

D. T. MAYER
ST. CLAIR COUNTY CAER COORDINATOR
TELE: 618-286-3483

St. Clair County/Sauget, Illinois
Community Emergency Response Field Exercise Drill
11:00 AM - 1:00 PM, Friday, April 24, 1987

Draft #3

Distribution:

(Drill Participants/Groups)

ESDA:

(2 each)

Noel Groves
Bruce Hill, Jr.-E. St. Louis, *George Foster*
John Hainline, Jr.-Cahokia
Bill Schreiber-Swansea/County Coordinator *St. Clair County*
Lee Williams-Springfield/Sector B Coordinator *Terry Costello*

Sherr
Federal EPA, Region V: Jack Barnett-Chicago, Illinois

(2)

Tam Powell

Chemtrec:

(1)

Richard L. Stephens (Tele: 202-887-1255)
Supervisor Chemtrec Operations
Chemtrec/CMA
2501 M. Street, N. W.
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Village of Sauget:

(2 each)

Mayor Paul Sauget
Chief Pat Delaney
Ollie Reeves (Acting Fire Chief)

Handling radio dispatching

Ethyl Petroleum Additives, Inc.:

(2 each)

Sauget, IL 62206

274-4000
Dave Taylor
Richard Rutherford & Participants (10)
Bud Mason
Don Brown

Monsanto Company:

(2 each)

Jack Molloy
Roy Shaneberger
Bob Murphy
~~Mark Schannon, MCC Public Relations~~
Jim Pace & Participants (20)

out of town

Rogers Cartage:

(2 each)

J. D. Tolbird
Dave Kramp

Amax Zinc Company, Inc.:

(2 each)

Steve Mueller
Raymond A. Ehrhard

Alton & Southern RR/Union Pacific RR:

~~467-3332~~
Ken Moore, VP, A&S
Jim Miller & Participants (10)
Tim Hogan, UPRR Dir. PR

(Other CAER Members)

622-2232
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Cerro Copper Products Company:

P.O. Box 681

E. St. Louis, IL 62202

Paul Tandler (VP Mfg.)
Sandy Silverstein (Envir. Dir.)
(337-6000)

Phillips Pipeline Company:

Highway 3

Cahokia, IL 62206

Charles E. Jones (Plt. Mgr.)
(337-6066)

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Pfizer, Inc.:
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Roger E. Pader (Plt. Mgr.)
Jeff Carlton (Environmental Dir.)
(271-4700)

Chemtech Industries, Inc.:
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E. St. Louis, IL 62202

Al Williams (Plt. Mgr.)
(274-0755)
Michael H. Berg (Mgr. Safety-Envir.)
(314-966-9912)

General Chemical Co. (Formerly Allied)
2500 Kingshighway
E. St. Louis, IL 62201

Donald Smith (Plt. Mgr.)
(271-2430)

Slay Bulk Transportation
2001 South 7th
St. Louis, MO 63104

Gary Slay (President)

Illinois Central Gulf RR
1700 So. 20th St.
E. St. Louis, IL

Herman Watts (Supt.)
(271-6403)

Terminal RR
2016 Madison Avenue
Granite City, IL

Jim Beard (Pres.)
Charles Cross (VP)

(Others)

Midwest Rubber Reclaiming Co.:
3101 Mississippi Avenue
Sauget, IL 62201

Joe Bagarinao (Plt. Mgr.)
(337-6400)

Mobil Oil Company
2000 South 20th St.
Sauget, IL 62207

Ben E. Kemper
(231-3155)

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STLCOPCB4036382

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Amax, Ethyl Petroleum Additives, Inc., Monsanto and the Sauget, Illinois Police and Fire Department plan to have a Sauget Community Emergency Response Exercise Drill in Sauget, Illinois on Friday, April 24, 1987. Extensive details of the exercise are attached. We have identified a twelve-step implementation process covering the design, development, conduct and evaluation of the Sauget, Illinois exercise. This process is suitable for the complex exercise planned. This section describes each step and provides guidelines for the successful conduct of our exercise. A flow diagram for the implementation process follows the steps. The implementation steps are as follows:

1. Create a team with the experience and skills required to develop and conduct the exercise (Village of Sauget Officials, ESDA Countywide, District II State Police, Primary Truck Common Carriers, Major Largest Service Carrier Alton and Southern RR/Union Pacific RR, Region V Federal EPA).
2. Review plans and resources to ensure that the exercise design reflects actual emergency assignment and capabilities.

(This is a rehearsal for the "real-thing", testing procedures and training of industry and first responders during 1986 and is an evaluation to incorporate lessons learned into procedure.)
3. Establish specific objectives of the exercise. (Ref "Purpose of the Exercise and Follow-Up", "Objectives Background", "Exercise Objectives".)
4. Prepare a scenario narrative that sets the stage for the exercise. ("Scenario Narrative")
5. Prepare a list of events that will drive the exercise. (Simulator Master File)
6. Prepare messages that will be used to stimulate exercise play. (Simulator Messages/Time Schedule)
7. Develop a control plan that covers all administrative and implementation details of the exercise. (D. T. Mayer preparing with individual training for all roles and NAME TAG identity.)
8. Prepare a media information package to ensure successful media participation. (Andi Smith with assistance from Monsanto Corporation P.R..)
9. Conduct a pre-exercise briefing to enhance proper participation and control. (Ethyl's Taylor; Monsanto's Molloy; Jerry Costello or ESDA's Bill Schreiber; Village of Sauget; Mayor Sauget; District II State Police Paul Styger; EPA Region V (Title III Compliance) Jack Barnett-to all participants at Sauget Village Hall, 11:00 A.M. Wednesday, April 15, 1987. D. T. Mayer will assist with simulators and their roles. The EXERCISE PACKAGE will be distributed and highlights made on:

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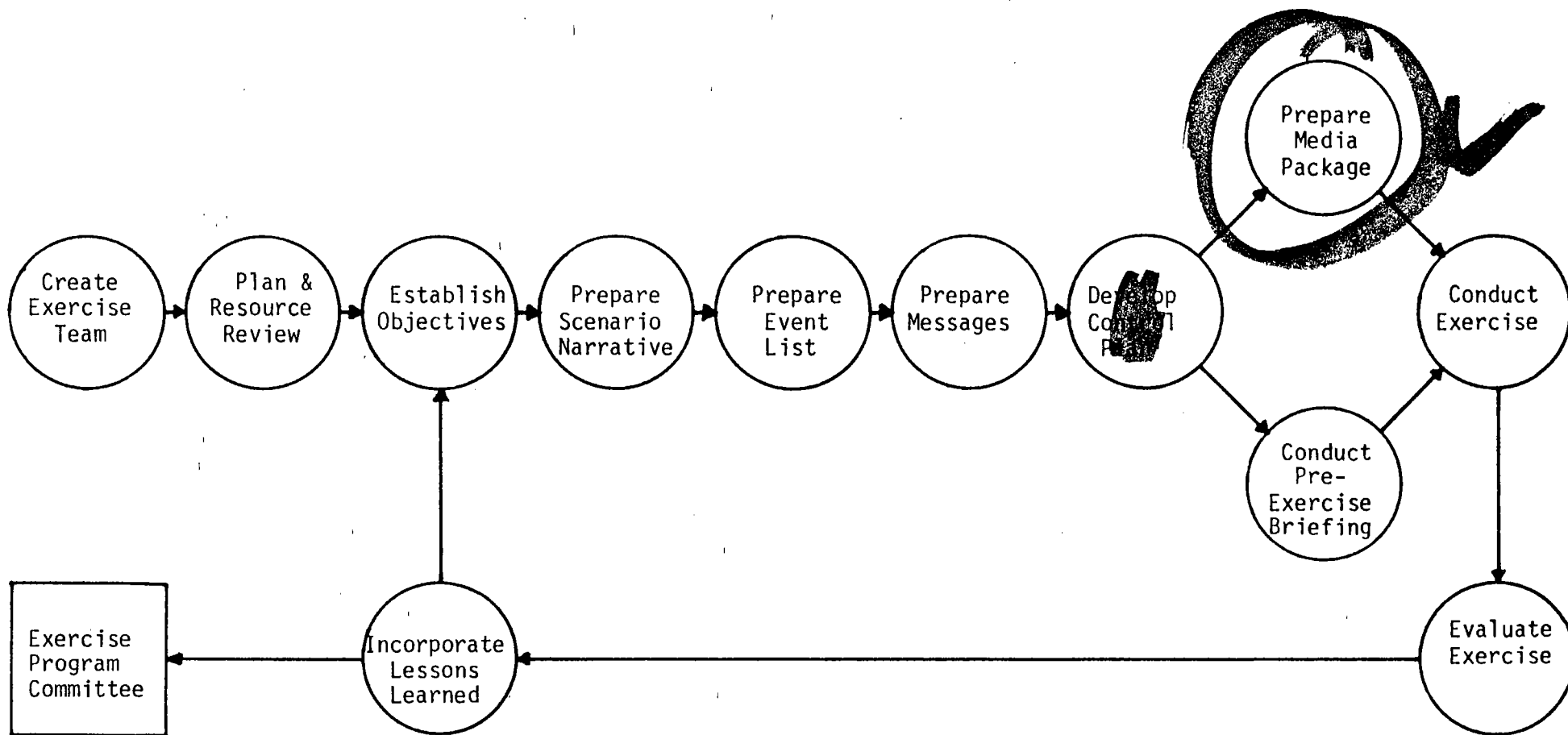
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"Plan and Resource Review"
"Purpose of the Exercise and Follow-up"
"Objective Background"
"Exercise Objectives"
"Safety Officer" (call off procedure)

Followed by formal acknowledgement of exercise date and time and any questions of participating organizations.

