# Resource Conservation and Recovery Act Waste Determinations Iowa Strategic Goals Program December 8, 2022

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# Presentation Overview

- What are Resource Conservation and Recovery Act (RCRA) hazardous wastes?
- What processes should I consider using to determine whether my facility generates hazardous waste?
- What hazardous waste code(s) applies to my waste (if any)?

# Assumptions

- Your facility has generated a waste
- Your facility has determined that the waste is a “solid waste”
- We will not discuss “other” wastes (i.e., used oil, universal waste, medical waste, radioactive, asbestos, PCBs, etc.)

# Overview of RCRA Hazardous Waste

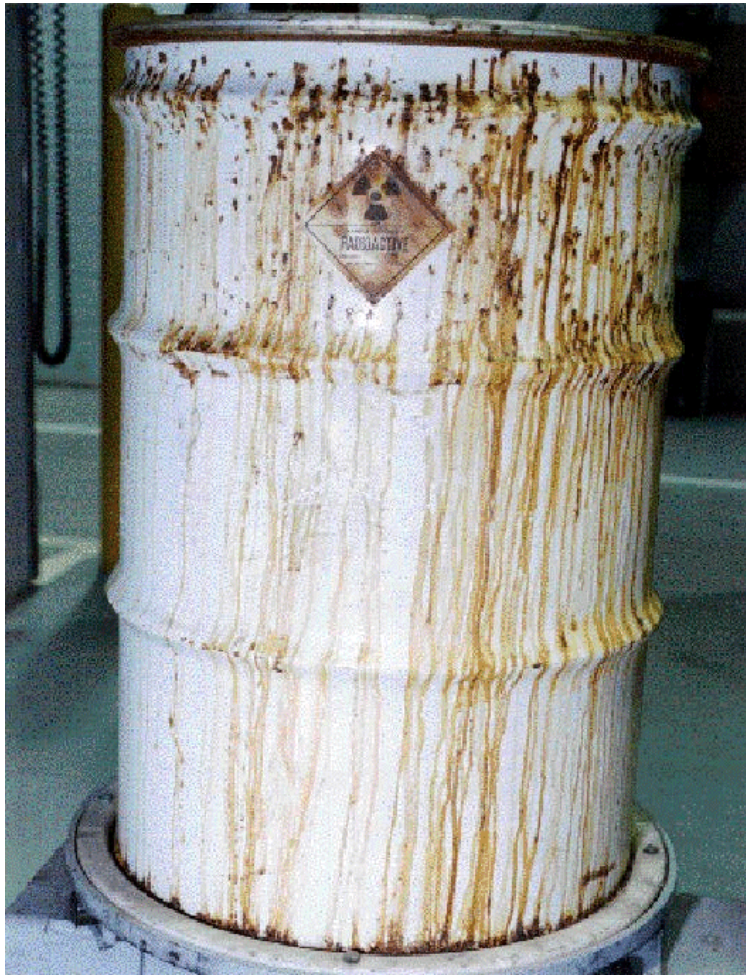
- Characteristic Hazardous Wastes (40 CFR 261.21 through 40 CFR 261.24)
  - Ignitable (Hazardous Waste Code – D001)
  - Corrosive (Hazardous Waste Code – D002)
  - Reactive (Hazardous Waste Code – D003)
  - Toxic (Hazardous Waste Codes – D004 – D043)

# Ignitable Characteristic Hazardous Waste (D001)

- A liquid (other than a solution containing less than 24 percent alcohol by volume and at least 50 percent water by weight) with flashpoint <140°F (<60°C)
- Not a liquid and is capable, under STP, of causing a fire and, when ignited, burns vigorously
- Is an ignitable compressed gas
- Is an oxidizer

# Corrosive Characteristic Hazardous Waste (D002)

- Aqueous with pH ≤ 2 or ≥ 12.5
- A liquid that corrodes steel



# Reactive Characteristic Hazardous Waste (D003)

- The only characteristic hazardous waste that does not have an associated analytical test
- Normally unstable and readily undergoes violent change without detonating
- Reacts violently with water
- Forms potentially explosive mixtures with water
- When mixed with water, it generates toxic gases, vapors or fumes

