United States
Environmental Protection
Agency

Office of Information
Analysis and Access

March 2000

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT SECTION 313

EPCRA/TRI TRAINING MATERIALS:

Spring 2000

TWO DAY WORKSHOP

2202002

EPA
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TRAINING DISCLAIMER

#45231108

This document was developed for the sole purpose of helping potential reporters understand and comply with the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA). Nothing in this document is intended to independently alter, supplement, or revoke the statutory and/or regulatory requirements imposed by EPCRA section 313 and the applicable regulations at 40 CFR 372, et seq. Although these training materials provide an overview of the section 313 reporting requirements, facilities should consult the statute and regulations when developing threshold determinations and calculating releases and other waste management amounts. Facilities should be aware that EPA also provides guidance documents containing both sector specific guidance and guidance on specific elements of the EPCRA section 313 program. Covered facilities are encouraged to consult these guidance documents for additional assistance. Facilities may also receive assistance by contacting the EPCRA Hotline at (800) 424-9346. This document was prepared specifically for Reporting Year 1999, for reports due on July 1, 2000. Facilities should be aware that EPA may promulgate regulatory changes to the EPCRA section 313 program that may alter reporting requirements for future reporting years.

TOXICS RELEASE INVENTORY PROGRAM

WHO MUST REPORT?

- Facilities (Private- and Public-sector)
  - In covered primary SIC code(s); and
  - With 10 or more full time employees (equivalent of 20,000 hours per year); and
  - That exceed manufacture, or process, or otherwise use thresholds for each Section 313 chemical

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WHAT TO REPORT?

- File a TRI report for each Section 313 chemical exceeding threshold
- Submit to U.S. EPA, designated state officials or designated tribal office

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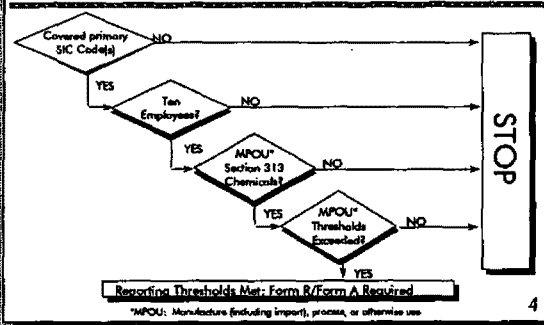
TRI REPORTING PROCESS



COVERED SIC CODES

Industrial Sector	Primary SIC code
Manufacturing	20-39
Metal mining	10 (except 1011, 1081, and 1094)
Coal mining	12 (except 1241)
Electrical utilities	4911, 4931, and 4939, limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce
Treatment, Storage, and Disposal facilities	4953, limited to RCRA Subtitle C permitted or interim status facilities
Solvent recovery services	7389, limited to facilities primarily engaged in solvent recovery services on a contract or fee basis
Chemical distributors	5169
Petroleum bulk terminals	5171

FEDERAL FACILITIES

- **Federal facilities (covered by Executive Order 12856)**
  - **Owned or operated by Executive Branch agencies**
    - **No restrictions based on SIC code**
    - **Includes laboratories, prisons, parks, hospitals**
  - **With 10 or more full-time employees (equivalent of 20,000 hours per year)**
  - **That exceed manufacture, or process, or otherwise use thresholds**
  - **Agency responsible for reporting on activities at Federal facilities that are conducted by, for, or in support of the agency**

SIC CODES

- EPCRA Section 313 subjects facilities to reporting based on classification of primary activities in the Standard Industrial Classification (SIC) system (40 CFR 372.22)
- On April 9, 1997 (62 FR 17288), the North American Industry Classification (NAIC) System was implemented
- SIC codes are to be used until EPA transitions to new NAIC system in future reporting years
- A crosswalk exists between the SIC and new NAIC codes (see 62 FR 172188)

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DEFINITION OF "FACILITY"

- "Facility - all buildings, equipment, structures, and other stationary items which are located on a single site or contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with, such person)." (EPCRA §329(4))
- Establishment - an unique and separate economic unit of a "facility"
- Auxiliary facility - primarily supports another establishment's activities

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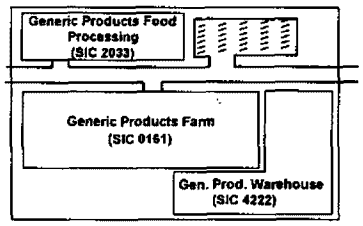
MULTI-ESTABLISHMENT FACILITY

Three separate establishments located on contiguous/adjacent property owned by same person(s), is one facility under EPCRA



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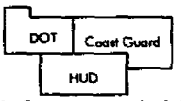
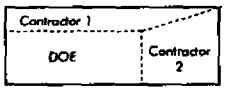
MULTI-ESTABLISHMENT FACILITY

- Determining how facilities report
  - Federal facilities and federal contractors (GOCOs)



Ex. 1: Two separate reporting facilities (HUD and DOT including Coast Guard)



Ex. 2: One reporting facility (DOE)

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AUXILIARY FACILITY

- *Non-contiguous and non-adjacent to a covered establishment*
- Primary function is to support a covered establishment's activities (e.g., warehouses, laboratories)
- Assumes SIC code of covered establishment for reporting purposes
- Employee and chemical activity threshold determinations are separatel

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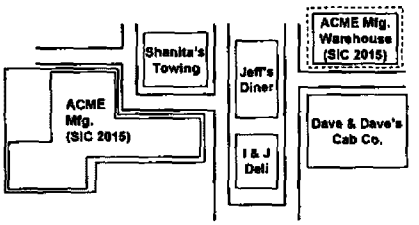
AUXILIARY FACILITY

ACME Mfg. Facilities
(Warehouse is auxiliary facility of ACME Mfg.)



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EMPLOYEE THRESHOLD

- 10 full-time employee (20,000 hours) threshold
  - Worked at or directly for facility
  - Includes operational staff, administrative staff, contractors, dedicated sales staff, company drivers, off-site direct corporate support
  - Does NOT include contract drivers or janitorial contractors
- Determinations based on available time management systems/data

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THRESHOLDS TRIGGERING SECTION 313 REPORTING

- A facility meeting all criteria must file a TRI report for a Section 313 chemical if the facility:
  - Manufactured (including imported) more than 25,000 pounds per year, or
  - Processed more than 25,000 pounds per year, or
  - Otherwise used more than 10,000 pounds per year
- Activity thresholds are mutually exclusive
- Threshold calculations are based on cumulative quantities per Section 313 chemical over the reporting year

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CATEGORIES OF MANUFACTURING ACTIVITIES

- Manufacturing - generating a Section 313 chemical
  - Intentionally producing chemicals for:
    - Sale
    - Distribution
    - On-site use or processing (e.g., intermediates)
  - Coincidentally producing chemicals as impurities or byproducts:
    - At any point at the facility, including waste treatment and fuel combustion
  - Importing
    - "Cause" to be imported

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MANUFACTURING WITHIN A CHEMICAL CATEGORY

- Chemical conversion within a metal or organic compound category must be counted towards the manufacturing threshold
- For Example:
  - A copper mine converts copper sulfide to copper sulfate in its beneficiation operations
    - » Copper sulfate, a member of the copper compounds category, is "manufactured"

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CATEGORIES OF PROCESSING ACTIVITIES

- Processing - preparation of a Section 313 chemical for further distribution in commerce
  - Using as a reactant to manufacture another substance or product
  - Adding as a formulation component
  - Incorporating as an article component
  - Repackaging for distribution
    - » Including quantities sent off-site for recycling

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REPACKAGING AS A PROCESSING ACTIVITY

- Repackaging a Section 313 chemical for distribution into commerce is considered processing
  - Repackaging includes transfer:
    - » From container to tanker truck and visa versa
    - » Between similar size containers
    - » Via pipeline to/from a tank
  - Repackaging does not include:
    - » Sampling without repackaging
    - » Re-labeling
- Repackaging without distribution into commerce is not considered processing

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OTHERWISE USE

- Otherwise using - includes most activities that are not manufacturing or processing

  Examples

  - Chemical processing aid (e.g., solvents)
  - Manufacturing aid (e.g., lubricants, refrigerants)
  - Ancillary activities (e.g., chemicals used to remediate wastes)

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OTHERWISE USE (CONTINUED)

- Otherwise use of a Section 313 chemical also includes disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction if:
  - Section 313 chemical was received from off-site for the purposes of further waste management, or
  - Section 313 chemical was manufactured as a result of waste management activities on materials received from off-site for the purpose of further waste management
- Waste management activities include recycling, combustion for energy recovery, treatment for destruction, waste stabilization and release (including disposal)

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CALCULATING ACTIVITY THRESHOLDS

- Calculate total amount of Section 313 chemical to a threshold activity
  - Example:
    - » A plant uses MEK to manufacture liquid industrial adhesive for distribution in commerce. The plant adds 27,000 lbs. of MEK to the liquid adhesive-making operation during the reporting year, but 3,000 lbs. are volatilized during the operation
    - » 27,000 lbs. of MEK is processed, reporting required

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CALCULATING ACTIVITY THRESHOLDS

- Activities that do NOT constitute an activity threshold
  - Storage
  - Remediation of on-site contamination
  - Re-labeling without repackaging

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SECTION 313 CHEMICALS AND CHEMICAL CATEGORIES

- Original list developed from Maryland "High Production Volume" and New Jersey "Right to Know" chemical lists
- Current list contains over 600 individual chemicals and chemical categories (See Table II of the *TRI Reporting Forms and Instructions* document)
- Petition process to add or delete chemicals or forms of chemicals

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EPCRA SECTION 313 CHEMICAL QUALIFIERS

- Qualifiers - Listed chemicals with parenthetic qualifiers subject to TRI reporting only if manufactured, processed, or otherwise used in specified form. Below are some examples:

CHEMICAL	CAS#	QUALIFIER
Aluminum	7429-90-5	Fume or dust
Aluminum oxide	1344-28-1	Fibrous forms
Asbestos	1332-21-4	Friable forms
Isopropyl alcohol	67-63-0	Manufactured by strong acid process
Phosphorus	7723-14-0	Yellow or white
Saccharin	81-07-2	Manufacture only
Hydrochloric acid	7647-01-0	Acid aerosols
Sulfuric acid	7664-93-9	Acid aerosols

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EPCRA SECTION 313 CHEMICALS

- Calculate threshold determinations and releases and other waste management estimates by multiplying the percentage of a Section 313 chemical by the total amount of the mixture, other trade name product, or waste
  - Example: 80,000 pounds of a solvent containing benzene was used on-site at the facility to clean machinery. The solvent contains 10% benzene.
    - » 80,000 pounds X 10% = 8,000 pounds otherwise used

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COMPOUND CATEGORIES

- Count together all compounds that fall within a category, even if different compounds within a category are used in separate operations
  - For example, if a facility processes 20,000 lbs. of methylene bis(phenylisocyanate) (MDI) in one operation and 10,000 lbs. of 1,4-Cyclohexane diisocyanate in another operation during the reporting year
    - » 30,000 lbs. of diisocyanates have been processed. Reporting for diisocyanates category is required!
- Consider the entire weight of the compounds in the category when determining thresholds
  - Calculations for release and other waste management estimate are different for metal and nitrate compounds

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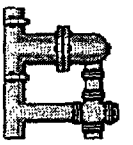

SECTION 313 REPORTING EXEMPTIONS

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SECTION 313 EXEMPTIONS

- Originally designed for manufacturing facilities to:
  - Reduce burden of reporting associated with small or ancillary chemical uses
  - If an exemption applies, then the amount of an EPCRA Section 313 chemical subject to the exemption does not have to be included in:
    - Threshold determinations
    - Release and other waste management reporting
    - Supplier notification
- Recognize that exemptions only apply to certain limited circumstances

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SECTION 313 EXEMPTIONS

- Types of exemptions
  - *De minimis*
  - Articles
  - Laboratory activities
  - Motor vehicle maintenance
  - Routine janitorial or facility grounds maintenance
  - Structural components
  - Personal use
  - Intake water and air
  - Mining (extraction activities and overburden)

3

DE MINIMIS EXEMPTION

- The quantity of a Section 313 chemical in a mixture or other trade name product is eligible for the exemption if the chemical is:
  - An OSHA-defined carcinogen present at a concentration of less than 0.1% by weight

    or
  - Any other Section 313 chemicals present at a concentration of less than 1% by weight

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DE MINIMIS EXEMPTION
How It Works

- *De minimis* exemption can apply to:
  - Chemicals in mixtures or other trade name products processed or otherwise used
  - Chemicals coincidentally manufactured as impurities that remain in products
  - Chemicals imported in mixtures or other trade name products

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DE MINIMIS EXEMPTION
How It Works

- *De minimis* exemption does not apply to:
  - Manufacturing chemicals (in most cases)
  - Manufacturing chemicals as by-products
  - Coincidentally manufacturing chemicals
    - As by-products of waste treatment or fuel combustion

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DE MINIMIS EXEMPTION
How It Works

- *De minimis* exemption does not apply to:
  - Wastes and waste streams, from non-exempt sources, that are processed or otherwise used
    - » Wastes received from off-site for purposes of on-site incineration
  - Releases and other waste management activities from mixtures or other trade name products that are not associated with a processing or otherwise use activity
    - » Material storage not associated with processing or otherwise use activities

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DE MINIMIS EXEMPTION
How It Works

- *De minimis* concentration for toluene is 1.0% (not an OSHA carcinogen)

Cleaning Mixture
0.5% Toluene
(exempt)

Raw Material Mixture
90% Toluene
(not exempt)

- Toluene in cleaning mixture is below *de minimis* concentration and is eligible for the exemption

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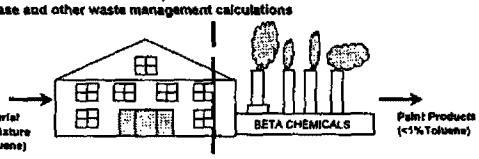
DE MINIMIS EXEMPTION
How It Works

- Processing a Section 313 chemical in a mixture to below the *de minimis* concentration does not exempt the chemical fromthreshold determinations and release and other waste management calculations



Toluene > 1%	Toluene <1%
De minimis exemption does not apply	*De minimis* exemption does not apply
Threshold determination required	Threshold determination required
Release and other waste management calculations required	Release and other waste management calculations still required

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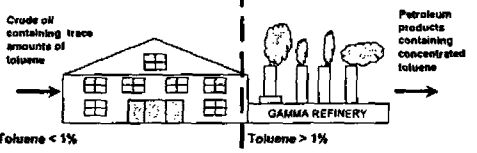
DE MINIMIS EXEMPTION
How It Works

- Processing a Section 313 chemical in a mixture to above the *de minimis* concentration triggers threshold determinations and release and other waste management calculation requirements



Toluene < 1%	Toluene > 1%
De minimis exemption can apply	*De minimis* exemption does not apply
Do not include in threshold	Threshold determination required
Do not include in release and other waste management calculations	Release and other waste management calculations required

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ARTICLES EXEMPTION

- "Article" is defined as an item that is already manufactured and:
  - Is formed into a specific shape or design during manufacture; and
  - Has end-use functions dependent in whole or in part on its shape or design during end-use; and
  - Does not release a Section 313 chemical under normal processing or otherwise use conditions at a facility
- EPCRA Section 313 chemicals otherwise used to manufacture an article are not exempt

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ARTICLES EXEMPTION
How It Works

- Releases from an article may negate the exemption. To maintain the article status, total releases from all like items must be:
  - In a recognizable form
  - Recycled or
  - 0.5 pounds or less (may be rounded down to zero)
- If more than 0.5 pounds of a Section 313 chemical are released from all like items in a non-recognizable form and is not recycled, none of the items meet the article exemption.

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ARTICLES EXEMPTION
How It Works

- Example:
  Wire is cut to specified lengths. Wastes include off-spec cuts and dust.
  - Dust and off-spec cuts not recognizable as articles, released from like items in quantities greater than 0.5 pounds, and not recycled, negate the article status
  - Generation of off-spec cuts that are recognizable as articles will not, by itself, negate the article status

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LABORATORY ACTIVITIES EXEMPTION

- Section 313 chemicals manufactured, processed, or otherwise used in certain laboratory activities, performed under the supervision of a technically qualified individual, may be eligible for the exemption
- Activity must occur in a laboratory to be exempt
- Laboratories, themselves, are not exempt

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LABORATORY ACTIVITIES EXEMPTION

- Definition of technically qualified individual (40 CFR 720.3(ee))
  - Capable of understanding the health and environmental risks associated with the chemical substance which is used under his or her supervision because of education, training, or experience, or a combination of these factors;
  - Responsible for enforcing appropriate methods of conducting scientific experimentation, analysis, or chemical research to minimize such risks; and
  - Responsible for the safety assessments and clearances related to the procurement, storage, use, and disposal of the chemical substance as may be appropriate or required within the scope of conducting a research and development activity.

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LABORATORY ACTIVITIES EXEMPTION
How It Works

Section 313 chemicals manufactured, processed, or otherwise used in these laboratory activities are eligible for the exemption

- Sampling and analysis
- Quality assurance
- Quality control

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LABORATORY ACTIVITIES EXEMPTION
How It Works

Section 313 chemicals manufactured, processed, or otherwise used in these laboratory activities are NOT exempt

- Any activities conducted outside laboratories
- *Specialty chemical production*
- Pilot-scale plant operations
- Support services
  - Photo processing
  - Equipment maintenance / cleaning

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MOTOR VEHICLE MAINTENANCE EXEMPTION

- Section 313 chemicals otherwise used to maintain motor vehicles operated by the facility are eligible for the exemption
- *Examples of motor vehicles eligible for the exemption include* cars, trucks, and forklifts
- Examples of exempt motor vehicle maintenance:
  - Body repairs
  - Parts washing and plating
  - *Fueling and adding other fluids (e.g., ethylene glycol)*

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ROUTINE JANITORIAL OR FACILITY GROUNDS MAINTENANCE EXEMPTION

- Section 313 chemicals contained in products otherwise used for non-process related routine janitorial or facility grounds maintenance are eligible for the exemption
  - Phenol in bathroom disinfectants
  - Pesticides in lawn care products
- Section 313 chemicals otherwise used in the following process-related activities are not exempt
  - Facility equipment maintenance
  - Cleaning or maintenance activities that are integral to the production process of the facility

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STRUCTURAL COMPONENT EXEMPTION

- The otherwise use of Section 313 chemicals, that are part of structural components of a facility, are eligible for the exemption provided the structure is not process related
  - Copper in pipe used in construction of employees' bathroom facilities
  - Metals, pigments, and solvents in paint applied to facility structure

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OTHER SECTION 313 EXEMPTIONS

- Section 313 chemicals contained in non-process related items for employee personal use
  - HCFC 22 in air conditioners used solely for employee comfort
  - Chlorine used to treat on-site potable water
  - Phenol in a facility medical dispensary
- Section 313 chemicals found in intake water (e.g., process water and non-contact cooling water) and air (e.g., used as compressed air)

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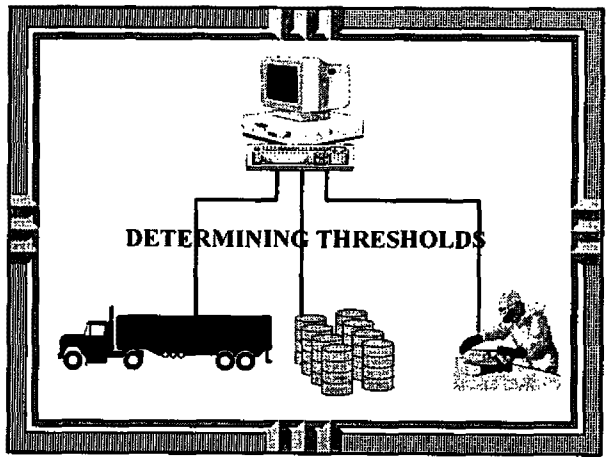
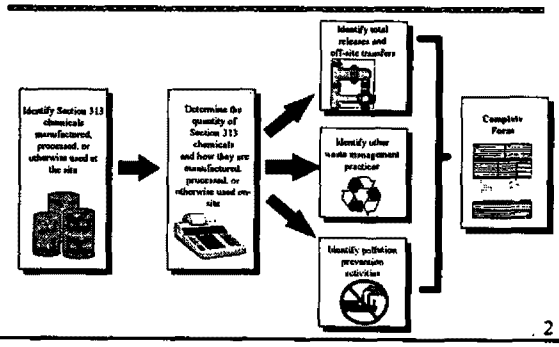
SIC CODE-SPECIFIC EXEMPTIONS

- SIC Code 12: Coal mining extraction activities are exempt from threshold determinations and release reporting (40 CFR 372.38(g))
  - Coal extraction: the physical removal or exposure of ore, coal, minerals, waste rock, or overburden prior to beneficiation, and encompasses all extraction-related activities prior to beneficiation. (40 CFR 372.3)
- *SIC Code 10: Chemicals in overburden are specifically exempt* from TRI reporting (See 40 CFR 372.38(h))
  - Overburden: unconsolidated material that overlies a deposit of useful materials or ores (40 CFR 372.3)



TRI REPORTING PROCESS



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DETERMINING THRESHOLDS

- Identify what Section 313 chemicals are handled on-site
- Identify concentrations of Section 313 chemicals
- Collect data and calculate quantities towards each threshold

3

DETERMINING THRESHOLDS

Identify Chemicals and Concentrations:	Collect Data to Calculate Thresholds:
MSDS	Inventory Records
Specifications	Throughput/Production Data
Waste Profiles	Purchase Records
Process Knowledge	*EPCRA or Other Env. Reports*
Other References (AP-42, Merck Index)	Ask the User
Supplier Notification	Call the Vendor

4

DETERMINING CONCENTRATIONS OF SECTION 313 CHEMICALS

- Chemical component - include in threshold "each listed Section 313 chemical known to be present" at a concentration greater than the *de minimis* limits (EPCRA §313 (g)(1)(C))
  - "Known" - knowledge based on MSDS, analytical data, process knowledge, labeling, literature, other vendor-supplied information, or existing analysis
  - *If concentration is unknown, threshold determination for the Section 313 chemical is not required (40 CFR 372.30(b)(3))*

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SUPPLIER NOTIFICATION FOR MIXTURES AND OTHER TRADE NAME PRODUCTS

- Supplier Notification - requires suppliers to facilities described in 40 CFR 372.22 to:
  - *Identify Section 313 chemical(s) by name and CAS number*
  - Identify Section 313 chemical(s) as being subject to EPCRA Section 313 requirements
  - *Provide concentration (or range) of Section 313 chemicals in mixtures and other trade name products (not wastes)*
  - Provide notification at least annually in writing or attached to the MSDS
  - Update notification when changes occur
  - Only facilities in primary SIC codes 20-39 must initiate the notification

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DETERMINING CONCENTRATIONS IN MIXTURES OR OTHER TRADE NAME PRODUCTS

- Include a Section 313 chemical in the threshold determinations if you know:
  - Exact concentration - use concentration provided
  - Upper bound - use upper limit
  - Range - use the midpoint of the range
  - Lower bound - subtract out other known constituents, create a range, and use the midpoint of range

Note: Thresholds are based on weight in pounds.

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DETERMINING CONCENTRATIONS IN WASTES

- De minimis exemption does not apply to wastes that are processed or otherwise used
- If concentration is exact, upper bound, range, or lower bound, use the guidance for mixtures and other trade name products
- If concentration is below detection limit, use engineering judgment:
  - If the Section 313 chemical is expected to be present, assume 1/2 of full detection limit
  - If the Section 313 chemical is not expected to be present, assume 0

8

MEETING MULTIPLE THRESHOLDS

- There are many situations where one Section 313 chemical must be counted towards multiple activity thresholds
  - Section 313 chemicals manufactured or imported on-site, then used or incorporated into a product (processed)
  - Section 313 chemicals formed during destruction of wastes received from off-site and subsequently destroyed on-site (manufactured and otherwise used)
  - Section 313 chemicals that are otherwise used on-site, recycled, then processed
- Section 313 chemicals should not be counted twice towards the same activity threshold

9

WATCH FOR DOUBLE COUNTING!!!

