HEALTH and SAFETY for EPA SITE SUPERVISORS

presented by
Tetra Tech, Inc.

for the
U.S. Environmental Protection Agency's
Environmental Response Team

ENVIRONMENTAL RESPONSE TRAINING PROGRAM (ERTP)

U.S. EPA	United States Environmental Protection Agency
OSWER	Office of Solid Waste and Emergency Response (Superfund)
OSRTI	Office of Superfund Remediation and Technology Innovation
ERT	Environmental Response Team

ERTP TRAINING COURSES

- Are offered tuition-free for environmental and response personnel from federal, state, and local agencies
- Vary in length from one to five days
- Are conducted at locations throughout the United States

ERTP TRAINING COURSES

Course Descriptions, Class Schedules, and Registration are available at www.trainex.org

Course Descriptions and Course Materials are available at www.ertpvu.org

COURSE MATERIALS

- Student Registration Card
- Student Evaluation Form
- Course Agenda
- Student Manual
- Student Handouts

FACILITY INFORMATION

- Parking
- Classroom
- Restrooms
- Water fountains, snacks, refreshments
- Lunch
- Telephones
- Alarms and emergency exits

Please...

In consideration of your fellow students and the instructors, please silence all cell phones and pagers.

COURSE OBJECTIVES

- Define your health and safety responsibilities and liabilities under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the Occupational Safety and Health Administration (OSHA).

COURSE OBJECTIVES

- List what you should be looking for when reviewing a site health and safety plan
- Describe the purpose of and steps in conducting an accident investigation
- Identify resources available to you

COURSE CERTIFICATE

- Attendance is mandatory
- CEUs awarded

Questions/Introductions

Version 1.0

Emergency Responder
Health and Safety

OSC/RPM Responsibilities

OSHA® Occupational Safety and Health Administration
www.osha.gov

Hazardous Waste Operations and Emergency Response

Objectives

- Describe OSHA and EPA roles in health and safety
- Describe your responsibility for health and safety

WHO ARE THE PLAYERS?

EPA United States Environmental Protection Agency

OSHA® Occupational Safety and Health Administration
www.osha.gov

Occupational Safety and Health Act

- OSHA – All government agencies and private employers are directly responsible for the health and safety of their employees
- Impact to you:
  1. As an employee, EPA thru the SHEMD has responsibilities to you.
  2. As an OSC/RPM, you have health and safety responsibilities for your sites.

OSHA STANDARDS
General Duty Clause

- 5(a)(1)
  - shall furnish to each of his employees a place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- 5(a)(2) comply with standards promulgated under this Act.
- 5(b) *Employee* shall comply

EPA

- Implementing this at EPA :

  EPA's Safety, Health and Environmental Management Division (SHEMD) whose role is "*to better protect their employees and the Agency's assets, and to help reduce EPA's environmental footprint.*"

  - EPA Orders 1440.1 and 1440.2
  - Guidelines

EPA Safety and Health

- EPA Order 1440.1 – Agency must support SHEMP (Safety Health and Environmental Management Program) to promote safety and health of employees and
- “The agency has the authority to implement safety, health and environmental management SHEM-related oversight over activities and operations that occur at agency facilities (owned, rented or leased) and *at field work sites*.”

EPA Safety and Health

- EPA Order 1440.2 – Safety and Health Training Requirements for Agency Employees
- Objectives:
  - Ensure that all EPA employees are aware of the potential hazards (Job Hazard Analysis)
  - Provide the knowledge and skills to perform the work safely
  - Accomplish Agency goals in a safe manner
  - Ensure safe disengagement from actual hazardous situation

SHEM Guidelines Examples

#29 – Permit-Required Confined Space

#33 – Heat Stress and Cold Stress

#42 – Hazard Communication

#44 – Personal Protective Equipment

#46 – Respiratory Protection

#56 – Job Hazard Analysis

Job Hazard Analyses

"Job Hazard Analysis (JHA)" is a systematic technique to identify, characterize, and evaluate the demands, potential health, and physical hazards or risks associated with an employee's job description and tasks. The purpose of a JHA is to ultimately develop and confirm recommended safe work procedures and controls to eliminate/control the associated hazards.

Job Hazard Analysis – RPM (1)

Job Hazard Analysis Form

JOB HAZARD ANALYSIS

Hazard Types (HT)

1. Toxic Chemicals
2. Flammable Chemicals
3. Corrosive Chemicals
4. Environmental
5. Explosion (Chemical Reaction)
6. Explosion (Over pressurization)
7. Mechanical / Vibration
8. Electrical (Shock, Short Circuit)
9. Electrical (Fire)
10. Electrical (Static, ESD)
11. Electrical (Loss of Power)
12. Ergonomic (Overexertion)
13. Ergonomic (Human Error)
14. Vibration
15. Fall (Slips / Trips)
16. Fall (To a Different Level)
17. Excavation (Collapse)
18. Fire, Heat, Thermal, Cold
19. Noise
20. Radiation (Ionizing / Nonionizing)
21. Visibility
22. Weather
23. Caught (In, On, Between)
24. Struck (by, against)
25. Water
26. Vermin, insects, reptiles, dogs, animals
27. Dermatitis causing agents
28. Sun

Job Task: Superfund Remedial Project Manager (RPM)

Personal Protective Equipment: Hard Hat, Gloves, Tyvek Suit (or equivalent if necessary), Eye Protection, Boots, Hearing Protection (if necessary), Respirator (if qualified and necessary)

Chemicals In Use: None

Medical Surveillance: Yes (Potential for exposure to Lead-Based Paint and Dusts contaminated with Lead)

CRITICAL TO SAFETY (CTS): Step 8

Risk Estimation Matrix

Probability of Occurrence of Harm	SEVERITY OF HARM			
	Catastrophic	Serious	Moderate	Minor
VERY LIKELY	High	High	High	Medium
LIKELY	High	High	Medium	Low
UNLIKELY	Medium	Medium	Low	Negligible
REMOTE	Low	Low	Negligible	Negligible

* High = CTS tasks should receive engineering controls prior to assigning administrative or PPE controls.

Step #	Procedures (LOP procedure or job tasks step)	Potential Hazards	HT	Check CTS	Recommended Safe Practi
1.	Drive to/from Superfund Site	Motor Vehicle Accidents	24	Medium	See Motor Vehicle Operation JHA; W Belts; Take Defensive Driving Cours Traffic Laws; Do not text or talk on c while operating motor vehicle; Be aw surroundings; Do not operate motor v adverse (snow/ice, heavy rain, etc.) c unless absolutely necessary
2.	Using Office Equipment	Electrical Shock; Struck By (Doors, Falling Objects); Ergonomics (Reaching Overhead, Ergonomics (Computer Use); Ergonomics	8,9,13, 15,23,24	Low	Ensure that cords are in good conditi circuits are not overloaded; avoid "D Chaining" of strip outlets; watch ties, and loose items/clothing while using use step stools/ladders to reach items shoulder height; keep aisles clear of e

Job Hazard Analyses – RPM (2)

Job Hazard Analysis Form

4.	Survey Site from a distance. Observe Superfund response actions being conducted by EPA, contractors, or potentially responsible parties (PRPs).	Bitten by animal	26	Low	Observe Site area for the presence of animals e.g. dogs before exiting the vehicle; Be alert aggressive animals and take precautions whe on site
5.	Meet with owners/contractors/PRPs to determine nature of Superfund response activities and whether/what hazards may exist prior to entering work zone.	None		Neg.	N/A
6.	Request and review all paperwork related to the Site.	None		Neg.	N/A
7.	Determine PPE requirements based on discussions with owners/contractors/PRPs, and available records/observations/past experiences. Don appropriate PPE prior to entry.	None		Neg.	N/A
8.	Carry out inspection and information gathering activities in and around the Superfund Site. If remediation, construction, or sample collection/testing activities are ongoing during Site activities the potential for exposure is greatly increased.	a. Chemical exposure from Site inspection, construction, remediation, sample collection, and sample testing activities. b. Slips/trips/falls from uneven terrain, tarps, construction debris, etc. c. Falls into onsite excavations. d. Thermal stress due to exposure to extreme hot/cold temperatures – may be exacerbated by requirements for PPE use. e. Weather-related exposure (rain, lightning, snow, etc.). f. Electrical shock from temporary non-GFCI wiring onsite. g. Injuries due to falling objects/construction debris. h. Accidental contact with heavy equipment. i. Accidental contact with power tools. j. Noise from equipment or power tool use. k. Contact with screws, nails, and other construction debris.	1,4,7,8,12,15,16, 18,19,21,22,23, 24,25,28	CTS – YES Med.	a. Wear appropriate PPE (Tyvek, safety boots, safety glasses, gloves, respirator i necessary, hearing protection if necessar b. Watch where you will be walking and av areas where potential trip/slip hazards ex if possible. c. Watch for open trenches/excavations and avoid areas where such hazards exist as much as possible. d. Dress appropriately to the conditions – w enough clothes to stay warm in cold weather, and do not overdress in warm weather. Consider working early/late in warm weather to avoid peak temperature Limit work time where PPE is required t avoid thermal stress. e. Do not work during lightning, tornadoes, severe weather. f. Watch for and avoid electrical hazards. g. Be aware of construction activities in wo areas. h. Use caution when working where heavy equipment is being operated. i. Use caution in areas where power tools a in use. j. Wear hearing protection when appropria k. Watch for nails, screws, and sharp object in areas where Site work will be perform
9.	Remove PPE and dispose of properly.	a. Exposure from chemical residue on PPE from Site activities.	1	Low	Remove PPE in proper sequence, place waste appropriate containers, and dispose of proper
10.	Conduct post-inspection briefing and close-out.	None		Neg.	N/A

OVERALL HEALTH & SAFETY RESPONSIBILITIES

NCP [40 CFR 300.135(l)]:

OSC/RPM is responsible for addressing worker health and safety concerns at a response scene, in accordance with 300.150.

Subpart B: Responsibility and Organization for Response

300.150 - Worker health and safety.

(a) Response actions under the NCP will comply with the provisions for response action worker safety and health in 29 CFR 1910.120. The NRS (National Response System) meets the requirements of 29 CFR 1910.120 concerning use of an incident command system.

Subpart B: Responsibility and Organization for Response (cont'd)

- (b) In a response action taken by a responsible party, the responsible party must assure that an occupational safety and health program consistent with 29 CFR 1910.120 is made available for the protection of workers at the response site.

SUPERFUND RESPONSE FUND-LEAD

- For EPA actions, response action contracts should contain assurances that contractors will comply with any applicable provisions of OSHA and related state laws. NCP at 300.150(c)

- OSCs/RPMs should stop unsafe activity until the safety issue can be resolved. Unsafe work should not be allowed to continue.

RPM
Oversight Activities and Scoping Activities

Model AOC (2001):

The OSC/RPM shall be responsible for overseeing Respondents' implementation of this Order. The OSC/RPM shall have the authority vested in an OSC/RPM by the NCP, including the authority to halt, conduct, or direct any Work required by this Order, or to direct any other removal action undertaken at the Site.

RPM Oversight Activities and Scoping Activities

RPM OVERSIGHT ACTIVITIES AND SCOPING ACTIVITIES

PRELIMINARY PLANNING
- Refine conceptual Model with potential risks and possible remedies
- Evaluate need for treatability studies
- Preliminary identity ARARs

INITIAL PROJECT AND OVERSIGHT SCOPE DEFINED IN AO

HOLD PROJECT INITIATION MEETING WITH PRPs

CONTACT NATURAL RESOURCES TRUSTEES

REVIEW DRAFT RI/FS PROJECT PLANS AND CIP

RPM FINAL REVIEW AND APPROVAL OF RI/FS PROJECT PLANS AND CIP

NOTE: RPMs Review, But Do Not Approve PRP Health and Safety Plans

CERCLA Enforcement Project Management Handbook

40 CFR 300.150

- Response actions under NCP (whether by EPA or RP) will comply with provisions for response action worker safety and health in 29 CFR 1910.120 and other applicable OSHA standards.
- All government agencies and private employers are directly responsible for health and safety of their own employees.
- OSHA may issue citations for “multi-employer worksites.”

29 CFR 1910.120

- A general supervisor who has the responsibility and authority to direct all hazardous waste operations.
- A site safety and health supervisor who has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.

The HASP Wheel

Questions?

How to Review Elements of a Site-Specific Health and Safety Plan

1910.120(b)(4)

Student Performance Objectives

At the end of this module, the student will be able to:

1. Use the Field Site Health & Safety Plan Review Checklist to review a Site-Specific Health and Safety Plan (HASP).
2. Identify the elements that should be in the HASP they use.

Resources

- Field Site Health & Safety Review Checklist (Safety Officer Toolbox)
  - Modified for this Training Course
- EPA Emergency Responder Health and Safety (ERH&S) Manual (http://www.epaosc.org/_HealthSafetyManual/index.htm)
- Region/Team Customized HASP (http://www.epaosc.org/_HealthSafetyManual/specific.htm)

Resources

- Safety, Health and Environmental Management Division (http://intranet.epa.gov/shemd)
  - Program Guidelines
  - Safety and Health Training
  - Job Hazard Analyses
- OSHA
  - https://www.osha.gov/dep/etools/ehasp/index.html

EPA Emergency Responder Health and Safety Manual

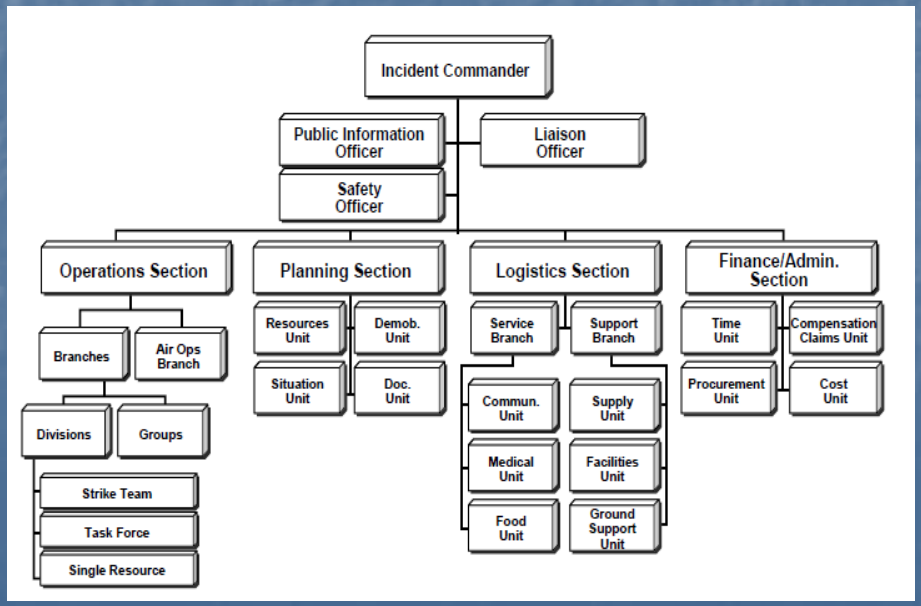
- A series of chapters developed to ensure consistency of implementation of the Agency's health and safety guidance for the emergency response program
- Developed by emergency response representatives from all 10 regions, SHEMD, and the Special Teams

