _____

Common/Trade Name	Chemical Name	Type*	Empirical Formula	CAS/M-Number	%

PLACE ASTERISK NEXT TO NAME AND NOTE ON ATTACHED SHEET ANY REGULATIONS TO WHICH COMPONENT IS KNOWN TO BE SUBJECT

Physical/chemical properties:

Appearance _____ Odor: _____

Physical State _____

Viscosity _____

pH _____

VOC content by EPA Method 24 _____

Specific Gravity _____ @ _____ C

Vapor Pressure _____ @ _____ C

Solubility in H₂O _____ @ _____ C

Melting Point _____ °C

Flash Point _____ °F via _____ Method

POLYMERS: Average Molecular Weight _____ Range _____ % below 500 _____ % below 1000 _____

DSW 122594

Rev. 5/6/96

STLCOPCB4032542

Complete by Initiator
LEVEL 2 PRODUCT ASSESSMENT
(Research and Development Samples)

Enter estimates where facts may not yet be known and mark with (E).

III. PRODUCT MANUFACTURE & USE (complete by Initiator)

No. of sites for manufacture _____

Estimated annual volume (or range) _____ (bold) <1000kg.....1000-10,000kg.....10,000-100,000kg.....

>100,000kg

Probable location(s) of process _____

What countries will product be manufactured or sold? _____

Number of samples _____ Sample size _____ Number of customers _____

No. people exposed _____

Product use(s) _____

How will product be handled? _____

Known hazardous decomposition products _____

IV. REGULATORY INFORMATION (complete by Product Safety)

Will this product require any registration or notification? _____

If yes, indicate which country Inventories: _____

Other registrations: Food _____ Drug _____ Pesticide _____ USDA _____

Private Certification(s): _____

For which of these are there special data requirements? _____

Is product or any of its components on any Federal or State Regulatory or Advisory lists?

DSW 122595

Rev. 5/6/96

STLCOPCB4032543

Complete by Initiator

LEVEL 3 PRODUCT ASSESSMENT

IF YOU HAVE PREVIOUSLY SUBMITTED A LEVEL 2 ASSESSMENT, USE THIS PAGE TO PROVIDE NEW AND UPDATED INFORMATION OR RESUBMIT REVISED PAGES.

IF THIS IS YOUR FIRST SUBMISSION FOR THIS PRODUCT, COMPLETE PAGES 1-3 AND PROVIDE COMPLETE DETAILED RESPONSE TO QUESTIONS.

IF Space is inadequate for detailed responses, provide information on additional pages

I. UPDATED PRODUCT IDENTITY

II. UPDATED PHYSICAL/CHEMICAL PROPERTIES

III. PRODUCT MANUFACTURE (ATTACH FLOW DIAGRAM OF PROCESS)

In what countries will this product be manufactured? _____

Expected volume in 3-5 years _____

Number of workers expected to be involved in production _____

Will product be manufactured at a non-Solutia location? If yes, identify site and waste treatment plan _____

Expected environmental releases from process _____

Estimated volume from each release to air _____ to water _____

Expected waste products _____

Expected disposal method _____

Process(es) at location with similar waste _____

Have alternate processes/raw materials been considered which could reduce waste generation/health/environmental hazards? _____

Have any adverse health effects been observed during product research or manufacture? _____

Will an LP & EC review be required? _____

IV. UPDATED PRODUCT USE

List currently expected uses _____

Estimated number of persons exposed _____

In what countries will this product be sold? _____

Releases during processing or use: _____

Product disposal method(s) after use or processing _____

DSW 122596

Rev. 5/6/96

STLCOPCB4032544

PRODUCT SAFETY CHECK LIST (Level 3 Review):

After the Toxicologist and the Environmental Scientist have completed their review and issued evaluation memos, the Product Safety Manager (PSM) will review the entire package and determine if any additional information is required to complete the review. (The PSM will consult with the Environmental Protection Manager and Mgr, S&PP as required). The PSM will then summarize the requirements in a memo to the initiator. The following check list may prove helpful in this review:

MANUFACTURING (Consult with Environmental Protection Mgr.)

1. Will new Industrial Hygiene guidelines or exposure data need to be developed?
2. Is the environmental fate of emissions known?
3. Are emissions (including contract manufacturing sites) expected to be a problem?
4. Does the product (or any components) appear on the priority pollutants list of chemicals?
5. Are there any regulatory constraints under EPA or DOT regulations?
(SDWA, RCRA, etc.)
6. Are waste discharge or manufacturing permits (or revisions) expected to be required?
7. Are there reactive chemical concerns associated with storing or transporting the product?
8. Have potential spills been addressed?
9. What is the waste/100 lbs. of product? How has disposal been addressed?
10. Is process safety review necessary?

PRODUCT USE (Product Safety Mgr.)

1. Can exposure to components of the product occur during customer processing?
2. Are there any Industrial Hygiene test data available? Do we need to develop?
3. Could exposure to components degradation products or emissions occur during consumer use?
4. What are potential product misuses?
5. Are there potential exposures during product misuses?
6. Are handling procedures described adequately to avoid mishandling of the product?
7. Could components leach from a landfill so as to cause exposure?
8. Could incineration of the product cause exposure to hazardous substances?
9. Could recycling of the end product cause exposure to hazardous substances?
10. Are there emissions to water when the product is used or disposed of?

DSW 122597

Rev. 5/6/96

STLCOPCB4032545

Complete by Initiator
LEVEL 4 ASSESSMENT

THIS PAGE MUST BE COMPLETED, WITH INDICATED ATTACHMENTS, IN ADDITION TO PAGES 1-4, PRIOR TO COMMERCIALIZATION OF A NEW OR SIGNIFICANTLY MODIFIED PRODUCT, PROCESS, FORMULATION, USEFUL WASTE OR BY-PRODUCT OR NEW USE OF AN EXCISING PRODUCT.

I. UPDATED PRODUCT CHARACTERIZATION

Indicate any changes or updates from previously reported information concerning product composition, raw materials and physical/chemical properties which may have changed or may not have been previously available. Including compatibility with water, acids, bases, solvents. (attach continuation sheet, if necessary)

II. PRODUCT MANUFACTURE

a) Show any changes or additions to previously reported process/raw material/mixture component information as well as impurities, wastes and emissions. Give latest estimate of manufacturing volume and number of persons exposed during manufacture.

b) Show any changes in the level of air or water pollutants and/or waste products in comparison with processes used for similar previous products?

III. PRODUCT USE

List any product uses not previously described.

IV. TEST RESULTS

Attach summaries of any test data generated in response to recommendations following Level 3 review.

V. MSDS/LABELS

Attach latest Safety Data Sheet and label text.

VI. RESPONSE to SPECIFIC QUESTIONS

Attach responses to any special environmental, safety, health or regulatory recommendations identified in Level 3 review.

DSW 122598

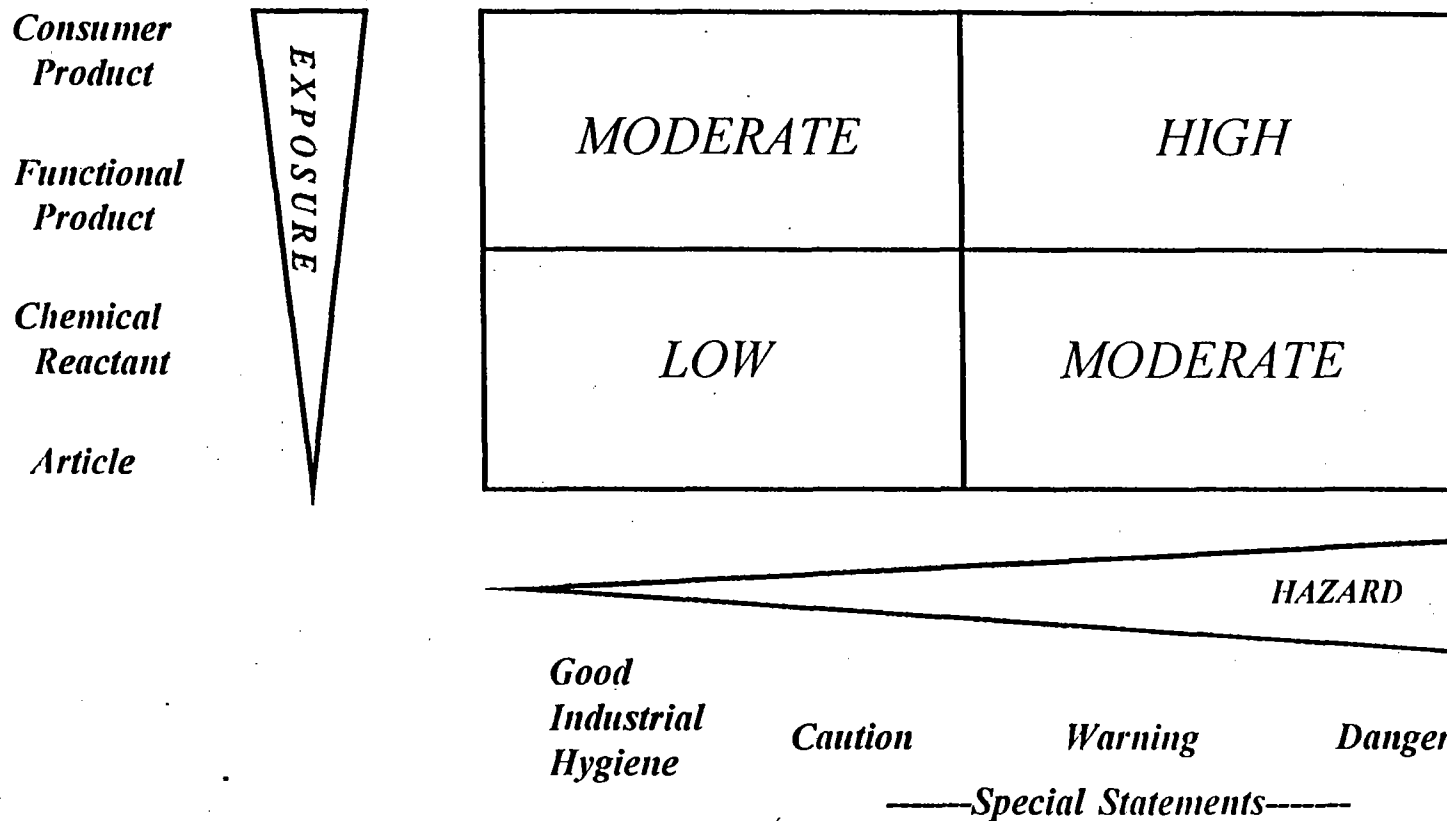
Rev. 5/6/96

STLCOPCB4032546

Risk Evaluation

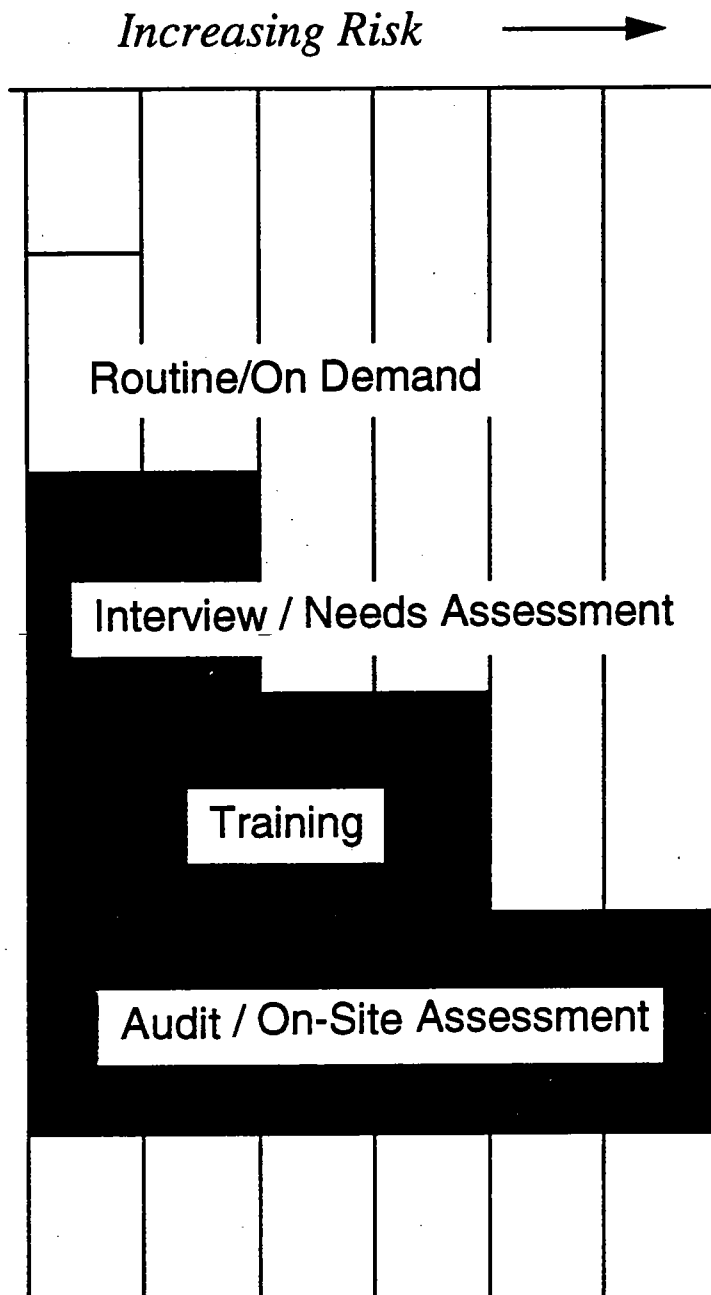
DSW 122599

STLCOPCB4032547



Product Stewardship Proactive Measures

Commensurate with Risk



Proactive Measures

**Toxic Substances
Control Act**

DSW 122601

STLCOPCB4032549

TSCA Training

- Overview
- Historical perspective
- Role of Inventory of Chemical Substances
- Exemptions
- Recording and reporting requirements
- Existing chemical review
- Imports and exports
- * = significant difference in Canada/EU

TSCA Overview

- U.S. chemical control law which covers most "industrial" chemicals
- Applies to products we manufacture or import, and to certain exports
- Important to Technology, Commercial Development and Manufacturing, but some provisions apply to all employees
- Many other countries now have similar chemical control laws

Historical Perspective

- Legislation became effective January 1, 1977
- Intended to fill gaps between FDA and FIFRA
- Empowered EPA to evaluate and regulate existing and new chemicals
- Granted EPA broad authority to gather information, evaluate risks and take necessary steps to prevent unreasonable risk
- Focused on evaluating and reporting risk, and recordkeeping

What's Expected of Individuals

- Violations of TSCA carry civil and criminal penalties
- Civil penalties up to \$25,000/day, even for recordkeeping errors*
- Individuals must be aware of reporting requirements
- EPA allows individuals to discharge certain reporting requirements by notifying proper company authority

Canada

- Environment Canada and Health Canada conduct risk assessment
- Up to \$1M or 3 yrs imprisonment
- For imported chemicals not on DSL, the customer is at jeopardy

Resources for Help

- Product Stewardship Managers
 - Jim Downes Andre Aarts
 - Jim Mieure David Tucker
 - Rashmi Nair Beatrice Decelle
 - Tony Sardella Jeff Felder (lead)
- TSCA hotline - 202-554-1404
- EPA website - www.epa.gov

Canadian Resources

- CEPA New Substance Notification:
Janic Lauzon Monnet 547-1147
- CEPA hot line (800)567-1999

European Resources

Andre Aarts Monnet 772-1518
David Tucker Monnet 772-508
Beatrice Ducelle Monnet 772-1531

Role of Inventory

- A chemical must be on the inventory prior to commercial manufacture or import*
- Also applies to isolated intermediates*
- Initial inventory compiled in 1979, now has 74,000 substances
- 2000 chemicals added each year via PMN
- Public and confidential sections*
- Listing applicable only to discrete, unique chemicals, not mixtures or formulations
- Do not assume CAS# = inventory listing!

Canadian Inventory

- Domestic Substances List (DSL)
- 23,000 substances
- NDSL - equivalent to 1991 TSCA inventory. Not on DSL but less stringent notification requirements

Exemptions to Inventory

- FDA or FIFRA-regulated materials*
- Wastes
- By-products (no commercial value)*
- Impurities (unintentional)*
- R&D materials*
- Certain polymers*
- Non-isolated intermediates
- Articles
- EU has additional exemptions

PMN Process*

- If new chemical not on TSCA Inventory and not exempt, Solutia must file PMN to add chemical
- PMN contains structural, physical property, manufacture, use and ESH data sufficient to allow preliminary assessment of risk
- Agency has 90 days in which to object, or company is free to manufacture or import for commercial purposes

PMN Process (2)

- EPA can issue SNUR limiting new uses which could result in increased release of or exposure to chemical. A SNUR on a competitive product can also apply to Solutia products.
- Provision for including "pollution prevention" information which can lead to favorable consideration during EPA assessment

DSW 122605

PMN Process (3)

- Involve your Manager, Product Stewardship, early in the PMN planning
- Usually wise to have pre-notice conference with EPA
- PMN format now available for Word
- \$2500 filing fee*
- Wise to file "bonifide intent to manufacture" notice to learn if substance on confidential inventory

PMN Process (4)

- Improper chemical name is biggest source of rejection by EPA
- Apply to CAS to receive correct name and CAS #
- Must file notice of commencement of manufacture within 30 days, and resubstantiate any confidentiality claims

Inventory Update*

- Required in 1998 and every 4 years for all manufacturers and importers of > 10,000 lbs/year
- Information includes:
 - specific chemical identity
 - quantity manufactured or imported
 - is substance site-limited
 - name of technical contact
 - certification and CBI statements

Inventory Update (2)

- Must specify quantities by site, although corporate aggregation is permitted
- Polymers, inorganics and naturally occurring substances are exempt
- EPA considering expanding scope to reduce exemptions and include chemical use data
- Retain records until next update

Recording and Reporting

- For certain listed chemicals:
 - Section 8(a) - EPA can require manufacturer or processor to submit information on quantity produced or processed, amount released to the environment and estimated uses
 - Section 8(d) - EPA can require manufacturer or processor to submit all completed health and environmental safety studies and lists of ongoing studies

Recording and Reporting

- For all chemicals manufactured, imported or processed:
 - Section 8(c) - companies must keep records of "allegations" of adverse effects - no technical merit or substantiation needed
 - Section 8(e) - companies have 30 days* to report findings of "substantial risk" to health or environment - technical merit required
- Solutia has formal process for complying with both - details available early 1998

Imports*

- Importers required to certify that imports comply with or are exempt from TSCA (R&D chemicals are exempt)
- Chemicals not released from customs until certification signed
- Solutia uses brokers for compliance
- Brokers may contact you for clarification on your orders

Exports*

- Companies required to notify EPA of first shipment each year of certain TSCA-regulated (Section 5, 6 and 7) substances, first shipment for Section 4
- EPA then notifies receiving country's embassy
- Solutia operates an IT system linked to order/billing to provide compliance. If you bypass order/billing, notify us.

Solutia ESHA Process

- Formal assessment of product safety
- Prompts creation or update of MSDS
- Consists of 5 levels consistent with product/process development process
 - Level 1 - very similar to known reference
 - Level 2 - limited scale R&D evaluation
 - Level 3 - undergoing commercialization
 - Level 4 - final approval for commercialization
 - Level 5 - reapproval of existing product

ESHA Level 1

- Determine if new or modified product is sufficiently similar to existing reference material that no additional assessment needed
- Prompts creation of commercial MSDS equivalent to reference material
- Review and approval:
 - manager, product stewardship

ESHA Level 2

- Approval for R&D evaluation of limited quantities of new or modified product (new ingredient) outside synthesizing laboratory; begins the identification of testing needs
- Prompts creation of R&D MSDS
- Review and approval:
 - toxicologist
 - manager, product stewardship

ESHA Level 3

- Approval to proceed with commercial development of novel product and to define comprehensive ESH data needs (testing may require several months)
- May prompt creation of commercial MSDS
- Review and approval:
 - toxicologist
 - environmental scientist
 - manager, product stewardship

ESHA Level 4

- Final approval for full-scale product commercialization, including MSDS
- Review and approval:
 - toxicologist
 - environmental scientist
 - manager, product stewardship
 - other ESH professional if appropriate
- May be waived if Level 3 assessment answers all questions

ESHA LEVEL 5

- Assessment of existing product after several years of sales and use, to confirm validity of previous approvals
- For many products the 3-5 year MSDS review process qualifies as ESHA 5; in any case includes update of MSDS
- Review and approval - formal ESHA 5:
 - same as level 4 plus various director-level ESH and commercial representatives

ESHA Form

(E-mail Compatible Word Document)

- Administrative/sign off page
- Product identity and composition
- Physical and chemical properties
- Product manufacture and use
- Regulatory information
- ESH test result summaries
- Ingredient MSDS

Final Comments on ESHA

- Approvals are limited to requested countries/regions
- Product developer should forwarn commercial reps in applicable countries
- Product developer encouraged to have early and frequent dialog with manager, product stewardship
- Plants have independent review and approval process for new raw materials

Chemical Weapons Treaty

- Multilateral treaty signed by 160 countries
- Entered into force April 29, 1997, after ratification by 65 countries
- As of September 15, 99 countries had ratified, including Canada and most EU
- Each country must pass enabling legislation and create regulations

Definitions

- Chemical Weapons - toxic chemicals and their precursors
- Toxic Chemicals - chemicals which cause death, temporary incapacitation or permanent harm
- Precursor - any chemical reactant used in the production of a toxic chemical

Categories

- Schedule 1 - chemical agents actually designed as weapons, having little commercial value
- Schedule 2 - precursors having commercial value
- Schedule 3 - precursors having legitimate commercial utility
- Discrete Organic Chemicals - organics except oxides, sulfides and carbonates

Solutia Listed Chemicals

- Schedule 3 Chemicals:
 - Phosphorus Oxychloride
 - Phosphorus Trichloride
- Discrete Organic Chemicals (DOC)

Schedule 3 Requirements

- Production, import and export volumes must be reported annually for plants producing > 30 tonnes/yr. Sites also declared as producing site.
- Sites subject to routine verification if production exceeds 200 tonnes/yr
- Governments also subject to various reporting requirements

Discrete Organic Chemicals

- All compounds of carbon except oxides, sulfides and metal carbonates:
 - chemical name
 - structural formula
 - CAS number
- Any chemical containing phosphorus, sulfur or fluorine

DOC Requirements

- Must report if production of DOC > 200 tonnes/yr or if production of DOC containing phosphorus, sulfur or fluorine is > 30 tonnes/yr
- Subject to inspection after April 29, 2000

Specifics of Reporting

- U.S. reports will go to Department of Commerce
- Forms to be available on website (www.acda.gov)
- Commerce has not issued regs yet
- Volumes likely reported in ranges
- For Schedule 3 and DOC, probably report only for previous year

Inspections Are Onerous

- Will consist of 20-21 people
- Allowed to see production and shipping records
- Site must provide 2 conference rooms and telephones
- Site must provide space for mobile lab
- Allowed to take photographs & samples
- Will include armed FBI agent

Chemical Diversion & Drug Trafficking Act

- Applies to manufacturers, distributors, importers and exporters of listed substances
- List of substances includes several common chemicals
- Annual reporting required

Listed Chemicals

- Benzaldehyde (list 1)
- Acetic anhydride
- Acetone
- Benzyl chloride
- Methyl ethyl & methyl isobutyl ketones
- Toluene
- Hydrochloric acid
- Sulfuric acid

Records

- Each regulated transaction
 - List 1 chemicals kept for 4 years
 - List 2 chemicals kept for 2 years
- Stored at site
- Readily retrievable and available for inspection

Content of Records

- Name and shipping address of customer
- Date of transaction
- Name of chemical
- Quantity
- Form of packaging
- Method of transfer

Report

- Suspicious transactions - immediate
- Annually
 - aggregated quantity of each chemical
 - year-end inventory
 - aggregate quantity used internally
 - aggregate quantity going into exempted products

DSW 122615

Toxic Substances Control Act: Recent Developments

by Charles A. O'Connor III
Elizabeth C. Brown
and Dr. Robert J. Israel

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The Toxic Substances Control Act (TSCA) places on manufacturers the responsibility to provide data on the health and environmental effects of chemical substances and mixtures, and gives the U.S. Environmental Protection Agency (EPA) comprehensive authority to regulate the manufacture, use, distribution in commerce and disposal of chemical substances.

TSCA, enacted on Oct. 11, 1976, has been amended three times and covers control of toxic substances, title I; asbestos hazard emergency response, title II; indoor radon abatement, title III; and lead-based paint exposure reduction, title IV.

Unlike other federal statutes that regulate chemical risks after a

substance has been introduced into commerce, the major objective of TSCA is to characterize and understand the risks that a chemical poses to humans and the environment before it is introduced into commerce.

Before undertaking regulatory action, however, TSCA requires that EPA balance the economic and social benefits derived from the use of a chemical against that chemical's identified risks. Thus, the goal of TSCA is not to regulate all chemicals which present a risk, but only those which present an "unreasonable" risk of harm to human health or the environment.

Importers of chemicals into the United States often find themselves in a precarious position. Under the Toxic Substances Control Act, they are considered the equivalent of chemical manufacturers and thus are subject to the most burdensome responsibilities under TSCA. The burden is compounded by the fact that TSCA is such a complex and demanding statute, and few com-

panies outside the U.S. are able to achieve sufficient expertise.

Indeed, it is frequently quite difficult for American companies to maintain high standards of compliance, given the ever-changing requirements of the law.

This paper provides a brief overview of the TSCA requirements of interest to importers and examines their effect on chemical importers.

Key Provisions

Toxic Substances Control Act requirements of concern to importers include establishment and organization of the TSCA Inventory (Section 8(b)); adding new chemical substances to the TSCA Inventory through the Premanufacture Notification process (Section 5); testing of existing chemicals (Section 4); data gathering information on the effects of chemicals on human health and the environment, and exposure potential (Section 8); regulation of chemicals

(Section 6); import certification requirements (Section 13); and export notification requirements (Section 12).

Subject to TSCA

The varied requirements of TSCA apply to persons and companies that manufacture, process, distribute, use or dispose of TSCA-regulated chemicals.

Thus, it is necessary to determine case-by-case whether a particular activity constitutes regulated conduct.

Unfortunately, TSCA defines neither "use" nor "dispose," and the definitions of "manufacture," "process" and "distribute" are worded too broadly to provide meaningful guidance.

Moreover, EPA's implementing regulations generally define these terms more narrowly than the statute, and the preambles to those regulations sometimes provide further clarification, but in some cases the scope of TSCA jurisdiction remains unclear and varies among TSCA regulatory provisions.

TSCA Inventory

TSCA Sec. 8(b) requires EPA to compile, keep current and publish a list of chemical substances manufactured or processed for commercial purposes in the U. S.