- [REDACTED]
10. Conduct the exercise according to the control plan and scenario materials. (April 24, 1987)
 11. Evaluate the exercise objectively, using pre-established evaluation criteria. (Four exercise evaluations to be completed during and after the exercise by participants.)
 12. Act on lessons learned by revising the plan and upgrading training, systems, equipment. (An Emergency Operation Simulation (EOS) planned for "weak link" Fall of 1987 or Spring, 1988.)

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EXERCISE IMPLEMENTATION STEPS

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DRILL SAFETY OFFICER

Roy Shaneberger, Personnel Superintendent, at Monsanto, Sauget, Illinois is designated as the Drill Safety Officer.

All participants must closely review this critical highlight.

From the onset of the exercise planning, safety must be our prime consideration and cannot be left to chance. To insure that safety problems are noted and eliminated, a SAFETY OFFICER has been designated. His primary responsibilities are to analyze the entire exercise from a safety perspective. Certain measures are being taken to help us ensure a safe exercise:

1. The Safety Officer has the highest field authority.
2. Safety is one of the key points in the exercise design activities.
3. Each exercise team member has the responsibility of examining the exercise for safety within his or her discipline.
4. Identify all possible safety problems or hazards and resolve each.
5. The Safety Officer will address safety during the pre-exercise briefing on April 15, 1987 at the Sauget Village Hall.
6. Include "Safety Factors" commentary in your exercise evaluation questionnaire.
7. Examine each field location before the exercise to guarantee that safety precautions have been taken.
8. The Safety Officer has the authority to terminate the exercise if a problem arises OR an actual emergency occurs. He will wear a RED HAT.

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Sauget, Illinois Community Emergency Response Field Exercise Drill

Date: 11:00 A.M. - 1:00 P.M. Friday, April 24, 1987

Location: A&S spur to Monsanto Hold Tracks and Route #3 Crossing

Principals: Rogers Cartage Trucking, A&S RR, Ethyl Petroleum Additives, Inc., Monsanto Company, Cahokia-East St. Louis-St. Clair County ESDA, Chemtrec, Sauget Village and Police Fire Departments, East-West Gateway Communications Bus.

Team Members: 1. Evaluators-The evaluators are to be familiar with plans, procedures, and resources and must be able to identify "strengths" and "weaknesses" in the emergency response during the field exercise.

(26)

*Director of All
Observers

Team (A) Tom Buell
Jack Barnett and Party (2)/Federal Region V (Chicago) EPA (312-353-2212). Mr. Barnett has been assigned to implement Illinois requirements of "Title III of the Superfund Amendments and Reauthorization Act of 1986. Title III requires that Governor's set up state planning commissions by April 17, 1987; state planning commission's establishing planning districts by July 17, 1987; appoint local planning committees by August 17, 1987. In Illinois, Governor Thompson has assigned this Federal requirement to Illinois ESDA Director C. Jones. As such, ESDA is primary to its implementation.

(B) Lee Williams-ESDA District 8 Coordinator (includes St. Clair County).

(C) Bill Schreiber-ESDA St. Clair Countywide Coordinator.

*(D) Raymond Ehrhard, P.E.-Amax Zinc Company, Inc. Environmental Engineer.

(E) Joe Calloway - Dupo, Ill. Union Pacific RR Superintendent.

(F) Gary Slay-Slay Bulk Transportation V. P.

2. Simulators - The simulators stimulate the exercise play by entering messages (concise, single-action messages), encouraging free play activities, and acting as victims).

Team (A) Jim Miller A&S RR Safety Director.

(9) (B) Dan Simmons A&S RR Captain of Police.

(C) Charles Patterson Monsanto Traffic Supvr.

(D) Jim Pace Monsanto Company Safety Supvr.

(E) Dennis Range Monsanto Company Safety Specialist.

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- (F) Pat Delaney Sauget Village Police Chief.
- (G) J. D. Tolbird Roger's Cartage Manager.
- (H) Ollie Reeves Sauget Village (Acting) Fire Chief.
- (I) John Hainline Cahokia, Illinois ESDA.
- (J) [REDACTED] Monsanto P.R./News Media.
- (K) Mike Bonaventure-Ethyl Environmental Supv.
- (L) Dan Braun-Ethyl Public Relations
- (M) Tim Hogan-Union Pacific RR Director of Public Relations

- (3) Observers-Record what occurs giving exact attention to detail.

- Team (A) Bob Murphy Monsanto Co. Supt. of Safety
- (7) (B) Tim Hogan-Union Pacific RR Public Relations
- (C) [REDACTED] Monsanto Co. Public Relations
- (D) John Boehm-Monsanto Co. to observe "Control Center"
- (E) Bud Mason-Ethyl Petroleum Additives, Inc. at Ethyl plant to observe "Control Center"
- (F) Paul Sauget-Mayor of Village of Sauget per Field Observation
- (G) Bruce Hill-E. St. Louis Fire Chief & ESDA) Coord. George Foster at office
- (H) Dave Volkman-Amax Safety Director Incident Scene

- (4) Controller-Regulates the pace of drill by permitting free play and determining exactly when to introduce specific events. Maintains overall direction of operation.

Team D. T. Mayer-St. Clair Cty CAER Coordinator
(1)

- (5) Safety Officer-Safety of the exercise must be a prime consideration and not left to chance. To ensure that safety problems are noted and eliminated, a Safety Officer is designated to provide safety perspective. He has authority to terminate the exercise.

- (1) Team-Roy Shaneberger

Plan and Resource Review: (To be completed by all "Simulators")

- (1) What actions are required in the plan?

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2. Who is to perform those actions?

3. What equipment and materials are needed?

4. What standards of performance are appropriate?

(i.e. time lapse/Chemtrec response, safety of first responders, public safety, mitigation techniques, environmental concerns, responsibility and liability, resource availability, technical advisory, etc.)

Your Name _____

Your Company or Agency _____

Your Drill Function _____

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Purpose of the Exercise and Follow Up

The April 24, 1987 Field Exercise is the beginning of an ongoing exercise program. It is to be followed (at some subsequent date, i.e. approx. 1 year) by an Emergency Operation Simulation (EOS), a full scale emergency simulation that uses various forms of message-traffic (telephones, radios, forms, procedure, etc.) to create a realistic, high pressure, emergency situation. The EOS exercise stimulates decision-making and interaction by EMERGENCY MANAGERS (only) in response to simulated emergency conditions. It differs from a Field Exercise in that it is conducted in an Emergency Operating Center with the controlled environment of the facility used and is specific to training that function. Field Exercises are to be alternated with the EOS contingent on critique/follow up. The St. Clair County Exercise Program will:

1. Help evaluate emergency plans and response capability.
2. Provide feedback necessary to improve plans and procedures.
3. Provide training for participants.
4. Improve coordination and relationships between industry, public officials, first responders and agencies.
5. Ensure continued involvement of key community organizations such as ESDA.
6. Provide a means to inform and involve the public and media.
7. Serve as a visible demonstration of industry and community commitment to protect the public.

Background

During 1986, Ethyl Petroleum Additives, Inc., Monsanto Company and St. Clair County ESDA representatives spearheaded establishing a Community Awareness and Emergency Response (CAER) program. Community specific procedures were drafted for St. Clair Countywide and Sauget, Illinois. Industry members currently include Amax Zinc Company, Inc. (Sauget), Cerro Copper Products Company (Sauget), Chemtech Industries (Alorton), Ethyl Petroleum Additives (Sauget), Pfizer, Inc. (East St. Louis), General Chemical/formerly Allied (Fairmount City), Monsanto Company (Sauget), Phillips Pipeline Company (Cahokia), Railroads and Truckers. An emergency exercise program is an essential part of the CAER effort. It completes the cycle of community and industry representatives forming a community coordination group to manage emergencies. All emergency plans are integrated into the community emergency response plan. The Chemical Safety Contingency Plans are now on file at ESDA Centers and Fire Departments. The East St. Louis Fire Department Engine Houses (5), Sauget Illinois Fire and Police Departments, Cahokia and Camp Jackson Fire Departments have received training (October-November, 1986) in:

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First Responders (VCR)
Chemtrec/Chemnet
CAER/CEPP/CSCP (CFR Title 49/172.101)
DOT 5800.1-5800.2-5800.3

This was intended to establish knowledge of resources, state and federal law requirements, enforcement, response guides and roles of "First Responders" and industry. The exercise objectives are intended to define the significant actions expected of the participants.

Exercise Objective

To determine use of Communications Systems and notification procedures in response to on-site emergency conditions.

