

Environmental Control & Monitoring



HSES Training Center

Topics Covered

- Relevant Legislation (SCENR, RLIC, CHP)
- ISO 14001
- HazCom
- Chemical & Waste Management
- Environmental Monitoring
- Spill Prevention
- Pop Quiz

Objectives

- Understanding Legal Framework of Project
- Learn Basic Principles of ISO 14001
- Enhance Awareness of Environmental Aspects & Impacts of Project
- Help Supervisors & Management to Improve Environmental Performance of Project

What do we mean by Environment?

- Air
- Sounds / Noise
- Water (Surface & Underground)
- Land
- Flora and Fauna
- Archeology



Applicable HSE Legislation Regulations & Standards

- SASO
- Royal Commission Environmental Guidelines
- SABIC HSE Regulations
- ISO 14001, OHSAS 18001 std.

ISO 14001

Environment Management System (EMS)

- Procedures are important but not sufficient...
- ISO 14001 has been developed to help organizations to:
 - 1) minimize harmful effects on the environment caused by their activities, and
 - 2) To achieve continual improvement of their environmental performance

ISO 14001

In a Nutshell...

- These goals will be accomplished by following five Environmental Management System (EMS) principles:
 - Commitment and Environmental Policy (objectives – generic)
 - Planning (how, specific targets)
 - Implementation (Procedures)
 - Measurement and Evaluation (e.g. audits)
 - Review and Improvement (analysis and corrective actions)
- Overall aim of ISO 14001 is to support environmental protection and prevention of pollution in balance with socio-economic needs.

HAZCOM

- YOU have the Right and Need to know:
 - What hazardous chemicals you work with,
 - Associated hazards, and
 - How to protect yourself from these hazards



HazCom

Hazard Communication Program:

- Purpose is to ensure that the hazards of workplace chemicals are evaluated, and that information on the hazards is provided to employers and employees.

HazCom

Hazard Communication Program documentation:

1. Identifying and keeping an inventory of hazardous chemicals
2. Obtaining and keeping Material Safety Data Sheets (MSDS) on the identified hazards
3. Ensuring that the hazardous materials are labeled with name and hazard, and
4. Training employees on the standard, safety information, labeling and protective measures.

Chemical Management



Hazardous Materials

Definition:

- Substance which is: flammable, toxic, harmful, corrosive, irritant, carcinogenic, mutagenic or teratogenic.

Hazardous Materials

The degree of hazard associated with a particular chemical will depend on:



- Its physical properties
- Its toxicity
- The way it is used
- The environment in which it is encountered








Hazardous Materials

Information Tools at our disposal...

