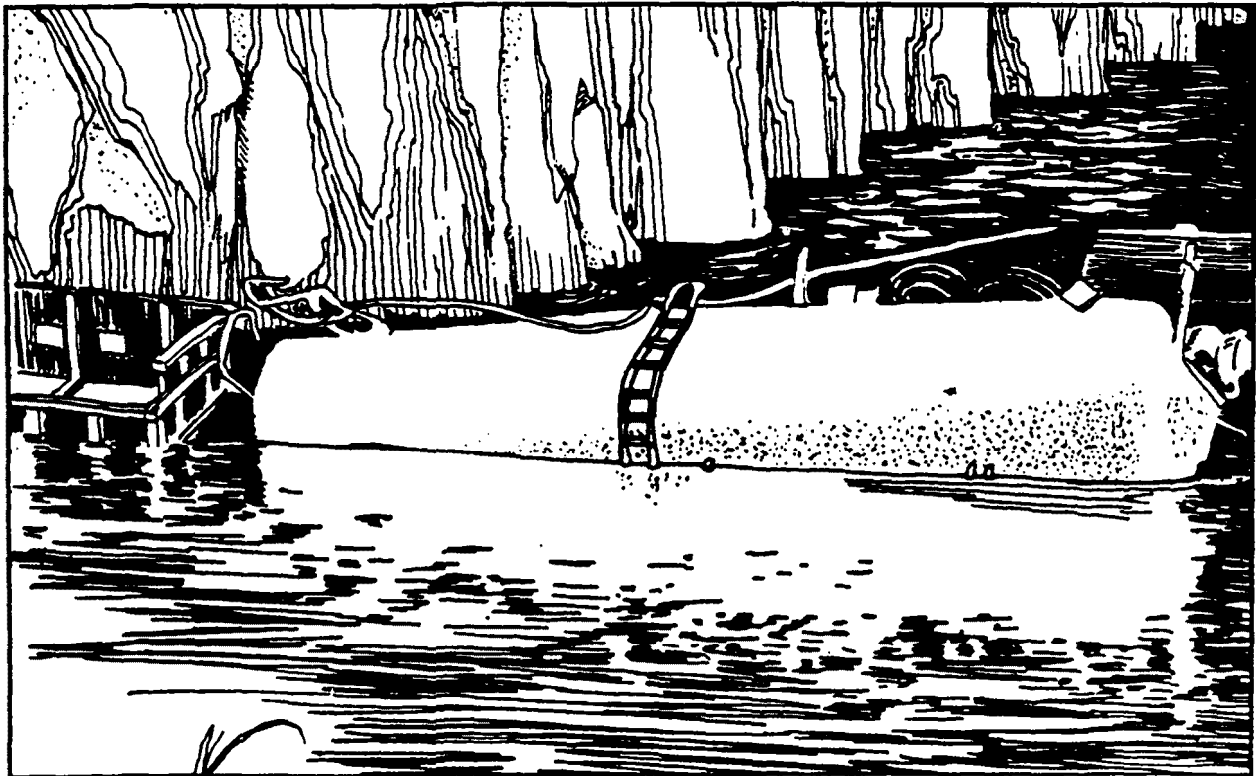




# Report of the EPA Hazardous Substances Task Force



**REPORT OF THE EPA  
HAZARDOUS SUBSTANCES  
TASK FORCE**

**Office of Solid Waste and Emergency Response  
U.S. Environmental Protection Agency  
Washington, DC 20460**

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## **ACKNOWLEDGEMENTS**

This report could not have been possible without the great time and effort put forth by all members of the Hazardous Substances Task Force. Timothy Fields, Jr. provided able leadership in his capacity as Task Force Chair. Special appreciation is extended to the chairpersons of each Working Group: David Ouderkirk of the Response Operations Branch, chair of the Background and Release Trends Working Group; Jim Jones of the Office of Prevention, Pesticides, and Toxic Substances, chair of the Short-Term Innovative Solutions Working Group; Barbara Hostage of the Response Standards and Criteria Branch, chair of the Longer-Term Regulatory Solutions Working Group; and John Riley, Chief of the Response Standards and Criteria Branch, chair of the Coordination and Communications Working Group. Additionally, the contributions of Dorothy Canter, Science Adviser to the Assistant Administrator for Solid Waste and Emergency Response, the many other EPA employees, and the representatives of the Federal agencies participating with EPA in this effort are greatly appreciated.

The efforts of the Task Force are rewarded by the impact its work and recommendations reflected in this report will have on the protection of human health and the environment in the future.



## HAZARDOUS SUBSTANCES TASK FORCE MEMBERS

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## EXECUTIVE SUMMARY

### BACKGROUND

On July 14, 1991, several Southern Pacific railway cars derailed on the Cantara Loop near Dunsmuir, California. One of these railway cars ruptured and released approximately 19,500 gallons of the herbicide metam sodium into the Sacramento River. As a result of the spill, the surrounding environment along a 45-mile stretch of the river and portions of Lake Shasta were significantly affected, more than 200,000 fish were killed, and several hundred people were treated for eye, skin, and respiratory irritation.

Metam sodium is not a listed hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), nor was the metam sodium shipment regulated by the U.S. Department of Transportation (DOT) as a hazardous material pursuant to the Hazardous Materials Transportation Act (HMTA). However, its release was subject to CERCLA notification and liability provisions because the metam sodium rapidly hydrolyzed and decomposed into at least three specifically listed CERCLA hazardous substances, and because the released substance became a hazardous waste under the Resource Conservation and Recovery Act (RCRA).

Early assessments of the situation failed to indicate that a release of metam sodium had occurred. Once the release was discovered, however, an incident command system was established, under the direction of the California Department of Fish and Game, to coordinate the response efforts of more than 60 different Federal and State agencies and hundreds of response personnel. In addition to participating at the scene, EPA issued an enforcement order to Southern Pacific, requiring that the railroad undertake response actions. EPA also accessed the CERCLA Trust Fund to implement a plume interdiction operation at Lake Shasta.

### THE HAZARDOUS SUBSTANCES TASK FORCE

Although this spill of metam sodium did trigger the notification, response, and liability

provisions of CERCLA, it points to the fact that many chemicals that are potentially hazardous to human health and the environment are not specifically listed under CERCLA and do not meet DOT's criteria as hazardous materials, even though such chemicals may pose a significant hazard upon release. As such, the spill raised public concerns that the regulatory framework of the Federal government often overlooks many chemicals that are, or potentially could be, hazardous to human health and the environment. It called into question the ability of the Federal government to prevent and respond to future releases similar to the Cantara Loop release.

To respond to these concerns, EPA Assistant Administrator for Solid Waste and Emergency Response (OSWER), Don Clay, in consultation with the EPA Assistant Administrator for Prevention, Pesticides, and Toxic Substances, Linda Fisher, established the Hazardous Substances Task Force. The task force was charged with examining the issues associated with the expansion of the CERCLA hazardous substance list, as well as identifying public health and environmental hazards for purposes of further regulating environmentally hazardous material in transportation. The task force also was instructed to look beyond the Agency's traditional regulatory framework to identify innovative approaches that would enhance protection of human health and the environment.

Although the focus of the task force was on EPA responsibilities and additional activities that could be taken by the Agency, the problems that arose were not solely within EPA's authority and expertise. Thus the task force was a coordinated Federal effort, involving representatives from several Headquarters offices and Regions within EPA and a variety of other Federal entities: the Departments of Transportation, Agriculture, and Interior; the U.S. Coast Guard; the National Institute for Environmental Health Sciences; the Agency for Toxic Substances and Disease Registry; and the National Library of Medicine.

The task force established four working groups. Briefly, the working groups and their key responsibilities were as follows:

**The Background and Release Trends Working Group**, established to provide the technical data and analyses necessary to identify and characterize past releases.

**The Short-Term Innovative Solutions Working Group**, which focused on (1) identification of ecological and human health criteria that DOT may consider for use in identifying substances to be regulated as hazardous materials in transportation, and (2) short-term public information, training, and information exchange opportunities.

**The Long-Term Regulatory Solutions Working Group**, whose objective was to analyze existing statutory and regulatory authorities and identify and develop regulatory options for addressing releases of potentially dangerous substances, including those not currently regulated as CERCLA hazardous substances or DOT hazardous materials.

**The Coordination and Communications Working Group**, established to ensure the sharing of information among the working groups and to develop a communications strategy for the task force's findings. This working group also served as the point of coordination and contact with related activities being undertaken by the National Response Team (see below).

In addition to the EPA Task Force, Assistant Administrator Don Clay requested that the National Response Team (NRT) form an interagency task force to evaluate the Federal role in regulating substances that pose human health and environmental threats and can result in significant natural resource damages, and to recommend actions for improving interagency coordination on these issues. The work of the NRT Task Force, which was chaired by DOT, was coordinated through the EPA Task Force. The NRT Task Force Report will be issued separately, after it has been reviewed by the 15 Federal agencies comprising the NRT.

## **TASK FORCE RECOMMENDATIONS**

In this report, the task force makes a number of recommendations. The key recommendations

fall into three broad areas and are summarized in Exhibit ES-1.

## **TASK FORCE ACHIEVEMENTS**

In the process of carrying out its work and developing recommendations, the Hazardous Substances Task Force completed a number of activities. These accomplishments consist of both short-term, stand-alone achievements and achievements that lay the ground work for action on the various task force recommendations.

### **Short-Term Achievements**

The short-term, completed achievements of the task force include:

- ✓ Designation of a workgroup to develop ecological and human health criteria for consideration by DOT in identifying potentially dangerous substances for regulation as hazardous materials because they may pose a significant environmental or human health hazard if released during transportation accidents.
- ✓ Convening of an **Open Forum** for representatives of interested government agencies, industry, labor, and environmental groups, and the general public to exchange information about initiatives and other activities that could be taken to enhance the prevention and control of releases of potentially dangerous substances.
- ✓ Development of a draft **Federal Register** notice that clarifies and reiterates the requirement under CERCLA to immediately report releases of substances that form ignitable, corrosive, reactive, or toxic wastes (i.e., RCRA characteristic wastes) when released into the environment. Metam sodium is an example of such a substance.
- ✓ Development, publication, and distribution of a **technical bulletin** providing information on metam sodium, its uses, its environmental and human health effects, and ways in which it is regulated.

## **EXHIBIT ES-1**

### **KEY TASK FORCE RECOMMENDATIONS**

#### **Development of criteria to identify potentially dangerous substances.**

- Finalize development of the ecological and human health criteria for transportation incidents, and provide support to DOT in the development of appropriate hazardous materials transportation regulations.
- Resolve issues related to designation of Extremely Hazardous Substances as CERCLA hazardous substances prior to proceeding with the further development of designation criteria under CERCLA.
- Thoroughly review the approach utilized by the task force in developing screening criteria for hazardous substances designation, and consider, as necessary and appropriate, the convening of an interagency workgroup to develop additional criteria or take other actions to refine or expand upon that work.

#### **Expanded availability of information about potentially dangerous substances.**

- Work with groups representing chemical manufacturers, NIOSH, and the Occupational Safety and Health Administration (OSHA) in the Department of Labor to ensure that Material Safety Data Sheets (MSDSs) include any information that may be pertinent to: (1) possible breakdown products that may form and (2) any hazardous characteristics (e.g., ignitability, reactivity, or corrosivity) that may be displayed when substances are released into the environment.
- Develop additional advisories on potentially dangerous substances for distribution to State emergency response commissions (SERCs), local emergency planning committees (LEPCs), local governments, unions, the general public, and public and private responders and response organizations. Topics could include information on substances that are most toxic, released most frequently, or in the greatest quantity, or those that are responsible for the most injuries, death, or property and environmental damage.