Reactivity

# Reactive Characteristic Hazardous Waste (D003)

- Cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes
- Capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement
- readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure
- forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53

# Toxic Characteristic Hazardous Waste

- RCRA Characteristic Hazardous Waste Codes D004 through D043
- Includes metals, volatile organic compounds, semi-volatile organic compounds, pesticides, and herbicides as shown in Table 1 of 40 CFR 261.24
- Waste is analyzed using the Toxicity Characteristic Leaching Procedure – a.k.a. "TCLP"

# Listed Hazardous Waste (40 CFR 261 Subpart D)

- Hazardous wastes from non-specific sources (40 CFR 261.31)
  - "F" listed hazardous wastes
  - May be ignitable (I), reactive (R), toxic (T), and/or acutely hazardous (H)
- Hazardous wastes from specific sources (40 CFR 261.32)
  - "K" listed hazardous wastes
  - Sources may include wood treatment, inorganic pigments, organic chemicals, explosives, petroleum refining, iron and steel, primary aluminum, secondary steel, vet pharmaceuticals, ink formulation, or coking

# Listed Hazardous Waste (40 CFR 261 Subpart D)

- Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof (40 CFR 261.33)
  - "U" and "P" listed hazardous wastes
  - Sole active ingredient
  - Can include residues, containers, container liners, rinsates, mixtures with other wastes, spill cleanup materials, contaminated soils, etc.

# Waste Determination (40 CFR 262.11)

- A hazardous waste determination for each solid waste must be made at the point of waste generation
- Determine whether the solid waste is excluded from regulation (40 CFR 261.4)
- Using knowledge of the waste, determine whether the waste meets the listing descriptions under 40 CFR 261 Subpart D
- Following methods in 40 CFR 261 Subpart C – analyze the waste
- Identify all applicable waste codes

# SDS/MSDS Waste Determination Overview

- OSHA – "Right to Know" in the workplace
- Contains information on ingredients and their physical and chemical characteristic
- gives the specific chemical's name and formula, and common names for the ingredients (except for trade secrets)
- Warehouse for SDS/MSDS information – http://www.ilpi.com/msds/index.html
- List of Lists – https://www.epa.gov/sites/default/files/2015-03/documents/list_of_lists.pdf?VersionId=8We.OedeRCrHO0gArFv6CYKNYiH.E09

# SDS/MSDS Waste Determination Overview

- Great starting point for waste determination without analyses (i.e., “process knowledge”)
- SDS/MSDS review may or may not be helpful
- May provide information on specific chemicals in waste

# SDS/MSDS Waste Determination Overview

- May provide Chemical Abstract Service (CAS) Number(s)
- May provide information on concerning waste characteristics (ignitability, corrosivity, reactivity)
- May provide disposal information

# What Sections of the SDS/MSDS Should I Review?

- Ingredients/Composition  (Section 2, 3, or other)
  - Typically provides list of chemicals/ingredients
  - Typically provides a list of chemical percentages
  - Typically provides Chemical Abstract Service (CAS) Number(s)
- Hazards Identification (could be Section 2)
  - May provide incompatibility information (i.e., Reactivity characteristic (D003))

# What Sections of the SDS/MSDS Should I Review?

- Fire and Explosion Data (Section 5)
  - May provide flashpoint information for ignitability determination (D001)
- Handling and Storage (Section 7)
  - May provide incompatibility information concerning reactivity (D003)

# What Sections of the SDS/MSDS Should I Review?

- Physical and Chemical Properties (Section 9)
  - Flashpoint data – Ignitability characteristic (D001)
  - Corrosivity (pH) data – Corrosivity characteristic (D002)
- Disposal Considerations/Regulatory Considerations (Section 13 or 15)
  - May provide EPA hazardous waste code

# Code of Federal Regulations (eCFR)

- eCFR - https://www.ecfr.gov/
- Protection of Environment (EPA) – https://www.ecfr.gov/current/title-40
- Protection of Environment, Subpart I (RCRA) – https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I

# Code of Federal Regulations (eCFR)

- Your computer and/or smart device search engine can be used to locate a specific EPA regulation
- Using your search engine, look up “40 CFR 261 Subpart D”