ER S&H Manual
www.epaosc.org

1. HASP Development
2. Training
3. Medical Surveillance
4. Respiratory Protection Program
5. Personal Protective Equipment Program
6. Injury, Illness, and Exposure Reporting
7. Physical Stress Management Program
8. Transportation Safety
9. Radiation Safety Program
10. Chemical and Biological Agents
11. Confined Space Safety Program
12. Bloodborne Pathogen Exposure Control Plan

The HASP Wheel

Key Personnel and Organizational Structure

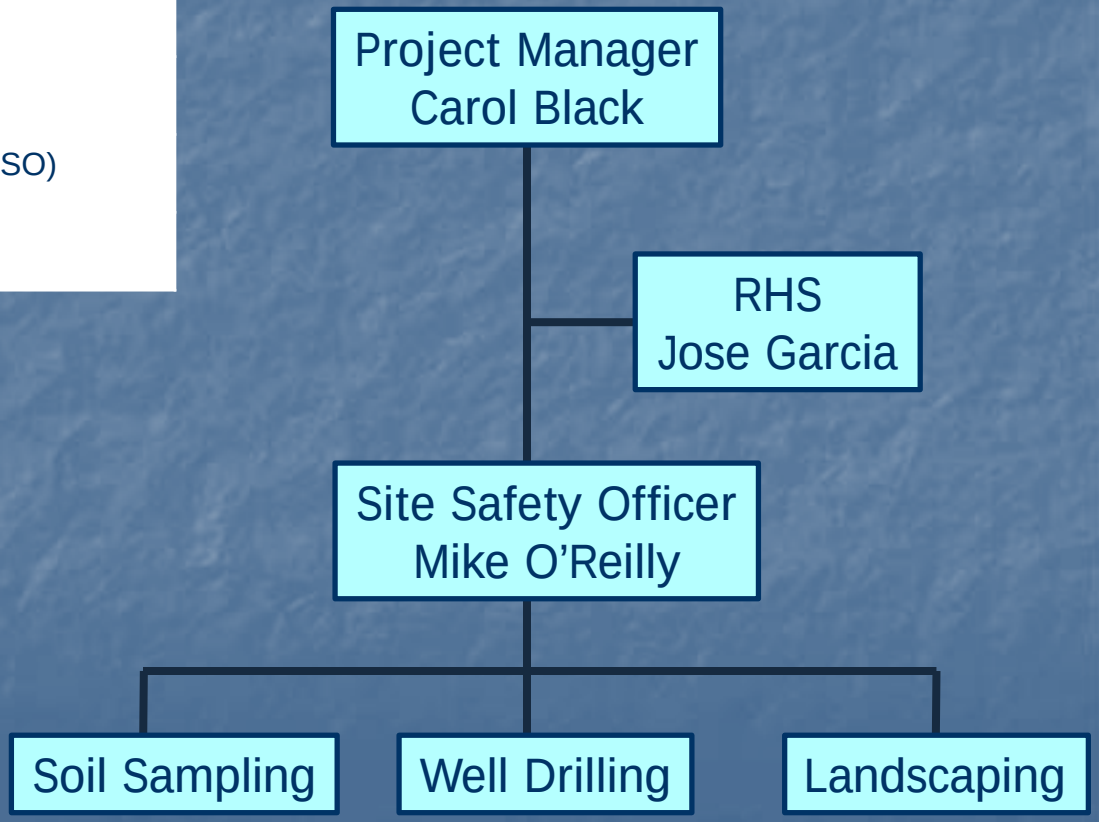


Checklist
Organization

- Is there an organizational structure?
- Site supervisor?
- Safety officer?
- All other personnel?
- Lines of authority?

Examples

Personnel	Tasks Assigned
Carol Black	Project Manager (PM)
James White	Field Operations Leader (FOL)
Mary Smith	Health and Safety Manager (HSM)
Jose Garcia	Project Health and Safety Officer (PHSO)
Mike O'Reilly	Site Safety Officer (SSO)



The HASP Wheel

Checklist
Work Plan

- Addresses cleanup and standard operating procedures?
- Define work tasks?
- Establish personnel needed?
- Implement training?
- Implement informational programs?
- Implement medical surveillance program?

SOPs

- The comprehensive workplan shall address anticipated clean-up activities as well as normal operating procedures which need not repeat the employer's procedures available elsewhere.
- A site-specific safety and health plan which need not repeat the employer's standard operating procedures required in paragraph (b)(1)(ii)(F) of this section;

ERH&S Manual

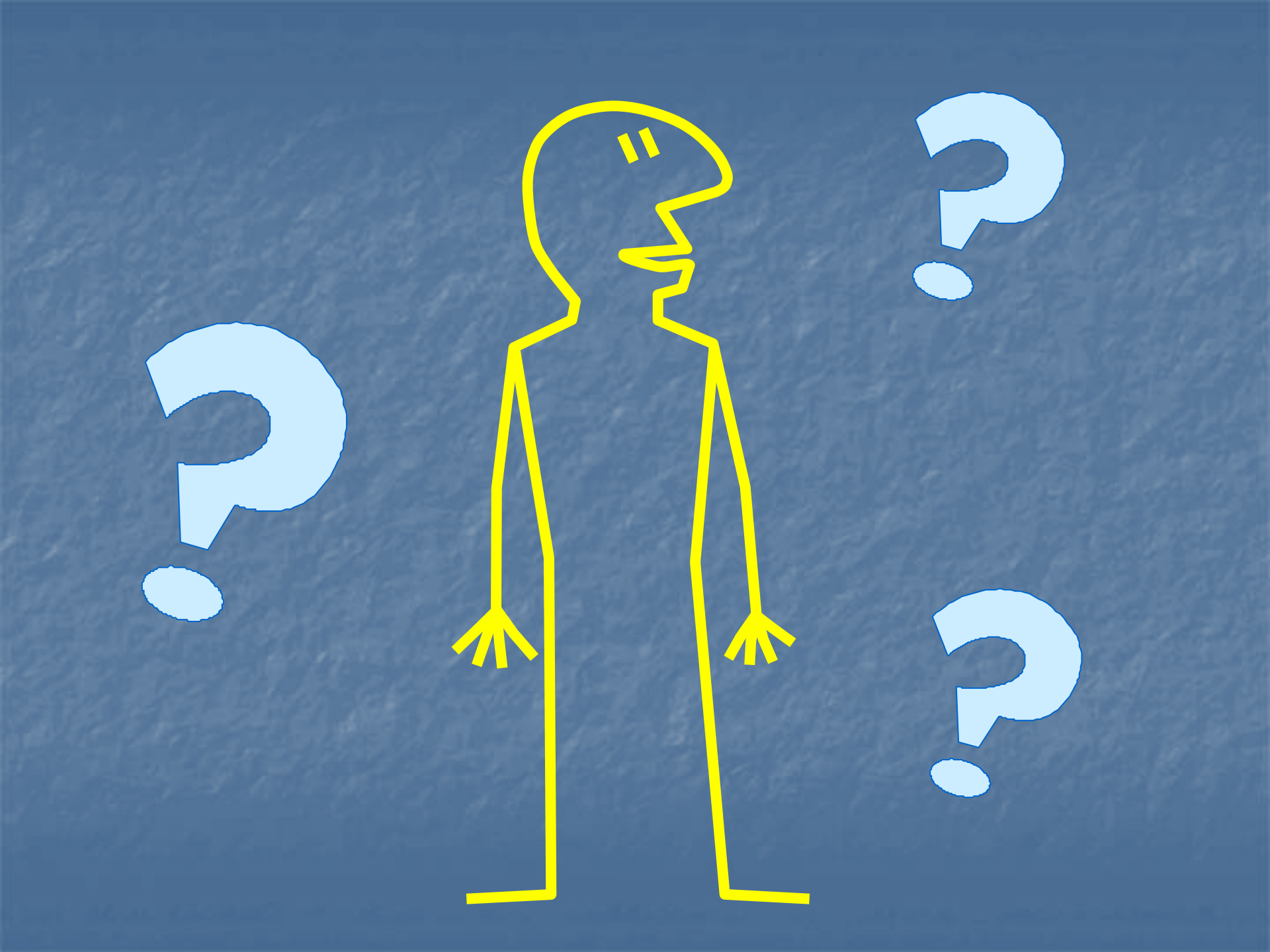
- Define work objectives;
- Determine methods;
- Determine personnel requirements;
- Determine need for additional training; and
- Determine equipment requirements.

Example

Specific tasks to be conducted at Unit 17 include the following:

- Mobilization and demobilization
- Soil boring using concrete coring, hand augering, and DPT
- Collection of concrete and soil samples
- Decontamination of sampling equipment

For more detailed description of the associated tasks refer to the Quality Assurance Project Plan (QAPP).



The HASP Wheel

Hazard Analysis

Photo courtesy of U.S. Fish and Wildlife

Checklist

- √ Has a risk/hazard analysis been done?
- √ For each task/operation?
- √ How do you know?

Details in HASP

(Example)

6.0 HAZARD ASSESSMENT AND CONTROLS

This section provides reference information regarding the chemical and physical hazards which may be associated with activities that are to be conducted as part of the scope of work.

6.1 Chemical Hazards

6.2 Physical Hazards

6.3 Natural Hazards

ERH&S Manual

- JHA required
- Conduct for all tasks
- Address hazards
- Implement controls
- Task specific
- May be employer specific

ERH&S

JHA			
JHA Number:	Name of Task:	Location Where Task Is Performed:	
Task Description:			
Step 1:		Step 3:	
Step 2:		Step 4:	
Estimated Duration of Task:		Date JHA Conducted/Updated:	
Biological Hazards			
Biological Hazard:	Characteristics:	Concentration:	Exposure Potential During Task:
	Infectious/pathogenic/ toxic	N/A	High Medium Low
Chemical Hazards			
Chemical Hazard:	Characteristics:	State/Concentration:	Exposure Potential During Task:
	Flammable/ignitable Corrosive Poison/acutely toxic Air-/water-reactive Carcinogenic Explosive/shock Sensitive Volatile	Gas/Vapor Solid Liquid	High Medium Low
Chemical Evaluation Sheets or SDSs are located in Attachment 2 for known chemical hazards.			
Physical Hazards			
Physical Hazard (Check Applicable Hazards):			Exposure Potential During Task
Overhead Below grade Slip/trip/fall Burn Puncture Cut Splash Noise Heat stress Cold stress Excavation/trench Electrocution Traffic** Other			High Medium Low
Ionizing radiation Alpha particles Beta particles Gamma rays Neutrons			High Medium Low
Confined space (hazards associated with PRCS entries will be addressed in a separate document)			High Medium Low N/A
Control Measures			
Engineering Controls: (list engineering controls necessary for this task)			
Work Practices: (describe those work practices specific to this task [e.g., medical monitoring])			
PPE: (list PPE necessary for this task)			
Workers/Site Role:	PPE Level:	Modifications Allowed:	

Job Hazard Analysis

JHA		
JHA#: 010	Name of Task: Drum and Container Sampling	Location: Throughout Impacted Area
Task Description: This task refers to the sampling of 55-gallon drums, 5 gallon buckets, laboratory jars, and other containers with known and unknown materials for analytical profile		Task Duration: 1-8 hrs

Physical Hazards

Hazard	Source	Control Measures	Exposure Potential				
			H	M	L	UNK	N/A
Traffic	Local road & highways to and from sampling sites. Debris in roads.	Defensive driving while on road. Assume traffic lights may not be operating in all areas.					
Slip/Trip/Fall	Sampling areas can be slippery, icing conditions when temperature drops below freezing or rain	Reduce site clutter at site. Ensure proper footing on site surfaces					
Overhead Hazards	Identify hanging/rotten tree limbs, overhead power lines	Look overhead, work with local utilities for downed or unsecure power lines..					
Heat/Cold Stress	Inclement weather, ice, snow	Cold/foul weather gear. Check local weather report daily					

From Safety Officer Toolbox

Activity Hazard Analysis

Análisis de Riesgos Laborales (ARL)

Actividad / Tarea:	Código de Evaluación de Riesgos (MER) (Utilice el nivel mas alto) _
Ubicación del Proyecto:	**Matriz de Evaluación de Riesgos (MER)**
Número de Contrato:	
Fecha de Preparación	
Preparado por (Nombre/Título):	
Revisado por (Nombre/Título):	
Notas: (Notas de campo, Comentarios, etc.)	

Severidad	**Probabilidad**				
	Frecuente	Probable	Ocasional	Raramente	Improbable
Catastrófica	E	E	A	A	M
Crítica	E	A	A	M	B
Marginal	A	M	M	B	B
Insignificante	M	B	B	B	B

1er Paso: Revise cada "Peligro" con sus respectivos "Controles" de seguridad y determine el adecuado codigo de la MER (Ver arriba).

"Probabilidad" es la probabilidad de causar un incidente, un casi accidente, o un accidente e identificado como: Frecuente, Probable, Ocasional, Raramente o Improbable.

"Severidad" es el resultado/grado de un incidente, un casi accidente, o un accidente que ocurrió y se identifica como: Catastrófica, Crítica, Marginal o Insignificante.

2do Paso: Identifique la MER (Probabilidad/Severidad) como E, A, M, o B para cada peligro dentro el ARL. Anote el nivel mas alto dentro la MER en la parte superior del ARL.