#### **Enhanced notification and response procedures and capabilities.**

- Expand centralized reporting to the National Response Center (rather than separate reports to a variety of governmental agencies), and develop a mechanism for updating and correcting initial reports of information on releases of potentially dangerous substances.
- Work with industry trade associations to promote voluntary reporting to the National Response Center of any release that results in "significant harm," including all releases that cause death, injury, environmental damage, or exceed some specified quantity (e.g., 10,000 pounds).
- Develop and make widely available regional, State, and local contingency plans that clearly and simply delineate the roles and responsibilities of agencies, departments, and other organizations that may be involved in an emergency response.
- Widely disseminate comprehensive information on available training opportunities for emergency responders, and promote greater coordination among training providers to make the most of existing training resources. Provide, as necessary, more and better training to workers on the use of contingency plans during an emergency release.

- ✓ Development of an advisory to alert transporters and first responders of the hazards and reporting requirements that may arise when there is a release of substances that rapidly form or become CERCLA hazardous substances when they are released into the environment.

#### **Long-Term Achievements**

In addition to these specific and significant accomplishments, a number of additional achievements will lay the ground work for future actions taken as a result of task force recommendations. Specifically, the task force completed the following additional activities:

- ✓ A case study of the Cantara Loop incident, which reviews the response effort at the Federal, State, and local levels, and illustrates that there is a need for contingency plans throughout the country that are clearer and more direct in assigning responsibilities, as well as increased training of workers who may have to respond to releases of potentially dangerous substances.
- ✓ A review of State and Federal requirements to report releases of potentially dangerous substances that shows some inconsistencies in different reporting requirements and the potential for confusion and duplication.
- ✓ An analysis of historical releases of potentially dangerous substances that have caused death, injury, or serious environmental damage.
- ✓ Identification of several regulatory and guidance options that would enhance the likelihood that the National Response Center would be notified of any release that directly causes significant adverse effects to human health or the environment.
- ✓ Evaluation of different approaches for designating additional chemicals as hazardous substances under CERCLA, including (1) immediately designating a chemical that has caused significant damage as a result of a release, and (2) designating the MARPOL Annex III pollutants (which include metam sodium).

- ✓ Development and evaluation of an overall strategy for identifying chemicals that should be considered for designation as hazardous substances under CERCLA, including an analysis of the RTECS, AQUIRE, and MERCK databases to identify substances that pose acute, chronic, and carcinogenic human health hazards or aquatic toxicity hazards, or that exhibit characteristics of ignitability or reactivity. Preliminary analyses indicate that between 1,500 and 2,000 substances have been identified as potentially dangerous, warranting further evaluation.

#### **IMPLEMENTATION OF TASK FORCE RECOMMENDATIONS**

EPA is moving forward expeditiously to implement the task force recommendations. The EPA Office of Pollution Prevention and Toxics (OPPT) will continue to take lead responsibility for developing ecological and non-acute human health criteria for identifying potentially dangerous substances in transportation so that DOT may consider incorporating the criteria into its hazardous materials regulations. OPPT also will take lead responsibility for coordinating EPA support to the DOT rulemaking effort.

The EPA Office of Emergency and Remedial Response (OERR) will continue to develop criteria for designating additional chemicals as hazardous substances under CERCLA. The criteria may be used to identify high priority substances for EPA advisories, as well as possible designation under CERCLA.

OPPT will work with OERR to revise the draft policy statement interpreting section 8(e) of the Toxic Substances Control Act (TSCA) to enhance the likelihood that the National Response Center will receive reports of releases of potentially dangerous substances. OPPT also will take the lead in requiring manufacturers to communicate to potential users that their product poses an environmental hazard; this communication may be accomplished through product labels or information on MSDSs.

OERR will take the lead in developing additional advisories and guidance documents to assist facilities in complying with existing CERCLA notification requirements. The clarification notice

also will be published in the Federal Register, clarifying CERCLA notification and liability provisions that apply to substances that become RCRA characteristic wastes when released into the environment. The notice also may address the CERCLA notification requirements that pertain to potentially dangerous substances that rapidly form CERCLA hazardous substances when released.

OERR will convene a workgroup to identify options for improving the quality of EPA data on release incidents, effects, and response, including expanding ERNS to include information confirming data supplied during the initial release reports to the National Response Center.

The EPA Chemical Emergency Preparedness and Prevention Office (CEPPO) will work with the

Regional Title III Coordinators to ensure that local emergency exercises test both the procedural and technical features of the LEPC plans, and will work to ensure a more active role for Regional Response Teams in reviewing LEPC plans as well as area plans under the Oil Pollution Act of 1990.

Finally, OSWER will ensure that hazardous materials training curricula include procedures for notification as well as information on technical issues facing transporters in the event of a hazardous materials release, and will work through the NRT Training Committee to ensure that Federal training courses cover both procedural and technical issues.

## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND

On July 14, 1991, a diesel locomotive and six Southern Pacific railway cars derailed on the Cantara Loop near Dunsmuir, California, falling 25 feet down a rocky embankment into the Sacramento River. Although Southern Pacific first reported the incident as a minor train derailment to the National Response Center, it was learned several hours later that one of the railway cars carrying the herbicide metam sodium had ruptured. Approximately 19,500 gallons of metam sodium spilled into the river through several holes in the wall of the tank car. As an immediate precaution, the Sheriff's Department issued an advisory to the citizens of Dunsmuir to stay away from the river and to close their windows. Following the metam sodium spill, an incident command system was established that, under the direction of the California Department of Fish and Game, successfully coordinated the response efforts of more than 60 different Federal and State agencies and hundreds of response personnel.

The tank car carrying metam sodium was not marked for special handling, but was labeled "weed kl" for weed killer, and the bill of lading showed that the car carried metam sodium. As a herbicide, metam sodium is a soil disinfectant that is used to treat soil fungi, nematodes, and soil insects. Its spill had a devastating effect on the surrounding environment, heavily damaging a 45-mile stretch of the Sacramento River and portions of Lake Shasta, into which the river flows. In addition, more than 200,000 fish were killed and several hundred people were treated for eye, skin, and respiratory irritation. Because harmful reproductive effects (i.e., neural tube defects) may be attributed to exposure to metam sodium, pregnant women in the area in their first trimester of pregnancy were advised to consult with their doctors.

Although metam sodium is not specifically designated as a hazardous substance under CERCLA, when released into the water it rapidly hydrolyzed and decomposed into several different CERCLA hazardous substances, including hydrogen sulfide, monomethylamine, and carbon disulfide. In addition, when released, the metam

sodium became a hazardous waste because it exhibited the RCRA characteristic of reactivity, and thus became a CERCLA hazardous substance as well. Because, when released, metam sodium rapidly formed a CERCLA hazardous substance and became a RCRA hazardous waste, EPA issued an enforcement order to Southern Pacific under section 106 of CERCLA requiring that the company undertake appropriate response actions. In addition, EPA used the CERCLA Trust Fund to implement a plume interdiction operation at Lake Shasta.

#### Implications of the Cantara Loop Incident

The circumstances of the Cantara Loop incident did trigger the notification, response, and liability provisions under CERCLA; however, the incident points out that the regulatory framework of the Federal government may overlook certain substances that, when released, are, or potentially could be, hazardous to human health and the environment. At a minimum, there are many potentially dangerous substances that are not CERCLA hazardous substances, and have never been considered for listing under CERCLA. In addition, the DOT regulations governing hazardous materials in transportation have not covered many substances that pose primarily environmental hazards. In its implementation of HMTA, DOT has focused on acute human health effects (principally human lethality).

As the metam sodium spill clearly illustrates, certain substances may, when released, rapidly degrade or hydrolyze into substances that are hazardous to human health and the environment. Thus, the metam sodium spill raised the question of why potentially dangerous substances, such as metam sodium, are neither listed as hazardous substances under CERCLA nor regulated in transportation as hazardous materials under HMTA.

#### 1.2 HAZARDOUS SUBSTANCES UNDER CERCLA

As used in this report, the terms potentially dangerous substances, hazardous materials, and

hazardous substances refer to distinct sets of chemical substances:

The term potentially dangerous substances is the generic term used in this report to refer broadly to all chemical substances that have the potential to cause harm to human health, welfare, or the environment.

The term hazardous materials refers to those chemicals or categories of chemicals, such as explosives, that are regulated in transportation by the DOT under HMTA.

The term hazardous substances refers only to the subset of hazardous materials that are listed by EPA under CERCLA. All CERCLA hazardous substances are also automatically listed and regulated by DOT as hazardous materials.

#### Designation Under CERCLA

CERCLA is the primary Federal statute by which Federal government officials are notified of the release of a hazardous substance, allowing them to evaluate and carry out response actions.

Under CERCLA section 104, EPA has the authority to respond to a release or a threatened release of a hazardous substance, or a pollutant or contaminant that may present an imminent and substantial danger to the public health or welfare. Although EPA has the authority to respond to all such releases, only releases of CERCLA hazardous substances trigger CERCLA's notification and liability requirements under CERCLA sections 103 and 107, respectively.

A substance can become a "hazardous substance" under CERCLA through one of three mechanisms. First, section 101(14) of CERCLA defines as hazardous substances those substances that are specifically listed or designated under section 307 or 311 of the Clean Water Act (CWA), section 112 of the Clean Air Act (CAA), or section 3001 of RCRA, and those for which action has been taken under section 7 of the Toxic Substances Control Act (TSCA). When a substance is added by regulation or law to any of these lists, it automatically becomes a CERCLA hazardous substance.

Second, a substance may become a CERCLA hazardous substance if it is a waste that exhibits

any of the RCRA characteristics of ignitability, corrosivity, reactivity, or toxicity.

Finally, CERCLA section 102 authorizes EPA to designate as a hazardous substance any additional chemical element, compound, mixture, solution, or substance that, when released, may present a substantial danger to public health or welfare or the environment.

#### IMPLICATIONS OF DESIGNATION OF A CHEMICAL AS A CERCLA HAZARDOUS SUBSTANCE

- Persons in charge of a facility or vessel must immediately notify the National Response Center of the release of any CERCLA hazardous substance that equals or exceeds the reportable quantity.
- Releases of hazardous substances must be reported to State emergency response commissions and local emergency planning committees.
- Responsible parties are liable for the costs of cleanup and any injury to or loss of natural resources that result from a CERCLA hazardous substance release or potential release.
- CERCLA hazardous substances also are automatically listed and regulated as hazardous materials by DOT.

#### 1.3 EPA AND NRT TASK FORCES

Following the Cantara Loop incident, Representative Barbara Boxer, Chair of the House Subcommittee on Government Activities and Transportation, held two hearings to investigate what steps could be taken at the Federal level to increase the likelihood that incidents similar to Cantara Loop would not happen in the future.

At the first of these hearings held on July 31, 1991, Don Clay, EPA Assistant Administrator for Solid Waste and Emergency Response, expressed concern that there are many potentially dangerous substances in commerce that could pose a threat to



human health and the environment and that currently are not CERCLA hazardous substances.

At a second hearing held on October 3, 1991, Linda Fisher, EPA Assistant Administrator for Prevention, Pesticides, and Toxic Substances, testified about the pesticide programs' information on the adverse effects of metam sodium. In addition, Alan Roberts, Associate Administrator for Hazardous Materials Safety in the Research and Special Programs Administration at DOT testified that his agency relies on EPA to identify the environmental and chronic human health hazards posed by various chemicals.

More broadly, the implications of the Cantara Loop release indicated that Federal regulatory agencies, in general, need to explore other approaches beyond the traditional regulatory framework for acting to prevent releases of substances known to be dangerous to human health or the environment, and to improve responses to releases of such substances. The testimony provided at these hearings supplied the impetus for the formation of both EPA's Hazardous Substances Task Force and the NRT's Hazardous Materials Task Force.

#### **The EPA Hazardous Substances Task Force**

In responding to the concerns raised by the Cantara Loop spill, the EPA Hazardous Substances Task Force was created to explore the short-term and long-term steps EPA could take to prevent or mitigate the likelihood that releases like the metam sodium spill will occur in the future, and to better respond to them if they do occur. The EPA Task Force was composed of representatives from several offices and Regions within EPA and a variety of other Federal entities, including:

- Department of Transportation
- Department of Agriculture
- Department of the Interior
- The U.S. Coast Guard
- The National Institute for Environmental Health Sciences
- The Agency for Toxic Substances and Disease Registry

- The National Library of Medicine.