1. Chemical Labels
2. Hazard Rating Diamond (NFPA)
3. Material Safety Data Sheets (MSDS)

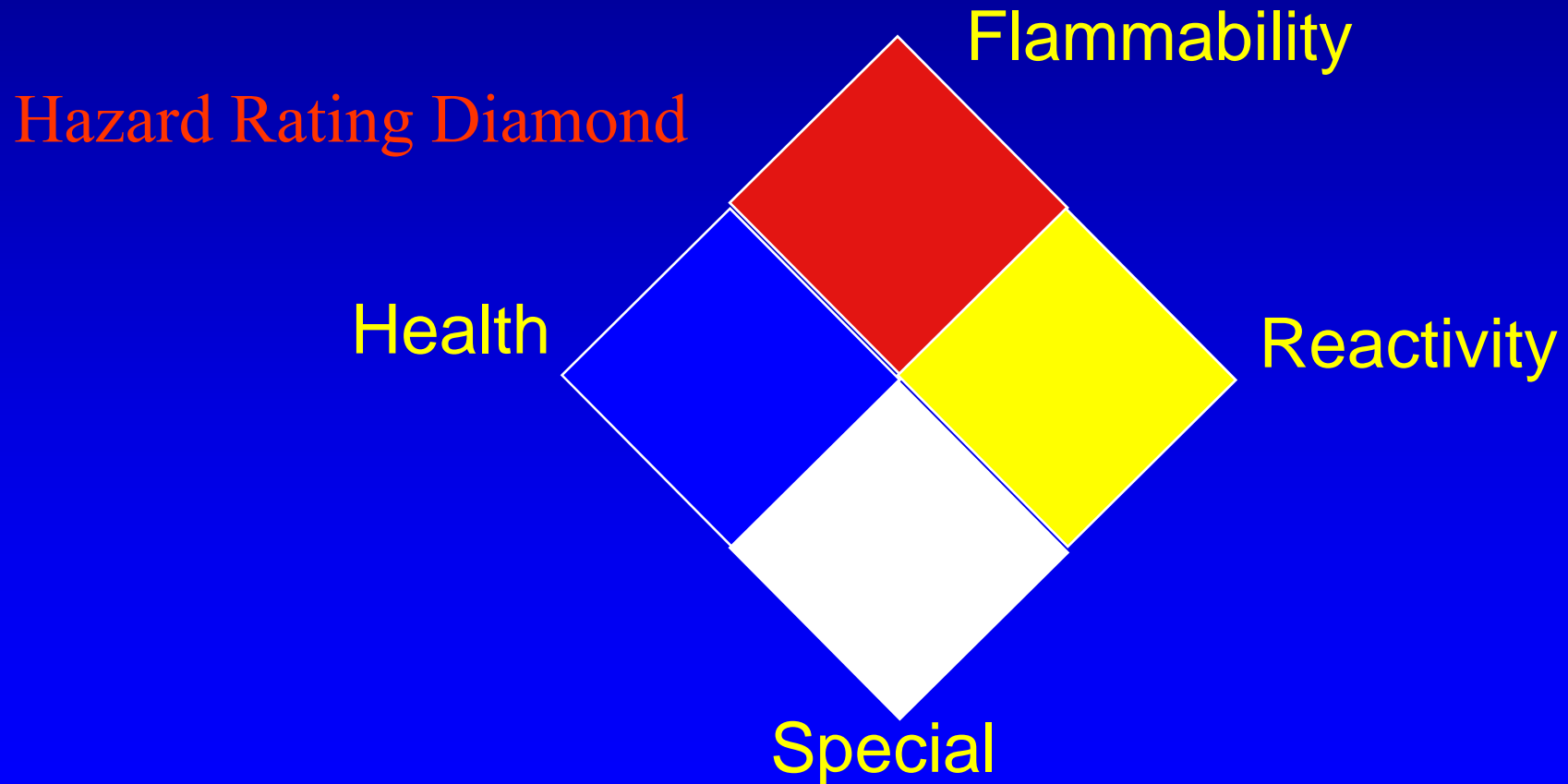
Hazardous Materials

1) Chemical Labels – Learn How to Read Them!