Niveles de la MER

- E = Extremadamente Alta
- A = Alta
- M = Media
- B = Baja

Etapa del Trabajo	Peligros	Controles	MER

JHA Sources
Safety Officer Toolbox

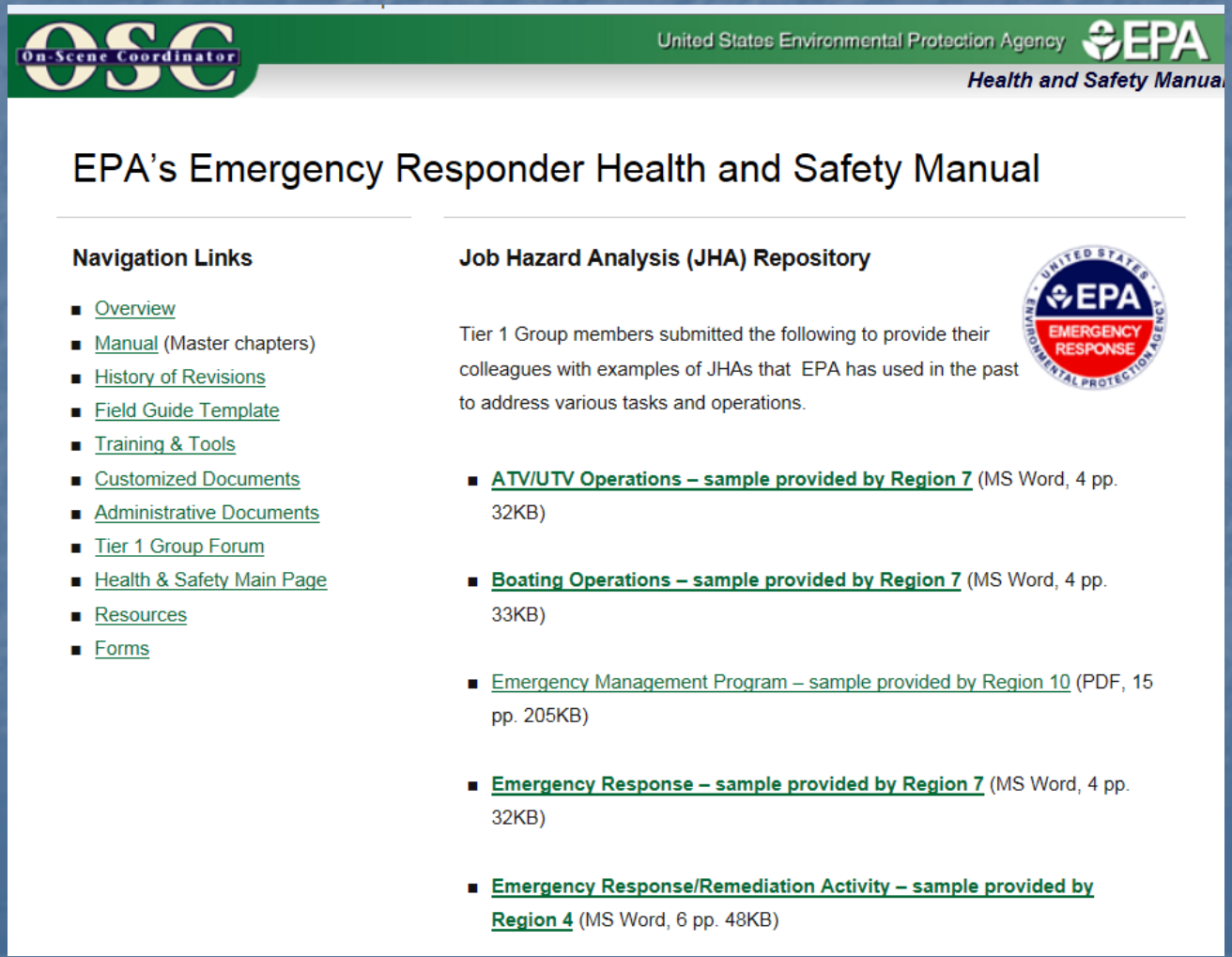
Safety Officer Toolbox

Folder: JHAs (H. Sandy) [15]

<< < 1 > >>

Categories	File Name	Description
All Documents Fact Sheet-Electric Form-Accident Report Form-Safety Audit HASP Example Heat/Cold Stress ICS Documents ICS Form 208 DWH ICS Forms JHAs (H. Sandy) Message-Irene/Lee Message-Sandy Reference Docs Safety Brief Safety Tng & Quals	JHA 013 CIC_111112[1].docx	Community Involvement Coordinators Activities
	JHA 016 ATV.docx	Container Assessment/Collection using ATVs
	JHA 015 Drum Disposal - Cutting operations[1].docx	Drum Disposal (Cutting Drums)
	JHA 012 Powerwash MCUA [1].docx	Powerwashing Middlesex County Pumping Station (MCUA)
	JHA 011 bulk_overpack_[1].docx	Bulking and Overpacking Containers
	JHA 010 drum_container-sampling [1].docx	Drum Container Sampling
	JHA 009 boat OPS updated 12-9-12[1].docx	Boat and On Water Operations
	JHA 008 HM handling[1].docx	Sampling, Hazcatting and Handling of Hazmat Containers
	JHA 007 Dive Operations[1].docx	Dive Operations
	JHA 006 pumping basement [1].docx	Pumping of Cellars
	JHA 005 Air Operations 110612 [1].docx	Air Operations for aerial assessment of impacted areas.
	JHA 004 POTW&DW sampling	POTW & DW Sampling Support

JHA Sources
JHA Repository



EPA's Emergency Responder Health and Safety Manual

Navigation Links

- Overview
- Manual (Master chapters)
- History of Revisions
- Field Guide Template
- Training & Tools
- Customized Documents
- Administrative Documents
- Tier 1 Group Forum
- Health & Safety Main Page
- Resources
- Forms

Job Hazard Analysis (JHA) Repository

Tier 1 Group members submitted the following to provide their colleagues with examples of JHAs that EPA has used in the past to address various tasks and operations.

- **ATV/UTV Operations – sample provided by Region 7** (MS Word, 4 pp. 32KB)
- **Boating Operations – sample provided by Region 7** (MS Word, 4 pp. 33KB)
- Emergency Management Program – sample provided by Region 10 (PDF, 15 pp. 205KB)
- **Emergency Response – sample provided by Region 7** (MS Word, 4 pp. 32KB)
- **Emergency Response/Remediation Activity – sample provided by Region 4** (MS Word, 6 pp. 48KB)

Resources

- Appendix F: *Tools to Assist with Hazard Evaluations and HASPs*

Version 1.0
(October 2008)

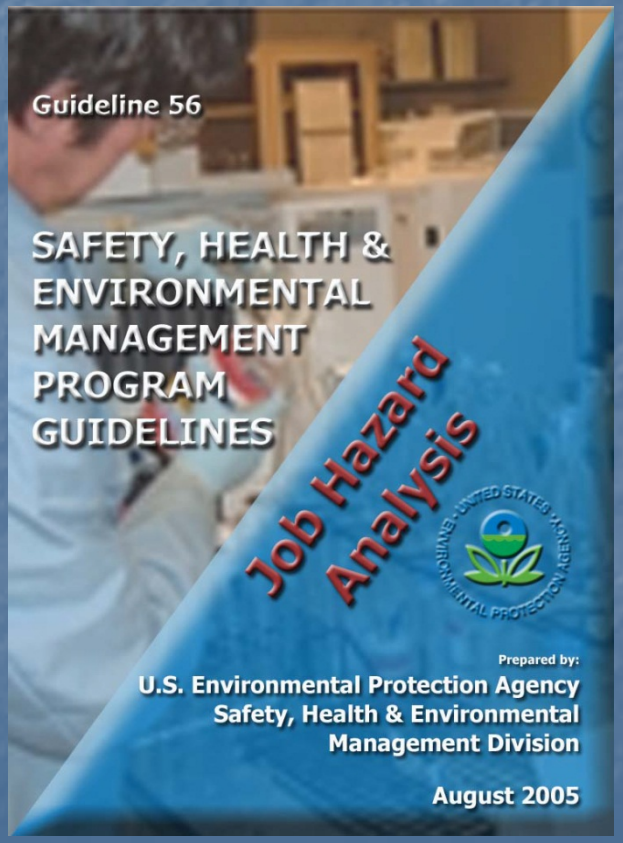
Emergency Responder Health and Safety

Chapter 4

Respiratory Protection Program

SHEMD

Guideline 56



Examples

- http://intranet.epa.gov/shemd/links/index.htm#jhas

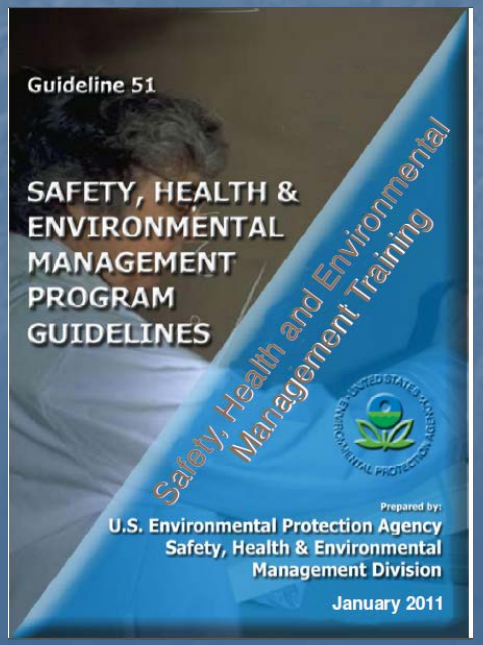
Questions?

Patient: Doctor, it hurts when I do this.

Doctor: Then don't *do* that.

The HASP Wheel

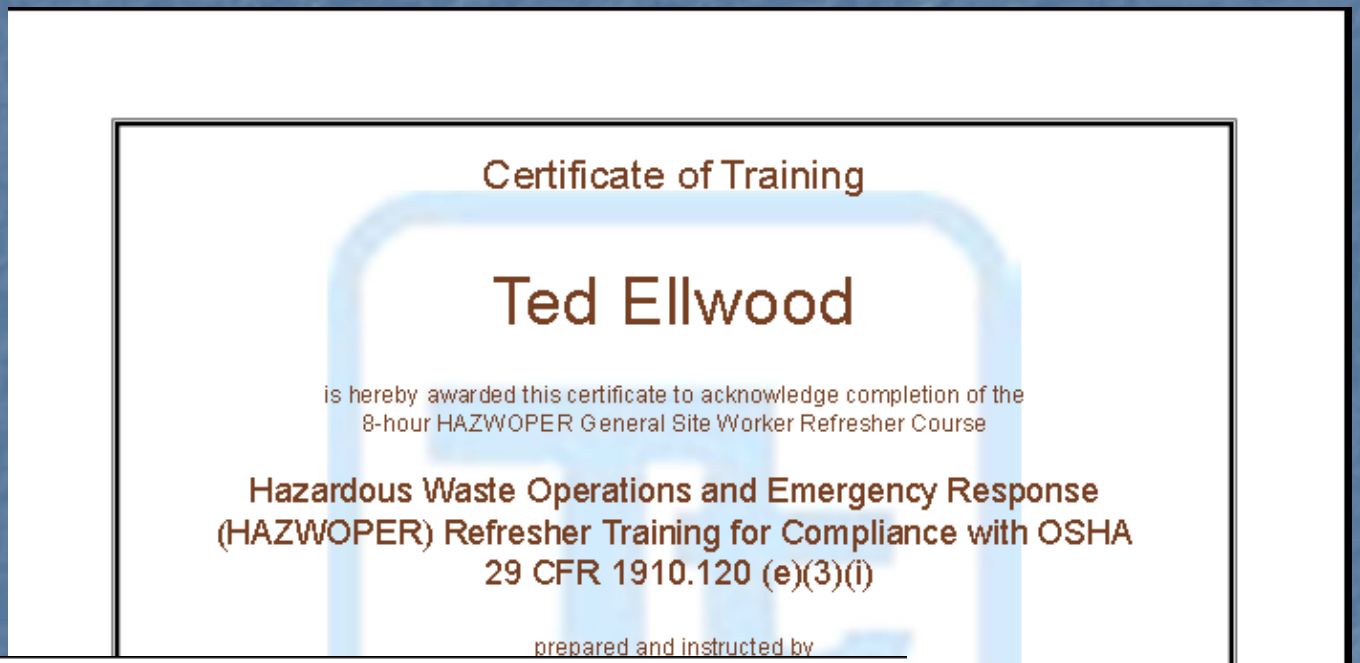
Training Requirements



Checklist

- √ Have the workers received 40-hour HAZWOPER training?
- √ Is documentation available?
- √ Are they current on 8-hour refresher?
- √ Have supervisors received 8 hours specialized training?

Documentation



Certificate of Training

Ted Ellwood

is hereby awarded this certificate to acknowledge completion of the
8-hour HAZWOPER General Site Worker Refresher Course

Hazardous Waste Operations and Emergency Response
(HAZWOPER) Refresher Training for Compliance with OSHA
29 CFR 1910.120 (e)(3)(i)

prepared and instructed by

2010

CPR, AED, and
Basic First Aid
Certification Card

Theodore Ellwood
has successfully completed and competently performed
the required knowledge and skill objectives for this program

☑ Adult
☐ Child and Infant
☐ Adult, Child, and Infant
Card is void if more than one box is checked

AMERICAN SAFETY & HEALTH INSTITUTE

ASHI-Approved Certification Card

Gene Seay
Authorized Instructor (Print Name)

65964
Registry No.

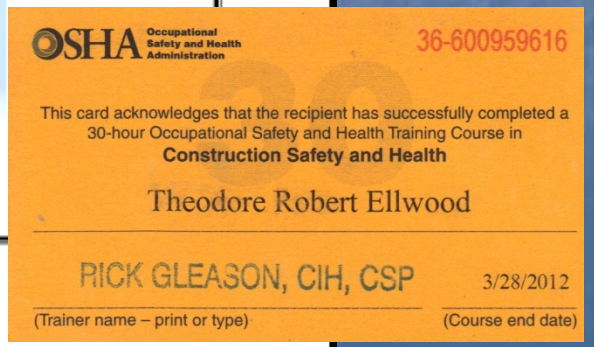
04/29/2014
Class Completion Date

04/29/2016
Expiration Date

513-761-3966
Training Center Phone No.

65962
Training Center I.D.

This card certifies the holder has demonstrated the required knowledge and skill objectives, to a currently authorized ASHI instructor. Certification does not guarantee future performance, or imply licensure or credentialing. Course content conforms to the 2010 AHA Guidelines for CPR and ECC, and other evidence-based treatment recommendations. Certification period may not exceed 24 months from class completion date. More frequent reinforcement of skills is recommended.



OSHA Occupational Safety and Health Administration

36-600959616

This card acknowledges that the recipient has successfully completed a
30-hour Occupational Safety and Health Training Course in
Construction Safety and Health

Theodore Robert Ellwood

RICK GLEASON, CIH, CSP
(Trainer name – print or type)

3/28/2012
(Course end date)

Additional

- √ Did the workers receive 3 days of supervised field experience?
- √ Does the documentation state what level of protection they can use?

1910.120

What if they are only 24-hour HAZWOPER trained?

- Are they wearing respirators?
- Exposure above PELs?
- Then, need 40-hour

Not HAZWOPER?

3.3.1 HAZWOPER-Regulated Tasks

- Dredging sediments
- Management of sediment at dredge stations
- Capping the newly exposed sediment surface

3.3.2 Non-HAZWOPER-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. The following tasks do not involve exposure to safety or health hazards associated with the hazardous waste operations. Hazwoper training or medical requirements do not apply for the tasks listed below.

Tasks	Controls
• Turbidity Sample Buoys Installation • Security • Materials hauling • Electrical • Mechanical • Startup and testing of systems • Biological surveys • Onsite analysis of surface water samples • Sampling surface water • Site maintenance	• Brief on hazards, limits of access, and emergency procedures. • Post areas of contamination as appropriate. • Perform air sampling/monitoring as specified in this HSP.