To carry out its mission, the task force examined the issues associated with both using the traditional regulatory approach of expanding the CERCLA hazardous substance list, as well as looking at approaches for providing controls that are beyond the Agency's traditional regulatory framework. Within the task force, four working groups were established, each with its own defined set of activities and responsibilities. In practice, however, many of these activities were inter-dependent.

#### **The Roles of the Four Working Groups**

To identify and define the broad scope of the problem of chemical releases, the **Background and Release Trends Working Group** was asked to provide technical data and analyses that would characterize historical releases of potentially dangerous substances. Because the metam sodium spill involved a transportation accident and because DOT relies on EPA to identify potentially dangerous substances that pose deleterious chronic human health or environmental hazards, the **Short-Term Innovative Solutions Working Group** was asked to focus on identifying ecological and human health criteria that DOT may consider incorporating into regulations under HMTA. In addition, the working group was charged with identifying short-term innovative and non-regulatory approaches for controlling the release of potentially dangerous substances, such as providing public information, enhanced and more frequent training, and information exchange opportunities.

The Hazardous Substances Task Force also was committed to examining regulatory options for addressing releases of potentially dangerous substances that are currently not covered by the existing Federal regulatory framework, as well as those that are so regulated; therefore, the **Long-Term Regulatory Solutions Working Group** was asked to analyze existing statutory and regulatory authorities to assess how this could best be accomplished. The **Coordination and Communications Working Group** was given responsibility for ensuring that information was shared among the various working groups and for providing a liaison between EPA's Hazardous Substances Task Force and the NRT's Hazardous Materials Task Force to coordinate the efforts and activities of the two groups.

## KEY DATES

**July 14, 1991:** The Cantara Loop spill occurs when a Southern Pacific railway tank car derails, releasing 19,500 gallons of metam sodium into the Sacramento River.

**July 31, 1991:** First hearing held by the Subcommittee on Government Activities and Transportation to investigate ways of addressing concerns raised by Cantara Loop release. Testimony is provided by Don Clay, EPA Assistant Administrator for Solid Waste and Emergency Response and Alan Roberts, DOT Associate Administrator for Hazardous Materials Safety in the Research and Special Programs Administration.

**September 4, 1991:** The EPA Hazardous Substances Task Force convenes for its first organizational and planning meeting. The EPA task force subsequently met four additional times over the next four months.

**September 5, 1991:** The NRT Hazardous Materials Task Force convenes for its first organizational and planning meeting. The NRT task force subsequently met eight additional times over the next five months.

**October 3, 1991:** Second hearing held by the Subcommittee on Government Activities and Transportation. Testimony is provided by Alan Roberts of DOT and Linda Fisher, EPA Assistant Administrator for Prevention, Pesticides, and Toxic Substances.

**October 29, 1991:** The Open Forum is held to explore innovative, non-regulatory solutions for preventing or mitigating releases of potentially dangerous substances into the environment.

**January 31, 1992:** The Interim Task Force Report on the findings and recommendations of the EPA Hazardous Substances Task Force is completed and presented to Don Clay and Linda Fisher.

**February 3, 1992:** The Draft Task Force Report on the findings and recommendations of the NRT Hazardous Materials Task Force is completed and presented to the NRT Task Force members.

**April 1992:** The Final EPA and NRT Task Force Reports on the findings and recommendations of the EPA and NRT Task Forces are completed.

## The NRT Hazardous Materials Task Force

While EPA's Hazardous Substances Task Force focused on EPA's role in addressing releases of potentially dangerous substances, at the request of Don Clay, a parallel effort was carried out by the NRT's Hazardous Materials Task Force. The objective of the NRT Task Force was to evaluate the broader arena of the Federal role in regulating potentially dangerous substances that, if released, pose a threat to human health and the environment and can result in significant natural resource damages. Chaired by DOT, the NRT Task Force is developing a compendium of Federal regulatory programs that are implemented under the auspices of various Federal agencies.

The compendium will describe which Federal agencies control or regulate potentially dangerous substances and what substances are regulated; the purpose of each regulatory agency's control; what criteria are used by various agencies to recognize, classify, and control potentially dangerous substances; what regulatory and functional relationships exist among Federal regulatory agencies with respect to these activities; and what gaps and overlap among agencies exist in recognizing, classifying, and controlling potentially dangerous substances.

Finally, based on its findings, the NRT Task Force will submit a report assessing these regulatory deficiencies and recommending approaches for improving interagency coordination and control among Federal agencies.

### 1.4 NON-TASK FORCE ACTIVITIES

In addition to the efforts and activities of the EPA and NRT Task Forces, other activities and initiatives have been carried out at the Federal and Regional level, as well as by the State of California in response to the Cantara Loop spill.

#### Federal-level Activities: EPA and DOT

At the Federal level, both EPA and DOT have implemented initiatives outside of the respective activities of the two task forces to address the metam sodium spill. EPA's Office of Prevention, Pesticides, and Toxic Substances (OPPTS) has implemented new restrictions on the use of metam sodium as a pesticide, including eliminating its registration for use by homeowners. In addition, OPPTS has worked to establish an agreement for

additional requirements for protective clothing for people involved in commercial applications of metam sodium and is continuing to evaluate the status of metam sodium under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Separately, DOT has published a Notice of Proposed Rulemaking for regulating under HMTA the MARPOL Annex III list of marine pollutants, on which metam sodium is listed (57 FR 3853, January 31, 1992).

#### **State of California Activities**

In addition to immediately responding to the Cantara Loop spill, the State of California took the lead in implementing response actions, cleanup of the spill, and monitoring the impact of the spill. The California Regional Water Quality Control Board is monitoring water quality in the area; the California Department of Health Services is conducting a health effects survey and establishing a database with the help of ATSDR; the California Department of Fish and Game has issued a draft Damage Assessment Plan; and the California Public Utilities Commission is formally investigating the circumstances surrounding the derailment.

#### **1.5 ORGANIZATION OF THIS REPORT**

This report is organized along the lines of the working groups that made up the task force. Following this introductory chapter, there are chapters for each of Working Groups 1, 2, and 3. Working Group 4, as part of its coordination and communication functions, has been responsible for the production of the report itself. Each of the next three chapters presents a complete discussion of the working group, its objectives, and its specific activities. Accomplishments of each working group are described in detail. Each issue area investigated is described and findings and recommendations are presented. Following the main body of this report is a list of acronyms. This report also includes two appendices, representing discrete significant work products developed by individual working groups in the course of their activities that may be of particular interest to readers of this report. Other discrete work products of the task force, such as the preliminary analysis of CERCLA designation criteria, will be utilized by EPA to assist in the implementation of task force recommendations.



## CHAPTER 2

### REPORT FROM WORKING GROUP ONE: BACKGROUND AND RELEASE TRENDS

#### 2.1 INTRODUCTION

The primary purpose of Working Group 1 was to gather data on past releases of potentially dangerous substances, and to analyze the data to identify trends and characteristics common to those releases that resulted in damage to human health, welfare, or the environment. This analysis provides a context in which the metam sodium spill and other releases of potentially dangerous substances may be viewed. The working group's data collection effort involved preparation of a case study of the July 14, 1991, Cantara Loop train derailment near Dunsmuir, California; a review of Federal and State notification requirements; and retrieval of reports of chemical releases from various databases. As a result of this effort, the working group provided:

- A determination of whether there are adequate notification requirements to ensure appropriate responses to releases of potentially dangerous substances;
- An analysis of past releases of potentially dangerous substances that may have caused substantial damage to human health or the environment; and
- A list of substances that pose a potential threat to human health or the environment and may be candidates for designation as hazardous substances under CERCLA, or the subject of advisories about potentially dangerous substances.

Working Group 1 accessed and analyzed data and information from multiple sources, which required close cooperation among representatives from many different Federal and State agencies and departments. The working group was chaired by David Ouderkirk of the Emergency Response Division in EPA's Office of Emergency and Remedial Response. The achievements of the working group are summarized in the accompanying box.

#### ACHIEVEMENTS

The review and analysis of the Cantara Loop train derailment and historical release data provided valuable lessons in emergency response, and information on the quantity and frequency of releases of potentially dangerous substances.

- A Case Study of the July 14, 1991, Cantara Loop Train Derailment – This review of the response effort at the Federal, State, and local levels provided insights into how emergency responses can be improved in the future.
- A Review of Notification Requirements – This review of Federal and State requirements for reporting releases of potentially dangerous substances shows some inconsistencies and the potential for confusion and duplication.
- An Analysis of Historical Releases and a Short List of Potentially Dangerous Substances – The analysis resulted in a list of potentially dangerous substances that, when released, may have caused death or injury in the past.

#### 2.2 CASE STUDY OF THE CANTARA LOOP TRAIN DERAILMENT

To provide a context in which to understand and evaluate the task force's findings and recommendations, and to determine whether there were any direct lessons to be learned from the incident, Working Group 1 conducted a case study of the July 14, 1991, Cantara Loop train derailment near Dunsmuir, California, in which approximately 19,500 gallons of metam sodium spilled into the Sacramento River. The case study, which is provided in Appendix A, summarizes the uses for and regulation of metam sodium; describes the emergency and long-term response activities associated with the spill; and provides available information on the health and environmental effects of the Cantara Loop release.

The working group prepared the case study by reviewing and comparing numerous reports and incident summaries issued by various Federal, State, and local agencies and departments, and private industry; Congressional testimonies; news releases; and newspaper articles.

Two key issues made consolidation of the information into an unambiguous and complete chronology of events challenging. The first is that the several and varied sources of information often contained contradictory and/or dissimilar information, and several aspects of the release are subject to interpretation. In particular, contradictions were found most frequently among accounts of when the spill was discovered and when notification of the spill was provided to the appropriate response agencies.

A second issue that influences any findings is that conclusive data on the environmental and human health effects of the metam sodium spill are still being collected and analyzed. For example, the effect of exposure to the vapors of metam sodium and its breakdown products on pregnancy outcomes among Dunsmuir women cannot be known until all of the women give birth. Thereafter, an analysis of the incidence of birth defects after the spill will be required to compare post-spill incidence to the normal incidence. In addition, several years will be required before other potential adverse health effects (e.g., learning disabilities) may be assessed with respect to the Cantara Loop spill. Similarly, a natural resources damage assessment being conducted by the California Department of Fish and Game will not be completed for at least a year.

### Findings

The working group devoted substantial effort to reviewing selected State and local emergency response contingency plans, as well as the specific plan and response effort surrounding the metam sodium spill near Dunsmuir, California. Although Federal, State, and local agencies made important contributions to response efforts, the Cantara Loop release raises questions about the ability of responsible agencies to effectively deal with certain emergencies involving potentially dangerous substances, particularly in remote areas. Review of the sequence of events immediately following the release indicates that there was some uncertainty about appropriate response activities, and also suggests the need for manufacturers and/or

transporters of potentially dangerous substances to provide personnel with more training about chemical properties and safety.

The working group found that clearer, less complicated contingency plans could alleviate some of the uncertainties associated with response activities. A review of selected contingency plans throughout the country revealed that persons charged with responding to and mitigating chemical release emergencies might easily become overwhelmed by information presented in the plans. Some of the plans, for example, are voluminous collections of emergency response instructions designed more appropriately for pre-emergency education. The plans do not always present a clear and direct explanation of the appropriate sequence of actions to be taken in the event of a release of a potentially dangerous substance. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), promulgated under the authority of CERCLA and the Clean Water Act, seeks to do just this by providing a relatively concise overview of how site assessment and emergency response activities will be carried out in Federal-lead situations.