- (A) Monsanto and Ethyl Emergency Control Centers activation time and effectiveness.
- (B) ESDA response time and effectiveness.
- (C) "East-West Gateway Communication Bus" response time and availability.
- (D) Meet (Monsanto) and Ethyl Field Team response time and effectiveness.
- (E) Chemtrec response time.
- (F) Sauget Village Police and Fire Departments response time and role assumed.
- (G) A&S RR knowledge of resources and response mode.

To test activation and deployment procedures for the on-site emergency response team.

- (A) Rogers Cartage
- (B) A&S RR
- (C) Merit (Monsanto)
- (D) Ethyl

To demonstrate accident scene coordination between the on-site emergency response team and the Sauget Village Fire and Police Departments.

- (A) ESDA (evacuation judgements)
- (B) Merit (Monsanto)
- (C) Ethyl
- (D) Sauget Fire and Police

To demonstrate activation procedures for the Sauget-Industry Emergency Operation Centers.

- (A) A&S RR
- (B) Merit (Monsanto)
- (C) Ethyl

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Scenario Narrative

Sauget, Illinois is occupied by industrial facilities of Air Products, Amax Zinc Company, Inc., Cerro Copper, Ethyl Petroleum Additives, Inc., Monsanto Company, Mineweld, Inc. (nitrogen/hydrogen) and Midwest Rubber. These operations are serviced by several railroads with major volume by A&S RR, Terminal RR, Illinois Central Gulf RR (Ethyl only) and two bulk common carriers, Rogers Cartage and Slay Bulk Transportation. Sauget, Illinois has its own police and fire departments. The industrial park is bordered on the West and North by populated areas of medium density/Sauget Village and Rush City. Farther to the South (approx. 2 miles) is the fringe of a high density suburban area and the City of Cahokia. The City of St. Louis, Missouri is 2½ miles due West, separated by the Mississippi River.

At 11:00 A., while the "switch crew" of the A&S RR are withdrawing loaded tank cars on the A&S spur to the Monsanto Hold Track at Route 3 intersection, they collide with a Rogers Cartage tank trailer releasing an undetermined volume of a flammable (and toxic) liquid from the trailer (destined for Ethyl) and a drip-puncture in the colliding tankcar containing an "oxidizer". The truck driver is trapped in his cab. The switch engine is intact but has other tankcars of hazardous materials (hydrochloric acid solution) coupled to the "oxidizer tankcar". The A&S switch crew notifies Superintendent, Floyd Cooper, who notifies Rogers Cartage, Sauget Police and Fire Departments and dispatches an A&S officer to the incident site. "Noon traffic" has increased by now and several cars are stopping, out of curiosity. Sauget Police/Fire notify Chemtrec. Chemtrec reports to Ethyl and Monsanto Emergency Response Coordinators. The Sauget Police Car and Sauget Fire Engine both arrive at the incident site simultaneously. They radio to Cahokia and East St. Louis ESDA who are placed on "Alert". Ethyl and Monsanto activate their Emergency Control Centers. Ethyl and Monsanto Merit teams, ESDA (Cahokia), A&S RR Safety Director, Rogers Cartage, Police and the Fire Department are dispatched to the site; Mayor Sauget is advised.

The Ethyl and Monsanto Merit (advisory) response team Captains recognize the severity of the situation, establish communication links with their control centers. The potential for an emission exists with possible threat to the municipality of St. Louis, Missouri since wind is in a Northwesterly direction. The East-West Gateway Communication Bus is requested for location standby. ESDA (Cahokia) confers with East St. Louis ESDA and District II State Police (Paul Styger) on need/alert for evacuation. A decision to reroute traffic and isolate the incident is pending. The Monsanto foam truck is requested for standby. Decisions are critical on protective clothing and equipment. Traffic has now become congested and the First Responders are waiting for directions.

Event List

Critical points to stimulate key response actions by simulators. The following "KEYS" are to be separated into single handouts in the sequence listed. Simulators will have name tags and "Simulator" identity.

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USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

STLCOPCB4036392

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MASTER LIST OF MAJOR EVENTS

(1) Time: 11:00 AM 4/24/87

To: A&S Switch Crew

From: Jim Miller (A&S)

Message: "This is a drill. You have collided with a "flammable liquid" tanktrailer. The oxidizer car is leaking. None of your crew is injured. The truck driver is trapped in the tractor, unconscious and bleeding at the head. The trailer is leaking a "pencil" stream. Tractor is still running."

Action: Your safety is of primary concern and can be assured only if you do not expose yourself and crew to a suspected hazard. Duties do NOT include use of protective equipment by train and engine crews.

1. Back train away from leaking trailer (upwind) to a safe distance ($\frac{1}{2}$ mile) to avoid mixing products and providing a safe distance for crew.
2. Make notification by radio A&S Superintendent, stating exact location, status of train, repeating transmission twice.
3. Identify problem if you can/hazard class of materials and name of trunktrailer company/Rogers Cartage.

(2) Time: 11:00 AM 4/24/87

To: Rogers Cartage Truckdriver

From: J. D. Tolbird (Terminal Mgr.)

Message: "This is a drill. You have just collided with the A&S switch engine and railcars and are unconscious (head on steering wheel, bleeding). Remain in tractor with motor running until you are rescued OR YOUR SIMULATOR ADVISES OTHERWISE."

Action:

1. Stay slumped over wheel (blood on forehead simulated) until rescued by Braun Colonial Ambulance Service and "Rescue Team".

DRIVER AND SIMULATOR

UNDERSTAND THE SIGNIFICANCE OF PLACARDS.

UNDERSTAND COMMODITIES HAVE PRIMARY HAZARD CLASSES BUT MAY ALSO HAVE SECONDARY HAZARDS, I.E. HEXANE IS A VOLATILE FLAMMABLE LIQUID PER HAZARD CLASS BUT ALSO MAY CONTAIN SOME AMOUNT OF TOXIC BENZENE. (FLASH POINT: -7°F, close cup)

DO NOT ACT BEFORE PROBLEM/POTENTIAL IS ANALYZED. THIS REQUIRES OTHER RESOURCES. WAIT FOR INDUSTRY ADVISORY.

DSW 136430

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

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- (2) Time: 11:08 AM 4/24/87
To: A&S Superintendent Floyd Cooper
From: Dan Simmons (A&S)
Message: "This is a drill. Train crew has radio-reported incident to you, identifying tankcar contents (Nitric Acid/Oxidizer leaking, Xylene intact). You are aware of tanktrailer leaking but do not know it's contents or consignee. Trailer is identified as a Roger's Cartage vehicle."

Action:

1. Confirm crews position ($\frac{1}{2}$ mile from collision site).
2. Advise Rogers Cartage (Dave Cramp).
3. Advise Sauget Police and Fire Department (one call).
4. Dispatch A&S officer to incident site.
5. Wait for report back.

- (3) Time: 11:20 AM 4/24/87
To: Sauget Police and Fire Departments
From: Pat Delaney (Chief of Police)
Message: "This is a drill. A&S Trainmaster Floyd Cooper has telephoned you of an "accident" on Route 3 at the A&S spur (between Cerro Copper and Monsanto), involving hazardous materials and an apparently injured driver in a Rogers Cartage tractor trailer."

Action:

1. Respond to site immediately (patrol car).
2. Move and keep people away from incident scene.
3. Report to Chemtrec (800) 424-9300 name (yours) and call-back number number location of incident and that they should notify Ethyl Petroleum Additives and Monsanto Company of the need to respond for assistance.
4. Wait for advisory from Ethyl and Monsanto Company response teams.

USE THE DOT 5800.3 ERG TO IDENTIFY PROBLEM.

DO NOT WALK INTO OR TOUCH ANY SPILLED MATERIAL.

AVOID BREATHING FUMES, SMOKE AND VAPORS EVEN IF NO HAZARDOUS MATERIALS ARE SUSPECTED.

DO NOT ASSUME GASES OR VAPORS ARE HARMLESS BECAUSE OF LACK OF SMELL.

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(Monsanto Company)

(4) Time: 11:45 4/24/87
To: Dan Middleton Merit Coordinator/Monsanto
From: Dennis Range
Message: (Relate to Middleton as soon as he hangs up from Chemtrec; if he activates the Emergency Control Center, follow him.)

"This is a drill. Chemtrec has just reported a potentially serious incident on Route 3, A&S spur to Monsanto Hold Tracks. The first-responders are standing by for your advisory and/or team response. You need to make decisions on activating the Emergency Control Center and a team response. The News media and Cahokia ESDA are at the incident site."

Action:

1. Activate Control Center.
2. Dispatch a response team (4).
3. Establish a communication link.
4. Formulate mitigation plan, subjectively.
5. Close the loop with Chemtrec.
6. Rescue plan for injured Roger's driver (Braun Colonial Ambulance Service/Tele. 332-6793). Who is coordinating? Is Roger's Cartage representative acting on this critical need without "exposure clearance"?

Has problem been identified/hazardous substances involved, injuries determined, resources needed, officials notified? What is your mitigation plan? Response time? Are all the proper agencies notified? Precede any and all communications with "This is a drill.....".