- For threshold determinations, Section 313 chemicals reused or recycled at a facility: count original amount used only once
  - Note: Section 313 chemicals sent off-site for recycling and returned to the facility are considered new materials and counted for threshold determinations
  - For materials in use from previous years: count only the *quantity added during current reporting year*

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MULTI-ESTABLISHMENT FACILITY

- Determining how facilities report
  - Multi-establishment facility
    - » Apply threshold determination on aggregate amount of chemicals used at facility
    - » Able to file separate Form R reports for each establishment if they are distinct economic entities (must be designated as part of a facility on Form R)
    - » Report all releases and other waste management activities of reportable Section 313 chemicals
    - » Avoid double-counting of chemicals involved in intra-facility transfers

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CALCULATING THRESHOLDS

- Consider all activities
  - Chemicals used in neutralization, refrigerants, cleaners, paints, lubricants (for non-vehicles), fuel (for non-vehicles), refractory bricks
  - Consider all sources
  - Purchasing/Inventory Control
  - Contractors
  - Bulk deliveries
  - Capital purchases
  - "Credit card" or "emergency" purchases

12

ORCHESTRATING DATA COLLECTION

- Methods for orchestrating data collection
  - Coordinate with purchasing/vendors
  - Develop inventory controls
  - Require requisition or "sign out" procedure for Section 313 chemicals
  - Take year-end inventories
- Identify ALL chemical purchasing and usage
- Threshold determination worksheets

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OPTIONAL SECTION 313 THRESHOLD DETERMINATION WORKSHEET

Facility Name: OMNI CHEMICAL Date Worksheet Prepared: _____
Toxic Chemical or Chemical Category: Toluene Prepared By: J.S.P.
Reporting Year: _____

Step 1. Identify amounts of the toxic chemical manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Percent by Weight	Total Weight (in lbs)	Amount of the Listed Toxic Chemical by Activity (in lbs)		
				Manufactured	Processed	Otherwise Used
1. Joe's Degreaser	Purchasing	50	10,000			5,000
2. Yellow Safety Paint	Vendor	5	30,000			1,500
3. Parts Washer Fluid	Purchasing	40	10,000			4,000
4.						
5.						
6.						
7.						
Subtotal:				(A) _____ lbs.	(B) _____ lbs.	(C) 10,500 lbs.

Step 2. Identify exempt forms of the toxic chemical that have been included in Step 1.

Mixture Name as Listed Above	Applicable Exemption	Toxic Fraction or Percent Exempt (if Applicable)	Exempt Amounts of the Toxic Chemical from Above (in lbs)		
			Manufactured	Processed	Otherwise Used
1. Yellow Safety Paint	Strict. Comp.	100			1,500
2.					
3.					
4.					
5.					
6.					
7.					
Subtotal:			(A_1) _____ lbs.	(B_1) _____ lbs.	(C_1) 1,500 lbs.

Step 3. Calculate the amount subject to threshold: ($A - A_1$) _____ lbs. ($B - B_1$) _____ lbs. ($C - C_1$) 9,000 lbs.

Compare to thresholds for section 313 reporting. 15,000 lbs. 25,000 lbs. 10,000 lbs.

If any threshold is met, reporting is required for all activities. Do not submit this worksheet with Form R. Retain for your records.

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MANAGEMENT PRACTICES

- Begin early
  - Implement a program to gather "real-time" data on usage
  - Searches for historical information can be difficult
- Use a team approach
  - Include all relevant personnel (e.g., engineering, environmental, operations)
  - Spread the burden

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RECORDKEEPING

- Detailed records
  - Improve reporting accuracy and data quality
  - Reduce replication of effort from year to year
- Well-labeled calculations and assumptions
  - Serve as standard operating procedures (SOPs) for future years
  - Ensure consistency from year to year, especially if personnel responsible for reporting change
- All records used to complete Form R must be kept for three years (40 CFR 372.10)
- EPA will review records during a data quality audit

EXERCISE #1

IDENTIFYING EPCRA SECTION 313 CHEMICALS

Purpose: Familiarize participants with the chemical lists in Table 2 of the TRI Forms and Instructions Document.
Ability to identify correctly Section 313 chemicals from MSDSs.

Take-Aways: Understanding of nuances of chemical compositions.

Materials: TRI Forms and Instructions Document
Material Safety Data Sheets (MSDSs)

Instructions: Attached is a package of chemicals, chemical compounds, and chemical mixtures present at your facility. Determine if any of these chemicals or parts of these chemicals is on the EPCRA Section 313 list. If you determine that a chemical or component of a product or mixture is on the list present at or above the appropriate de minimis level, prepare a list of the appropriate section 313 chemicals and CAS numbers.

IDENTIFYING EPCRA SECTION 313 CHEMICALS

MSDS Name	Section 313 Chemical(s) Name	Concentration	Notes

MEADOWBROOK COMPANY

SPELTER, WEST VIRGINIA 26438

RAW MATERIAL SUPPLIER DATA SHEET

I. TRADE NAME CRUDE ZINC OXIDE

CHEMICAL NAME ZINC OXIDE EPA/GAS 1314-13-2

MANUFACTURER MEADOWBROOK COMPANY
DIV OF T. L. DIAMOND & CO., INC.

SPECIFICATIONS	GRADE A	GRADE B
Zn	50-59%	60%-68%
Fe	1-3%	1-3%
Al	.8-3.5%	.8-3.5%
Pb	0.1-0.5 Avg. 0.2	0.1-0.5 Avg.0.2%
Cl	0.0-0.3%	0.0-0.3%
Cd	Less Than .01	Less Than .01
Cu	0.04-0.40	0.04-0.40

II. NON TOXIC SOLID MATERIAL WITH A PARTICLE SIZE RANGE UP TO 1/4 INCH.

III. SPECIFIC GRAVITY 5.6
APPARENT DENSITY 130-160 LBS/CU FOOT
NON SOLUABLE IN WATER NON VOLATILE
LIGHT GRAY, ODORLESS COARSE POWDER

IV. NO FIRE OR EXPLOSION HAZARD. CAN REACT WITH MAGNESIUM OR CARBON WHEN HEATED.

V. NO PARTICULAR HEALTH HAZARD, TLV (S) FOR PRINCIPLE INGREDIENT
PEL 5 Mg/M³ FOR ZINC OXIDE FUME

VI. NON REACTIVE AT AMBIENT EXCEPT WITH MINERAL ACIDS

VII. SPILL OR LEAK PROCEDURES
Clean up & return to labeled containers

VII. PERSONAL PROTECTION
Niosh respirator suggested for comfort when material is dry & dusty

HANDLERS SHOULD WEAR GLOVES AND SAFETY GOGGLES.

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MATERIAL SAFETY
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DIVISION: INDUSTRIAL MINERAL DIVISION
TRADE NAME:
3M BRAND ROOFING GRANULES (WAUSAU, WI)

3M I.D. NUMBER: 98-0111-1216-0 98-0111-1217-8 98-0111-1218-6 98-0111-1219-4
98-0111-1220-2 98-0111-1221-0 98-0111-1222-8 98-0111-1223-6
98-0111-1252-5 98-0111-1253-3 98-0111-1278-0 98-0111-1288-9
98-0111-1290-5 98-0111-1292-1 98-0111-1293-9 98-0111-1294-7
98-0111-1318-4 98-0111-1319-2 98-0111-1320-0 98-0111-1321-8
98-0111-1322-6 98-0111-1323-4 98-0111-1324-2 98-0111-1325-9
98-0111-1348-1 98-0111-1444-8 98-0111-1445-5 98-0111-1446-3
98-0111-1447-1 98-0111-1448-9 98-0111-1449-7 98-0111-1450-5
98-0111-1451-3 98-0111-1452-1 98-0111-1453-9 98-0111-1454-7
98-0111-1457-0 98-0111-1484-4 98-0111-1488-5

ISSUED: SEPTEMBER 13, 1994
SUPERSEDES: NOVEMBER 23, 1993
DOCUMENT: 10-0170-0

1. INGREDIENT

INGREDIENT	C.A.S. NO.	PERCENT		
PLAGIOCLASE FELDSPAR	None.	30.0	-	35.0
QUARTZ	14808-60-7	25	-	35
POTASSIUM FELDSPAR	None	20	-	25
SODIUM SILICATE	1344-09-8		<	5.0
KAOLIN	1332-58-7		<	5.0
CARBON BLACK	1333-86-4		<	0.9
CHROMIUM OXIDE (TRIVALENT CHROMIUM)	1308-38-9		<	0.9
HYDROTREATED HEAVY NAPHTHENIC PETROLEUM DISTILLATES	64742-52-5		<	0.9
RUTILE TITANIUM DIOXIDE	1317-80-2		<	0.9
IRON OXIDE (FE2O3)	1309-37-1		<	0.9
ZINC FERRITE	12063-19-3		<	0.9

NOTE: THE AMOUNT OF DUST GENERATED WHILE HANDLING THESE ROOFING GRANULES IS EXPECTED TO VARY DEPENDING ON THE USER'S OPERATION. THE LEVEL OF RESPIRABLE CRYSTALLINE SILICA IS EXPECTED TO BE LESS THAN 15% OF THE RESPIRABLE DUST.

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE REPORTI REQUIREMENTS OF SECTION 313 OF TITLE III OF THE EMERGENCY PLANNING ANDCOMMUNITY RIGHT-ACT OF 1986 AND 40 CFR PART 372:
CHROMIUM OXIDE (TRIVALENT CHROMIUM)
ZINC FERRITE

2. PHYSICAL DATA

BOILING POINT:	N/A
VAPOR PRESSURE:	N/A
VAPOR DENSITY:	N/A
EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	N/A
SP. GRAVITY:	2.6-2.7
PERCENT VOLATILE:	N/A
VOLATILE ORGANICS:	N/A

Abbreviations: N/D - Not Determined N/A - Not Applicable

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DATA SHEET

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2. PHYSICAL DATA (continued)

VOC LESS H2O & EXEMPT SOLVENT N/A
pH: ..... SL BASIC
VISCOSITY: ..... N/A
MELTING POINT..... N/A
APPEARANCE AND ODOR: Granules, Various colors, slightly oily odor

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:..... N/A
FLAMMABLE LIMITS - LEL: ..... N/A
FLAMMABLE LIMITS - UEL: ..... N/A
AUTOIGNITION TEMPERATURE: ... N/A
EXTINGUISHING MEDIA:
Non-combustible. Choose material suitable for surrounding fire.
SPECIAL FIRE FIGHTING PROCEDURES:
Not applicable
UNUSUAL FIRE AND EXPLOSION HAZARDS:
No unusual fire or explosion hazards are anticipated.

4. REACTIVITY DATA

STABILITY: Stable
INCOMPATIBILITY - MATERIALS TO AVOID:
Not applicable.
HAZARDOUS POLYMERIZATION: Will Not Occur
HAZARDOUS DECOMPOSITION PRODUCTS:
None known.

5. ENVIRONMENTAL INFORMATION

SPILL RESPONSE:
Observe precautions from other sections. Collect spilled material. Use wet sweeping compound or water to avoid dusting.

RECOMMENDED DISPOSAL:
Dispose of waste product in a sanitary landfill.

Since regulations vary, consult applicable regulations or authorities before disposal.

ENVIRONMENTAL DATA:
Not determined.

REGULATORY INFORMATION:
U.S. EPA Hazardous Waste Number = None (Not U.S. EPA Hazardous). In the event of an uncontrolled release of this material, the user should determine if the release qualifies as a reportable quantity.

EPCRA HAZARD CLASS:
FIRE HAZARD: No PRESSURE: No REACTIVITY: No ACUTE: Yes CHRONIC: Yes

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DATA SHEET

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6. SUGGESTED FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water. Get immediate medical attention.

SKIN CONTACT:
No need for first aid is anticipated in the event of skin contact.

INHALATION:
If signs/symptoms occur, remove person to fresh air. If signs/symptoms continue, call a physician.

IF SWALLOWED:
Drink two glasses of water. Call a physician.

7. PRECAUTIONARY INFORMATION

EYE PROTECTION:
Avoid eye contact. The following should be worn alone or in combination, as appropriate, to prevent eye contact: Wear safety glasses with side shields.

SKIN PROTECTION:
Avoid prolonged or repeated skin contact..

VENTILATION PROTECTION:
If exhaust ventilation is not available, use appropriate respiratory protection.

RESPIRATORY PROTECTION:
Avoid breathing of dust. Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: half-mask dust respirator.

PREVENTION OF ACCIDENTAL INGESTION:
Wash hands after handling and before eating.

RECOMMENDED STORAGE:
Not applicable.

FIRE AND EXPLOSION AVOIDANCE:
Not applicable.

EXPOSURE LIMITS

INGREDIENTS	VALUE	UNIT	TYPE	AUTH	SKIN*
PLAGIOCLASE FELDSPAR	NONE	NONE	NONE	NONE	
QUARTZ	0.1	mg/m3	TWA	ACGIH	
	as quartz resp.		dust		

Abbreviations: N/D - Not Determined N/A - Not Applicable

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MSDS: 3M BRAND ROOFING GRANULES (WAUSAU, WI)
SEPTEMBER 13, 1994

7. PRECAUTIONARY INFORMATION (continued)

EXPOSURE LIMITS

INGREDIENTS	VALUE	UNIT	TYPE	AUTH	SKIN*
QUARTZ	0.1	mg/m3	TWA	OSHA	
	as quartz resp. dust				
POTASSIUM FELDSPAR	NONE	NONE	NONE	NONE	
SODIUM SILICATE	NONE	NONE	NONE	NONE	
KAOLIN	2	mg/m3	TWA	ACGIH	
	respirable dust.				
KAOLIN	10	mg/m3	TWA	OSHA	
CARBON BLACK	3.5	mg/m3	TWA	ACGIH	
CARBON BLACK	3.5	mg/m3	TWA	OSHA	
CHROMIUM OXIDE (TRIVALENT CHROMIUM)	0.5	mg/m3	TWA	ACGIH	
	as Cr				
CHROMIUM OXIDE (TRIVALENT CHROMIUM)	0.5	mg/m3	TWA	OSHA	
	as Cr				
HYDROTREATED HEAVY NAPHTHENIC PETROLEUM DISTILLATES	5	mg/m3	TWA	CMRG	
HYDROTREATED HEAVY NAPHTHENIC PETROLEUM DISTILLATES	10	mg/m3	STEL	CMRG	
RUTILE TITANIUM DIOXIDE	10	mg/m3	TWA	ACGIH	
RUTILE TITANIUM DIOXIDE	10	mg/m3	TWA	OSHA	
IRON OXIDE (FE2O3)	5	mg/m3	TWA	ACGIH	
	as Fe				
IRON OXIDE (FE2O3)	10	mg/m3	TWA	OSHA	
	as fume				
IRON OXIDE (FE2O3)	5	mg/m3	TWA	ACGIH	
	as Fe				
ZINC FERRITE	NONE	NONE	NONE	NONE	

* SKIN NOTATION: Listed substances indicated with "Y" under SKIN refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly by direct contact with the substance. Vehicles can alter skin absorption.

SOURCE OF EXPOSURE LIMIT DATA:
- ACGIH: American Conference of Governmental Industrial Hygienists
- OSHA: Occupational Safety and Health Administration
- CMRG: Chemical Manufacture Recommended Guidelines
- NONE: None Established

8. HEALTH HAZARD DATA

EYE CONTACT:
May cause eye irritation if dust gets into eyes.

SKIN CONTACT:
No adverse health effects are expected from skin contact.

INHALATION:
Single overexposure, above recommended guidelines, may cause:

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8. HEALTH HAZARD DATA (continued)

Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

Prolonged or repeated overexposure, above recommended guidelines, may cause:

Silicosis: signs/symptoms can include shortness of breath and persistent coughing.

Pneumoconiosis (general): signs/symptoms can include persistent coughing and shortness of breath.

IF SWALLOWED:
Ingestion is not a likely route of exposure to this product.

CANCER:
QUARTZ SILICA (14808-60-7) is a potential cancer hazard causing lung tumors by the inhalation and intratracheal routes of exposure in laboratory animal studies(NTP anticipated human carcinogen, IARC probable human carcinogen 2A, Calif. Proposition 65).

SECTION CHANGE DATES

HEADING	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
INGREDIENTS	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
ENVIRON. DATA	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
PRECAUT. INFO.	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE
HEALTH HAZD. DATA	SECTION CHANGED SINCE	NOVEMBER 23, 1993 ISSUE

Abbreviations: N/D - Not Determined N/A - Not Applicable

The information on this Data Sheet represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this Data Sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

EMERGENCY TELEPHONE NO: (203) 791-3500 M-F 8:30-5:00 ET
CHEMTREC 1-800-424-9300 (for Chemical Emergency" spill, leak, fire exposure or accident. 24 hours)

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	INSTAPAK • COMPONENT "A"
Chemical Name:	Polymethylene Polyphenylisocyanate
Trade Name:	Polymeric MDI
Chemical Family:	Aromatic Isocyanates
Chemical Formula:	N.A.

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredients:	CAS No.	Wt.%	OSHA-PEL	ACGIH-TLV
Polymeric Diphenylmethane Diisocyanate ("polymeric" MDI)	9016-87-9	100	N.E.	N.E.
Contains:				
4,4'-Diphenylmethane diisocyanate (4,4'-MDI; CAS 101-68-8; ≈ 45%)			0.02 ppm (Ceiling)	0.005 ppm (TWA)
Other MDI isomers and oligomers			N.E.	N.E.

SECTION 3 - HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW

Health Hazards: Irritating to eyes, respiratory system and skin. Inhalation at levels above the occupational exposure limit could cause respiratory sensitization. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons. Sensitized persons should not be exposed to any mixture containing unreacted MDI.

Physical Hazards: Reacts slowly with water to produce carbon dioxide which may rupture closed containers. This reaction accelerates at higher temperatures.

Appearance: Dark brown liquid.

Odor: Slightly aromatic (musty).

Note: Read the entire MSDS for a more thorough evaluation of the hazards.

SECTION 4 - FIRST AID MEASURES

Inhalation: Remove from further exposure and obtain medical attention. Treatment is symptomatic for primary irritation or difficulty in breathing. If breathing is labored, oxygen should be administered by qualified personnel. Apply artificial respiration if breathing has ceased or shows signs of failing. Asthmatic-like symptoms, if manifested, may develop immediately, or be delayed for up to several hours.

Skin Contact: Wash affected area thoroughly with soap and water. Launder contaminated clothing thoroughly before reuse. If irritation, redness, or a burning sensation develops and persists, obtain medical advice.

Eye Contact: Flush with copious amounts of water for at least 15 minutes, holding lids open with fingers. If irritation persists, repeat flushing. Refer individual to a physician for immediate follow-up.

Ingestion: Do NOT induce vomiting. Provided the patient is conscious, wash out mouth with water then give 1 or 2 glasses of water to drink. Refer person to medical personnel for immediate attention.

Note to Physicians: Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for 48 hours. Pulmonary disorders may be aggravated by overexposure.

SECTION 5 - FIRE-FIGHTING MEASURES

Flash Point: 390° F (199° C) [Pensky-Martens Closed Cup]
Flammable Limits (lower): Not available
Flammable Limits (upper): Not available

Extinguishing Media: Carbon dioxide (CO_2), dry chemical, or chemical foam. If water is used, large quantities are required. Contain run-off water with temporary barriers.

Fire and Explosion Hazards: Containers may burst under intense heat. Avoid water contamination in closed containers; carbon dioxide is evolved which can cause pressure build-up. **Caution:** Reaction between water and hot isocyanate can be vigorous.

Special Fire Fighting Procedures: Firefighters must wear self-contained breathing apparatus to protect against toxic and irritating vapors; full protective clothing should also be worn.

NFPA Hazard Code:		
	Health:	2
	Flammability:	1
	Reactivity:	1
	Special Hazard:	None

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Evacuate area surrounding the spill and prevent further leakage, spillage or entry into drains. Eye and skin protection should be worn during spill cleanup and ventilation maintained. If the potential for airborne concentrations of MDI above the PEL exists, then respiratory protection should be worn.

... without warranty, expressed or implied, except that it is accurate to the best knowledge of Sealed Air Corporation. The data on this sheet

SECTION 6 - ACCIDENTAL RELEASE MEASURES (continued)

Contain and cover spill with loose absorbent (earth, sand, sawdust or other absorbent material), or absorbent pillows, pads or socks. Collect absorbed material in open containers or plastic bags, and treat with deactivating solution (90% water, 8% concentrated ammonia, 2% detergent). Allow to stand uncovered for 48-72 hours to permit carbon dioxide to escape and solidification to occur. Wash spill area with deactivating solution and let stand for 15 minutes or longer. Dispose of spilled material properly.

SECTION 7 - HANDLING AND STORAGE

Storage Temperature: Min. 50° F (10° C) Max. 100° F (38° C)

Average Shelf Life: 6 months

Special Sensitivity: Reacts with moisture to produce carbon dioxide gas.

Precautions to be Taken in Handling and Storage: Do not store drums uncovered outdoors. Do not reseal containers unless it is certain that no moisture contamination has occurred. Do not breathe vapors or allow skin contact.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:	OSHA-PEL:	4,4'-Diphenylmethane diisocyanate;	Ceiling = 0.02 ppm
	ACGIH-TLV:	4,4'-Diphenylmethane diisocyanate;	TWA = 0.005 ppm

HMIS Hazard Code:	Health	3	
	Flammability	1	
	Reactivity	1	
	PPE	B	(Personal Protective Equipment)

Respiratory Protection: Due to the low vapor pressure of this material, the PEL is not likely to be exceeded under normal conditions. If the material is heated or spilled in a confined area, respiratory protection should be worn. Because of their short life and lack of breakthrough indicators, cartridge type respirators equipped for organic vapors are generally not recommended for use with isocyanates. They can be used for short term emergency situations at concentrations below the PEL where the presence of adequate breathing oxygen can be assured. Where concentrations exceed the PEL, air supplied respirators must be used.

Eye Protection: Goggles or safety glasses with side shields.

Protective Clothing: Chemical resistant butyl rubber, nitrile rubber, neoprene, or other suitable protective gloves.

Ventilation: Use local exhaust ventilation if necessary to maintain levels below the PEL. For guidance on engineering controls refer to the ACGIH publication "Industrial Ventilation".

Other: Eyewash station, safety shower and deactivating solution should be available. Refer to the "Recommendations for the Safe Use and Handling of Instapak® Foam-in-Place Chemicals" bulletin before handling Instapak® chemicals.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Form: Liquid
Color: Dark brown
Odor: Slightly aromatic (musty)
Vapor Density (Air = 1): 8.5
Molecular Weight: Approx. 350
Melting Point: N. E.

Boiling Point: 406° F (208° C)
Vapor Pressure: < 10^{-5} mm Hg @ 25° C (for Polymeric MDI)
Specific Gravity: 1.24 @ 25° C
Bulk Density: 10.3 lbs/gal
% Volatile by Volume: Nil
Solubility in Water: Not soluble. Reacts slowly with water to liberate CO_2 gas.

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable under normal conditions. Avoid temperatures above 110° F (43° C) or below 40° F (4° C).
Polymerization: May occur at elevated temperatures in the presence of moisture, alkalies, tertiary amines and metal compounds.
Conditions to Avoid: Contact with moisture and other materials which contain active hydrogen.
Incompatible Materials: Water, amines, strong bases and alcohols. The reaction with water is slow at temperatures less than 120°F (49°C) but is accelerated at higher temperatures.
Hazardous Decomposition Products: Highly unlikely under normal industrial use. Exposure to fire or extreme heat may generate oxides of carbon, oxides of nitrogen, and traces of hydrogen cyanide.

SECTION 11 - TOXICOLOGICAL INFORMATION

Polymeric MDI:

LD_{50}, Oral:	>15,800 mg/kg (rat)
LD_{50}, Dermal:	>5000 mg/kg (rabbit)
LC_{50}, Inhalation:	370 - 490 mg/m^3/4 hours (rat) for an aerosol of polymeric MDI

Primary Route(s) of Exposure: Skin contact from liquid. Inhalation. However, due to the low vapor pressure, overexposure is not expected under normal conditions unless material is heated or used in a poorly ventilated area.

Inhalation: This product is a respiratory irritant and potential respiratory sensitizer. Inhalation of vapor or aerosol at levels above the occupational exposure limit can cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat, and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons. Sensitized persons should be removed from any further exposure. Persons with asthma-type conditions or other chronic respiratory diseases should be excluded from working with MDI. In a single evaluation of 5 men occupationally exposed to MDI and hydrocarbon solvent vapors under conditions where adequate ventilation or other safety precautions were not used, neuropsychologic findings were attributed to MDI.

Skin Contact: May cause irritation or rash. Can cause skin discoloration. Repeated and/or prolonged contact may result in skin sensitization. There is limited evidence from laboratory tests that skin contact may play a r in respiratory sensitization. This data reinforces the need to prevent direct skin contact and the importance of protective gloves.