The working group also concluded that development of a clear explanation of the delineation of the roles and responsibilities of various responding agencies and organizations could be useful in ensuring a unified and comprehensive response to a release. The response to the Cantara Loop incident involved coordinating the activities of more than 60 public and private agencies. In the hours immediately following the derailment, there was some indication of confusion as to who was in charge. Confusion can delay the overall response process. Local response authorities, particularly in remote or sparsely populated areas, bear much of the responsibility as first responders. As regional, State, or Federal involvement increases, however, primary response authority must be effectively transferred based on predetermined roles and responsibilities.

The lines of authority for responses to releases of CERCLA hazardous substances may serve as a useful model for response networks involved in responding to releases of other potentially dangerous substances. The NCP outlines an organizational structure for the Federal response system composed of several different entities with clearly defined authorities and responsibilities.

National policy making, preparedness planning, and coordination are the responsibility of the multi-agency National Response Team (NRT). Regional Response Teams are designed to serve in much the same way as the NRT, except on a regional level. Various special teams, such as the National Strike Force Coordination Center, have been created to provide specialized response support in a variety of areas, such as identifying and mobilizing public and private response resources. National response action is coordinated by a predesignated On-Scene Coordinator (OSC), who serves as the lead Federal official at the scene of a release, and is responsible for taking whatever actions are necessary, consistent with Federal law, to remove the threat posed by the release. All other entities in the national response system support the OSC in their areas of expertise during a response action.

#### **RECOMMENDATIONS**

- **Develop and Make Available Contingency Plans that are Clearer and More Direct in Assigning Responsibilities:** States, regions, and localities should develop in a coordinated fashion and make available contingency plans that clearly delineate the roles and responsibilities of agencies, departments, and other organizations that may be involved in an emergency response. These plans should include specific actions to be taken when releases of potentially dangerous substances occur near population centers or environmentally sensitive areas.
- **Provide Adequate Training that Emphasizes the Need to Report Releases of Potentially Dangerous Substances:** The transportation industry should provide more extensive training and simulation experience to their workers on the use of contingency plans during an emergency release. Workers should be encouraged to make the toll-free telephone call to the National Response Center if there is any potential for release of a large volume of any contained material, or if any actual release of a potentially dangerous substance occurs.

#### **2.3 NOTIFICATION REQUIREMENTS**

Notification is the first step in ensuring a timely and effective response to a release of a potentially dangerous substance, although notification does not, in and of itself, ensure a proper and effective response to such a release. Notification requirements vary among States, and between State and Federal authorities. State and Federal requirements for notifying authorities in the event of a release or potential release of a potentially dangerous substance are, at times, inconsistent or unclear. Confusing and duplicative notification requirements can reduce the likelihood that response officials receive timely notifications which, in turn, can compromise the effectiveness of a response.

Working Group 1 analyzed eight Federal and 115 State and territorial land, air, and water regulations that require notification of releases or potential releases of potentially dangerous substances to different environmental media, and contacted several State agencies by telephone to verify data. This analysis reveals the complexity of the notification requirements and provides a mechanism for identifying where regulations may be inadequate to ensure prompt and appropriate notification of, and response to, releases of potentially dangerous substances.

#### **Findings**

It is important to note that many State and Federal notification requirements have been imposed to satisfy different needs; some regulations pertain to permit excursions and violations, others to emergency notification about unanticipated and uncontrolled releases of potentially dangerous substances. Differences in regulations do not necessarily need to be eliminated; however, confusing and duplicative requirements for reporting to many different government agencies may reduce the likelihood that the appropriate agencies are notified about the release in a timely manner.

In addition, to evaluate the need for a response by Federal authorities, it is extremely important that as much complete and accurate information as possible on the release be obtained from the caller. This information should include information, whenever possible, on the specific name and/or Chemical Abstracts Service Registry Number (CASRN) of the released substance;

volume released; cause of the release; location of the release; environmental medium affected; and a characterization of the immediate environment (e.g., industrial, residential, natural). Although this information may not be known with certainty, a mechanism for linkage among responding agencies and for updating and correcting initially reported information (e.g., through the use of written follow-up reports) would enhance the Federal government's understanding of the types of releases that occur and the hazards they pose.

Finally, the responsibility for notification is on the shipper and carrier (during transportation), and on the producers and users of potentially dangerous substances if released at other times. These parties must be made aware of the potential for damage posed by their cargo or products, and must be prepared to act immediately should any potentially dangerous substances be accidentally released into the environment.

#### 2.4 ANALYSIS OF HISTORICAL RELEASES

Many substances that are not currently subject to regulations under CERCLA or HMTA can nonetheless, if released into the environment, cause significant damage to human health and the environment. Working Group 1 reviewed historical data on releases of potentially dangerous substances to identify a discrete list of substances that are released frequently, in large quantity, or that have been shown to cause significant damage to human health or the environment. These chemicals may be prime candidates for additional regulation by EPA or some other Federal agency.

The working group considered five databases in depth that contain historical information on releases of potentially dangerous substances, and selected two databases for extensive analysis because they contain the most comprehensive number of release reports. These two databases are (1) The Emergency Response Notification System (ERNS); and (2) The Hazardous Materials Information System (HMIS), a DOT database that contains reports of releases of hazardous materials during transportation.

The ERNS database is the repository of all initial telephone reports to the National Response Center, EPA Regions, or U.S. Coast Guard Marine Safety Offices, for releases of oil and other petroleum products (reported pursuant to section 311 of the Clean Water Act) and CERCLA

#### RECOMMENDATIONS

- **Expand Centralized Reporting to the Federal Government:** EPA should analyze the legal and administrative feasibility of requiring all emergency release reports to be directed to the National Response Center. The Center would then immediately notify the appropriate EPA Region, SERC, and LEPC. Information received from the one telephone call could satisfy all reporting requirements (thereby reducing the burden on industry), and could trigger the response network through notification to all appropriate Federal, State, regional, and local authorities and responders.
- **Require Follow-up Information About Releases:** EPA should consider establishing a mechanism for updating and verifying information on releases reported to the National Response Center, including data on the release effects and the resources required to respond to the release.
- **Increase Worker Knowledge of Potential Hazards:** Because of the potential risks associated with handling potentially dangerous substances, greater emphasis should be placed on making workers more aware of the dangers of a release and the appropriate response procedures.

hazardous substances (reported pursuant to CERCLA section 103). The database, however, also contains reports of other potentially dangerous substances that are not specifically listed under CERCLA. These release reports of other potentially dangerous substances, which represent about 12 percent of the non-petroleum release reports in ERNS, may have been reported to the National Response Center for a variety of reasons, including the possibility that the release posed a sufficient enough hazard that the person in charge decided that a report to the National Response Center or EPA Region was warranted, or because the release occurred during transportation and resulted in a fatality, property damage greater than \$50,000, or was otherwise required to be reported under HMTA.<sup>1</sup>

The HMIS database is the repository for all information on releases of hazardous materials



reported pursuant to the requirements of DOT's hazardous materials regulations. HMIS, therefore, includes release reports related solely to unintentional releases during transportation, including loading and unloading but excluding releases that involve carriers engaged only in intrastate highway transportation.

Nonetheless, the HMIS database has some very valuable attributes. For example, the data are based on written reports submitted by the carrier involved in the release, who is given 30 days to collect information on the circumstances, causes, and effects of the release. Thus, the HMIS data are generally more complete and accurate than data from ERNS, which reflect unverified information submitted in the initial telephone reports of the release.

Another important difference between the ERNS data and the HMIS data is the relationship between the release data and the effects data in each database. The ERNS data do not differentiate between the effects of the released substances and the effects of the incident itself. For example, if a transportation accident resulted in a release of a potentially dangerous substance and vehicular injury to the driver of the vehicle, the ERNS data would indicate that the release caused an injury but would not specify whether the injury was caused by exposure to the released substance or to the collision. In contrast, HMIS data reflect injuries, deaths, and property damage attributable to exposure to the hazardous material.

Although ERNS and HMIS contain the most comprehensive and reliable national data for purposes of the analyses planned by Working Group 1, they contain only federally reported release information. However, releases of many potentially dangerous substances (especially those that are currently unregulated) are not required to be reported to the National Response Center or to DOT or EPA. Thus, historical information on significant releases of some potentially dangerous substances may be missing from these data sources. The working group believes, however, that most significant releases of potentially dangerous substances do get reported and incorporated into one or both of these databases because many persons report releases regardless of their legal requirements to do so, and because most significant releases of potentially dangerous substances are newsworthy events. Thus, although certain data elements, such as quantity released,

may not be completely reliable, a significant release event generally will be represented in at least one of the databases.

The working group also analyzed, to a lesser extent, three other databases: (1) the Acute Hazardous Events (AHE) database, an EPA database that contains information from other sources (such as newspapers) about potentially dangerous substance releases and explosions; (2) the Accidental Release Information Program (ARIP), an EPA database that contains extensive information from facilities about the causes and consequences of accidental releases and on release prevention procedures and equipment; and (3) the Agency for Toxic Substances and Disease Registry's (ATSDR) Hazardous Substance Emergency Event Surveillance (HSEES) System, which describes the release or threatened release of specific hazardous substances and the resulting public health consequences (e.g., deaths, injuries, evacuations). The AHE and ARIP databases use ERNS to varying degrees as a basic screen to identify releases. Thus, Working Group 1 used these more focused databases to verify the trends and indications revealed through the analysis of ERNS and HMIS.

### Findings

One of the primary objectives of Working Group 1 was to identify non-petroleum substances that are not currently listed as CERCLA hazardous substances, but whose release may have caused significant adverse effects on human health (i.e., death or injury) or the environment. Exhibit 2-1 presents a list of such substances. The exhibit shows 106 substances (including one chemical-use category--pesticides) that have been reported in ERNS or the HMIS database and whose release may have caused a death or injury. (The ERNS data represent reported releases between January 1987 and July 1991; HMIS data span the period between January 1982 and July 1991.) Fourteen of these substances are extremely hazardous substances (EHSs) already proposed for designation as CERCLA hazardous substances, and 18 are pesticide active ingredients. Sixteen percent of the listed chemicals were reported to be associated with a release that caused deaths. The chemical category, pesticides, represents reported releases where the caller did not identify the specific pesticide.

Several of the substances listed in Exhibit 2-1 are not highly toxic or dangerous, but have been released frequently in very large quantities, resulting in deaths or injuries. For example, some of the substances released in large quantities include sulfur (104 releases/13 million pounds), chlorine dioxide (17 releases/1.3 million pounds), propylene (32 releases/1.2 million pounds), soda ash (8 releases/1 million pounds), and ethanol (143 releases/1 million pounds). These five substances were reported in release incidents that caused three deaths and 50 injuries, as reported in ERNS.

Four gases, nitrogen, oxygen, carbon dioxide, and hydrogen, were reported in release incidents that caused deaths or injuries; these gases are not included in Exhibit 2-1 because they are ubiquitous and non-toxic under normal conditions and generally would not be considered potentially dangerous substances. Nitrogen and carbon dioxide are inert and are generally used as cryogens to provide inert atmospheres or for other industrial purposes. Hydrogen and oxygen can form explosive atmospheres. Although they are not considered potential environmental toxicants, they nonetheless have histories of frequent releases and can pose a health hazard through overpressure, asphyxiation, or burns. For example, 128 releases of nitrogen (a total of 6 million pounds) were reported in ERNS for the period 1987 through July 1991. All four of these gases have been involved in release incidents that caused three deaths and 15 injuries, as reported in ERNS.

There are also other substances not included in Exhibit 2-1 that are not toxic under normal circumstances but nonetheless have been responsible for significant environmental damage when released into sensitive areas in significant amounts. Examples of such substances include molasses (in Boston), butter (in Delaware), and liquid manure.