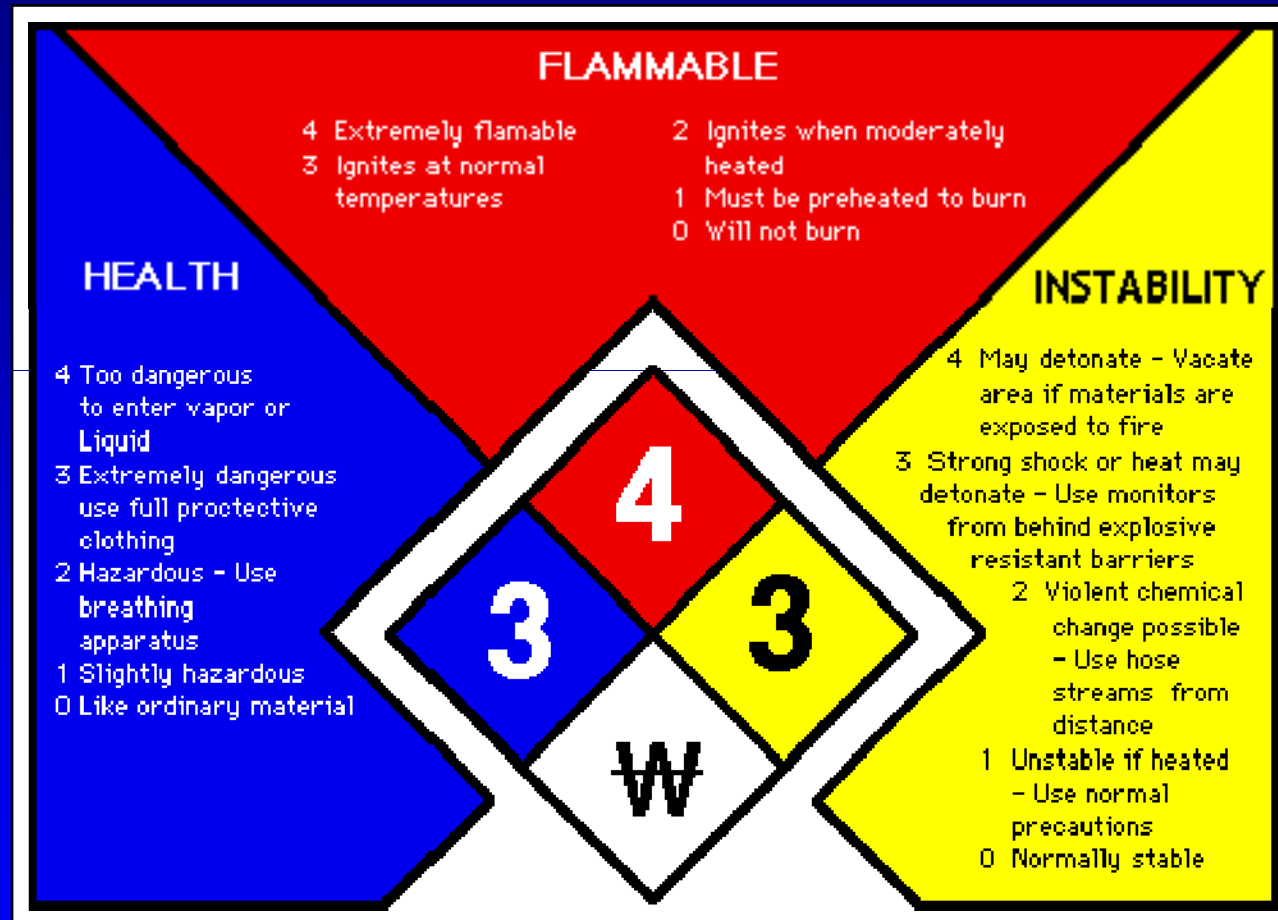
STORAGE CODE RED		FLAMMABLE																			
<p>DANGER! FLAMMABLE! POISON </p> <p>VAPOR HARMFUL. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. HARMFUL IF INHALED.</p> <p>Cannot be made nonpoisonous. Keep container tightly closed. Use only in a well-ventilated area. Keep away from heat and open flame. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Target organs: Liver, kidneys, heart, central nervous system.</p> <p>FIRST AID: INGESTION: If conscious, give one or two glasses of water to drink, induce vomiting and call a physician. Never give anything by mouth to an unconscious person. EYES: Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. SKIN: Flush with mild soap and water. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.</p> <p>FOR LAB USE ONLY. NOT FOR DRUG, FOOD OR HOUSEHOLD USE. KEEP OUT OF REACH OF CHILDREN.</p>	<p>Methyl Alcohol Anhydrous</p> <p>Absolute, Reagent Grade</p> <p>CH₃OH</p> <p>CAS # 67-56-1</p>	<p>F.W. 32.04</p> <p>UN 1230</p>	<p>Methanol, Wood alcohol</p> <p>SPECIFICATIONS</p> <p>Assaymin. 99.85%</p> <p>Flashpoint TCC 11°C (52°F)</p>																		
	<p>500 mL</p> <p>To Re-order this chemical, call Frey Scientific and use item number listed above.</p>	<p># 579366</p>	<div style="display: flex; flex-direction: column; align-items: center;">     </div> <p style="color: red; font-size: small;">This label is printed by the customer for the customer's use only.</p> <p>For More Information, Refer to MSDS.</p> <table border="1" style="font-size: x-small;"> <tr> <td>HAZARD RATING</td> <td></td> <td></td> </tr> <tr> <td>0 - Minimal</td> <td>HEALTH</td> <td style="text-align: center;">3</td> </tr> <tr> <td>1 - Slight</td> <td>FLAMMABILITY</td> <td style="text-align: center;">3</td> </tr> <tr> <td>2 - Moderate</td> <td>REACTIVITY</td> <td style="text-align: center;">1</td> </tr> <tr> <td>3 - Serious</td> <td></td> <td></td> </tr> <tr> <td>4 - Extreme</td> <td></td> <td></td> </tr> </table> <p>Date Rec'd. / / Pkg. in U.S.A.</p>	HAZARD RATING			0 - Minimal	HEALTH	3	1 - Slight	FLAMMABILITY	3	2 - Moderate	REACTIVITY	1	3 - Serious			4 - Extreme		
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	 <p>FREY SCIENTIFIC CO.</p> <p>100 PARAGON PARKWAY MANSFIELD, OHIO 44903 1-800-225-3729</p>																				

Hazardous Materials

2) National Fire Protection Association (NFPA)



Hazardous Materials



Hazardous Materials

MSDS

What is an MSDS?