SECTION 11 - TOXICOLOGICAL INFORMATION (continued)

Eye Contact: Liquid can cause eye irritation, tearing, reddening and swelling. Permanent corneal injury is unlikely. Exposure to MDI vapors in excess of 0.02 ppm may cause irritation.

Ingestion: Ingestion is unlikely. Based on the acute oral LD_{50}, this product is considered practically non-toxic by ingestion. Ingestion can cause irritation and corrosive action in the mouth, stomach and digestive tract.

Chronic Effects: A study was conducted where groups of rats were exposed for 6 hours/day, 5 days/week for a lifetime to atmospheres of respirable polymeric MDI aerosol either at concentrations of 0, 0.2, 1, or 6 mg/m^3 (which corresponds to MDI levels equal to the OSHA-PEL, 5 times the OSHA-PEL and 30 times the OSHA-PEL). No adverse effects were observed at 0.2 mg/m^3 concentrations. At the 1 mg/m^3 concentration, minimal nasal and lung irritant effects were seen. Only at the top concentration (6 mg/m^3) was there an increased incidence of benign tumor of the lung (adenoma) and one malignant tumor (adenocarcinoma). Overall, the tumor incidence, both benign and malignant, and the number of animals with tumors were not different. The increased incidence of lung tumors is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumor formation will occur.

Carcinogenicity: The ingredients of this product (>0.1%) are not classified as carcinogenic by ACGIH or IARC, not regulated as carcinogens by OSHA and not listed as carcinogens by NTP.

Mutagenicity: There is no substantial evidence of mutagenic potential.

Reproductive Effects: No adverse reproductive effects are anticipated.

Teratogenicity and Fetotoxicity: No birth defects were seen in two independent animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. The dose that produced this effect (1.2 ppm) is 60 times higher than the OSHA-PEL. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations well in excess of the defined occupational exposure limits.

SECTION 12 - ECOLOGICAL INFORMATION

Environmental Fate and Distribution: It is unlikely that significant environmental exposure in the air or water will arise, based on consideration of the production and use of the substance.

Persistence and Degradation: Immiscible with water, but will react with water to produce carbon dioxide, and inert and non-biodegradable solids.

Aquatic Toxicity:

LC_{50}:	>1000 mg/l (Zebra fish) At the highest level of 1000 mg/l, there were no deaths.
EC_{50} (24 hour):	>1000 mg/l (Daphnea magna)
EC_{50}:	>100 mg/l (E. Coli)

SECTION 13 - DISPOSAL CONSIDERATIONS

Incinerate or dispose of in accordance with existing federal, state and local environmental control regulations. This material is not a hazardous waste under RCRA 40 CFR 261 when disposed of in its purchased form. Small quantities should be treated with deactivation solution outlined in Section 6. Refer to the "Recommendations for the Safe Use and Handling of Instapak® Foam-in-Place Chemicals" bulletin for additional information concerning disposal of wastes and empty containers. Chemical waste, regardless of quantity, should never be poured into drains, sewers or waterways.

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Sealed Air Corporation. The data on this [illegible] assumes no legal responsibility for use or reliance upon these data.

SECTION 14 - TRANSPORT INFORMATION

DOT: Containers less than 5,000 pounds are not regulated.

IMO: Not regulated.

IATA/ICAO Class: Not regulated.

Reportable Quantity (RQ): 5,000 lbs. for Methylene diphenyl diisocyanate (MDI), CAS #101-68-8 (≈ 45% of product).

SECTION 15 - REGULATORY INFORMATION

OSHA Status: This product is considered hazardous under the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: All ingredients are listed or are not required to be listed.

SARA 302 Extremely Hazardous Substances: None

SARA 311/312 Hazard Categories: Immediate (acute) Health Hazard
Delayed (chronic) Health Hazard
Reactive Hazard

SARA 313 Listed Ingredients: This product contains the following chemicals subject to the reporting requirements: 100% Diisocyanate compounds (Category Code N120).

RCRA Status: Discarded product is not a hazardous waste under RCRA, 40 CFR 261, when disposed of in its purchased form.

SECTION 16 - OTHER INFORMATION

The following states have regulations that apply to the use of this product.

MA Massachusetts Hazardous Substance List
NJ New Jersey Hazardous Substance List
PA Pennsylvania Hazardous Substance List

The appropriate state agency should be contacted for further details on regulatory requirements for the substances shown below.

Ingredient	CAS No.	Wt. %
Methylene bisphenyl isocyanate (MDI) (Benzene, 1,1'-methylenebis[4-] isocyanato-)	101-68-8	45

Section(s) Revised: Format change

Printed on recycled paper (50% secondary material, minimum 10% post consumer) using vegetable based inks
M-3 Rev. 4/97

MAR 9 1992

Material Safety Data Sheet

EPS

Emergency Phone
708-438-1800

Section 1 Product Identification

TRADE NAME: Endocrseen 4933

PRODUCT TYPE: Return line treatment

CODE IDENT.: 15-933

DOT SHIPPING NAME: Alkaline Corrosive Liquid NOS (Contains Morpholine & Cyclohexylamine)*

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Morpholine	110-91-8	< 15	TWA: 20 ppm (skin)
Cyclohexylamine	108-91-8	< 30	TWA: 10 ppm (skin)
Diethylaminoethanol	100-37-8	< 40	TWA: 10 ppm (skin)

* NA 1719

HMIS 3-2-0

Section 3 Physical Data

BOILING POINT, 760 mm Hg	> 150 F	MELTING POINT	NA
FREEZING POINT	- 85 F	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H2O = 1)	0.95	SOLUBILITY IN H2O	appreciable
VAPOR DENSITY (AIR = 1)	ND	EVAPORATION RATE (Bu Ace = 1)	< 1
% VOLATILES BY VOLUME	ND	pH	12.2

APPEARANCE & ODOR

Clear, pale yellow liquid

Section 4 Fire & Explosion Hazard Data

FLASH POINT (& METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME LOWER	UPPER	AUTO IGNITION TEMPERATURE
135 F TCC	ND	ND	ND

EXTINGUISHING MEDIA: WATER FOG FOAM CO2 DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS): Stable

CONDITIONS TO AVOID: Extreme heat, open flames

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong acids, oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of carbon & nitrogen

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Not applicable

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Section 6 Health Hazard Information

TOXICITY INFORMATION:

Exposure level not established for product. See Section 2 for component information. Exposure may occur through skin absorption.

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: Harmful if swallowed.

SKIN CONTACT: Prolonged or frequent skin contact will cause irritation and may cause chemical burns. Possible skin sensitizer.

EYE CONTACT: Will cause irritation

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected person to fresh air and treat symptoms.

INGESTION: If conscious, give water to dilute and contact physician immediately.

SKIN CONTACT: Wash with soap & water. Remove contaminated clothing and wash before reuse.

EYE CONTACT: Flush with water for 15 minutes and seek medical attention.

Section 7 Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation to remain below exposure criteria

RESPIRATORY PROTECTION (SPECIFY TYPE)

Wear NIOSH/MSHA approved respirator if the exposure criteria is exceeded

EYE PROTECTION

Chemical goggles and face shield

GLOVES

Impervious

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Long sleeve work shirt and pants, chemical-protective apron

Section 8 Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Extinguish all flames in the vicinity. Wear protective clothing including chemical resistant overshoes. Dike spill and soak up on an inert absorbent material. Flush area of spill with water.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Product is considered an EPA ignitable hazardous waste, D001 (40 CFR 261)

Product does not contain ingredients with CERCLA reportable quantities.

Section 9 Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed and away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: R. Ruthe DATE: 1/24/92

The data contained herein are presented according to W. R. Grace & Co.'s procedures current at the time of preparation hereof, are made available solely for the consideration, investigation and verification of the proposed recipients hereof and are not warranties or representations or recommendations for materials for which Grace assumes no responsibility, it is the responsibility of a recipient of this or similar information or chemical hazard information, to design and maintain work activity programs and to comply with all national, federal, state, and local laws and regulations. W. R. Grace & Co. reserves the right to change and amend its procedures.

GRACE Dearborn

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CANYON INDUSTRIES, INC.
P.O. Box 26447
Tempe, AZ 85285

Phone: 800-255-3423
602-258-2402
Date: May 1, 1990

MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

Product Name: AL-5(R) DE-ICING FLUID
General/Generic ID: Glycol-Alcohol Solution

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO	CAS NAME	%Vol	PEL	TLV (UNITS)
Ethylene Glycol*	107-21-1	1,2-Ethanediol	85	50 ppm	50 ppm ceiling vapor
Isopropyl Alcohol	67-63-0	2-Propanol	<10	400 ppm	400 ppm

*Subject to reporting requirements of Section 313 of SARA Title III

SECTION III - PHYSICAL DATA

PROPERTY	REFINEMENT	MEASUREMENT
Initial Boiling Point	Product	256 deg F (124 deg C) @760 mm Hg
Specific Gravity (H2O=1)		1.095 @ 68 deg F (20 deg C)
Vapor Density	Heavier Than Air	2.5 (Air=1)
Percent Volatiles By Volume	Ingredients with initial Boiling points below 425 deg F	100%
Appearance and Odor		Colorless liquid, faint alcohol odor
Vapor Pressure	Product	9.4 mm Hg @ 68 deg F (20 deg C)
Solubility in Water % by Wt.		100%
Evaporation Rate	Butyl Acetate = 1	>1.00

(R) Registered Trademark of Canyon Industries, Inc.

SECTION IV - FIRE AND EXPLOSION DATA

Flash Point:	138 deg F (Pensky-Martens, ASTM 93)
Flammable Limits in Air, % by Volume:	Component (lowest) Lower: 2.0 Upper: 12.7
Extinguishing Media:	Water, Fog or Carbon Dioxide or Dry Chemical
Special Fire Fighting Procedures:	Do not spray fires directly. A solid stream of water directed into hot, burning liquid can cause frothing. Use self-contained breathing apparatus and protective clothing
Unusual Fire and Explosion Hazards:	None
NFPA Hazard Rating:	Health: 1 Fire: 2 Reactivity: 0

SECTION V - HEALTH HAZARD DATA

Permissible Exposure Level (PEL): 50 ppm

Threshold Limit Value (TLV): 50 ppm

EFFECTS OF OVEREXPOSURE FOR PRODUCT:

Eyes:	Can cause irritation, redness, tearing.
Skin:	Can cause irritation. Prolonged or repeated contact can cause irritation, defatting, dermatitis.
Breathing:	Excessive inhalation of vapors can cause nasal and respiratory irritation.
Swallowing:	May cause abdominal discomfort and pain, dizziness, malaise, lumbar pain, oliguria, uremia, and central nervous system depression. Severe kidney damage accompanies gross overexposure.
Chronic effects of Overexposure:	Inhalation of mists may produce signs of central nervous system effects, particularly dizziness and nystagmus.
Other Health Hazards:	None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

If swallowed:	If conscious, give two glasses of water, induce vomiting by sticking finger down throat. Call a physician immediately. Never give anything by mouth to an unconscious person.
If on skin:	Remove contaminated clothing and thoroughly wash exposed area with soap and water. Launder contaminated clothing before reuse.
If in eyes:	Flush with large amounts of water, lifting upper and lower lids occasionally. Get medical attention.
If inhaled:	If affected, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet, and get medical attention.

SECTION VI - REACTIVITY DATA

HAZARDOUS POLYMERIZATION:	Will not occur	Conditions to Avoid:	None
STABILITY:	Stable	Conditions to Avoid:	Heat, sparks, and open flames
INCOMPATIBILITY:	Strong oxidizing agents (e.g. nitric and sulfuric acids, permanganates, etc.)		
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:	Burning may produce toxic materials: Carbon dioxide and/or carbon monoxide, etc.		

********** SECTION VII - SPILL OR LEAK PROCEDURES **********

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
-Wear suitable protective equipment.
-Small spills should be flushed with large quantities of water.
-Larger spills should be collected for disposal.

WASTE DISPOSAL METHOD: Incinerate in a furnace where permitted under appropriate Federal, State, and local regulations. See Section IX.

********** SECTION VIII - SPECIAL PROTECTION INFORMATION **********

RESPIRATORY PROTECTION: Self-contained breathing apparatus in high concentrations.

VENTILATION: Provide sufficient mechanical (general) and/or local exhaust ventilation to maintain exposure below TLV (s).

PROTECTIVE GLOVES: Wear resistant gloves such as: Rubber, Plastic, Neoprene, Buna-N.

EYE PROTECTION: Chemical splash goggles in compliance with OSHA regulations are advised.

OTHER PROTECTIVE EQUIPMENT: Eye bath and safety shower.

********** SECTION IX - SPECIAL PRECAUTIONS **********

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Keep away from heat, sparks and open flames.
May be fatal if swallowed.
Do not breathe mist. Avoid prolonged or repeated breathing of vapor.
Avoid contact with eyes.
Wash thoroughly after handling.
Keep container closed. Do not store in open or unlabeled containers.

FOR INDUSTRIAL USE ONLY

OTHER PRECAUTIONS: Where heavy concentrations of a fine mist are present, a respirator should be used to prevent inhaling mist particles. Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in this data sheet must be observed.

****

The information contained herein is believed to be accurate but is not warranted to be whether originating with Canyon Industries, Inc. or not. The information is presented solely for consideration, investigation, and verification. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

EXERCISE #2: DETERMINING THRESHOLDS
MANUFACTURING CASE STUDY

Using the information in the exercise, complete the following tasks to determine which chemicals will require you to prepare a Form R report.

1. Identify each listed chemical or chemical category manufactured, processed, and/or otherwise used at the facility that you should evaluate for threshold determinations.

2. Use the attached threshold determination worksheets to determine which toxic chemicals meet or exceed an applicable threshold for manufacture, process, or otherwise use.

3. Prepare Part II, Sections 1, 2 and 3 of Form R for each toxic chemical that exceeds an applicable threshold.

Make any necessary assumptions and be prepared to identify the assumptions you have made and the approach you used in completing this exercise.

Facility Description and Chemical Usage

Darcy Corp. operates adjacent plants at a site in central Ohio: Plant 1 manufactures industrial refrigeration units and Plant 2 manufactures molded plastic components for a variety of consumer product applications. Plant 1 employs a staff of 1,600 employees. Plant 2 employs a staff of 800 full-time employees. The two plants operate independently.

Plant 1 uses Hi-Copper Brass Tubing (90.0 percent copper, 9.2 percent zinc) in the manufacture of the air conditioners' components. The tubing is cut, bent into the appropriate shapes, and welded into the air conditioning units. The purchasing department indicates that Plant 1 received 100,000 pounds of Hi-Copper Brass Tubing in the reporting year.

One of the refrigerants used by Plant 1 in its products is HCFC-22 (>98.0 percent pure). The A100 series of refrigeration units use HCFC-22. In the reporting year, the facility produced 240 of these units, each of which contains 100 pounds of HCFC-22. Information provided by the HCFC-22 supplier indicates that they delivered 20,000 pounds to the site's HCFC-22 storage tank in the reporting year. Inventory records for the HCFC-22 storage tank indicated that the tank contained 15,000 pounds at the beginning of the reporting year and 9,000 pounds at the end of the reporting year.

Plant 1 paints certain refrigeration unit components using a paint that contains 10 weight percent methyl-ethyl-ketone (MEK), a solvent. Paint booth logs indicate Plant 1 used 110,000 pounds of this paint in these painting operations.

Plant 2 uses a resin in an injection molding process to make various plastic components. Inventory records indicate that the facility used 300,000 pounds of the resin in the reporting year. The resin contains 4 weight percent of barium hydroxide and 1.5 percent elemental zinc.

Information obtained from the vendor indicates that during the curing of the resin, 1 pound of ammonia is generated for each 100 pounds of resin used.

Inventory records indicate that 10,000 pounds of an adhesive that contains 12 weight percent MEK was used as a solvent in the adhesive application operations in the reporting year.

In the reporting year, a contractor painted the exterior and interior of all buildings on site. The contractor reported that their paint usage in the reporting year was 20,000 pounds, containing 5 weight percent MEK.

In the reporting year, remediation of soil contaminated with 1,1,1-trichloroethane (TCA) and 2-butanone was conducted with a soil vapor extraction (SVE) system. After being processed through an activated carbon adsorption unit that is 99 percent efficient in capturing the organic emissions, the exhaust from the SVE system is emitted to the air through a stack. The SVE system is estimated to extract from the ground and send to the activated carbon adsorption unit 20 pounds of TCA and 10 pounds of 2-butanone every month. The carbon is replaced every 10 months and the spent carbon is sent to ACME for incineration.

Facility Name: _____

EPCRA Section 313 Chemical or Chemical Category: _____

CAS Number: _____

Reporting Year: _____

Date Worksheet Prepared: _____

Prepared By: _____

Amounts of the EPCRA Section 313 chemical or chemical category manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Total Weight (lb)	Percent EPCRA Section 313 Chemical by Weight	EPCRA Section 313 Chemical Weight (lb)	Amount of the EPCRA Section 313 Chemical or Chemical Category by Activity (lb.):		
					Manufactured	Processed	Otherwise Used
1.							
2.							
3.							
4.							
Subtotal:					(A)_____lb	(B)_____lb	(C)_____lb

Exempt quantity of the EPCRA Section 313 chemical or chemical category that should be excluded.

Mixture Name as Listed Above	Applicable Exemption (*de minimis*, article, facility, activity)	Fraction or Percent Exempt (if Applicable)	Amount of the EPCRA Section 313 Chemical Exempt from Above (lb):		
			Manufactured	Processed	Otherwise Used
1.					
2.					
3.					
4.					
Subtotal:			(A_1)_____lb	(B_1)_____lb	(C_1)_____lb
Amount subject to threshold:			($A-A_1$)_____ lb	($B-B_1$)_____ lb	($C-C_1$)_____ lb
Compare to threshold for EPCRA Section 313 reporting.			25,000 lb	25,000 lb	10,000 lb

If any threshold is exceeded, reporting is required for all activities. Do not submit this worksheet with Form R or Form A; retain it for your records.

Facility Name: _____

EPCRA Section 313 Chemical or Chemical Category: _____

CAS Number: _____

Reporting Year: _____

Date Worksheet Prepared: _____

Prepared By: _____

Amounts of the EPCRA Section 313 chemical or chemical category manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Total Weight (lb)	Percent EPCRA Section 313 Chemical by Weight	EPCRA Section 313 Chemical Weight (lb)	Amount of the EPCRA Section 313 Chemical or Chemical Category by Activity (lb.):		
					Manufactured	Processed	Otherwise Used
1.							
2.							
3.							
4.							
Subtotal:					(A)_____lb	(B)_____lb	(C)_____lb

Exempt quantity of the EPCRA Section 313 chemical or chemical category that should be excluded.

Mixture Name as Listed Above	Applicable Exemption (*de minimis*, article, facility, activity)	Fraction or Percent Exempt (if Applicable)	Amount of the EPCRA Section 313 Chemical Exempt from Above (lb):		
			Manufactured	Processed	Otherwise Used
1.					
2.					
3.					
4.					
Subtotal:			(A_1)_____lb	(B_1)_____lb	(C_1)_____lb
Amount subject to threshold:			($A-A_1$)_____ lb	($B-B_1$)_____ lb	($C-C_1$)_____ lb
Compare to threshold for EPCRA Section 313 reporting.			25,000 lb	25,000 lb	10,000 lb

If any threshold is exceeded, reporting is required for all activities. Do not submit this worksheet with Form R or Form A; retain it for your records.

Facility Name: _____

EPCRA Section 313 Chemical or Chemical Category: _____

CAS Number: _____

Reporting Year: _____

Date Worksheet Prepared: _____

Prepared By: _____

Amounts of the EPCRA Section 313 chemical or chemical category manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Total Weight (lb)	Percent EPCRA Section 313 Chemical by Weight	EPCRA Section 313 Chemical Weight (lb)	Amount of the EPCRA Section 313 Chemical or Chemical Category by Activity (lb.):		
					Manufactured	Processed	Otherwise Used
1.							
2.							
3.							
4.							
Subtotal:					(A)_____lb	(B)_____lb	(C)_____lb

Exempt quantity of the EPCRA Section 313 chemical or chemical category that should be excluded.

Mixture Name as Listed Above	Applicable Exemption (*de minimis*, article, facility, activity)	Fraction or Percent Exempt (if Applicable)	Amount of the EPCRA Section 313 Chemical Exempt from Above (lb):		
			Manufactured	Processed	Otherwise Used
1.					
2.					
3.					
4.					
Subtotal:			(A_1)_____lb	(B_1)_____lb	(C_1)_____lb
Amount subject to threshold:			($A-A_1$)_____ lb	($B-B_1$)_____ lb	($C-C_1$)_____ lb
Compare to threshold for EPCRA Section 313 reporting.			25,000 lb	25,000 lb	10,000 lb

If any threshold is exceeded, reporting is required for all activities. Do not submit this worksheet with Form R or Form A; retain it for your records.

Facility Name: _____

EPCRA Section 313 Chemical or Chemical Category: _____

CAS Number: _____

Reporting Year: _____

Date Worksheet Prepared: _____

Prepared By: _____

Amounts of the EPCRA Section 313 chemical or chemical category manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Total Weight (lb)	Percent EPCRA Section 313 Chemical by Weight	EPCRA Section 313 Chemical Weight (lb)	Amount of the EPCRA Section 313 Chemical or Chemical Category by Activity (lb.):		
					Manufactured	Processed	Otherwise Used
1.							
2.							
3.							
4.							
Subtotal:					(A)_____lb	(B)_____lb	(C)_____lb

Exempt quantity of the EPCRA Section 313 chemical or chemical category that should be excluded.

Mixture Name as Listed Above	Applicable Exemption (*de minimis*, article, facility, activity)	Fraction or Percent Exempt (if Applicable)	Amount of the EPCRA Section 313 Chemical Exempt from Above (lb):		
			Manufactured	Processed	Otherwise Used
1.					
2.					
3.					
4.					
Subtotal:			(A_1)_____lb	(B_1)_____lb	(C_1)_____lb
Amount subject to threshold:			($A-A_1$)_____ lb	($B-B_1$)_____ lb	($C-C_1$)_____ lb
Compare to threshold for EPCRA Section 313 reporting.			25,000 lb	25,000 lb	10,000 lb

If any threshold is exceeded, reporting is required for all activities. Do not submit this worksheet with Form R or Form A; retain it for your records.

Facility Name: _____
EPCRA Section 313 Chemical or Chemical Category: _____
CAS Number: _____
Reporting Year: _____

Date Worksheet Prepared: _____
Prepared By: _____

Amounts of the EPCRA Section 313 chemical or chemical category manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Total Weight (lb)	Percent EPCRA Section 313 Chemical by Weight	EPCRA Section 313 Chemical Weight (lb)	Amount of the EPCRA Section 313 Chemical or Chemical Category by Activity (lb.):		
					Manufactured	Processed	Otherwise Used
1.							
2.							
3.							
4.							
Subtotal:					(A)_____lb	(B)_____lb	(C)_____lb

Exempt quantity of the EPCRA Section 313 chemical or chemical category that should be excluded.

Mixture Name as Listed Above	Applicable Exemption (*de minimis*, article, facility, activity)	Fraction or Percent Exempt (if Applicable)	Amount of the EPCRA Section 313 Chemical Exempt from Above (lb):		
			Manufactured	Processed	Otherwise Used
1.					
2.					
3.					
4.					
Subtotal:			(A_1)_____lb	(B_1)_____lb	(C_1)_____lb
Amount subject to threshold:			($A-A_1$)_____ lb	($B-B_1$)_____ lb	($C-C_1$)_____ lb
Compare to threshold for EPCRA Section 313 reporting.			25,000 lb	25,000 lb	10,000 lb

If any threshold is exceeded, reporting is required for all activities. Do not submit this worksheet with Form R or Form A; retain it for your records.

Facility Name: _____

EPCRA Section 313 Chemical or Chemical Category: _____

CAS Number: _____

Reporting Year: _____

Date Worksheet Prepared: _____

Prepared By: _____

Amounts of the EPCRA Section 313 chemical or chemical category manufactured, processed, or otherwise used.

Mixture Name or Other Identifier	Information Source	Total Weight (lb)	Percent EPCRA Section 313 Chemical by Weight	EPCRA Section 313 Chemical Weight (lb)	Amount of the EPCRA Section 313 Chemical or Chemical Category by Activity (lb.):		
					Manufactured	Processed	Otherwise Used
1.							
2.							
3.							
4.							
Subtotal:					(A)_____lb	(B)_____lb	(C)_____lb

Exempt quantity of the EPCRA Section 313 chemical or chemical category that should be excluded.