# What is the Waste Code?

## Phosphoric Acid 75% FCC

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Phosphoric Acid 75% FCC

**Synonyms/Generic Names:** Orthophosphoric acid

### 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Appearance (physical state, color, etc.) | Syrupy, viscous, clear liquid. |
| Odor | Odorless. |
| Odor threshold | Not Available |
| pH | <2 |
| Melting point/freezing point | ~-17 °C (~1 °F) |
| Initial boiling point and boiling range | ~135 °C (~275 °F) |
| Flash point | Not Flammable |

# What is the Waste Code?

- SDS indicates pH < 2
- Wastes that have pH ≤ 2 or ≥ 12.5 are D002 RCRA Characteristic Corrosive Waste

# What is the Waste Code?

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** ..... Pels® Caustic Soda Beads

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| Material/CAS Number | Percent |
|---|---|
| Sodium Hydroxide<br>1310-73-2 | 95-99 |
| Water<br>7732-18-5 | balance |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** ..... Solid Beads

# What is the Waste Code?

- The SDS indicates that the waste contains Sodium Hydroxide
- The SDS indicates that the physical state of the waste is “solid beads”
- If in a solid state, the waste would not be a RCRA Characteristic Hazardous Waste

# What is the Waste Code?

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Water | 7732-18-5 | 5 |
| Ethyl alcohol 200 Proof | 64-17-5 | 95 |

**Toxicological Data on Ingredients:** Ethyl alcohol 200 Proof: ORAL (LD50): Acute: 7060 mg/kg [Rat]. 3450 mg/kg [Mouse]. VAPOR (LC50): Acute: 20000 ppm 8 hours [Rat]. 39000 mg/m 4 hours [Mouse].

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** The lowest known value is 363°C (685.4°F) (Ethyl alcohol 200 Proof).

**Flash Points:** CLOSED CUP: 18.5°C (65.3°F).(estimated)

**Flammable Limits:** The greatest known range is LOWER: 3.3% UPPER: 19% (Ethyl alcohol 200 Proof)

# What is the Waste Code?

- Flashpoint is 18.5°C (65.3°F)
- If flashpoint is < 140°F (<60°C), waste is D001 RCRA Characteristic Ignitable Waste

# What is the Waste Code?

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: "TECSOL" D Solvent, 95%

2. COMPOSITION/INFORMATION ON INGREDIENTS

| Weight % | Component - (CAS Registry No.) |
|---|---|
| 76 | ethanol (000064-17-5) |
| 13 | isopropanol (000067-63-0) |
| 4 | methanol (000067-56-1) |
| 6 | water (007732-18-5) |
| 1 | methyl isobutyl ketone (000108-10-1) |

9. PHYSICAL AND CHEMICAL PROPERTIES

- Physical Form: liquid
- Color: colorless
- Odor: alcohol
- Flash Point (Tag closed cup): 13°C (56°F) - Data for ethanol

# What is the Waste Code?

- Flashpoint is 13°C (56°F)
- If flashpoint is < 140°F (<60°C), waste is D001 RCRA Characteristic Ignitable Waste

# What is the Waste Code?

## Section 2. Composition, Information on Ingredients

| Name | CAS number | % Volume | Exposure limits |
|---|---|---|---|
| Acetylene | 74-86-2 | 100 | NIOSH REL (United States, 6/2001). CEIL: 2662 mg/m³ Form: All forms |

## Section 5. Fire fighting measures

| | | |
|---|---|---|
| **Flammability of the product** | : | Flammable. |
| **Auto-ignition temperature** | : | 304.85°C (580.7°F) |
| **Flash point** | : | Closed cup: -18.15°C (-0.7°F). |
| **Flammable limits** | : | Lower: 2.5% Upper: 82% |
| **Products of combustion** | : | These products are carbon oxides (CO, $CO_2$). |
| **Fire hazards in presence of various substances** | : | Extremely flammable in presence of open flames, sparks and static discharge, of heat, of oxidizing materials. |
| **Explosion hazards in presence of various substances** | : | Explosive in presence of heat. |