DSW 136432

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

STLCOPCB4036395

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(Ethyl Petroleum Additives, Inc.)

(5) Time: 11:45 4/24/87

To: Bud Mason (Primary Chemtrec Contact)

From: Mike Bonaventure

Message: (Relate to Mason as soon as he hangs-up from Chemtrec; if he activates the Emergency Control Center, follow him.) "This is a drill. Chemtrec has just reported a potentially serious incident on Route 3, A&S spur to Monsanto Hold Tracks. The first responders are standing-by for your advisory and/or team response. You need to make decisions on activating the Emergency Control Center and a team response. The News Media and Cahokia ESDA are at the incident site."

Action:

1. Activate Control Center.
2. Dispatch a response team (4).
3. Establish a communication link.
4. Formulate mitigation plan, subjectively.
5. Close the loop with Chemtrec.
6. Rescue plan for injured Roger's Cartage Driver (Braun Colonial Ambulance Service/Tele: 332-6793). Who is coordinating? Is Rogers Cartage representative acting on this critical need without "exposure clearance".

Has problem been identified/hazardous substances involved, injuries determined, resources needed. Officials notified? What is your mitigation plan? Response time? Are all the proper agencies notified? Precede any and all communications with "This is a drill.....".

(6) Time: 11:45 AM 4/24/87

To: Police and fire crew at incident site

From: Ollie Reeves-Jim Pace (Pass out copies to each man).

Message: "This is a drill." You have arrived at the incident site. Driver is unconscious and trapped in his tractor. Trailer tank is leaking a pencil stream. Train crew is not injured and have backed away a safe distance to avoid exposure. You are aware that both train and truck commodities are HAZARDOUS MATERIALS."

Actions:

REMEMBER YOUR CAER "FIRST RESPONDERS" TRAINING. USE YOUR SAUGET EMERGENCY RESPONSE PLAN AND DOT 5800.3 ERG, VISIBLY.

- important*
1. APPROACH CAUTIOUSLY

Do not rush in! You cannot help other until you know what you're getting into. Look for the cues of hazardous materials.

YOUR
GUIDE
TO
SURVIVAL

DSW 136433

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

D. T. MAYER
ST. CLAIR COUNTY CAER COORDINATOR
TELE: 618-286-3483

2. IDENTIFY HAZARDS

Placards, container labels, shipping papers and or knowledgeable persons (Industry-ESDA on the scene are your PRIMARY SOURCES OF INFORMATION. USE THEM AND YOUR DOT 5800.3 EMERGENCY RESPONSE GUIDEBOOK (VISIBLY).

3. SECURE SITE

STAY UPWIND UNLESS YOU HAVE SELF-CONTAINED BREATHING APPARATUS (SCBA) WITH FULL FACE SHIELD. DO WHAT YOU CAN TO ISOLATE THE SITE TO ASSURE THE SAFETY OF PERSONS AND THE ENVIRONMENT. DO NOT ATTEMPT TO RESCUE THE DRIVER AT THIS TIME.

4. OBTAIN HELP

Your Sauget Dispatcher has telephoned Chemtrec (800-424-9300). Monsanto, Ethyl and ESDA are on the way.

5. SITE ENTRY

DO NOT become part of the problem. Confirm protective clothing and equipment, FIRST.

(7) Time: 12:00 Noon, 4/24/87

To: ESDA Group

From: John Hainline, Jr.

Message: "This is a drill. Monsanto and Ethyl Emergency Response teams have just arrived. Police are directing traffic around tank trailer (upwind). Train crew has moved their locomotive and cars ½ mile to the West, on the A&S spur and are at or around the locomotive. You have just confirmed the trailer (Hexane) is leaking and the "oxidizer car" (Nitric Acid) is dripping. Other cars, Hydrochloric Acid solution and Xylene appear to be intact. You are concerned about:

(A) Closing Route 3-rerouting traffic thru Sauget to secure site and protect the public.

(B) Train Crew Safety-wind could shift exposing crew.

(C) Potential Evacuation-Alerting Illinois District II State Police (Styger) for evacuation assistance. Alerting E. St. Louis ESDA (Rush City/Bruce Hill). Notify East-West Gateway Council for communication van standby.

Action:

1. Immediately confer with Ethyl and Monsanto Emergency Response Team Captains to:

IDENTIFY PROBLEM
MITIGATION PLAN
CONCLUDE ON POTENTIAL/STANDBY

DSW 136434

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

STLCOPCB4036397

D. T. MAYER
ST. CLAIR COUNTY CAER COORDINATOR
TELE: 618-286-3483

- Alert immediate community to stay indoors until all clear is given. Utilize police "speaker vehicle". On any announcement precede message with "This is a drill. Stay in your house, keep doors and windows shut, etc.."

(8) Time: 12:00 Noon, 4/24/87

To: News Media/Reporters

From: Andi Smith/Monsanto; Dan Braun/Ethyl; Tim Hogan VP PR

Message: "This is a drill." Dan Middleton, Monsanto Merit Coordinator has directed you to proceed to the A&S spur/Route 3 intersection with the response team to act at P.R. to new media. YOU HAVE JUST ARRIVED AT THE SITE. Several reporters and a tv van have just arrived. They are clamoring for a story. It starts with "Why is everyone standing around doing nothing? Isn't truck driver hurt? No one is helping him! Are these chemicals dangerous?"

Action:

- You recognize that an accident is legitimate news. Your goal is simplicity. Remember that the carrier's representative (Rogers and A&S) have the primary responsibility for providing information. You represent "product experts"; answer relevant questions about the name, hazard and characteristics or the material involved. Use analogies, where appropriate, such as (HEXANE) "a gasoline type compound" to make it understandable. NEVER SPECULATE ON POTENTIAL OR PLACE BLAME.
- Explain your role as clearly as possible, telling WHO you represent.
- Request their patience and tell only what you already know.
- Tell them you will provide a "story" in just a few minutes.
- Act as though you enjoy it, whether you do or not!
- Get story!
- Report story, control the interview. Be intensive, be excited, be honest. Preplanning: A full field exercise is an excellent opportunity to gain media and public support and understanding for the St. Clair County CAER Program. Even more importantly, it is an opportunity to emphasize the significant part the media play in a community emergency response system and to educate the public, the the media to action. They may be asked to take to protect themselves. A carefully prepared media package will assure that this happens. It is your responsibility.

The package should give pertinent information on the exercise:

DSW 136435

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

STLCOPCB4036398

D. T. MAYER
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Date/Time
Exercise Location(s)
Media Center Location
Scenario Key Points
Participants Involved
Makeup and status of CAER
Arrange for Photographs
Highlight drill deadlines
Hold a separate briefing at least two days before the exercise for media assignment editors.

- (9) Time: 12:00 noon, 12/2/84
To: Monsanto and Ethyl Response Teams (3/Merit, Hygiene, Environ.)
From: Charles Patterson/Monsanto for Ethyl & Monsanto
Message: "This is a drill. You have just arrived at the incident site. You already know that A&S has collided with a Rogers Cartage "Flammable" trailer and that driver is unconscious in the tractor. You have self-contained breathing apparatus with full facepiece, rubber foot coverage and Viton suits in the emergency vehicle. Your spokesperson ("most knowledgeable person") wonders who is in charge."

Action:

1. Find out who is in charge (police, fire, trucker, railroad personnel, Ethyl, Monsanto, ESDA). If NO ONE confirms "being in charge", request leaders from police, fire, truck, railroad personnel, Ethyl/Monsanto and confer with ESDA as the OSC (on-site coordinator).
2. Identify yourself, and explain your function.
3. If you are a product expert, say so.
4. If your company shipped the material, or is the user, make that clear also.
5. Ask the man in charge (ESDA) who else is on the scene and what has been done so far.
6. Hold a short meeting (5-10 minutes) to decide who will do what, who is responsible for which phase of the action, and what has been done so far. Obviously, all of you must cooperate to solve a multiple problem. You know your chemicals---they need your assistance. Use your "Emergency Response Plan, Sauget, Illinois".

Suggested priorities are:

- A. What is the real hazard(s)? Is there a leak and what is its severity and potential? Need for East-West Gateway Communication vehicle on standby/St. Louis? Need for District II State Police/evacuation? Need for E. St. Louis ESDA alert? Need for Monsanto Foam truck? Who will and how will driver be rescued? Is train crew in a safe-secure position? Is the "oxidizer" tankcar any threat per potential? Is diking or absorption materials necessary?

DSW 136436

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

D. T. MAYER
ST. CLAIR COUNTY CAER COORDINATOR
TELE: 618-286-3483

- B. Are the emergency personnel proceeding properly? Has Route 3 been barricaded and a safe detour established? Has Cerro Copper been advised/their possible exposure? Are first responders or any other personnel exposing themselves unnecessarily? Remember, PROTECTING THE PUBLIC is your first priority.
- C. Advise the man in charge (ESDA) of the nature of the product(s), the hazards and the physical characteristics. Is diking necessary?
- D. Contact with news media personnel may be at this time. Advise Andi Smith (PR) of status.
- E. Remember that the carrier is responsible for equipment in transit. Your role is to provide product expertise and give advice to assure safe handling of the materials with priority always given to protecting first responders and the public.
- F. Establish communications with a coordinator at your plant as soon as possible. Your Control Center is the focal point for resources and information.