Mixture Name as Listed Above	Applicable Exemption (*de minimis*, article, facility, activity)	Fraction or Percent Exempt (if Applicable)	Amount of the EPCRA Section 313 Chemical Exempt from Above (lb):		
			Manufactured	Processed	Otherwise Used
1.					
2.					
3.					
4.					
Subtotal:			(A_1)_____lb	(B_1)_____lb	(C_1)_____lb
Amount subject to threshold:			(A-A_1)_____ lb	(B-B_1)_____ lb	(C-C_1)_____ lb
Compare to threshold for EPCRA Section 313 reporting.			25,000 lb	25,000 lb	10,000 lb

If any threshold is exceeded, reporting is required for all activities. Do not submit this worksheet with Form R or Form A; retain it for your records.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete **only** if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☐ Ancillary or other use
f. ☐ As an impurity	d. ☐ Repackaging	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year) (Enter range code or estimate*)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1					
5.3.2					
5.3.3					
5.4.1	Underground Injection onsite to Class I Wells	NA ☐			
5.4.2	Underground Injection onsite to Class II-V Wells	NA ☐			

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐
and indicate the Part II, Section 5.3 page number in this box. ☐ **(example: 1,2,3, etc)**

* Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number
Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☐ Ancillary or other use
f. ☐ As an impurity	d. ☐ Repackaging	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year) (Enter range code or estimate*)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1					
5.3.2					
5.3.3					
5.4.1	Underground Injection onsite to Class I Wells	NA ☐			
5.4.2	Underground Injection onsite to Class II-V Wells	NA ☐			

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc)

* Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☐ Ancillary or other use
f. ☐ As an impurity	d. ☐ Repackaging	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year) (Enter range code or estimate*)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1					
5.3.2					
5.3.3					
5.4.1	Underground Injection onsite to Class I Wells	NA ☐			
5.4.2	Underground Injection onsite to Class II-V Wells	NA ☐			

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc)

* Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number
Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete **only** if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☐ Ancillary or other use
f. ☐ As an impurity	d. ☐ Repackaging	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

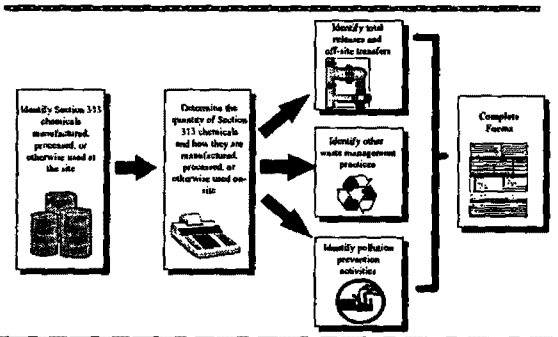
			A. Total Release (pounds/year) (Enter range code or estimate*)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1					
5.3.2					
5.3.3					
5.4.1	Underground Injection onsite to Class I Wells	NA ☐			
5.4.2	Underground Injection onsite to Class II-V Wells	NA ☐			

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐
and indicate the Part II, Section 5.3 page number in this box. ☐ **(example: 1,2,3, etc)**

* Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

TRI RELEASE AND OTHER WASTE MANAGEMENT REPORTING

THE EPCRA SECTION 313 REPORTING PROCESS



SECTION 313 REPORTING

- Importance of a structured process for release and other waste management reporting
  - Ensures accurate data
  - Reduces burden in completing Form R report
    - Systematic approach reduces redundancy over time
    - Team approach distributes responsibility
  - Ensures compliance with TRI reporting requirements

REPORTING METHOD

- Identify potential release and other waste management sources
- Identify available data and tools
- Collect data
- Estimate quantity of chemical being released and otherwise managed as waste
- Document your work

4

TOOLS AND DATA SOURCES FOR CALCULATING REPORTING ESTIMATES

- Process flow diagrams
- Waste management manifests, invoices, and waste profiles
- Environmental monitoring data
- Permit applications
- RCRA (BRS), NPDES, CAA, CERCLA and other env. reports
- Engineering calculations and other notes
- EPA guidance

5

CALCULATING REPORTING ESTIMATES

- Consider all sources (routine and non-routine)
- Reasonable estimates are required by law
- Facility determines best approach
- Data and approach must be documented

6

TECHNIQUES FOR ESTIMATING CHEMICAL QUANTITIES

- Use of monitoring data
- Mass balance calculation
- Use of emission factors
- Engineering calculations

7

ANALYSIS OF MONITORING DATA

- Product of measured concentrations, volumetric flow rates, and density equals pounds of chemical released per year
- Most commonly used for wastewater (Discharge monitoring reports (DMRs))
- Use Basis of Estimate code "M" if calculations based primarily on monitoring data

8

MASS BALANCE CALCULATION

- Mass Balance is based on the law of conservation of mass
- Input + Generation = Output + Amount Reacted + Accumulation
- Most useful in simple situations
- Use Basis of Estimate code "C"
  - Example: Estimating fugitive air emissions from storage containers and process equipment

9

USE OF PUBLISHED EMISSION FACTORS

- Values used to describe the quantity of chemical released as a function of:
  - Specific chemical used
  - Specific process used
  - Specific equipment used
- Available in *Compilation of Air Pollutant Emission Factors (AP-42)*
- Use Basis of Estimate code "E"

10

ENGINEERING CALCULATIONS

- Calculations based on best engineering judgment/assumptions
- Calculations based on process knowledge
- Use of non-chemical-specific emission factors
- Use of non-published emission factors
- Use Basis of Estimate code "O"

11

SIGNIFICANT FIGURES

- Significant figures should reflect the precision of the estimate
  - EPA recommends using two significant figures when reporting releases and other waste management estimates
  - If estimate is more precise, additional significant figures should be used
  - for estimates under 1,000 pounds, a range code can be used:
    - » A= 1-10 lbs.; B = 11-499 lbs.; C = 500-999 lbs.

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"NA" VS. "0"

- Use "NA" (not applicable) when no possibility of Section 313 chemical being released to or otherwise managed as waste in that media
  - Example: Facility has no on-site landfill
- Use "0" when no release to or other waste management in the specific media occurs, but is possible
  - Example: Discharge to water is zero; however, release possible if control equipment fails
  - Must indicate a Basis of Estimate code (i.e., M, C, E, O) for all numerical estimates, including "0"

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FUGITIVE EMISSIONS

- Part II, Section 5.1: Fugitive or non-point air emissions
  - Approach: ID potential sources --> ID data/tools --> estimate
- Data Sources/Tools
  - Engineering calculations
  - Emission factors
  - Monitoring data
  - Mass balance

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STACK EMISSIONS

- Part II, Section 5.2: Stack or point-source air emissions
  - Approach: ID potential sources --> ID data/tools --> estimate
  - Data Sources/Tools
    - Air permit applications
    - CAA Title V air inventories
    - Process and production data
    - Engineering calculations
    - Mass balance
    - Emission factors

15

WASTEWATER DISCHARGES

- Part II, Section 5.3: Release to stream or water body and Part II, Section 6.1: Discharges to POTW
  - Approach: ID potential sources --> ID data/tools --> estimate
- Potential release sources
  - Wastewater treatment facility discharge
  - Storm Drains
- Data/Tools
  - Monitoring, if available
  - DMRs or other required monitoring data
  - NPDES permits/permit applications
  - Process knowledge and/or mass balance

16

CALCULATING WASTEWATER DISCHARGES

- Calculate the yearly pounds of methanol discharged using the following data concerning wastewater discharges of methanol:

Date	Conc. (mg/L)	Flow (MGD)	Amt.(lbs./day)
3/1	1.0	1.0	8.33
9/8	0.2	0.2	.33
		Average =	4.33

(4.33 lbs./day) x (365 days/yr.) = 1581 lbs./yr.

MGD = million gallons per day

1 mg/L = 8.33 lbs./million gal

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RELEASED TO LAND ON-SITE

- Part II, Section 5.4
  - » 5.4.1 Underground Injection on-site to Class I Wells
  - » 5.4.2 Underground Injection on-site to Class II-V Wells
- Part II, Section 5.5: Releases to land
  - » 5.5.1A RCRA Subtitle C Landfills
  - » 5.5.1B Other Landfills
  - » 5.5.2 Land treatment/application farming
  - » 5.5.3 Surface impoundment
  - » 5.5.4 Other disposal

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RELEASED TO LAND ON-SITE

- Approach: ID potential sources --> ID data/tools -->estimate
- Potential sources of release to land
  - Landfills
  - Surface Impoundments
  - Spills
  - Leaks
- Data/tools:
  - Operating records/analytical data
  - Spill reports
  - Process knowledge

19

WASTE RELEASED TO LAND ON-SITE--STORAGE

- Storage of wastes on the land
  - Regular shipment schedule
    - Must transfer the waste off-site before that reporting year's Form R report is submitted or July 1, whichever comes first
    - Report material transferred off-site during the year in Part II, Section 6 of Form R
  - No regular shipment schedule
    - Report material added to pile that remains on-site during the year as the quantity released to land, Part II, Section 5.5.4 of Form R

20

ON-SITE WASTE MANAGEMENT

Examples of on-site waste management (Section 7)

- Air Pollution control devices (Section 7A)
- Wastewater treatment processes (Section 7A)
- Energy recovery devices (Section 7B)
- Recycling devices (Section 7C)

21

OFF-SITE WASTE MANAGEMENT

- Approach: ID potential sources --> ID data/tools --> estimate
- *Potential sources of off-site waste management*
  - Identify final disposition of Section 313 chemical
    - Disposal
    - Waste treatment
    - *Energy recovery*
    - Recycling
- Data/tools
  - Waste manifests and vendor receipts
  - RCRA reports
  - Waste characterization - analyses, profiles

22

MAXIMUM QUANTITY ON-SITE

- Part II, Section 4.1: Maximum amount on-site at any time during the calendar year
  - Based on amount in storage, process, and wastes
  - Not the same as Tier II maximum amount on site
    - *Tier II is usually by mixtures, Form R is chemical-specific*
    - Tier II excludes hazardous wastes, Form R does not
- Data sources
  - Tier II records/calculations
  - Waste inventory data

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BEST PRACTICE: RECORDKEEPING

- Importance of good recordkeeping
  - Detailed records improve reporting accuracy and data quality
  - Well-labeled calculations and engineering assumptions serve as standard operating procedures for future years
    - Reduce replication
    - Ensure consistency
- Requirements
  - All records used to complete Form R reports must be kept for three years (40 CFR 372.10)
  - EPA will review records during a data quality audit

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REFERENCE SOURCES

- *Estimating Releases and Waste Treatment Efficiencies*
- EPA Industry Guidance
- *AP-42: Compilation of Air Pollutant Emission Factors*
- Technology Transfer Network (http://www.epa.gov/ttn)
  - AP-42
  - Water 8/ChemDat 8 programs
  - TANKS program
- *Perry's Chemical Engineer's Handbook; CRC Handbook of Chemistry and Physics; Lange's Handbook of Chemistry*

OVERVIEW OF FORM R

1

AUTOMATED TRI REPORTING SYSTEM (ATRS)

- Voluntary option to submit form electronically
- Forms submitted on diskette and loaded directly into EPA's TRI Database
- Windows 3.1, 95, 98, NT versions available
- ATRS has built-in data validation program and pick lists
- A signed ATRS - generated cover letter is the sole paper requirement

2

OVERVIEW OF FORM R

- Two principal types of information
  - Facility-specific
  - Chemical-specific
- *One form must be submitted to EPA and to the SERC/TERC for each Section 313 chemical or chemical category exceeding applicable thresholds*

3

PART I: FACILITY INFORMATION

- Identifies the facility
  - Name and address
  - TRI facility identification number
- Provides key data for linking information to other databases
  - SIC code(s)
  - Identification numbers (RCRA, NPDES, Dun & Bradstreet, Underground Injection Control)
- Identifies key personnel
  - Technical contact
  - Public contact

4

PART I. SECTIONS 1 AND 2

- Reporting year is the calendar year to which the reported information applies; not the year in which the form is submitted
- Trade secret submissions require substantiation
- Two forms are required for trade secret submissions:
  - One complete
  - One "sanitized" version
- Separate process for national security claims

PART I. FACILITY IDENTIFICATION INFORMATION			
SECTION 1. REPORTING YEAR 19__			
SECTION 2. TRADE SECRET INFORMATION			
2.1	Are you claiming the toxic chemical identified on page 2 trade secret? ☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No Do not answer 2.2; go to Section 3	2.2	Is this copy ☐ Sanitized ☐ Unsanitized (Answer only if "YES" in 2.1)

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PART I. SECTION 3

- An original signature is required
- Name must be legible (printed or typed)
- Title of the official who signs is also required

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)		
I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.		
Name and official title of owner/operator or senior management official:	Signature:	Date signed:

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PART I. SECTION 4.1

- All parts of the facility name and address are essential
- Mailing address required if different from street address
- TRI facility identification number (if a form was filed in a previous reporting year) or "New Facility" (if reporting for the first time)

SECTION 4. FACILITY IDENTIFICATION	
4.1	TRI Facility ID Number
Facility or Establishment Name	Facility or Establishment Name or Mailing Address (if different from street address)
Street	Mailing Address
City/County/State/Zip Code	City/County/State/Zip Code

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PART I. SECTION 4.1

- Federal facilities
  - Enter name of Federal department or agency standard acronym followed by the site name

SECTION 4. FACILITY IDENTIFICATION	
4.1	TRI Facility ID Number
Facility or Establishment Name U.S. DOE Kansas City Plant	Facility or Establishment Name or Mailing Address (if different from street address)
Street	Mailing Address
City/County/State/Zip Code	City/County/State/Zip Code

EXAMPLE

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PART I. SECTION 4.2 THROUGH 4.4

- Specify whether the form covers all or part of the facility
  - Federal facilities check only "c"
  - List name and phone number
  - Technical contact - should be able to explain data to EPA
  - Public contact - should be able to represent the facility's data to the public

SECTION 4. FACILITY IDENTIFICATION (Continued)			
4.2	This report contains information for: (Important: check a or b; check c if applicable)	a. ☐ An entire facility b. ☐ Part of a facility c. ☐ A Federal facility	
4.3	Technical Contact Name		Telephone Number (include area code)
4.4	Public Contact Name		Telephone Number (include area code)

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PART I. SECTION 4.5 THROUGH 4.6

- Enter covered 4-digit SIC code(s)
  - Enter primary SIC code in first box (a.)
  - Enter other covered SIC codes in decreasing order of significance
- Supply latitude and longitude coordinates

4.5	SIC Code(s) (4-digits)	Primary a.		b.	c.	d.	e.	f.
4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds

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PART I. SECTION 4.7 THROUGH 4.10

- Enter the specified identification numbers or "NA" if not applicable
  - Enter Dun and Bradstreet number(s)
  - EPA ID numbers (assigned to RCRA-covered facilities)
  - NPDES permit number(s)
  - Underground Injection Well Code (UIC) I.D. number(s)

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number(s) (RCRA I.D. No.) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters	4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a.		a.		a.		a.	
b.		b.		b.		b.	

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PART I. SECTION 5

- Private-sector and GOCO facilities
  - Enter complete name and Dun & Bradstreet number of parent company
- Federal facilities
  - Enter the complete name of department or agency for parent company (e.g., U.S. Department of Interior)
  - Check "NA" for Dun & Bradstreet number of parent company

SECTION 5. PARENT COMPANY INFORMATION			
5.1	Name of Parent Company	☐ NA	
5.2	Parent Company's Dun & Bradstreet Number	☐ NA	(9 digits)

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PART II: CHEMICAL-SPECIFIC INFORMATION

- Identifies the Section 313 chemical and its uses at the facility
  - Chemical identity
  - Activities and uses of the Section 313 chemical
  - Maximum amount on-site at one time
- Identifies quantities released and managed as wastes
  - Total release of the Section 313 chemical to each medium
  - Transfers of waste to off-site locations (excluding transfers for sale)
  - On-site waste treatment methods and efficiency(ies)
- Identifies other waste management and source reduction activities

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PART II. SECTIONS 1 AND 2: TOXIC CHEMICAL OR MIXTURE IDENTITY

SECTION 1. TOXIC CHEMICAL IDENTITY	(Important: DO NOT complete this section if you completed Section 2 below.)
1.1	CAS Number (IMPORTANT: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes." Generic name must be structurally descriptive.)

- Complete either Section 1.1 & 1.2 <u>or</u> Section 1.3 <u>or</u> Section 2
- Enter CAS number or category code and name of Section 313 chemical or chemical category (except on "sanitized" form)
- Enter generic name <u>only</u> if claiming Section 313 chemical name as a trade secret (Section 1.3)

SECTION 2. MIXTURE COMPONENT IDENTITY	(Important: DO NOT complete this section if you complete Section 1 above.)
2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

- If supplier claims trade secret, report generic name by supplier

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PART II. SECTION 3: ACTIVITIES AND USES OF THE CHEMICAL AT THE FACILITY

- Specify use(s) of the Section 313 chemical: manufacture, process, or otherwise use
- Report only activities taking place at reporting facility
- Check all applicable boxes

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a.☐ Produce b.☐ Import		
If produce or import:	a.☐ As a reactant	a.☐ As a chemical processing aid
c.☐ For on-site use/processing	b.☐ As a formulation component	b.☐ As a manufacturing aid
d.☐ For sale/distribution	c.☐ As an article component	c.☐ Ancillary or other use
e.☐ As a byproduct	d.☐ Repackaging	
f.☐ As an impurity		

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PART II. SECTION 4: MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING YEAR

- Insert appropriate code from instructions indicating the maximum quantity on-site
- Use maximum total amount present at one time during reporting year, even if Section 313 chemical is present at more than one location at the facility
- Include amounts in storage, processes, and wastes (but not those amounts which have been previously land disposed)

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ON-SITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

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PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

- Total aggregate releases of Section 313 chemical to the environment from the facility during calendar year
  - Report total releases of Section 313 chemical to each environmental medium
- In column A, Total Releases, report total quantity
  - A range code can be used for quantities less than 1,000 pounds)
    - » A = 1 - 10 pounds
    - » B = 11 - 499 pounds
    - » C = 500 - 999 pounds

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PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

- Basis of estimate codes
  - Monitoring data (M)
  - Mass balance (C)
  - Emission factor (E)
  - Other approaches and engineering estimates (O)
- Use the code for the method used to estimate the largest portion of the release

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PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

- **Section 5.1 Fugitive or Non-Point Air Emissions**
  - **Enter total fugitive releases of Section 313 chemical in column A, including leaks, evaporative losses, building ventilation, or other non-point air emissions**
- **Section 5.2 Stack or Point Air Emissions**
  - ***Enter total releases to air from point sources, including stacks, vents, pipes, ducts, storage tanks, or other confined air streams***

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM					
			A. Total Release (pounds/year) (enter range from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	☐ NA			
5.2	Stack or point air emissions	☐ NA			

PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

- **Section 5.3 Releases to Streams or Water Bodies**
  - **Enter names of streams or water bodies to which your facility directly discharges the Section 313 chemical**
  - **Enter total amount of releases to each receiving stream or water body in *column A; include amounts from stormwater runoff, if available***
  - **Indicate in column C the percentage of the total quantity (by weight) of the Section 313 chemical contributed by stormwater**

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM				
5.3	Discharges to receiving streams or water bodies (enter one name per box)			
Stream or Water Body Name		A. Total Release (pounds/year) (enter range from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.3.1				
5.3.2				
5.3.3				

PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM

- **Section 5.4.1 Underground Injection to Class I wells**
  - Enter total amount of Section 313 chemical injected into Class I wells at facility in column A and basis of estimate code in column B
- **Section 5.4.2 Underground Injection to Class II - V wells**
  - Enter total amount of Section 313 chemical injected into Class II - V wells at facility in column A and basis of estimate code in column B

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM					
			A. Total Release (pounds/year) (enter range from instructions or estimate)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.4.1	Underground injections on-site to Class I Wells	☐ NA			
5.4.1	Underground injections on-site to Class II-V Wells	☐ NA			

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PART II. SECTION 5: QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENV. MEDIUM

- **Section 5.5 Releases to Land On-Site**
  - Other disposal (5.5.4) includes spills or leaks of the Section 313 chemical to land
  - Quantities of Section 313 chemicals released to air or water after initial release to land (e.g., volatilization from surface impoundments) are not included here

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM				
		NA	A. Total Release (pounds/year) (enter range code from instructions or estimate)	B. Basis of Estimate (enter code)
5.5	Disposal to land on-site			
5.5.1A	RCRA Subtitle C landfills	☐		
5.5.1B	Other landfills	☐		
5.5.2	Land treatment/application farming	☐		
5.5.3	Surface impoundment	☐		
5.5.4	Other disposal	☐		

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PART II. SECTION 6: TRANSFERS OF THE TOXIC CHEMICAL IN WASTE STREAMS TO OFF-SITE LOCATIONS

- Includes both off-site location information and quantities of Section 313 chemicals transferred to off-site locations
- Report quantities of a Section 313 chemical sent off-site to any POTW or other location for recycling, energy recovery, waste treatment, or disposal
- Report only total quantity of a Section 313 chemical transferred off-site, not entire waste
- In Sections 6.1.A.1 and 6.2.A, Total Transfers, report total quantity
  - A range code can be used for quantities less than 1,000 pounds
    - » A = 1 - 10 pounds
    - » B = 11 - 499 pounds
    - » C = 500 - 999 pounds

PART II. SECTION 6: TRANSFERS OF THE TOXIC CHEMICAL IN WASTE STREAMS TO OFF-SITE LOCATIONS

- Section 6.1 Discharges to Publicly Owned Treatment Works
  - Enter total quantity of the Section 313 chemical transferred to all POTWs and basis of estimate

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS	
6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)	
6.1.A Total Quantity Transferred to POTWs and Basis of Estimate	
6.1.A.1 Total Transfers (pounds/year) (enter range code or estimate)	6.1.A.2 Basis of Estimate (enter code)

PART II. SECTION 6: TRANSFERS OF THE TOXIC CHEMICAL IN WASTE STREAMS TO OFF-SITE LOCATIONS

- **Section 6.1.B POTW Name and Location**
  - **Include name and address of each POTW**
  - **Photocopy page 3 if reporting discharges to more than 2 POTWs (ATRS accommodates this without photocopying)**

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS							
6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)							
6.1.B. ___ POTW Name							
POTW Address							
City		State		County		Zip	
6.1.B. ___ POTW Name							
POTW Address							
City		State		County		Zip	

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PART II. SECTION 6: TRANSFERS OF THE TOXIC CHEMICAL IN WASTE STREAMS TO OFF-SITE LOCATIONS

- **Section 6.2 Transfers to Other Off-Site Locations**
  - **Include name, address, and EPA identification (RCRA ID) number**
  - **Enter quantities, basis of estimate, and codes for multiple activities (waste treatment, disposal, recycling, and energy recovery) in Rows 1 through 4**
  - **Photocopy page 4 if reporting more than 2 off-site transfer locations (ATRS accommodates this without photocopying)**

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS							
6.2. OFF-SITE EPA IDENTIFICATION NUMBER (RCRA ID NO.)							
Off-site Location Name							
Off-site Address							
City		State		County		Zip	
Is location under control of reporting facility or parent company? ☐ Yes ☐ No							

A. Total Transfers (pounds/year) (enter range code or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment Disposal/ Recycling/Energy Recovery(enter code)
1.	1.	1.M
2.	2.	2.M
3.	3.	3.M
4.	4.	4.M

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PART II. SECTION 7A: ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

- General waste stream type containing the Section 313 chemical, treatment method(s), influent concentration range, estimate of treatment efficiency, and indication if information is based on operating data
- Report each waste treatment method that the Section 313 chemical undergoes
  - Include even if method has no effect on Section 313 chemical
- Only data element in Form R focusing on the entire waste stream rather than the Section 313 chemical in the waste stream

PART II. SECTION 7A: ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence (enter 3-character code(s))			c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data?
7A.1a	7A.1b	1	2	7A.1c	7A.1d	7A.1e
	3	4	5		%	Yes ☐ No ☐
	6	7	8			

PART II. SECTION 7A: ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

- Section 7A.a General Waste Stream
  - Enter a waste stream code for each waste treatment method sequence
    - » There are four waste stream types: Gaseous, Wastewater, Liquid Waste, Solid Waste
- Section 7A.b Waste Treatment Method(s) Sequence
  - Enter code(s) from EPA instructions document for on-site waste treatment method(s) used
  - Enter code(s) regardless of whether waste treatment actually affected the Section 313 chemical
  - Report waste treatment method(s) used on aggregate waste stream as single stream
  - If applicable, enter codes in sequence in which they occur

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PART II. SECTION 7A: ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

- Section 7A.c Range of Influent Concentration
  - Use range of concentration of the Section 313 chemical in waste stream as it typically enters treatment equipment
  - Enter code(s) for concentration ranges (parts per million) from EPA instructions document
- Section 7A.d Waste Treatment Efficiency Estimates
  - Waste treatment efficiency expressed as percent removal of Section 313 chemical from waste stream through biological degradation, chemical conversion, or physical removal
    - » Use overall efficiency of waste treatment sequence, not a specific waste treatment method
    - » Use percent removal of Section 313 chemical only, not other constituents of the waste stream

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PART II. SECTION 7A: ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

- **Section 7A.e Based on Operating Data?**
  - Check "yes" if efficiency estimate is based on monitoring from typical operating conditions
  - Check "no" if efficiency estimate is based on published data for similar processes or equipment supplier's literature, or if the influent or effluent waste comparison or the flow rate was otherwise estimated

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PART II. SECTION 7A: ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

- **Procedures for using two lines of data to enter 9 or more sequential waste treatment methods**

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]			c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data?
7A.1a	7A.1b	1 P12	2 P18	7A.1c	7A.1d	7A.1e
W	3 P17	4 P61	5 P42	NA	%	Yes ☐ No ☐
	6 P21	7 P21	8 P11			
7A.2a	7A.2b	9 C44	2 NA	7A.2c	7A.2d	7A.2e
	3	4	5	1	99 %	Yes ☑ No ☐
	6	7	8			
7A.3a	7A.1b	1 A01	2 NA	7A.3c	7A.3d	7A.3e
A	3	4	5	1	91 %	Yes ☑ No ☐
	6	7	8			

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PART II. SECTION 7B: ON-SITE ENERGY RECOVERY PROCESSES

- Enter on-site energy recovery methods for Section 313 chemical
  - Section 313 chemical must be combustible and have a significant heating value (e.g., 5,000 BTU/lb.)
  - Combustion unit is integrated into an energy recovery system (e.g., industrial furnace, industrial kiln, or boiler)
- Enter codes in descending order by quantities combusted

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐

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PART II. SECTION 7C: ON-SITE RECYCLING PROCESSES

- Enter methods used for on-site recycling of Section 313 chemical
  - Codes for recycling methods used are found in EPA instructions document
  - Do not include energy recovery processes
- Enter codes in descending order by quantities recycled

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

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PHOTOCOPYING PAGES OF FORM R

- Form R pages may be photocopied if additional space is necessary to complete these sections (photocopying is not necessary with ATRS)
  - Section 6.1: Transfers to POTWs
  - Section 6.2: Transfers to Other Off-Site Locations
  - Section 7A: Waste Treatment Methods and Efficiency
- When photocopying pages, you must complete the box on each page to indicate the number of copies you are attaching
- For the page being photocopied, enter in the left box the total number of pages submitted including the original

  original + number photocopied = total pages submitted

  - In the second box, indicate the position of the individual page

Example:

> If additional pages of Part II, Sections 6.2/7A are attached, indicate the total number of pages in this box ☐ and indicate which Part II, Sections 6.2/7A page this is, here. ☐ (example: 1.2.3. etc.)