ERH&S Manual

Emergency Responder Core Training	
Health and Safety	
Medical surveillance	First aid (29 CFR 1910.120)
Fit test	Radiation safety (EPA Order 1440)
40-hour HAZWOPER training (165.5 or equivalent) or 24-hour HAZWOPER if appropriate	Radiation safety refresher (EPA Order 1440)
8-hour HAZWOPER refresher	Radiation safety/badge training (4 hours)
8-hour HAZWOPER supervisor	Defensive driving (EPA Order 1440.2)
Bloodborne pathogens (1910.1030)	Asbestos awareness (EPA Order 1440)
CPR	

	Site-Specific Training	

Other Training

- Pre-entry briefings*
- 1st Aid/CPR*
- Other OSHA standards
- Job Specific

*ERH&S Manual

Job Specific Training

Training	Standard	Requirement
Respiratory Protection	1910.134	Initial, annual
Hazard Communication	1910.1200	Initial
Hearing Conservation	1910.95	Initial, annual
Heat Stress	California	Initial Worker & Supervisor
Construction	Several states	Initial, some 5 years

Job Hazard Analysis: Emergency Response Remedial

Other Required Training					
☐	24 hr HAZWOPER	☒	40 hr HAZWOPER	☒	HAZWOPER Annual Refresher
☒	Defensive driving	☒	Radiation Safety	☒	Boating Operation Training
☒	TLD Program	☒	RPP Program	☒	Medical Surveillance
☒	1st Aid/CPR	☐	Other:		

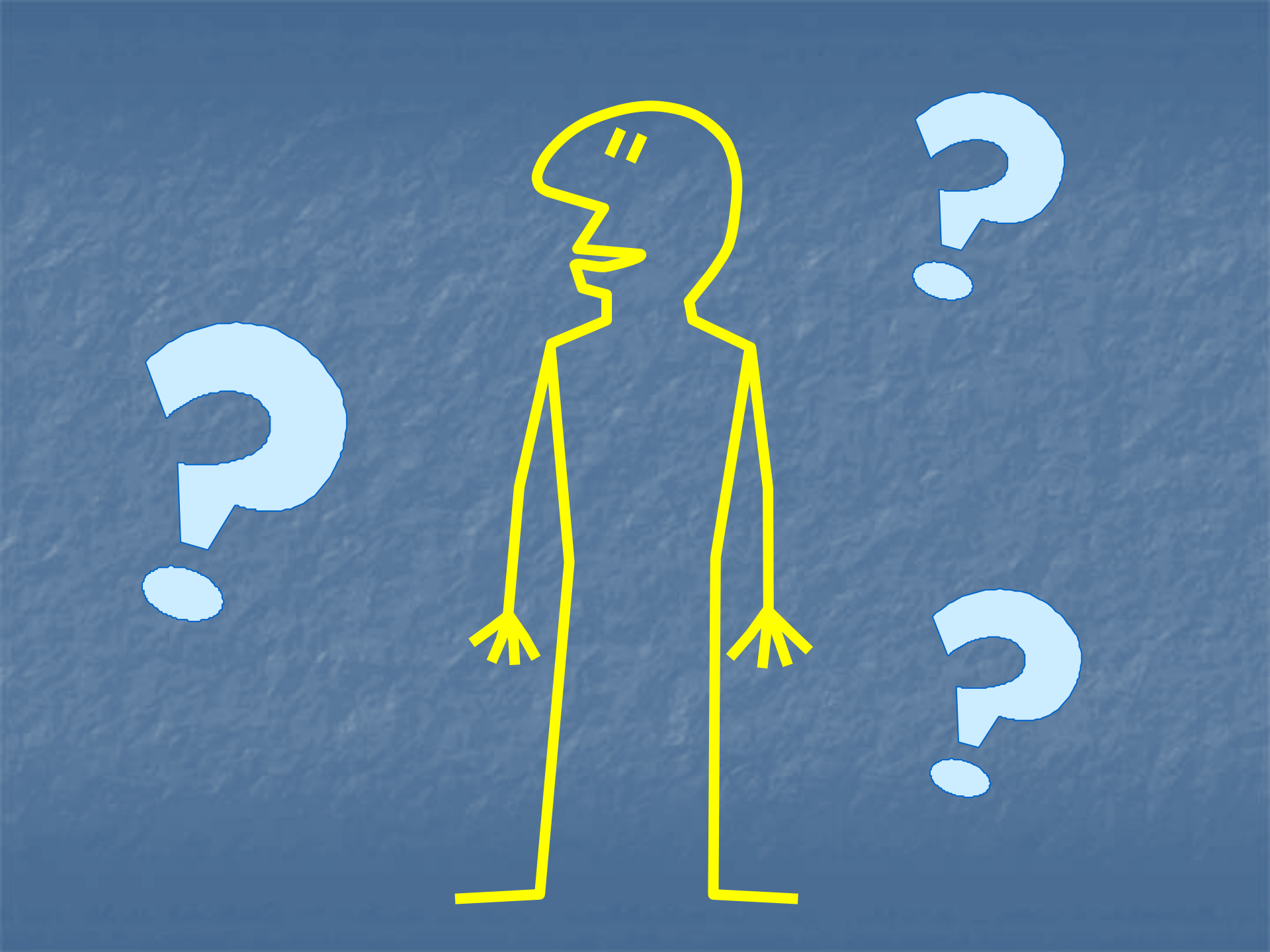
Activity Hazard Analysis
Fence Mending-Repair

Training Requirements

- Safe Lifting Procedures
- Hearing Conservation
- Personal Protective Equipment
- CPR/First Aid (one employee on-site must have current CPR/First Aid training)
- [CA projects require Ergonomics, Heat Stress, and Injury and Illness Prevention Plan training]

References

- Emergency Responder Health and Safety Manual, Chapter 2, Health and Safety Training Program
- Training for U.S. EPA OSCs
  - http://trainex.org/pdf/OSC_training_guidelines.pdf
- OSHA Publication 2254
  - https://www.osha.gov/Publications/osha2254.pdf



The HASP Wheel

Personal Protective Equipment

Hierarchy of Controls

- Engineering controls
  - Pressurized cabs
  - Remotely operated equipment
- Work practices
  - Wetting dusty operations
  - Minimize personnel
- Personal protective equipment (PPE)

References

- ERH&S Manual, Chapter 5, PPE Program
- ERH&S Manual, Guidelines for PPE Ensemble Selection
- ERH&S Manual, Chapter 4, Respiratory Protection Program

Checklist

- √ Trained in use of PPE?
- √ Selection based on hazards?
- √ Use and limitations?
- √ Work mission duration?
- √ Maintenance and storage?
- √ Decontamination and disposal?

Checklist

- √ Training and proper fitting?
- √ Donning and doffing procedures?
- √ Inspection procedures
- √ Evaluation of the Program
- √ Limitations during temperature extremes, etc.

Medical Considerations

Medical surveillance requirements in 1910.120 and 1910.134

- Ability to wear any required PPE under work site conditions
- Tell physician what PPE (or additional PPE) will be worn

Site-Specific Hazard Assessment For PPE Selection

Protection Site	Hazard Source/Activity	Type of Hazard	Type of PPE Required	Notes/Comments
Eyes and Face  **Refer to Appendix I-1.**		☐ Impact-flying objects, chips, sand, or dirt	☐ Safety glasses w/side shields Goggles w/face shield shields	
		☐ Nuisance dust	☐ Unvented chemical goggles	
		☐ Splashing molten metal	☐ Safety goggle w/face shield	
		☐ Hot sparks-grinding	☐ Safety glasses w/side shields ☐ Safety goggles w/face shield	
		☐ Glare/high intensity lights	☐ Shaded safety glasses	
		☐ UV light: welding, cutting, torch brazing, or soldering	☐ Welding goggles ☐ Welding helmet/shield w/safety glasses and side shields	
		☐ Laser operations	☐ Laser goggles or glasses	
		☐ Chemical – splashing liquid	☐ Chemical goggles/face shield	
		☐ Chemical – irritating mists	☐ Unvented chemical goggles	
		☐ **Other:**	☐ **PPE required:**	

ERH&S Manual, Chapter 5, Appendix H

PPE Guidelines

- Chemical exposure scenarios (non-CBRN)
  - *Guidelines to Ensembles for Specific Activities/Tasks Where Chemical Exposure Is Possible*
  - *Suggested Ensemble/Monitor Per Chemical*
  - Justification and Assumptions Associated With the *Suggested Ensemble/Monitor Per Chemical* table
- CBRN scenarios

Suggested Ensemble Example

Compound	Level C	Level B/A	Level C Suit	Level B/A Suit	Gloves	Boots
Acetone	250	1000	CPF-3	RESPONDER	Ansel - Chem Tek	Tingley HazProof Model 82330
			BR	CSM	Best - Butyl	
				TK		
Dichloromethane	See Level B	13	BR	RESPONDER	Ansel - PVA	Tingley HazProof Model 82330 w/ PVA boot cover

Is it the right respirator?

- Chemical: Dichloromethane
- No fire, not an emergency
- Oxygen normal; LEL = 0
- Concentration: 30 ppm
- IDLH: 2300 ppm
- OSHA PEL: 25 ppm TWA/125 ppm STEL
- Eye irritant

Respirator Selection Table 3 – High Hazard

Step	Condition/Hazard	Selected Respirator
1	Will respirator be used for fire fighting?	If yes, only use FF, PD SCBA meeting NFPA 1981 requirements. If no, go to Step 2
2	Will respirator be used in oxygen-deficient atmosphere (<19.5%)?	If yes, use any type SCBA (other than escape) or SAR with an auxiliary SCBA. If no, go to Step 3.
3	Does situation involve entry into unknown or IDLH atmospheres?	If yes, use a FF, PD SCBA or a FF, PD SAR in combination with an auxiliary PD SCBA. If no, go to Step 4.

Source: EPA ERH&S Manual

Respirator Selection Table 3 – APR?

Step	Condition/Hazard	Selected Respirator
4	Is exposure concentration(s) less than 0.5 the limit (REL, PEL, TLV)?	If yes, a respirator is not required for routine work If yes, but if an escape respirator is being considered, go to Step 5 If no, a respirator is needed – go to Step 6.
5	If respirator fails, or situation changes unexpectedly, can worker escape without suffering loss of life or irreversible health effects?	If yes, go to Step 6 If no return to Step 3 to select a respirator for IDLH OR If appropriate, choose an escape respirator following 2004 NIOSH Respirator Selection Logic

Source: EPA ERH&S Manual

Respirator Selection Table 3 – Facepiece

Step	Condition/Hazard	Selected Respirator
6	Is the contaminant an eye irritant or can it cause eye damage at the workplace concentration?	If yes, full facepiece recommended. Go to Step 7 If no, half-mask may be an option, with SHEMP manager approval. See Appendix F-4. Go to Step 7
7	Calculate the maximum use concentration (MUC).	MUC = 0.5 PEL X APF Cap the MUC below the IDLH APF = 10 for half-mask, 50 for full-facepiece (quantitative fit only) Particulates? Go to Step 8 Vapor/gases? Go to Step 9 Both? Go to Step 10

Source: EPA ERH&S Manual

MUC Calculation

- MUC = ½ PEL x APF
- MUC = ½ (25 ppm) x 50 (full facepiece)
- MUC = 125 ppm
- *But, Suggested Ensemble chooses Level B at 13 ppm. Why?*
- *Cartridge breakthrough*

Respirator Selection
Table 3 – Filter/cartridge

Step	Condition/Hazard	Selected Respirator
8	Particulate contaminant(s)?	P-100 cartridge only.
9	Gas/vapor contaminant(s)?	Use APR suitable for the chemical properties of anticipated gas/vapor and for anticipated concentrations.
10	Combination of particulate and gas/vapor?	Use P-100/appropriate gas-vapor combination. For multi-component mixtures calculate the sum: C1/MUC1 + C2/MUC2 +…Cn/MUCn = X X<1: acceptable X>1: unacceptable

Source: EPA ERH&S Manual

Hazards Posed by PPE Use

- Heat-related illnesses
- Dehydration
- Exhaustion
- Limited vision
- Restricted mobility

Hazards Posed by PPE Use

- Slip/trip/fall incidents
- Bump/struck-by incidents
- Psychological stress
- Impaired ability to communicate

Covered in HASP?

The HASP Wheel

Emergency Responder Health and Safety Manual

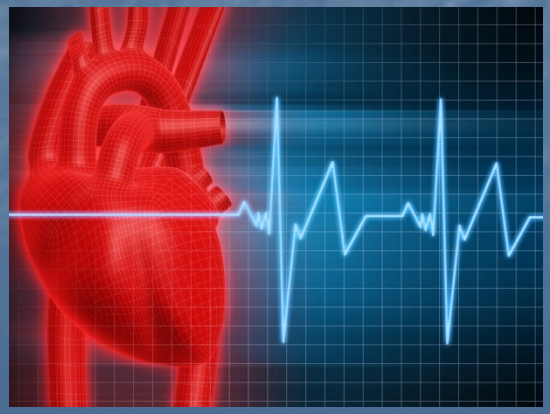
Chapter I-1

Medical Surveillance Program

Medical Surveillance

OSHA® Occupational Safety and Health Administration
www.osha.gov

Screening and Surveillance: A Guide to OSHA Standards



Medical Surveillance

- Is there a medical surveillance program?
- If not, why not?
- Are all employees in a medical surveillance program?
- If not, why not?

1910.120(f)
If . . ., then Yes

- Exposed?
- Use a respirator?
- Are injured, become ill, develop signs or symptoms?
- On HAZMAT team?

OSHA Medical Requirements Other

- 29 CFR 1910.134 – Respiratory Protection
- 29 CFR 1910.1030 – Bloodborne Pathogens
- 29 CFR 1910.95 – Noise Exposure
- 29 CFR 1910.1001 through 1052
  - 30 chemical-specific standards
  - Trigger levels

Supervisor Responsibilities

- Must consider the information provided in Medical Clearance Statements when assigning work
- Retain copy of Medical Clearance Statements

ERH&S Manual, Medical Surveillance

Medical Clearance

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	☒	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	☒	☐

STATUS

1. ☒ **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

2. ☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

3. ☐ **NOT QUALIFIED**

4. ☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

Medical Clearances

Can the RPM/OSC require the contractor to provide documentation of medical clearances for workers?

Occupational Medical Surveillance Program

Main Objectives

- Detect changes in the employee's health status
- Ensure that employees have the physical capacity (fitness for duty)
- Trends in disease and injury incidence and/or prevalence

Resources

- EPA ERH&S Manual, Chapter 3, Medical Surveillance
- OSHA Medical Screening and Surveillance
  - https://www.osha.gov/SLTC/medicalsurveillance/index.html

Discussion?