“A comprehensive fact sheet that provides information on the identification, health hazards, and the precautions required for the safe use and handling of a specific substance”

Hazardous Materials

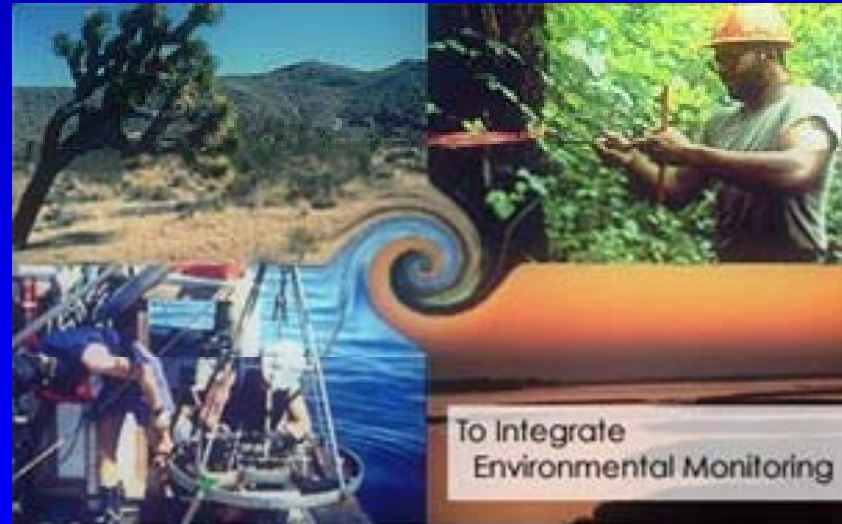
2 Popular Format for MSDS

- OSHA Format 174: 8-9 sections
- ANSI Format: 16 sections

In fact, OSHA now recommends that the ANSI format be used ...

Environmental Monitoring & Control

- Air Quality & Dust
- Exhaust Emissions
- Noise
- Water Resources
- Solid & Liquid Waste
- Flora & Fauna



Why Environmental Monitoring?

- To detect and assess potential environmental impacts of project
- To protect Flora & Fauna
- To evaluate corrective actions
- To stay out of court (National and International)
- To improve a company profile
- For the next generation

Environmental Monitoring & Control

Sources of Dust Emissions

- Vehicles driving on dry dirt road
- Excavating, screening, grading, abrasive blasting, etc.
- Strong winds



Environmental Monitoring & Control

Abrasive Blasting

- Creation of fugitive dust clouds
- Minimization through working within enclosure
- High Concentration of airborne particles
- Selection of abrasive agent very important



Environmental Monitoring & Control

How Do we Monitor Dust?

- Daily Qualitative Monitoring (visual)
- Weekly Dust (PM10) Sampling
- RLIC Criteria: $PM_{10} \leq 250$ ppm

Main Dust Control Methods used:

- 1) Reducing Speed of Equipment on Site
- 2) Use of Water Trucks to Keep Roads Damp



Environmental Monitoring & Control

Noise Monitoring

Noise Basics

- Two factors determine how hazardous noise is:
 - Intensity (Loudness) measured in dBA
 - Time of Exposure measured in Hours and Minutes
- The louder the noise, the more hazardous it is. Also, the longer the exposure time, the more hazardous the noise is.
- A “Noise Dose” combines both loudness and time and is a convenient way of describing the relative hazard of the noise.

Environmental Monitoring & Control

Noise Basics

Loudness is measured using a logarithmic scale. This means that a 10 decibel increase does not simply *add* 10 to the previous level. It *multiplies* the previous level by 10.

Threshold of Hearing	0 dBA
Quiet Room	45 dBA
Conversation	55 dBA = 45 dBA x 10
Car (50 mph at 50 ft)	65 dBA = 45 dBA x 100
End Loader (In Good Cab)	75 dBA = 45 dBA x 1,000
Haul Truck (In Good Cab)	85 dBA = 45 dBA x 10,000
Crusher	95 dBA = 45 dBA x 100,000
Old Dozer (No Cab)	105 dBA = 45 dBA x 1,000,000
Air Track Drill (No Controls)	115 dBA = 45 dBA x 10,000,000

115 dBA has 10 million times more sound energy than 45 dBA and is capable of causing 10 million times more damage to hearing.

Environmental Monitoring & Control

Noise Monitoring

- Noise Level Meter Used
- Weekly Measurement at Property Limits of Sites
- RLIC Criteria for Industrial Zone: $\leq 75\text{dBA}$



Environmental Monitoring & Control

Monitoring of Water Resources

- Drinking Water
- Groundwater
- Treated Wastewater (Irrigation water)
- Storm Water (at a later stage)



Environmental Monitoring & Control

Flora, Fauna & Topsoil

- Especially emphasized at start of project
- Relocation of Top Soil for future use
- Relocation of plants taller than 50 cm
- Identification and protection of rare and endangered species (e.g. spiny-tailed lizards, desert monitor lizards, hares, etc.)