(10) Time: 12:00 Noon, 4/24/87

To: Dave Cramp-Rogers Cartage, Safety Manager

From: J. D. Tolbird

Message: "This is a drill. You have just arrived at the incident site. You know an A&S switch engine has collided with a Roger's Cartage "Flammable" trailer and that driver is unconscious in the tractor. ESDA, Monsanto and Ethyl Emergency Response Teams are present. You want to rescue driver!"

Action:

1. Find out who is in charge.
2. Identify yourself and explain your function.
3. Aggressively pursue rescuing driver. However, get clearance on product exposure first.
4. Hold a short meeting with ESDA and response teams to confirm who is to call Braun Colonial Ambulance Service.
5. Confirm what protective clothing and equipment Braun personnel need. Do the response teams (protected) need to assist Braun?

REMEMBER all Emergency Resources including ambulance service are listed in the "Emergency Response Plan-Sauget, Illinois".

(11) Time: 1:00 PM, 4/24/87

To: Braun Colonial Ambulance Service (332-6793) "Crew"

From: Jim Pace/Dave Cramp

Message: "This is a drill. You have just responded to a Sauget Police dispatch and have arrived at the accident site. You know driver is unconscious, bleeding at forehead and slumped over the steering wheel of his tractor."

DSW 136437

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

STLCOPCB4036400

D. T. MAYER
ST. CLAIR COUNTY CAER COORDINATOR
TELE: 618-286-3483

Action:

1. Find out who is in charge.
2. Request instructions and obtain clearance of "hazard exposure".
3. Make rescue.

CLIMAX DRILL

Prepare for evaluating exercise. Retain your evaluation sheets. Attend meeting for evaluation.

DSW 136438

USE THE "EMERGENCY RESPONSE PLAN-SAUGET, ILLINOIS"

STLCOPCB4036401

Sauget Emergency Response Exercise
April 24, 1987
All Participants After Exercise

EXERCISE EVALUATION

Please complete this form by placing an "x" in the appropriate box.
Provide an explanation when you select the boxes "sometimes", "seldom"
or "never".

NAME:

TITLE:

EMERGENCY SERVICE POSITION:

1. Were the plans, procedures, and resources utilized during the exercise adequate?

// always // sometimes // seldom // never

Explanation: _____

2. Did you have access to the information you needed in carrying out your responsibilities?

// always // sometimes // seldom // never

Explanation: _____

3. Did the exercise adequately address the exercise objectives?

// always // sometimes // seldom // never

Explanation: _____

4. Were communication systems adequate for staff alert, notification and emergency operations?

// always // sometimes // seldom // never

Explanation: _____

DSW 136439

STLCOPCB4036402

5. Was public information accurate and timely with respect to the actual play of the exercise?

// always // sometimes // seldom // never

Explanation: _____

6. Was the exchange of information among the participants adequate?

// always // sometimes // seldom // never

Explanation: _____

DSW 136440

STLCOPCB4036403

Sauget Emergency Response Exercise
April 24, 1987
(1) ~~Controller~~ after exercise
(2) Controller anytime

NAME _____
TITLE _____
TELE. _____

EVALUATION QUESTIONNAIRE

A number of factors will contribute to the success of emergency operations. Reflect on the exercise in which you just participated as you consider the factors listed below. What observations can you make regarding each factor? How did those factors impact on emergency operations?

FACTOR	OBSERVATION	IMPACT ON EMERGENCY OPERATIONS
--------	-------------	-----------------------------------

COMMUNICATIONS

INCIDENT
MANAGEMENT

INTRA-AGENCY
COOPERATION

RESOURCE
ALLOCATION

PLAN UTILIZATION
STAFF ALERT AND
NOTIFICATION

PUBLIC
INFORMATION

DSW 136441

Sauget Emergency Response Exercise

April 24, 1987

 after exercise

NAME _____

TITLE _____

EVALUATION QUESTIONNAIRE

Take a few minutes to think about the exercise in which you have just participated. What have you learned? After writing your response, compare it to what other participants have learned.

WHAT YOU HAVE LEARNED

WHAT OTHERS HAVE LEARNED

DSW 136442

STLCOPCB4036405

Sauget Emergency Response Exercise

April 24, 1987

(1) Evaluators during exercise

(2) Observers during exercise

NAME _____

TITLE _____

TELE. _____

EVALUATION QUESTIONNAIRE

In the left-hand column, record the five most important areas of concern about the emergency system raised by the exercise. Give a reason for each of your choices in the center. In the right-hand column, write your recommendations for improvement or a solution.

KEY AREAS

REASON

RECOMMENDATIONS OF CONCERN

1.

2.

3.

4.

5.

DSW 136443

STLCOPCB4036406

HEXANE

Flammable Liquid

GENERAL INFORMATION

Hexane is a clear colorless and fairly volatile liquid hydrocarbon with an odor similar to gasoline. It is used as a general solvent and medium for chemical reactions. Only barely soluble in water and lighter, hexane will form a floating surface slick. Its flash point of -7°F indicates that the product is easily ignited under most ambient temperature conditions. Vapors are somewhat heavier than air and may travel some distance to a source of ignition and flash back. Accumulations of vapor in confined spaces such as buildings or sewers may explode if ignited. Containers of liquid may rupture violently if exposed to fire or excessive heat for sufficient time duration. The product weighs approximately 5.5 pound per gallon.

Hexane does not react with water or many other common materials and is stable in normal transportation. It is incompatible with strong oxidizing materials, however, and may attack some forms of plastics, rubber, and coatings. Toxicity by all potential routes of exposure is generally low to moderate, but the volatility of hexane indicates that high vapor concentrations may be present in air. Products of combustion may include toxic constituents.

If hexane is leaking (not on fire) and generating vapors or fumes, downwind evacuation of the immediate spill area should be considered until properly equipped responders have evaluated the hazard.

CHEMICAL/PHYSICAL DATA

Solubility in Water: Practically insoluble, 0.014 g/100 g water at 68°F (20°C)

Solubility in Other Chemicals: Soluble in alcohol, chloroform, and diethyl ether.

Specific Gravity (Liquid): 0.659 at 68°F (20°C)

Boiling Point: 155.7°F (68.7°C) at 1 atm.

Melting Point: -139°F (-95°C)

Freezing Point: -139°F (-95°C)

Molecular Weight: 86.17

Heat of Combustion: $-10,692$ cal/g

Vapor Pressure: 124 mm Hg (2.4 psia) at 68°F (20°C)

Flash Point: -7°F (-21.7°C), closed cup.

Autoignition Temperature: 437°F (225°C)

Burning Rate: 7.3 mm/minute

Stability: Stable

Corrosiveness: Noncorrosive to metals but may attack some forms of plastics, rubber, and coatings.

Reactivity with Water: No reaction

Reactivity with Other Chemicals: Reacts with strong oxidizing materials.

IDENTIFICATION

Shipping Names: Hexane (USDOT and IMO)

Synonyms and Tradenames: Hexyl hydride; normal hexane; n-hexane; Skellysolve B.

Chemical Formula: $\text{CH}_3(\text{CH}_2)_4\text{CH}_3$

Constituent Components(% each): Various grades that are mostly hexane with remainder being petroleum hydrocarbons like cyclopentanes, isohexane, and possibly benzene.

49 STCC: 49 081 83

UN/NA Designation: UN1208

IMO Designation: 3.1, flammable liquid

Physical State as Shipped: Liquid

Physical State as Released: Liquid

Color of the Shipped Material: Colorless

Odor Characteristics: Like gasoline

Common Uses: General solvent and extractant; chemical reaction medium for pharmaceuticals; mfg. plastics, adhesives, inks, lacquers, stains, and low temperature thermometers; food additive.

DSW 136444

FOR ADDITIONAL ASSISTANCE OR INFORMATION CALL:
CHEMTREC (800)424-9300 OR (202)483-7616 OR
THE AAR BUREAU OF EXPLOSIVES (202)835-9500

STLCOPCB4036407



HEXANE

Flammable Liquid



POTENTIAL HAZARDS

GENERAL HAZARDS

Threshold Odor Concentration: Unavailable

Unusual Hazards: Fairly volatile flammable liquid with somewhat heavier than air vapors. May contain some amounts of toxic benzene.

Short Term Exposure Limits(STEL): Unavailable

Time Weighted Average(TLV-TWA): 50 ppm over each 8 hours of a 40 hour work week.(ACGIH)

Conditions to Avoid: Heat, fire, or sparks; contact with incompatible materials; runoff to sewers or water bodies; inhalation, ingestion, or direct physical contact.

HEALTH HAZARDS

Public Health Hazards: Major health hazard is from inhalation of the high vapor concentrations that may be present in the spill area and some distance downwind. Ingestion and direct contact are also to be avoided. Note that hexane may be a sensitizer of the heart to epinephrine. Any benzene present may increase the acute and chronic health risks of the product.