The HASP Wheel

Exposure Monitoring Program

Checklist

Does the plan address?

- Air monitoring
- Personnel monitoring
- Environmental sampling techniques
- Instruments to be used
- Calibration

Site-Specific HASP
1910.120(b)(4)(ii)(E)

Shall address:

- Frequency and types/techniques and instrumentation
  - air monitoring
  - personnel monitoring
  - environmental sampling
- Maintenance
- Calibration

When?
1910.120 (h)

- Initial entry
- Periodic – when a change may have occurred
  - Different portion of the site
  - Different contaminants
  - Different type of operation
  - Obvious liquid contamination

Who?
High-Risk Employees

- Most likely to have highest exposures
  - During actual cleanup phase
  - Use personal sampling
- Evaluation of other employees needed if high-risk employees exceed exposure limits

1910.120(h)(4)

Techniques

Personal

Area

Instrumentation

Direct-Reading

Sample Collection

ERH&S Manual

- Chapter 2: HASP, Section 4.5
- Monitoring is a required element of the HASP
- Purpose: Determine the appropriate levels of worker protection needed.
- How
  - Direct-reading instruments
  - Collection of air samples

HASP TEMPLATE

H. ENVIRONMENTAL AND PERSONAL MONITORING

AIR MONITORING SUMMARY (common site air requirements)			
Instrument Type:	**Contaminant:**	**Frequency:**	**Action Level/Comments:**
Combustible Gas Indicator (CGI)	Explosive/ flammable atmospheres	As needed	<10% proceed with caution; ≥10% evacuate area and re-evaluate
Oxygen Meter	Oxygen	Confined space work	≤ 19.5% or ≥ 23.5% oxygen, evacuate area and re-evaluate
PID/FID	Organic vapors and gases, CO	Periodic during container handling	Unidentified contaminants Background units - Level D > Background – TBD - Level C > TBD - Level B
Detector Tubes	Benzene, cyanide, total hydrocarbons, etc. (Tubes are chemical-specific and used for verification of PID readings.)	As necessary to further evaluate PID/FID readings	TBD on site according to PEL
Other: MiniRam	Dust particulates Respirable dust	During dusty conditions resulting from site operations	> 7.5 mg/m^3, Level C > 2.5 mg/m^3 respirable dust, Level C
AIR MONITORING SUMMARY (site-specific air requirements)			

Uses

- ERH&S Manual – upgrade/downgrade PPE
- All decisions to downgrade PPE must be accompanied by air monitoring results
- Action levels

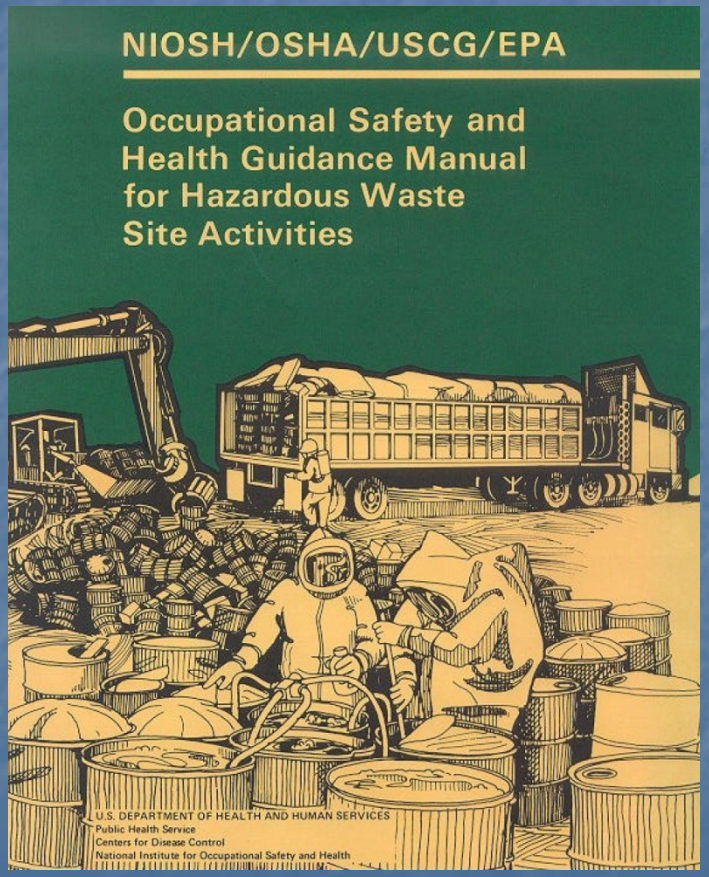
Action Levels

Contaminant	Level	Action
Oxygen	19.5%–22%	Continue work in Level D or C
	<19.5% or >22%	Upgrade to Level B or A
Lower explosive limit (LEL)	10%–25% of LEL	Continuous monitoring
	>25% of LEL	Evacuate immediately
Particulates	>5 milligrams per cubic meter (assume that all dust is respirable dust)	Upgrade to Level C
Radiation	Above background but <1 milliroentgen (mR) per hour	Continuous monitoring
	≥1 mR/hr	Withdraw, contact radiation safety officer, and reassess work plan
Unknown organic vapors/gases	Background to 1 part per million (ppm)	Level D with continuous monitoring
	1 ppm to ≤5 ppm	Level C with continuous monitoring
	>5 ppm to ≤500 ppm	Level B
	>500 ppm	Level A

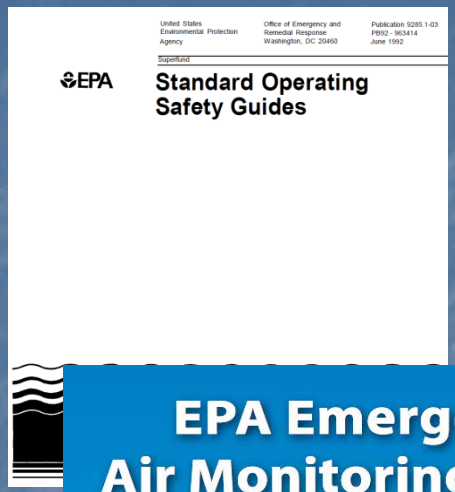
ERH&S Manual, SSH&SP Chapter

Additional Information

ERH&S Manual References Chapter 7 of the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* for more info.



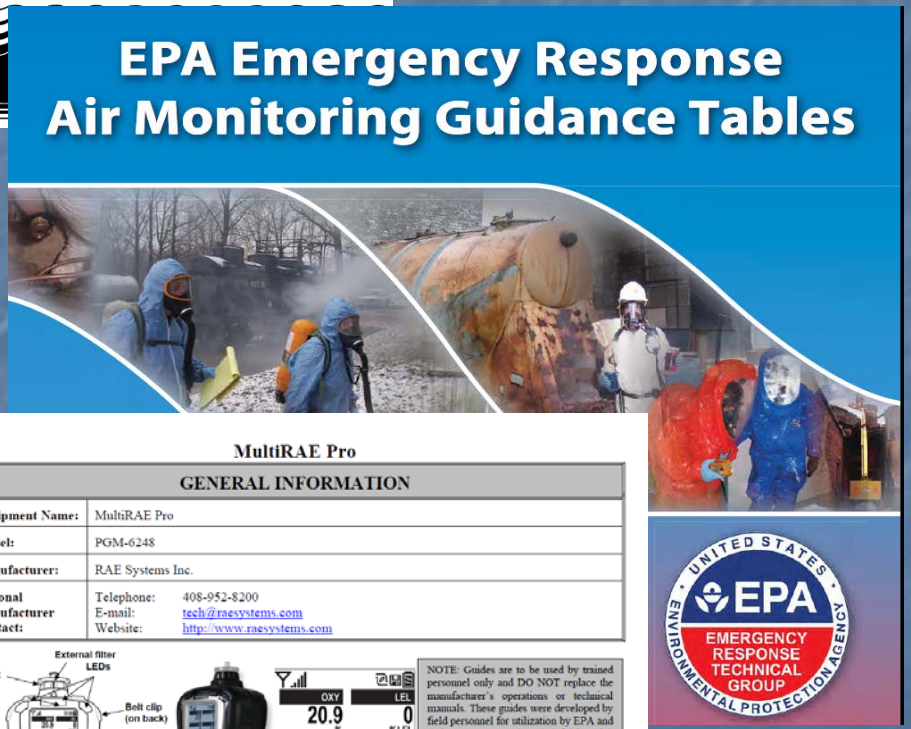
Other Guidance


United States Environmental Protection Agency | Office of Emergency and Remedial Response Washington, DC 20460 | Publication 9285.1-03 PB92 - 963414 June 1992

Superfund

EPA

Standard Operating Safety Guides



MultiRAE Pro

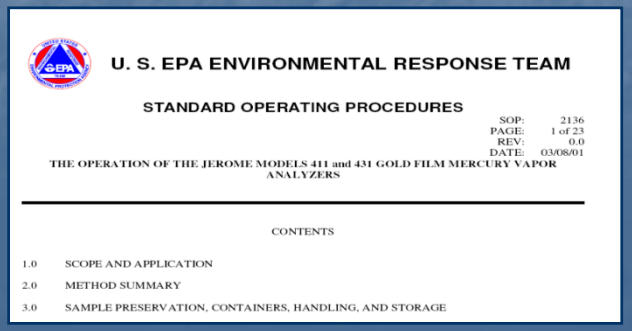
GENERAL INFORMATION	
Equipment Name:	MultiRAE Pro
Model:	PGM-6248
Manufacturer:	RAE Systems Inc.
National Manufacturer Contact:	Telephone: 408-952-8200 E-mail: tech@raesystems.com Website: http://www.raesystems.com

External filter
LEDs
Gas inlet
Belt clip (on back)
Display
[MODE] key
[Y/+] key
[N/-] key
Alarm Buzzer
LED
LED
Charging and Communication Contacts

OXY	LEL
20.9 %	0 %LEL
CO	H2S
0 ppm	0.0 ppm
VOC	GAMMA
0 ppb	4 urem/h

NOTE: Guides are to be used by trained personnel only and DO NOT replace the manufacturer's operations or technical manuals. These guides were developed by field personnel for utilization by EPA and their contractors and are helpful in quick start-up and operations. Various limitations have been identified through the experience of the development group. Different makes, models, and updates to this equipment may change the limitations. It is recommended that calibration, maintenance, and use be recorded in a logbook. Additional product information may be found in the accompanying Equipment Operating Guides.

- EPA Standard Operating Safety Guides (SOSGs)
- The Emergency Response Technical Group (ERTG) prepares Quick Start Guides (QSGs), Equipment Operating Guides (EOGs) and air monitoring guides.
- ERT Standard Operating Procedures are also available.


U. S. EPA ENVIRONMENTAL RESPONSE TEAM

STANDARD OPERATING PROCEDURES

SOP: 2136
PAGE: 1 of 23
REV: 0.0
DATE: 03/08/01

THE OPERATION OF THE JEROME MODELS 411 and 431 GOLD FILM MERCURY VAPOR ANALYZERS

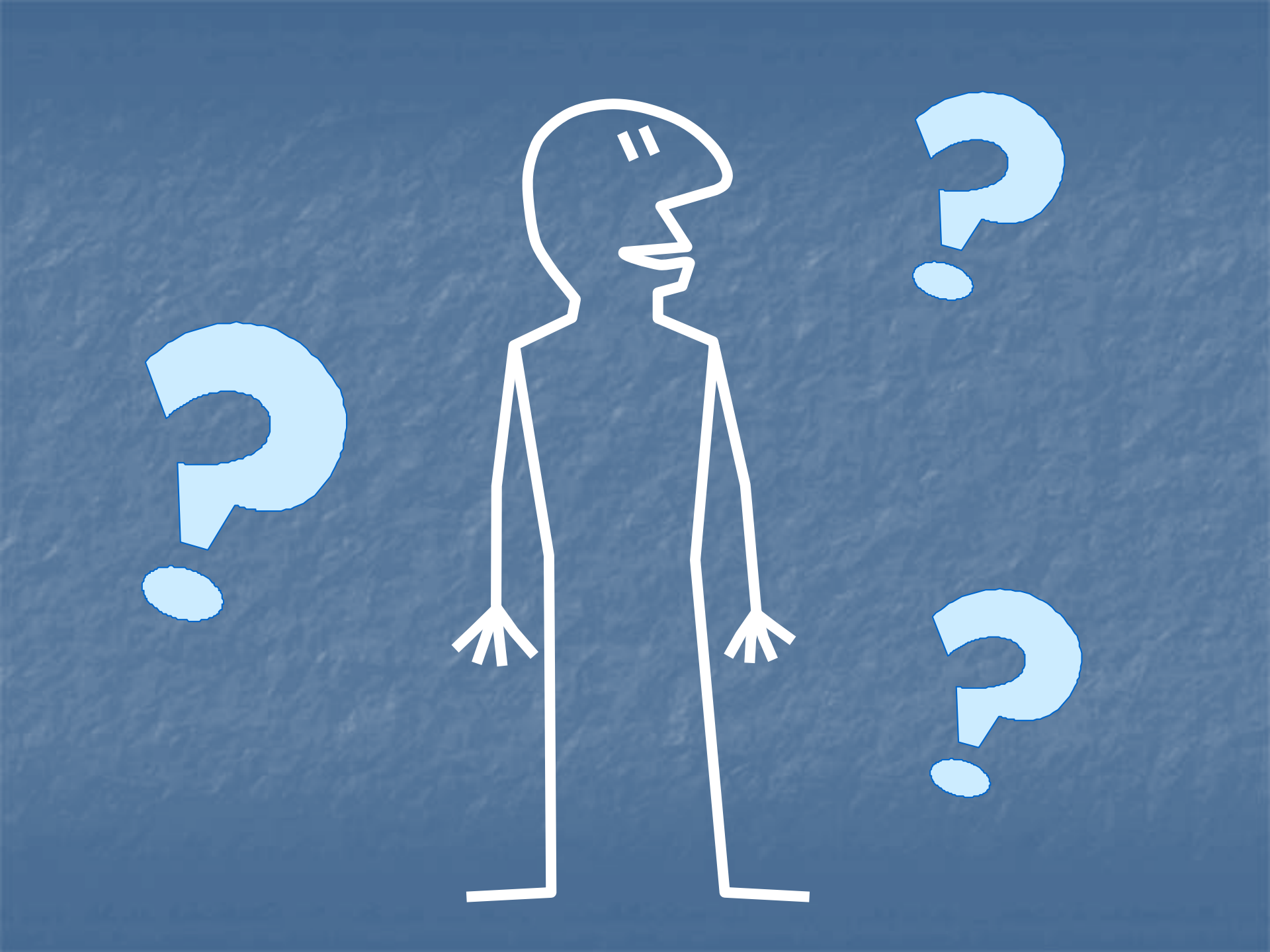
CONTENTS

1.0 SCOPE AND APPLICATION
2.0 METHOD SUMMARY
3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Summary

In the HASP there should be information about

- What you are monitoring (contaminants)
- How you will monitor
- When and where you will monitor
- Who will be monitored
- Action levels
- Maintenance and calibration