Waste Management



Waste Management

WHAT IS WASTE?

- Any material that is unused and rejected as worthless or unwanted ...

Waste Management

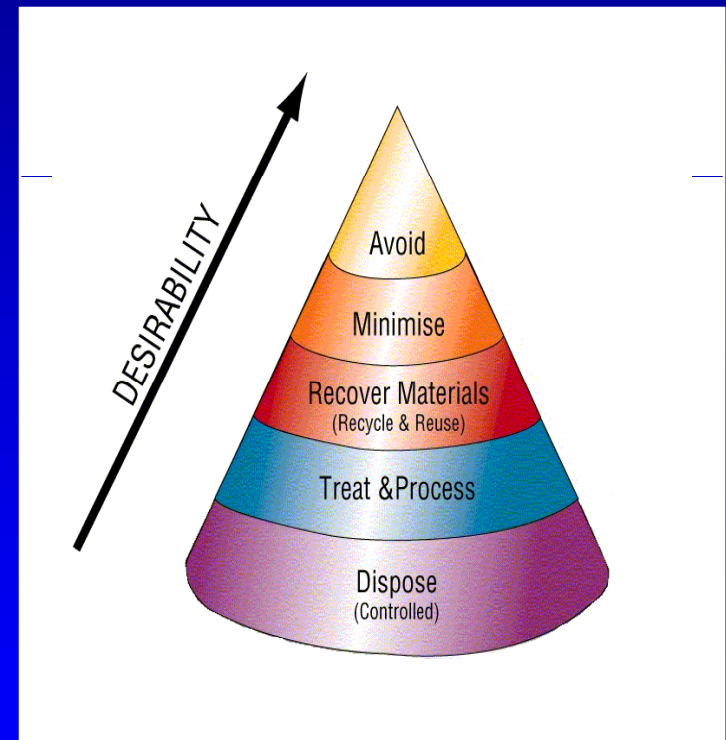
Goals

- Minimize environmental impact of waste generated through the project
- Maximize reduction, reuse and recycling of waste
- Ensure environmentally sound disposal of all waste streams

Waste Management

Waste Management Hierarchy Practice

- Source Elimination/Reduction
- Reuse
- Recycling/Recovery
- Treatment
- Responsible Disposal



Waste Management

General Waste Classification

- *Class 1 – Municipal Waste*
- *Class 2 – Non-Hazardous Industrial Waste*
- *Class 3 – Inert Waste*
- *Class 4 – Hazardous Wastes*

Waste Management

HSE Department Responsibilities

- Overseeing all waste handling and disposal
- Prepare procedures for waste collection & disposal
- Identify disposal methods for each waste category
- Provide support for waste recovery and recycling

In Addition:

- HSE officers will conduct regular inspections of waste storage areas to insure compliance with CHP regulations



Waste Management

Subcons Responsibilities

- All personnel are aware of their responsibilities with regards to waste management
- Initiate waste disposal as a function of planning any activities
- Take action to reduce and segregate waste
- Ensure that adequate number of bins/skips are provided
- Ensure that all waste containers are adequately labeled
- All waste is disposed of in the appropriate containers
- Ensure that records are kept of all waste transfers

Waste Management

Why Segregate Waste?

1. Avoid mixing incompatible substances
2. Optimize reuse and recycling possibilities
3. Helps in ensuring adequate containment is used
4. Ensure waste is transported and disposed of in an environmentally sensible way

Waste Management

Hazardous Waste Procedure

- All subcontractors must exercise “Due Diligence” as to the handling, collection and disposal of hazardous waste
- Due Diligence: subcontractors **MUST** ensure that they deal with licensed waste collector/ recycler (from cradle to grave approach)

How can problems be avoided?

- Segregate all waste at source
- Store in adequate containers
- Send only to authorized dumps
- Ensure waste records are kept
- Ensure transporter has license to collect wastes
- Maximize on reuse and recycling
- Remember the waste hierarchy



Fuel & Chemical Storage

- Must be sited on impervious base within an impervious secure bund
- Bund must be sufficient to contain 110% of volume of largest container
- Spill containment equipment in immediate vicinity



Fuel & Chemical Storage

Non-centralized store of fuel or lubricant oil

- Store so they do not pose a risk to the environment
- As a minimum – use drip trays to contain potential leaks
- **AVOID OVERCROWDING OF TRAYS**



Spill Prevention



Spill Prevention

Most spills currently occurring on sites can be prevented with proper maintenance and containment using drip trays



Presentation Complete

Any Questions?