This "list," known as the TSCA Inventory, forms the basis for distinguishing between "existing" chemicals (those included on the TSCA Inventory) and "new" chemicals (substances that require pre-manufacture notification under TSCA Sec. 5).

The inventory was developed under EPA's inventory reporting regulations in December 1977. To be eligible for inclusion in the inventory, a substance had to be a "reportable chemical substance," defined under the regulations as: a chemical substance; manufactured, imported, or processed for a com-

mercial purpose in the U.S. between Jan. 1, 1975 and the date of publication of the initial inventory (June 1, 1979); and not specifically excluded from the inventory.¹

EPA continuously adds to the inventory new chemicals that have cleared TSCA Sec. 5 premanufacture notice (PMN) review and for which notices of Commencement of Manufacture have been filed.

The agency also periodically removes, or "de-lists," from the inventory "orphan chemicals" that are not currently being manufactured or imported for commercial purposes. Prior to delisting, the agency publishes a notice of its intent to delist in the *Federal Register* and in its quarterly *Chemicals in Progress Bulletin*. As a result of this process, the inventory is maintained as a list of chemicals currently in commerce, not just those which were in commercial use during the 1975-1979 reporting period for the initial inventory.

Using the Inventory

The 1985 edition of the inventory is the most current and consists of non-confidential identities and generic names for confidential substances. EPA maintains the master file that contains both the confidential and the non-confidential identities.

There are five volumes in the TSCA Inventory, each indexed to categorize the TSCA list of chemical substances in different ways.

Volume One lists chemical substances in ascending order by CAS Registry Number, the Chemical Abstract Service (CAS) Index, or Preferred Names.

Volumes Two and Three are an alphabetically ordered listing of all CAS Index or Preferred Names, EPA submitter names, and CAS synonyms for the substances in the Chemical Substance Identity section.

Volume Four lists all substances appearing in the Chemical Sub-

stance Identity section which have determinable molecular formulas.

Volume Five lists substances of Unknown or Variable Composition, Complex Reaction Products and Biological materials (UVCB) substances.

Because confidential chemicals are not listed by specific chemical identity and new confidential chemicals are continually being added, the only way to determine if a substance is or is not on the inventory is to search EPA's master file of the inventory. EPA will search the confidential inventory only if the person requesting the search can demonstrate a *bona fide* intent to manufacture or import the substance for a commercial purpose.²

A notice of *bona fide* intent to manufacture or import must be submitted in writing and include: the specific chemical identity; a signed statement of intent to manufacture or import for a commercial purpose; a description of the research and development activities conducted; the purpose of the manufacture or import; an elemental analysis; and either an x-ray diffraction pattern (for inorganic substances), a mass spectrum, or an infrared spectrum.³

As discussed more fully in the following section on recent developments in TSCA regulation, EPA has proposed to add additional information requirements to the *bona fide* notice further substantiating the intent to manufacture or import.

New Chemical Review

Under TSCA Sec. 5, any person intending to manufacture or import a chemical substance first must determine whether it is listed on the TSCA Inventory. If it is listed, then manufacture or importation may commence immediately.

If the chemical substance is not listed on the inventory, then the manufacturer or importer of this

"new" chemical substance must determine whether the chemical substance is excluded altogether from regulation under TSCA or whether it is exempt from the PMN requirements. If the chemical substance is neither excluded nor exempted, the prospective manufacturer or importer must file a PMN at least ninety days before commencing those activities.

Under Sec. 5(a), EPA has 90 days (extendable for good cause to 180 days) within which to review the PMN. During its PMN review, EPA assesses the potential risks associated with the manufacture, processing, distribution, use and disposal of the new substance, based upon information supplied by the PMN submitter, available from various agency data bases and the scientific literature, and the agency's own professional judgment.

If EPA takes no regulatory action on the PMN within the 90-day review period, the submitter may commence commercial manufacture or importation forthwith and without the need for prior agency approval.

Within 30 days after commencing manufacture or importation, the manufacturer or importer must file a Notice of Commencement (NOC) of Manufacture or Import.⁴

The NOC certifies that commercial manufacture or importation actually has occurred. After receiving an NOC, EPA will add the PMN substance to the inventory, and the new chemical will then become an "existing" chemical under TSCA.

Exclusions

The PMN requirements apply to a "new chemical substance" and, once an applicable rule is promulgated, to a "significant new use" of an existing chemical substance.

The statutory definition of "chemical substance" excludes any pesticide as defined by the Federal Insecticide, Fungicide and Rodenti-

cide Act, and any food, food additive, drug, cosmetic or device as defined by the Federal Food, Drug, and Cosmetic Act, various nuclear materials regulated under the Atomic Energy Act, and any tobacco or tobacco product.⁵

Thus, by definition, these substances are excluded from TSCA jurisdiction and, as such, are not subject to the PMN requirements. The PMN requirements nevertheless may apply to such "excluded" substances, if they also are intended for a "TSCA use."

Exemptions

TSCA expressly establishes two exemptions from the PMN requirements—for test marketing and research and development (R & D) chemical substances—and also grants EPA authority to establish additional exemptions by regulation where the agency determines that the manufacture, processing, distribution or use of a chemical substance will not present an unreasonable risk to health or the environment.

Under this authority, EPA has prescribed fifteen additional exemptions to the PMN requirements including low volume exemption; polymer exemption; new chemicals imported in articles; impurities, by-products, non-isolated intermediates; chemicals formed during the manufacture of an article; and chemicals formed incidental to the storage and end-use of chemical substances and the use of certain additives.

In 1992 and 1993, EPA actively reviewed the PMN review process, and on Feb. 8, 1993, published a package of four proposed rules modifying numerous aspects of the PMN review process.

New Chemicals, Uses

Under TSCA Sec. 5, once having submitted a PMN and awaited 90 days, a manufacturer may com-

mence commercial operations without specific EPA approval. Nevertheless, the agency may exercise one of three statutory options to regulate and/or bar commercial manufacture of the new chemical substance described below.

First, under TSCA Sec. 5(a) EPA may delay manufacture for one additional 90-day review period for "good cause."

Second, under TSCA Sec. 5(e), EPA may issue a proposed order limiting or prohibiting manufacture if the agency makes statutorily prescribed findings regarding possible risk or substantial production and exposure.

Third, under TSCA Sec. 5(f), EPA may propose a Sec. 6(a) rule which becomes immediately effective to limit or condition manufacture, or alternatively may issue a proposed order totally banning manufacture, if the agency concludes that manufacture "presents or will present an unreasonable risk of injury to health or [the] environment."

Risk

TSCA Sec. 5(e) grants EPA authority to issue an administrative order regulating a new chemical substance if the agency finds that there is insufficient information to evaluate the risk reasonably; and either the chemical may present an unreasonable risk to health and the environment, or it will be produced in substantial quantities with the result that either substantial quantities will enter the environment or there will be substantial or significant human exposure to the substance.

The purpose of a TSCA Sec. 5(e) order is to ban or limit manufacture, distribution, use, or disposal of a chemical pending development of sufficient data for EPA to evaluate the risks the chemical poses to human health or the environment.

Where EPA acts unilaterally to issue a Sec. 5(e) order, the order must issue at least 45 days before the end of the PMN review period. Unless the PMN submitter objects and forces EPA to go to court to enforce the order, such unilateral orders become effective on the day the review period ends.

Unreasonable Risk

If EPA determines that a new chemical substance presents or will present an unreasonable risk before the agency can issue a rule under Sec. 6 to protect against such risks, the administrator may act under Sec. 5(f) to control that risk. TSCA Sec. 5(f)(2) authorizes the administrator to issue an immediately effective proposed rule under Sec. 6(a) that limits or delays manufacture of a chemical substance undergoing a PMN review.

Under Sec. 6(a), EPA has authority to limit the amount; prohibit particular uses; limit the amount or concentration for a particular use; require specific labels; require recordkeeping; prohibit or regulate commercial use; prohibit or regulate disposal; and give notice of the risk.

Such a rule is effective immediately upon publication in the *Federal Register*. The PMN submitter may challenge it with subsequent rulemaking.

Significant New Use

Persons who submitted initial inventory notices were required to describe the uses to which their chemicals were being put. Similarly, a PMN submitter must describe the intended uses of its new chemical.

If EPA determines that a particular use of a chemical already on the inventory constitutes a "significant new use," the agency can issue a Significant New Use Rule (SNUR). A SNUR requires anyone who wants to manufacture or process a

chemical substance for a use that EPA has determined is a "significant new use" to give EPA 90 calendar days prior notice.⁶

This notice is referred to as a "Significant New Use Notice" or SNUN.

If, after reviewing a SNUN, EPA fails to initiate any action under Secs. 5, 6 or 7, then TSCA Sec. 5(g) requires the administrator to publish a notice in the *Federal Register* giving EPA's reasons for not initiating any action.

As is the case with a PMN, a SNUN submitter may manufacture, import, or process the chemical for the "significant new use" without EPA approval or further notice to EPA upon expiration of the 90-day review period.

When EPA has concerns about a new chemical substance but does not want to prohibit its manufacture completely, the agency will enter into a Sec. 5(e) consent order with the PMN submitter as discussed above, allowing limited production under carefully controlled conditions.

Once the chemical is placed on the inventory, however, other manufacturers can begin producing this substance without complying with the restrictions in the consent order, giving them a competitive advantage over the original manufacturer.

As a result, manufacturers subject to Sec. 5(e) consent orders have urged EPA to designate as a "significant new use" any manufacture of such a substance that is not in compliance with the same restrictions placed upon the original manufacturers in the consent orders.

The agency's difficulties in developing individual SNURs tailored to specific the Sec. 5(e) consent orders, prompted the agency to develop the "Generic SNUR Rule." This rule establishes a menu of standardized significant new uses, and recordkeeping requirements, as well as two procedures EPA can

use to issue SNURs without the usual notice-and-comment rulemaking.

Testing under TSCA

One of Congress' objectives in enacting TSCA was to require chemical manufacturers and processors to develop data on the health and environmental effects of their products.⁸

Under the law, EPA may require manufacturers and processors to develop safety and environmental data when the chemical may present an unreasonable risk of injury; or substantial quantities of the chemical are produced with the potential for substantial environmental or human exposure.⁹

Selection for Testing

Congress created the Interagency Testing Committee (ITC) "to make recommendations to the administrator respecting the chemical substances and mixtures to which the administrator should give priority consideration."¹⁰

The ITC consists of designees from eight agencies of the federal government. TSCA requires the ITC to give priority consideration to substances that are suspected of causing or contributing to cancer, gene mutations, or birth defects. Within 12 months after the ITC designates a chemical, the agency must initiate Sec. 4 rulemaking or publish its reasons for not doing so.

Whether a test rule is risk-based or exposure-based will influence the type of testing required.

Risk Trigger

EPA may require testing if the agency finds that the chemical or mixture may present an unreasonable risk of injury to human health or the environment; existing data on and experience with the chemi-

cal or mixture are insufficient to reasonably predict or determine the effects of the chemical substance, and testing is necessary to obtain such data.¹¹

EPA's first step, therefore, is to make a risk determination: EPA must find that the chemical may present an unreasonable risk.

As EPA uses the term, "risk" is a function of both hazard (toxicity) and exposure. The agency considers several factors in assessing the possible unreasonable risk of a substance, including knowledge of a chemical's physical and chemical properties, structural relationships to other chemicals with demonstrated adverse effects, data from inconclusive tests, and case history data.¹²

Moreover, EPA has advised manufacturers that risk may be significant, even when exposure is extremely low.

Exposure Trigger

TSCA Sec. 4(a)(1)(B) provides EPA with an alternative basis for requiring testing founded on an exposure trigger. Using an exposure trigger, EPA can require testing if: a chemical substance is produced in substantial quantities; a substance is reasonably expected to be released into the environment in substantial quantities, or there is or may be significant or substantial human exposure; there are insufficient data or experience upon which to reasonably predict the effects on human health or the environment; and testing is necessary to develop the data.¹³

By its express terms, Sec. 4(a)(1)(B) requires both substantial production and substantial or significant environmental or human exposure. This exposure trigger requires an exposure finding much higher than that required to satisfy the exposure trigger under Sec. 4(a)(1)(A).¹⁴

This difference is based on the fact that less exposure is necessary

when EPA has a scientific basis for suspecting potential toxicity under section 4(a)(1)(A).

Until recently, EPA had declined to quantify "substantial," contending that it is "neither feasible nor desirable to make strict numerical definitions of substantial exposure or release," and that production and exposure determinations should be made individually for each chemical.¹⁵

On May 14, 1993, EPA published the final policy statement on TSCA Sec. 4(a)(1)(B) findings in which it has quantified "substantial" production, release and exposure.¹⁶ The policy establishes quantitative thresholds to serve as guidance for determining "substantial" production, release and human exposure.

<u>Category</u>	<u>Threshold Value</u>
Substantial production	1 million pounds total year
Substantial release	1 million pounds total year
Substantial human exposure	
general population	100,000 people
consumers	10,000 people
workers	1,000 workers

In addition to making a finding of substantial production volume or exposure under TSCA Sec. 4(a)(1)(B), EPA also must determine that there are insufficient data and that testing is necessary to develop the needed information. These required findings are identical to those in TSCA Sec. 4(a)(1)(A).

Letters of Intent

Within 30 days after the effective date of a test rule, each person subject to the rule must either notify EPA by letter of his intent to conduct testing or submit an application for exemption.¹⁷

Manufacturers or processors who continue their activities and who do not submit a letter of intent to test or a request for an exemp-

tion will be considered in violation of the rule.¹⁸

Typically, where both manufacturers and processors are subject to the test rule, processors will only participate if specifically directed to do so or if no manufacturer has made known its intent to test. If no manufacturer notifies EPA within 30 days of receipt of EPA's notification, all manufacturers and processors will be in violation of the rule from the 31st day after receipt of notification.¹⁹

Significant Risk

If the test data indicate that there may be a "reasonable basis to conclude that a chemical substance or mixture presents or will present a significant risk of serious or wide-

spread harm to human beings from cancer, gene mutations, or birth defects," the administrator must initiate appropriate rulemaking.²⁰

If EPA chooses not to initiate rulemaking, the agency must publish in the *Federal Register* the reasons for not taking action.²¹

Recording, Records

TSCA Sec. 8 establishes reporting and recordkeeping requirements to provide EPA with information on which to base regulatory and enforcement actions and to track patterns of adverse reactions to chemicals.

EPA uses the information obtained under Sec. 8 in other EPA programs to provide chemical information to industry and citizens, to evaluate existing data to deter-

mine their adequacy for risk assessment purposes, to identify data gaps, and to monitor ongoing activities with respect to specific chemicals.

Under TSCA Sec. 8(a), EPA may require companies to maintain records and submit reports on their chemical manufacturing, importing, and processing activities.

The agency has used its Sec. 8(a) authority to impose record-keeping and reporting requirements on specific listed chemicals. In implementing its section 8(a) authority, EPA has issued "model" rules that require submission of detailed production and exposure data on certain listed chemicals.

The first of these model rules, the Preliminary Assessment Information Rule (PAIR), issued in June 1982, automatically adds chemicals to the PAIR list 30 days after they are placed on the ITC Priority Testing List.²²

The rule requires manufacturers and importers to submit a two-page PAIR report for each plant site involved in manufacturing or importing a listed chemical substance within 60 days of the effective date of the listing of the chemical. Small manufacturers, manufacturers of less than 500 kgs per site and manufacturers of the substance solely for R&D or as an impurity, non-isolated intermediate or by-product are exempt from PAIR reporting.²³

The second model rule, the Comprehensive Assessment Information Rule (CAIR), issued Dec. 22, 1988, was intended to elicit far more detailed information about a more narrow group of chemical substances.²⁴ CAIR was extremely controversial when promulgated, due to the lack of a low volume exemption or a *de minimis* concentration exemption, the amount of information required to be reported, the fact that processors were required to comply and the requirement that manufacturers of mixtures incorporating CAIR-listed

chemicals disclose this information so that processors of these mixtures would be aware of their reporting obligation or, alternatively, report for their customers.

Initially, CAIR listed only 19 chemicals. Due to the controversy surrounding the rule, EPA has added no other chemicals to the original 19 on the CAIR list.

On Nov. 30, 1993, however, EPA published in the *Federal Register* proposed amendments to CAIR addressing those aspects of the rule that made it so controversial when promulgated.²⁵ In this rule, EPA proposes to establish both a low volume exemption for manufacturers or processors of less than 10,000 lbs per site of any listed chemical substance and *de minimis* concentration exemption for processors of mixtures containing the listed chemical substance at 1% or less (0.1% if the chemical is listed in the rule as a carcinogen).

In addition, EPA proposes to provide permanent relief from the trade name reporting requirement for companies that cannot report for their customers and cannot disclose the presence of a CAIR-listed substance in their product without directly or indirectly revealing confidential business information.

Finally, EPA proposes to add chemical substances would need to submit a CAIR report responding only to certain limited questions. In addition, for these automatically listed chemicals, no trade name reporting would be required. As of the time of this writing, EPA has yet to publish a final rule.

Inventory Update

In June 1986, also under its TSCA Sec. 8 authority, EPA issued an Inventory Update Rule (IUR) requiring manufacturers and importers of certain chemicals listed on the inventory to report current data on production volume, plant site, and site-limited status.²⁶ Such

reporting is required every four years for all chemical substances listed on the inventory, except for polymers; micro-organisms; naturally occurring substances; and inorganics.²⁷

Under the rule, any company that manufactures or imports any "reportable substance" for commercial purposes in amounts of 10,000 pounds or more at any time during the most recent complete corporate fiscal year immediately preceding the reporting year is obligated to file the IUR report.²⁸

Exceptions to the rule are available to small manufacturers and for certain chemicals exempt from PMN requirements.

The Inventory Update Rule requires each manufacturer or importer subject to the rule to maintain specific records documenting the information submitted to EPA.²⁹

Importantly, production records for substances manufactured at less than 10,000 pounds must be maintained to justify a decision not to report.

Significant Adverse Reactions

TSCA Sec. 8(c) requires manufacturers, processors, and distributors to keep records of significant adverse reactions to health and the environment alleged to have been caused by a chemical substance or mixture they manufacture, process, or distribute.

Allegations by employees must be kept on file for 30 years; allegations by others for five years. These allegations do not have to be reported to EPA unless the agency specifically requests them.

EPA may require submission of copies of the Sec. 8(c) records to the agency, however, and employees can petition the agency to collect and release Sec. 8(c) information.

EPA has defined "significant adverse reaction" to mean a reaction that may indicate a substantial im-

pairment of normal activities, or long-lasting or irreversible damage to health or the environment.³⁰

In order to place some limitation on an otherwise open-ended recording obligation, EPA has provided a narrow exemption for known human health effects.³¹

Those environmental reactions which must be recorded include gradual or sudden changes in the composition of animal life or plant life, abnormal numbers of deaths of organisms, reduction of the reproductive success of a species, reduction in agricultural productivity, and alterations in the behavior or distribution of a species.³²

In order to constitute a recordable allegation under Sec. 8(c), the statement must state clearly the alleged cause of the adverse reaction.³³

An "allegation" is defined as "a statement, made without formal proof or regard for evidence, that a chemical substance or mixture has caused a significant adverse reaction to health or the environment."³⁴

It is important to remember that a series of identical or very similar allegations about a particular substance may indicate a significant risk, which can trigger reporting requirements under Sec. 8(e).

Health, Safety Studies

Sec. 8(d) requires that upon request a person who manufactures, processes, or distributes in commerce any chemical substance or mixture, must submit to the agency lists and copies of health and safety studies conducted by, known to, or ascertainable by that person.

Under the Sec. 8(d) Model Reporting Rule, submission of unpublished health and safety studies is required on certain specifically listed chemicals or mixtures.

Persons who currently manufacture, import, or process a chemical substance or a mixture listed at 40 C.F.R. Sec. 716.120 (or propose

to do so) or who did so (or proposed to do so) within the 10 years preceding the effective date of the listing of the chemical are subject to the provisions of the Model Reporting Rule.

There are two phases to Sec. 8(d) reporting. First, persons are required to submit copies of all non-exempt studies in their possession at the time they become subject to the rule. Second, such persons must inform EPA within 30 days of initiating any study on a subject chemical.³⁵

Substantial Risk

Sec. 8(e) requires the manufacturer, processor, or distributor of a chemical substance to report to EPA any information concerning the substance that "reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment."

EPA has not issued regulations implementing Sec. 8(e). The primary source of guidance for compliance with this section is EPA's Statement of Interpretation and Enforcement Policy, 43 Fed. Reg. 11,110 (March 16, 1978), otherwise known as the 1978 policy statement.

In addition, during the Compliance Audit Program in 1992, EPA issued further guidance on the 8(e) reportability of certain "toxic" signs and end-points.

On July 13, 1993, EPA published proposed "refinements" to this policy statement in an attempt to clarify the reportability of environmental contamination information. EPA also provides some limited policy guidance through Sec. 8(e) Status Reports, and from time to time through its monthly publication, *TSCA Chemicals in Progress*. The status reports contain a summary of EPA's initial review of submitted Sec. 8(e) and *For Your Information* reports and are available for public viewing in the OTS Public Reading

Room at EPA Headquarters in Washington, D.C.

Existing Regulation

TSCA Sec. 6 grants EPA full authority to regulate existing chemicals that present unreasonable risks to health or the environment. Under TSCA Sec. 6, EPA must place controls and restrictions, including outright bans if necessary, upon the manufacture, use, processing, disposal, or distribution of such chemicals. This is EPA's most extreme regulatory power.

Despite its broad authority under TSCA Sec. 6, EPA to date has regulated only six chemical substances under this section: asbestos; chlorofluorocarbon; dioxins; hexavalent chromium; certain metal-working fluids; and polychlorinated biphenyls.

In the case of asbestos the regulations were ultimately overturned. In the case of polychlorinated biphenyls (PCBs) which Congress specifically directed in TSCA Sec. 6(e), the regulations may be the most widely applicable and best known of any TSCA regulations.

Import-Export

Importers of any chemical substance must comply not only with the same obligations imposed on domestic manufacturers but also with a certification requirement pursuant to TSCA Sec. 13.

Similarly, exporters of certain chemicals regulated under TSCA Secs. 4, 5, and 6 may be subject to export notification obligations under TSCA Sec. 12.

Import Regulation

TSCA Sec. 13 requires the Secretary of the Treasury (the executive branch with authority over the U.S. Customs Service) to refuse entry into U.S. customs territory for a shipment of any chemical substance or mixture, if it fails to com-

ply with any TSCA rule or regulation; it is offered for entry in violation of a Secs. 5, 6, or 7 rule, order or action.³⁶

The U.S. customs territory includes the fifty states, the District of Columbia and Puerto Rico.³⁷

Thus, Customs Service regulations require an importer to certify at the port of entry that either any chemical substance in the shipment is subject to TSCA and complies with all applicable rules and orders thereunder; or is not subject to TSCA.³⁸ Customs has established approximately 90 ports where entry documents may be filed.³⁹

Customs Service regulations establish precise requirements regarding the form of the required certification, including sample statements. According to the regulations, the importer must use one of the statements as worded. No other language may be substituted. The certification may appear either on the appropriate entry document or commercial invoice, or on an attachment to the entry document or invoice. The importer, or its agent, must keep a copy of the import certification along with other customs entry documentation for five years.⁴⁰

Export Regulation

TSCA Sec. 12(a) exempts from most provisions of the law any chemical substance, mixture, or article manufactured, processed, or distributed solely for export from the U.S.⁴¹

In order to qualify for this export exemption, the substance, mixture, or article must bear a stamp or label stating that it is intended solely for export.⁴² The recordkeeping and reporting requirements of TSCA Sec. 8, however, continue to apply to such chemical exports.

TSCA Sec. 12(b) requires exporters to notify EPA before exporting any substance for which test data are required under Secs. 4 or

5(b). regulatory action has been proposed or taken under Secs. 5 or 6, or an action is pending or relief has been granted under Sec. 5 or 7. For chemical substances regulated under TSCA Sec. 4, EPA requires submission of an export notice for the first shipment to each country. This one-time notification for TSCA Sec. 4 chemicals became effective Jan. 1, 1994, and represents a reduction in the reporting requirement for these chemicals.⁴³

For all other chemical substances, EPA requires notification of the first shipment each year to each country.⁴⁴ Export notification is required regardless of the intended foreign use of the regulated chemical. EPA does not consider it relevant whether the chemical is being exported for use in a manner that is not regulated domestically under an action, rule or order.⁴⁵ In addition to the export notices required under Sec. 12(b) special notices are required in the case of PCBs.⁴⁶

On July 27, 1993, EPA promulgated a final TSCA Sec. 12(b) rule which will be effective Jan. 1, 1994, and which modifies the existing export notification procedures.

Compliance, Audits

EPA has placed greater emphasis on TSCA enforcement in recent years, and it is expected that the agency will become more aggressive in the future in its efforts to ensure compliance with TSCA. As a result, industry compliance programs are an increasingly common and valuable undertaking in companies that are potentially subject to TSCA requirements.

The reasons for instituting and implementing a TSCA compliance program are several. TSCA imposes a regulatory scheme that is extremely broad in scope, applying to virtually any type of company involved in today's diversified business economy.

Companies engaged in the manufacture, processing, distribution, use, importation or exportation of chemical substances—as those terms are expansively defined under TSCA—are all potentially subject to the varied requirements of TSCA.

The inadvertent manufacture or importation of a chemical substance not listed in the TSCA Inventory, for example, can create a very serious enforcement problem for the unwary company. Consequently, chemical companies, as well as many business entities well outside the traditional notion of a "chemical manufacturer," are discovering the importance of TSCA compliance programs.

The penalties assessed for non-compliance with TSCA can be staggering—up to \$25,000 per day of violation. The agency's penalty scheme for TSCA violations is inflexible and mechanistic with little regard for actual environmental impact.

Furthermore, TSCA is a "strict liability" statute. That is, knowledge of the law's requirements or the existence of a violation is not necessary for the imposition of a civil penalty. Knowing or willful violations of TSCA, however, will subject the violator to potential criminal sanctions under Sec. 16(b).

Penalty reductions are available for voluntary self-reporting of TSCA violations, which can significantly lower a penalty below that which would be assessed if EPA discovered them.

In addition to the threat of criminal and civil penalties, TSCA violations also can cause economic and operational effects far more devastating than any EPA-imposed TSCA penalties.

For example, a process for which a particular product is critical may be entirely shut down for months while that product proceeds through PMN review after discovery that it lacks Inventory listing. EPA will not allow manufac-

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are to resume until the product completes the PMN process.

A well-organized TSCA compliance problem and a general sensitization of employees to the importance of TSCA and the potential consequences of non-compliance can help to ensure a company's compliance with the Act and to avoid the enforcement problems discussed above. These objectives are often achieved through internal TSCA audits.