The HASP Wheel

Site Control

What to look for

- √ Map in Site-Specific HASP
- √ Work zones defined
  - √ Exclusion Zone*
  - √ Contamination Reduction Zone*
  - √ Support Zone*
- √ Buddy system

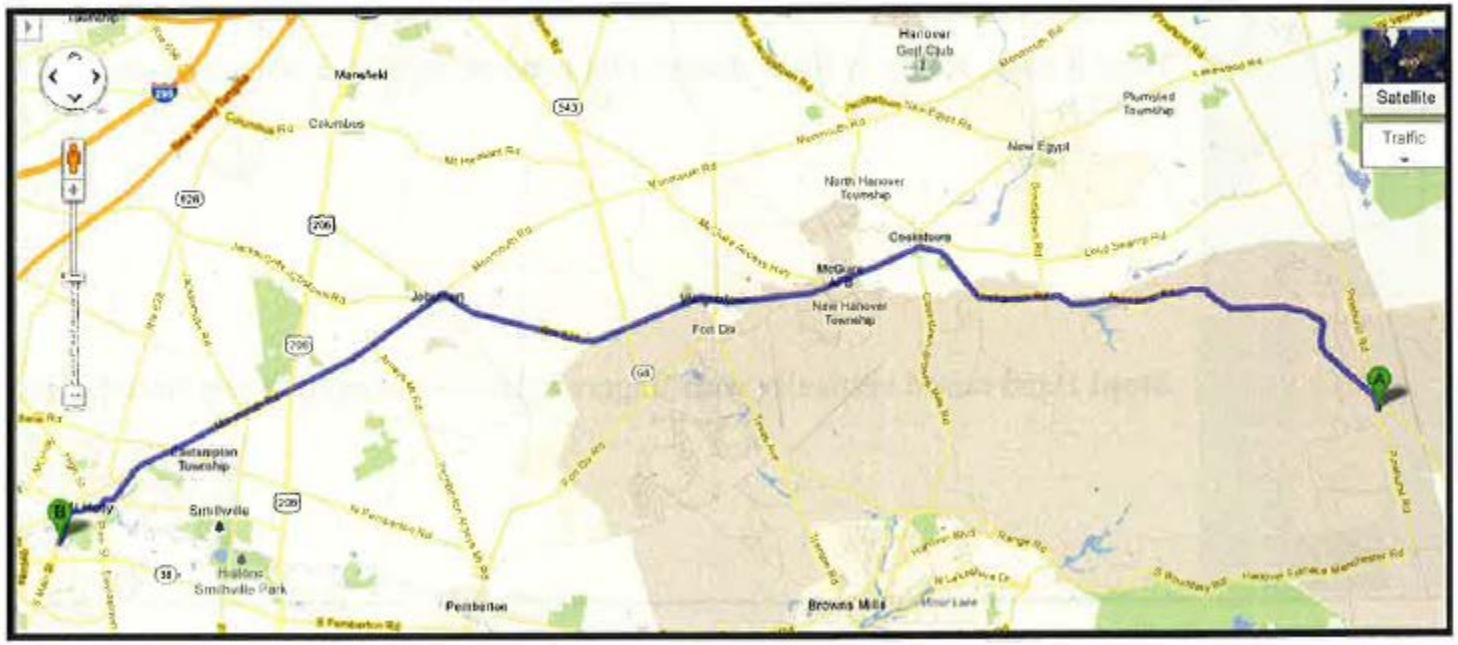
*ERH&S Manual

What to look for

- √ Site communications
  - √ Including alerting for emergencies*
- √ SOPs or safe work practices*
- √ Route to nearest hospital
  - √ Explained to crew
  - √ Posted
  - √ In each vehicle

*ERH&S Manual

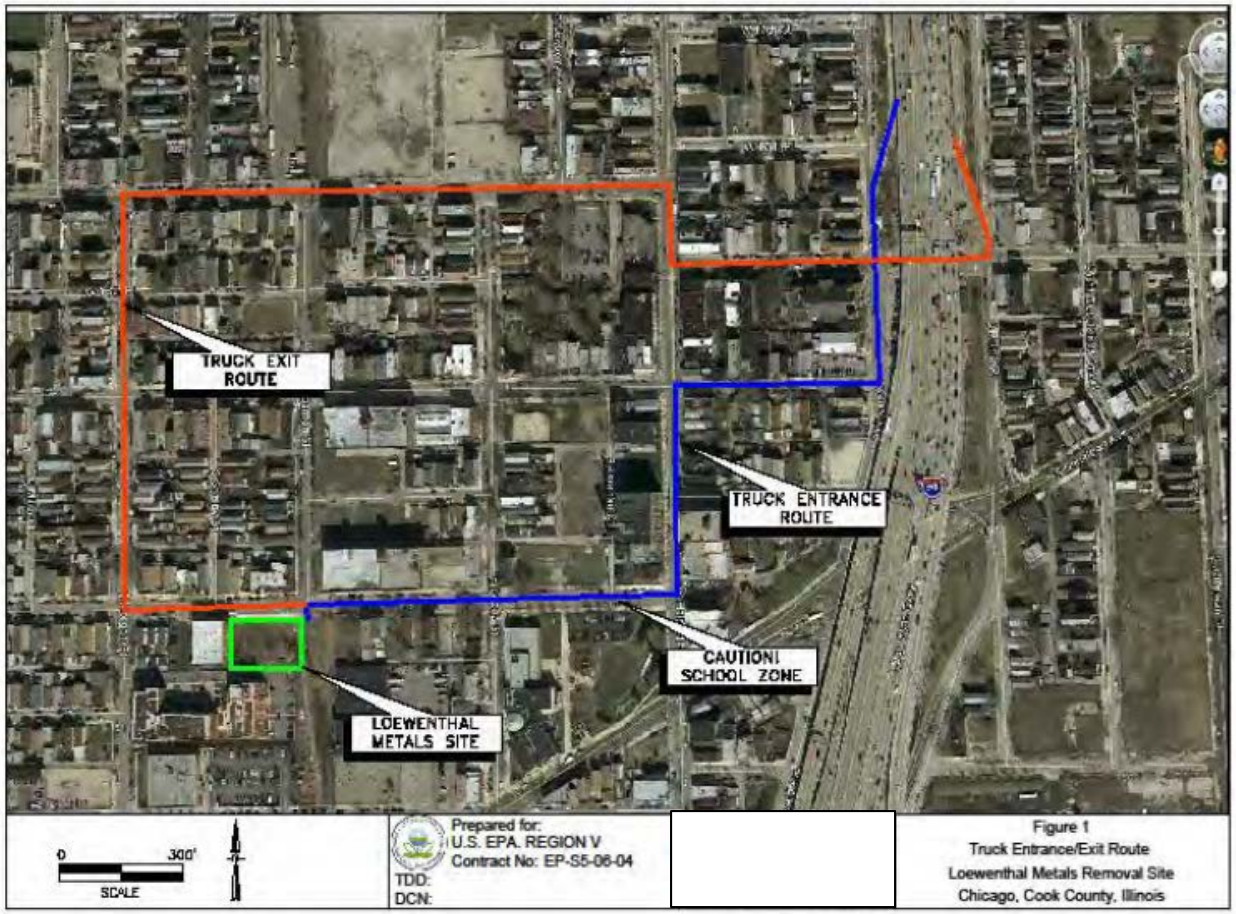
Virtua Memorial at Mount Holly

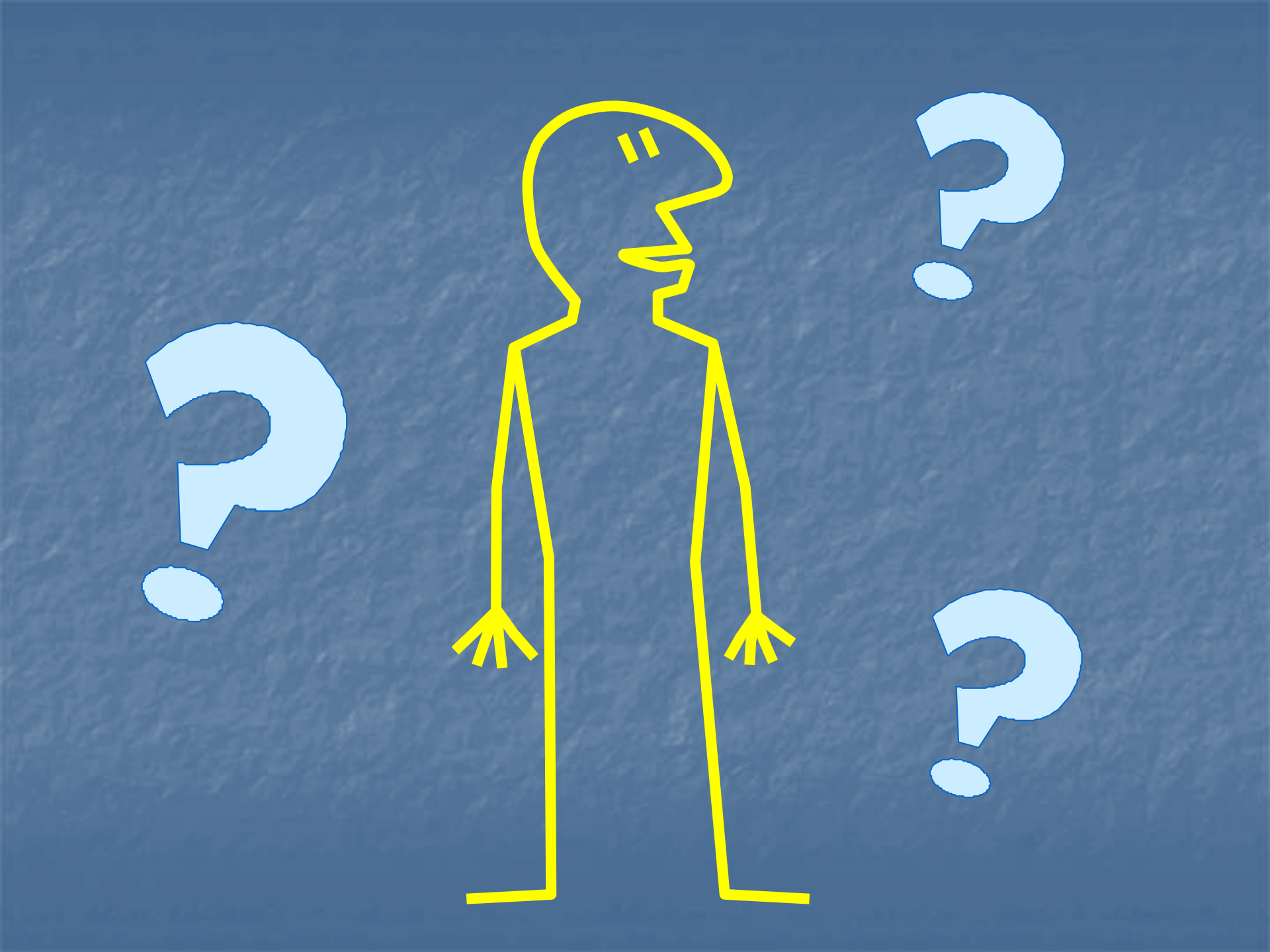


Directions to **Virtua Memorial Hospital** from the Combined Arm Collective Training Faiclity:

1. Turn LEFT onto Pinehurst Rd 4.0 mi (continue on Hockamic Rd .8mi)
2. Slight LEFT onto Cranberry Canners Rd 0.8 mi (continue on Hockamic Rd 2.4 mi)
3. Continue on what is now Cookstown-Wrightstown Rd.
4. Continue on what is now W Main St 0.2 mi
6. Take SLIGHT LEFT onto Rte 670/Saylors Pond Rd Continue to follow Saylors Pond Rd 4.0 mi
9. Turn LEFT onto County Rd 537 W/Monmouth Rd 5.6 mi
10. Slight RIGHT onto Mill St 0.4 mi
11. Continue onto Washington St 0.3 mi
12. Turn left onto Madison Ave, Destination will be on the left

Traffic Control Plan





The HASP Wheel

Decontamination

Checklist

Written Procedures?

- √ Communicated
- √ Minimize contact
- √ Procedure for personnel and equipment
- √ Safety Officer monitoring effectiveness
- √ Location, location, location

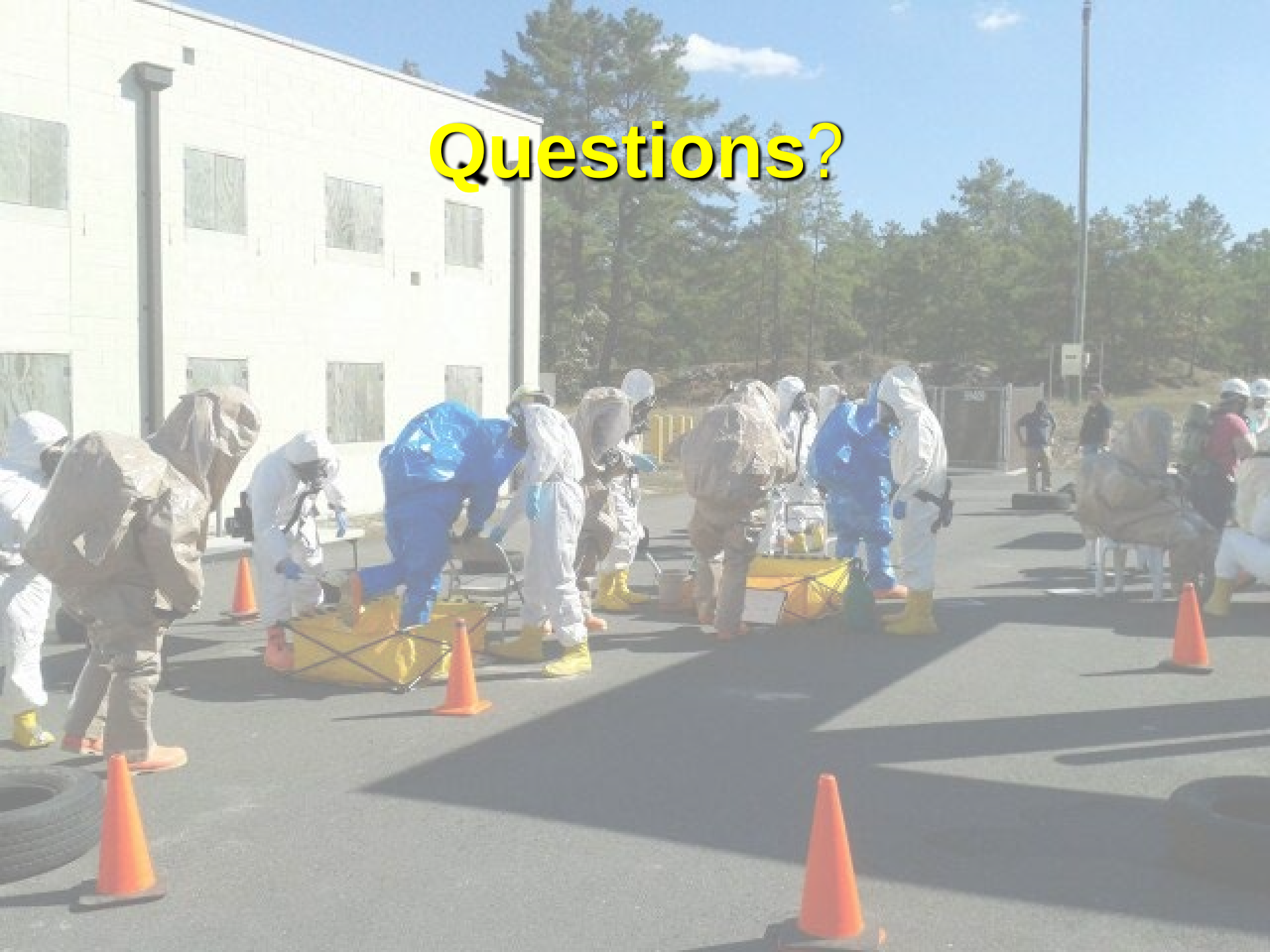
Checklist

Written Procedures?