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ATRS SOFTWARE

- Advantages of completing Form R or Form A electronically
  - Reduce error by covered facilities
  - Reduce data entry error by EPA
  - Reduced data entry redundancy
  - Photocopying pages of the Form R would not be required
  - Menu-driven screens with special "hot" keys displayed
  - "Pick lists" containing valid reporting codes
  - "Real-time" error checking and validation
- Submission of forms on magnetic media is encouraged but not required

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ATRS SOFTWARE

- Technical Support
  - Phone: 703-816-4434
  - Fax: 703-816-4466
  - e-mail: tris.user.support@epcra.org

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(IMPORTANT: Type or print; read instructions before completing form)

EPA
United States Environmental Protection Agency

FORM R

TOXIC CHEMICAL RELEASE INVENTORY REPORTING FORM

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center, P.O Box 3348, Merrifield, VA 22116-3348, ATTN: TOXIC CHEMICAL RELEASE INVENTORY 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR _____

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? ☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No (Do not answer 2.2; Go to Section 3)	2.2	Is this copy ☐ Sanitized ☐ Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	
Facility or Establishment Name		Facility or Establishment Name or Mailing Address(if different from street address)	
Street		Mailing Address	
City/County/State/Zip Code		City/County/State/Zip Code	

4.2	This report contains information for: (Important : check a or b; check c if applicable)	a. ☐ An entire facility	b. ☐ Part of a facility	c. ☐ A Federal facility			
4.3	Technical Contact Name				Telephone Number (include area code)		
4.4	Public Contact Name				Telephone Number (include area code)		
4.5	SIC Code (s) (4 digits)	Primary a.	b.	c.	d.	e.	f.

4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters)	4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a.		a.		a.		a.	
b.		b.		b.		b.	

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA ☐	
5.2	Parent Company's Dun & Bradstreet Number	NA ☐	

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 1. TOXIC CHEMICAL IDENTITY (Important: DO NOT complete this section if you completed Section 2 below.)

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete **only** if Part 1, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces, and punctuation.)

SECTION 3. ACTIVITIES AND USES OF THE TOXIC CHEMICAL AT THE FACILITY
(Important: Check all that apply.)

3.1 Manufacture the toxic chemical:	3.2 Process the toxic chemical:	3.3 Otherwise use the toxic chemical:
a. ☐ Produce b. ☐ Import		
If produce or import:		
c. ☐ For on-site use/processing	a. ☐ As a reactant	a. ☐ As a chemical processing aid
d. ☐ For sale/distribution	b. ☐ As a formulation component	b. ☐ As a manufacturing aid
e. ☐ As a byproduct	c. ☐ As an article component	c. ☐ Ancillary or other use
f. ☐ As an impurity	d. ☐ Repackaging	

SECTION 4. MAXIMUM AMOUNT OF THE TOXIC CHEMICAL ONSITE AT ANY TIME DURING THE CALENDAR YEAR

4.1	☐ (Enter two-digit code from instruction package.)	

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE

			A. Total Release (pounds/year) (Enter range code or estimate*)	B. Basis of Estimate (enter code)	C. % From Stormwater
5.1	Fugitive or non-point air emissions	NA ☐			
5.2	Stack or point air emissions	NA ☐			
5.3	Discharges to receiving streams or water bodies (enter one name per box)				
	Stream or Water Body Name				
5.3.1					
5.3.2					
5.3.3					
5.4.1	Underground Injection onsite to Class I Wells	NA ☐			
5.4.2	Underground Injection onsite to Class II-V Wells	NA ☐			

If additional pages of Part II, Section 5.3 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 5.3 page number in this box. ☐ (example: 1,2,3, etc.)

* Range Codes: A= 1 - 10 pounds; B= 11- 499 pounds; C= 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number
Toxic Chemical, Category or Generic Name

SECTION 5. QUANTITY OF THE TOXIC CHEMICAL ENTERING EACH ENVIRONMENTAL MEDIUM ONSITE (Continued)

		NA	A. Total Release (pounds/year) (enter range code* or estimate)	B. Basis of Estimate (enter code)
5.5	Disposal to land onsite			
5.5.1A	RCRA Subtitle C landfills	☐		
5.5.1B	Other landfills	☐		
5.5.2	Land treatment/application farming	☐		
5.5.3	Surface Impoundment	☐		
5.5.4	Other disposal	☐		

SECTION 6. TRANSFERS OF THE TOXIC CHEMICAL IN WASTES TO OFF-SITE LOCATIONS

6.1 DISCHARGES TO PUBLICLY OWNED TREATMENT WORKS (POTWs)

6.1.A Total Quantity Transferred to POTWs and Basis of Estimate

6.1.A.1. Total Transfers (pounds/year) (enter range code* or estimate)	6.1.A.2 Basis of Estimate (enter code)

6.1.B.__	POTW Name						
POTW Address							
City		State		County		Zip	
6.1.B.__	POTW Name						
POTW Address							
City		State		County		Zip	

If additional pages of Part II, Section 6.1 are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 6.1 page number in this box ☐ (example: 1,2,3, etc.)

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS

6.2. __ Off-Site EPA Identification Number (RCRA ID No.)							
Off-Site Location Name							
Off-Site Address							
City		State		County		Zip	

Is location under control of reporting facility or parent company? ☐ Yes ☐ No

* Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R

PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS (Continued)

A. Total Transfers (pounds/year) (enter range code* or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

6.2.___ Off-Site EPA Identification Number (RCRA ID No.)

Off-Site location Name

Off-Site Address

City | State | County | Zip

Is location under control of reporting facility or parent company? ☐ Yes ☐ No

A. Total Transfers (pounds/year) (enter range code* or estimate)	B. Basis of Estimate (enter code)	C. Type of Waste Treatment/Disposal/ Recycling/Energy Recovery (enter code)
1.	1.	1. M
2.	2.	2. M
3.	3.	3. M
4.	4.	4. M

SECTION 7A. ON-SITE WASTE TREATMENT METHODS AND EFFICIENCY

☐ Not Applicable (NA) - Check here if no on-site waste treatment is applied to any waste stream containing the toxic chemical or chemical category.

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Range of Influent Concentration	d. Waste Treatment Efficiency Estimate	e. Based on Operating Data ?
7A.1a	7A.1b 1 2 3 4 5 6 7 8	7A.1c	7A.1d %	7A.1e Yes ☐ No ☐
7A.2a	7A.2b 1 2 3 4 5 6 7 8	7A.2c	7A.2d %	7A.2e Yes ☐ No ☐
7A.3a	7A.3b 1 2 3 4 5 6 7 8	7A.3c	7A.3d %	7A.3e Yes ☐ No ☐
7A.4a	7A.4b 1 2 3 4 5 6 7 8	7A.4c	7A.4d %	7A.4e Yes ☐ No ☐
7A.5a	7A.5b 1 2 3 4 5 6 7 8	7A.5c	7A.5d %	7A.5e Yes ☐ No ☐

If additional pages of Part II, Section 6.2/7A are attached, indicate the total number of pages in this box ☐ and indicate the Part II, Section 6.2/7A page number in this box : ☐ (example: 1,2,3, etc)

* Range Codes: A = 1 - 10 pounds; B = 11 - 499 pounds; C = 500 - 999 pounds.

EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐

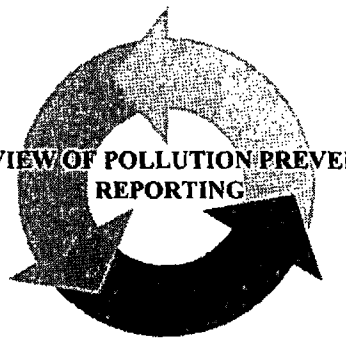
6. ☐ 7. ☐ 8. ☐ 9. ☐ 10. ☐

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year)	Column B Current Reporting Year (pounds/year)	Column C Following Year (pounds/year)	Column D Second Following Year (pounds/year)
8.1	Quantity released **				
8.2	Quantity used for energy recovery onsite				
8.3	Quantity used for energy recovery offsite				
8.4	Quantity recycled onsite				
8.5	Quantity recycled offsite				
8.6	Quantity treated onsite				
8.7	Quantity treated offsite				
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)				
8.9	Production ratio or activity index				

8.10	Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.			
	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1		a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.
8.11	Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one box)			YES ☐ NO ☐

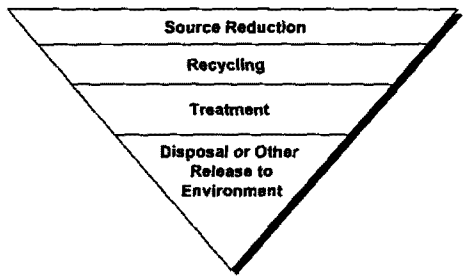
** Report releases pursuant to EPCRA Section 329(8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite or offsite.



OVERVIEW OF POLLUTION PREVENTION REPORTING

1

POLLUTION PREVENTION HIERARCHY



2

THINGS TO REMEMBER WHEN COMPLETING SECTION 8

- Key concepts
  - Waste streams
  - Process streams
  - Reportable recycling
  - Source reduction activities
- Develop consistent definitions for key terms
  - Across facility
  - Across agency/company

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EPA FORM R
PART II. CHEMICAL-SPECIFIC INFORMATION (CONTINUED)

TRI Facility ID Number

Toxic Chemical, Category or Generic Name

SECTION 7B. ON-SITE ENERGY RECOVERY PROCESSES

☐ Not Applicable (NA) - Check here if no on-site energy recovery is applied to any waste stream containing the toxic chemical or chemical category.

Energy Recovery Methods [enter 3-character code(s)]

1 ☐ 2 ☐ 3 ☐ 4 ☐

SECTION 7C. ON-SITE RECYCLING PROCESSES

☐ Not Applicable (NA) - Check here if no on-site recycling is applied to any waste stream containing the toxic chemical or chemical category.

Recycling Methods [enter 3-character code(s)]

1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐

6. ☐ 7. ☐ 8. ☐ 9. ☐ 10. ☐

SECTION 8. SOURCE REDUCTION AND RECYCLING ACTIVITIES

		Column A Prior Year (pounds/year)	Column B Current Reporting Year (pounds/year)	Column C Following Year (pounds/year)	Column D Second Following Year (pounds/year)
8.1	Quantity released **				
8.2	Quantity used for energy recovery onsite				
8.3	Quantity used for energy recovery offsite				
8.4	Quantity recycled onsite				
8.5	Quantity recycled offsite				
8.6	Quantity treated onsite				
8.7	Quantity treated offsite				
8.8	Quantity released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes (pounds/year)				
8.9	Production ratio or activity index				

8.10 Did your facility engage in any source reduction activities for this chemical during the reporting year? If not, enter "NA" in Section 8.10.1 and answer Section 8.11.

	Source Reduction Activities [enter code(s)]	Methods to Identify Activity (enter codes)		
8.10.1		a.	b.	c.
8.10.2		a.	b.	c.
8.10.3		a.	b.	c.
8.10.4		a.	b.	c.

8.11 Is additional information on source reduction, recycling, or pollution control activities included with this report ? (Check one box) YES ☐ NO ☐

** Report releases pursuant to EPCRA Section 329(8) including "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." Do not include any quantity treated onsite or offsite.

RELEASES AND OTHER WASTE MANAGEMENT

- Part II, Sections 8.1 through 8.7 of Form R
  - Column A - Prior Reporting Year Estimate
  - Column B - Current Reporting Year Estimate
  - Column C - Next Reporting Year Projection
  - Column D - Following Reporting Year Projection

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RELEASES AND OTHER WASTE MANAGEMENT

- Part II, Sections 8.1 through 8.7 of Form R
  - Quantity of a Section 313 chemical reported in Sections 8.1 through 8.7 does not include releases (including on-site and off-site disposal) and other off-site waste management activities resulting from remedial actions, catastrophic events, or one-time events not associated with production process. These quantities should be reported in Section 8.8 only.

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RELEASES

- Section 8.1: Quantity released
  - Quantity of a Section 313 chemical "released"
    - » Definition of release: "...any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing...into the environment..." (EPCRA §329(8))
    - » Includes fugitive and stack air emissions, releases to land, releases to water, underground injections, and on-site and off-site disposal
    - » Includes metals in wastes sent to a POTW (metals cannot be destroyed)

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RELEASES

- Section 8.1: Quantity Released (continued)
  - § 8.1 = §5 + §6.2 (disposal only) + §6.1(for metals and metal compounds only) - §8.8 (release or off-site disposal only)
  - Possible data sources
    - » Data and calculations from Sections 5 and 6 of Form R

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ENERGY RECOVERY

- Sections 8.2 and 8.3: On-site and off-site energy recovery
  - Things to remember about energy recovery
    - » Combustion unit (e.g., industrial furnace, industrial kiln, or boiler) must be integrated into an energy recovery system
    - » Section 313 chemical must have significant heating value (e.g., 5,000 BTU/lb.)
    - » Section 313 chemicals that are, or are contained in, commercially available fuels should not be reported as combusted for energy recovery

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ENERGY RECOVERY

- Section 8.2: On-site energy recovery
  - Quantity of Section 313 chemical used for energy recovery <u>on-site</u>
    - » Quantity *actually* combusted in the energy recovery unit - *not* the quantity entering the unit
  - A code reported in Section 7B indicates that Section 8.2 should be calculated
  - Possible data sources
    - » Engineering process specifications
    - » Mass balance calculations
    - » Best engineering judgement

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ENERGY RECOVERY

- Section 8.3: Off-site energy recovery
  - Quantity of Section 313 chemical that is *transferred* off-site for energy recovery
    - » Includes total quantity of Section 313 chemical *transferred* off-site for energy recovery purposes - *not* quantity actually combusted off-site
  - Possible data sources
    - » Section 6.2 (codes M56 and M92) of Form R
    - » Receipts from off-site facilities
    - » RCRA hazardous waste manifests

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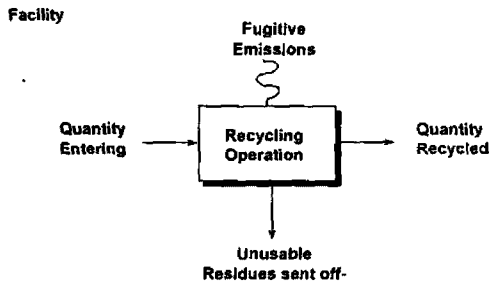
RECYCLING

- Section 8.4: On-site recycling
  - Quantity of Section 313 chemical recycled on-site
    - » Includes total quantity of Section 313 chemical *recovered* from the recycling process and made available for further use
  - Possible data sources
    - » Engineering process specifications
    - » Mass balance calculations
  - A code reported in Section 7C indicates that Section 8.4 should be calculated

14

CALCULATING QUANTITY RECYCLED IN SECTION 8.4



15

RECYCLING

- Section 8.5: Off-site recycling
  - Quantity of Section 313 chemical *transferred* off-site for recycling
    - » Includes total quantity of Section 313 chemical *transferred* to off-site locations for recycling
  - Possible data sources
    - » Section 6.2 of Form R (only for recycling destinations)
    - » Receipts from off-site recycling facilities
    - » RCRA hazardous waste manifests
    - » RCRA Hazardous Waste Report (BRS)

16

WASTE TREATMENT

- Section 8.6: Quantity *treated on-site*
  - Quantity of Section 313 chemical *treated* on-site
    - » Includes all quantities of Section 313 chemical destroyed
  - Possible data sources
    - » Calculations used to complete Section 7A of Form R

17

WASTE TREATMENT

- Section 8.7: Off-site waste treatment
  - The amount of Section 313 chemical that is *transferred* off-site for waste treatment
    - » Includes all quantities of Section 313 chemical *transferred* to off-site facilities for waste treatment
  - Possible data sources
    - » Sections 6.1.A.1 and 6.2.A (i.e., off-site transfers for waste treatment)
      - Important: Assume all Section 6.1.A.1 quantities are treated, except metals and metal compounds

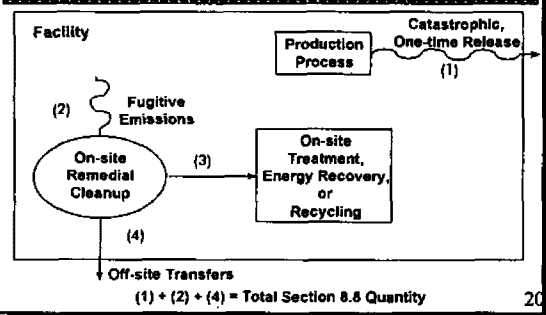
18

REMEDIAL, CATASTROPHIC, OR ONE-TIME RELEASES

- Section 8.8: Remedial, catastrophic, or one-time releases
  - Quantity of Section 313 chemical released into the environment or transferred off-site as a result of:
    - » Remediation
    - » Catastrophic events (e.g., earthquake, hurricane, fire, floods)
    - » One-time events not associated with production processes (e.g., pipe rupture due to unexpected weather)
  - Does not include Section 313 chemicals treated, recovered, or recycled on-site.
  - Excludes quantities in Sections 8.1 through 8.7

19

CALCULATING QUANTITY REPORTED IN SECTION 8.8



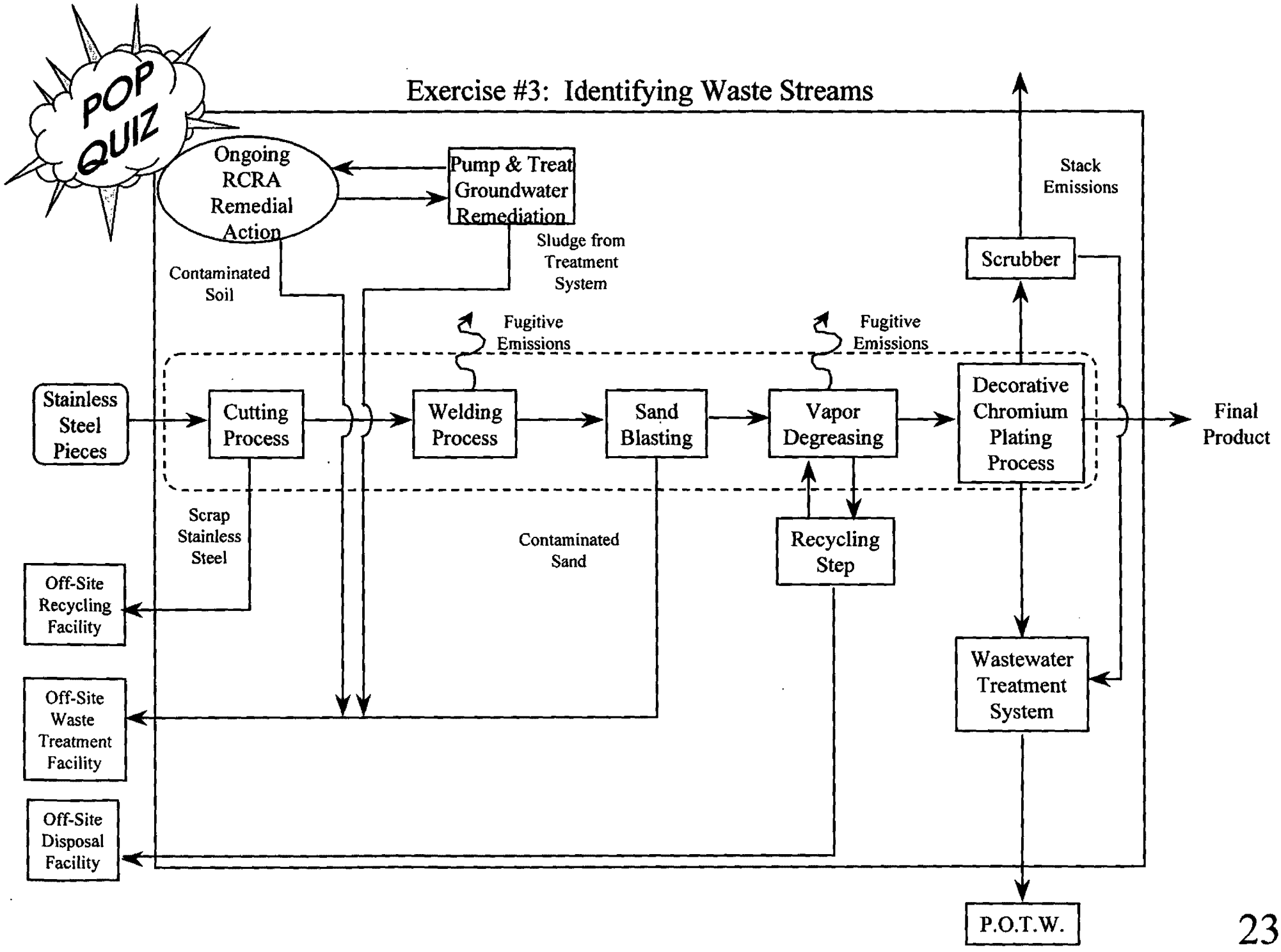
(1) + (2) + (4) = Total Section 8.8 Quantity

20

REMEDIAL, CATASTROPHIC, OR ONE-TIME RELEASES

- Section 8.8 (continued)
  - Possible data sources
    - » Quantities reported in Part II, Sections 5 and 6
    - » Accident investigation reports
    - » Inventory reconciliation
    - » Mass balance calculations
    - » Monitoring reports (e.g., pH, discharge monitoring reports, continuous emissions monitoring)
    - » CERCLA reports filed with the National Response Center
    - » Release notification reports required under EPCRA section 304

21


POP QUIZ
Exercise #3: Identifying Waste Streams
Ongoing RCRA Remedial Action
Pump & Treat Groundwater Remediation
Sludge from Treatment System
Contaminated Soil
Stack Emissions
Scrubber
Fugitive Emissions
Fugitive Emissions
Stainless Steel Pieces
Cutting Process
Welding Process
Sand Blasting
Vapor Degreasing
Decorative Chromium Plating Process
Final Product
Scrap Stainless Steel
Contaminated Sand
Recycling Step
Off-Site Recycling Facility
Off-Site Waste Treatment Facility
Off-Site Disposal Facility
Wastewater Treatment System
P.O.T.W.