# What is the Waste Code?

- Acetylene is an “ignitable compressed gas”
- Ignitable compressed gases are D001 RCRA Characteristic Hazardous wastes
- In addition, flashpoint is -18.15°C (-0.7°F)
- If flashpoint is < 140°F (<60°C), waste is D001 RCRA Characteristic Ignitable Waste

# What is the Waste Code?

## Section 1. Identification

**GHS product identifier** : 142 Solvent 66/3

## Section 3. Composition/information on ingredients

| Ingredient name | % | CAS number |
|---|---|---|
| C9-C15 Cycloalkanes | 60 - 100 | ** |
| C9-C15 Alkanes | 10 - 30 | ** |

## Section 9. Physical and chemical properties

**Flash point** : Closed cup: 67°C (152.6°F) [Tagliabue (ASTM D-56)]

# What is the Waste Code?

- Flashpoint is 67°C (152.6°F)
- Not a RCRA Characteristic Ignitable Hazardous Waste since flashpoint is >140°F (>60°C)

# What is the Waste Code?

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: PCNB 75 DG, A SOIL FUNGICIDE FOR TURF AND ORNAMENTALS - FOR FIELD AND VEGETABLE CROPS
GENERAL USE: Fungicide
PRODUCT DESCRIPTION: Light brown to dark brown crystalline solid

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| COMPONENT | WT % | CAS No. |
|---|---|---|
| Pentachloronitrobenzene (PCNB) | 75% | 82-68-8 |
| Other Compounds | 25% | |

# What is the Waste Code?

- Pentachloronitrobenzene's CAS No. 82-68-8
- RCRA Listed Hazardous Waste – U185

# What is the Waste Code?

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** AllPro Cygon 2E
**EPA REG. NUMBER:** 769-948
**PRODUCT NUMBER:** 332821

## SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

| INGREDIENTS*: | CAS NO. | % WT | OSHA TWA | OSHA STEL | ACGIH TWA | ACGIH STEL |
|---|---|---|---|---|---|---|
| Dimethoate | 60-51-5 | 23.4% | N/E | N/E | N/E | N/E |
| aromatic hydrocarbon solvent | 64742-95-6 | <50.0 | N/E | N/E | N/E | N/E |
| cyclohexanone | 108-94-1 | <30 | 50 ppm | N/E | 25 ppm | N/E |

## SECTION 13: DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** This material (as packaged) is considered a hazardous waste (EPA P044).

# What is the Waste Code?

- Dimethoate's CAS No. 60-51-5
- RCRA Listed Hazardous Waste – P044 (an acute hazardous waste)

# What is the Waste Code?

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** 10% SEVIN GRANULES
**CHEMICAL NAME:** Carbaryl: 1-naphthyl n-methylcarbamate
**CHEMICAL FAMILY:** N-methyl Carbamate Insecticide
**EPA REG. NO.:** 34704-289

## 3. COMPOSITION, INFORMATION ON INGREDIENTS

| Chemical Ingredients: | Percentage by Weight: | CAS No. | TLV (Units) |
|---|---|---|---|
| Carbaryl | 10.00 | 63-25-2 | 5 mg/m$^3$ |
| Inert ingredients | 90.00 | | |

## 15. REGULATORY INFORMATION

**RCRA Waste Code:** U279

# What is the Waste Code?

- Carbaryl's CAS No. 63-25-2
- RCRA Listed Hazardous Waste – U279

# What is the Waste Code?

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** AllPro BK32 Brush Killer

## SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

| INGREDIENTS*: | CAS NO. | % WT | OSHA TWA | OSHA STEL | ACGIH TWA | ACGIH STEL |
|---|---|---|---|---|---|---|
| Isoctyl (2-ethyl exyl) Ester of 2,4-dichlorophenoxyacetic acid Isoctyl (2-ethyl exyl) Ester of 2-(2-methyl-4-dichlorophenoxy) | 1928-43-4 | 16.05 | 10 $mg/m^3$ | NE | 10 $mg/m^3$ | NE |
| propionic acid | 28631-35-8 | 16.1 | NE | NE | NE | NE |
| kerosene | 8008-20-6 | NE | NE | NE | NE | NE |

## SECTION 13: DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** This material (as packaged) is considered a hazardous waste (EPA D016, U240).