Internal Audits

Faced with enormous potential liability for the corporation and its officers and

directors, companies have initiated voluntary internal audits as a means of ensuring their compliance with TSCA.

Because a TSCA audit involves a significant commitment of corporate resources, the undertaking must receive the express approval of senior management. Further, the audit should follow a written plan which sets forth the purpose and scope of the audit, the auditing procedure, and the corporate policy on corrective action.

The reasons for initiating and implementing a voluntary internal TSCA auditing program include the high risk of TSCA violations, the costs associated with noncompliance, the effectiveness of voluntary auditing, and the facilitation of merger and acquisition transactions.

Until recently, TSCA did not have the same level of recognition as other environmental statutes, such as the Resource Conservation and Recovery Act (RCRA) or the Clean Water Act. As EPA has become more aggressive in its enforcement of TSCA, more companies have realized the importance of TSCA compliance.

TSCA's relatively low profile in the past fostered a slack compliance attitude and a high risk of TSCA violations. An effective vol-

untary internal auditing program, including in-house training concerning the existence and importance of TSCA requirements, provides an excellent mechanism for lessening the risk of TSCA violations.

Noncompliance with TSCA can be costly. In addition to the threat of civil and criminal penalties for TSCA violations, a noncompliant company may be faced with substantial legal fees stemming from enforcement proceedings or negotiations toward the execution of a consent order with EPA as well as the disruption of manufacturing processes and the loss of sales. In addition, the cost of conducting an EPA-required TSCA audit under a consent order can well exceed the cost of conducting a voluntary internal audit.

Many major TSCA violations now result in consent agreements which include TSCA audits as well as the payment of fines. EPA has stated that it may seek to include environmental auditing provisions in consent agreements where auditing could resolve identified compliance problems and reduce the likelihood of their recurrence.

EPA has developed an internal policy for agency negotiators regarding the incorporation of environmental auditing provisions in consent agreements and other enforcement settlements.⁴⁷ The agency considers that auditing requirements are appropriately included in consent agreements "where heightened management attention could lower the potential for noncompliance to recur."⁴⁸

Enforcement Trends

EPA TSCA enforcement activities in 1994 focused primarily on compliance with the Inventory Update Rule (IUR) in an attempt to highlight the fact that 1994 was an IUR reporting year. On June 24, 1994, EPA both at headquarters and in numerous regional offices, filed

civil complaints against 39 companies for failure to report more than 400 commercial chemicals in 1990 Inventory Update reports.

The proposed penalties for these violations ranged from \$6,000 to \$374,000 and totaled over \$2.9 million for all penalties. This enforcement initiative mirrored an earlier initiative that occurred on July 22, 1993 also involving violations of the Inventory Update Rule. EPA attorneys indicate that they expect to be even more aggressive in identifying and prosecuting Inventory Update violations in 1995 by cross-referencing other mandatory reports such as the Toxic Release Inventory and the 1990 Inventory Update Report to identify companies that failed to file 1994 Inventory Update reports.

EPA's IUR enforcement activities called into question the compliance status of the entire natural gas processing industry and prompted that industry to evaluate its past reporting practices. As early as May 1993, the industry requested clarification from EPA regarding the scope of the exemption from IUR reporting for "naturally occurring substances."

Naturally occurring substances are exempt from IUR reporting if they are unprocessed or "processed only by manual, mechanical or gravitational means, by dissolution in water, by flotation or by heating solely to remove water." 40 C.F.R. Sec. 710.4 (b).

The natural gas processing industry through the Gas Processors Association, argued that ambiguity in EPA's IUR regulations and guidance regarding the meaning of the phrase "processed only by manual, mechanical or gravitational means" caused the entire industry to conclude that many of the chemicals it manufactured were exempt from IUR reporting as "naturally occurring substances."

EPA conceded that its regulations and guidance may have been ambiguous and agreed to allow

natural gas processors to enter into a voluntary IUR compliance audit program called the Inventory Update Rule Records Search (IURRS), to rectify past non-compliance with the IUR. Interested companies were required to join IURRS by Jan. 31, 1995.

The agreement requires each company to audit its facility's compliance with both the 1986 and 1990 IUR reporting periods, mitigate any failures to report by submitting the reports now, but to pay stipulated penalties only for those reports the company failed to file in 1990. A total of 70 natural gas processing companies signed up for the IURRS).

This development is of note because EPA, in discussing the IURRS, indicated that it would entertain similar proposals from any other industry similarly situated. Those who believe that they are similarly situated, however, must move quickly to enter into such an agreement before EPA discovers the non-compliance through its own review of 1994 and 1990 IUR reports.

Statute of Limitations

In March 1992, the 3M company appealed to the U.S. Court of Appeals for the D.C. Circuit the decision of the EPA Administrator, acting through the chief judicial officer, upholding an administrative law judge ruling that the general federal statute of limitations does not apply to EPA initiation of enforcement actions under TSCA.

Faced with a \$1.3 million EPA demand for payment of a civil penalty for inadvertent violations of TSCA, 3M took a stand. The company won two important victories for industry, denting EPA's rigid enforcement response policy and resurrecting the five-year statute of limitations for federal civil penalty actions. (See *Chemical Times & Trends*, July 1994.)

The court found that 28 U.S.C. Sec. 2462 applies to all administrative civil penalty actions brought before federal agencies and cited four cases and two Congressional reports supporting this finding. The court also found that a TSCA enforcement action constitutes a proceeding for the "enforcement of civil penalty" consistent with the language of Sec. 2462. EPA's contention that "enforcement" connotes only an action to collect a penalty already assessed was rejected.

The court also rejected EPA's contention that the period of limitations did not begin to run until EPA first discovered the violation, not when the violation first occurred. An action, suit or proceeding must be commenced within five years of the date of violation giving rise to the penalty. The decision is now final as the Department of Justice has decided not to seek a review of the transcribed proceedings on any part of the ruling.

While the decision is significant in that it imposes a five-year statute of limitations where previously EPA asserted that none existed, many questions remain outstanding. For example, EPA asserts that the statute of limitations will not apply to "continuing" violations.

The questions remains as to which TSCA violations EPA would consider "continuing" and therefore not subject to repose by action of the statute of limitations.

In addition, in at least one regional enforcement action, EPA appears to have taken the position that submission of a false positive import certification may toll the running of the statute of limitations on both Sec. 5 and 13 violations associated with the importation because the false certification "fraudulently concealed" the violations.

EPA Exercises Power

On Sept. 21, 1994, EPA issued expansive subpoenas to 95 U.S.

companies believed to own or operate industrial facilities in Mexicali, Mexico, seeking information regarding their manufacture, use, disposal and release of chemical substances to the environment.

The agency claims it has authority to seek this information under TSCA Sec. 11. EPA officials indicate that the agency is trying to determine whether chemicals exported by the subpoena recipients to their Mexican facilities for use there are contaminating the New River, which flows into the U.S., thereby presenting a risk to citizens.

Although the subpoenas were issued to companies located in the U.S., the inquiry clearly pertains to the activities of the facilities in Mexico. The agency's action raises troubling issues regarding the scope of EPA's authority under TSCA Sec. 11 to demand information regarding activities outside the U.S.

Generally, U.S. legislation cannot be applied by executive agencies to activities outside the U.S. Observers and subpoena recipients alike are concerned that this action not serve as precedent for EPA to routinely demand information from U.S. companies, foreign subsidiaries and perhaps other companies about their extraterritorial activities under the rationale that the agency is carrying out the provisions of TSCA.

Responses to the subpoenas were due by 12:00 p.m. EST on Nov. 21, 1994. EPA reports that it has received 78 responses to the subpoenas and expects four more shortly. EPA withdrew five of the subpoenas because EPA located an earlier voluntary response from the company. EPA does not expect responses from five recipients who have gone out of business.

Finally, three of the subpoenas were undeliverable. This accounts for all 95 of the subpoenas EPA sent. Consequently, EPA has made no referrals to the Department of Justice (DOJ) for non-compliance with the subpoenas.

Many of the companies responding to the subpoena have done so with the understanding that if their responses are adequate, EPA will withdraw the subpoenas and accept the responses as voluntarily submitted. Most recipients believe the data will show that U.S.-owned companies are not a primary source of pollution to the New River and therefore are unconcerned about releasing this information to EPA.

By submitting the information voluntarily, however, companies hope to avoid the unsettling precedent that this action might otherwise have had. Only if EPA determines that these first responses are inadequate and subsequent negotiations prove unsuccessful, is EPA likely to ask DOJ to seek a court order enforcing the subpoenas.

Proposed PMN Changes

A package of proposed reforms aimed at streamlining the premanufacture notification process for new industrial chemicals was published in the *Federal Register* on Feb. 8, 1993. 58 Fed. Reg. 7646. The proposed reforms would amend the polymer exemption rule (40 C.F.R. Sec. 723), the low volume exemption rule (40 C.F.R. Secs. 700, 723), the expedited significant new use rule (40 C.F.R. Sec. 721), and change a variety of PMN reporting requirements (40 C.F.R. Sec. 720).

Comments on all of these proposed rules were due to EPA by April 9, 1993, or May 24, 1993. EPA has yet to finalize any of these proposed reforms, although publication of a final rule is expected at any time.

Polymer Exemption Changes: Under the proposed rule, the definition of polymer would be modified to coincide with the wording of the international definition of polymer agreed upon by the Organization of Economic Cooperation and Development (OECD). In addition,

the proposal expands the criteria for selecting polymers that are eligible for the exemption. The polymer exemption application will no longer need to be submitted on the standard PMN form, and the quantity of required data will be reduced.

The time period for submitting the exemption application would change such that manufacturers and importers must submit the exemption application within 30 days *after* commencement of manufacture or importation for commercial purposes. In what turned out to be a controversial modification, the proposed rule provides for the revocation of the exemption if EPA obtains information indicating that an exempt polymer may present an unreasonable risk of injury to health or the environment.

Finally, EPA will not place exempted polymers on the TSCA Inventory even after their commercial manufacture.

The proposed changes to the polymer exemption were received by the regulated community with mixed reactions. Many of the changes are viewed as improvements to the exemption, such as the post-manufacturing notification. However, industry felt strongly that the revocation procedure could all but eliminate these advantages and cause manufacturers to file both the polymer exemption and a regular PMN to ensure uninterrupted production.

Low Volume Exemption Changes: Under the proposed rule, several changes will occur to the current low volume exemption (LVE) and a new exemption will be created for low release and exposure chemicals (LOREX). EPA will increase the production volume to qualify for the LVE such that chemicals produced in quantities of 10,000 kilograms or less per year will now be eligible.

EPA will extend the LVE review period from 21 to 30 days, and will require the application to be sub-

mitted on the standard PMN form. The most significant change, however, is that the LVE will no longer be limited to one manufacturer per chemical. Under the proposed LVE, any manufacturer who meets the production volume limitation may apply for and receive an exemption from the PMN requirements.

Finally, the proposed rule creates a new exemption, LOREX. This exemption is available for chemicals that meet certain release and exposure criteria regardless of production volume. LOREX chemicals are subject to the same administrative requirements as the LVE, such as review period and mandatory use of the PMN form for submission of the exemption application.

These changes do not appear to significantly reduce the burden on industry because, in order to apply for the LVE or LOREX exemptions, manufacturers still must complete the standard PMN form and pay the same filing fee as it would for a regular PMN.

SNUR Changes: This proposed rule would amend the procedure for generating an expedited significant new use rule where a TSCA Sec. 5(e) order has not been issued. The proposed change would make available to EPA for designation as a significant new use all of the activities enumerated in 40 C.F.R. Sec. 721, subpart B which are currently available to it when promulgating a non-expedited SNUR or an expedited SNUR after a Sec. 5(e) order has been issued.

Significant new use designations available for expedited non-5(e) SNURs are currently limited to environmental release activities and certain industrial, commercial, or consumer activities. Other designations, such as protection in the workplace and hazard communication, currently may not be promulgated in non-5(e) SNURs via expedited rulemaking procedures. 40 C.F.R. Sec. 721.170(c)(1). This proposal would make available to EPA these additional designations when

promulgating an expedited non-5(e) SNUR.

PMN Reporting Requirement

Changes: Several changes are proposed to the PMN reporting requirements found at 40 C.F.R. Sec. 720. First, the proposed rule adds the requirement that all Sec. 5 notices and Bona Fide Inventory search notices use the Chemical Abstract preferred name and registry number when identifying the chemical substance in the notice.

The rule also proposes to require additional information in Bona Fide Inventory search notices to more clearly demonstrate a genuine intention to manufacture or import the chemical substance for a commercial purpose. The rule also would modify the "Two Percent Rule" for reporting polymers to give manufacturers an option in determining a polymers' identity. Under the proposal, manufacturers would still be allowed to use the

1 "amounts charged" method to determine the polymer chemical identity, but they would also have the option of determining the amounts incorporated in the manufactured polymer to determine its identity. Finally, the rule increases the number of copies of Sec. 5 notices required to be submitted, allows for electronic transmission of Sec. 5 notices and requires use of a standard form for submitting Notices of Commencement of Manufacture or Import. These proposed changes appear to be non-controversial.

Environmental Contamination

On Feb. 1, 1991, the agency announced a one-time voluntary TSCA Sec. 8(e) Compliance Audit Program (CAP). 56 Fed. Reg. 4128. Due to confusion in the regulated community over the reportability of data on "widespread and previously unsuspected distributions in environmental media" and "emergency incidents of environmental

contamination," EPA announced on Sept. 30, 1991, an extension of the reporting deadline for such data until such time as the agency develops additional section 8(e) reporting guidance for environmental contamination. 56 Fed. Reg. 49,478.

On July 13, 1993, EPA published refinements to its 1978 policy on the reporting of information on the release of chemical substances to, and the detection of chemical substances in, environmental media. 58 Fed. Reg. 37,735.

EPA is soliciting comments on these policy refinements, as well as its proposal to increase the reporting deadline for 8(e) substantial risk information from 15 working days to 30 calendar days and its policy on the circumstances under which certain information need not be reported to EPA under TSCA Sec. 8(e).

The "refinements" unveiled in this document provide very little additional guidance to the regulated community because EPA has declined to establish chemical-specific quantities and/or concentrations as benchmarks for determining TSCA Sec. 8(e) reportability of non-emergency environmental contamination information.

The extent of the refinements made by EPA with regard to reportability of such information is that it is reportable if it provides evidence of widespread environmental distribution of a chemical substance or mixture, and which because of the extent, pattern and amount of the contamination seriously threatens or may seriously threaten—humans with cancer, birth defects, mutation, death or serious or prolonged incapacitation (e.g., neurotoxicological effects, reproductive/developmental effects); or non-human organisms with large-scale or ecologically significant population destruction.

The policy refinements also discussed more fully the types of information that need not be report-

ed. Since 1978, numerous federal laws and regulations have been promulgated that are designed to gather chemical-related information.

In recognition of the increased mandatory reporting of information under various laws administered, delegated or authorized by EPA, EPA proposes to revise that portion of the 1978 policy statement detailing information that need not be reported so that a section 8(e) obligation is satisfied if emergency information is reported immediately and non-emergency is reported within 30 calendar days on a mandatory basis to:

- EPA, under any Federal statute administered by EPA;
- A State, under any Federal statute administered by EPA and delegated to that State; or
- A State, under an EPA authorized State program which has been established pursuant to a Federal statute administered by EPA.

EPA has taken the position that, where information must be reported under both TSCA and other federal statutes, the TSCA Sec. 8(e) reporting deadline will still apply even if this deadline is shorter than that imposed by other statutes. Thus, the regulated community must still evaluate the reportability of information under all applicable statutes and submit the information timely for each statute or submit all information within the TSCA Sec. 8(e) deadline.

Comments on the proposed policy refinements were due to EPA by Oct. 28, 1993. EPA anticipates publishing a revised draft guidance document responding to the many comments the agency received on the 1993 draft.

The second draft is expected by April 1995. Comments will be received on that document for 45 days thereafter. Some in the industry speculate that EPA may abandon the CAP for environmental contamination in recognition of the

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diminished need for the agency to collect such information under TSCA given the numerous other federal and state reporting mechanisms already in place.

Proposed Regulations

EPA has been regulating biotechnology under TSCA since 1986 under its Coordinated Framework for Regulation of Biotechnology. Under the TSCA biotechnology program, EPA requires submission of premanufacture notifications for intergeneric microorganisms prior to commercial manufacture and requests voluntary submission of PMNs prior to introduction of intergeneric microorganisms into the environment for R&D purposes.

To date, EPA has reviewed 30 PMNs for intergeneric microorganisms used in the manufacture of enzymes or pesticide intermediates and 25 voluntary PMNs for R&D activities. In this *Federal Register* notice, EPA promulgates proposed regulations for the manufacture and processing of microorganisms under TSCA Sec. 5 (premanufacture notification).

EPA always has asserted jurisdiction over biotechnological products because such organisms are "chemical substances" under TSCA's definition. Plants and animals, although organisms, are specifically exempted from this rule, but intermediate microorganisms, like traditional chemical intermediates, are regulated under TSCA unless regulated under another federal law (such as the Food, Drug and Cosmetic Act).

Definition of New Microorganism. The proposed rule defines microorganism to mean an organism classified in the kingdoms Monera (or Prokaryotae), Protista, Fungi and the Chlorophyta and the Rhodophyta of the Plantae and a virus or virus-like particle.

New microorganisms are those not listed on the TSCA Inventory and that result from deliberate, intergeneric combinations of genetic material from organisms in difference genera. Consistent with its current policy, EPA proposes to exclude from the definition of "new microorganisms" those resulting from the addition of intergeneric material that is well-characterized and contains only non-coding regulatory regions such as operators, promoters, origins of replication, terminators and ribosome-binding regions. In addition, naturally occurring microorganisms are implicitly listed on the TSCA Inventory (as are all naturally occurring substances).

Premanufacture Notification. EPA proposes to require premanufacture notification for new microorganisms using a microbial commercial activity notice (MCAN). The MCAN must be submitted 90 days prior to commercial manufacture or import of a new microorganism or prior to the manufacture, import or processing of an existing microorganism for a significant new use.

At this time, EPA is not requiring the MCAN to be submitted on a specific form. The information required to be submitted with the MCAN is listed in the proposed rule at 40 C.F.R. Sec. 725.155. EPA will add new microorganisms to the inventory upon receipt of a notice of commencement of manufacture or import (NOC).

The timing of the NOC for microorganisms is the same as traditional chemicals. EPA is proposing to identify and list microorganisms on the TSCA Inventory by a taxonomic designation and certain phenotypic and genotypic information.

Exemptions from MCAN. EPA proposes to exempt certain microorganisms from all or part of the MCAN requirement based on a finding that the microorganism does not present an unreasonable risk to human health or the environ-

ment. These exemptions differ from those available for traditional chemicals.

For example, microorganisms will not be eligible for the low volume exemption, but will be entitled to an identical test marketing exemption (TME). EPA also proposes to establish tiered exemptions for certain microorganisms.

The Tier I exemption is a complete exemption from the MCAN requirement. In order to qualify for the Tier I exemption, the recipient microorganism must be listed in 40 C.F.R. Sec. 725.420, the introduced genetic material must be limited in size, of known function and associated nucleotide sequences, poorly mobilizable and free of certain nucleotide sequences that encode toxins. The site where the microorganism will be used must meet certain containment and control standards.

Although manufacturers and importers need not apply for Tier I exemptions, they are required to submit a certification to EPA at least 30 days prior to commercial manufacture or import stating that the microorganism meets the Tier I exemption criteria.

The Tier II exemption provides for expedited review of microorganisms that meet the recipient organism requirements of Sec. 725.420 and genetic material requirements of Sec. 725.421, but will not meet the containment and control requirements of Sec. 725.422. The exemption application must be submitted 45 days prior to commencing manufacture or import.

Regulation of R&D Activities. EPA proposes to regulate microorganisms during commercial research and development (R&D) more closely than traditional chemicals due to the ability of microorganisms to multiply on their own once released into the environment. Provided the R&D takes place in a "contained structure," EPA proposes to exempt such activity from all but recordkeeping,

containment and employee notification requirements. See 40 C.F.R. Secs. 725.234 and 235.

In addition, the R&D must be supervised by a technically qualified individual. This exemption is very similar to the standard R&D exemption for traditional chemicals. If the R&D activity is conducted under the supervision of another federal agency that requires compliance with NIH Guidelines for Research Involving Recombinant DNA Molecules, EPA proposes to exempt such R&D from all regulation under TSCA, even the recordkeeping, containment and employee notification requirements.

EPA proposes to exempt R&D activities involving intentional testing in the environment of specifically listed microorganisms deemed to be safe. At this time, EPA proposes to list two microorganisms eligible for this exemption. Under this exemption, EPA proposes to place restrictions on the recipient microorganisms, the introduced genetic material and the conditions of use. In addition, persons who intend to conduct R&D activities under this exemption must submit a certification stating compliance with the provisions of the exemption prior to initiation of the activity.

Persons engaged in R&D activities that do not qualify for the contained structure exemption or are not specifically exempted under Sec. 725.239 must submit a TSCA experimental release application (TERA) 60 days prior to commencing such activities.

Thus, the TERA process provides a shortened review period compared to the MCAN process and the data requirements are somewhat less burdensome than the MCAN data requirements. EPA may extend the TERA review period by 60 days for "good cause." Unlike the MCAN or PMN, however, if EPA determines prior to expiration of the TERA review period

the activity does not pose an unreasonable risk to human health or the environment, EPA would allow the R&D activity to proceed prior to expiration of the review period.

Final Action Plan

On June 20, 1994, EPA published its final action plan to reform the CBI provisions of TSCA in response to a study indicating that many CBI claims were inappropriate, the rate of CBI claims was increasing and CBI claims inhibit public access to TSCA-generated CBI provisions:

A CBI sunset rule requiring companies to reassert CBI claims after a certain time period or lose CBI protection.

A high-level signature rule requiring a senior corporate official to sign off on CBI claims.

Up front CBI substantiation for most claims except those made in PMNs.

In addition, the final action plan includes a number of non-regulatory initiatives:

- ◆ Education of the reporting community about what information should be claimed as CBI and of the public about what non-CBI data is available under TSCA.
- ◆ Information dissemination aimed at making non-CBI available more easily and in a more usable form.
- ◆ Dialog between representatives of the Chemical Manufacturers Association (CMA) and states that are members of the Forum on State and Tribal Toxics Action (FOSTTA) to explore ways to disseminate TSCA CBI to state officials.
- ◆ Review and amendment of most of its regulations and policy statements on CBI to insure clarity.
- ◆ Continuation of the Challenge Program to evaluate CBI claims for appropriateness.

- ◆ Review of old CBI claims by chemical companies to uncover claims that are no longer necessary.

On Nov. 23, 1994, EPA published in the *Federal Register* a comprehensive proposal to revamp its Confidential Business Information rules under 40 C.F.R. Part 2. 59 Fed. Reg. 60,446. Portions of this proposal address the three rule-making initiatives EPA discussed in its TSCA CBI Final Action Plan.

First, the proposed rule adds a definition for "senior management official" at 40 C.F.R. Sec. 2.306(a)(7) and requires that all CBI claims be signed by a "senior management official."

Second, the proposed rule now requires up front substantiation of all CBI claims for data submitted pursuant to TSCA Secs. 8(c), 8(d), 4(e) and 4 (chemical identity).

Finally, although the proposed rule does not actually establish any sunset provision for information claimed to be confidential, it does establish a framework within which the Agency may promulgate regulations requiring that submitters reassert a confidentiality claim or it will expire. EPA specifically declined to use this framework now to establish sunset provisions for any data received under TSCA, but solicited comments regarding how best to do so in the future.

Program Update

On June 29, 1994, EPA disseminated by letter to interested parties its long-awaited guidance for the Chemical Additives Amnesty Program. The program is being developed in order to correct what the agency believes is widespread non-compliance in the regulated community with the exemption from PMN requirements for chemicals created when various types of additives are used in mixtures.

This issue surfaced when EPA declared that PMNs were required

for certain "polymer salts" that form when manufacturers mix an acid-functionally polymer with a base in water, thereby creating a transient salt of the polymer in solution.

In the June 29 letter, EPA states that a substance is excluded from the Inventory or PMN reporting requirements if:

- the substance is formed from a chemical reaction that involves the use of a chemical substance of the type described under 40 C.F.R. Sec. 710.4(d)(7) or Sec. 720.30(h)(7);
- the substance does not function to provide one or more primary properties that would determine the use of the product or product mixture distributed in commerce, even though it may impart certain physicochemical characteristics to the product, product mixture or formulation of which it is a part; and
- the substance is not itself the one intended for distribution in commerce as a chemical substance *per se*. Although it may be a component of the product, product mixture or formulation actually distributed in commerce, it has no commercial purpose separate from the product, product mixture or formulation of which it is a component.

Pursuant to this guidance, the "polymer salts" that initially stirred the controversy over this exemption presumably would be exempt based on the following example provided by EPA in the letter.

Where an acid polymer in converted to its soluble amine salt during an ink formulation process in which other ingredients are added, the polymer salt formed as a result of a chemical reaction that brings the insoluble acid polymer into solution is exempt because it does not itself contribute a primary property that is essential to the functioning of the ink as a viable commercial product; is not itself

the product intended for distribution in commerce as a chemical substance *per se*; and has no commercial purpose separate from the ink formulation. Nevertheless, even with this new guidance, determining whether a particular chemical substance is exempt can be challenging.

PCB Mega-amendments

On Dec. 6, 1994, EPA published a proposed rule addressing more than 50 PCB regulatory issues, commonly called the PCB mega-amendments because it is a comprehensive overhaul of the PCB regulations. 59 Fed. Reg. 62,788. The most significant changed proposed in the rule is the deregulation of disposal requirement for high-volume, low-concentration PCB wastes, such as contamination at superfund sites, metal shredding facilities, and RCRA corrective action sites.

The proposal would allow more flexibility in disposing of these PCB contaminated wastes, leading to less incineration of wastes with low levels of PCB contamination. According to EPA, the proposal is designed to provide EPA regional administrators more flexibility in approving remedial plans as a way of reducing costs associated with cleanups. EPA estimates that the proposed revisions could save industry between \$2 billion and \$6 billion per year.

In addition to this change in the disposal requirements for high-volume, low-concentration PCB wastes, the proposal would amend the PCB disposal rules to:

- allow for the recognition of PCB waste management activities undertaken under other Federal or State authorities;
- delete out-of-date provisions, modify the regulations to address problems in their applicability or implementation, make certain policies and provisions consistent with the require-

ments of other Federal statutes and reduce requirements for PCB disposal activities which present a *de minimis* risk; and

- provide certain authorizations and exemptions which would address the need for the scientific community to conduct research as well as health and environmental studies on PCBs and on media contaminated with PCBs (to include processing and distribution in commerce of PCBs) for the development of innovative disposal technologies which otherwise would require issuance of a disposal approval.