SOURCE REDUCTION AND OTHER WASTE MANAGEMENT ACTIVITIES

- Important points regarding Sections 8.1 through 8.8
  - Sum of the quantities in Sections 8.1 through 8.7 equals the total quantity of the Section 313 chemical "entering any waste stream (or otherwise released into the environment) prior to recycling, treatment, or disposal." (PPA section 6607(b)(1))
  - Quantities reported in Sections 8.1 through 8.7 are exclusive of each other
  - Sum of Sections 8.1 through 8.7 is mutually exclusive of the quantity in Section 8.8

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PRODUCTION RATIO OR ACTIVITY INDEX

- Section 8.9: Production ratio or activity index
  - A ratio of production or activity involving the Section 313 chemical in the reporting year to production or activity in the previous year
  - Allows quantities of the Section 313 chemical reported in Sections 8.1 through 8.7 in the current year to be compared to quantities reported in the prior year
  - Production ratio or activity index is determined by dividing the level of production (or activity) in the current year by the level of production (or activity) in the prior year
  - Select methodology least likely to be affected by potential source reduction activities

24

PRODUCTION RATIO

- Use production ratio if Section 313 chemical usage is directly proportional to a production level
  - Equation

$$\frac{\text{Quantity of Product: Current Reporting Year}}{\text{Quantity of Product: Prior Reporting Year}}$$

Example:

Oven manufacturing

$$\frac{\text{40,000 ovens assembled (Current RY)}}{\text{35,000 ovens assembled (Prior RY)}} = 1.14$$

25

ACTIVITY INDEX

- Use activity index if Section 313 chemical usage is related to an activity at the facility and not to a production level
  - Equation

$$\frac{\text{Level of Activity : Current Reporting Year}}{\text{Level of Activity: Prior Reporting Year}}$$

Example:

Tank Washouts

$$\frac{\text{60 Washouts (Current RY)}}{\text{50 Washouts (Prior RY)}} = 1.2$$

26

PRODUCTION RATIO OR ACTIVITY INDEX

- Possible data sources
  - Production reports
  - Maintenance records for otherwise used chemicals
  - Waste minimization section of the RCRA Hazardous Waste Report
  - *State/corporate pollution prevention reports*

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SOURCE REDUCTION ACTIVITIES

- Section 8.10
  - Source reduction practices used with respect to the Section 313 chemical at the facility and the methods used to identify those activities
  - *This section includes only those source reduction activities implemented during the reporting year*
    - Only include activities that reduce or eliminate quantities reported in Sections 8.1 through 8.7

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SOURCE REDUCTION ACTIVITIES

- Section 8.10 (continued)
  - Possible data sources
    - » Standard operating procedures
    - » Process changes or equipment changes (e.g., replacements, adjustments)
    - » Raw material changes
    - » Work orders for process changes
    - » Product redesign specifications
    - » Audit reports and follow-up actions
    - » Waste minimization section of the RCRA Hazardous Waste Report
    - » State/corporate pollution prevention reports

OPTIONAL INFORMATION

- Section 8.11
  - Facility should indicate whether additional optional information on source reduction, recycling, or pollution control activities is included with the report
  - A one-page summary is encouraged
  - Facility can provide information on previous years' activities
  - EPA and others use this information for granting awards and recognition to companies and employees

TRI UPDATE

TRI UPDATE

- TRI expansion
  - Industry Expansion
  - PBT Reporting
- Reporting form changes
- Interpretive guidance
- Form R submissions/revisions

2

INDUSTRY EXPANSION

- TRI now covers seven new industries (Metal Mines, Coal Mines, Electricity Generating Facilities, Petroleum Bulk Terminals, Chemical Distributors, Solvent Recyclers, & Hazardous Waste Treatment and Disposal Facilities)
  - First Form R reports were due by 7/1/99
  - EPA has prepared guidance documents for specific industries
  - New Supplier Notification Requirements for facilities in SIC codes 20-39
  - EPA revised definition of "otherwise use" to include treatment and disposal of wastes received from off-site

3

INDUSTRY EXPANSION

- EPA considering petition to add SIC Code 45, Transportation By Air (February 10, 1998; 63 FR 6691)
  - EPA also considering elimination or modification of the motor vehicle exemption and otherwise use exemptions

4

PERSISTENT, BIOACCUMULATIVE, TOXIC CHEMICALS

- PBT final rule was published in the Federal Register on October 29, 1999 (64 FR 58666).
  - Effective for RY 2000, reports due by 7/1/01
  - Does not impact reporting for RY 1999
- Proposal to add Lead and Lead Compounds to the PBT list published in Federal Register on August 3, 1999 (64 FR 42222); EPA reviewing comments

5

PPA REPORTING

- PPA (Section 8) reporting
  - EPA may issue proposed rule within the year
  - EPA considering petition to modify its guidance on "Energy Recovery" to include the combustion of high-energy chemicals for the purpose of destroying low-energy chemicals in hazardous waste incinerators. (64 FR 15324; March 31, 1999)

6

REPORTING FORM CHANGES

- For RY 1999, the first SIC code reported should be primary SIC code
- Other recent modifications
  - Underground injection: releases to Class I wells reported separately from releases to class II-V wells
  - On-site landfills: releases to RCRA subtitle C landfills reported separately from releases to other types at landfills
  - Report multiple chemicals on a single Form A certification statement

7

FORM R SUBMISSIONS/REVISIONS

- Voluntary revisions must be submitted by July 31 of the same year as the reporting deadline for the revised data to be included in the next TRI data release
- Form R submitted to replace previously filed Form A
  - Considered to be a late submission of a Form R and a request for a withdrawal of the previously filed Form A
  - Do not check the revision box!
- No DOS version of ATRS for RY 1999

8

CHEMICAL MIGRATION GUIDANCE

- Migration of a Section 313 chemical contained in waste released (including disposal) may occur
  - Migration of reportable chemical within one environmental medium (e.g., leachate from landfill)
    - » Only required to report initial release of chemical to the environment
  - Migration of chemical from one environmental medium to another (e.g., volatilization from a landfill) within the reporting year
    - » Release estimates should be calculated and reported for all media in Part II, Sections 5, 6, and 8 of Form R

9

THRESHOLD GUIDANCE

- For threshold determinations, the definitions of "manufacture," "process," and "otherwise use" currently do not include Section 313 chemicals:
  - Remediated
  - Demolished
  - Treated in wastes generated on site
  - Stored
  - Recycled on-site for use on-site
- These activities, in and of themselves, do not constitute threshold activities

10

OTHERWISE USE EXEMPTION GUIDANCE

- Otherwise use exemptions do not apply to coincidental manufacturing activities
  - Ammonia coincidentally manufactured, as a result of the degradation of the sewage, is not exempt under the personal use exemption
  - Acid aerosols and metal compounds manufactured as by-products of fuel combustion
- Section 313 chemicals in gasoline used to refuel motor vehicles from off-site are considered processed and do not qualify for the motor vehicle maintenance exemption
- Laboratory activities exemptions only applies to certain activities that take place in a laboratory.

11

SECTION 313 CHEMICAL LIST

1

SECTION 313 CHEMICAL LIST

- Current list contains over 600 individual chemicals and chemical categories (40 CFR 372.65)
- Top 20 chemicals for 1997 based on total waste

Methanol	Ethylene	Toluene
Copper	Propylene	Ammonia
Creosote	Zinc cmpds.	Lead cmpds.
Phosphoric acid	Ethylene glycol	n-Hexane
Copper cmpds.	Vinyl chloride	Nitrate cmpds.
Nitric acid	Chlorine	HCl (aerosol)
Xylene (mix.)	Sulfuric acid (aerosol)	

2

SECTION 313 CHEMICALS AND CHEMICAL CATEGORIES

- Dynamic, evolving list
  - Additions
  - Deletions
  - Modifications
- Petition process to add or delete chemicals or forms of chemicals

3

CHEMICALS ADDED BY THE PBT RULE

- Additions to TRI list effective 1/1/00 for reports due 7/1/01
  - Benzo(g,h,i)perylene
  - Benzo(j,k)fluorene (fluoranthene) & 3-methylcholanthrene added as part of polycyclic aromatic compounds (PACs) category
  - Octochlorostyrene
  - Pentachlorobenzene
  - Tetrabromobisphenol A (TBBPA)
  - Dioxin and dioxin-like compounds category
  - Vanadium compounds
- Modifications to TRI list effective 1/1/00 for reports due 7/1/01
  - Vanadium (fume or dust) is now vanadium (except when in an alloy)

4

CHEMICAL LIST CHANGES

- Proposed for deletion
  - Phosphoric acid
  - Chromite ore mined in the Transvaal Region of South Africa and the unreacted ore component of the chromite ore processing residue (COPR)
- Deletion proposals denied
  - MEK
  - MIBK
  - Acetonitrile

5

EPCRA SECTION 313 CHEMICAL QUALIFIERS

- Qualifiers - Listed chemicals with parenthetic qualifiers subject to TRI reporting only if manufactured, processed, or otherwise used in specified form. Below are some examples:

CHEMICAL	CAS#	QUALIFIER
Aluminum	7429-90-5	Fume or dust
Zinc	7440-66-6	Fume or dust
Aluminum oxide	1344-28-1	Fibrous forms
Asbestos	1332-21-4	Friable forms
Hydrochloric acid	7647-01-0	Acid aerosols
Sulfuric acid	7664-93-9	Acid aerosols

- Not reportable unless present in the specified form

6

METAL COMPOUND CATEGORIES

- Consider the entire weight of the compounds in the category when determining thresholds
- Include only the weight of the parent metal of the category (e.g., copper for copper compounds) when calculating releases and other waste management quantities

7

DETERMINING THRESHOLDS FOR METAL COMPOUNDS

Multiple Compounds Within A Mixture Example

A facility processes 200,000 pounds of a mixture containing 10% zinc chromate and 15% chromium dioxide by weight

- Quantity toward chromium compounds threshold

  (10% + 15%) x (200,000) = 50,000 pounds

- Quantity toward zinc compounds threshold

  (10%) x (200,000) = 20,000 pounds

- 25,000-pound processing threshold applies; chromium compounds are reportable and zinc compounds are not

8

NITRATE COMPOUNDS

- Water dissociable nitrate compounds category
  - For threshold determinations, use the weight of the nitrate compound, but use only the weight of the nitrate ion portion when calculating releases and other waste management quantities
  - Nitrate compounds are produced when nitric acid is neutralized
  - Includes compounds like sodium nitrate, silver nitrate, and ammonium nitrate

9

DETERMINING THRESHOLDS FOR NITRATE COMPOUNDS

Example

- 20,000 pounds of nitric acid (HNO_3) are neutralized with sodium hydroxide (NaOH) in an on-site wastewater treatment system. Perform a threshold determination for nitrate compounds (water dissociable; in aqueous solution):

  Assume:

  - Neutralization 100% complete and generates sodium nitrate ($NaNO_3$), which is released to a waterbody
  - Molecular weight (MW) of HNO_3 = 63
  - MW of $NaNO_3$ = 85
  - 1 mole of HNO_3 generates 1 mole of $NaNO_3$

10

DETERMINING THRESHOLDS FOR NITRATE COMPOUNDS

Example (continued)

Quantity of $NaNO_3$ manufactured = quantity of HNO_3 neutralized x (MW of $NaNO_3$/MW of HNO_3)

Quantity of $NaNO_3$ manufactured = 20,000 pounds x (85/63)

Quantity of $NaNO_3$ manufactured = 26,984 pounds

The 25,000 pound manufacturing threshold is exceeded!

11

CALCULATING RELEASES FOR NITRATE COMPOUNDS

Example (continued)

Releases are reported on nitrate ion (NO_3^-) basis. Calculate the quantity of nitrate ion (MW of NO_3^- = 62) released to a waterbody:

Pounds of NO_3^- = pounds of $NaNO_3$ x (MW of NO_3^-/MW of $NaNO_3$)

Pounds of NO_3^- = 26,984 pounds x (62/85)

Pounds of NO_3^- = 19,682 pounds (rounded to 20,000 pounds)

12

NON-METAL COMPOUND CATEGORIES

- Consider the entire weight of the compounds in these categories when determining thresholds
- Include the entire weight of the compounds in the category when calculating releases and other waste management quantities for all compounds in these categories

13

XYLENE AND XYLENE ISOMERS

- If data do not specify o-, m-, or p- isomers of xylene, calculate thresholds, release and other waste management quantities based on "xylene (mixed isomers)"
- If data specifies o-xylene, m-xylene, or p-xylene individually, calculate thresholds, release and other waste management quantities based on the individual isomers
  - If thresholds are exceeded for more than one isomer, releases and other waste management quantities can be consolidated in one report as "xylene (mixed isomers)"
- Same logic applies to cresol, toluene diisocyanates

14

CHEMICALS MODIFIED

- Ammonia
  - Requires threshold determination and release and other waste management quantity calculations for aqueous ammonia from any source (i.e., anhydrous ammonia in water or water dissociable ammonium salts) be based on 10 percent of the total ammonia present in aqueous solutions
  - Anhydrous ammonia - include 100% for thresholds and releases
    - Including air releases from aqueous ammonia
  - Effective RY 1994

15

CHEMICALS MODIFIED

- Glycol ethers category
  - Removed surfactant glycol ethers from category (59 FR 34386, 7/5/94)
  - Common glycol ethers still in category include:
    - 2-Butoxyethanol (CAS # 111-76-2)
    - Diethylene glycol monoethyl ether acetate (CAS # 112-15-2)
    - Diethylene glycol monobutyl ether (CAS # 112-34-5)
  - Effective RY 1993

16

ADMINISTRATIVE STAYS

- No reporting required for the following chemicals until further notice
  - 2,2-Dibromo-3-nitrilopropionamide (DBNPA) (CAS # 10222-01-2)
    - Effective RY 1995
  - Hydrogen sulfide (CAS # 7783-06-4)
    - Effective RY 1994
  - Methyl mercaptan (CAS # 74-93-1)
    - Effective RY 1994

17

EXERCISE 4:
CALCULATING RELEASES OF AMMONIA AND NITRATE COMPOUNDS

During the calendar year, a facility uses 200,000 pounds of nitric acid solution containing 50 percent (by weight) nitric acid (HNO_3) in an etching operation. All of the nitric acid is eventually transferred to an on-site treatment facility as part of an aqueous waste stream. The nitric acid is neutralized with pure (gaseous) anhydrous ammonia (NH_3). The facility uses an excess of ammonia to assure complete neutralization to pH 8. During the calendar year, the facility used 30,000 pounds of ammonia. As a result of the treatment process, a nitrate compound, ammonium nitrate (NH_4NO_3), is formed. The ammonium nitrate and any remaining ammonia are then released to a waterbody.

Using the additional information below, complete questions a through d.

Assumptions

For simplicity, assume air emissions are zero.

Chemical Name	Molecular Weights
Ammonium nitrate (NH_4NO_3)	= 80.04 lb/lbmol
Ammonia (NH_3)	= 17.03 lb/lbmol
Nitric acid (HNO_3)	= 63.01 lb/lbmol
Nitrate ion (NO_3^-)	= 62.01 lb/lbmol

Chemistry Fundamentals

Nitric acid (HNO_3) and anhydrous ammonia (NH_3) are monovalent and react in a 1:1 ratio. One mole of NH_3 is used to neutralize each mole of HNO_3 treated. When neutralized with anhydrous ammonia, nitric acid (HNO_3) produces ammonium nitrate (NH_4NO_3) in a 1:1 ratio. These substances are monovalent, so for each mole of HNO_3 neutralized, one mole of NH_4NO_3 is produced. As indicated in the following formula:

$$HNO_3 + NH_3 \rightleftharpoons NH_4NO_3$$

Therefore, 63.01 pounds of nitric acid reacts with 17.03 pounds of ammonia to produce 80.04 pounds of ammonium nitrate (which contains 62.01 pounds of nitrate ion).

a) Based on the above scenario and information available, determine which toxic chemicals would be subject to EPCRA section 313 threshold and release determinations.

b) Calculate the quantity of nitric acid applied towards threshold determinations and release calculations.

c) Calculate the quantity of ammonia applied towards threshold determinations and release calculations.

d) Calculate the quantity of ammonium nitrate applied towards threshold determinations and release calculations.

METAL AND METAL COMPOUND REPORTING

EPCRA SECTION 313 METALS

- Metals are EPCRA section 313 chemicals
  - Examples:
    - » Elemental metals: chromium, nickel, manganese, cobalt, silver, arsenic, copper
    - » Metal compound categories: zinc compounds, selenium compounds, nickel compounds, chromium compounds
    - » Individually listed metal compounds: sodium fluoroacetate , calcium cyanamide, lithium carbonate, molybdenum trioxide, titanium tetrachloride
- Alloys are mixtures of elemental metals
  - Stainless steels, nickel superalloys, brasses, aluminum alloys, and carbon steels

2

EPCRA SECTION 313 METALS WITH QUALIFIERS

- Metals and metal compounds can have qualifiers:
  - Zinc (fume or dust)
  - Aluminum (fume or dust)
  - Vanadium (fume or dust)
    - » Beginning RY 2000, listing will change to vanadium (except when in an alloy)
  - Aluminum oxide (fibrous forms)

3

EPCRA SECTION 313 METAL COMPOUND CATEGORIES

- Consider the entire weight of the compounds in the category when determining thresholds
- Include only the weight of the parent metal of the category (e.g., copper for copper compounds) when calculating releases, off-site transfers, and waste management activities

4

EPCRA SECTION 313 METALS AND COMPOUND CATEGORIES

- Elemental metals and metal compound categories are separately listed chemicals under EPCRA Section 313
  - Separate threshold determinations
  - Report for each listing (e.g., nickel or nickel compound category) only if the threshold for each listing is exceeded
  - If threshold exceeded for both the elemental metal & metal compound category (e.g., nickel and nickel compounds), you have options to report separately or file one combined report

5

CATEGORIES OF MANUFACTURING ACTIVITIES

- Manufacturing - generating a Section 313 chemical
  - Combustion. When coal or oil are combusted, metal oxides are manufactured
  - Electroplating. In a nickel plating operation, elemental nickel and nickel compounds are manufactured
  - Fume or Dust. Machining an aluminum part manufactures aluminum (fume or dust)
  - Importing. Importing copper ore = manufacturing copper
  - Beneficiation of ore. Complex process where metal compounds are converted to other metal compounds and elemental metals

6

CATEGORIES OF PROCESSING ACTIVITIES

- Processing - incorporating a section 313 chemical into a product for further distribution in commerce
  - Metals and metal compounds extracted from mines distributed into commerce
  - Metals are incorporated into a wide variety of products including motor vehicles, consumer products, industrial equipment, and various other products
  - Metals sent off-site for recycling or reuse

7

OTHERWISE USE

- Otherwise using - includes most activities that are not manufacturing or processing
  - Fabricating and/or using tooling
  - Installation of process-related equipment and piping
    - For example, constructing storage tanks
  - Use of ash and waste rock for land contouring, structural backfill, or soil building

8

THRESHOLD DETERMINATIONS: DATA SOURCES

- Mines
  - Use ore analyses and geochemical knowledge
  - Examine if impurities are ever concentrated above *de minimis* concentration
- Industrial processing of alloys
  - Use alloy specifications in addition to MSDSs to improve precision
  - Be comprehensive: Some carbon steels and aluminum alloys may contain manganese above *de minimis*

9

ARTICLES EXEMPTION TEST

- The three criteria for articles exemption status are:
  - Is formed into a specific shape or design during manufacture; and
  - Has *end-use functions dependent in whole or in part on its* shape or design during end-use; and
  - Does not release a Section 313 chemical under normal *processing or use conditions at a facility*
- Articles exemption is often inappropriately used!
  - A useful rule of thumb is that when metal is melted, machined, or ground, articles exemption usually NOT applicable.

10

STRUCTURAL COMPONENT EXEMPTION TEST

- Structural components need to pass a test to be exempt. Test has 2 *criteria:*
  - Is part of the facility structure; and
  - Is NOT process related.
- Non-process-related structural items eligible for the exemption:
  - Potable water pipes and other non-process-related pipes and *structures*
- Processed-related items/uses NOT eligible for the exemption:
  - Refractory brick, process-related pipes, anodes used in electroplating, grinding wheels, & metal working tools

11

FORM R: AIR EMISSIONS

- Fugitive emissions (Section 5.1)
  - Ambient air monitoring can indicate emissions occurring.
  - Particulate emission data combined with speciation can be used to estimate emissions
- Stack emissions (Section 5.2)
  - Many techniques available: adjusting permit estimates to actual production, use of sampling data, back-calculation from control device efficiencies and quantity of dust collected, and engineering estimates

12

FORM R: WASTEWATER DISCHARGES

- Wastewater discharges (Section 5.3 and/or Section 6.1)
  - Calculate based on wastewater flows and measured concentrations
  - For metals not measured, consider engineering estimate (e.g., use ratio of metals in process and measured metal quantity)

13

FORM R: OFF-SITE WASTE TRANSFERS

- It's critical to be comprehensive!
- Potential off-site waste transfers of reportable metals
  - Hazardous waste
  - Non-hazardous waste (e.g., waste oil and coolant)
  - Trash
  - Scrap metal (reuse versus recycle)
- Exercise caution when using TCLP data

14

FORM R: OFF-SITE WASTE TRANSFERS

- Report final disposition of metal sent off-site for further waste management
- Off-site waste management codes for metals are disposal and recycling codes
  - Examples:
    - » M41 Solidification/Stabilization-Metals and Metal Compounds only
    - » M62 Wastewater Treatment (Excluding POTW)-Metals and Metal Compounds only

15

TREATMENT OF METALS

- Generally, metals cannot be treated or combusted for energy recovery for sections 6 and 8 of Part II of the Form R
  - Metals are elements and cannot be destroyed
  - Exceptions include conversions to non-listed chemicals, including:
    - » Aluminum (fume or dust) converted to a solution
    - » Barium chloride (included in barium compounds category) converted to barium sulfate (not included)
    - » Molybdenum trioxide converted to molybdenum carbonate

16

RECYCLE OR REUSE?

- Metal sent off-site for direct reuse:
  - Is processing
  - No contaminants removed
  - De *minimis* exemption applies
  - Not reported on Form R

17

RECYCLE OR REUSE?

- Materials sent off-site for recycling:
  - Contaminants removed or usable materials extracted
  - Is processing
  - *De minimis* exemption DOES NOT apply
  - Report on Form R in Sections 6.2 and 8.5

18

FORM R: SECTION 7, ON-SITE WASTE TREATMENT

- Part II, Section 7A: On-site waste treatment methods and efficiency
  - Treatment INCLUDES removal from waste stream
  - Report any waste treatment step through which a reportable chemical passes
- Air pollution control equipment and wastewater treatment typically reported

19

FORM R: SECTION 8

- Consistency with data reported on other parts of Form R is critical
  - Quantity Released: §8.1 = §5 + §6.2 (disposal codes only) + §6.1 (metals and metal compounds only) - §8.8 (release or off-site disposal only)
  - Off-Site Recycling: §8.5 = §6.2 (recycling codes only) - §8.8 (off-site recycling)
  - On-Site & Off-Site Energy Recovery: §8.2 = NA & §8.3 = NA
  - On-Site & Off-Site Waste Treatment: §8.6 = NA & §8.7 = NA
    - » Remember exceptions when treatment of metals can occur!