In identifying potentially dangerous substances, Working Group 1 attempted to focus on releases that have been shown to cause significant adverse effects on human health or the environment, and have some probability of causing similar damage in the future. None of the databases examined, however, have ecological effects data related to chemical release reports. The HMIS database, however, does contain property damage information. To some extent, property damage may be used as a proxy for environmental damage. Many of the substances listed in Exhibit 2-1 caused

significant property damage in addition to deaths or injury. Seven other substances not listed in Exhibit 2-1 caused more than \$50,000 worth of property damage, but did not cause death or injury: ammonium phosphate, chloroprene, diisobutylene, dicyclopentadiene, dimethylcarbinol, isobutyl acetate, and helium.

In general, many of the substances listed in Exhibit 2-1 are produced in large volumes and are used as feedstocks or intermediates in a variety of industrial processes. For example, ammonium nitrate, whose primary use is as a fertilizer, is an important component of certain industrial explosives and has been implicated in some serious accidents. Sulfur and sulfur trioxide are precursors of sulfuric acid (a large volume CERCLA hazardous substance). Several other substances, including butadiene, isopropyl acetate, propylene, and the alcohols are flammable. Propylene and butadiene can also polymerize, resulting in heat generation and overpressure of containers. Hydrogen peroxide and chlorine dioxide are strong oxidizers.

An analysis also was performed to identify the 10 most frequently reported releases of potentially dangerous substances and the 10 substances reported released in the greatest quantities, excluding release reports of listed CERCLA hazardous substances. The results are shown in Exhibits 2-2 and 2-3, respectively, and are based on data contained in ERNS for the period 1987 through 1991. These exhibits contain 16 potentially dangerous substances that are either among the top 10 substances reported in terms of frequency of reports or quantity released, or both (ammonium nitrate, nitrogen, sulfur, and sulfur dioxide). Half of the substances listed in Exhibits 2-2 and 2-3 are also listed in Exhibit 2-1 because they also have been involved in incidents with deaths or injury (ammonium nitrate, chlorine dioxide, ethanol, nitrogen, propyl alcohol, propylene, sulfur, and sulfur trioxide). The substance most frequently reported released in ERNS (and currently not listed as a CERCLA hazardous substance) is sulfur dioxide, which is used extensively as a preservative, disinfectant, and bleaching agent; the substance released in the greatest quantity, as reported in ERNS, is ammonium nitrate.

Exhibits 2-4 and 2-5 further demonstrate the relationship between quantity released and the likelihood of death or injury based on data

contained in ERNS and HMIS, respectively. These data were derived from release reports of both CERCLA hazardous substances and other potentially dangerous substances. As illustrated in Exhibit 2-4, only one to two percent of releases between 1 and 10,000 pounds are associated with incidents involving deaths or injury. Releases in excess of 10,000 pounds are between two times and four times more likely to result in a death or injury, but represent only about four percent of all releases in this size range. This same trend is observed in the HMIS data.<sup>2</sup>

#### RECOMMENDATIONS

- Consider Further Regulation and Control of Potentially Dangerous Substances That Have Historically Caused Serious Damage: Potentially dangerous substances whose release has caused death, injury, or significant environmental damage should be further evaluated and additional control measures considered.

**EXHIBIT 2-1**  
**POTENTIALLY DANGEROUS SUBSTANCES RELEASED IN**  
**INCIDENTS INVOLVING DEATH OR INJURY**

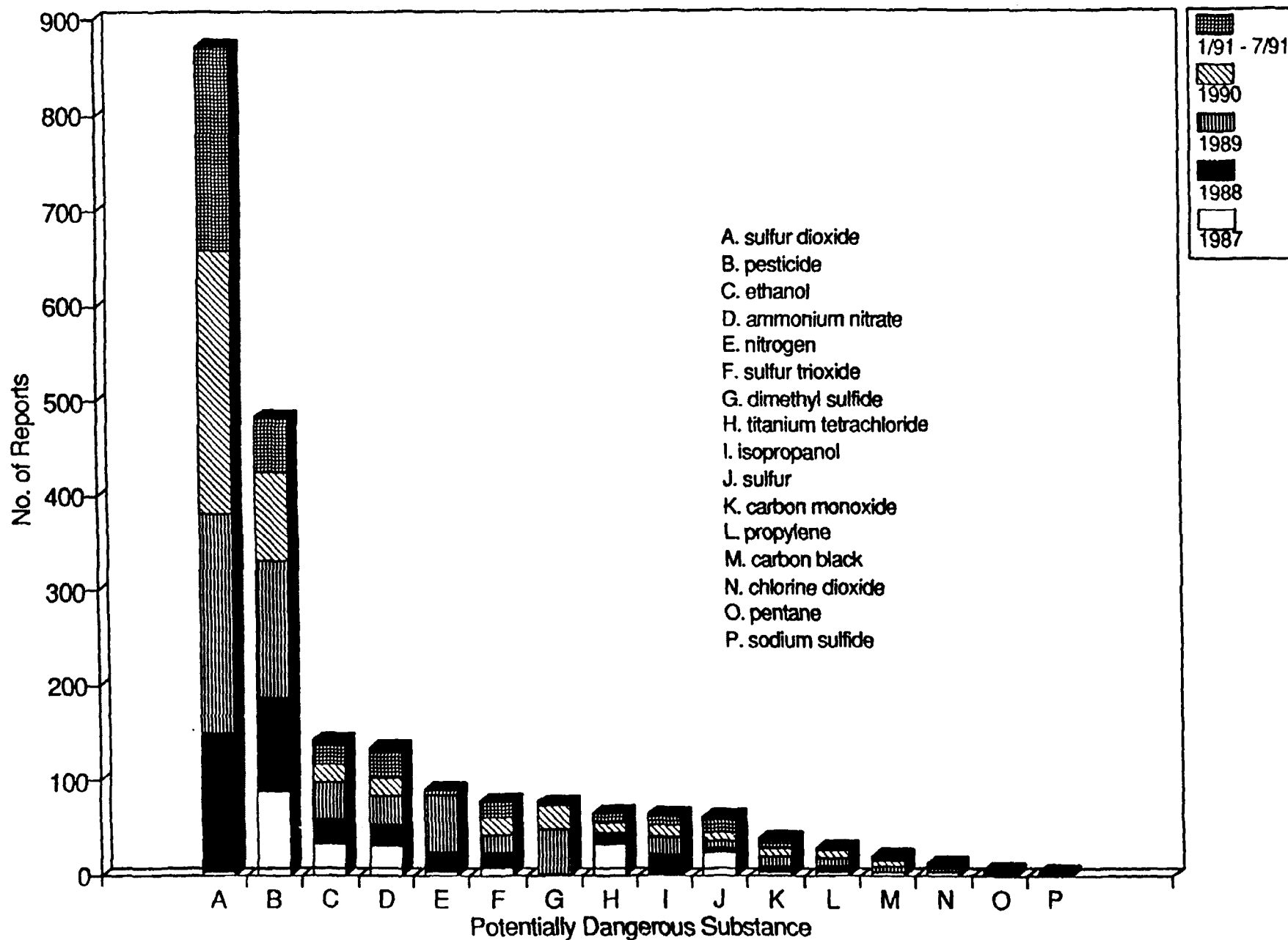
Acetylene <sup>1,2</sup>	Chloroacetyl Chloride <sup>1,2</sup>	Hydrogen Peroxide <sup>1,2</sup> (P,E)	Propylene <sup>1,2</sup>
Allyl Bromide <sup>1,2</sup>	Chloropicrin <sup>1,2</sup> (P)	Hydroxyacetic Acid <sup>1</sup> (P)	Propylene Glycol <sup>1</sup> (P)
Allyl Chloroformate <sup>2</sup>	Cyclohexylamine <sup>1,2</sup> (E)	Hydroxyethylacrylate <sup>1</sup>	Silicon Chloride <sup>1,2</sup>
Aluminum Chloride <sup>1,2</sup>	Decyl Alcohol <sup>1</sup> (P)	Isophorone Diisocyanate <sup>1</sup> (E)	Silicon Tetrafluoride <sup>2</sup>
Aminoethylethanolamine <sup>1</sup>	Diborane <sup>1,2</sup> (E)	Isopropanol <sup>1,2</sup> (P)	Soda Ash <sup>1</sup> (P)
Aminoethylpiperazine <sup>1,2</sup>	Diethylene Glycol <sup>1</sup>	Isopropyl Acetate <sup>1,2</sup>	Sodium Aluminate <sup>1,2</sup>
Ammonium Lauryl Ether Sulfate <sup>1</sup> (P)	Diisobutyl Ketone <sup>1,2</sup>	Isopropylamine <sup>1,2</sup>	Sodium Chlorate <sup>1,2</sup> (P)
Ammonium Nitrate <sup>1,2</sup>	Dimethyl Aniline <sup>2</sup>	Lime <sup>1</sup>	Sodium Chlorite <sup>2</sup>
Ammonium Sulfate Nitrate <sup>1</sup>	Dimethyl Disulfide <sup>1</sup>	Lithium <sup>1,2</sup>	Sodium Dichloro-s-Triazinetrione <sup>1</sup> (P)
Ammonium Thiosulfate <sup>1,2</sup> (P)	Dimethyl Sulfide <sup>1,2</sup>	Lithium Hydride <sup>1</sup> (E)	Sodium Hydrosulfite <sup>1</sup>
Amylene <sup>1,2</sup>	Dimethyl Terephthalate <sup>1</sup>	Magnesium Chloride <sup>1</sup> (P)	Sodium Nitrate <sup>1,2</sup> (P)
Benzaldehyde <sup>1,2</sup>	Diocetyl Adipate <sup>1</sup>	Mercaptoethanol <sup>1</sup>	Sodium Pentachlorophenate <sup>1,2</sup> (E)
Benzene Phosphorous Dichloride <sup>1</sup>	Dioxolane <sup>2</sup>	Methamidophos <sup>1</sup> (P,E)	Sodium Sulfide <sup>1,2</sup>
Boron Trifluoride <sup>1,2</sup> (E)	Diphenylmethane <sup>1</sup>	Methyl Acrylate <sup>1,2</sup>	Stearic Acid <sup>1</sup>
Bromine <sup>1,2</sup> (E)	Ethanol <sup>1,2</sup> (P)	Methyl Amyl Ketone <sup>1,2</sup>	Sulfur <sup>1,2</sup> (P)
Bromine Trifluoride <sup>1</sup>	Ethyl Butyrate <sup>1,2</sup>	Methyl Butyrate <sup>2</sup>	Sulfur Dioxide <sup>1,2</sup> (E)
Butadiene* <sup>1,2</sup>	Ethyl Mercaptan <sup>1,2</sup>	Methyl Ethyl Pyridine <sup>1,2</sup>	Sulfur Trioxide <sup>1,2</sup> (E)
Butyl Acrylate <sup>1,2</sup>	Ethyl Silicate <sup>1,2</sup>	Methyltrichlorosilane <sup>1,2</sup> (E)	Sulfuryl Chloride <sup>1,2</sup>
Butyl Isocyanate <sup>2</sup>	Ethylene <sup>2</sup>	Morpholine <sup>1,2</sup>	Thioglycolic Acid <sup>2</sup>
Butyl Mercaptan <sup>1,2</sup>	Ethylene Glycol Monoethyl Acetate <sup>2</sup>	Mustard Gas <sup>1</sup> (E)	Thionyl Chloride <sup>2</sup>
Butyl Methacrylate <sup>1</sup>	Ethylene Glycol Monomethyl Ether <sup>1,2</sup>	Nitrocellulose <sup>2</sup>	Titanium Tetrachloride <sup>1,2</sup> (E)
Butyl Trichlorosilane <sup>1,2</sup>	Fluoroboric Acid <sup>2</sup>	Nitrochlorobenzene, o- <sup>1</sup>	Toluenesulfonic Acid <sup>1</sup>
Butyraldehyde <sup>1,2</sup>	Fluorosulfonic Acid <sup>1,2</sup>	Nitromethane <sup>1,2</sup>	Trichloroisocyanuric Acid <sup>1,2</sup>
Carbon Monoxide <sup>1,2</sup>	Hexaldehyde <sup>2</sup>	Oxalic Acid <sup>1</sup> (P)	Trichloromethyl-Sulfone <sup>1</sup>
Chlorine Dioxide <sup>1</sup> (P)	Hexamethylenediamine <sup>1,2</sup>	Pesticides <sup>1,2</sup> (Use Category)	Trichlorosilane <sup>1,2</sup>
Chlorine Trifluoride <sup>1</sup>	Hydrated Lime <sup>1</sup>	Phosphorus Tribromide <sup>2</sup>	
Chloroacetophenone* <sup>1,2</sup>	Hydrofluorosilicic Acid <sup>1</sup>	Potassium Sulfide <sup>2</sup>	

\* Certain isomers are CERCLA hazardous substances.