- √ Decon equipment deconned
- √ PPE cleaned or tossed
- √ Immediate decon
- √ Authorized removal
- √ Commercial establishments informed
- √ Showers/change rooms meet regs

ERH&S Manual

- Procedures for heavy equipment
- Template: Minimum steps
- Example setups
  - Four agency document
  - PPE chapter of Manual


Questions?

The HASP Wheel

Emergency Response Plan

Emergency Response Plan

Types of emergencies

- Fire and explosion
- Chemical spills
- Personnel injuries in the EZ or CRZ
- Releases of toxic vapors
- Reactions of incompatible materials
- Collapse of structures
- Radiation discovery

Checklist

Is there an emergency response plan?

- Pre-emergency planning
- Personnel roles
- Lines of authority
- Training
- Communications

Checklist

- Emergency recognition and preventions
- Safe distances and refuge
- Site security and control
- Evacuation routes and procedures
- Decontamination
- Emergency medical and first aid

Checklist

- Emergency alerting
- Critique
- PPE and emergency equipment
- Site topography, layout and weather
- Reporting procedures

Checklist

- Separate section
- Integrated with other agencies
- Rehearsed
- Reviewed
- Alarm system (1910.165)
- Evaluation

Emergency Action Plan

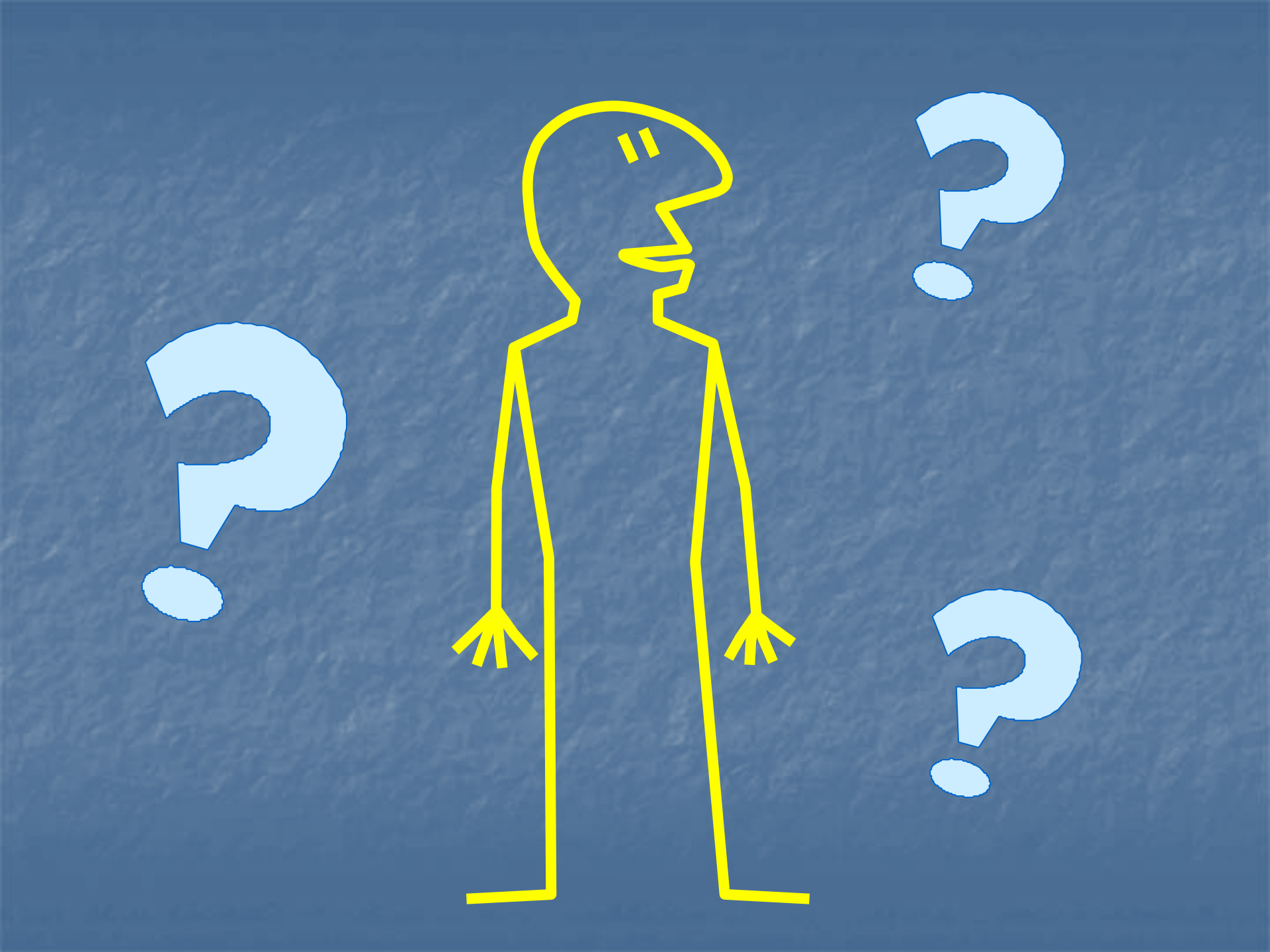
If employers

- evacuate their employees and
- do not permit them to assist

Then they are exempt from the requirements of this paragraph if they provide an emergency action plan

What to do

- Should I stay or should I go?
- On-site or off-site response?
- Off-site – do they know?
- Do ***you*** know what to do at a specific site?



The HASP Wheel

Confined Space Entry

Checklist

- Are there confined space entry procedures?
- Have any confined entry situations been identified?
  - Signage
  - In plan
- Are any of them a permit-required confined space (PRCS)?

Confined Space

- Characteristics
  - Large enough and configured for entry and work
  - Limited or restricted means for entry or exit
  - Not designed for continuous occupancy

Confined Space?

Is it a PRCS?

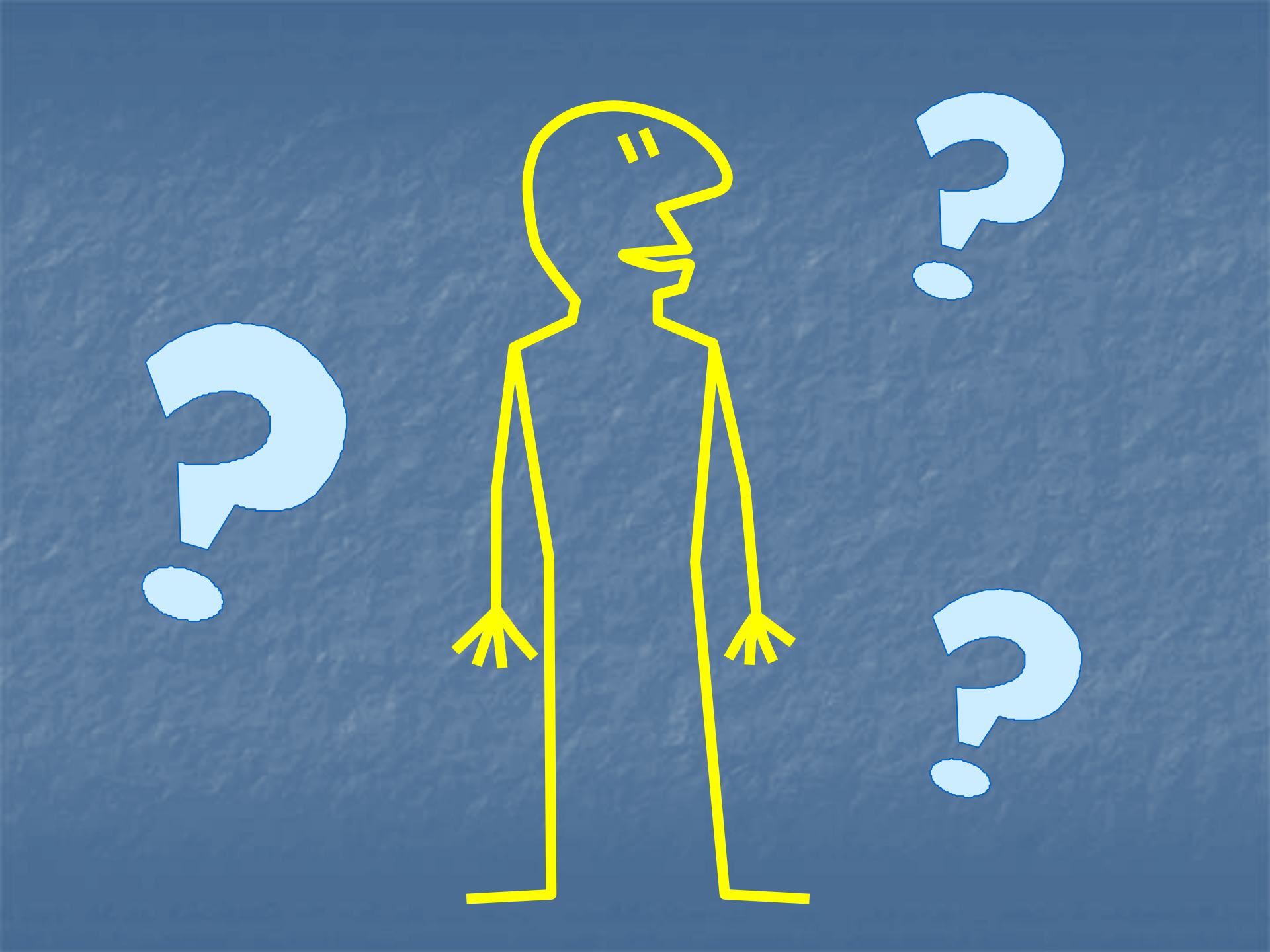
Resource

Version 1.0
(April 2014)

Emergency Responder Health and Safety Manual

Chapter 11

Confined Space Safety Program
(permit-required and non-permit spaces)



The HASP Wheel


Spill Containment
05/02/2008

Checklist

- Is there a spill containment program?

10.2 POTENTIAL SPILL AREAS

Potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, there are various areas vulnerable to this hazard including the areas used for central staging and decontamination activities. Additionally, areas designated for handling, loading, and unloading of potentially contaminated soils, waters, and debris present limited potential for leaks or spills. It is anticipated that all IDW generated as a result of this scope of work will be disposed of on-site.

10.3 PERSONNEL TRAINING AND SPILL PREVENTION

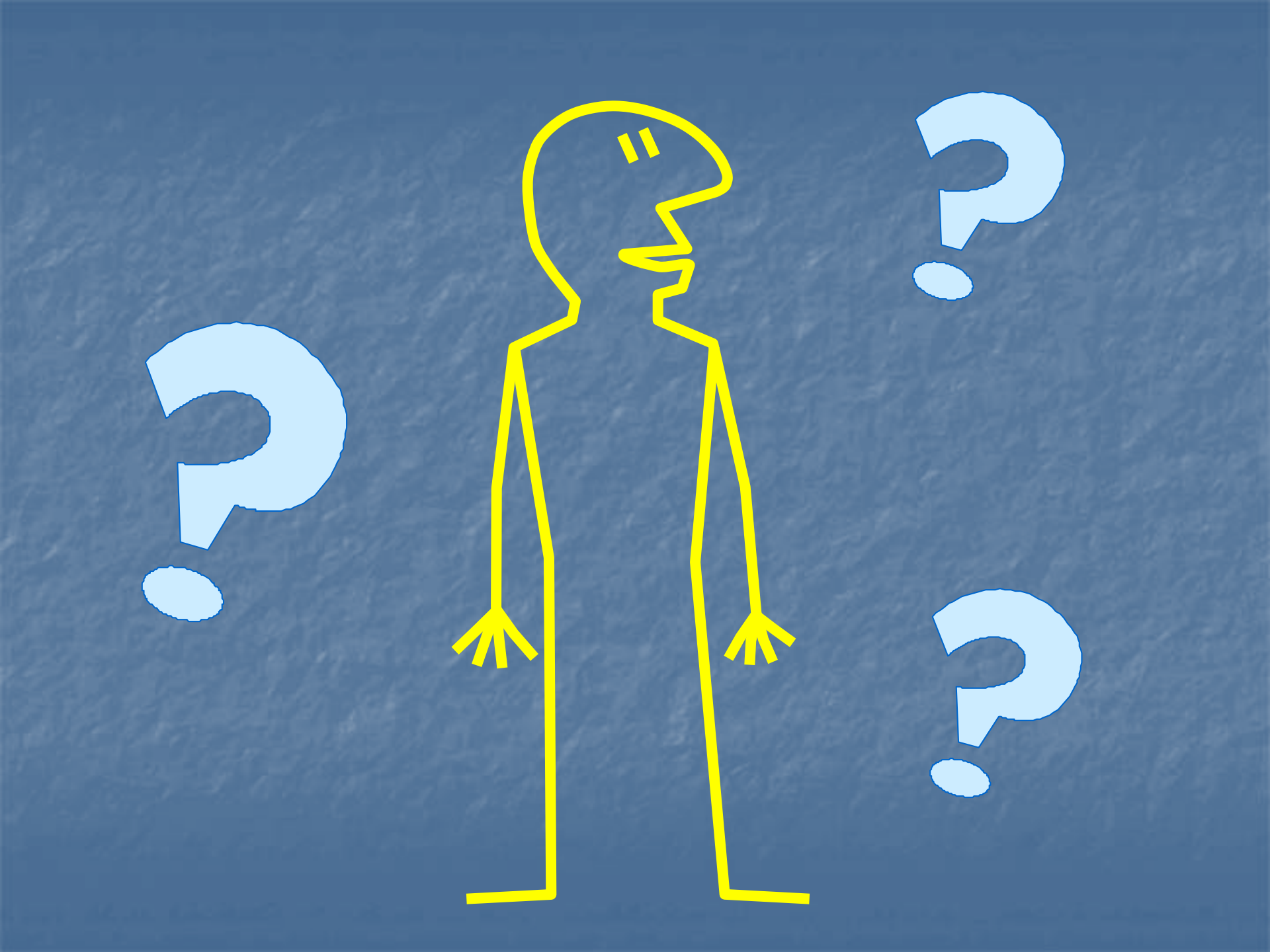
Personnel will be instructed in the procedures for incipient spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and the SSO will serve as the Spill Response Coordinators for this operation, should the need arise.