20

ACID AEROSOL AND FUEL COMBUSTION REPORTING

ACID AEROSOLS

- Aerosol forms include any airborne hydrochloric acid (including mists, vapors, gases or fogs) droplets without regard to particle size
- Sulfuric acid listing modified, effective RY 1994
- Hydrochloric acid listing modified, effective RY 1995

ACID AEROSOLS THRESHOLD DETERMINATIONS

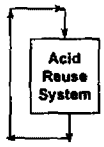
- Manufacture - Acid aerosols manufactured from non-aerosol acid solutions and as by-products of combustion
- Processing - Acid aerosol or a reaction product is incorporated into a product for distribution into commerce
- Otherwise Use - Acid aerosol used, e.g., spray application for etching, cleaning, neutralizing, without incorporation into a product

ACID AEROSOLS THRESHOLD DETERMINATIONS

- *Acid Reuse Systems (Sulfuric and hydrochloric acid only)*
  - Acid aerosol manufactured and otherwise used.
  - Simplified method of estimating quantity for threshold determination:

Total System Volume + Total Virgin Acid Added

= Amount Acid Aerosols Manufactured/Otherwise Used



  - See EPA's *Guidance for Reporting Sulfuric Acid* (March 1998) for specific calculations

4

ACID AEROSOLS TREATMENT FOR DESTRUCTION

- Acid Aerosols Removed by Scrubbers
  - *Non-aerosol forms of sulfuric/hydrochloric acid are not* reportable under EPCRA Section 313
  - Acid aerosols removed by scrubbers are converted to a non-reportable form
  - *Report the quantity removed by the scrubber as treatment* for destruction

5

COMBUSTION

- EPCRA Section 313 chemicals may be coincidentally manufactured during combustion of:
  - Oil
  - Coal
  - Natural gas
  - Waste
  - Other materials

6

COMBUSTION - MANUFACTURING

- Examples of manufactured chemicals:
  - » Hydrochloric acid aerosol, sulfuric acid aerosol
  - » Hydrogen fluoride
  - » Metal compounds and metals (e.g., mercury)
  - » Organics
  - » Dioxin
- *De minimis* does not apply
- Most other exemptions do not apply

7

COMBUSTION - OTHERWISE USE

- Combustion of fuel is also otherwise use
- *De minimis* and other exemptions would apply
- Example: 1,2,4-trimethylbenzene and n-hexane in No. 2 fuel oil

8

COMBUSTION & METAL COMPOUNDS

- Metal compounds and elemental metals in fuel are converted to metal oxide
- If no other data available, assume compound is lowest weight oxide that could be manufactured from metal
- Example
  - » Nickel in fuel → Assume NiO not Ni_2O_3 is manufactured

9

COMBUSTION & METAL COMPOUNDS

- Amount of metal compound manufactured is determined by the total weight of the compound, not the parent metal
- Be comprehensive: Include all metal compounds and all *combustion units and any other activities that may* manufacture metal compounds
- Elemental metal may be manufactured (e.g., mercury)
- Releases and other waste management estimates are based on the weight of the parent metal

10

METAL COMPOUNDS

- Example calculation:
  - During the year, a facility burns 70,000 tons of coal with a manganese (Mn) concentration of 141 micrograms/gram.

    Lowest weight Mn compound manufactured = MnO

    Molecular weight Mn = 55

    Molecular weight MnO = 71
  - Do they exceed the manufacturing threshold?

11

METAL COMPOUNDS

- Amount MnO manufactured

  = amount coal x concentration Mn x MW_{MnO}/MW_{Mn}

  = 70,000 tons x 2,000 lbs/ton x 141 μg/g x 71/55

  = 25,483 pounds
- Threshold exceeded

12

METAL COMPOUNDS IN COAL

- Sources of data for calculating amounts manufactured
  - Fuel analysis, fuel specifications, or other supplier information
  - U.S. Geological Survey's (USGS) coal quality data base (http://energy.er.usgs.gov/products/databases/CoalQual/)
  - Electrical Power Research Institute's (EPRI) PISCES data base on coal constituents
  - Tables in EPA's *EPCRA Section 313 Industry Guidance: Electricity Generating Facilities*

13

METAL COMPOUNDS IN OIL

- Sources of data for calculating amounts manufactured
  - Producer's fuel analysis, fuel specifications, or other producer information
  - Tables in EPA's *EPCRA Section 313 Industry Guidance: Electricity Generating Facilities*

14

ACIDS FORMED DURING COMBUSTION

- Hydrochloric acid aerosols and hydrogen fluoride form during the combustion of fuels/wastes containing chlorine & fluorine
  - See EPA's *EPCRA Section 313 Industry Guidance: Electricity Generating Facilities* for emission factors
- Sulfuric acid aerosols form in stacks from combustion processes of fuel oil, coal, and other sulfur-containing fuels
  - Water and sulfur trioxide, products of fuel combustion, react quickly to form sulfuric acid in the presence of moisture
  - See EPA's *Guidance for Reporting Sulfuric Acid* (March 1998) for specific calculations

15

ORGANICS

- Organics may be released during combustion, e.g., PACs, formaldehyde
- Manufacture of formaldehyde and releases of other organics: see emission factors in EPA's *EPCRA Section 313 Industry Guidance: Electricity Generating Facilities*
- For more information on PACs: see EPA's *Guidance for Reporting Toxic Chemicals in the Polycyclic Aromatic Compounds Category*

16

RELEASES FROM COMBUSTION

- Sources of data:
  - Monitoring data
  - Facility-specific emission factors
  - Emission factors in EPA's *EPCRA Guidance for Electricity Generating Facilities* guidance document

17

COMBUSTION ASH

- Combustion ash may contain manufactured metals and metal compounds.
- Ash released on-site (e.g., land disposal, fugitive air emissions)
  - *De minimis* exemption does not apply to manufacture of metals and metal compounds as by-products
  - Ash used on-site to construct roads or berms should be reported as release to land: other disposal (Section 5.5.4 of Form R)

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COMBUSTION ASH

- Ash sent off-site to be managed as a waste should be reported in Section 6.2. Example: ash sent off-site for direct application to land as roadfill
- Ash sent off-site for direct reuse is not reported on the Form R. Example: ash used to manufacture concrete blocks
  - Ash considered distributed into commerce and, therefore, processed
  - *De minimis* exemption can apply

MAINTENANCE CHEMICALS AND OTHERWISE USE

- Otherwise uses of Section 313 chemicals include:
  - Maintaining process-related equipment and structures
  - Cleaning process-related equipment and structures
  - Other activities including waste treatment, process-related building cooling/heating, and process-related fuel use (not used in motor vehicle activities)

2

MAINTENANCE CHEMICALS OTHERWISE USED

- Examples of Section 313 chemicals otherwise used for maintenance of process equipment and structures:
  - Xylene in paint
  - Zinc compounds in lubricating oils
  - Metal alloys in parts tooling and equipment repair
  - Metal compounds in welding rods used to repair equipment and structures
  - Metal compounds in refractory bricks used to line furnaces

3

CLEANING CHEMICALS OTHERWISE USED

- Examples of Section 313 chemicals otherwise used for cleaning process equipment and structures:
  - 1,2,4-trimethylbenzene in diesel fuel used to clean bulk storage tanks
  - Phenol in paint strippers
  - Xylene in degreasers
  - Dichlorofluoromethane in contact cleaners

4

ADDITIONAL CHEMICALS OTHERWISE USED

- Examples of Section 313 chemicals otherwise used at facilities:
  - HCFC-22 used to refrigerate product before sale
  - Ammonia used to treat process water
  - Ethylbenzene in fuel used to power process equipment
  - Ethylene glycol sprayed on coal piles to prevent freezing
  - Pesticides used in cooling towers to prevent algae

5

OTHERWISE USE CHEMICAL EXEMPTIONS

- For Section 313 chemicals otherwise used for maintenance or cleaning of non process-related equipment and structures, the following may apply:
  - Routine janitorial or facility grounds maintenance exemption
    - Example: Xylene in cleaners used to clean the employee cafeteria
  - Structural component exemption
    - Example: Toluene in paint used to paint the employee recreation center

6

OTHERWISE USE CHEMICAL EXEMPTIONS

- Motor vehicle exemption if the chemical is used to maintain motor vehicles operated by the facility
  - » Example: Xylene in engine degreasers used to maintain the facility motor vehicles
- Personal use exemption if the chemical is contained in non-process related items solely for employee personal use
  - » Example: Chlorine to treat on-site drinking water

7

OTHERWISE USE CHEMICAL EXEMPTIONS

- For Section 313 chemicals contained in like items (e.g., tooling) otherwise used for maintenance of equipment and structures:
  - Article exemption provided that the item:
    - » Is formed into a specific shape or design during manufacture; and
    - » Has end-use functions dependent in whole or in part on its shape or design during end-use; and
    - » Does not release a Section 313 chemical under normal processing or otherwise use conditions at a facility (> 0.5 lbs.)

8

ACCOUNTING TIPS FOR OTHERWISE USE CHEMICALS

- Otherwise use chemicals are easily overlooked and not accounted for in threshold determinations
- Identify otherwise use activities even if a manufacturing and/or processing threshold has been exceeded for a section 313 chemical
- Develop tools to identify and account for the otherwise use of these chemicals in mixtures or trade name products

9

ACCOUNTING TIPS FOR OTHERWISE USE CHEMICALS

- Identify the otherwise use activities at your facility and the mixtures and trade name products used in those activities
- *Identify the avenues through which these mixtures and* trade name products enter your facility
  - Purchasing/Inventory
  - Contractors
  - "Credit card" or "emergency" purchases
  - Bulk shipments

10

ACCOUNTING TIPS FOR OTHERWISE USE CHEMICALS

- Develop methods for orchestrating data collection of mixtures and trade name products being otherwise used
  - *Coordinate with purchasing/vendors*
  - Develop inventory controls
  - Require maintenance logs for process equipment
  - Require requisition or "sign out" procedure for Section 313 chemicals from tool cribs and supply rooms
  - Take year-end inventories

11

ACCOUNTING TIPS FOR OTHERWISE USE CHEMICALS

- Begin early
  - Implement a program to gather "real-time" data on usage (i.e., every week, month, quarter)
  - Suppliers may be slow to provide data
- Use a team approach
  - Include all relevant personnel (e.g., engineering, environmental, operations, supply room, purchasing)

12

ACCOUNTING TIPS FOR OTHERWISE USE CHEMICALS

- Detailed records
  - Improve reporting accuracy and data quality
  - Reduce replication of effort from year to year
- Well-labeled calculations and assumptions
  - Serve as standard operating procedures (SOPs) for future years
  - Ensure consistency from year to year, especially if personnel responsible for reporting change
- All records used to complete Form R must be kept for three years (40 CFR 372.10)
- EPA will review records during a data quality audit

FORM R /FORM A SUBMISSION: GETTING IT RIGHT!

ALTERNATE THRESHOLD RULE

- EPA published *Final Rule* (40 CFR 372.27; 59 FR 61501, 11/30/94)
  - Reduced reporting option for low annual reportable amounts
    - » No Form R report
    - » No release, other waste management, or source reduction reporting
    - » Submit certification form (Form A) each year

2

ALTERNATE THRESHOLD RULE

- Criteria for using alternate threshold
  - Do not exceed 1,000,000 pounds manufactured, processed, or otherwise used, and
  - Do not exceed 500 pounds of a Section 313 chemical equivalent to the sum of the quantities released, transferred off-site in wastes, combusted for energy recovery on- or off-site, recycled, or treated on-site.

3

United States Environmental Protection Agency

TOXIC CHEMICAL RELEASE INVENTORY
FORM A

WHERE TO SEND COMPLETED FORMS: 1. EPCRA Reporting Center, P.O Box 3348, Merrifield, VA 22116-3348, ATTN: TOXIC CHEMICAL RELEASE INVENTORY 2. APPROPRIATE STATE OFFICE (See instructions in Appendix F)

Enter "X" here if this is a revision

For EPA use only

Important: See instructions to determine when "Not Applicable (NA)" boxes should be checked.

PART I. FACILITY IDENTIFICATION INFORMATION

SECTION 1. REPORTING YEAR _____

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? ☐ Yes (Answer question 2.2; Attach substantiation forms) ☐ No (Do not answer 2.2; Go to Section 3)	2.2	Is this copy ☐ Sanitized ☐ Unsanitized (Answer only if "YES" in 2.1)

SECTION 3. CERTIFICATION (Important: Read and sign after completing all form sections.)

I hereby certify that to the best of my knowledge and belief, for each toxic chemical listed in the statement, the annual reportable amount as defined in 40 CFR 372.27 (a), did not exceed 500 pounds for this reporting year and that the chemical was manufactured, processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year.

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:

SECTION 4. FACILITY IDENTIFICATION

4.1		TRI Facility ID Number	
Facility or Establishment Name		Facility or Establishment Name or Mailing Address(if different from street address)	
Street		Mailing Address	
City/County/State/Zip Code		City/County/State/Zip Code	

4.2	This report contains information for: (Important : check c if applicable)	c. ☐	A Federal facility
4.3	Technical Contact Name	Telephone Number (include area code)	
4.4	Intentionally left blank		

4.5	SIC Code (s) (4 digits)	Primary a.	b.	c.	d.	e.	f.
4.6	Latitude	Degrees	Minutes	Seconds	Longitude	Degrees	Minutes	Seconds

4.7	Dun & Bradstreet Number(s) (9 digits)	4.8	EPA Identification Number (RCRA I.D. No.) (12 characters)	4.9	Facility NPDES Permit Number(s) (9 characters)	4.10	Underground Injection Well Code (UIC) I.D. Number(s) (12 digits)
a.		a.		a.		a.	
b.		b.		b.		b.	

SECTION 5. PARENT COMPANY INFORMATION

5.1	Name of Parent Company	NA ☐	
5.2	Parent Company's Dun & Bradstreet Number	NA ☐	

IMPORTANT: Type or print; read instructions before completing form

EPA FORM A
PART II. CHEMICAL IDENTIFICATION

TRIFID:

SECTION 1. TOXIC CHEMICAL IDENTITY

Report ___ of ___

1.1	CAS Number (Important: Enter only one number exactly as it appears on the Section 313 list. Enter category code if reporting a chemical category.)
1.2	Toxic Chemical or Chemical Category Name (Important: Enter only one name exactly as it appears on the Section 313 list.)
1.3	Generic Chemical Name (Important: Complete only if Part I, Section 2.1 is checked "yes". Generic Name must be structurally descriptive.)

SECTION 2. MIXTURE COMPONENT IDENTITY (Important: DO NOT complete this section if you completed Section 1 above.)

2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces and punctuation.)

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2.1	Generic Chemical Name Provided by Supplier (Important: Maximum of 70 characters, including numbers, letters, spaces and punctuation.)

(Make additional copies of this page, if needed)

ALTERNATE THRESHOLD RULE

- Recordkeeping
  - All documentation to support the determination, including:
    - » Inventory, purchasing, and sales records
    - » Release calculations
    - » Waste manifests or receipts
    - » Other waste management data

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OVERVIEW: FORM R VS. FORM A

- *Form R*
  - Standard Reporting Method
  - Use for all levels of releases and other waste management
  - Report releases, other waste management, and source reduction activities
  - Recordkeeping *Requirements*
- *Form A*
  - Alternate Reporting Method
  - Use for low annual reportable amounts (<500 lbs.)
  - Submit Certification Form
  - Recordkeeping Requirements

8

WHY IT'S IMPORTANT TO GET IT RIGHT

- Using TRI Data
  - EPA is required to make non-trade secret data available to the public through an on-line database (operated by National Library of Medicine)
  - Data are widely available on Internet
  - Data are available in other forms (reports, CD-ROM)
  - All states receive data; some will make it available electronically

9

SECONDARY IMPACTS

- Some state and federal regulations link fees, pollution prevention planning requirements, and storm water permitting requirements to the requirement to file a Federal Form R.
- Facilities that become subject to TRI reporting as a result of the PBT rule may become subject to additional requirements.

10

EPCRA SECTION 313 ENFORCEMENT

- Current enforcement trends
  - Shift from simply identifying non-reporting facilities to facilities submitting poor quality data
  - Focus on multi-media inspections (i.e., across Agency programs)
  - Assign pollution prevention-related supplemental environmental projects (SEPs)
    - In FY99, 36% of EPCRA penalty actions included a SEP. Most SEPs of any regulatory program.

11

EPCRA SECTION 313 ENFORCEMENT

- Current enforcement trends
  - Citizen Initiated Enforcement
    - EPCRA Section 313 and stormwater requirements generated the largest number of calls to EPA hotlines — over 22,000 for those two programs, and close to 40,000 for the FY99 total.

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EPCRA SECTION 313 ENFORCEMENT

- Koch Refining ($585,000)
  - Data quality violations
- Sinclair Oil Corp. ($201,969 + $350,000 SEP)
  - Non-reporting and data quality errors on emissions
- Coca-Cola Bottling Company ($14,938 + $44,000 equipment to LEPC)
  - EPCRA Sections 311, 312 and 313 violations

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EPCRA SECTION 326: CIVIL ACTIONS

- Any person may bring civil action on their own behalf against a private-sector facility owner or operator for:
  - Failure to submit emergency follow-up notices under Section 304
  - Failure to submit an MSDS or a list of MSDS chemicals
  - Failure to complete or submit Tier I/II inventories
  - Failure to complete or submit Form Rs or Form As

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EPCRA SECTION 326: CIVIL ACTIONS

- State and local governments may bring a civil action against a private-sector facility owner or operator for:
  - Failure to notify the SERC regarding coverage under the emergency planning and notification requirements
  - Failure to make relevant emergency planning information available as requested by the LEPC
  - Failure to submit MSDS or list of hazardous chemicals
  - Failure to prepare or submit Tier I/II inventories
- Any SERC or LEPC may bring a civil action against a facility for failure to submit Tier II information upon request

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COMMONLY MADE ERRORS

- Threshold determination errors
- Completion errors
- Release estimation errors
- Off-site transfers reporting errors
- Other waste management and source reduction errors
- Federal facility name and/or parent company name errors

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THRESHOLD DETERMINATIONS

- Helpful hints for conducting accurate threshold determinations
  - Apply chemicals to correct threshold activity
  - Avoid missing a Section 313 chemical by considering: all avenues a chemical may enter a facility; chemical qualifiers; chemical synonyms; or on-site manufacturing
  - Consider quantities of Section 313 chemicals in mixtures or other trade name products
  - Recognize the limitations of eligibility for exemptions
- Results of incorrect threshold determinations
  - No form is submitted when one is required
  - Federal facility does not meet requirements of EO 12856

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FORM COMPLETION CHECKLIST

- Helpful hints for completing the Form R/Form A
  - Complete all required sections of a current, valid form
  - Verify trade secret information (if applicable)
  - Correctly identify the Section 313 chemical using the correct CAS number and correct listed TRI name
  - Use the NA indicator for data elements that are not relevant
  - Indicate the correct reporting year
  - Verify latitude/longitude coordinates
  - Clearly identify revisions or duplicate submissions
  - Sign hardcopy of forms or certification letters for electronic submissions

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FORM COMPLETION CHECKLIST (CONT'D)

- Result of completion errors
  - Delay in processing of form
  - Form prevented from being entered into the database
- To avoid completion errors, use EPA's ATRS software
  - ATRS will prompt the user to complete required sections
  - ATRS will require the use of NA as a terminating indicator or to denote data elements that are not relevant

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RELEASE ESTIMATES

- Helpful hints for accurate release estimates
  - Differentiate fugitive from stack emissions
  - Zero air emissions for VOCs are unlikely
  - Always use your best available information
  - Estimate the quantity of Section 313 chemical, not the entire waste stream
  - Check your math
  - Document your work!
- Result of release estimation errors
  - Suspect release estimates

20

OFF-SITE TRANSFER REPORTING

- Helpful hints for accurate off-site transfer reporting
  - Do not report intra-facility transfers as off-site transfers
  - Report the quantity of Section 313 chemical transferred, not the entire transfer quantity
  - Identify waste treatment, disposal, recycling, and energy recovery activities correctly
- Results of off-site transfer errors
  - Incorrect estimates (e.g., over-estimates)
  - Misclassification of facility's handling of Section 313 chemicals in wastes

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WASTE MANAGEMENT AND SOURCE REDUCTION--SECTION 8.1

- Helpful hints for reporting quantity released, Section 8.1
  - Include off-site disposal quantities (reported in Section 6.2), on-site releases (reported in Sections 5.1 through 5.5), and releases to POTWs for metals and metal compounds only (reported in Section 6.1)
  - Do not include non-production-related, one-time events (e.g., catastrophic or remedial releases/transfers)
    - » These should be reported in Section 8.8

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WASTE MANAGEMENT AND SOURCE REDUCTION--SECTIONS 8.2-8.7

- For on-site energy recovery (Section 8.2), on-site recycling (Section 8.4), and on-site treatment (Section 8.6):
  - Report the quantity of Section 313 chemical actually recovered, recycled, or treated, not the total amount entering the recovery, recycling, or treatment unit
- For off-site energy recovery (Section 8.3), off-site recycling (Section 8.5), and off-site treatment (Section 8.7):
  - Conversely, report the total quantity sent off-site for recovery, recycling, or treatment
    - » You are not required to know the efficiency of the off-site unit

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WASTE MANAGEMENT AND SOURCE REDUCTION

- Helpful hints for Sections 8.2-8.7
  - Energy recovery, Sections 8.2 and 8.3
    - » Report only for substances with significant heat value (do not report halons, metals, or metal compounds)
    - » Do not include incineration activities
  - Metals and metal compounds cannot be destroyed; therefore, do not report quantities in Sections 8.6, or 8.7

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WASTE MANAGEMENT AND SOURCE REDUCTION--SECTION 8.8

- *Helpful hints for reporting catastrophic and remedial releases and transfers, Section 8.8*
  - Section 8.8 is exclusive of Sections 8.1 through 8.7 (do not include Section 8.8 quantities in Sections 8.1 through 8.7)
  - Section 8.8 quantities should be included in Sections 5-7 (as appropriate)

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FEDERAL FACILITY IDENTIFICATION

- *Helpful hints for federal facilities*
  - Correctly identify department or agency
  - Check box c. in Part I, Section 4.2 (or enter "F" on the ATRS software)
  - Correctly identify GOCO
  - Use SIC codes in Part I, Section 4.5 that best describes the facility's activities
- Results of incorrect federal facility identification
  - Double-counting
  - Form entered into TRI database improperly

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SUBMITTING REVISIONS

- Revisions can be made electronically or in hardcopy
  - Hardcopy revisions must be made in blue or black ink on a copy of the form originally submitted
  - Magnetic media revisions must be accompanied by a newly signed cover letter
- For revisions made for reporting year 1991 or later, mark an "X" in the space marked "Enter "X" here if this is a revision" on page 1
- Provide a new original signature and date for each revision
- Send to EPA's EPCRA Reporting Center and to the appropriate state agency

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TRI KNOWLEDGE QUIZ

Purpose: Familiarize participants with the criteria for TRI reporting, including thresholds for manufacturing, processing, or otherwise using listed chemicals, which determine whether or not a facility must submit a Form R for a listed chemical.

Take-Aways: Knowledge and understanding of TRI reporting thresholds.

Instructions: Read each question carefully. Using your knowledge of TRI reporting thresholds, choose the best of the four answers.

1. A facility processes 21,000 pounds of formaldehyde each calendar year. It also imports and then otherwise uses 9,000 pounds of formaldehyde annually. In addition, each year the facility receives 15,000 pounds of solution that contains 34 percent formaldehyde by weight and repackages it for distribution and sale. The firm is in SIC code 2834, ships over 600 pounds of formaldehyde in wastes off-site for disposal, and has 20 full-time employees. Assuming these values remain the same over the next five years, under section 313 this firm:

   a. Must report for each calendar year.

   b. Does not have to report for each calendar year, because the thresholds are not met.

   c. Will not be required to report for each calendar year because it does not manufacture the chemical.

   d. Is not required to report because it employs less than 25 full-time employees.

2. Fifteen thousand (15,000) pounds of a listed chemical is purchased in the current reporting year and is used in a re-circulating cooling jacket. This quantity remains in use indefinitely and no additional quantity is added in subsequent years. Are you required to report for this chemical and if so, for what year?

   a. Do not consider this type of material at all because it is a purchased compound.

   b. The use of the compound must be considered towards the otherwise use threshold for the current reporting year only.

   c. The use of the compound must be considered for the current reporting year and every reporting year thereafter, until the mixture is replaced.

   d. Consider only a part of the total amount the current reporting year, and a part every reporting year thereafter, for the life of the mixture.

3. A facility produces nitrate compounds as a result of its waste treatment operations, and transfers the nitrate compounds to an off-site location, where all of the section 313 chemical is extracted and recycled. Which of the following is true?

   a. The facility can exclude amounts of the nitrate compound from threshold determinations and release estimation because the source qualifies for the de minimis exemption.

   b. Coincidental production of the nitrate compounds is not covered under section 313, therefore the facility need not consider this source of chemical production towards thresholds and estimation of off-site transfers.

   c. The facility need not consider this source for thresholds and estimation of off-site transfer because all of the listed chemical is eventually recycled.

   d. The facility must include all amounts of the nitrate compounds coincidentally produced in threshold determinations and release and other waste management calculations if it exceeds a threshold.