(P) = pesticide; (E) = EHS.

SOURCE: (1) ERNS data, 1/87 - 7/91; (2) HMIS data, 1/82 - 7/91.

EXHIBIT 2-2  
MOST FREQUENTLY REPORTED POTENTIALLY DANGEROUS SUBSTANCES (ERNS DATA)



**EXHIBIT 2-3**  
**POTENTIALLY DANGEROUS SUBSTANCES REPORTED**  
**RELEASED IN THE GREATEST QUANTITIES**

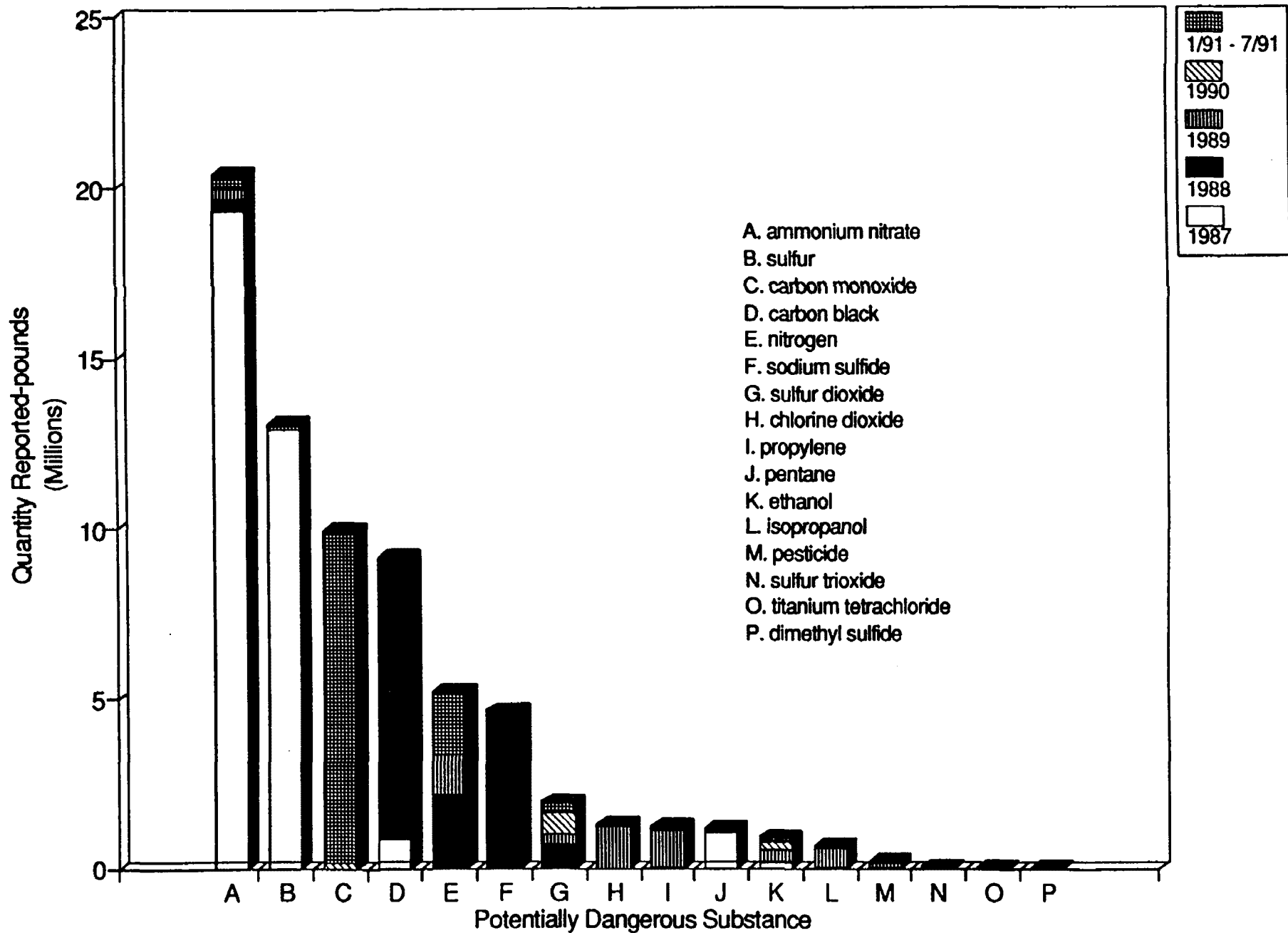
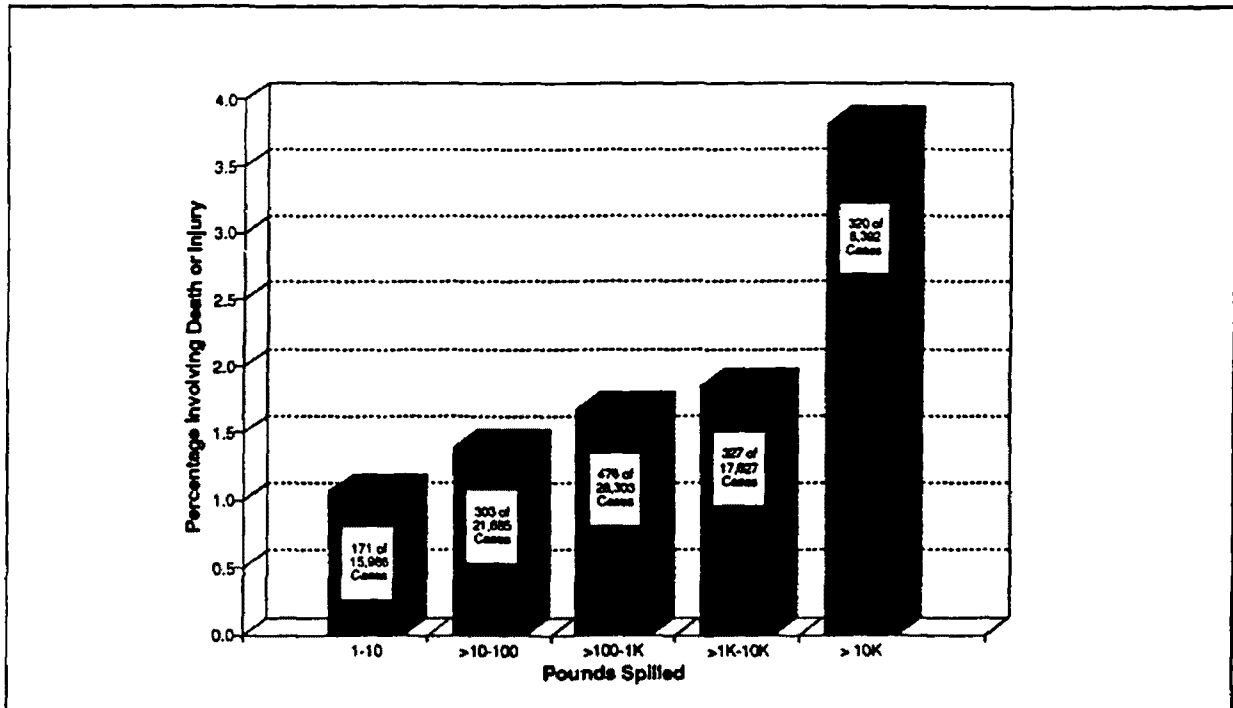
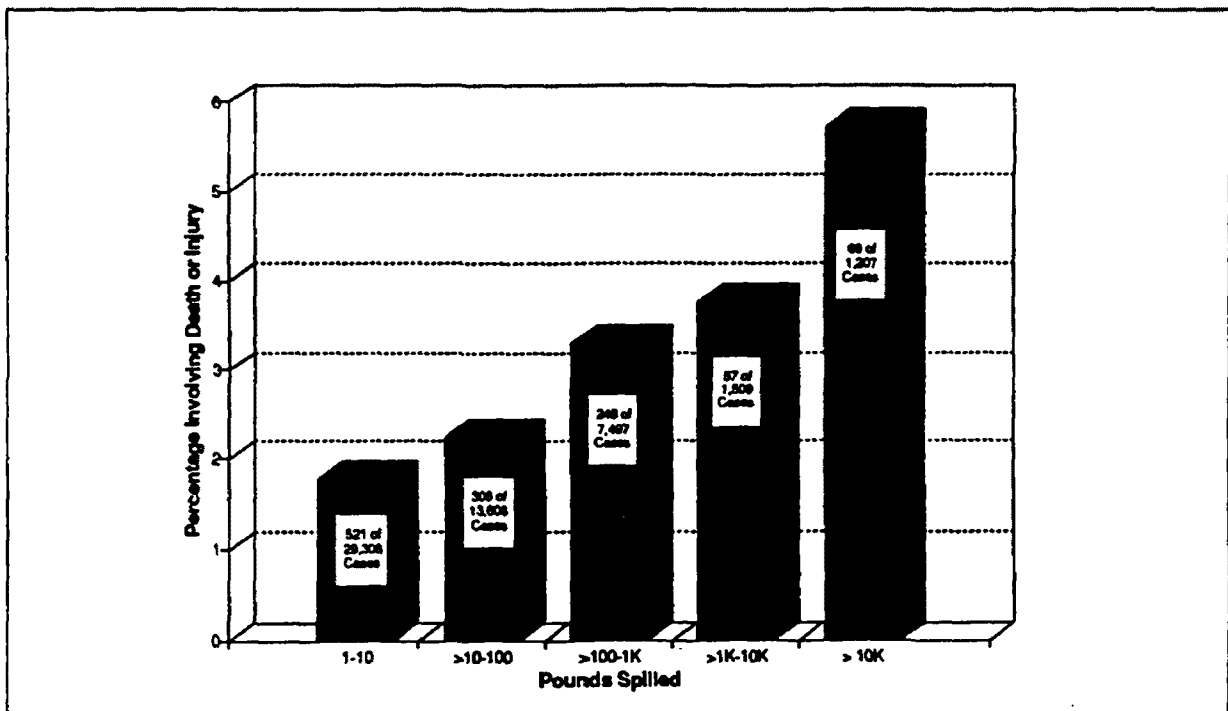


EXHIBIT 2-4



Relationship Between Spill Size and Death or Injury (ERNS data).

EXHIBIT 2-5



Relationship Between Spill Size and Death or Injury (HMIS data).





## CHAPTER 3

### REPORT FROM WORKING GROUP TWO: SHORT-TERM INNOVATIVE SOLUTIONS

#### 3.1 INTRODUCTION

The broad goal of the task force focuses on the issue of identifying potentially dangerous substances that are not adequately regulated and thus pose a significant risk to human health and the environment when released. Working Group 2 was given the general mission of identifying and implementing short-term solutions to the problems resulting from releases of inadequately regulated potentially dangerous substances, including developing possible non-regulatory, innovative approaches. To achieve this goal, Working Group 2 conducted activities under two general tracks:

- Implementation of short-term, regulatory solutions -- focusing on a sub-set of the larger regulatory problem by analyzing the feasibility of establishing ecological and human health criteria that can be used to identify additional substances that should be handled as hazardous materials in transportation; and
- Identification of innovative, non-regulatory solutions -- tapping into the expertise of the various task force members, as well as industry and other members of the public, to identify innovative solutions, including outreach materials and industry/government initiatives.