Hazards of Skin or Eye Contact: Repeated or prolonged skin contact with liquid hexane may result in drying and cracking of the skin due to the defatting action of the product. Contact of liquid hexane with the eyes may cause irritation.

Hazards of Inhalation: Exposure to appreciable vapor concentrations of hexane in air may cause irritation of the eyes, nose, and respiratory tract. Higher concentrations may cause narcosis and central nervous system depression with symptoms including lightheadedness, giddiness, nausea, headache, dizziness, unconsciousness, and possibly death. Exposure to 5000 ppm in air for only 10 minutes may be sufficient to cause dizziness and the sensation of giddiness.

Hazards of Ingestion: Ingestion may result in nausea, vomiting, swelling of the abdomen, headache, and other signs of central nervous system depression. Aspiration into the lungs during vomiting may cause delayed pulmonary edema or chemical pneumonia with possibly severe consequences.

FIRE HAZARDS

Lower Flammable Limit: 1.1-1.2%

Upper Flammable Limit: 7.5-7.7%

Behavior in Fire: Flammable liquid. May generate significant quantities of flammable vapors upon release. Vapors may be heavier than air and may travel some distance to a source of ignition and flash back.

Hazardous Combustion Products: Not well-defined, may include toxic constituents.

EXPLOSION HAZARDS

Lower Explosive Limit: Unavailable

Upper Explosive Limit: Unavailable

Explosiveness: Explosion may result if vapors are ignited in a confined area. There is limited potential that containers may rupture violently in fire.

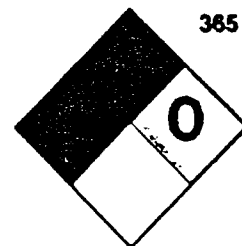
PROTECTIVE CLOTHING AND EQUIPMENT

Protective Clothing Required: Equipment should prevent repeated or prolonged skin contact and any reasonable probability of eye contact with the spilled product. This may include rubber boots, gloves, face shields, splash-proof safety goggles, and other impervious and resistant clothing. Compatible materials may include neoprene, nitrile rubber, chlorinated polyethylene, polyurethane, polyvinyl alcohol, Viton, and nitrile-butadiene rubber.

Respiratory Protection: For unknown concentrations, fire fighting, or high concentrations (above 5000 ppm), a self-contained breathing apparatus (SCBA) with full facepiece (or the equivalent). For lesser concentrations, a gas mask with chin-style or front or back mounted organic vapor canister (5000 ppm or less) or an organic vapor cartridge respirator (1000 ppm or less) within the use limitations of these devices.

HEXANE

Flammable Liquid



FIRST AID

Nonspecific symptoms: Irritation of the eyes, nose, respiratory tract, or skin; other symptoms of exposure.

First Aid for Inhalation: Remove victim to fresh air and keep warm and at rest. If breathing becomes difficult or if breathing has stopped, administer artificial respiration. Get medical attention immediately. (Caution: Administration of mouth-to-mouth resuscitation may expose the first aid provider to chemical within the victim's lungs or vomit.)

First Aid for Skin and Eye Contact: Flush eyes immediately with water for at least 15 minutes, occasionally lifting the eyelids. Remove all contaminated clothing. Wash affected body areas with large amounts of soap and water. Get medical attention if irritation persists after washing.

First Aid for Ingestion: Do not induce vomiting. Keep victim warm and at rest. Get medical attention immediately.

FIRE RESPONSE

Extinguishing Materials: Carbon dioxide, dry chemical, foam, water spray. Water may be ineffective.

Extinguishing Techniques: Stay upwind. Wear breathing apparatus and appropriate protective clothing. Move container from fire area if no risk. Do not extinguish burning cargo unless flow can be stopped safely. Be alert to the possibility that the container may tear or rupture and suddenly release massive amounts of product when exposed to high heat (over 800°F), such as from a direct flame. Use water from side and from safe distance to keep fire exposed containers cool. For massive fire in cargo area, use unmanned hose holder or monitor nozzles. Withdraw immediately in case of rising sound from venting safety device or discoloration of tank.

SPILL RESPONSES

General Information: Proceed with caution. Restrict access to area. Keep unprotected personnel upwind of spill area. Eliminate ignition sources. Prevent liquid from entering sewers and confined spaces. Avoid contact with spilled product. Notify proper authorities, downstream sewer and water treatment operations, and other downstream users of potentially contaminated water. Note that intake of hexane may result in rupture or explosion of boilers or industrial process equipment. Use explosion-proof equipment where necessary. Choose equipment, where possible, that is not corroded or otherwise damaged by the spilled product. Take into account while planning the response that hexane is a highly flammable substance.

AIR SPILL

TECHNIQUE

EVACUATION ... Evacuate local and downwind areas as conditions warrant to prevent exposure and to allow vapors or fumes to dissipate. Hexane spills may expose downwind areas to toxic or flammable concentrations over considerable distances in some cases, particularly if large quantities have spilled in warm weather.

CONSEQUENCE

Need to notify, organize, transport and house displaced persons.

MITIGATION

Stop leak if without risk and if proper equipment available. Allow vapors and fumes to dissipate completely before reentering spill area without special protective gear. Consult qualified experts for assistance.

TECHNIQUE

MONITOR THE SITUATION ... Hexane may not evolve large amounts of hazardous airborne contaminants in some outdoor spill situations. It may be advisable in some cases to simply monitor the situation until the spilled product is removed, particularly for small spills or in cold weather.

CONSEQUENCE

Hazardous levels of hexane in air may be found in the local spill area and immediately downwind:

MITIGATION

Remove the spilled product as soon as possible. Restrict access to the local spill area and areas immediately downwind by unprotected personnel.

HEXANE

Flammable Liquid

TECHNIQUE

WATER FOG OR SPRAY . . . Water fog or spray applied to hexane vapors may accelerate their dispersal in the atmosphere.

CONSEQUENCE

Water runoff may contain a small amount (if any) of hexane from contact with airborne vapors.

MITIGATION

Contain contaminated water and remove as soon as possible to prevent spread of contamination. Be alert to conditions such as fire hose runoff or rainwater that may add to spill volume and overflow impoundments.

TECHNIQUE

FOAM . . . Firefighting foam applied to the surface of liquid pools may slow the release of hexane vapors into the atmosphere.

CONSEQUENCE

The effects of foam may be short term. As the foam breaks down, release of vapors will increase. Products of foam breakdown will add to the volume of spilled material.

MITIGATION

Continue foam applications until spilled product is removed. Contain increased volume.

LAND SPILL**TECHNIQUE**

CONTAINMENT DIKES . . . Hexane may be contained by building dikes or barriers using soil, sand or other materials.

CONSEQUENCE

Contained hexane may percolate into soil or seep through dike material. This may result in loss of contained product and spread of contamination.

MITIGATION

Remove contained product as soon as possible to prevent spread of contamination. Be alert to conditions such as fire hose runoff or rainwater that may overflow impoundments. Where possible, line collection basins with compatible impervious material.

TECHNIQUE

EXCAVATION . . . A trench or ditch may be excavated to contain leaking product.

CONSEQUENCE

There may be increased potential for groundwater contamination in some cases.

MITIGATION

Remove contained products as soon as possible to prevent spread of contamination. Use surface dikes or barriers where groundwater contamination is possible or line collection basin with compatible impervious material.

TECHNIQUE

PUMPING/VACUUM SUCTION . . . Accumulated liquid pools may be recovered using appropriate hoses, pumps and storage containers or vacuum trucks.

CONSEQUENCE

Equipment that is incompatible with the spilled product may become damaged or develop leaks.

MITIGATION

Use equipment compatible with spilled product.

TECHNIQUE

ABSORPTION . . . Spreading of spilled product may be controlled by absorbing liquid with sand, earth, clay, peat moss, saw dust, straw, commercial sorbents, or other compatible substances.

CONSEQUENCE

Once used, sorbent materials pose the same hazards as the spilled product. Their use adds to the overall volume of contaminated material.

MITIGATION

Deplete accumulated liquid pools with pumps or vacuum trucks if possible before applying sorbents. Remove contaminated sorbents to safe storage by mechanical means.

DSW 136447

HEXANE

Flammable Liquid

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TECHNIQUE

MECHANICAL REMOVAL . . . Contaminated soil and any remaining chemical residue may be removed with shovels or motorized graders, scrapers, loaders, bulldozers, or draglines.

CONSEQUENCE

Removal equipment may become contaminated and present a hazard to later users. Incompatible equipment may be damaged or corroded. Improper storage of removed materials may result in future spread of contamination. Any flammable vapors or gases present in the area may be ignited by motorized removal equipment.

MITIGATION

Decontaminate all equipment after use. Use equipment compatible with spilled product. Store contaminated materials in a safe and secure location. Do not operate motorized equipment in potentially flammable atmospheres. Consult qualified experts for advice where necessary.

WATER SPILL

TECHNIQUE

STOP USE . . . Notify downstream industrial, municipal, and public users to stop water intake or to monitor water for contamination.

CONSEQUENCE

Alternative water supplies may be needed to accommodate users.

MITIGATION

Provide alternative water supplies as needed until water supply is declared safe.