CUI Activities

EPA is considering a new information collection initiative which it calls the Chemical Use Inventory (CUI), essentially a compilation of data related to the use of chemicals in commerce and resulting human and environmental exposures. EPA is considering gathering this information via two sources; an amendment of the Toxic Substances Control Act Inventory Update Rule (IUR) applicable to chemical manufacturers and importers and an expansion of the Toxic Release Inventory (TRI) reporting requirements applicable to U.S. manufacturing, processing and distribution facilities.

EPA intends to use these data to better understand potential chemical exposures and identify which chemicals in commerce are of highest concern; establish priorities and goals for chemical risk assessment, management and prevention; identify potentially safer substitute chemicals; and enhance the effectiveness of chemical risk communication.

As part of these changes, EPA may substantially reduce the ability of companies reporting under the IUR and TRI to claim their submissions as confidential

The IUR currently requires chemical manufacturers, including importers, to report to EPA only the chemicals they produce, the locations of manufacturing facilities or the business unit responsible for importation and the quantities produced.

EPA is considering requiring IUR reporting every two years instead of every four years; on manufacture of previously exempted inorganic chemicals; of the reporting companies' EPA identification numbers to facilitate linkage if IUR information with TRI information; and on the basis of calendar years rather than the companies' fiscal years. In addition, EPA intends to create a publicly available report containing all of the non-confidential information collected under the IUR.

EPA also may expand the annual TRI reporting applicable to U.S. facilities to require information on worker exposure indicators and demographics, material use, accounting information and conditions of toxic use within facilities.

EPA intends to negotiate these rule changes with interested companies, environmental interest groups and other members of the public, and issue proposed rules during 1995. In a September 1994 public meeting, EPA encouraged companies, interest groups and members of the public to provide EPA with their comments concerning possible new IUR and TRI requirements. Companies wishing to have EPA consider their concerns about the proposed rule should now be organizing to participate in the EPA process.

Chemical Regulation

The regulation of chemical substances is not unique to the U.S. Many countries have, or are developing, regulations that parallel roughly the U.S. Toxic Substances Control Act. For example, China has imposed chemical registration,

testing and fee requirements on chemical imports only. The discriminatory nature of such requirements has not only U.S. industry, but EPA and Department of Commerce officials, understandably concerned.

Korea's TSCA equivalent is operating, but apparently is not being enforced against domestic manufacturers. In addition, Canada, the Philippines, Taiwan and Australia recently have enacted TSCA-like laws and are in varying states of implementation, and Mexico anticipates enacting similar legislation within the next one to two years.

Finally, the European Union has well-established harmonized chemical control laws, but these requirements, much like those here in the U.S., are always changing. The challenge to U.S. businesses selling chemical products abroad is to keep abreast of these developments and avoid loss of sales due to lengthy delays in getting a product approved for sale into a foreign market. &

1. 40 C.F.R. Sec. 710.4 (1992).
2. 40 C.F.R. Sec. 720.25(b)(1).
3. 40 C.F.R. Sec. 720.25(b)(2).
4. 40 C.F.R. Sec. 720.102.
5. See TSCA Sec. 3(2)(B).
6. TSCA Sec. 5(a)(1)(B), (a)(2); 40 C.F.R. Sec. 721.
7. See 40 C.F.R. Sec. 721.
8. TSCA Sec. 2(b)(1).
9. TSCA Sec. 4(a)(1).
10. TSCA Sec. 4(e)(1)(A).
11. TSCA Sec. 4(a)(1)(A).
12. *Id.*
13. TSCA Sec. 4(a)(1)(B).
14. 45 Fed. Reg. 48,528 (July 18, 1980).
15. 50 Fed. Reg. 20,664 (May 17, 1985).
16. 58 Fed. Reg. 28,735 (May 14, 1993).
17. 40 C.F.R. Sec. 790.45.
18. 40 C.F.R. Sec. 790.45(e), (f).
19. 40 C.F.R. Sec. 790.48(a)(3).
20. TSCA Sec. 4(f).
21. *Id.*
22. 40 C.F.R. Sec. 712.
23. 40 C.F.R. Sec. 712.25.
24. 40 C.F.R. Sections 704.1-704.225.
25. 58 Fed. Reg. 63,134 (1993).
26. 51 Fed. Reg. 21,438 (1986).
27. 40 C.F.R. Sec. 710.26.
28. 40 C.F.R. Sec. 710.28(a).
29. 40 C.F.R. Sec. 710.37.
30. 40 C.F.R. Sec. 717.3(i).
31. 40 C.F.R. Sec. 717.12(b).
32. 40 C.F.R. Sec. 717.12(c).
33. 40 C.F.R. Sec. 717.10(b)(2).
34. 40 C.F.R. Sec. 717.3(a).
35. 40 C.F.R. Sections 716.60, .65.
36. TSCA Sec. 13(a)(1).
37. 19 C.F.R. Sec. 101.1(e).
38. 19 C.F.R. Sec. 12.121(a).
39. 19 C.F.R. Sec. 101.3(b).
40. 19 C.F.R. Sec. 162.1a(a)(2), .1b, .1c.
41. TSCA Sec. 12(a)(1).
42. TSCA Sec. 12(a)(1)(B).
43. 58 Fed. Reg. 40,238 (July 27, 1993).
44. 40 C.F.R. Sec. 707.65(A)(2).
45. 45 Fed. Reg. 82,844 (Dec. 16, 1980).
46. See 40 C.F.R. Sec. 707.60(c).
47. See Memorandum from Thomas L. Adams, Jr., Assistant Administrator for Enforcement and Compliance Monitoring, EPA, Final EPA Policy on the Inclusion of Environmental Auditing Provisions in Enforcement Settlements (Nov. 14, 1986) (Enforcement Audit Policy).
48. *Id.* at 2.

**Contract
Manufacturers**

DSW 122632

STLCOPCB4032580

Contract Manufacturers

- CMA's Responsible Care Codes
- Solutia Program #7
- Definition of Contract Manufacturing
- "Outside Processor Assessment"
- Contracting Details

Responsible Care

Product Stewardship Code

- Select contract manufacturers who employ appropriate practices for health, safety and environmental protection for the operations under contract.
- Work with contract manufacturers to help them implement such practices.
- Provide information and guidance appropriate to the product and process risk to foster proper handling, use, recycling and disposal.
- Periodically review performance of contract manufacturers.

DSW 122634

Responsible Care

Pollution Prevention Code

- Select, retain, and review contractors and toll manufacturers taking into account sound waste management practices that protect the environment and the health and safety of employees and the public.

SOLUTIA PROGRAM #7

OUTSIDE PROCESSORS

Program 7

Outside Processors

OVERVIEW

Introduction	This program describes policies, goals, standards and procedures necessary to implement Solutia's commitment to "... ensure that our operations and distribution systems are safe for employees, site contractors, communities and the environment."
Policy	To support its operations, the company will select outside processors that will operate with concern for • worker safety, • regulatory compliance, • community protection, and • protection of the environment.
Goal	The company will pursue into its outside processor plan the specific goal to manage the company's exposure to present and future liabilities associated with the use of outside processors by maintaining current assessments and written contracts for each outside processor used.
Measuring Progress	To measure progress against this goal, the company will maintain records that document the • outside processors used, • status of assessments, and • status of contracts.
For Further Information	When further information or clarification is required, you may contact the following: <u>ISSUE OWNER</u> H. D. (Dunny) Toy, Policy & Compliance, F2EI (314)674-6698
Program Approval	The content of this program was approved by

Continued on next page

DSW 122637

OVERVIEW, Continued

In This Program . This program contains the following procedures.

Procedures	See Page
P7.1 OUTSIDE PROCESSORS	P7-3
P7.2 TOLL MANUFACTURERS	P7-4

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DSW 122638

P7.1 OUTSIDE PROCESSORS

P7.1.1 Introduction	This section describes procedures to be used to accomplish the company's specific goals regarding outside processors.
P7.1.2 Applicability	This section applies to firms which provide services related to Solutia chemicals, products or wastes. This includes toll manufacturers, which are a subset of Outside Processors and which are detailed in the next section of this chapter.
P7.1.3 Selection Elements	The company will use only outside processors that have been selected and periodically assessed to ensure their • ability to protect the public, employees and the environment adequately from any adverse effect of the company's chemicals, products or wastes, • compliance with all applicable laws and regulations, • knowledge of potential hazards and any applicable manufacturing requirements associated with the handling of company materials, and • use of waste disposal methods and locations as specified by contracts, with recordkeeping of all material use and waste disposal.
P7.1.4 Assessments	Before they are used by the company, outside processors will be subject to • contracts, • on-site assessments unless waived (see P7.1.6, Waivers), • approval by the appropriate Director of Manufacturing or equivalent, and • approvals and reviews by others as appropriate. NOTE: The Leader, ESH Policy & Compliance co-approves selection of waste management firms, including cleaning firms.
P7.1.5 Assessment Requirements	Initial assessments are intended to be thorough and multi-disciplinary. Periodic reassessments will concentrate on general performance and deficiencies previously defined.
P7.1.6 Waivers	On-site assessments of outside processors are required unless waived by both the Leader, ESH Policy & Compliance and the Director of Manufacturing and formally documented. Any such waivers must be resolved or re-approved every three years or less.
P7.1.7 Waste Management	For outside processor categories other than toll manufacturing (waste management, cleaning services, etc.), a processor's waste management practices will be reviewed as part of the on-site assessment.

Continued on next page

P7.1.8
Worldwide
Applicability

These elements will be implemented worldwide, with modifications to reflect local conditions and the extent of the company's operating control.

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DSW 122640

P7.2 TOLL MANUFACTURERS

P7.2.1 Introduction

This section describes procedures to be used to accomplish the company's specific goals regarding toll manufacturers.

P7.2.2 Applicability

This section applies to toll manufacturers, which are firms under arrangements where Solutia owns two or more of the following factors:

- raw materials,
- process technology, or
- some or all of the output.

Pilot plant operations for process development and/or market introduction are included.

P7.2.3 Accountability

The Director of Manufacturing is the primary person accountable for ensuring that the initial assessments, contracts and other provisions are in place prior to commencing operations.

Approval must be based on the assessment and any waivers (see 7.2.10, Waivers).

The Director of Manufacturing will consult as needed with business and environmental management.

The decision to toll will be reviewed and re-approved by the Director of Manufacturing, or equivalent, at least every three years.

P7.2.4 Selection Elements

<DRAFT>
In addition to the selection elements listed for outsourcing processors, the company will use only toll manufacturers that have been selected and periodically assessed to ensure their

- ability to produce to market demands, producing quality product cost-effectively,
 - capability to manage key external relations, and
 - financial condition, which must be able to prevent business interruption and support the value of indemnifications.
-

P7.2.5 Initial Assessment

Sites will be assessed against Solutia as the standard.

The initial assessment is intended to be thorough and to cover

- environmental compliance,
 - groundwater history/protection,
 - safety and IH status and programs,
 - waste management,
 - knowledge of Solutia technology, and
 - general knowledge/performance against the tenets of Responsible Care or similar programs worldwide.
-

Continued on next page

DSW 122641

P7.2 TOLL MANUFACTURERS, Continued

P7.2.6 Reassessment and Additional Requirements

Periodic reassessment will be conducted at least every three years.

For those operations under contract to Solutia, tollers must also have a

- spill response plan, and
 - Groundwater Protection Plan.
-

P7.2.7 Waste Management

Toll manufacturers, including bulk terminals and transloading, will

- take title to, adopt and own any wastes generated, and
 - manage them as their own under manifests and contracts.
-

P7.2.8 Shipping Operations

Toll manufacturers involved in shipping of hazardous or regulated materials for Solutia will be supported and controls verified to be in place at the same level as such operations at Solutia locations.

P7.2.9 Cost Accounting

Where feasible and desired by the Director of Manufacturing, costs of toller assessment, oversight and management will be borne by the tolled products at the cost-of-goods level.

P7.2.10 Waivers

The Director of Manufacturing is authorized to

- <DRAFT>**
- reduce the scope of assessments where warranted,
 - waive requirements for prior assessments or contracts in normal situations, and
 - accept, conditionally or otherwise, any deficiencies noted in the assessments.

Any such waivers must be resolved or reapproved every three years or less. Where improvements are stipulated as a condition of approval, the work plan will be reviewed annually.

P7.2.11 Exclusions

Vendor equipment tests or bench-scale manufacture of small quantities/samples are conditionally excluded, dependent on

- coverage by purchase order or contract,
 - Solutia stipulation of return of materials or disposal method/location of wastes, and
 - exchange of material safety and handling information.
-

P7.2.12 Termination

A termination plan, put into place when toll operations are initiated, will be executed when operations are discontinued.

DSW 122642

What is a “Contract Manufacturer”?

- **Conversion** - Raw materials are converted to product which is returned to Solutia for sale or use as intermediate.
- **Processing** - Change in physical properties, e.g., milling, granulating, or sizing.
- **Blending** - Solids and/or liquids are physically mixed to make a product.
- **Recovery** - Spent material, e.g., catalyst or solvent, is treated in order to be reusable.
- **Purification** - Material quality is modified; improved to meet specifications for use or sale.
- **Packaging/Repackaging** - Product is packaged, or repackaged into smaller or larger containers, with Solutia labels.

DSW 122643

Selection and Periodic Reviews Are Documented In “Outside Processors Assessments”

- 13-page Solutia form:
 - Business aspects
 - Technology/material transfer
 - Environmental control
 - Air/Water/Waste
 - “Superfund”/SARA
 - Industrial hygiene/safety
- Conducted by Solutia plant environmental personnel (or consultants)
 - Initially and every 3 years
- Approved by Directors of Policy and Manufacturing
- Timely follow-up on any “conditions”

OUTSIDE PROCESSOR ASSESSMENT

Company Name:

Mailing Address:

Facility Address:
(Specific Site)

Name / Title of
Facility Contact:

Phone Number:

SIC CODE:

Summary of service to be performed (materials, specific service, how much, value, etc.):

Processor's prior experience with similar services:

Service code(s) (see Pledge Guideline #7):

Brief evaluation of alternatives (other processes, other means, costs) to this arrangement:

Solutia Plant Location:

Department Contacts (Name and Phone Number):

Environmental -

Production Unit -

Purchasing -

Research -

Law -

DSW 122645

STLCOPCB4032593

BUSINESS ASPECTS OF PROCESSOR

Give a description of the processor's business, size, reputation, and a measure of his financial stability. Attach brochures, advertisement copy, letters of estimate, etc.

CORPORATE/FACILITY OWNERSHIP STRUCTURE: Publicly Traded? Yes ☐ No ☐
Describe the organization structure and relationship to Parent; note major ownership/structure changes in the past 5 years; years in business; facility operation at this location:

INSURANCE SUMMARY: Attach processor's Certificate of Insurance.

Insurance Broker:

Workman's Compensation	Amount:
Bodily Injury and Death	Amount:
Property Damage	Amount:
Facility General Liability	Amount:
Environmental Impairment	Amount:

RCRA Closure/Post Closure Estimates:

RCRA Closure/Post Closure Financial Assurance Mechanism:

DSW 122646

STLCOPCB4032594

BUSINESS ASPECTS (cont'd.)

Give an analysis of the impact this arrangement will have on processor's business.

List other products, services and customers Processor has besides this arrangement. Do any of these present unusual risks to workers or the environment? What is potential for contamination appearing in Solutia's goods or service?

TECHNOLOGY TRANSFER

Describe technology or technical assistance Solutia would be supplying processor. Attach copies of agreements, reports, etc.

Describe safety and health information supplied to processor. State if processor gives indications that the information is understood. List copies of MSDS, labels, and other documents given to processor.

State personnel and equipment to be used to fulfill goals of this arrangement.

MATERIAL TRANSFER

Describe specifications of material supplied to processor. Are other raw materials covered by specifications? Attach copies of labels and spec sheets, if available.

Describe specifications of materials supplied to Solutia. State quality control measures to be used by processor. If a product is to be sold to Monsanto customers, indicate plans for quality control in detail. Give test methods, "specs," shipping arrangements and contents of labels. Give procedures for handling customer complaints. Recordkeeping?

DSW 122649

STLCOPCB4032597

ENVIRONMENTAL CONTROL

Site History. Site Assessment report available?

Results of Regulatory Agency database search.

Summarize outside processor's ability to properly handle wastewater, emissions, and waste. Include key permit numbers and expiration dates.

Water Permit No.:
Status/Compliance.

DSW 122650

STLCOPCB4032598

ENVIRONMENTAL CONTROL (cont'd)

Air Permit No.:
Status/Compliance.

Solid Waste Permit No.:
Status/Compliance.

RCRA related issues.

TSCA related issues.

FIFRA related issues.

ENVIRONMENTAL CONTROL (cont'd)

Describe Site Location And Surrounding Area:

Hydrology Information For Landfill (attach when applicable):

On-Site Groundwater Contamination - Monitoring or Other Wells. Results.

UST/AST Status.

ENVIRONMENTAL CONTROL (cont'd.)

CERCLA (Superfund) Notification: Describe company's involvement, \$ estimate.

Potential CERCLA/Superfund Liability to Monsanto from Processor/Adjacent Sites.

SARA TITLE III (Community-Right-To-Know). - Emergency Planning (301/303), Release Notification (304), MSDS Submission/Inventory (311/312), and Annual Release Reporting (313): Describe company's awareness of requirements, submittal of reports, etc.

ENFORCEMENT ACTIONS (filed or pending): Describe any administrative orders, consent orders, notices of violation (NOV's), etc.

THIRD-PARTY LITIGATION (filed or pending): Please describe.

INDUSTRIAL HYGIENE / SAFETY

Give information on housekeeping and safety aspects of processor's facilities.

Employee Training Programs.

Process Safety Management. What equipment does processor have to assure worker safety while handling materials under this arrangement? What about other activities of business done at this site?

Risk Management Plan. Has the processor developed a Risk Management Plan?

DSW 122654

STLCOPCB4032602

INDUSTRIAL HYGIENE/SAFETY (Cont'd)

What provisions does processor have for handling flammables and to minimize risk of fire and explosion?

Recordkeeping.

Date of last OSHA inspection. Results of inspection. Any citations issued.

DSW 122655

OUTSIDE PROCESSOR APPROVAL FORM

Company Name: _____

Headquarters Address: _____

Headquarters Contact: _____

Phone: _____

Facility Address: _____

Facility Contact: _____

Phone: _____

Initial Assessment: _____ or Reassessment: _____

Contract For Services in Place: ☐ Yes ☐ No ☐ Negotiation

Service to be Performed: _____

Service Code(s) (see Pledge Manual Program #7): _____

Other Activities At Site: _____

Monsanto users conducting assessment: _____

DSW 122656

STLCOPCB4032604

OUTSIDE PROCESSOR APPROVAL FORM

Company Name:

Recommendation (complete one of the following three sections):

- Recommended _____ Reassess in _____ months

- Recommend interim approval based upon the following conditions:

Reassess in _____ months

- Not recommended _____

o **Assessment conducted by:**

(Name, Date) _____

o **Strategic Business Unit:** _____
For: (Sites)

o **Approved by:**

o Plant or Staff Manager: _____

o Environmental Manager: _____

o Director of Environmental, Safety & Health: _____

o Director of Manufacturing: _____

o **Other SBU(s) Utilizing Facility:** _____

Solutia Purchasing Will Approve All Contract Manufacturing Agreements

- **Manager, Toll Manufacturing**
 - **W. F. (Bill) Parker**
Mail Zone F2WB
Phone 4-7030
- **Environmental Manager**
 - **Dunny Toy**
Mail Zone F2EI
Phone 4-6698

DSW 122658

Wastes

DSW 122659

What Do I Need To Know About Waste Management As A Product Steward?

- 1 How does a customer manage our products when they become wastes?
- 2 MSDS will say if the material is "hazardous" per RCRA in the Disposal Considerations section once it becomes a waste.
- 3 Spills of "listed" material and spill cleanup residues which meet a hazardous "characteristic" are hazardous.
- 4 Containers which contained a "listed" or "characteristic" material are hazardous, unless "empty" (see attached definition). However, containers of "acute" products (P listed) are still hazardous unless triple rinsed.

Discourage reusing Solutia product drums for wastes.

Note: DOT regulates drum reuse.

What Do I Need To Know About Waste Management As A Product Steward?

Cont'd:

- 5 Generally, spent materials can be reused, and remain outside of RCRA, as long as they can be reused as is (no filtering, no distillation, etc.).
Note: This is one of the most confusing sections of RCRA. Get help! Don't speculate!
- 6 Mixing of "listed" hazardous waste with non-hazardous wastes, even if not intentional, results in the entire volume being hazardous.
- 7 Solutia strongly urges disposal by incineration because it destroys the waste and because "land ban" regulations often require incineration.
- 8 No Solutia facility is permitted to accept hazardous wastes from customers.
- 9 STATE LAWS MAY VARY !!!

What Do I Need To Know About Waste Management As A Product Steward?

Cont'd:

- 10 Some Solutia fluids can be disposed of or returned as used oil. See MSDS disposal considerations section for applicability.

Final Note: A Product Steward needs to know when RCRA might apply, not necessarily what the RCRA requirements might be.

Resource Conservation & Recovery Act (RCRA 1976)

Hazardous & Solid Waste Amendments (HSWA 1984)

USEPA has developed a fairly precise concept of “hazardous”:

- Physical/chemical properties (characteristic)
- Specific chemical (listed)
- Waste from identified source (listed)

Definition of when a material is a “waste” is less clear.

- Check with an Environmental Manager or Product Safety Manager if in doubt

“Cradle to Grave” approach - “Government’s management tools” are:

- Generator and transporter standards
- Facility standards
treatment, storage and disposal
- Inspection/Recordkeeping

Characteristic Hazardous Wastes

The following describes physical and chemical properties of wastes which make them hazardous under RCRA.

Subpart C—Characteristics of Hazardous Waste

§ 261.20 General.

(a) A solid waste, as defined in § 261.2, which is not excluded from regulation as a hazardous waste under § 261.4(b), is a hazardous waste if it exhibits any of the characteristics identified in this subpart.

[Comment: Section 262.11 of this chapter sets forth the generator's responsibility to determine whether his waste exhibits one or more of the characteristics identified in this subpart]

(b) A hazardous waste which is identified by a characteristic in this Subpart is assigned every EPA Hazardous Waste Number that is applicable as set forth in this Subpart. This number must be used in complying with the notification requirements of Section 3010 of the Act and all applicable recordkeeping and reporting requirements under Parts 262 through 265, 268, and 270 of this chapter.

(c) For purposes of this subpart, the Administrator will consider a sample obtained using any of the applicable sampling methods specified in Appendix I to be a representative sample within the meaning of Part 260 of this chapter.

[Comment: Since the Appendix I sampling methods are not being formally adopted by the Administrator, a person who desires to employ an alternative sampling method is not required to demonstrate the equivalency of his method under the procedures set forth in §§ 260.20 and 260.21.]

[45 FR 33119, May 19, 1980, as amended at 48 FR 14294, Apr. 1, 1983; 51 FR 40636, Nov. 7, 1986; 55 FR 22684, June 1, 1990; 56 FR 3876, Jan. 31, 1991]

§ 261.21 Characteristic of ignitability.

(a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (incorporated by reference, see § 260.11), or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78 (incorporated by reference, see § 260.11), or as determined by an equivalent test method approved by the Administrator under procedures set forth in §§ 260.20 and 260.21.

◆ RCRA—281

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

(3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21.

(4) It is an oxidizer as defined in 49 CFR 173.151.

(b) A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990]

§ 261.22 Characteristic of corrosivity.

◆ RCRA—127

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

◆ RCRA—288

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using Method 9040 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter.

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 as standardized in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter.

(b) A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990; 58 FR 46049, Aug. 31, 1993]

§ 261.23 Characteristic of reactivity.

◆ RCRA—35, 126

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has *any* of the following properties:

- (1) It is normally unstable and readily undergoes violent change without detonating.
- (2) It reacts violently with water.
- (3) It forms potentially explosive mixtures with water.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

◆ RCRA—124

- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

[45 FR 33119, May 19, 1980, as amended at 55 FR 22684, June 1, 1990]

§ 261.24 Toxicity characteristic.

◆ RCRA—126, 242, 268, 301, 309

(a) A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in Table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

(b) A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table 1 which corresponds to the toxic contaminant causing it to be hazardous.

TABLE 1.—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR THE TOXICITY CHARACTERISTIC

EPA HW No. ¹	Contaminant	CAS No. ²	Regulatory Level (mg/L)	EPA HW No. ¹	Contaminant	CAS No. ²	Regulatory Level (mg/L)
D004	Arsenic	7440-38-2	5.0	D033	Hexachlorobutadiene	87-68-3	0.5
D005	Barium	7440-39-3	100.0	D034	Hexachloroethane	67-72-1	3.0
D018	Benzene	71-43-2	0.5	D008	Lead	7439-92-1	5.0
D006	Cadmium	7440-43-9	1.0	◆ RCRA—275			
D019	Carbon tetrachloride	56-23-5	0.5	D013	Lindane	58-89-9	0.4
D020	Chlordane	57-74-9	0.03	D009	Mercury	7439-97-6	0.2
D021	Chlorobenzene	108-90-7	100.0	◆ RCRA—211			
D022	Chloroform	67-66-3	6.0	D014	Methoxychlor	72-43-5	10.0
D007	Chromium	7440-47-3	5.0	D035	Methyl ethyl ketone	78-93-3	200.0
D023	o-Cresol	95-48-7	⁴ 200.0	D036	Nitrobenzene	98-95-3	2.0
D024	m-Cresol	108-39-4	⁴ 200.0	D037	Pentachlorophenol	87-86-5	100.0
D025	p-Cresol	106-44-5	⁴ 200.0	D038	Pyridine	110-86-1	³ 5.0
D026	Cresol		⁴ 200.0	D010	Selenium	7782-49-2	1.0
D016	2,4-D	94-75-7	10.0	D011	Silver	7440-22-4	5.0
D027	1,4-Dichlorobenzene	106-46-7	7.5	D039	Tetrachloroethylene	127-18-4	0.7
D028	1,2-Dichloroethane	107-06-2	0.5	D015	Toxaphene	8001-35-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7	D040	Trichloroethylene	79-01-6	0.5
D030	2,4-Dinitrotoluene	121-14-2	³ 0.13	D041	2,4,5-Trichlorophenol	95-95-4	400.0
D012	Endrin	72-20-8	0.02	D042	2,4,6-Trichlorophenol	88-06-2	2.0
D031	Heptachlor (and its epoxide)	76-44-8	0.008	D017	2,4,5-TP (Silvex)	93-72-1	1.0
D032	Hexachlorobenzene	118-74-1	³ 0.13	D043	Vinyl chloride	75-01-4	0.2

¹Hazardous waste number.²Chemical abstracts service number.³Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.⁴If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993]

Listed Hazardous Wastes

The inherent properties of certain chemicals has caused USEPA to specifically list them by chemical name as hazardous. "P listed" waste are "acute" hazardous wastes and "U listed" wastes are "toxic" hazardous wastes. Slightly different management requirements apply and case-specific evaluations are frequently necessary to define exact regulatory requirements.