Working Group 2 was chaired by Jim Jones, Special Assistant to the Assistant Administrator for Prevention, Pesticides, and Toxic Substances (OPPTS), and included representatives from OPPTS, the Office of Solid Waste and Emergency Response (OSWER) and the Office of General Counsel within EPA, and representatives from other Federal government agencies, including the Departments of Agriculture and Transportation and the National Institute of Environmental Health Sciences (NIEHS). Dorothy Canter, Science Advisor to the Assistant Administrator for OSWER, played a critical role in several innovative, non-regulatory initiatives.

#### ACHIEVEMENTS

The specific accomplishments of the working group both in the near term and as part of continuing activities include:

- Implementation of short-term, regulatory solutions -- Creation of workgroup to identify potential ecological and human health criteria for consideration by DOT in identifying additional substances that should be regulated as hazardous materials in transportation.
- Identification of Short-Term, Innovative Solutions -- Identification of innovative approaches to reducing the risk from releases of potentially dangerous substances through: (1) an Open Forum for representatives of interested government agencies, industry, labor, and environmental groups, and the general public to exchange information about initiatives and other activities that could be taken to enhance the prevention and control of releases of potentially dangerous substances; and (2) an information-exchange exercise with task force members to identify other innovative solutions.
- Outreach -- To enhance compliance and control in the short term, development of: (1) an advisory to alert transporters and first responders of the hazards and the reporting requirements that may arise when there is a release of a substance that rapidly forms a CERCLA hazardous substance when released into the environment; and (2) a technical bulletin on metam sodium, its uses, its environmental and human health effects, and ways in which it is regulated.

The achievements of the working group are summarized on this page. Further explanation of the activities and findings under each of these areas is described in more detail in the sections that follow.

### 3.2 CRITERIA FOR REGULATING POTENTIALLY DANGEROUS SUBSTANCES IN TRANSPORTATION

One of the primary issues raised by the July 1991 release of metam sodium was the fact that the metam sodium in concentrations of less than 35 percent was not classified as a hazardous material by DOT and, thus, was not subject to DOT's hazardous materials regulations (HMR). Historically, DOT's primary emphasis has been to regulate the transportation of materials that pose medium and high acute hazards to human health. The HMR both lists specific materials as hazardous and provides criteria for classifying hazards; pursuant to CERCLA section 306, any CERCLA hazardous substance is also listed and regulated as a hazardous material under HMTA. The recent revisions to the HMR set forth in Docket HM-181 (published December 21, 1990) provide additional, expanded criteria for classifying materials as poisonous, including numerical cutoff values for acute toxicity.<sup>3</sup> However, the HMR does not specify set criteria based on ecological and non-acute human health hazards.

In hearings before Congresswoman Barbara Boxer's Subcommittee on Government Activities and Transportation, DOT testified that it looks to EPA to take the lead in identifying substances that pose environmental hazards. In subsequent meetings between EPA and DOT, it was agreed that EPA would investigate the possibility of developing criteria for identifying substances that pose an environmental hazard, as well as substances that pose a human health hazard other than the acute hazards already addressed by DOT in the HMR. EPA would then provide these criteria to DOT for possible incorporation in the HMR.

To initiate the process of providing DOT with criteria, Working Group 2 recommended that EPA establish the Interagency Criteria Development Group to develop options for ecological and human health criteria. The Criteria Development Group established by EPA included representatives from the following EPA offices: Prevention, Pesticides, and Toxic Substances; Solid Waste and Emergency Response; Research and Development; Water, Air and Radiation; and Policy, Planning, and Evaluation; as well as representatives from the Departments of Agriculture, Interior, and Transportation; and the Agency for Toxic Substances and Disease Registry. The Group

further subdivided into subgroups: one to develop ecological effects criteria and the other to develop human health effects criteria. The analysis undertaken and the options developed by each subgroup are described below.

#### Findings

Ecological Effects Subgroup. Given that DOT's HMR currently does not include ecological criteria, the group first identified types of effects (i.e., endpoints) that would address ecological threats posed by substances released in a one-time spill event. Endpoints considered included aquatic acute toxicity, terrestrial avian acute toxicity, and terrestrial mammalian acute toxicity. For each of these endpoints, the group then determined that it was possible to identify different numerical cutoff values to correspond to DOT's Packaging Groups I, II, and III (i.e., those substances posing relatively high, medium, and low hazards, respectively). In establishing the cutoff values, the group considered the potential magnitude of transportation releases and the relative frequency of different sizes of streams and rivers.

Human Health Effects Subgroup. The human health effects subgroup initially determined that it would focus on criteria for human health effects other than acute lethality, which is already addressed by DOT's HMR. It also decided that the criteria should be based on toxicity associated with acute exposure rather than chronic exposure, because acute exposure is generally the primary concern for transportation-related releases. Thus, the criteria focus on *sublethal human health effects of acute exposure*.

The group determined, however, that data - especially numerical toxicity values - for such effects are limited for many substances, and that there are few, if any, existing criteria based on such effects that could be used as precedent. Thus, the group focused the criteria development effort on a small number of sublethal human health endpoints associated with acute exposure: neurotoxicity, developmental toxicity, and reproductive toxicity. Although numerous other endpoints potentially could be of concern, these three were selected because of their severity, their clear and direct association with acute exposures, the (relatively) high likelihood that at least some relevant test data would be available for many substances, and the availability of consensus EPA risk assessment

guidelines for them. The group also determined that, due largely to limitations in data availability, it is not possible at this time to develop scientifically defensible numerical cutoff values for these three endpoints. As a result, the group is considering the development of qualitative criteria that would define each of the three endpoints, so that substances could be classified as either "known to cause" or "not known to cause" the relevant toxic effect(s).

### RECOMMENDATIONS

- **Complete Analysis of Ecological and Non-Acute Human Health Criteria:**  
EPA should continue to analyze issues surrounding the development of ecological and non-acute human health criteria and provide the criteria to DOT for incorporation, if appropriate, in its hazardous materials regulations. EPA also should provide technical support to DOT in its regulation development effort.

### 3.3 INNOVATIVE, NON-REGULATORY SOLUTIONS

In setting the agenda for Working Group 2, EPA recognized that traditional, long-term regulatory approaches may not represent the only way to address the risks posed by releases of unregulated, potentially dangerous substances. In other environmental areas, EPA has developed voluntary programs to achieve tangible environmental benefits through non-traditional, non-regulatory approaches.

To identify a broad range of possible non-traditional approaches, the working group wanted to draw upon the experience and expertise of task force members as well as industry and other members of the general public. Two efforts were undertaken: an internal "brainstorming" effort and an Open Forum with external groups.

As a first step in identifying non-traditional options, the working group sought ideas from the members of the Hazardous Substances Task Force. At the second meeting of the task force, the members were asked to present ideas for both short-term and long-term innovative solutions to the problem of better controlling potentially dangerous substances. This effort resulted in a list

of 35 ideas, which the working group then prioritized and categorized by subject area, including more expansive outreach efforts to improve information about the presence of and methods for responding to releases of potentially dangerous substances; improved training for transporters and emergency responders; and improved accessibility and generation of data on chemical toxicity and hazards.

The working group also sponsored an Open Forum on October 29, 1991, for representatives of interested government agencies, industry, labor, and environmental groups, and the general public. The Open Forum provided an opportunity for these interested parties to exchange information about planned and ongoing initiatives to enhance the prevention and control of releases of potentially dangerous substances, and to provide suggestions for non-traditional actions that the Federal government or private parties could take to address such releases.

The Forum was announced in a Federal Register notice on October 11, 1991 (56 FR 51626). EPA directly contacted potential speakers from organizations representing industry, labor, and environmental<sup>4</sup> concerns, as well as State and local government organizations and academic institutions involved in release prevention and safety. EPA also sent out a mailing to a number of groups that have an interest in release planning and prevention, and in Federal regulatory activities. In addition to EPA and DOT officials, the speakers at the forum included representatives from the following organizations: the Chemical Manufacturers' Association (CMA); the American Association of Railroads; the National Agricultural Chemicals Association; the International Brotherhood of Teamsters; the AFL-CIO Transportation Trades Department; the University of Maryland's Center for Hazard Communication; the Workplace Health Fund and its Center for Emergency Response Planning; and the International City/County Management Association. Also in attendance were representatives from industry, labor, Federal government, and the press.

The Forum began with an overview by EPA and DOT officials on the circumstances and implications of the July 1991 metam sodium spill, and on current DOT and task force efforts to address the problem. The overview presentations also addressed EPA and DOT regulations

governing the designation, control, cleanup, and transportation of potentially dangerous substances. The remainder of the morning session consisted of presentations about planned and ongoing industry, labor, educational, and local government initiatives to prevent and control releases of potentially dangerous substances in transportation and at fixed facilities. The afternoon session focused on information gathering and fact finding from these groups concerning innovative, non-traditional activities that could be undertaken by the Federal government and private parties to prevent and control releases of potentially dangerous substances.

### **Findings**

The innovative ideas generated at both the task force session and the Open Forum indicated a need to focus on improvements in training, communication, and coordination. Participants at the Open Forum identified a lack of information and coordination among regulatory agencies, industry, and the general public as a fundamental problem in preventing and controlling releases of potentially dangerous substances. Many of the initiatives suggested at the meetings were intended to prevent and mitigate releases by providing information and training to workers and emergency response personnel. Specifically, some of the "high priority" suggestions were:

- **Outreach** -- developing various communication tools for informing industry and the public about the need for notification to the National Response Center following a release of a potentially dangerous substance. Specifically, developing television spots to publicize the role of the National Response Center and its phone number; and developing "environmental alert advisories" to discuss voluntary actions that can be taken in response to a release.
- **Training** -- ensuring that the various parties responsible for responding to releases of potentially dangerous substances are provided with adequate training, either by increasing awareness about existing training programs or increasing funds available for training through grants and scholarships.
- **Data** -- identifying and filling gaps in data on potentially dangerous substances to ensure more effective emergency responses, including

data on environmental and health effects, and ways in which releases can be handled.

The specific initiatives already being undertaken in the chemical and transportation industries, labor groups, and academic institutions are presented in the summary of the Open Forum, which is provided as Appendix B to this report.

The speakers at the Open Forum also identified near-term options that could be undertaken by government agencies to prevent and mitigate releases of potentially dangerous substances. In general, these options stressed the need for improved communication and coordination among agencies, adequate training at all levels, and more stringent regulation of chemical production, transportation, and disposal. Some of the specific suggestions made were:

- Improve coordination and communication among those Federal agencies (i.e., DOT, EPA, and OSHA) that each have authority over certain aspects of chemical transportation and use.
- Increase enforcement of worker safety and transportation regulations.
- Provide local governments with greater authority to require release prevention initiatives.
- Emphasize the importance of training and encourage communities to commit resources to training emergency responders.
- Provide training programs to help prepare local officials for emergency response efforts.
- Encourage companies and trade associations to share training initiatives and improve communication among themselves.
- Encourage local emergency planning committees (LEPCs) to use available training programs to ensure consistent, high-quality emergency response training.
- Encourage insurance companies to offer lower premiums to companies that take appropriate release prevention measures.

### RECOMMENDATIONS

- **Enhance the Availability of Information on Potentially Dangerous Substances:** EPA and trade associations (such as CMA) should work with chemical manufacturers to ensure that material safety data sheets (MSDSs) and other emergency response information include all available information that may be pertinent when responding to releases of potentially dangerous substances. This would include any possible breakdown products that may form or any hazardous characteristics (e.g., toxicity, ignitability, reactivity, or corrosivity) that substances may display when they are released in the environment.

### 3.4 OUTREACH

In both the task force session and the Open Forum, the need for communication with industry and between agencies was identified as a key issue in preventing and controlling releases of potentially dangerous substances. Although development and enforcement of regulations will address the problem in the long term, voluntary compliance can be achieved in the short term by informing industry about the problem at hand. Working Group 2 has identified several initiatives that can be undertaken by both government agencies and industry to improve communication and outreach.