ERH&S Manual

- Address all likely spill scenarios
- Provide procedures to contain and isolate
- Prevention procedures
  - Store in appropriate containers.
  - Replace tops/lids
  - Store containers safe areas

ERH&S Manual

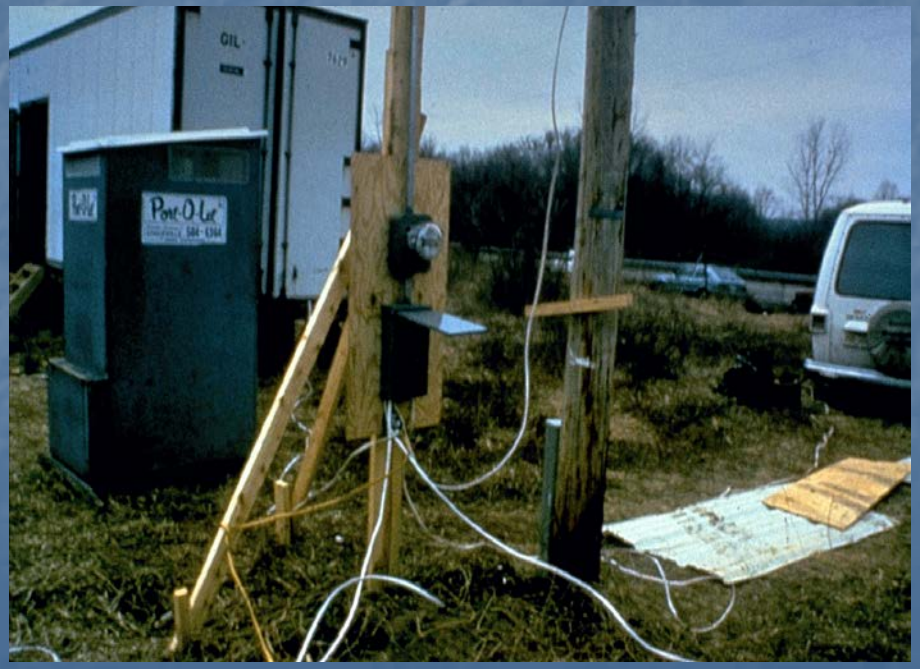
- Appropriate containment measures



The HASP Wheel

Checklist
Other Issues

- Sanitation
  - Potable/nonpotable water
  - Toilet facilities
  - Food handling
  - Temporary sleeping quarters
  - Washing facilities
  - Showers and change rooms



Checklist
Other Issues

- Local fire department contacted?
- Local hospital contacted?
- Should be addressed in emergency response plan

Checklist
Other Issues

- Compressed gas cylinders
  - Capped
  - Chained
  - Vertical
  - Transport

Checklist
Other Issues

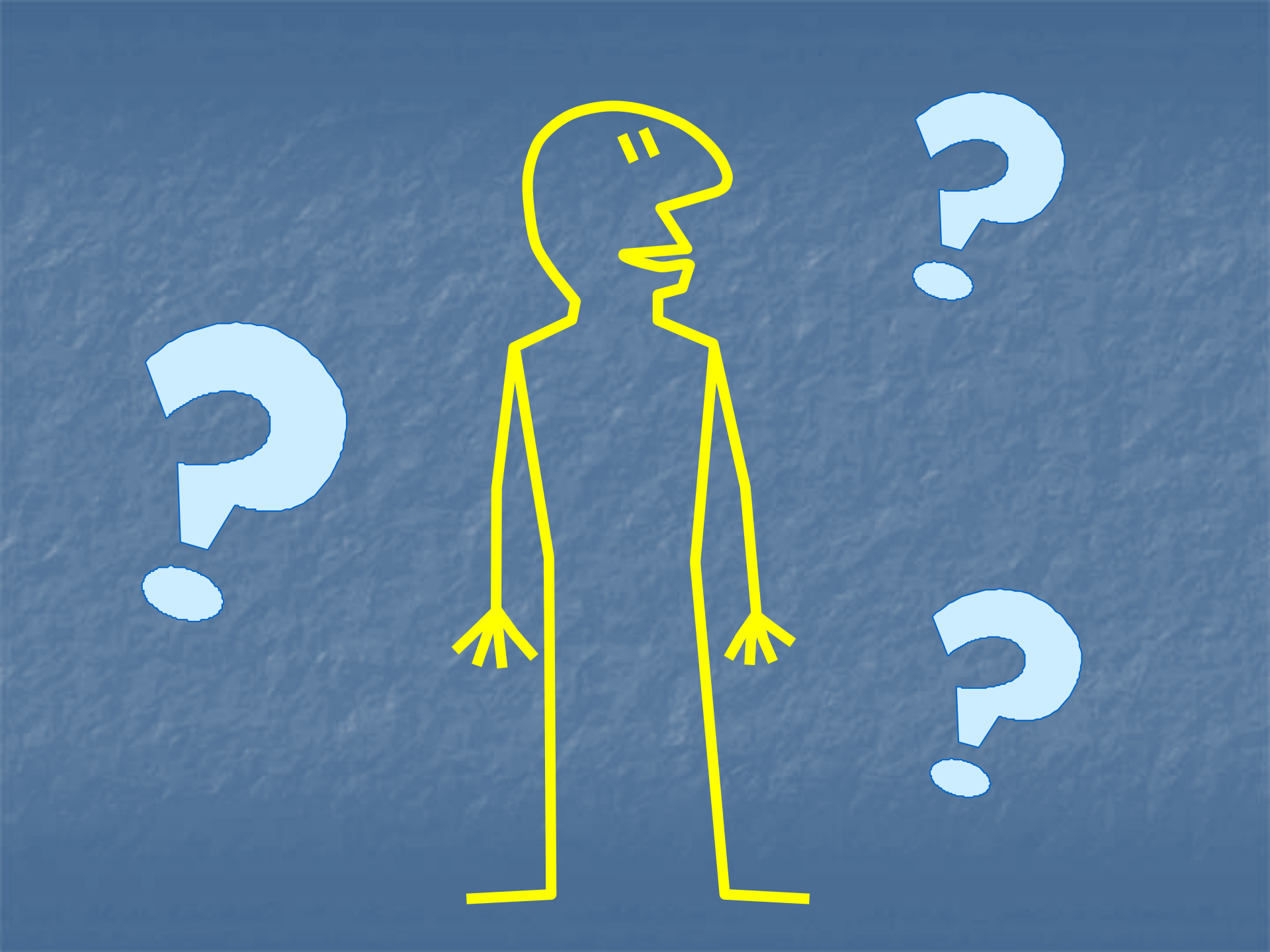
- Welding/torch cutting operations
  - Fire watch/Hot work permit procedure?
  - Compressed gases
  - Electrical shock

Checklist
Other Issues

- XRF on site?
  - Safety and security?
  - May contain a radioactive source
  - In “Monitoring” section
  - EPA: Check EOGs

Checklist
Other Issues

- Heat/cold stress
  - Action levels?
  - ERH&S
    - Heat: 70°F (PPE problem)
    - Cold: 61°F (monitor conditions)



Accident Investigations and Lessons Learned

Student Performance Objectives

1. List the goals of an accident investigation
2. List the steps in an accident investigation
3. Describe a root cause analysis
4. List employee and supervisor responsibilities for reporting an accident
5. Given an OSHA 300, determine site injuries
6. Give an example of a HASP deficiency

Accident Investigation

- Accident: An unplanned event that results in personal injury or property damage
- Near Miss: An event that could have resulted in a significant personal injury or property damage
- Incident: Term sometimes used to cover both situations

Goal

- Prevent the incident from occurring again
- Identify the root cause of the accident or incident
- Help identify deficiencies in Site Specific HASP

Steps

- Secure the accident scene
- Collect facts about what happened
- Develop the sequence of events
- Determine the causes
- Recommend improvements
- Write the report

The "Accident Weed"

Source: WA DOSH

Root Cause Analysis
Five Whys

- Keeping asking “What caused or allowed this condition/practice to occur?” until you get to root causes.

Root Cause Analysis

My car will not start. (the problem)

1) *Why?* - The battery is dead. (first why)
2) *Why?* - The alternator is not functioning. (second why)
3) *Why?* - The alternator belt has broken. (third why)
4) *Why?* - The alternator belt was well beyond its useful service life and has never been replaced. (fourth why)
5) *Why?* - I have not been maintaining my car according to the recommended service schedule. (fifth why and the root cause)

Root Cause Analysis

The radiation source container fell over. (the problem)

1) Why? -
2) Why? -
3) Why? -
4) Why? -
5) Why? -

Root Cause Analysis

Worker falls off ladder. (the problem)

1) Why? -

2) Why? -

3) Why? -

4) Why? -

5) Why? -

Employee Responsibilities

Employees must report to their supervisor every known or suspected job-related

- injury
- illness
- significant exposure
- hazardous work conditions
- motor vehicle accidents
- and near misses.

Employee Supervisor must:

- Establish reporting system
- Tell employees how to report
- Address the emergency
- Ensure an investigation is done
- Complete and submit an *OSHA & EPA 301* to the local SHEMP manager

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Note: You can type input into this form and save it. Because the forms in this recordkeeping package are "fillable/writable" PDF documents, you can type into the input form fields and then save your inputs using the free Adobe PDF Reader. In addition, the forms are programmed to auto-calculate as appropriate.

Attention: Thi employee health protects the con possible while th occupational saf

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form f each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Identify the person			Describe the case			Classify
(A) Case no.	(B) Employee's name	(C) Job title *(e.g., Welder)*	(D) Date of injury or onset of illness *(e.g., 2/10)*	(E) Where the event occurred *(e.g., Loading dock north end)*	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill *(e.g., Second degree burns on right forearm from acetylene torch)*	SELECT based on that case
						Death (G)
Reset 1	Worker 1	Technician	2 / 15 month / day	Work Trailer, ABC Site	Small cut on finger from knife	
Reset 2	Worker 2	Adm. Asst.	3 / 12 month / day	Soda machine	Fracture left arm from fall to floor	
Reset 3	Worker 3	Geologist	4 / 18 month / day	Woods, NW Site	Tick bite, right ankle	
Reset 4	Worker 4	Biologist	5 / 28 month / day	Woods, NW Site	Tick bite, left arm pit, Lyme Disease	
Reset 5	Worker 5	Env. Scientist	8 / 14 month / day	ABCSite	Back injury lifting empty cooler	
Reset 6	Worker 6	Env. Tech	8 / 16 month / day	NW quadrant, ABC Site	Tripped on wire, severely bruised left knee	
Reset 7	Worker 7	Biologist	9 / 14 month / day	NE River, west bank	Fell boarding boat, bruised ribs	
Reset 8	Worker 8	Env. Tech	10 / 12 month / day	Bldg 3 demolition	Cut knee from fall, required stitches	
Reset			/ month / day			
Reset			/ month / day			

Page totals ▶ 0

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Save Input | Add a Form Page

calculate as appropriate.

occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

that involves loss of consciousness, restricted work activity or job
k-related injuries and illnesses that are diagnosed by a physician or
of the specific recording criteria listed in 29 CFR Part 1904.8
nd Illness Incident Report (OSHA Form 301) or equivalent form for
OSHA office for help.

Form approved OMB no. 1218-0176

Establishment name _____

City Middle of State MA

(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	Classify the case: SELECT ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		(M) Select the "Injury" column or choose one type of illness:					
		Remained at Work										
	Death (G)	Days away from work (H)	Job transfer or restriction (I)	Other record-able cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
Small cut on finger from knife	○	○	○	○	____ days	____ days	○	○	○	○	○	○
Fracture left arm from fall to floor	○	●	○	○	14 days	____ days	●	○	○	○	○	○
Tick bite, right ankle	○	○	○	○	____ days	____ days	○	○	○	○	○	○
Tick bite, left arm pit, Lyme Disease	○	●	○	○	5 days	____ days	○	○	○	○	○	●
Back injury lifting empty cooler	○	○	●	○	____ days	2 days	●	○	○	○	○	○
Tripped on wire, severely bruised left knee	○	○	○	●	____ days	____ days	●	○	○	○	○	○
Fell boarding boat, bruised ribs	○	○	○	●	____ days	____ days	●	○	○	○	○	○
Cut knee from fall, required stitches	○	●	○	○	1 days	____ days	●	○	○	○	○	○
	○	○	○	○	____ days	____ days	○	○	○	○	○	○
	○	○	○	○	____ days	____ days	○	○	○	○	○	○
Page totals ▶	0	3	1	2	20	2	5	0	0	0	0	1
							Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)

Save Input | Add a Form Page

Page 1 of 1

OSHA “reportable" event

Within 8 hours after

- the death of any employee

Within 24 hours after

- the in-patient hospitalization of one or more employees
- amputation
- loss of an eye

the SHEMP manager or **supervisor** must report the fatality/multiple hospitalization incident by telephone or in person to the OSHA area office nearest the site of the incident.

Lessons Learned

- Health and Safety Plan (HASP) too large >200 pages
- HASP does not follow EPA Requirements
- Too many contractor “Corporate” safety policies
- References from other sites (wrong hazard concerns)

Lessons Learned

- Safety management not proactive, not elevating or tracking hazards
- Corrective actions not timely
- Contractor safety officers not communicating with each other

Lessons Learned

Transportation plans inadequate

- Traffic control not properly managed
- Vehicle accidents #1 safety hazard
- Coordinate site traffic flow with local community

OSHA Report

- S&H supervisors need authority
- SSHASP include all personnel
- Ongoing JHAs
- JHAs ➔ SOPs
- Need ERP elements

OSHA Report

- Site Control
- Monitor PPE, decon and housekeeping
- Implement formal self-audit
- Improve Process Safety Management
- Heat stress

Student Performance Objectives

1. List the goals of an accident investigation
2. List the steps in an accident investigation
3. Describe a root cause analysis
4. List employee and supervisor responsibilities for reporting an accident
5. Given an OSHA 300, determine site injuries
6. Give an example of a HASP deficiency