§ 261.33 Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof.

◆ RCRA—29, 122, 211

The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded as described in § 261.2(a)(2)(i), when they are mixed with waste oil or used oil or other material and applied to the land for dust suppression or road treatment, when they are otherwise applied to the land in lieu of their original intended use or when they are contained in products that are applied to the land in lieu of their original intended use, or when, in lieu of their original intended use, they are produced for use as (or as a component of) a fuel, distributed for use as a fuel, or burned as a fuel.

(a) Any commercial chemical product, or manufacturing chemical intermediate having the generic name listed in paragraph (e) or (f) of this section.

(b) Any off-specification commercial chemical product or manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in paragraph (e) or (f) of this section.

◆ RCRA—311

(c) Any residue remaining in a container or in an inner liner removed from a container that has held any commercial chemical product or manufacturing chemical intermediate having the generic name listed in paragraphs (e) or (f) of this section, unless the container is empty as defined in § 261.7(b) of this chapter.

◆ RCRA—334

[Comment: Unless the residue is being beneficially used or reused, or legitimately recycled or reclaimed; or being accumulated, stored, transported or treated prior to such use, re-use, recycling or reclamation, EPA considers the residue to be intended for discard, and thus, a hazardous waste. An example of a legitimate re-use of the residue would be where the residue remains in the container and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.]

(d) Any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in paragraph (e) or (f) of this section, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill, into or on any land or water, of any off-specification chemical product and manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in paragraph (e) or (f) of this section.

◆ RCRA—19, 226, 235, 290, 349

[Comment: The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in . . ." refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) or (f). Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either § 261.31 or § 261.32 or will be identified as a hazardous waste by the characteristics set forth in Subpart C of this part.]

◆ RCRA—211, 273, 308, 390

(e) The commercial chemical products, manufacturing chemical intermediates or off-specification commercial chemical products or manufacturing chemical intermediates referred to in paragraphs (a) through (d) of this section, are identified as acute hazardous wastes (H) and are subject to be the small quantity exclusion defined in § 261.5(e).

◆ RCRA—358

[Comment: For the convenience of the regulated community the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), and R (Reactivity). Absence of a letter indicates that the compound only is listed for acute toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

IDENTIFICATION AND LISTING

§ 261.33

P LISTED "WASTES ARE ACUTE HAZARDOUS WASTES"

Hazardous waste No.	Chemical Abstracts No.	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	640-19-7	Acetamide, 2-fluoro-
P058	62-74-8	Acetic acid, fluoro-, sodium salt
P002	591-08-2	1-Acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P203	1646-88-4	Aldicarb sulfone.
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-Aminopyridine
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P099	506-61-6	Argentate(1-), bis(cyano-C)-, potassium
P010	7778-39-4	Arsenic acid H ₃ AsO ₄
P012	1327-53-3	Arsenic oxide As ₂ O ₃
P011	1303-28-2	Arsenic oxide As ₂ O ₅
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl-
P036	696-28-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P067	75-55-8	Aziridine, 2-methyl-
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-
P077	100-01-6	Benzenamine, 4-nitro-
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methyl-amino)ethyl]-, (R)
P046	122-09-8	Benzenethanamine, alpha, alpha-dimethyl-
P014	108-98-5	Benzenethiol
P127	1563-66-2	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate.
P188	57-64-7	Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3-b]indol-5-yl methylcarbamate ester (1:1).
P001	'81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium powder
♦ RCRA-291		
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P045	39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methyl-amino)carbonyl] oxime
P021	592-01-8	Calcium cyanide
P021	592-01-8	Calcium cyanide Ca(CN) ₂
P189	55285-14-8	Carbamic acid, [(dibutylamino)-thio]methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester.

Hazardous waste No.	Chemical Abstracts No.	Substance
P191	644-64-4	Carbamic acid, dimethyl-, 1-[(dimethyl-amino)carbonyl]- 5-methyl-1H-pyrazol-3-yl ester.
P192	119-38-0	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester.
P190	1129-41-5	Carbamic acid, methyl-, 3-methylphenyl ester.
P127	1563-66-2	Carbofuran.
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P189	55285-14-8	Carbosulfan.
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P026	5344-82-1	1-(o-Chlorophenyl)thiourea
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide
P029	544-92-3	Copper cyanide Cu(CN)
P202	64-00-6	m-Cumenyl methylcarbamate.
P030	—	Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P033	506-77-4	Cyanogen chloride (CN)Cl
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P016	542-88-1	Dichloromethyl ether
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropylfluorophosphate (DFP)
P004	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-
P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-
P051	'72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-, & metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P191	644-64-4	Dimetilan.
P047	'534-52-1	4,6-Dinitro-o-cresol, & salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb

DSW 122669

Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
P085	152-16-9	Diphosphoramidate, octamethyl-	P050	115-29-7	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
P111	107-49-3	Diphosphoric acid, tetraethyl ester	P059	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P039	298-04-4	Disulfoton	P199	2032-65-7	Methiocarb.
P049	541-53-7	Dithiobiuret	P066	16752-77-5	Methomyl
P185	26419-73-8	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino)-carbonyl]oxime.	P068	60-34-4	Methyl hydrazine
P050	115-29-7	Endosulfan	P064	624-83-9	Methyl isocyanate
P088	145-73-3	Endothall	P069	75-86-5	2-Methylactonitrile
P051	72-20-8	Endrin	P071	298-00-0	Methyl parathion
P051	72-20-8	Endrin, & metabolites	P190	1129-41-5	Metolcarb.
P042	51-43-4	Epinephrine	P128	315-18-4	Mexacarbate.
◆ RCRA—334			P072	86-88-4	alpha-Naphthylthiourea
P031	460-19-5	Ethanedinitrile	P073	13463-39-3	Nickel carbonyl
P194	23135-22-0	Ethanimidothioic acid, 2-(dimethylamino)-N-[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester.	P073	13463-39-3	Nickel carbonyl Ni(CO) ₄ , (T-4)-
P066	16752-77-5	Ethanimidothioic acid, N-[(methylamino)carbonyl]oxy]-, methyl ester	P074	557-19-7	Nickel cyanide
P101	107-12-0	Ethyl cyanide	P074	557-19-7	Nickel cyanide Ni(CN) ₂
P054	151-56-4	Ethyleneimine	P075	54-11-5	Nicotine, & salts
P097	52-85-7	Famphur	P076	10102-43-9	Nitric oxide
P056	7782-41-4	Fluorine	P077	100-01-6	p-Nitroaniline
P057	640-19-7	Fluoroacetamide	P078	10102-44-0	Nitrogen dioxide
P058	62-74-8	Fluoroacetic acid, sodium salt	P076	10102-43-9	Nitrogen oxide NO
P198	23422-53-9	Formetanate hydrochloride.	P078	10102-44-0	Nitrogen oxide NO ₂
P197	17702-57-7	Formparanate.	P081	55-63-0	Nitroglycerine (R)
P065	628-86-4	Fulminic acid, mercury(2+) salt (R,T)	◆ RCRA—306, 347		
P059	76-44-8	Heptachlor	P082	62-75-9	N-Nitrosodimethylamine
P062	757-58-4	Hexaethyl tetraphosphate	P084	4549-40-0	N-Nitrosomethylvinylamine
P116	79-19-6	Hydrazinecarbothioamide	P085	152-16-9	Octamethylpyrophosphoramidate
P068	60-34-4	Hydrazine, methyl-	P087	20816-12-0	Osmium oxide OsO ₄ , (T-4)-
P063	74-90-8	Hydrocyanic acid	P087	20816-12-0	Osmium tetroxide
P063	74-90-8	Hydrogen cyanide	P088	145-73-3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P096	7803-51-2	Hydrogen phosphide	P194	23135-22-0	Oxamyl.
P060	465-73-6	Isodrin	P089	56-38-2	Parathion
P192	119-38-0	Isolan.	P034	131-89-5	Phenol, 2-cyclohexyl-4,6-dinitro-
P202	64-00-6	3-Isopropylphenyl N-methylcarbamate.	P128	315-18-4	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester).
P007	2763-96-4	3(2H)-Isoxazolone, 5-(aminomethyl)-	P199	2032-65-7	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate
P196	15339-36-3	Manganese, bis(dimethylcarbamodithioato-S,S')-,	P048	51-28-5	Phenol, 2,4-dinitro-
P196	15339-36-3	Manganese dimethyldithiocarbamate.	P047	534-52-1	Phenol, 2-methyl-4,6-dinitro-, & salts
P092	62-38-4	Mercury, (acetato-O)phenyl-	P202	64-00-6	Phenol, 3-(1-methylethyl)-, methyl carbamate.
P065	628-86-4	Mercury fulminate (R,T)	P201	2631-37-0	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate.
P082	62-75-9	Methanamine, N-methyl-N-nitroso-	P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P064	624-83-9	Methane, isocyanato-	P009	131-74-8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P016	542-88-1	Methane, oxybis(chloro-	P092	62-38-4	Phenylmercury acetate
P112	509-14-8	Methane, tetranitro- (R)	P093	103-85-5	Phenylthiourea
P118	75-70-7	Methanethiol, trichloro-	P094	298-02-2	Phorate
P198	23422-53-9	Methanimidamide, N,N-dimethyl-N'-[3-[(methylamino)-carbonyl]oxy]phenyl]-, monohydrochloride.	P095	75-44-5	Phosgene
P197	17702-57-7	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[(methylamino)carbonyl]oxy]phenyl]-	P096	7803-51-2	Phosphine
			P041	311-45-5	Phosphoric acid, diethyl 4-nitrophenyl ester

DSW 122670

Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
P039	298-04-4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	P104	506-64-9	Silver cyanide Ag(CN)
P094	298-02-2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	P105	26628-22-8	Sodium azide
P044	60-51-5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	P106	143-33-9	Sodium cyanide
P043	55-91-4	Phosphorofluoridic acid, bis-(1-methyl-ethyl) ester	P106	143-33-9	Sodium cyanide Na(CN)
P089	56-38-2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	P108	157-24-9	Strychnidin-10-one, & salts
P040	297-97-2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	P018	357-57-3	Strychnidin-10-one, 2,3-dimethoxy-
P097	52-85-7	Phosphorothioic acid, O-[4-[(di-methylamino)sulfonyl]phenyl] O,O-dimethyl ester	P108	157-24-9	Strychnine, & salts
P071	298-00-0	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	P115	7446-18-6	Sulfuric acid, dithallium(1+) salt
P204	57-47-6	Physostigmine.	P109	3689-24-5	Tetraethyldithiopyrophosphate
P188	57-64-7	Physostigmine salicylate.	P110	78-00-2	Tetraethyl lead
P110	78-00-2	Plumbane, tetraethyl-	P111	107-49-3	Tetraethyl pyrophosphate
P098	151-50-8	Potassium cyanide	P112	509-14-8	Tetranitromethane (R)
P098	151-50-8	Potassium cyanide K(CN)	P062	757-58-4	Tetraphosphoric acid, hexa-ethyl ester
P099	506-61-6	Potassium silver cyanide	P113	1314-32-5	Thallic oxide
P201	2631-37-0	Promecarb	P113	1314-32-5	Thallium oxide Tl_2O_3
P203	1646-88-4	Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime.	P114	12039-52-0	Thallium(I) selenite
P070	116-06-3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime	P115	7446-18-6	Thallium(I) sulfate
P101	107-12-0	Propanenitrile	P109	3689-24-5	Thiodiphosphoric acid, tetraethyl ester
P027	542-76-7	Propanenitrile, 3-chloro-	P045	39196-18-4	Thiofanox
P069	75-86-5	Propanenitrile, 2-hydroxy-2-methyl-	P049	541-53-7	Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$
P081	55-63-0	1,2,3-Propanetriol, trinitrate (R)	P014	108-98-5	Thiophenol
P017	598-31-2	2-Propanone, 1-bromo-	P116	79-19-6	Thiosemicarbazide
P102	107-19-7	Propargyl alcohol	P026	5344-82-1	Thiourea, (2-chlorophenyl)-
P003	107-02-8	2-Propenal	P072	86-88-4	Thiourea, 1-naphthalenyl-
P005	107-18-6	2-Propen-1-ol	P093	103-85-5	Thiourea, phenyl-
P067	75-55-8	1,2-Propylenimine	P185	26419-73-8	Tirpate.
P102	107-19-7	2-Propyn-1-ol	P123	8001-35-2	Toxaphene
P008	504-24-5	4-Pyridinamine	P118	75-70-7	Trichloromethanethiol
P075	154-11-5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts	P119	7803-55-6	Vanadic acid, ammonium salt
P204	57-47-6	Pyrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-.	P120	1314-62-1	Vanadium oxide V_2O_5
P114	12039-52-0	Selenious acid, dithallium(1+) salt	P120	1314-62-1	Vanadium pentoxide
P103	630-10-4	Selenourea	P084	4549-40-0	Vinylamine, N-methyl-N-nitroso-
P104	506-64-9	Silver cyanide	P001	181-81-2	Warfarin, & salts, when present at concentrations greater than 0.3%
			P205	137-30-4	Zinc, bis(dimethylcarbamodithioato-S,S'),
			P121	557-21-1	Zinc cyanide
			P121	557-21-1	Zinc cyanide $Zn(CN)_2$
			P122	1314-84-7	Zinc phosphide Zn_3P_2 , when present at concentrations greater than 10% (R,T)
			P205	137-30-4	Ziram.

¹CAS Number given for parent compound only.

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(f) The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products referred to in paragraphs (a) through (d) of this section, are identified as toxic wastes (T), unless otherwise designated and are subject to the small quantity generator exclusion defined in § 261.5 (a) and (g).

◆ RCRA—311, 358

[Comment: For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), R (Reactivity), I (Ignitability) and C (Corrosivity). Absence of a letter indicates that the compound is only listed for toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
U394	30558-43-1	A2213.	U328	95-53-4	Benzenamine, 2-methyl-
U001	75-07-0	Acetaldehyde (I)	U353	106-49-0	Benzenamine, 4-methyl-
U034	75-87-6	Acetaldehyde, trichloro-	U158	101-14-4	Benzenamine, 4,4'-methylenebis-[2-chloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-	U222	636-21-5	Benzenamine, 2-methyl-, hydrochloride
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl-	U181	99-55-8	Benzenamine, 2-methyl-5-nitro-
U240	94-75-7	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters	U019	71-43-2	Benzene (I,T)
U112	141-78-6	Acetic acid, ethyl ester (I)	U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
U144	301-04-2	Acetic acid, lead(2+) salt	U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U214	563-68-8	Acetic acid, thallium (1+) salt	U035	305-03-3	Benzenecarboxylic acid, 4-bis(2-chloroethyl)amino]-
See F027	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-	U037	108-90-7	Benzene, chloro-
U002	67-64-1	Acetone (I)	U221	25376-45-8	Benzenediamine, ar-methyl-
U003	75-05-8	Acetonitrile (I,T)	U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U004	98-86-2	Acetophenone	U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U005	53-96-3	2-Acetylaminofluorene	U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U006	75-36-5	Acetyl chloride (C,R,T)	U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U007	79-06-1	Acrylamide	U107	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester
U008	79-10-7	Acrylic acid(I)	U070	95-50-1	Benzene, 1,2-dichloro-
U009	107-13-1	Acrylonitrile	U071	541-73-1	Benzene, 1,3-dichloro-
U011	61-82-5	Amitrole	U072	106-46-7	Benzene, 1,4-dichloro-
U012	62-53-3	Aniline (I,T)	U060	72-54-8	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U136	75-60-5	Arsinic acid, dimethyl-	U017	98-87-3	Benzene, (dichloromethyl)-
U014	492-80-8	Auramine	U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U015	115-02-6	Azaserine	U239	1330-20-7	Benzene, dimethyl- (I,T)
U365	2212-67-1	H-Azepine-1-carbothioic acid, hexahydro-, S-ethyl ester.	U201	108-46-3	1,3-Benzenediol
U010	50-07-7	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha,8beta,8aalpha,8balpha)]]-	U127	118-74-1	Benzene, hexachloro-
U280	101-27-9	Barban.	U056	110-82-7	Benzene, hexahydro- (I)
U278	22781-23-3	Bendiocarb.	U220	108-88-3	Benzene, methyl-
U364	22961-82-6	Bendiocarb phenol.	U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U271	17804-35-2	Benomyl.	U106	606-20-2	Benzene, 2-methyl-1,3-dinitro-
U157	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	U055	98-82-8	Benzene, (1-methylethyl)- (I)
U016	225-51-4	Benz[c]acridine	U169	98-95-3	Benzene, nitro-
U017	98-87-3	Benzal chloride	U183	608-93-5	Benzene, pentachloro-
U192	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	U185	82-68-8	Benzene, pentachloronitro-
U018	56-55-3	Benz[a]anthracene	U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-	U020	98-09-9	Benzenesulfonyl chloride (C,R)
U012	62-53-3	Benzenamine (I,T)	U207	95-94-3	Benzene, 1,2,4,5-tetrachloro-
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-	U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene) bis(4-chloro-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-, hydrochloride	U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene) bis(4-methoxy-
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-	U023	98-07-7	Benzene, (trichloromethyl)-
			U234	99-35-4	Benzene, 1,3,5-trinitro-

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Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
U021	92-87-5	Benzidine	U409	23564-05-8	Carbamic acid, [1,2-phenylenebis(iminocarbonothioyl)]-bis-, dimethyl ester.
U202	'81-07-2	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts	U097	79-44-7	Carbamic chloride, dimethyl-
U278	22781-23-3	1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate.	U379	136-30-1	Carbamodithioic acid, dibutyl, sodium salt.
U364	22961-82-6	1,3-Benzodioxol-4-ol, 2,2-dimethyl-,	U277	95-06-7	Carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester.
U203	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-	U381	148-18-5	Carbamodithioic acid, diethyl-, sodium salt.
U141	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-	U383	128-03-0	Carbamodithioic acid, dimethyl, potassium salt.
U090	94-58-6	1,3-Benzodioxole, 5-propyl-	U382	128-04-1	Carbamodithioic acid, dimethyl-, sodium salt.
U367	1563-38-8	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-	U376	144-34-3	Carbamodithioic acid, dimethyl-, tetraanhydrosulfide with orthothioselenious acid.
U064	189-55-9	Benzo[rs]pentaphene	U114	'111-54-6	Carbamodithioic acid, 1,2-ethanediy-bis-, salts & esters
U248	'81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations of 0.3% or less	U378	51026-28-9	Carbamodithioic acid, (hydroxymethyl)methyl-, monopotassium salt.
U022	50-32-8	Benzo[a]pyrene	U384	137-42-8	Carbamodithioic acid, methyl-, monosodium salt.
U197	106-51-4	p-Benzoquinone	U377	137-41-7	Carbamodithioic acid, methyl-, monopotassium salt.
U023	98-07-7	Benzotrichloride (C,R,T)	U062	2303-16-4	Carbamothioic acid, bis(1-methyl-ethyl)-, S-(2,3-dichloro-2-propenyl) ester
U085	1464-53-5	2,2'-Bioxirane	U389	2303-17-5	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester.
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine	U392	2008-41-5	Carbamothioic acid, bis(2-methylpropyl)-, S-ethyl ester.
U073	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-	U391	1114-71-2	Carbamothioic acid, butylethyl-, S-propyl ester.
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-	U386	1134-23-2	Carbamothioic acid, cyclohexyl-ethyl-, S-ethyl ester.
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-	U390	759-94-4	Carbamothioic acid, dipropyl-, S-ethyl ester.
U401	97-74-5	Bis(dimethylthiocarbamoyl) sulfide.	U387	52888-80-9	Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester.
U400	120-54-7	Bis(pentamethylene)thiuram tetrasulfide.	U385	1929-77-7	Carbamothioic acid, dipropyl-, S-propyl ester.
U225	75-25-2	Bromoform	U279	63-25-2	Carbaryl.
U030	101-55-3	4-Bromophenyl phenyl ether	U372	10605-21-7	Carbendazim.
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	U367	1563-38-8	Carbofuran phenol.
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-	U215	6533-73-9	Carbonic acid, dithallium(1+) salt
U031	71-36-3	1-Butanol (I)	U033	353-50-4	Carbonic difluoride
U159	78-93-3	2-Butanone (I,T)	U156	79-22-1	Carbonochloridic acid, methyl ester (I,T)
U160	1338-23-4	2-Butanone peroxide (R,T)	U033	353-50-4	Carbon oxyfluoride (R,T)
U053	4170-30-3	2-Butenal	U211	56-23-5	Carbon tetrachloride
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)	U034	75-87-6	Chloral
U143	303-34-4	2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy)methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-	U035	305-03-3	Chlorambucil
U031	71-36-3	n-Butyl alcohol (I)	U036	57-74-9	Chlordane, alpha & gamma isomers
U392	2008-41-5	Butylate.	U026	494-03-1	Chlormaphazin
U136	75-60-5	Cacodylic acid	U037	108-90-7	Chlorobenzene
U032	13765-19-0	Calcium chromate	U038	510-15-6	Chlorobenzilate
U372	10605-21-7	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester.	U039	59-50-7	p-Chloro-m-cresol
U271	17804-35-2	Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester.	U042	110-75-8	2-Chloroethyl vinyl ether
U375	55406-53-6	Carbamic acid, butyl-, 3-iodo-2-propynyl ester.	U044	67-66-3	Chloroform
U280	101-27-9	Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester.	U046	107-30-2	Chloromethyl methyl ether
U238	51-79-6	Carbamic acid, ethyl ester	U047	91-58-7	beta-Chloronaphthalene
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester	U048	95-57-8	o-Chlorophenol
U373	122-42-9	Carbamic acid, phenyl-, 1-methylethyl ester.	U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride

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Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
U032	13765-19-0	Chromic acid H_2CrO_4 , calcium salt	U098	57-14-7	1,1-Dimethylhydrazine
U050	218-01-9	Chrysene	U099	540-73-8	1,2-Dimethylhydrazine
U393	137-29-1	Copper, bis(dimethylcarbamodithioato-S,S'),	U101	105-67-9	2,4-Dimethylphenol
U393	137-29-1	Copper dimethyldithiocarbamate.	U102	131-11-3	Dimethyl phthalate
U051		Creosote	U103	77-78-1	Dimethyl sulfate
♦ RCRA—290			U105	121-14-2	2,4-Dinitrotoluene
U052	1319-77-3	Cresol (Cresylic acid)	U106	606-20-2	2,6-Dinitrotoluene
U053	4170-30-3	Crotonaldehyde	U107	117-84-0	Di-n-octyl phthalate
U055	98-82-8	Cumene (I)	U108	123-91-1	1,4-Dioxane
U246	506-68-3	Cyanogen bromide (CN)Br	U109	122-66-7	1,2-Diphenylhydrazine
U386	1134-23-2	Cycloate.	U110	142-84-7	Dipropylamine (I)
U197	106-51-4	2,5-Cyclohexadiene-1,4-dione	U111	621-64-7	Di-n-propylnitrosamine
U056	110-82-7	Cyclohexane (I)	U403	97-77-8	Disulfiram.
U129	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-	U041	106-89-8	Epichlorohydrin
U057	108-94-1	Cyclohexanone (I)	U390	759-94-4	EPTC.
U130	77-47-4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	U001	75-07-0	Ethanal (I)
U058	50-18-0	Cyclophosphamide	U174	55-18-5	Ethanamine, N-ethyl-N-nitroso-
U240	94-75-7	2,4-D, salts & esters	U404	121-44-8	Ethanamine, N,N-diethyl-
U059	20830-81-3	Daunomycin	U155	91-80-5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U366	533-74-4	Dazomet.	U067	106-93-4	Ethane, 1,2-dibromo-
U060	72-54-8	DDD	U076	75-34-3	Ethane, 1,1-dichloro-
U061	50-29-3	DDT	U077	107-06-2	Ethane, 1,2-dichloro-
U062	2303-16-4	Diallate	U131	67-72-1	Ethane, hexachloro-
U063	53-70-3	Dibenz[a,h]anthracene	U024	111-91-1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U064	189-55-9	Dibenzo[a,i]pyrene	U117	60-29-7	Ethane, 1,1'-oxybis-(I)
U066	96-12-8	1,2-Dibromo-3-chloropropane	U025	111-44-4	Ethane, 1,1'-oxybis[2-chloro-
U069	84-74-2	Dibutyl phthalate	U184	76-01-7	Ethane, pentachloro-
U070	95-50-1	o-Dichlorobenzene	U208	630-20-6	Ethane, 1,1,1,2-tetrachloro-
U071	541-73-1	m-Dichlorobenzene	U209	79-34-5	Ethane, 1,1,2,2-tetrachloro-
U072	106-46-7	p-Dichlorobenzene	U218	62-55-5	Ethanethioamide
U073	91-94-1	3,3'-Dichlorobenzidine	U226	71-55-6	Ethane, 1,1,1-trichloro-
U074	764-41-0	1,4-Dichloro-2-butene (I,T)	U227	79-00-5	Ethane, 1,1,2-trichloro-
U075	75-71-8	Dichlorodifluoromethane	U410	59669-26-0	Ethanimidothioic acid, N,N'-[thiois((methylimino)carbonyloxy)]bis-, dimethyl ester
U078	75-35-4	1,1-Dichloroethylene	U394	30558-43-1	Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester.
U079	156-60-5	1,2-Dichloroethylene	U359	110-80-5	Ethanol, 2-ethoxy-
U025	111-44-4	Dichloroethyl ether	U173	1116-54-7	Ethanol, 2,2'-(nitrosoimino)bis-
U027	108-60-1	Dichloroisopropyl ether	U395	5952-26-1	Ethanol, 2,2'-oxybis-, dicarbamate.
U024	111-91-1	Dichloromethoxy ethane	U004	98-86-2	Ethanone, 1-phenyl-
U081	120-83-2	2,4-Dichlorophenol	U043	75-01-4	Ethene, chloro-
U082	87-65-0	2,6-Dichlorophenol	U042	110-75-8	Ethene, (2-chloroethoxy)-
U084	542-75-6	1,3-Dichloropropene	U078	75-35-4	Ethene, 1,1-dichloro-
U085	1464-53-5	1,2,3,4-Diepoxybutane (I,T)	U079	156-60-5	Ethene, 1,2-dichloro-, (E)-
U395	5952-26-1	Diethylene glycol, dicarbamate.	U210	127-18-4	Ethene, tetrachloro-
U108	123-91-1	1,4-Diethyleneoxide	U228	79-01-6	Ethene, trichloro
U028	117-81-7	Diethylhexyl phthalate	U112	141-78-6	Ethyl acetate (I)
U086	1615-80-1	N,N'-Diethylhydrazine	U113	140-88-5	Ethyl acrylate (I)
U087	3288-58-2	O,O-Diethyl S-methyl dithiophosphate	U238	51-79-6	Ethyl carbamate (urethane)
U088	84-66-2	Diethyl phthalate	U117	60-29-7	Ethyl ether (I)
U089	56-53-1	Diethylstilbesterol	U114	111-54-6	Ethylenebisdithiocarbamic acid, salts & esters
U090	94-58-6	Dihydrosafrole	U067	106-93-4	Ethylene dibromide
U091	119-90-4	3,3'-Dimethoxybenzidine	U077	107-06-2	Ethylene dichloride
U092	124-40-3	Dimethylamine (I)	U359	110-80-5	Ethylene glycol monoethyl ether
U093	60-11-7	p-Dimethylaminoazobenzene	U115	75-21-8	Ethylene oxide (I,T)
U094	57-97-6	7,12-Dimethylbenz[a]anthracene	U116	96-45-7	Ethylenethiourea
U095	119-93-7	3,3'-Dimethylbenzidine	U076	75-34-3	Ethylidene dichloride
U096	80-15-9	alpha, alpha-Dimethylbenzyl-hydroperoxide (R)	U118	97-63-2	Ethyl methacrylate
U097	79-44-7	Dimethylcarbamoyl chloride			

Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
U119	62-50-0	Ethyl methanesulfonate	U045	74-87-3	Methane, chloro- (I,T)
U407	14324-55-1	Ethyl Ziram.	U046	107-30-2	Methane, chloromethoxy-
U396	14484-64-1	Ferbam.	U068	74-95-3	Methane, dibromo-
U120	206-44-0	Fluoranthene	U080	75-09-2	Methane, dichloro-
U122	50-00-0	Formaldehyde	U075	75-71-8	Methane, dichlorodifluoro-
♦ RCRA—311			U138	74-88-4	Methane, iodo-
U123	64-18-6	Formic acid (C,T)	U119	62-50-0	Methanesulfonic acid, ethyl ester
U124	110-00-9	Furan (I)	U211	56-23-5	Methane, tetrachloro-
U125	98-01-1	2-Furancarboxaldehyde (I)	U153	74-93-1	Methanethiol (I,T)
U147	108-31-6	2,5-Furandione	U225	75-25-2	Methane, tribromo-
U213	109-99-9	Furan, tetrahydro- (I)	U044	67-66-3	Methane, trichloro-
U125	98-01-1	Furfural (I)	U121	75-69-4	Methane, trichlorofluoro-
U124	110-00-9	Furfuran (I)	U036	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U206	18883-66-4	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-	U154	67-56-1	Methanol (I)
U206	18883-66-4	D-Glucose, 2-deoxy-2-[[[(methylnitrosoamino)-carbonyl]amino]-	U155	91-80-5	Methapyriline
U126	765-34-4	Glycidylaldehyde	U142	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U163	70-25-7	Guanidine, N-methyl-N'-nitro-N-nitroso-	U247	72-43-5	Methoxychlor
U127	118-74-1	Hexachlorobenzene	U154	67-56-1	Methyl alcohol (I)
U128	87-68-3	Hexachlorobutadiene	U029	74-83-9	Methyl bromide
U130	77-47-4	Hexachlorocyclopentadiene	U186	504-60-9	1-Methylbutadiene (I)
U131	67-72-1	Hexachloroethane	U045	74-87-3	Methyl chloride (I,T)
U132	70-30-4	Hexachlorophene	U156	79-22-1	Methyl chlorocarbonate (I,T)
U243	1888-71-7	Hexachloropropene	U226	71-55-6	Methyl chloroform
U133	302-01-2	Hydrazine (R,T)	U157	56-49-5	3-Methylcholanthrene
U086	1615-80-1	Hydrazine, 1,2-diethyl-	U158	101-14-4	4,4'-Methylenebis(2-chloroaniline)
U098	57-14-7	Hydrazine, 1,1-dimethyl-	U068	74-95-3	Methylene bromide
U099	540-73-8	Hydrazine, 1,2-dimethyl-	U080	75-09-2	Methylene chloride
U109	122-66-7	Hydrazine, 1,2-diphenyl-	U159	78-93-3	Methyl ethyl ketone (MEK) (I,T)
U134	7664-39-3	Hydrofluoric acid (C,T)	U160	1338-23-4	Methyl ethyl ketone peroxide (R,T)
U134	7664-39-3	Hydrogen fluoride (C,T)	U138	74-88-4	Methyl iodide
U135	7783-06-4	Hydrogen sulfide	U161	108-10-1	Methyl isobutyl ketone (I)
U135	7783-06-4	Hydrogen sulfide H ₂ S	U162	80-62-6	Methyl methacrylate (I,T)
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethyl- (R)	U161	108-10-1	4-Methyl-2-pentanone (I)
U116	96-45-7	2-Imidazolidinethione	U164	56-04-2	Methylthiouracil
U137	193-39-5	Indeno[1,2,3-cd]pyrene	U010	50-07-7	Mitomycin C
U375	55406-53-6	3-Iodo-2-propynyl n-butylcarbamate.	U365	2212-67-1	Molinate.
U396	14484-64-1	Iron, tris(dimethylcarbamodithioato-S,S'),	U059	20830-81-3	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl]oxy-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U190	85-44-9	1,3-Isobenzofurandione	U167	134-32-7	1-Naphthalenamine
U140	78-83-1	Isobutyl alcohol (I,T)	U168	91-59-8	2-Naphthalenamine
U141	120-58-1	Isosafrole	U026	494-03-1	Naphthalenamine, N,N'-bis(2-chloroethyl)-
U142	143-50-0	Kepone	U165	91-20-3	Naphthalene
U143	303-34-4	Lasiocarpine	U047	91-58-7	Naphthalene, 2-chloro-
U144	301-04-2	Lead acetate	U166	130-15-4	1,4-Naphthalenedione
U146	1335-32-6	Lead, bis(acetato-O)tetrahydroxytri-	U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo) bis-[5-amino-4-hydroxy]-, tetrasodium salt
U145	7446-27-7	Lead phosphate	U279	63-25-2	1-Naphthalenol, methylcarbamate.
U146	1335-32-6	Lead subacetate	U166	130-15-4	1,4-Naphthoquinone
U129	58-89-9	Lindane	U167	134-32-7	alpha-Naphthylamine
U163	70-25-7	MNNG	U168	91-59-8	beta-Naphthylamine
U147	108-31-6	Maleic anhydride	U217	10102-45-1	Nitric acid, thallium(1+) salt
U148	123-33-1	Maleic hydrazide	U169	98-95-3	Nitrobenzene (I,T)
U149	109-77-3	Malononitrile			
U150	148-82-3	Melphalan			
U151	7439-97-6	Mercury			
U384	137-42-8	Metam Sodium.			
U152	126-98-7	Methacrylonitrile (I,T)			
U092	124-40-3	Methanamine, N-methyl- (I)			
U029	74-83-9	Methane, bromo-			

Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
U170	100-02-7	p-Nitrophenol	U377	137-41-7	Potassium n-methyldithiocarbamate.
U171	79-46-9	2-Nitropropane (I,T)	U192	23950-58-5	Pronamide
U172	924-16-3	N-Nitrosodi-n-butylamine	U194	107-10-8	1-Propanamine (I,T)
U173	1116-54-7	N-Nitrosodiethanolamine	U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U174	55-18-5	N-Nitrosodiethylamine	U110	142-84-7	1-Propanamine, N-propyl- (I)
U176	759-73-9	N-Nitroso-N-ethylurea	U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U177	684-93-5	N-Nitroso-N-methylurea	U083	78-87-5	Propane, 1,2-dichloro-
U178	615-53-2	N-Nitroso-N-methylurethane	U149	109-77-3	Propanedinitrile
U179	100-75-4	N-Nitrosopiperidine	U171	79-46-9	Propane, 2-nitro- (I,T)
U180	930-55-2	N-Nitrosopyrrolidine	U027	108-60-1	Propane, 2,2'-oxybis[2-chloro-
U181	99-55-8	5-Nitro-o-toluidine	U193	1120-71-4	1,3-Propane sultone
U193	1120-71-4	1,2-Oxathiolane, 2,2-dioxide	See	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
U058	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-, 2-oxide	F027		
			U235	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U115	75-21-8	Oxirane (I,T)	U140	78-83-1	1-Propanol, 2-methyl- (I,T)
U126	765-34-4	Oxiranecarboxyaldehyde	U002	67-64-1	2-Propanone (I)
U041	106-89-8	Oxirane, (chloromethyl)-	U007	79-06-1	2-Propenamide
U182	123-63-7	Paraldehyde	U084	542-75-6	1-Propene, 1,3-dichloro-
U391	1114-71-2	Pebulate.	U243	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-
U183	608-93-5	Pentachlorobenzene	U009	107-13-1	2-Propenenitrile
U184	76-01-7	Pentachloroethane	U152	126-98-7	2-Propenenitrile, 2-methyl- (I,T)
U185	82-68-8	Pentachloronitrobenzene (PCNB)	U008	79-10-7	2-Propenoic acid (I)
See	87-86-5	Pentachlorophenol	U113	140-88-5	2-Propenoic acid, ethyl ester (I)
F027			U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U161	108-10-1	Pentanol, 4-methyl-	U162	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U186	504-60-9	1,3-Pentadiene (I)	U373	122-42-9	Propham.
U187	62-44-2	Phenacetin	U411	114-26-1	Propoxur.
U188	108-95-2	Phenol	U194	107-10-8	n-Propylamine (I,T)
U048	95-57-8	Phenol, 2-chloro-	U083	78-87-5	Propylene dichloride
U039	59-50-7	Phenol, 4-chloro-3-methyl-	U387	52888-80-9	Prosulfocarb.
U081	120-83-2	Phenol, 2,4-dichloro-	U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro
U082	87-65-0	Phenol, 2,6-dichloro-	U196	110-86-1	Pyridine
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl) bis-, (E)-	U191	109-06-8	Pyridine, 2-methyl-
U101	105-67-9	Phenol, 2,4-dimethyl-	U237	66-75-1	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U052	1319-77-3	Phenol, methyl-			
U132	70-30-4	Phenol, 2,2'-methylenebis-[3,4,6-trichloro-	U164	56-04-2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U411	114-26-1	Phenol, 2-(1-methylethoxy)-, methylcarbamate.	U180	930-55-2	Pyrrolidine, 1-nitroso-
U170	100-02-7	Phenol, 4-nitro-	U200	50-55-5	Reserpine
See	87-86-5	Phenol, pentachloro-	U201	108-46-3	Resorcinol
F027			U202	181-07-2	Saccharin, & salts
See	58-90-2	Phenol, 2,3,4,6-tetrachloro-	U203	94-59-7	Safrole
F027			U204	7783-00-8	Selenious acid
See	95-95-4	Phenol, 2,4,5-trichloro-	U204	7783-00-8	Selenium dioxide
F027			U205	7488-56-4	Selenium sulfide
See	88-06-2	Phenol, 2,4,6-trichloro-	U205	7488-56-4	Selenium sulfide SeS ₂ (R,T)
F027			U376	144-34-3	Selenium, tetrakis-(dimethyldithiocarbamate).
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl) amino]-	U015	115-02-6	L-Serine, diazoacetate (ester)
U145	7446-27-7	Phosphoric acid, lead(2+) salt (2:3)	See	93-72-1	Silvex (2,4,5-TP)
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl S-methyl ester	F027		
U189	1314-80-3	Phosphorus sulfide (R)	U379	136-30-1	Sodium dibutyldithiocarbamate.
U190	85-44-9	Phthalic anhydride	U381	148-18-5	Sodium diethyldithiocarbamate.
U191	109-06-8	2-Picoline	U382	128-04-1	Sodium dimethyldithiocarbamate.
U179	100-75-4	Piperidine, 1-nitroso-	U206	18883-66-4	Streptozotocin
U400	120-54-7	Piperidine, 1,1'-(tetrathiodicarbonyl)-bis-	U277	95-06-7	Sulfallate.
			U103	77-78-1	Sulfuric acid, dimethyl ester
U383	128-03-0	Potassium dimethyldithiocarbamate.	U189	1314-80-3	Sulfur phosphide (R)
U378	51026-28-9	Potassium n-hydroxymethyl-n-methyl-di-thiocarbamate.	See	93-76-5	2,4,5-T
			F027		
			U402	1634-02-2	Tetrabutylthiuram disulfide.

Hazardous waste No.	Chemical Abstracts No.	Substance	Hazardous waste No.	Chemical Abstracts No.	Substance
U207	95-94-3	1,2,4,5-Tetrachlorobenzene	U222	636-21-5	o-Toluidine hydrochloride
U208	630-20-6	1,1,1,2-Tetrachloroethane	U389	2303-17-5	Triallate.
U209	79-34-5	1,1,2,2-Tetrachloroethane	U011	61-82-5	1H-1,2,4-Triazol-3-amine
U210	127-18-4	Tetrachloroethylene	U227	79-00-5	1,1,2-Trichloroethane
See F027	58-90-2	2,3,4,6-Tetrachlorophenol	U228	79-01-6	Trichloroethylene
U213	109-99-9	Tetrahydrofuran (I)	U121	75-69-4	Trichloromonofluoromethane
U401	97-74-5	Tetramethylthiuram monosulfide.	See F027	95-95-4	2,4,5-Trichlorophenol
U214	563-68-8	Thallium(I) acetate	See F027	88-06-2	2,4,6-Trichlorophenol
U215	6533-73-9	Thallium(I) carbonate	U404	121-44-8	Triethylamine.
U216	7791-12-0	Thallium(I) chloride	U234	99-35-4	1,3,5-Trinitrobenzene (R,T)
U216	7791-12-0	Thallium chloride TICI	U182	123-63-7	1,3,5-Trioxane, 2,4,6-trimethyl-
U217	10102-45-1	Thallium(I) nitrate	U235	126-72-7	Tris(2,3-dibromopropyl) phosphate
U366	533-74-4	2H-1,3,5-Thiadiazine-2-thione, tetrahydro-3,5-dimethyl-	U236	72-57-1	Trypan blue
U218	62-55-5	Thioacetamide	U237	66-75-1	Uracil mustard
U410	59669-26-0	Thiodicarb.	U176	759-73-9	Urea, N-ethyl-N-nitroso-
U153	74-93-1	Thiomethanol (I,T)	U177	684-93-5	Urea, N-methyl-N-nitroso-
U402	1634-02-2	Thioperoxydicarbonic diamide, tetrabutyl.	U385	1929-77-7	Vernolate.
U403	97-77-8	Thioperoxydicarbonic diamide, tetraethyl.	U043	75-01-4	Vinyl chloride
U244	137-26-8	Thioperoxydicarbonic diamide [(H ₂ N)C(S)] ₂ S ₂ , tetramethyl-	U248	181-81-2	Warfarin, & salts, when present at concentrations of 0.3% or less
U409	23564-05-8	Thiophanate-methyl.	U239	1330-20-7	Xylene (I)
U219	62-56-6	Thiourea	U200	50-55-5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenz-oyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)-
U244	137-26-8	Thiram	U407	14324-55-1	Zinc, bis(diethylcarbamodithioato-S,S')-
U220	108-88-3	Toluene	U249	1314-84-7	Zinc phosphide Zn ₃ P ₂ , when present at concentrations of 10% or less
U221	25376-45-8	Toluenediamine			
U223	26471-62-5	Toluene diisocyanate (R,T)			
U328	95-53-4	o-Toluidine			
U353	106-49-0	p-Toluidine			

¹CAS Number given for parent compound only.

[45 FR 78529, 78541, Nov. 25, 1980, as amended at 46 FR 27477, May 20, 1981; 49 FR 19923, May 10, 1984; 50 FR 665, Jan. 4, 1985; 50 FR 2000, Jan. 14, 1985; 50 FR 28744, July 15, 1985; 50 FR 42942, Oct. 23, 1985; 51 FR 6541, Feb. 25, 1986; 51 FR 10175, Mar. 24, 1986; 51 FR 28296, Aug. 6, 1986; 52 FR 21306, June 5, 1987; 52 FR 26012, July 10, 1987; 53 FR 13382, Apr. 22, 1988; 53 FR 43881, Oct. 31, 1988; 53 FR 43884, Oct. 31, 1988; 55 FR 22684, June 1, 1990; 56 FR 7568, Feb. 25, 1991; 59 FR 31551, June 20, 1994; 60 FR 7849, Feb. 9, 1995; 60 FR 19165, Apr. 17, 1995; 60 FR 25620, May 12, 1995]

Container Management

The following describes how hazardous waste containers must be managed under RCRA at facilities having a RCRA Part B permit. Facilities operating under "interim status" who do not yet have a Part B permit must meet the same requirements, except for Section 264.175 Containment.

Subpart I—Use and Management of Containers

Source: 46 FR 2866, Jan. 12, 1981, unless otherwise noted.

§ 264.170 Applicability.

The regulations in this subpart apply to owners and operators of all hazardous waste facilities that store containers of hazardous waste, except as § 264.1 provides otherwise.

[Comment: Under § 261.7 and § 261.33(c), if a hazardous waste is emptied from a container the residue remaining in the container is not considered a hazardous waste if the container is "empty" as defined in § 261.7. In that event, management of the container is exempt from the requirements of this subpart.]

§ 264.171 Condition of containers.

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the owner or operator must transfer the hazardous waste from this container to a container that is in good condition or manage the waste in some other way that complies with the requirements of this part.

§ 264.172 Compatibility of waste with containers.

The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

§ 264.173 Management of containers.

(a) A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.

(b) A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

[Comment: Reuse of containers in transportation is governed by U.S. Department of Transportation regulations including those set forth in 49 CFR 173.28.]

§ 264.174 Inspections.

At least weekly, the owner or operator must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors.

[Comment: See §§ 264.15(c) and 264.171 for remedial action required if deterioration or leaks are detected.]

§ 264.175 Containment.

(a) Container storage areas must have a containment system that is designed and operated in accordance with paragraph (b) of this section, except as otherwise provided by paragraph (c) of this section.

(b) A containment system must be designed and operated as follows:

(1) A base must underly the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed;

(2) The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;

- (3) The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination;
- (4) Run-on into the containment system must be prevented unless the collection system has sufficient excess capacity in addition to that required in paragraph (b)(3) of this section to contain any run-on which might enter the system; and
- (5) Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.

[Comment: If the collected material is a hazardous waste under Part 261 of this Chapter, it must be managed as a hazardous waste in accordance with all applicable requirements of Parts 262 through 266 of this chapter. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of Section 402 of the Clean Water Act, as amended.]

(c) Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by paragraph (b) of this section, except as provided by paragraph (d) of this section or provided that:

- (1) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or
- (2) The containers are elevated or are otherwise protected from contact with accumulated liquid.

(d) Storage areas that store containers holding the wastes listed below that do not contain free liquids must have a containment system defined by paragraph (b) of this section:

- (1) F020, F021, F022, F023, F026, and F027.
- (2) [Reserved]

[46 FR 55112, Nov. 6, 1981, as amended at 50 FR 2003, Jan. 14, 1985]

§ 264.176 Special requirements for ignitable or reactive waste.

Containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) from the facility's property line.

[Comment: See § 264.17(a) for additional requirements.]

§ 264.177 Special requirements for incompatible wastes.

(a) Incompatible wastes, or incompatible wastes and materials (see Appendix V for examples), must not be placed in the same container, unless § 264.17(b) is complied with.

(b) Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material.

[Comment: As required by § 264.13, the waste analysis plan must include analyses needed to comply with § 264.177. Also, § 264.17(c) requires wastes analyses, trial tests or other documentation to assure compliance with § 264.17(b). As required by § 264.73, the owner or operator must place the results of each waste analysis and trial test, and any documented information, in the operating record of the facility.]

(c) A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

[Comment: The purpose of this section is to prevent fires, explosions, gaseous emission, leaching, or other discharge of hazardous waste or hazardous waste constituents which could result from the mixing of incompatible wastes or materials if containers break or leak.]

§ 264.178 Closure.

At closure, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

[Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate in accordance with § 261.3(d) of this chapter that the solid waste removed from the containment system is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of Parts 262 through 266 of this chapter.]

Empty Containers

The following describes how empty hazardous waste containers and inner liners must be managed to avoid hazardous waste storage and disposal requirements under RCRA. If a container is empty as defined by Section 261.7(b) it is not a hazardous waste.

While these rules apply to hazardous waste containers the same guidance can be used for empty product containers.

§ 261.7 Residues of hazardous waste in empty containers.

(a)(1) Any hazardous waste remaining in either (i) an empty container or (ii) an inner liner removed from an empty container, as defined in paragraph (b) of this section, is not subject to regulation under Parts 261 through 265, or Part 268, 270 or 124 of this chapter or to the notification requirements of Section 3010 of RCRA.

◆ RCRA—81, 369

(2) Any hazardous waste in either (i) a container that is not empty or (ii) an inner liner removed from a container that is not empty, as defined in paragraph (b) of this section, is subject to regulation under Parts 261 through 265, and Parts 268, 270 and 124 of this chapter and to the notification requirements of Section 3010 of RCRA.

(b)(1) A container or an inner liner removed from a container that has held any hazardous waste, except a waste that is a compressed gas or that is identified as an acute hazardous waste listed in §§ 261.31, 261.32, or 261.33(e) of this chapter is empty if:

◆ RCRA—124

(i) All wastes have been removed that can be removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, and aspirating, *and*

(ii) No more than 2.5 centimeters (one inch) of residue remain on the bottom of the container or inner liner, *or*

(iii)(A) No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 110 gallons in size, or

(B) No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 110 gallons in size.

(2) A container that has held a hazardous waste that is a compressed gas is empty when the pressure in the container approaches atmospheric.

(3) A container or an inner liner removed from a container that has held an acute hazardous waste listed in §§ 261.31, 261.32, or 261.33(e) is empty if:

(i) The container or inner liner has been triple rinsed using a solvent capable of removing the commercial chemical product or manufacturing chemical intermediate;

(ii) The container or inner liner has been cleaned by another method that has been shown in the scientific literature, or by tests conducted by the generator, to achieve equivalent removal; or

(iii) In the case of a container, the inner liner that prevented contact of the commercial chemical product or manufacturing chemical intermediate with the container, has been removed.

[45 FR 78529, Nov. 25, 1980, as amended at 47 FR 36097, Aug. 18, 1982; 48 FR 14294, Apr. 1, 1983; 50 FR 1999, Jan. 14, 1985; 51 FR 40637, Nov. 7, 1986; 55 FR 2322, Jan. 23, 1990]

**Material Safety Data
Sheets (MSDS)**

DSW 122683

Material Safety Data Sheets

Agenda

- Laws impacting MSDS's
- Solutia Policy
- MSDS Preparation & Review
- Interpreting an MSDS
- ANSI MSDS Standard

DSW 122684

Laws Impacting MSDS's

● OSHA

- Hazard communication standard (November, 1983)
- Employee training on hazardous chemicals
- Sellers to communicate through MSDS & labels
- MSDS's for "Hazardous Products" only
- What is a Hazardous Chemical?
 - » OSHA definition is very broad
 - » Not related to risk
 - » Hazard areas:
 - Physical Hazard (i.e. flammable, etc.)
 - Exposure Limit (TLV or PEL)
 - Health Hazard

Laws Impacting MSDS's

● OSHA (Cont'd)

■ What is a Hazardous Chemical? (Cont'd)

» Typical Health Hazards:

- Toxic / Highly Toxic
- Corrosive or Irritant
- Sensitizer
- Carcinogen
- Target Organ (Blood, Kidney . . .)

» Mixtures

- 1% Hazardous Components
- .1% Carcinogens

● SARA Title III

● State right to know

● International

Solutia MSDS Policy

- **MSDS for all products**
- **Provided with first time purchases**
- **Provided to anyone on request**
 - **Lotus Notes Data Base**
- **Resend if significant changes**
- **Review all documents every 3 to 5 years**

American National Standard

*for Hazardous Industrial Chemicals –
Material Safety Data Sheets –
Preparation*

DSW 122688



American National Standards Institute

11 West 42nd Street
New York, New York
10036

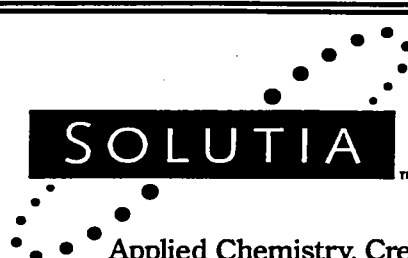
ANSI Standard MSDS

- **Chemical Product and Company Identification**
- **Composition/Information on ingredients**
- **Hazards Identification**
- **First Aid Measures**
- **Fire Fighting Measures**
- **Accidental Release Measures**
- **Handling and Storage**
- **Exposure Control/Personal Protection**

ANSI Standard MSDS

(Continued)

- **Physical & Chemical Properties**
- **Stability and Reactivity**
- **Toxicological Information**
- **Ecological Information**
- **Disposal Considerations**
- **Transport Information**
- **Regulatory Information**
- **Other Information**



SOLUTIA™

Applied Chemistry, Creative Solutions

Material Safety Data Sheet



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ^

MSDS NUMBER: ^ DATE: ^

CHEMICAL FAMILY: ^

CHEMICAL NAME: ^

SYNONYMS: ^

SOLUTIA INC., 10300 OLIVE BOULEVARD, P.O. BOX 66760, ST. LOUIS, MO
63166-6760

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR
ACCIDENT Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the
continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For
calls originating elsewhere: 703-527-3887 (collect calls accepted)

For additional non-emergency information, call: 314-674-6661

DSW 122691

STLCOPCB4032639

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>COMPONENT</u>	<u>CAS NO.</u>	<u>% BY WEIGHT</u>
------------------	----------------	--------------------

^

^

^

[If applicable show *OSHA or #carcinogen statements.]

* Hazardous chemical(s) under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

National Toxicology Program (NTP) and International Agency for Research on Cancer (IARC) listed carcinogen.

+ The specific chemical identity is being withheld because it is trade secret information of Solutia Inc.

DSW 122692

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR: ^

^

POTENTIAL HEALTH EFFECTS

LIKELY ROUTES OF EXPOSURE: ^

EYE CONTACT: ^

SKIN CONTACT: ^

INHALATION: ^

INGESTION: ^

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES: ^

IF ON SKIN: ^

IF INHALED: ^

IF SWALLOWED: ^

DSW 122694

5. FIRE FIGHTING MEASURES

FLASH POINT: ^ degrees F (^ degrees C) METHOD: ^

AUTOIGNITION TEMPERATURE: ^ degrees F (^ degrees C) METHOD: ^

FIRE POINT: ^ degrees F (^ degrees C) METHOD: ^

HAZARDOUS PRODUCTS OF COMBUSTION: ^

EXTINGUISHING MEDIA: ^

UNUSUAL FIRE AND EXPLOSION HAZARDS: ^

FIRE FIGHTING EQUIPMENT: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

[Select appropriate criteria.]