4. Ten times per year, a facility receives chlorine in 1 ton cylinders. Half of the chlorine mixture is transferred to a tank to make a bleaching mixture, where its concentration drops below the de minimis level, which is then sold and distributed in commerce. One fourth of the original mixture is used to treat the drinking water consumed by employees. The remaining one fourth of the original mixture is used throughout the plant to clean process equipment. Wastewater from the cleaning and bleach production operations is released with chlorine levels well below the de minimis level. Which of the following is true?

   a. All uses of the chlorine are subject to section 313 reporting because the concentration of the received mixture is well above the de minimis level and the threshold limit for otherwise use has been met.

   b. Only the use of chlorine for drinking water is exempt from section 313 reporting.

   c. Only the drinking water and cleaning operations will be exempt from section 313 reporting due to the personal use and routine maintenance exemptions, respectively.

   d. The drinking water and cleaning uses are covered under the personal use and routine maintenance exemptions, respectively. The bleach production operation and the wastewaters generated in conjunction with this operation are not exempt from section 313 reporting; however, the wastewaters from the cleaning operations are exempt.

5. A facility processes 100,000 pounds of a mixture containing 25% zinc chromate, and 25% chromium dioxide by weight. For purposes of Section 313 reporting, how much zinc and chromium were processed?

   a. 25,000 pounds zinc compounds, and 25,000 pounds of chromium compounds
   b. 25,000 pounds zinc, and 25,000 pounds chromium
   c. 25,000 pounds zinc, and 50,000 pounds chromium
   d. 25,000 pounds zinc compounds, and 50,000 pounds chromium compounds

6. If a chemical on Section 313 list has a "qualifier," it means that it is subject to TRI reporting when manufactured, processed, or otherwise used

   a. in the thresholds specified (i.e., its reporting threshold is higher or lower than that for other chemicals)
   b. in the specified form or activity
   c. within the specified SIC code industries
   d. except when used at federal facilities

7. For aqueous ammonia, what percentage of the total ammonia present is applied to threshold determinations?

   a. 100%
   b. 10%
   c. 1%
   d. 20%

8. A facility buys a solution containing 29 percent 1,1,1-trichloroethane and processes it as a constituent of a cleaning solution that they sell in retail stores. The 1,1,1- trichloroethane is present in final product at 0.5 percent. The product is packaged into one-gallon containers. What amounts of the 1,1,1-trichloroethane in mixtures must the facility consider for threshold determinations?

   a. Any amount used within the facility during the reporting year, except the amount distributed through retail outlets to consumers, must be considered processed.

   b. Because the mixture was otherwise used, it is not eligible for the de minimis exemption. The quantity used must be applied to the otherwise use threshold.

   c. Because the mixture was received and processed in concentrations above the de minimis for 1,1,1-trichloroethane, all quantities must be applied to the processing threshold.

   d. Only amounts distributed into commerce need to be considered towards the processing threshold, and because these quantities are present below the de minimis concentration, they are exempt.

9. Which of the following qualifies as a section 313 reporting exemption?

   a. Like "articles" that release over 10 pounds of a section 313 chemical, not recovered, under regular normal processing or use
   b. Painting process equipment at the facility
   c. Chemical use in non-process related routine janitorial or facility grounds maintenance
   d. Laboratory support activities

10. In order to file a Form A Report, you must manufacture or process or otherwise use no more than one million pounds of the toxic chemical and you must have

   a. Less than 1,000 pounds of total releases and other waste management estimates of the toxic chemical

   b. No more than 500 pounds of total releases and other waste management estimates of the toxic chemical

   c. No more than 100 pounds of total releases and other waste management estimates of the toxic chemical

   d. No more than 50 pounds of total releases and other waste management estimates of the toxic chemical

PERSISTENT, BIOACCUMULATIVE, TOXIC (PBT) CHEMICAL RULE

The PBT Rule

- PBT rule published in the *Federal Register* on October 29, 1999 (64 FR 58666)
- Rule applies beginning RY 2000, reports due 7/1/01
- Rule adds new chemicals to the TRI list
- Rule creates a new class of chemicals (PBT chemicals) with lower thresholds and special requirements

PBT CHEMICALS AND THRESHOLDS

100 lb/yr -	Aldrin Methoxychlor Pendimethalin	Polycyclic aromatic comp. Tetrabromobisphenol A Trifluralin
10 lb/yr -	Chlordane Heptachlor Mercury Toxaphene Isodrin PCBs	Benzo(g,h,i)perylene Hexachlorobenzene Mercury compounds Octachlorostyrene Pentachlorobenzene
0.1 gr/yr -	Dioxin and dioxin-like compounds	

PBT CHEMICALS AND EXEMPTIONS

- The *de minimis* exemption has been eliminated for PBT chemicals except for purposes of supplier notification
  - Users of mixtures must use best readily available knowledge to determine PBT chemicals present and concentrations
- No other EPCRA section 313 regulatory exemptions were modified or restricted by the PBT rule

4

PBT THRESHOLDS

- The combination of the low thresholds and no *de minimis* exemption means that a thorough review of chemical activities may be needed to achieve compliance with the PBT rule
  - Impurities need to be evaluated
  - Chemicals used in low volumes need to be considered

5

PBT CHEMICALS

Eighteen chemicals and chemical categories are regulated by the PBT rule:

- Pesticides - Aldrin, Chlordane, Heptachlor, Isodrin, Methoxychlor, Pendimethalin, Toxaphene, and Trifluralin
- Aromatics - Benzo(g,h,i)perylene, Polycyclic aromatic compounds (PAC) category, Dioxin and dioxin-like compounds category, Hexachlorobenzene, Octachlorostyrene, Pentachlorobenzene, Polychlorinated biphenyl (PCB), and Tetrabromobisphenol A (TBBPA)
- Metals - Mercury and Mercury compounds

6

PBT CHEMICALS

- The following are NOT on the EPCRA Section 313 PBT list for RY 2000:
  - Lead
  - Lead compounds
  - Cobalt
  - Cobalt compounds
  - Dicofol (pesticide)
  - Vanadium (except in alloy)
  - Vanadium compounds

7

POLYCYCLIC AROMATIC COMPOUNDS

- 3-Methylchloanthrene and Benzo(j,k)fluorene (fluoranthene) are being added as members of the PAC category
- All members (new and old) of the newly expanded PAC category are PBT chemicals
- Benzo(g,h,i)perylene is an individually listed polycyclic aromatic hydrocarbon (PAH) that is a PBT chemical
  - Other individually listed PAHs are not in the category and are not PBT chemicals

8

DIOXIN AND DIOXIN-LIKE COMPOUNDS

- Dioxin and dioxin-like compounds category qualifier reads:

  "Manufacturing; and the processing or otherwise use of dioxin and dioxin-like compounds if the dioxin and dioxin-like compounds are present as contaminants in a chemical and if they were created during the manufacturing of that chemical."
- Category includes polychlorinated dioxins and furans with chlorine in at least the 2, 3, 7, and 8 positions

9

VANADIUM

- PBT rule modifies the listing for vanadium:
  - Vanadium, with the qualifier "fume or dust," has been on the list of section 313 chemicals since 1987
  - Qualifier now reads "except when contained in an alloy"
    - "Alloy" does not include slags, crystalline structures, ores
    - EPA is reviewing what actions to take regarding alloys
- PBT rule adds vanadium compounds to the TRI list
- Neither vanadium (except when in an alloy) nor vanadium compounds are on PBT list for RY 2000

10

PBT REPORTING

- For PBT chemicals, EPA is requiring more precise reporting:
  - EPA has prohibited use of Form A's
  - EPA has prohibited use of range codes for reporting releases and waste management quantities
- EPA will be modifying the Form R or developing a new form for PBT chemicals

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DATA PRECISION

- Report releases and other waste management quantities >0.1 lb. at a level of precision supported by the data and estimation technique used
  - Can be more precise than whole numbers and two significant digits
  - If 157.243 pounds calculated, report 157.2, 157, 160, or 200 pounds depending on accuracy/quality of data source(s)
- Similar recommendation for dioxin and dioxin-like compounds but limit is lower: 100 micrograms (equals 0.0001 grams)
  - If 1.57243 grams calculated, report 1.5724, 1.572, 1.57,1.6, or 2 grams depending on accuracy/quality of data source(s)

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EPA's PBT INITIATIVE

- Initiative orchestrates activities across numerous EPA programs; example activities under EPA's multimedia PBT strategy:
  - Integrated Urban Air Toxics Strategy and the Toxic Substances Control Act (TSCA) PBT policy statement
  - EPA Action Plan for Mercury
  - International programs, e.g., Great Lakes Virtual Elimination Strategy
  - PBT Listserver: Email pbt-strategy@unixmail.rtpnc.epa.gov Place subscribe into subject line and body
  - PBT Initiative's home page: http://www.epa.gov/pbt/

Newly Expanded Polycyclic Aromatic Compounds (PACs) Category

Name	CAS #
Benz(a)anthracene	00056-55-3
Benzo(b)fluoranthene	00205-99-2
Benzo(j)fluoranthene	00205-82-3
Benzo(k)fluoranthene	00207-08-9
Benzo(j,k)fluorene*	00206-44-0
Benzo(r,s,t)pentaphene	00189-55-9
Benzo(a)phenanthrene	00218-01-9
Benzo(a)pyrene	00050-32-8
Dibenz(a,h)acridine	00226-36-8
Dibenz(a,j)acridine	00224-42-0
Dibenzo(a,h)anthracene	00053-70-3
7H-Dibenzo(c,g)carbazole	00194-59-2
Dibenzo(a,e)fluoranthene	05385-75-1
Dibenzo(a,e)pyrene	00192-65-4
Dibenzo(a,h)pyrene	00189-64-0
Dibenzo(a,l)pyrene	00191-30-0
7,12-Dimethylbenz(a)anthracene	00057-97-6
Indeno[1,2,3-cd]pyrene	00193-39-5
3-Methylcholanthrene*	00056-49-5
5-Methylchrysene	03697-24-3
1-Nitropyrene	05522-43-0

* New

Source: Persistent Bioaccumulative Toxic Chemicals; Final Rule (64 FR 58666; October 29, 1999)

The New Dioxin and Dioxin-Like Compounds Category

Name	CAS #
2,3,7,8-Tetrachlorodibenzo-dioxin	01746-01-6
1,2,3,7,8-Pentachlorodibenzo-dioxin	40321-76-4
1,2,3,4,7,8-Hexachlorodibenzo-dioxin	39227-28-6
1,2,3,6,7,8-Hexachlorodibenzo-dioxin	57653-85-7
1,2,3,7,8,9-Hexachlorodibenzo-dioxin	19408-74-3
1,2,3,4,6,7,8-Heptachlorodibenzo-dioxin	35822-46-9
1,2,3,4,6,7,8,9-Octachlorodibenzo-dioxin	03268-87-9
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0

Source: Persistent Bioaccumulative Toxic Chemicals; Final Rule (64 FR 58666; October 29, 1999)

PBT REPORTING

COMBUSTION

- Combustion activities are expected to be the primary source of PBT reports
  - Mercury, PACs, and benzo(g,h,i)perylene are contained in residual fuel oil (#6), distillate fuel oil (#2), and coal
  - Dioxin and dioxin-like compounds and vanadium compounds may also be manufactured during combustion of these fuels

DIOXIN AND DIOXIN-LIKE COMPOUNDS

- Dioxin and dioxin-like compounds may be formed as byproducts when chlorine-containing materials are involved in combustion or other high-temperature processes
- Emission factors are available:
  - "Locating And Estimating Air Emissions From Sources Of Dioxins And Furans," May 1997 (EPA-454/R-97-003) is available at http://www.epa.gov/ttn/chief/ap42etc.html#LE
  - "The Inventory of Sources of Dioxin in the United States," April 1998, (EPA/600/P-98/002Aa) is available at http://www.epa.gov/nceawww1/diox.htm

DIOXIN AND DIOXIN-LIKE COMPOUNDS

- Dioxin and dioxin-like compounds may also be manufactured during the manufacture of chemicals involving chlorine and remain with the manufactured chemicals as impurities
  - Examples: Chloranil, Pentachlorophenol (PCP), Ethylene dichloride (EDC), Vinyl chloride (VC), Polyvinylchloride (PVC), 2,4-D, 2,4-D Ester Herbicides
- Dioxin and dioxin-like compounds may be manufactured during some metallurgical processes and at some pulp and paper mills
  - For more information: "The Inventory of Sources of Dioxin in the United States"

4

MERCURY

- Mercury may be present in mined ores
- Mercury is present in petroleum products and coal
  - Combustion of fuels is expected to be the main source of mercury reports
- Mercury in switches and fluorescent lamps may be article exempt
- Mercury also used in a wide variety of processes
- For more information see "Locating And Estimating Air Emissions From Sources Of Mercury and Mercury Compounds," 12/97 (EPA-454/R-97-012) is available at http://www.epa.gov/ttn/chief/ap42etc.htm#LE

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POLYCYCLIC AROMATIC COMPOUNDS

- PACs are found in coal, fuel oil and other petroleum products
  - Refiners, coal mines, and petroleum bulk terminals process PACs
  - Electricity generating facilities and many manufacturing facilities otherwise use PACs in fuel combustion.
- Benzo(g,h,i)perylene is a separately listed PAH that can be found where PACs are found.
- For more information see "Locating And Estimating Air Emissions From Sources Of Polycyclic Organic Matter," 7/98 (EPA-454/R-98-014) is available at http://www.epa.gov/ttn/chief/ap42etc.htm#LE

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POLYCHLORINATED BIPHENYLS (PCBs)

- PCBs present in some dielectric fluid in electrical equipment
  - Off-site shipment of PCBs for treatment or disposal does not constitute a manufacturing, processing, or otherwise use activity
  - Could be processed if oil containing PCBs sent off site for recycling
  - Could be otherwise used if recycled/reconditioned oil with PCBs put into service
- PCB transformers are considered exempt as articles if no PCBs released during normal use
- PCBs could be present in fuel oils

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TETRABROMOBISPHENOL A

- TBBPA - flame retardant used in plastics and engineering resins for printed circuit boards and computer equipment
- TBBPA is used in polymers, such as
  - Acrylonitrile Butadiene Styrene (ABS),
  - Epoxy and polycarbonate resins,
  - High-impact polystyrene,
  - Phenolic resins,
  - Adhesives,
  - Unsaturated polyester resins, and
  - Thermoplastic polyesters.
- Users of plastics with additive TBBPA may be impacted as well
  - TBBPA is used as a reactive or additive flame retardant

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HEXACHLOROBENZENE

- Hexachlorobenzene (HCB) is produced as a byproduct or impurity in chemical manufacturing processes involving chlorine
  - HCB may be an impurity in many chemicals including Freon 113, Pentachlorophenol, Polyvinyl chloride, Tetrachloroethylene, Trichloroethylene, and 1,1,1-Trichloroethane
- HCB can also be manufactured during the combustion of chlorinated organic compounds and coal
- HCB can be manufactured when hexachloroethane is used to remove hydrogen gas from molten aluminum

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OCTACHLOROSTYRENE

- No commercial uses of octachlorostyrene (OCS) are known , a polychlorinated styrene
- OCS is a possible byproduct of chlorine production, chlorination reactions, and metal product/finishing operations
- OCS may also be formed by the high-temperature incineration of chlorinated hydrocarbons
- OCS is expected to be found where HCB is present

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PENTACHLOROBENZENE

- Pentachlorobenzene is used as an intermediate in the production of the fungicide pentachloronitrobenzene (quintozene)
- Pentachlorobenzene may be produced in small quantities in combustion processes such as medical waste incinerators, cement kilns, municipal waste and sewage sludge incinerators, and secondary copper production
- Pentachlorobenzene is expected to be found where HCB and OCS are present

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PESTICIDES

- PBT listed pesticides include:
  - Aldrin, Chlordane, Heptachlor, Isodrin, Methoxychlor, Pendimethalin, Toxaphene, and Trifluralin
- All of these pesticides currently are TRI chemicals
- Potential reporting facilities include manufacturers and processors of the pesticides as well as TSDFs that manage pesticide-containing wastes.
- EPA does not expect any additional reports on these pesticides from users of pesticides

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VANADIUM

- Vanadium (except in an alloy) and vanadium compounds are added by the PBT rule but are NOT on TRI PBT list
- Vanadium is present coal, oil, and natural gas
  - Vanadium oxide is produced during combustion of fuels
  - Mines, refiners, and electricity generating facilities expected to be impacted
- Vanadium is used to produce various alloys
  - Prior to becoming part of the alloy, vanadium is a listed chemical
  - Once part of the alloy, vanadium is not a listed chemical

PBT Quiz

Multiple Choice: For each item below, circle the answer or answers that is the BEST response for the question. All activities described below took place in RY 2000.

1. Which of the following chemicals is NOT a PBT chemical.

   a. Mercury
   b. Chloroform
   c. PCBs
   d. Mercury Compounds
   e. Toxaphene

2. My facility manufactured .009 lbs of dioxin and dioxin like compounds in our combustion units, and also incorporated 11.4 pounds of mercury into thermometers for our company's facility in Canada during the reporting year. Have I exceeded any thresholds?

   a. No. The facility doesn't exceed the threshold for dioxin and dioxin like compounds and the thermometers qualify for the articles exemption. Therefore, no thresholds have been exceeded.
   b. The facility must report for mercury, but does not exceed the threshold for dioxin compounds.
   c. The facility must report for dioxin and dioxin like compounds, but since the mercury is going to another country, it doesn't have to report for mercury.
   d. The facility must report for both dioxin and dioxin like compounds and mercury.

3. At Fred's golf club manufacturing facility, 5 pounds of polycyclic aromatic compounds (PACs) are manufactured in the combustion unit, 55 pounds of PACs are processed in the club handles, and 45 pounds of PACs are otherwise used by contractors that are constructing a new manufacturing plant. Does Fred need to report for PACs?

   a. No, none of the thresholds have been exceeded during the reporting year.
   b. Yes, since 5 + 45 + 55 equals 105, Fred must report for PACs by July 1, 2001.
   c. Yes, the processing and otherwise use activities both exceed a threshold.
   d. Yes, Fred has to report, but he doesn't have to consider the contractors because they aren't employed directly by Fred's company.

4. Which of the following statements is TRUE for PBT chemicals?

   a. Facilities can use the *de minimis* exemption for all PBT chemicals except for dioxin and dioxin-like compounds
   b. Facilities can report using the Form A for PBT chemicals
   c. Fluorescent light tubes used and disposed uncrushed containing mercury are subject to the articles exemption
   d. Only count dioxin and dioxin-like compounds if they are manufactured at your facility

5. During the reporting year, PCB-containing oil in transformers at the site have been replaced with non-PCB-containing oil. As a result of this project, 22 pounds of PCBs were shipped off site to be combusted in an incinerator. What should be done?

   a. Prepare a Form R report for PCBs.
   b. Document that a threshold has not been exceeded.
   c. Prepare a Form R or a Form A report for PCBs.
   d. Call the National Response Center within 15 minutes.

6. Due to combustion of fossil fuels, 0.08 grams of dioxins are manufactured and released to air through stacks. The facility also otherwise uses pentachlorophenol (which contains 0.03 grams of dioxins as an impurity) in an operation. The dioxins from this operation are also released to the air through a stack. What should be done?

   a. Prepare a Form R report for dioxin and dioxin like compounds and report 0.1 grams for stack emissions.
   b. Document that a threshold has not been exceeded because activity thresholds are aggregated separately
   c. Prepare a Form R report for dioxin and dioxin like compounds and report 0.11 grams for stack emissions.
   d. Prepare a Form R report for dioxin and dioxin like compounds and report 0 pounds for stack emissions.

INFORMATION RESOURCES

ADDITIONAL INFORMATION ABOUT TRI

- EPA Regional and State TRI Contacts
  - Check the *Form R and Instructions* booklet
- RCRA, Superfund & EPCRA Hotline

  (800) 424-9346 or (703) 412-9810 (DC Metro area)
  - Regulatory assistance
  - Information on availability of EPA publications
  - Information on EPA's electronic resources

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EPA ELECTRONIC MAILING LISTS (LISTSERVER)

- To subscribe to an electronic mailing list (listserver), send e-mail to: listserver@unixmail.rtpnc.epa.gov.
- Subject line: SUBSCRIBE TO LISTSERVERS
- Text: SUBSCRIBE <list name> <first name> <last name>

  SUBSCRIBE EPA-WASTE JOHN SMITH
- Some mailing lists are:
  - EPA-TRI2: Toxic Release Inventory Federal Registers
  - HOTLINE_OSWER: RCRA, Superfund & EPCRAMonthly Hotline Report and Updates
  - EPA-PRESS: EPA press releases
  - EPA-MEETING: EPA meeting notification
  - OPPT-NEWSBREAK: OPPT Library daily news service

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DOCUMENT DISTRIBUTION CENTERS

RCRA, Superfund & EPCRA Hotline (800) 424-9346 (703) 412-9810 (DC Metro area) Fax (703) 412-3333 http://www.epa.gov/epaoswer/hotline	National Center for Environmental Publications and Information (NCEPI) 1-800-490-9198 http://www.epa.gov/ncepihom/index.html
U.S. Government Printing Office (GPO) (202) 512-1800 Fax: (202) 512-2250 http://www.gpo.gov	National Technical Information Service (NTIS) (800) 553-6847 (703) 605-6000 (DC Metro area) http://www.ntis.gov

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ONLINE ACCESS TO TRI DATA

- Right-to-Know Network (RTK NET)
  - Modem: (202) 234-8570; Information: (202) 234-8494; Internet: http://www.rtk.net
- ENVIROFACTS Database Internet Site
  http://www.epa.gov/enviro/html/ef_home.html
- Environmental Defense Fund
  http://www.scorecard.org
- TOXNET (National Library of Medicine)
  - Modem: (301) 946-1184; Information: (301) 496-6531; Internet: http://www.nlm.nih.gov
  - nominal access charge

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PUBLIC ACCESS TO TRI

- TRI User Support Service: (202) 260-1531
- TRI Reports (EPCRA Hotline and EPA TRI Web Site)
  - TRI Public Data Release Annual Report
  - TRI Public Data Release State Fact Sheets
- TRI CD-ROM (GPO/NTIS)
- State Data Diskettes (GPO)

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TRI HOMEPAGE

- EPA Toxic Release Inventory: Community Right to Know Homepage (http://www.epa.gov/tri)
  - General information on the TRI program and program development
  - Information on how to use the TRI data
  - Access to TRI data (e.g., public data release, state fact sheets, links to TRI databases)
  - Guidance documents for newly added industries
  - *EPCRA Section 313 Questions and Answers Document* (Revised 1998 version)
  - Automated TRI Reporting Software (ATRS)

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SECTION 313 GENERAL GUIDANCE

- *Toxic Chemical Release Inventory Reporting Form R and Instructions*
- *EPCRA Section 313 Questions and Answers (Revised 1998 Version) EPA745-B-98-004*
- *Common Synonyms*
- *Consolidated List of Chemicals Subject to Reporting Under the Act (Title III List of Lists)*
  - Most recent version on Internet:

http://www.epa.gov/tri/

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SECTION 313 TECHNICAL GUIDANCE

- Industry-Specific Technical Guidance Documents such as:
  - *Estimating Chemical Releases From Electroplating Operations*
  - *Guidance for New Industries* (http://www.epa.gov/tri/guidance.htm)
- Chemical-Specific Guidance Documents such as:
  - *Guidance for Reporting Sulfuric Acid*
  - *List of Toxic Chemicals within the Glycol Ethers Category*
  - http://www.epa.gov/tri/guidance.htm
- *Estimating Releases and Waste Treatment Efficiencies For the Toxic Chemical Release Inventory Form*

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SECTION 313 TECHNICAL GUIDANCE

- Technology Transfer Network (TTN)
  - Help Desk (919) 541-5384
  - Internet: http://www.epa.gov/ttn/
    - *Compilation of Air Pollutant Emission Factors* (AP-42)
    - Water 9/ChemDat 9 programs
    - TANKS program

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POLLUTION PREVENTION INFORMATION

- OPPT Pollution Prevention (P2) Internet Site
  - http://www.epa.gov/opptintr/p2home/index.html
- Enviroene Information Network
  - BBS modem (703) 908-2092; User support (703) 908-2007
  - http://es.epa.gov/index.html
- Pollution Prevention Information Clearinghouse (PPIC)
  - (202) 260-1023

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