# What is the Waste Code?

- SDS indicates waste is D016 and U240 (2,4-D)
- CAS No. 1928-43-4 not shown in RCRA tables
- Analytical testing may need to be conducted to determine whether waste contains 2,4-D and the D016 and U240 waste codes are applicable

# What is the Waste Code?

| SECTION 2: INFORMATION ON INGREDIENTS | | | | |
|---|---|---|---|---|
| **Active Ingredient(s)/ Hazardous Inert Ingredient(s)** | **% by Wt.** | **CAS#** | **ACGIH TLV** | **OSHA PEL** |
| Dimethyl-4-4´-o-phenylenebis-3-thioallophanate | 50% | 23564-05-8 | NDA | NDA |

# What is the Waste Code?

- CAS No. 23564-05-8
- CAS No. 23564-05-8 is listed in RCRA Listed Hazardous Waste tables but not under Dimethyl-4-4'-o-phenylenebis-3-thioallophanate
- Synonyms include Thiophante, methyl and Carbamic Acid
- Waste is a RCRA Listed Hazardous Waste – U409

# What is the Waste Code?

## SECTION 1: Chemical Product & Company Identification

## Product Name(s): Dexol Rose Guard 8-12-4

**SECTION 2: Composition/Information on Ingredients**

| Hazardous Ingredients(*): | % by weight | CAS No. | OSHA TWA | PEL STEL | ACGIH TWA | TLV STEL |
|---|---|---|---|---|---|---|
| Disulfoton, 0,0-Diethyl S-[2-ethylthio) ethyl] Phosphorodithloate | 1.00 | 298-04-4 | 0.1 mg/m$^3$ | NE | 0.1 mg/m$^3$ | NE |
| trifluralin | 0.17 | 1582-09-8 | | | | |
| urea nitrogen | 8.0 | 57-13-6 | NE | NE | NE | NE |
| ammoniated phosphate | 12.0 | 16-46-0 | NE | NE | NE | NE |
| muriate of potash | 4.0 | 0-0-61 | NE | NE | NE | NE |

# What is the Waste Code?

- Contains Disulfoton (298-04-4) and Trifluralin (1582-09-8)
- Wastes containing Disulfoton may be RCRA Listed Hazardous Waste – P039
- However, there is more than one active ingredient
- Not a RCRA Listed Hazardous Waste

# What is the Waste Code?

## 1. Identification

**Product Name** **Sodium Metal**

## 2. Hazard(s) identification

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| | |
|---|---|
| Substances/mixtures which, in contact with water, emit flammable gases | Category 1 |
| Skin Corrosion/Irritation | Category 1 B |
| Serious Eye Damage/Eye Irritation | Category 1 |
| Specific target organ toxicity (single exposure) | Category 3 |
| Target Organs - Respiratory system. | |

**Flame: Flammable materials or substances liable to self ignite when exposed to water or air (pyrophoric), or which emit flammable gas.**

# What is the Waste Code?

- The SDS indicates it reacts with water and air ("pyrophoric") and it can self ignite
- Not a liquid and is capable, under STP, of causing a fire and, when ignited, burns vigorously
- Appears to be a RCRA Characteristic Hazardous Waste for Ignitability and Reactivity (D001/D003)

# Helpful Websites

- Warehouse for SDS/MSDS information – http://www.ilpi.com/msds/index.html
- List of Lists – https://www.epa.gov/sites/default/files/2015-03/documents/list_of_lists.pdf?VersionId=8We.OedeRCrHO0gArFv6CYKNYiH.E09

# EPA RCRA Contact Information

- Kevin Snowden, EPA R7 ECAD/CB/RCRA (snowden.kevin@epa.gov; 913-551-7022)
- EPA Region 7 Iowa RCRA Helpline – Call 913-551-7248 for general inquiries concerning RCRA
- EPA Region 7 Iowa RCRA Email Address – for general questions regarding RCRA or for questions regarding generator notifications please contact us at Iowa.Notifications@epa.gov

# Questions?