[For most solids ...]

[For most liquids ...]

[For liquids where water may cause dangerous reaction or otherwise create further hazard (such as in sewer) ...]

[For materials that generate vapor or fumes with water ...]

[Only refer to Section 14 if it has a RQ under DOT]

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

[For flammable liquid with flash point = or < 141 F ...]

[For flammable liquid with flash point > 141 & < 200 F ...]

[Non-flammable products ...]

[Only list storage statement if it carries significant information. Do not include a generic non-descript statement.]

STORAGE: ^

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION: ^

SKIN PROTECTION: ^

RESPIRATORY PROTECTION: ^

VENTILATION: ^

AIRBORNE EXPOSURE LIMITS:

PRODUCT/COMPONENT

OSHA PEL

ACGIH TLV

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Formula: ^

Appearance: ^

Odor: ^

pH: ^

Boiling Point @ 760 mm Hg: ^ degrees C

Freezing Point: ^ degrees C

Vapor Pressure: ^mm Hg @ 20 degrees C

Percent Volatile: ^by volume

Viscosity: ^centistoke @ 40 degrees C

Specific Gravity: ^@ 25/25 degrees C

Solubility in Water: ^ (wt. %)

Solubility in Other Solvents: ^

Dust Properties

Kst	^ bar-m/s
MIE	^ mJ
Pmax	^ bar g

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

DSW 122699

10. STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling. Store in a cool, well ventilated place away from foodstuffs, reducing agents and acids.

MATERIALS TO AVOID: ^

HAZARDOUS DECOMPOSITION PRODUCTS: ^

HAZARDOUS POLYMERIZATION: ^

11. TOXICOLOGICAL INFORMATION

Oral - Moderately Toxic (rat LD50 - XXXX mg/kg)

Dermal - Moderately Toxic (rat or rabbit LD50 - XXXX mg/kg)

Inhalation - Moderately Toxic (rat 4-hr LC50 - XXXX mg/l)

Eye Irritation - Moderately Irritating (rabbit, XXX/110.0)

Skin Irritation - Moderately Irritating (rabbit, XX-hr exp, XX/8.0)

12. ECOLOGICAL INFORMATION

[Summary statement here.]

[If Applicable]: The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity. A legend summarizing the classification scheme appears below.

^

Legend for Aquatic Organism Toxicity (Journal of the European Communities, Annex VII A, Section 5.2.1)

Values	Classifications
LC50 or EC50 < or = 1.0 mg/L	Very Toxic
LC50 or EC50 > 1.0 mg/L and < or = 10 mg/L	Toxic
LC50 or EC50 > 10 mg/L and < or = 100 mg/L	Harmful
LC50 or EC50 > 100 mg/L	Practically Nontoxic

[Degradability information here and any other ECO statements as approved by exception.]

13. DISPOSAL CONSIDERATIONS

Identify if [This material] or [This waste].

Is it hazardous?

Is it listed in RCRA Regulation and Keyword Index (40 CFR 261.31 - 34) 1994 Edition "Identification and Listing of Hazardous Waste"?

Is it a characteristic waste?

Identify EPA hazardous waste number.

Identify BDAT (Best Demonstrated Available Treatment).

For organics, always recommend incineration. If liquid, and landfill is suggested say "Solidify before disposal."

Use standard disclaimer and end of section. Dispose of in accordance with local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

US DOT CLASSIFICATION: ^ *

US DOT LABEL: ^

US DOT REPORTABLE QUANTITY: Packages of ^ lbs or more contain a (RQ amount) lb RQ of (RQ chemical name).

SPECIAL PROVISIONS: ^ This material meets the definition of a marine pollutant.

IMDG CODE: ^

IATA/ICAO: ^

* Applies ONLY to containers which contain an RQ.

* Applies ONLY to shipments in bulk or via water transportation

15. REGULATORY INFORMATION

TSCA INVENTORY: ^

Listed

All components are listed.

All intentional components are listed.

This product is not listed and is for research and development only by
TECHNICALLY QUALIFIED INDIVIDUALS under TSCA Section 5 (h)(3).

SARA HAZARD NOTIFICATION

Hazard Categories Under Title III Rules (40 CFR 370): ^

Section 302 Extremely Hazardous Substances: ^

Section 313 Toxic Chemical(s): ^

CERCLA REPORTABLE QUANTITY:

Amount) lb RQ of (RQ Chemical Name)
(RQ Amount) lb RQ of (RQ Chemical Name)
(RQ Amount) lb RQ of (RQ Chemical Name)

Release of more than ^ pounds of this product to the environment in a 24 hour period requires notification to the National Response Center (800-424-8802 or 202-426-2675).

CALIFORNIA PROPOSITION 65: The state of California's Safe Drinking Water and Toxic Enforcement Act of 1986 requires the following label on this product.
WARNING! This product contains chemicals known to the state of California to cause cancer (birth defects or other reproductive harm).

Refer to Section 2 for OSHA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

REASON FOR REVISION: Routine review and conversion to the 16 section format. Supersedes MSDS dated ^.

If Applicable, NSF status (food phosphates)

^® is a registered trademark of Solutia Inc.

Responsible Care ® is a registered trademark of the Chemical Manufacturers Association

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Solutia Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Solutia Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

HAZARD CLASSIFICATION FOR USA INDUSTRIAL MARKETS

EXPOSURE PATH		CLASSIFICATION	TEXT GUIDELINE CODE
INGESTION	☐	Highly Toxic	1.1
	☐	Toxic	1.2
	☐	Harmful	1.3
	☐	≤ Slightly Toxic	1.4
	☐	Non Toxic	1.4
	☐	Adverse G.I. Effect	1.5
	☐	HC Aspiration	1.6
ABSORPTION	☐	Highly Toxic	2.1
	☐	Toxic	2.2
	☐	Harmful	2.3
	☐	≤ Slightly Toxic	2.4
	☐	Non Toxic	2.4
INHALATION	☐	Highly Toxic	3.1
	☐	Toxic	3.2
	☐	≤ Slightly Toxic	3.3
	☐	Severely Irritating	3.4
	☐	Moderately Irritating	3.5
	☐	Respiratory Sensitizer	3.6
	☐	Inert Asphyxiant	3.7
EYE CONTACT	☐	Corrosive	4.1
	☐	Severe Irritant	4.2
	☐	Moderate Irritant	4.3
	☐	≤ Slightly Irritating	4.4
	☐	Gritty Dust	4.4
SKIN CONTACT	☐	Corrosive	4.5
	☐	Severe Irritant	4.6
	☐	Moderate Irritant	4.7
	☐	Defatting Effect	4.7
	☐	≤ Slightly Irritating	4.8
	☐	Gritty Solid	4.8
	☐	Sensitizer	4.9
GOOD HYGIENE	☐	≤ Low Toxicity, Irritation, etc.	6.0
CARCINOGEN	☐	Human	ANSI Category 1
	☐	Probable Human	ANSI Category 2
	☐	Animal/Possible Human	ANSI Category 3
	☐	OSHA Listed Carcinogen	Use OSHA Standard
	☐	NTP Listed or IARC Listed, & not one of the four above	NTP/IARC Listed Only in Section 2 MSDS & none of the above.

MONSANTO LABEL TEXT GUIDELINES FOR PHYSICAL HAZARDS ²							
TYPE	C O D E	CLASSIFICATION CRITERIA	CLASSIFICATION DESCRIPTION (DEGREE OF HAZARD)	MSDS SECTION 5	SIGNAL WORD	STATEMENT OF HAZARD	PRECAUTIONARY MEASURES
FIRE HAZARD	5.1	Flashpoint <20°F closed cup or any Flammable liquid that is DOT/IMO Class 3, Packing Group I	Extremely ¹ Flammable Liquid	Extinguishing media: (Use Fire Action Statement Table to select appropriate instruction for the type of chemical)	DANGER!	EXTREMELY FLAMMABLE LIQUID AND VAPOR VAPOR MAY CAUSE FLASH FIRE	Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.
	5.2	Flashpoint 20°F-141°F closed cup & DOT/IMO Class 3 Packing Group II or III	Flammable ¹ Liquid		WARNING!	FLAMMABLE LIQUID AND VAPOR	Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.
	5.3	Solids readily ignitable, burn vigorously and persistently.	Flammable ¹ Solid		WARNING!	FLAMMABLE SOLID	Keep away from heat, sparks and flame.
	5.4	Flashpoint >141° F to <200°F closed cup.	Combustible ¹ Liquid	Unusual Fire & Explosion Hazards & Fire Fighting Equipment: (Use statements published in past for product or similar products. Seek counsel from Safety Manager for new product with unknown properties)	CAUTION!	COMBUSTIBLE LIQUID LIQUID AND VAPOR	Keep away from heat and flame.
	5.5	Ignites spontaneously in air	Pyrophoric ¹ Chemical		DANGER!	EXTREMELY FLAMMABLE CATCHES FIRE IF EXPOSED TO AIR	Keep away from heat, sparks and flame. Keep container tightly closed.
	5.6	Oxidizes readily and, on contact with combustible material, may cause fire.	Strong Oxidizer ¹		DANGER!	STRONG OXIDIZER CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE	Keep from contact with clothing and other combustible materials. Do not store near combustible materials. Store in tightly closed container. Remove and wash contaminated clothing promptly.
	5.7	Organic or nitrogen ³ containing solid with potential to form dust.	Combustible Solids: ³ Large particles - Small particles -	If this material is milled or the processing generates fines, the fines could form an explosive mixture if dispersed in sufficient quantity in air. This material as normally packaged and handled can contain sufficient fines to form an explosive mixture if dispersed in sufficient quantity in air. MSDS SECTION 6: In case of spill, do not blow material. Use vacuum equipment designed specifically for handling combustible dusts.	WARNING!	COMBUSTIBLE DUST EXPLOSION POTENTIAL	Keep away from heat, sparks, and flame. Avoid creating dust cloud in handling, transfer and clean-up.

Footnotes:

¹ Test criteria and definitions appear in 49CFR173, D.O.T.
² Safety & Property Protection's Procedure Number 16 (MSDS Review) shall govern for products whose properties are unknown or whose properties are not clearly within the classifications specified here.
³ Safety & Property Protection's Procedure 16, Section 6.2.3 through 6.2.5 describes in detail size, physical properties, and testing criteria.
⁴ Use appropriate "Empty Container Statement". See footnote#7 for Guidelines for Immediate Effects.

FIRE ACTION STATEMENTS	
Type of Chemical	Fire Extinguishing Statements
For water-soluble, miscible, or dilutable liquids	In case of fire, use water fog, dry chemical, CO ₂ , or "alcohol" foam.
For water-immiscible liquids with specific gravity <1 (lighter than water)	In case of fire, use water fog, foam, dry chemical, or CO ₂ . Liquid will float and may reignite on surface of water.
For water-immiscible liquids with specific gravity >1 (heavier than water)	In case of fire, use water spray (fog) ¹ , foam, dry chemical, or CO ₂ .
For solids such as oxidizing agents where water is appropriate and not dangerous	In case of fire, use dry chemical, or flood with water.
For solids where water is not appropriate	In case of fire, smother with dry sand, or Class D dry powders.
For flammable gases	In case of fire, allow gas to burn if flow cannot be shut off immediately. Apply water from a safe distance to cool container and protect surrounding area.
¹ Substitute or add appropriate words in parentheses.	

MONSANTO LABEL TEXT GUIDELINES FOR IMMEDIATE EFFECTS								
TYPE	C O D E	CLASSIFICATION CRITERIA	CLASSIFICATION DESCRIPTION (DEGREE OF HAZARD)	EFFECTS FOR MSDS SECTION 3 (POTENTIAL HEALTH EFFECTS) ^{1,4}	SIGNAL WORD (EMER. OVER.) ²	STATEMENT OF HAZARD (EMERGENCY OVERVIEW) ¹	PRECAUTIONARY MEASURES (HANDLING & STORAGE) ^{4,7}	FIRST AID (FIRST AID MEASURES) ^{1,4}
(Con't) CONTACT	4.8	Gritty Dust (PNOC)	No More Than Slightly Irritating Skin	(This [product][component(s)]) is no more than slightly irritating (...is [practically non-irritating][non-irritating]). (Dust grittiness may cause slight irritation.)				IN CASE OF CONTACT, immediate first aid is not likely to be required. However, this material can be removed with (soap and) water. Wash heavily contaminated clothing before reuse.
	4.9		Sensitizer, Skin	(This [product][component(s)]) may cause allergic skin reaction.	WARNING!	MAY CAUSE ALLERGIC SKIN REACTION	Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.	IF ON SKIN, immediately wash with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes] [clothing].) IF IN EYES, immediately flush with plenty of water. If easy to do, remove any contact lenses.
	4.10	Hot Molten as Shipped, ≥140°F	Thermal Burns		WARNING!	HOT MELTED MATERIAL CAUSES THERMAL BURNS TO EYES AND SKIN	Avoid contact with hot liquid.	In case of contact with hot liquid, treat for thermal effects.
GENERAL WORK ENVIRONMENT	6.0	≤ low toxicity, low irritation, etc.	Needs only good industrial hygiene	{indicated elsewhere}		No significant hazards associated with this material	Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of material from eyes, skin and clothing.	{indicated elsewhere}

Footnotes:

- ¹ Use word or phrase in parenthesis only if appropriate.
² Labeling not necessary.
³ Labeling may be proposed.
⁴ Pick one or more of items within brackets.
⁵ If known or expected, based on professional judgement, list systemic toxicity/target organ effects anticipated in human exposure.
⁶ "...Wash skin gently with soap as soon as it is available."
⁷ EMPTY CONTAINER STATEMENTS

Flammable Liquids with flashpoint <141°F or Flammable Solids:
CONTAINER HAZARDOUS WHEN EMPTY. Emptied containers retain vapor and product residue. FOLLOW LABELED WARNINGS EVEN AFTER CONTAINER IS EMPTIED. RESIDUAL VAPORS MAY EXPLODE ON IGNITION. DO NOT CUT, DRILL, GRIND OR WELD ON OR NEAR THIS CONTAINER. Improper disposal or reuse of this container may be dangerous and/or illegal.

Combustible: Liquid with flashpoint ≥ 141°F < 200°F
Standard Statement for Drums and Bulk:
Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.

Optional Safeguard to advise against container reuse (non-bulk containers):
Emptied container retains vapor and product residue. Observe all labeled safeguards until container is destroyed. DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.

Non-Flammable or Non-Combustible (Use only if "Warning Statements" are other than Good Hygiene)
Standard Statement for Drums and Bulk:
Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

Optional Safeguard to advise against container reuse (non-bulk containers):
Emptied container retains vapor and product residue. Observe all labeled safeguards until container is destroyed.

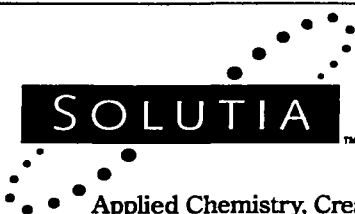
DSW 122710

DSW 122709

MONSANTO LABEL TEXT GUIDELINES FOR IMMEDIATE EFFECTS								
TYPE	C O D E	CLASSIFICATION CRITERIA	CLASSIFICATION DESCRIPTION (DEGREE OF HAZARD)	EFFECTS FOR MSDS SECTION 3 (POTENTIAL HEALTH EFFECTS) ^{1,4}	SIGNAL WORD (EMER. OVER.)	STATEMENT OF HAZARD (EMERGENCY OVERVIEW) ¹	PRECAUTIONARY MEASURES (HANDLING & STORAGE) ^{4,7}	FIRST AID (FIRST AID MEASURES) ^{1,4}
(Con't) INHALATION	 3.7	Asphyxiant	Physiologically Inert Vapor or Gas	(This [product][component(s)]) may cause suffocation (reduces oxygen available for breathing). This may cause dizziness, light headedness, rapid breathing, anxiety, loss of clear thinking, loss of consciousness or death.	CAUTION!	(VAPOR)(GAS) REDUCES OXYGEN AVAILABLE FOR BREATHING	Keep container closed. Use with adequate ventilation. Do not enter storage areas unless adequately ventilated.	IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin and clothing.
CONTACT	4.1		Corrosive, Eye	(This [product][component(s)]) causes eye burns. (Injury; Impaired vision) (may be permanent.)	DANGER!	CAUSES (SEVERE) EYE BURNS	Do not get in eyes, on skin, or on clothing. Avoid breathing [dust, vapor, mist, gas]. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.	IF IN EYES, immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. Remove material from skin and clothing.
	4.2		Severely Irritating, Eye	(This [product][component(s)]) causes intense pain; redness; tearing (inflammation; swelling; itching; burning sensation; burns; blisters; blurred vision; sensitivity to light; sensation of a foreign body).	WARNING!	CAUSES EYE IRRITATION	Avoid contact with eyes. Wash thoroughly after handling.	IF IN EYES, immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. Remove material from skin and clothing.
	4.3		Moderately Irritating, Eye	(This [product][component(s)]) may cause (modest) pain; redness; tearing (inflammation; swelling; itching; burning sensation; burns; blisters; blurred vision; sensitivity to light; sensation of a foreign body).	CAUTION!	MAY CAUSE EYE IRRITATION	Avoid contact with eyes. Wash thoroughly after handling.	IF IN EYES, immediately flush with plenty of water. If easy to do, remove any contact lenses. Get medical attention if irritation persists. Remove material from skin and clothing.
	4.4		No More Than Slightly Irritating, Eye	(This [product][component(s)]) is no more than slightly irritating (...is practically non-irritating).	²	²	²	IF IN EYES, immediate first aid is not likely to be required. However, this material can be removed with water.
		Dust (PNOC)		Dust (or fibers) may cause eye irritation as would any foreign material.				
	4.5		Corrosive, Skin	(This [product][component(s)]) causes skin burns. (The injury may be permanent.)	DANGER!	CAUSES (SEVERE) SKIN BURNS	Do not get in eyes, on skin, or on clothing. Avoid breathing [dust, vapor, mist, gas]. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.	IF IN EYES OR ON SKIN, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.* If easy to do, remove any contact lenses. Get medical attention. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes][clothing].) *for oily or sticky chemicals, see footnote ⁶
	4.6		Severely Irritating, Skin	(This [product][component(s)]) causes (intense; severe) pain; redness; swelling; blisters (dry skin; roughness; burning sensation).	WARNING!	CAUSES SKIN IRRITATION	Avoid contact with eyes, skin and clothing. Wash thoroughly after handling	IF IN EYES OR ON SKIN, immediately flush the area with plenty of water. If easy to do, remove any contact lenses. Remove contaminated clothing.* Get medical attention. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes] [clothing].) *for oily or sticky chemicals, see footnote ⁶
	4.7		Moderately Irritating, Skin (Defatting Effects)	(This [product][component(s)]) may cause (modest) pain; redness; swelling (dry skin; roughness; burning sensation; blisters). (Prolonged repeated) contact with this (product name/component(s)) may result in (mild; slight; modest; intense; severe; serious) redness; dry skin; roughness irritation (pain; swelling; dermatitis; defatting).	CAUTION!	MAY CAUSE SKIN IRRITATION	Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.	IF IN EYES OR ON SKIN, immediately flush the area with plenty of water. If easy to do, remove any contact lenses. Remove contaminated clothing.* Get medical attention if irritation persists. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes] [clothing].) *for oily or sticky chemicals, see footnote ⁶

MONSANTO LABEL TEXT GUIDELINES FOR IMMEDIATE EFFECTS								
TYPE	C O D E	CLASSIFICATION CRITERIA	CLASSIFICATION DESCRIPTION (DEGREE OF HAZARD)	EFFECTS FOR MSDS SECTION 3 (POTENTIAL HEALTH EFFECTS) ^{1,4}	SIGNAL WORD (EMER. OVER.)	STATEMENT OF HAZARD (EMERGENCY OVERVIEW) ¹	PRECAUTIONARY MEASURES (HANDLING & STORAGE) ^{4,7}	FIRST AID (FIRST AID MEASURES) ^{1,4}
(Con't) ABSORPTION	2.2	>200 - ≤1000 mg/kg	Toxic	(This [product][component(s)]) is harmful if absorbed. ⁵	WARNING!	HARMFUL IF ABSORBED THROUGH SKIN	Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.	IF IN EYES OR ON SKIN, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.* Get medical attention. Contact a Poison Control Center. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes] [clothing].) *for oily or sticky chemicals, see footnote ⁶
	2.3	>1000 - ≤2000 mg/kg	Harmful	(This [product][component(s)]) may be harmful if absorbed. ⁵	CAUTION!	MAY BE HARMFUL IF ABSORBED THROUGH SKIN	Avoid prolonged contact with eyes, skin and clothing. Wash thoroughly after handling.	IF IN EYES OR ON SKIN, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.* Get medical attention. Contact a Poison Control Center. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes] [clothing].) *for oily or sticky chemicals, see footnote ⁶
	2.4	>2000 mg/kg >20,000 mg/kg	No more than slightly toxic If Nontoxic or Inert	(This [product][component(s)]) is no more than slightly toxic. (This [product][component(s)]) is not toxic if absorbed.	²	²	²	IF IN EYES OR ON SKIN, immediate first aid is not likely to be required. However, this material can be removed with (soap and) water. Wash heavily contaminated clothing before reuse.
INHALATION	3.1	≤2 mg/l (dust or mist) ≤200 ppm (gas or vapor)	Highly Toxic	(This [product][component(s)]) may be fatal if inhaled. ^{5*} *List usual cause of death.	DANGER!	MAY BE FATAL IF INHALED	Do not breathe [dust, vapor, mist, gas]. Keep container closed. Use only with adequate ventilation.	POISON. Get medical attention. Contact a Poison Control Center. FIRST AID: IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin and clothing.
	3.2	>2-20 mg/l (dust or mist) >200-2000 (gas or vapor)	Toxic	(This [product][component(s)]) may be harmful if inhaled. ⁵	WARNING!	HARMFUL IF INHALED	Avoid breathing [dust, vapor, mist, gas]. Keep container closed. Use with adequate ventilation.	IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin and clothing.
	3.3	>20 mg/l (dust or mist) >2000 ppm (gas or vapor) Particulates not otherwise classified (PNOC/Dust)	No more than slightly toxic	(This [product][component(s)]) is no more than slightly toxic if inhaled (...is not toxic if inhaled). (However, inhalation of the dust may cause coughing and sneezing.)	²	²	²	IF INHALED, immediate first aid is not likely to be required. However, if symptoms occur, remove to fresh air. Remove material from eyes, skin and clothing.
	3.4		Severely Irritating	(This [product][component(s)]) causes (intense; severe; serious) coughing; chest pain; runny nose; burning throat (wheezing; chest tightness; shortness of breath).	WARNING!	CAUSES RESPIRATORY TRACT IRRITATION (or specific organ if appropriate)	Avoid breathing [dust, vapor, mist, gas]. Keep container closed. Use only with adequate ventilation.	IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin and clothing.
	3.5		Moderately Irritating	(This [product][component(s)]) may cause (modest) coughing; chest tightness; runny nose; chest pain; burning throat (wheezing; shortness of breath).	CAUTION!	MAY CAUSE RESPIRATORY TRACT IRRITATION (or specific organ if appropriate)	Avoid breathing [dust, vapor, mist, gas]. Keep container closed. Use only with adequate ventilation.	IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin and clothing.
	3.6	Reported Experience	Severe Sensitizer, Lungs	(This [product][component(s)]) may cause (severe) allergic respiratory reaction. This may include coughing; wheezing; shortness of breath; chest tightness (sneezing; runny nose; scratchy throat; respiratory arrest; death).	WARNING!	MAY CAUSE (SEVERE) ALLERGIC RESPIRATORY REACTION	Do not breathe [dust, vapor, mist, gas]. Keep container closed. Use only with adequate ventilation.	IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin and clothing.

MONSANTO LABEL TEXT GUIDELINES FOR IMMEDIATE EFFECTS								
TYPE	C O D E	CLASSIFICATION CRITERIA	CLASSIFICATION DESCRIPTION (DEGREE OF HAZARD)	EFFECTS FOR MSDS SECTION 3 (POTENTIAL HEALTH EFFECTS) ^{1,4}	SIGNAL WORD (EMER. OVER.)	STATEMENT OF HAZARD (EMERGENCY OVERVIEW) ¹	PRECAUTIONARY MEASURES (HANDLING & STORAGE) ^{4,7}	FIRST AID (FIRST AID MEASURES) ^{1,4}
INGESTION	1.1	≤50 mg/kg	Highly Toxic	(This [product][component(s)]) may be fatal if swallowed. ^{5*} *List usual cause of death.	DANGER!	MAY BE FATAL IF SWALLOWED	Wash thoroughly after handling. Do not taste or swallow.	POISON. Get medical attention. Contact a Poison Control Center. FIRST AID: IF SWALLOWED, rinse mouth thoroughly with water. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. (Induce vomiting only as directed by medical personnel.) Do NOT induce vomiting unless directed by medical personnel. Remove material from eyes, skin and clothing.
	1.2	>50-500 mg/kg	Toxic	(This [product][component(s)]) is harmful if swallowed. ⁵	WARNING!	HARMFUL IF SWALLOWED	Wash thoroughly after handling. Do not taste or swallow.	IF SWALLOWED, rinse mouth thoroughly with water. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Get medical attention. Contact a Poison Control Center. (Induce vomiting only as directed by medical personnel.) Do NOT induce vomiting unless directed by medical personnel. Remove material from eyes, skin and clothing.
	1.3	>500 - ≤2000 mg/kg	Harmful	(This [product][component(s)]) may be harmful if swallowed. ⁵	CAUTION!	MAY BE HARMFUL IF SWALLOWED	Wash thoroughly after handling. Do not taste or swallow.	IF SWALLOWED, rinse mouth thoroughly with water. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Get medical attention. Contact a Poison Control Center. (Induce vomiting only as directed by medical personnel.) Do NOT induce vomiting unless directed by medical personnel. Remove material from eyes, skin and clothing.
	1.4	>2000 - ≤5000 mg/kg	No More Than Slightly Toxic	(This [product][component(s)]) is no more than slightly toxic. Significant adverse health effects are not expected to develop if only small amounts (less than a mouthful) are swallowed.	²	²	²	IF SWALLOWED, immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice. Wash heavily contaminated clothing before reuse.
		>5000 mg/kg	If Nontoxic or inert	(This [product][component(s)]) is not toxic if swallowed.				
	1.5	Clear, colorless, odorless liquid that could be mistaken for a potable liquid.	G.I. Irritation or Damage	(This [product][component(s)]) may cause (modest; severe) nausea, vomiting, abdominal discomfort (burns; irritation; burning sensation (behind the breastbone); abdominal pain; diarrhea; gas; distress).	DANGER! OR WARNING!	CAUSES (SEVERE) DIGESTIVE TRACT (BURNS) (UPSET)	Do not taste or swallow.	IF SWALLOWED, do NOT induce vomiting. (Remove visible particles from mouth and rinse with water.) Offer a glass of water to drink. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
	1.6	Clear, colorless, odorless liquid that could be mistaken for a potable liquid.	Hydrocarbon Aspiration	Significant adverse health effects are not expected to develop if this product is swallowed. Coughing, choking and shortness of breath may occur if material is accidentally drawn into the lungs during swallowing or vomiting.	³	³	³	IF SWALLOWED, do NOT induce vomiting. Rinse mouth with water. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
ABSORPTION	2.1	≤200 mg/kg	Highly Toxic	(This [product][component(s)]) may be fatal if absorbed. ^{5*} *List usual cause of death.	DANGER!	MAY BE FATAL IF ABSORBED THROUGH SKIN	Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.	POISON. Get medical attention. Contact a Poison Control Center. FIRST AID: IF IN EYES OR ON SKIN, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes*. Wash clothing (and thoroughly clean shoes) before reuse. (Destroy contaminated [shoes] [clothing].) *for oily or sticky chemicals, see footnote ⁸



Material Safety Data Sheet



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: DISODIUM PHOSPHATE ANHYDROUS

MSDS Number: 007558794

Date: 09/17/97

Chemical Name: phosphoric acid, disodium salt

Synonyms: DSP; sodium phosphate, dibasic.