TECHNIQUE

FLOATING BOOMS/BARRIERS . . . Oil spill containment booms of compatible material may be deployed. Alternatively, mesh or nets may be strung across stream and anchored every 6-8 feet. Straw or peat placed on upstream side of mesh should absorb and retard spreading of spilled product.

CONSEQUENCE

Leakage may occur under or through barrier if high waves or current present or if not properly deployed. Incompatible materials may be damaged by spilled product. Booms, barrier materials, and deployment equipment may be contaminated. Fire hazards pose risk to response personnel and equipment.

MITIGATION

Proceed with caution. Stage barriers in series where necessary. Recover spilled product as soon as possible. Decontaminate equipment after use. Dispose of waste materials in proper and safe manner. Use compatible equipment. Eliminate ignition sources.

TECHNIQUE

WATER BY-PASS DAMS . . . Streams may be provided with a by-pass dam. This is a dam made of compacted earth, clay, or other material with open tubes or pipes passing through under water. Upstream ends of pipes or tubes should be well below the layer of floating contaminant. Downstream ends should be at a higher elevation but still below the floating layer. Valves may be installed on downstream ends to control water flow.

CONSEQUENCE

Earthen dams may become saturated with water and seep through or collapse. An insufficient number of by-pass tubes or pipes or additional water may cause overflow.

MITIGATION

Use sufficient number and capacity of tubes or pipes. Be alert to conditions that may lead to dam overflow or collapse. Remove spilled product as soon as possible.

DSW 136448

HEXANE

Flammable Liquid

TECHNIQUE

DIVERSION . . . Where other means are unavailable, floating slicks may be temporarily herded, diverted, or controlled using water hose streams, small boat propeller wash or chemical surface tension modifiers known as spill herders.

CONSEQUENCE

Hose streams and propeller washes have limited applicability and effectiveness. The latter may cause undesired mixing of spilled product and water due to extreme agitation. Chemical spill herders should not be used until approval is obtained from authorized environmental officials.

MITIGATION

Use other means if available.

TECHNIQUE

SURFACE SKIMMING . . . Oil spill skimming devices may be deployed to recover floating hexane.

CONSEQUENCE

Incompatible equipment may be damaged. Equipment may be contaminated and pose hazard to future users. Fire hazard may pose risk to response personnel and equipment.

MITIGATION

Decontaminate equipment after use. Use compatible equipment. Store recovered product in safe and secure location. Eliminate ignition sources.

TECHNIQUE

ABSORPTION . . . Straw, hay, peat, or commercial sorbent materials compatible with hexane may be used to absorb spilled product from the water surface, preferably after the spill has been contained.

CONSEQUENCE

Once used, sorbent materials pose the same hazards as the spilled product. Their use adds to the overall volume of contaminated material. Deployment and recovery can be difficult. Fire hazards pose risk to response personnel and equipment.

MITIGATION

Proceed with caution. Decontaminate equipment after use. Store and dispose of waste materials in proper and safe manner. Use compatible equipment. Eliminate ignition sources.

DSW 136449

NITRIC ACID, FUMING

Oxidizer

RQ 1000 Lb/454 Kg*

GENERAL INFORMATION

Fuming nitric acid is a colorless to pale yellow to reddish brown liquid that has a sweet to acrid odor and may fume in air. It is used to make various fertilizers, explosives, dyes, chemicals, pesticides, and rocket fuels and is also used for etching, bright-dipping, electroplating, and photoengraving. It is fully soluble in water but also reacts to produce heat and toxic and corrosive fumes. Although the product is not combustible, contact with many metals may generate flammable and potentially explosive hydrogen gas as well as toxic nitrogen oxides. In addition, the product is a strong oxidizing agent that may ignite or react explosively or violently with combustible or reactive materials and may accelerate their burning. There is some limited potential that containers may rupture due to overpressurization and release toxic nitrogen oxides if exposed to fire or excessive heat for sufficient time duration. The product weighs approximately 12.4-12.6 pounds per gallon. Its fumes and vapors may be heavier than air.

Fuming nitric acid is very corrosive to wood, paper, cloth, and most metals, and may also attack some forms of plastics, rubber, and coatings. Contact with such materials or heating of the liquid may generate toxic red oxides of nitrogen into the air. The product is also highly corrosive to bodily tissues.

Downwind evacuation should be considered if fuming nitric acid is leaking from its container. If nitric acid, fuming is in a mixed load shipment (small packages shipped with other small packages in the same outer packaging, railcar, container, or trailer) and exposed to fire or direct flame, evacuate for a radius of 1500 feet. If the material is leaking (not on fire) and generating vapors or fumes, downwind evacuation of the immediate spill area should be considered until properly equipped responders have evaluated the hazard.

CHEMICAL/PHYSICAL DATA

Solubility in Water: Soluble in all proportions but also reacts (see below).

Solubility in Other Chemicals: Soluble in ether.

Specific Gravity (Liquid): 1.49-1.55 for 95% or more HNO_3

Boiling Point: 190.4-203°F (88-95°C) at 1 atm.

Melting Point: -59.8 to -49°F (-45 to -51°C)

Freezing Point: -59.8 to -49°F (-45 to -51°C)

Molecular Weight: 63.01 HNO_3

Heat of Combustion: Not flammable

Vapor Pressure: 47.9 mm Hg (0.926 psia) at 68°F (20°C)
for 100% HNO_3 ; up to 103 mm Hg (1.99 psia) for red fuming HNO_3 .

Flash Point: Not flammable

Autoignition Temperature: Not flammable

Burning Rate: Not flammable

Stability: Evolves toxic red oxides of nitrogen when heated.

Corrosiveness: Very corrosive to wood, paper, cloth, and most metals. May attack some plastics, rubber, and coatings. Compatible with aluminum or stainless steel.

Reactivity with Water: Produces heat and toxic and corrosive fumes.

Reactivity with Other Chemicals: Reacts with a wide variety of metals (especially when powdered), bases, carbides, cyanides, sulfides, fulminates, picrates, chlorates, oxidizable inorganics, organic chemicals, turpentine, and combustible materials. Many substances may be ignited or may react violently or explosively.

IDENTIFICATION

Shipping Names: Nitric acid, fuming (USDOT); nitric acid; red fuming (IMO).

Synonyms and Tradenames: Hydrogen nitrate; Aqua fortis; Azotic acid; Nital; nitril hydroxide; white fuming acid; red fuming acid.

Chemical Formula: HNO_3

Constituent Components(% each): 95-99% pure
49 STCC: 49 185 29

UN/NA Designation: UN2032

IMO Designation: 8, corrosive

Physical State as Shipped: Liquid

Physical State as Released: Liquid

Color of the Shipped Material: Colorless to pale yellow to reddish brown

Odor Characteristics: Acrid, sweet to acrid, suffocating

Common Uses: Mfg. fertilizers, explosives, dyes, chemicals, pesticides, and rocket fuels; used for etching, bright-dipping, electroplating, photoengraving, and metal cleaning.

*Reportable quantity (RQ) subject to change—refer to current EPA regulations.

FOR ADDITIONAL ASSISTANCE OR INFORMATION CALL:
CHEMTREC (800)424-9300 OR (202)483-7616 OR
THE AAR BUREAU OF EXPLOSIVES (202)835-9500

DSW 136450



NITRIC ACID, FUMING Oxidizer



POTENTIAL HAZARDS

GENERAL HAZARDS

Threshold Odor Concentration: Unavailable

Unusual Hazards: Highly corrosive acid. May ignite or react explosively or violently with combustible or oxidizable materials and may increase their flammability. Evolves hydrogen gas and toxic nitrogen oxides in contact with most metals.

Short Term Exposure Limits(STEL): 4 ppm (10 mg/m³) for 15 minutes. (ACGIH)

Time Weighted Average(TLV-TWA): 2 ppm (5 mg/m³) over each 8 hours of a 40 hour work week.(ACGIH)

Conditions to Avoid: Heat or fire; sparks where hydrogen may be present; contact with incompatible materials; runoff to sewers or water bodies; inhalation, ingestion, or direct physical contact; sparks where hydrogen may be present.

HEALTH HAZARDS

Public Health Hazards: Highly corrosive to bodily tissues by all routes of exposure. Vapors and fumes in air include toxic oxides of nitrogen as well as nitric acid.

Hazards of Skin or Eye Contact: Contact of fuming nitric acid or its concentrated vapors or fumes in air with the skin or eyes may result in immediate, severe and deep burns. The skin may be ulcerated and stained a yellow or yellowish brown color. The eyes may be permanently damaged.

Hazards of Inhalation: Vapors or fumes of nitric acid in air may cause irritation or burns of the nose, mouth, throat, and respiratory system as well as erosion of exposed teeth. Exposure to high concentrations in air may also cause lung irritation, nitrogen oxide poisoning, and pulmonary edema and pneumonitis with possibly severe consequences. Onset of the latter effects may be delayed for 4-30 hours.

Hazards of Ingestion: Ingestion of nitric acid may result in immediate pain and burns of the mouth, esophagus, and gastrointestinal tract, and possibly death.