SOLUTIA INC., 10300 OLIVE BOULEVARD, P.O. BOX 66760, ST. LOUIS, MO 63166-6760

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT
Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted)

For additional non-emergency information, call: 314-674-6661

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component</u>	<u>CAS No.</u>	<u>% by weight</u>
disodium phosphate anhydrous	7558-79-4	100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor: white granules or powder with no odor

WARNING STATEMENTS

NO SIGNIFICANT HAZARDS ASSOCIATED WITH THIS MATERIAL

POTENTIAL HEALTH EFFECTS

Likely Routes of Exposure: skin contact and inhalation

EYE CONTACT: No more than slightly irritating based on toxicity studies. The dry powder may cause foreign body irritation in some individuals.

SKIN CONTACT: No more than slightly toxic or slightly irritating based on toxicity studies. Prolonged contact with the dry powder may cause drying or chapping of the skin.

INHALATION: Inhalation of the dust may cause coughing and sneezing.

INGESTION: Is not toxic if swallowed based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Swallowing large amounts may cause abdominal discomfort and diarrhea.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES OR ON SKIN, immediate first aid is not likely to be required. However, this material can be removed with water. Wash heavily contaminated clothing before reuse.

IF INHALED, immediate first aid is not likely to be required. However, if symptoms occur, remove to fresh air. Remove material from eyes, skin and clothing.

IF SWALLOWED, immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice. Wash heavily contaminated clothing before reuse.

5. FIRE FIGHTING MEASURES

FLASH POINT: not combustible

HAZARDOUS PRODUCTS OF COMBUSTION: not applicable

EXTINGUISHING MEDIA: not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS: none

6. ACCIDENTAL RELEASE MEASURES

In case of spill, sweep, scoop or vacuum all material, contaminated soil and other contaminated material and place in clean, dry containers for removal. If possible, complete cleanup on a dry basis. After all practical dry cleanup has been done, residual contamination can be flushed with plenty of water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

Handling:

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. THESE PRACTICES INCLUDE AVOIDING UNNECESSARY EXPOSURE AND REMOVAL OF MATERIAL FROM EYES, SKIN, AND CLOTHING.

STORAGE: Product is slightly hygroscopic and should be stored in a dry area to prevent moisture pickup and caking.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION: This product does not cause significant eye irritation or eye toxicity requiring special protection. Use good industrial practice to avoid eye contact.

SKIN PROTECTION: Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

RESPIRATORY PROTECTION: Avoid breathing dust. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure is excessive. Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 C.F.R. 1910.134.

VENTILATION: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

AIRBORNE EXPOSURE LIMITS:

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) which are the least stringent exposure limits applicable to dusts.

OSHA PEL

15 mg/m³ (total dust) 8-hr. TWA
5 mg/m³ (respirable) 8-hr. TWA

ACGIH TLV

10 mg/m³ (inhalable) 8-hr. TWA
3 mg/m³ (respirable) 8-hr. TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Formula:	Na ₂ HPO ₄
Appearance:	white granules or powder
Odor:	none
pH:	9.0 (as a 1% solution)
Solubility in Water:	(g./100 g. H ₂ O):
	1.7 @ 0 degrees C
	11.5 @ 25 degrees C
	51.7 @ 40 degrees C
	78.8 @ 60 degrees C
	102.4 @ 100 degrees C

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling. Store in a cool, dry place to maintain product performance.

MATERIALS TO AVOID: none known

HAZARDOUS DECOMPOSITION PRODUCTS: none

HAZARDOUS POLYMERIZATION: will not occur

11. TOXICOLOGICAL INFORMATION

The dry powder or granules may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Due to the high alkalinity of this product, prolonged contact with the eyes or skin may cause slight irritation. Inhalation of dust has been reported to produce a mild drying effect on the respiratory tract membranes of exposed workers. Excessive inhalation of dust may be annoying and can mechanically impede respiration.

Sodium phosphates have been used as therapeutic agents in medicinal preparations for their laxative effects. These phosphate salts are incompletely absorbed from the intestinal tract. Due to their osmotic activity, they draw water into the intestine and produce purging.

Data from Solutia single-dose (acute) animal studies with this material are given below:

Oral - rat LD₅₀: 5,950 mg/kg; practically nontoxic
Dermal - rabbit LD₅₀: >7,940 mg/kg; practically nontoxic
Eye Irritation - rabbit: 4.2/110.0; slightly irritating
Skin Irritation - rabbit: 0.0/8.0 (24-hr. exp.); nonirritating
DOT skin corrosion - rabbit (4-hr. exp.): not corrosive

This product (in anhydrous and hydrated forms) has produced no genetic changes in standard tests using bacterial cells.

12. ECOLOGICAL INFORMATION

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity. A legend summarizing the classification scheme appears below.

This product (in anhydrous and hydrated forms) has produced no genetic changes in standard tests using bacterial cells.

No algal toxicity data was available for this material.

Legend for Aquatic Organism Toxicity (Journal of the European Communities, Annex VII A, Section 5.2.1)

Values	Classifications
LC50 or EC50 < or = 1.0 mg/L	Very Toxic
LC50 or EC50 > 1.0 mg/L and < or = 10 mg/L	Toxic
LC50 or EC50 > 10 mg/L and < or = 100 mg/L	Harmful
LC50 or EC50 > 100 mg/L	Practically Nontoxic

No biodegradation data was available for this material.

13. DISPOSAL CONSIDERATIONS

This material when discarded is not a hazardous waste as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dry material may be landfilled or recycled in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations

to properly classify your shipment for transportation.

US DOT Classification: Environmentally hazardous substance, solid, n.o.s. (contains sodium phosphate, dibasic), 9, UN3077, III *

US DOT Label: Class 9 *

US DOT Reportable Quantity: Packages of 5,000 lbs or more contain a 5,000 lb. RQ of sodium phosphate, dibasic

IMDG Code: See US DOT

IATA/ICAO: See US DOT

* Applies only to packages containing an RQ quantity, and for shipments by water within the US Coastal Waterway.

15. REGULATORY INFORMATION

TSCA Inventory:

Listed as phosphoric acid, disodium salt

SARA Hazard Notification:

Hazard Categories Under Title III Rules (40 CFR 370): not applicable

Section 302 Extremely Hazardous Substances: not applicable

Section 313 Toxic Chemical(s): not applicable

CERCLA Reportable Quantity: 5,000 lb. RQ of sodium phosphate, dibasic

Release of more than 5,000 lbs. of this product into the environment, must be reported to the National Response Center (800-424-8802 or 202-426-2675).

Refer to Section 11 for OSHA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

Reason for revision: Routine review and conversion to the 16 section format. Also added new name and logo. Supersedes MSDS dated 2/03/92.

This material is certified to ANSI/NSF Standard 60 by NSF® International for use in potable water systems.

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Although the information and recommendations set forth herein (hereinafter 'Information') are presented in good faith and believed to be correct as of the date hereof, Solutia Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Solutia Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Responsible Care
A Public Commitment

Applied Chemistry, Creative Solutions

for molten material: **HOT MELTED MATERIAL CAUSES THERMAL BURNS**

POTENTIAL HEALTH EFFECTS

Likely Routes of Exposure: Skin Contact and inhalation

This product is **HAZARDOUS** by all routes of exposure. Exposure to this product should be tightly controlled. This product has a high potential to cause changes in the blood cells which decrease the oxygen-carrying capacity of the blood. This condition is called methemoglobinemia. As this condition progresses, oxygen deficiency increases (cyanosis occurs), producing possible headache, weakness, irritability, drowsiness, shortness of breath and unconsciousness. The appearance of methemoglobinemia may be delayed 6 to 12 hours after exposure.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

POISON: GET MEDICAL ATTENTION. CONTACT A POISON CONTROL CENTER.

Get patients to fresh air. Remove contaminated clothing but keep patient warm. Start decontamination and indicated treatment immediately. Rescuers must use care to prevent contact with the material.

FIRST AID: IF IN EYES OR ON SKIN, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. As soon as available, wash skin thoroughly with soap and water. Wash clothing thoroughly before reuse. Destroy contaminated shoes.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove material from eyes, skin, and clothing.

IF SWALLOWED, rinse mouth thoroughly with water. **NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.** Do not induce vomiting unless directed by medical personnel. Remove material from eyes, skin and clothing.

NOTE TO PHYSICIANS: Call a Poison Control Center for guidance. If absorbed, this product may cause methemoglobinemia which reduces oxygen carrying capacity of blood. Methemoglobin spontaneously but slowly reverts to hemoglobin after termination of exposure. Asymptomatic patients with methemoglobin levels under 30% generally respond to bed rest, oxygen, and supportive care. Patients with symptoms or with methemoglobin greater than 30% may also respond to intravenous injection of methylene blue. See package insert for indications, dosage, and precautions. Repeat methemoglobin level one to two hours after antidote to assess response. Thorough cleansing of contaminated skin, nails, and hair is essential to prevent continued absorption and methemoglobin formation.

5. FIRE FIGHTING MEASURES

Flash Point: 266 degrees F (130 degrees C)

Method: Cleveland Open Cup

Extinguishing Media: In case of fire, use water spray (fog), foam, dry chemical, or CO2.

Unusual Fire and Explosion Hazards: This material, as normally packaged and handled, can contain sufficient fines to present a potential dust explosion hazard if a sufficient quantity of this material is dispersed in air.

Fire Fighting Equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR LEAK, Keep people away. Keep upwind. Shut off leak if without risk. If necessary to enter spill area, wear self-contained breathing apparatus and full protective clothing including boots. Scoop up and place in container. Wear protective gloves, eye protection, rubber boots and protective, long-sleeved clothing. Use vacuum equipment designed specifically for handling combustible dusts. Keep out of sewer, watersheds, and waterways. Notify pollution control authorities.

Refer to Section 13 for disposal information.

7. HANDLING AND STORAGE

Do not get in eyes, on skin, or on clothing.
Do not breathe (dust, vapor or mist).
Do not taste or swallow.
Keep container closed.
Keep away from sparks and flame.
Avoid creating dust cloud in handling, transfer and clean up.
Use only with adequate ventilation or wear a suitable respirator.
Wash thoroughly after handling

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed. DO NOT REUSE THIS CONTAINER.

Storage: Store in a cool, well ventilated place away from foodstuffs, reducing agents and acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Aromatic amines such as ortho-nitroaniline are known to cause methemoglobinemia in man following oral, dermal, or inhalation exposure.

Eye Protection: Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available.

Skin Protection: ortho-Nitroaniline may be absorbed through the skin causing methemoglobinemia. Care must be taken to prevent skin contact. Wear chemical resistant gloves and boots, and protective long sleeved clothing when there is potential for skin contact. If handled as a liquid, wear a face shield and chemical resistant apron when splashing is likely. Wash contaminated skin immediately and thoroughly with soap and water. Launder contaminated clothing and clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Respiratory Protection: Avoid breathing dust or vapor. Use NIOSH/MSHA approved respiratory protection equipment (full facepiece recommended) when airborne exposure limits are exceeded. (See below). If used, full facepiece replaces need for face shield and/or chemical goggles. Consult respirator manufacturer to determine

appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR ' 1910.134.

Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). The use local mechanical exhaust ventilation at sources of air contamination such as open process equipment is preferred.

Airborne Exposure Limits:

Product: ortho-Nitroaniline

OSHA PEL: Not established

ACGIH TLV: Not established

Solutia has adopted an internal exposure guideline of 3 mg/m³ 8-hour time-weighted average- Skin* for this material.

*Skin notation means that skin absorption of this material may add to the overall exposure. Avoid skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Orange crystalline mass or flakes or orange molten liquid

Melting Point: 71.5 deg. C (106 deg. F)

Crystallizing Point: Refined, 69.7deg. C. min.

Boiling Point: 284 deg. C @ 760 mm Hg
104 deg. C @ 1 mm Hg

Specific Gravity 25/15.5 deg. C: 1.255

Solubility in Water @ 25 deg. C: 0.1%

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: Product is stable under normal conditions of storage and handling.

Materials to Avoid: Strong oxidizing agents, alkalis.

Hazardous Decomposition Products: Decomposition products are oxides of nitrogen, carbon monoxide (CO), soot, and smoke.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

NOTE: Human experience has shown that man is much more sensitive to methemoglobinemia caused by these type of compounds than the rat or the rabbit.

Data from laboratory studies conducted by Solutia and from the scientific literature with ortho-nitroaniline are summarized below.

Single exposure (acute) studies indicate:

Oral -	Slightly Toxic	(Rat LD50 2,050 mg/kg)
Dermal -	Practically Nontoxic	(Rabbit LD50 >7,940 mg/kg)
Inhalation -	Slightly Toxic	(Rat 4-hr LC50 >6.6 mg/l)
Eye Irritation -	Practically Nonirritating	(Rabbit, 1.5/110.0)
Skin Irritation -	Nonirritating	(Rabbit, 24-hr exposure, 0.0/8.0)

No adverse effects were reported in a repeated oral dosing study (2-week) with rats. Following repeated inhalation (4-weeks) of ortho-nitroaniline in ethylene glycol monoethyl ether, testicular effects were observed in rats. Because adverse reproductive effects have been reported in the scientific literature for ethylene glycol monoethyl ether, a second 4-week inhalation study was conducted to determine whether the observed testicular effects were reproducible and related to ortho-nitroaniline itself. In the second study, exposure to ortho-nitroaniline alone had no effect on rat testes. A very slight increase in methemoglobin formation occurred at the highest exposure level in this study.

A single birth defect (situ inversus of the stomach with heart malformation) was observed in two offspring of rats given ortho-nitroaniline orally during pregnancy at an amount which produced toxic effects on the mothers. ortho-Nitroaniline produced no genetic changes in standard tests using animals or animal cells. Both positive and negative responses have been reported in assays using bacterial cells.

12. ECOLOGICAL INFORMATION

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity. A legend summarizing the classification scheme appears below.

48-hr LC50 Daphnia magna: 14.5 mg/l, Harmful

ortho-Nitroaniline was evaluated in a semi-continuous sludge test without acclimation. Primary degradation was approximately 4-18%. Biodegradability is classified as resistant.

Legend for Aquatic Organism Toxicity (Journal of the European Communities, Annex VII A, Section 5.2.1)

Values	Classifications
LC50 or EC50 < or = 1.0 mg/L	Very Toxic
LC50 or EC50 > 1.0 mg/L and < or = 10 mg/L	Toxic
LC50 or EC50 > 10 mg/L and < or = 100 mg/L	Harmful

LC50 or EC50 > 100 mg/L	Practically Nontoxic
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13. DISPOSAL CONSIDERATIONS

This material when discarded is not a hazardous waste as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dispose of by incineration or recycle in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

This product should not be dumped, spilled, rinsed or washed into sewers or public waterways.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

US DOT Classification: Nitroanilines, 6.1, UN1661, II

US DOT Label: POISON

US DOT Reportable Quantity: Not applicable

IMDG Code: See US DOT

IATA/ICAO: See US DOT

15. REGULATORY INFORMATION

TSCA Inventory: Listed

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370):	Immediate
Section 302 Extremely Hazardous Substances:	Not applicable
Section 313 Toxic Chemical(s):	Not applicable

CERCLA Reportable Quantity: Not applicable

Refer Section 13 for RCRA classification.

16. OTHER INFORMATION

Reason for revision: Company name change to Solutia.
Supersedes MSDS dated 1/5/96.

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Environmental Operations

File Library

1. A Story With Spots, Monsanto, 3 copies 3/4" and 6 copies VHS.
2. The Toxic Substances Control Act, Part I, A Special Report, 2 copies 3/4".
3. The Toxic Substances Control Act, A Special Report, Parts I, II and III, 3/4".
4. The Toxic Substances Control Act, Part I, A Special Report, Part II, A Personal Quiz, 2 copies 3/4".
5. Toxic Substances Control Act, Parts I and II, 2 copies VHS.
6. Toxic Substances Control Act, A Special Report, Part I, 3/4".
7. Plastic PEL, TSCA, 1 copy 3/4" and 4 copies VHS.
8. TSCA, Parts I and II, DuPont, 6 copies VHS.
9. EPA, TSCA, 8(c), Recordkeeping, 3/4".
10. TSCA Training, Isolated Intermediate, 5 copies VHS.
11. Burning Issue; Burning Plastic, Today, KSDK-TV5, 8/27/85, VHS.
12. The Air We Breathe Indoors, January 25, 1990, VHS.
13. Working Safely With Formaldehyde, The Formaldehyde Institute, 3 copies VHS.
14. Formaldehyde Exposure Monitoring, The Formaldehyde Institute, VHS.
15. Handling Corrosive Materials, An Audiovisual Training Program, VHS.
16. Carpet Rash, Jack Benny Tape, September 19, 1989, VHS.
17. Common Sense, Bruce Ames, VHS.

For use of video tapes, contact Joani Madden, 314/694-3928, mail zone G4WR.

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IMPLEMENTING PRODUCT STEWARDSHIP A Matrix of Resource Tools and Guidelines

The Product Stewardship Code

The goal of the Product Stewardship Code of Management Practices is to make health, safety, and environmental protection an integral part of designing, manufacturing, marketing, distributing, using, recycling, and disposing of our products. The following materials, available through the Chemical Manufacturers Association or other organizations, may aid companies with implementing the Product Stewardship Code.

INSIDE:

General Guidance

Through its efforts to promote and implement Responsible Care®, CMA has put together numerous materials that assist companies with understanding the broad scope of Product Stewardship, and provide general guidance for implementation. These materials are listed on page 2.

Specific Guidance

CMA and other organizations have developed many other resource tools and guidelines that may aid companies with implementing the Product Stewardship Code. These materials are listed on pages that follow per the format below.

	<u>Product Stewardship Code Management Practice Numbers</u>	<u>See Page</u>
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Ordering Information

You may order CMA resource materials by calling CMA Publications Fulfillment at (301) 617-7824 or using the order form on page 6.

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General Guidance

Resource	Order #	Member/Non
Understanding Responsible Care® Video	047068	\$23.50/NA
Responsible Care® Coordinators Manual	047017	\$29.25/NA
Responsible Care® Overview Brochure	047057	\$.60/\$1.00*
Responsible Care® Code Brochures:		
CAER	047058	\$.60/NA**
Pollution Prevention	047059	\$.60/NA**
Process Safety	047060	\$.60/NA**
Distribution	047061	\$.60/NA**
Employee Health and Safety	047062	\$.60/NA**
Product Stewardship	047063	\$.60/NA**
Product Stewardship Progress Report	047074	\$5.75/\$8.75
Implementing Product Stewardship: A Resource Guide	020015	\$58.50/\$87.75
Product Risk Management Strategy Manual (current draft)	FREE - Call Amy Schofield, CMA at (703) 741-5226	
Product Risk Management Strategy Overview	FREE - Call Amy Schofield, CMA at (703) 741-5226	
PTB Implementation Guidance	FREE - Call Amy Schofield, CMA at (703) 741-5226	
CMA Web Site (includes Responsible Care® information)	http://www.cmahq.com	
CMA Publications and Resource Guide	FREE - Call CMA Publications Fulfillment at (301) 617-7824	
Responsible Care® Management Systems Verification Process	FREE - Call Dan Roczniak, CMA at (703) 741-5306	
Product Stewardship & Quality Management Synergies Tool	FREE - Call Amy Schofield, CMA at (703) 741-5226	

*Responsible Care® Overview Brochures are available at a discount when ordered in large quantities: 1-499 copies, \$.60 members, \$1.00 nonmembers; 500 to 999 copies, \$.50 members, \$.75 nonmembers; over 1,000 copies, \$.40 members, \$.60 nonmembers.

** Responsible Care® Code Brochures are available to members and partners only at a discount when ordered in large quantities: 1-499 copies, \$.60; 500-999 copies, \$.50; over 1,000 copies, \$.40.

Management Leadership and Commitment

Management Practice	Resource	Order #	Member/Non
1. Leadership	Senior Management Tools (Included in "Implementing Product Stewardship: A Resource Guide")	See listing under General Guidance	
2. Accountability and Performance Measurement	Example Internal Measures of Progress	FREE - Call Amy Schofield, CMA at (703) 741-5226	
	Example Practice in Place Criteria	FREE - Call Amy Schofield, CMA at (703) 741-5226	
3. Resources			

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Information and Characterization

Management Practice	Resource	Order #	Member/Non
4. Health, Safety, and Environmental Information	Product Risk Management Strategy Manual	See listing under General Guidance	
5. Product Risk Characterization	Product Stewardship Guidelines for Risk Characterization/Risk Management (Included in "Implementing Product Stewardship: A Resource Guide")	See listing under General Guidance	
	Hazard Characterization Resource Guide	020029	\$17.50/\$26.25
	• Hazard Evaluation Tool • Exposure Evaluation Tool • Public Concern Worksheet (Included in "Product Risk Management Strategy Manual")	See listing under General Guidance	

Risk Management Practices

Management Practice	Resource	Order #	Member/non
6. Risk Management System	Product Stewardship Guidelines for Risk Characterization/Risk Management (Included in "Implementing Product Stewardship: A Resource Guide")	See listing under General Guidance	
	• Industry Product Risk Decision Framework • Product Chemical Risk Management Specification (Included in "Product Risk Management Strategy Manual")	See listing under General Guidance	
	Distribution Code: Risk Management Implementation Aid	047028	\$4.75/\$7.00
	ANSI Z129.1-1994, Precautionary Labeling	020032	\$35/\$52.75
	ANSI Z400.1-1993, Preparation of MSDS	020022	\$58.50/\$87.75
	MSDS Section 12: Ecological Guidance Document	FREE - Call Amy Schofield, CMA at (703) 741-5226	
7. Product and Process Design, and Improvement	Product Stewardship Guidelines for Product and Process Design and Modification (Included in "Implementing Product Stewardship: A Resource Guide")	See listing under General Guidance	
	Designing Pollution Prevention Into the Process: Research, Development & Engineering	022018	\$41/\$61.50
	Managing Process Change	022020	\$23.50/\$35
	A Resource Guide for Implementing Process Safety Code of Management Practices	047024	\$29.25/\$44

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Risk Management, Con't

Management Practice	Resource	Order #	Member/non
8. Employee Education and Product Use Feedback	Responsible Care® Every Hour, Every Day Employee Awareness Kit	047073	\$87.75/NA
	Responsible Care® Every Hour, Every Day Employee Awareness Brochure	047072	\$1.75/NA
	The Power of Product Stewardship for Sales and Marketing Professionals: Brochure	020016	\$1.25/1.75
	Video	020023	\$58.50/87.75
	Marketing the Added Value of Product Stewardship Brochure	020025	\$1.25/\$1.75
	Product Stewardship: Beyond the Fenceline Video	041014	\$41/\$61.50
	Operations Training Guide for Process Safety	022017	\$29.25/\$44
	Employee Health and Safety Code Video	047054	\$46.75/\$70.25
	Employee Health and Safety Resource Guide	020013	\$29.25/\$43.75
9. Contract Manufacturers	Product Stewardship Assessment Review Guidelines for Contract Manufacturers (Included in "Implementing Product Stewardship: A Resource Guide")	See listing under General Guidance	
10. Suppliers	Product Stewardship Assessment Review Guidelines for Suppliers (Included in "Implementing Product Stewardship: A Resource Guide")	See listing under General Guidance	
	Customer/Supplier Self Assessment	170002	\$19/\$28.50
11. Distributors	A Guide to the Distribution Code of Management Practices	047027	\$9.50/\$14
	Chemical Distributors Self-Assessment Protocol	047049	\$11.75/\$17.50
	Product Stewardship Code Assessment Protocol for Chemical Distributors	047065	\$4.75/\$7.00
	Distribution Code Video	041009	\$23.50/\$35
	CMA Implementation Manual, Improving Safety in Hazardous Materials Rail Shipments	026002	\$11.75/\$17.50
	DOT General Awareness Training Video and Workbook	026033	\$35/\$52.75
	Distribution Code Resource Guide	026047	\$29.25/\$44
	Carrier Safety: Motor Carrier Assessment Protocol	026039	\$16.50/\$24.50
	Carrier Safety: Rail Carrier Assessment Protocol	026044	\$16.50/\$24.50

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Risk Management, Con't.

Management Practice	Resource	Order #	Member/non
Distributors, con't.	Carrier Safety: Barge Carrier Assessment Protocol	026045	\$16.50/\$24.50
	Carrier Safety: Container Carrier Assessment Protocol	026043	\$16.50/\$24.50
	Distribution Code: Carrier Safety Implementation Aid	047043	\$5.75/\$8.75
	Distribution Code: Risk Management Implementation Aid	047028	\$4.75/\$7.00
12. Customers and Other Direct Product Receivers	Product Stewardship Assessment Review Guidelines for Customers (<i>Included in "Implementing Product Stewardship: A Resource Guide"</i>)	See listing under General Guidance	
	Customer/Supplier Self-Assessment	170002	\$19/\$28.50
	The Power of Product Stewardship for Sales and Marketing Professionals		
	Brochure	020016	\$1.25/\$1.75
	Video	020023	\$58.50/\$87.75
	Marketing the Added Value of Product Stewardship Brochure	020025	\$1.25/\$1.75

Other Aids

Resource	
National Association of Chemical Distributors (NACD) Product Stewardship Resource Guide	Available on-line at www.nacdef.com

Order Form

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