FIRE HAZARDS

Lower Flammable Limit: Not flammable

Upper Flammable Limit: Not flammable

Behavior in Fire: There is some limited potential that containers may rupture violently in fire due to overpressurization. May generate large quantities of toxic and corrosive vapors and fumes upon release.

Hazardous Combustion Products: Decomposition products include toxic nitrogen oxides.

EXPLOSION HAZARDS

Lower Explosive Limit: Not flammable

Upper Explosive Limit: Not flammable

Explosiveness: There is some limited potential that containers may rupture violently in fire due to overpressurization. Contact with numerous other chemicals and materials may result in violent or explosive reactions. Contact with most metals produces hydrogen gas that may explode if ignited in confined spaces.

PROTECTIVE CLOTHING AND EQUIPMENT

Protective Clothing Required: Equipment should prevent any possibility of skin or eye contact with the spilled product. This may include rubber boots, gloves, face shields, splash-proof safety goggles, and other impervious and resistant clothing. Fully encapsulating suits with self-contained breathing apparatus (SCBA) may be advisable in some cases to prevent contact with high vapor or fume concentrations in air. Compatible materials may include natural rubber, neoprene, nitrile rubber, polyethylene, chlorinated polyethylene, polyvinyl chloride, Viton, nitrile-butadiene rubber, and Saranex for concentrated (more than 70%) nitric acid.

Respiratory Protection: For unknown concentrations, fire fighting, or high concentrations (above 250 mg/m³), a self-contained breathing apparatus (SCBA) with full facepiece (or the equivalent). For lesser concentrations, a gas mask with chin-style or front or back mounted canister or a chemical cartridge respirator with a full facepiece within the use limitations of these devices. The canister or cartridge should provide protection against nitric acid and should not contain oxidizable materials such as activated charcoal.

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FIRST AID

Nonspecific symptoms: Irritation or burns of any bodily tissues.

First Aid for Inhalation: Remove victim to fresh air and keep warm and at rest. If breathing becomes difficult or if breathing has stopped, administer artificial respiration. Get medical attention immediately. (Caution: Administration of mouth-to-mouth resuscitation may expose the first aid provider to chemical within the victim's lungs or vomit.)

First Aid for Skin and Eye Contact: Flush eyes immediately with water for at least 15 minutes, occasionally lifting the eyelids. Remove all contaminated clothing. Wash affected body areas with large amounts of water. Get medical attention immediately.

First Aid for Ingestion: If victim is conscious, administer large quantities of water immediately. Do not attempt to make the victim vomit. Get medical attention immediately. (Note: Avoid giving carbonates such as baking soda.)

FIRE RESPONSE

Extinguishing Materials: Apply water spray in flooding quantities, but note reactivity with water.

Extinguishing Techniques: Corrosive vapor or fume hazard. Stay upwind. Avoid all bodily contact. Wear breathing apparatus and appropriate protective clothing. Wear full chemical protective suit if contact with material or dense fumes/smoke anticipated. Move container from fire area if no risk. Be alert to container rupture potential. Use water from side and from safe distance to keep fire exposed containers cool. For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

SPILL RESPONSES

General Information: Proceed with caution. Restrict access to area. Keep unprotected personnel upwind of spill area. Avoid contact with spilled product. Prevent liquid from entering sewers and confined spaces. Protect sewers and waterways from contaminated runoff. Notify proper authorities, downstream sewer and water treatment operations, and other downstream users of potentially contaminated water. Note that intake of highly contaminated water may result in damage to boilers or industrial process equipment. Use explosion-proof equipment where necessary. Choose equipment, where possible, that is not corroded or otherwise damaged by the spilled product. Take into account while planning the response that fuming nitric acid is highly corrosive and reactive. Contact with most metals may produce flammable and potentially explosive hydrogen gas.

AIR SPILL

TECHNIQUE

EVACUATION ... Evacuate local and downwind areas as conditions warrant to prevent exposure and to allow vapors or fumes to dissipate. Nitric acid spills may expose downwind areas to toxic concentrations over considerable distances in some cases.

CONSEQUENCE

Need to notify, organize, transport and house displaced persons.

MITIGATION

Stop leak if without risk and if proper equipment available. Allow vapors and fumes to dissipate completely before reentering spill area without special protective gear. Consult qualified experts for assistance.

TECHNIQUE

WATER FOG OR SPRAY ... Water fog or spray applied to nitric acid vapors or fumes may absorb vapors, knockdown fumes, and accelerate their dispersal in the atmosphere. Apply water at a point downwind and do not allow it to contact pools of nitric acid as this may increase fume evolution.

CONSEQUENCE

Water runoff may contain nitric acid from contact with its vapors or fumes.

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MITIGATION

Contain contaminated water and remove or neutralize as soon as possible to prevent spread of contamination. Be alert to conditions such as fire hose runoff or rainwater that may add to spill volume and overflow impoundments. Consult qualified experts for safe neutralizing techniques.

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TECHNIQUE

NEUTRALIZATION . . . Application of an appropriate neutralization agent to liquid nitric acid may eventually slow the release of vapors or fumes into the atmosphere.

CONSEQUENCE

Depending on the neutralization agent and application technique used, the resulting chemical reaction may produce varying amounts of heat, vapors, fumes and spattering.

MITIGATION

Proceed with caution. Consult qualified experts for safe neutralizing techniques.

TECHNIQUE

DILUTION . . . The rapid addition of flooding quantities of water to liquid nitric acid may eventually slow the release of vapors or fumes into the atmosphere. This response is better suited to smaller spills and entails special risks.

CONSEQUENCE

Vapor or fume evolution may be vastly increased during and immediately after water application, thus increasing downwind and local hazards for a time.

MITIGATION

Some possibilities include knockdown of vapors or fumes via water fog or spray and temporary evacuation of downwind populations and other vulnerable resources. Proceed with caution. Consult qualified experts.

LAND SPILL

TECHNIQUE

CONTAINMENT DIKES . . . Nitric acid may be contained by building dikes using soil, sand or other materials.

CONSEQUENCE

Contained nitric acid may percolate into soil or seep through dike material. This may result in loss of contained product and spread of contamination.

MITIGATION

Remove or neutralize contained product as soon as possible to prevent spread of contamination. Be alert to conditions such as fire hose runoff or rainwater that may overflow impoundments. Where possible, line collection area with compatible impervious materials.

TECHNIQUE

EXCAVATION . . . A trench or ditch may be excavated to contain leaking product.

CONSEQUENCE

There may be increased potential for groundwater contamination in some cases.

MITIGATION

Remove contained products as soon as possible to prevent spread of contamination. Use surface dikes or barriers where groundwater contamination is possible or line collection basin with compatible impervious material.

TECHNIQUE

PUMPING/VACUUM SUCTION . . . Accumulated liquid pools may be recovered using appropriate hoses, pumps and storage containers or vacuum trucks.

CONSEQUENCE

Equipment that is incompatible with the spilled product may become damaged or develop leaks.

MITIGATION

Use equipment compatible with spilled product.

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TECHNIQUE

ABSORPTION . . . Spreading of spilled product may be controlled by absorbing liquid with sand, earth, clay, fly ash, cement powder, commercial sorbents, or other compatible substances.

CONSEQUENCE

Once used, sorbent materials pose the same hazards as the spilled product. Their use adds to the overall volume of contaminated material.

MITIGATION

Deplete accumulated liquid pools with pumps or vacuum trucks if possible before applying sorbents. Remove contaminated sorbents to safe storage by mechanical means. Where necessary, neutralize sorbents under guidance of qualified expert.

TECHNIQUE

NEUTRALIZATION . . . Application of an appropriate neutralization agent may modify the spilled product to a less hazardous substance.

CONSEQUENCE

Application and removal of chemical agents involves additional environmental risks.

MITIGATION

Consult qualified experts for safe neutralization techniques.

TECHNIQUE

MECHANICAL REMOVAL . . . Contaminated soil and spilled product may be removed by shovels, motorized graders and scrapers, loaders, bulldozers, and draglines.

CONSEQUENCE

Removal equipment may become contaminated and present a hazard to later users. Incompatible equipment may be damaged or corroded. Improper storage of removed materials may result in future spread of contamination.

MITIGATION

Decontaminate all equipment after use. Use equipment compatible with spilled product. Store contaminated materials in safe and secure location.

WATER SPILL

TECHNIQUE

STOP USE . . . Notify downstream industrial, municipal, and public users to stop water intake or to monitor water for contamination.

CONSEQUENCE

Alternative water supplies may be needed to accommodate users.

MITIGATION

Provide alternative water supplies as needed until water supply is declared safe.

TECHNIQUE

CONTAINMENT DIKES . . . Water with dissolved chemical may be contained (or diverted to impoundment area) by diking upper and/or lower bounds to limit volume of water affected and spread of contamination.

CONSEQUENCE

Earthen dikes may become saturated with water and seep through or collapse. Additional water may cause overflow of diked area or water body boundaries.

MITIGATION

Reinforce or modify dikes as necessary. Be alert to conditions that may lead to overflow or dike collapse. Remove contaminated water to impoundment or storage area for later treatment or disposal.

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