#### Advisories

One high-priority innovative solution identified during the task force session was to issue "environmental alert advisories" to discuss voluntary actions that can be taken in response to a release. As a first step, the working group suggested that the Emergency Response Division of EPA's Office of Emergency and Remedial Response develop an advisory focusing on metam sodium. The advisory was intended to increase transporters' and first responders' awareness of the hazards and reporting requirements associated with a situation that they may face, namely, accidents involving chemicals that become CERCLA hazardous substances when they are released into the environment. The advisory discusses characteristics of such chemicals; offers guidelines for transporters and emergency responders for

incident response, transportation safety, and reporting requirements for releases of unknown or hazardous substances; stresses the importance of notifying the National Response Center; and provides contact names and addresses for obtaining further information on emergency response and transportation outreach and training programs.

It is hoped that this advisory will result in increased communication among the parties involved in or responding to these releases. If transporters and first responders are aware of their responsibilities and know what to do when a release occurs, releases of the size and destructive potential of the recent metam sodium spill will be less devastating and more quickly mitigated.

In October 1991, Working Group 2 also issued a technical bulletin containing information about metam sodium, its regulation, and its health and environmental effects. The bulletin discusses the uses of metam sodium, and describes the circumstances under which the July 1991 spill occurred. The bulletin also explains why the particular release of metam sodium was subject to CERCLA provisions, while the chemical itself is not listed as a CERCLA hazardous substance. Finally, the bulletin provides addresses and phone numbers for obtaining further information on CERCLA and designated CERCLA hazardous substances.

### RECOMMENDATIONS

- **Develop Additional Advisories to Enhance Communication:** One or more advisories should be developed to address potentially dangerous substance releases, focusing on substances that are highly toxic, released most frequently or in the greatest quantity, or have been responsible for the most injuries, damage, or deaths when released.

#### Training

Another particularly important issue in improving efforts to prevent and control releases of potentially dangerous substances is the need for adequate training. The need for effective training was repeatedly identified as a high-priority consideration in both the Open Forum and the task force session.

Both the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the Hazardous Materials Transportation Act (HMTA) establish basic authorities, requirements, and programs for training workers in the handling and transportation of potentially dangerous substances, respectively. Some of the more pertinent components include:

- Training Standards -- As required by SARA section 126, OSHA and EPA each issued regulations that establish minimum training standards for employees engaged in responses to releases of potentially dangerous substances. These regulations cover workers at certain facilities who must respond to on-site releases, as well as first responders and HAZMAT teams that respond for the community. The OSHA regulations are codified at 29 CFR 1910.120 and the EPA regulations, which incorporate the OSHA regulations by reference, are codified at 40 CFR 311. DOT also has the responsibility for developing and periodically updating a curriculum which consists of a list of courses and other resources necessary to train public sector emergency response and preparedness teams.
- Worker Training Grants Programs -- SARA section 126(g) assists qualifying non-profit programs in training workers engaged in hazardous waste removal and containment, hazardous material handling, transportation, and emergency response. NIEHS is responsible for this program that now supports more than 60 institutions. Over 200,000 workers nationwide have been trained in the first four years of the program. Section 118 of HMTA, as amended, establishes a similar assistance program specifically for training workers engaged in hazardous materials transportation, which is also administered by NIEHS.
- State/Local Training Grants -- HMTA also provides training funds to States and local governments for use in emergency response training. These DOT funds will be made available beginning in FY93. In addition, LEPCs and their equivalents also may receive grants for planning for transportation emergencies; such grants will help make existing training programs more accessible to State and local planners and responders.

## Findings

The need for effective training has already been demonstrated. One particularly successful example identified by Working Group 2 is the Railway Workers Hazardous Materials Project of the George Meany Center for Labor Studies, which is an NIEHS grantee. Following the metam sodium spill, the Project developed training courses to ensure the protection of workers from harmful exposure to metam sodium. In November 1991, the Project conducted training, in both English and Spanish, for 456 California railworkers in Los Angeles, San Bernadino, Oakland, and Sacramento.

The Railway Workers Hazardous Materials Project provides evidence that there are many opportunities for training currently available in both the private and public sector. In particular, many public training programs that address hazardous materials issues are offered at the Federal and State level. Additionally, public and private academic institutions (e.g., universities and community colleges), as well as private organizations and institutes, offer opportunities for additional training in planning and response to releases of potentially dangerous substances. An abbreviated list of sources of information on training opportunities or additional materials and resources identified by the working group are presented in Exhibit 3-1.

Although there are numerous training opportunities and resources currently available, the working group recognizes that knowledge and use of these training opportunities may be insufficient. Some reasons identified by the working group include:

- Availability of resources -- Even when training information is available, the lack of financial resources or the time to undertake training is often an impediment. These resource and time constraints are particularly true for volunteer fire fighters, who make up the majority of first responders. This problem may be compounded when training efforts are not coordinated and the resulting duplications waste scarce resources.
- Quality of training materials -- High-quality training materials and programs are essential to protecting workers and the community. However, in some cases, although there may

### EXHIBIT 3-1

#### SOURCES OF INFORMATION ON TRAINING RESOURCES AND OPPORTUNITIES

The following is an abbreviated list of some training resources and opportunities identified by the Working Group:

- Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response - This peer-reviewed NIEHS document establishes the minimum criteria for training programs to effectively address the OSHA requirements in 29 CFR 1910.120, and describes minimum generic training curriculum guidelines. This document resulted from an NIEHS-sponsored technical workshop of experts from academia, management, labor, and government, and has had wide technical review in both private and public sectors, including the NRT Training Committee. This document is available from the National Clearinghouse on Occupational and Environmental Health (see below).
- Hazardous Materials Incident Response Training (HMIRT) Program -- The HMIRT program, available from EPA's Environmental Response Team (ERT), is designed for emergency responders and personnel who investigate and clean up uncontrolled hazardous waste sites. The HMIRT program has a curriculum of 12 courses that provide technical and professional training in worker health and safety and in various operations that must be performed by site personnel engaged in hazardous materials response activities. (Note: because these courses are highly technical, they may not be appropriate for all levels of workers.) The course schedule is available from EPA/ERT, 26 West Martin Luther King Drive, Cincinnati, OH 45268, (513) 569-7537.
- Standard Operating Safety Guides (SOSG) and the "Four-Agency" Document - EPA/ERT's SOSG and the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (Four-Agency document), written jointly by OSHA, EPA, NIOSH, and the U.S. Coast Guard, both provide guidance on fulfilling OSHA requirements for training workers engaged in hazardous waste operations and emergency response. SOSG is available through the National Technical Information Service (NTIS) at 703-487-4650. The Four-Agency document is available from NIOSH, Publications C-13, 4676 Columbia Parkway, Cincinnati, OH 45226-1998, (513) 533-8287.
- National Clearinghouse on Occupational and Environmental Health - This clearinghouse, administered by the Workplace Health Fund, disseminates a wide variety of training materials. The clearinghouse is located at 815 16th Street, NW, Suite 301, Washington, DC 20006, (202) 842-7833.
- National Fire Academy and Federal Emergency Management Administration (FEMA) - The National Fire Academy and the Emergency Management Institute of FEMA provide training materials for use by State and local emergency responders. They provide "train-the-trainer" courses at the Emmitsburg, Maryland, facility and disseminate materials to States for use in their own training programs. Contact FEMA, National Emergency Training Center, Emmitsburg, MD 21727-8995.
- Hazardous Materials Information Exchange (HMIX) - HMIX is an electronic bulletin board sponsored by DOT and FEMA, with support from EPA, providing information about training opportunities and facilitating an exchange of information, (708) 972-3275 or FTS 772-3275; for technical assistance: (800) 752-6367.

be funding for training, the materials available may not be of sufficient quality. In particular, training materials may not adequately address the OSHA regulations for hazardous waste operations and emergency response.

- Training appropriateness -- Training material for emergency response may not always be presented in a form appropriate for all audiences; materials may be too technical or provided at a reading level that is inappropriate for certain audiences, or may be in the wrong language. For example, trainers working with the emergency response personnel handling the metam sodium spill reported a need to translate English training material into Spanish. In other cases, the trainers themselves may not be adequately trained to effectively disseminate such training.

## RECOMMENDATIONS

- Ensure that Interested Parties are Informed About Currently Available Training Materials and Ways in Which These Curricula or Materials Can Be Effectively Disseminated: Government agencies involved in the preparation and dissemination of training materials should coordinate their activities to avoid overlaps and confusion and make the most of existing training resources. One focal point for Federal coordination is the NRT Training Committee, which comprises representatives from all key agencies that have training responsibilities. The committee should be fully supported and its efforts expanded to reduce duplication and to ensure adequate dissemination and sharing of training course information.
- Increase Support for Appropriate and Proven Training and Education Programs: Programs such as those supported by EPA, DOT, OSHA, FEMA, and NIEHS should be expanded to continue to provide models for and to stimulate high quality training at the local level.



## CHAPTER 4

### REPORT FROM WORKING GROUP THREE: LONGER-TERM REGULATORY SOLUTIONS

#### 4.1 INTRODUCTION

Working Group 3 of the Hazardous Substances Task Force was charged with identifying and, to the extent possible, developing longer-term, more traditional approaches to preventing and addressing releases of potentially dangerous substances. The approaches pursued by Working Group 3 include the development of a Federal Register Notice that clarifies existing notification requirements under CERCLA; identification of regulatory or guidance options that could be used to require or solicit additional notification to the National Response Center for releases of potentially dangerous substances that cause substantial harm to human health or the environment; and consideration of several different approaches that would add chemicals to the list of hazardous substances under CERCLA, including a methodology to identify criteria that may be used to screen chemical databases to identify potentially dangerous substances that currently are not listed as hazardous substances under CERCLA.

CERCLA defines hazardous substances in section 101(14) by reference to environmental statutes implemented by EPA. In particular, hazardous substances include any substance listed pursuant to sections 307 and 311 of the Clean Water Act (CWA), section 112 of the Clean Air Act (CAA), or section 3001 of the Resource Conservation and Recovery Act (RCRA), those for which action has been taken under section 7 of the Toxic Substances Control Act (TSCA), or any substance specifically designated as hazardous under CERCLA section 102. Persons in charge of facilities or vessels must immediately report releases of CERCLA hazardous substances to the National Response Center, if the release is into the environment in quantities that equal or exceed a reportable quantity (RQ). In addition, persons responsible for a release or potential release of a hazardous substance may be held liable for any response costs and natural resource damage resulting from the release.

An underlying purpose of the Working Group's activities was to explore whether the

#### ACHIEVEMENTS

The working group produced three major documents that together achieved its mandate:

- **Clarification of Reporting Requirements** – a Notice that will be published in the Federal Register that clarifies and reiterates the CERCLA notification requirements.
- **Additional Reporting** – an issues/options paper analyzing several regulatory and guidance options that could result in increased notifications to the National Response Center of any chemical release that directly causes significant adverse effects to human health or the environment.
- **Hazardous Substance Designation** – an evaluation of three different approaches for designating additional chemicals as hazardous substances under CERCLA:
  - (1) an analysis of current Agency authority to immediately designate a chemical that has caused significant damage as a result of a release;
  - (2) an analysis of the advantages and disadvantages of designating potentially dangerous substances on pre-established lists as hazardous substances under CERCLA; and
  - (3) a report on a Strategy for developing criteria to identify potentially dangerous substances that should be considered for designation as hazardous substances under CERCLA, and implementation of that strategy to identify a preliminary list of potentially dangerous substances.

CERCLA hazardous substances list includes, to the extent practicable, all potentially dangerous substances that, when released, pose a serious threat to human health and the environment. Further, the working group examined whether

there is a need for prompt notification to the National Response Center for releases of other potentially dangerous substances that might require a Federal response.

The Working Group's achievements are summarized in the box on the previous page.

Working Group 3 was chaired by Barbara Hostage of the Emergency Response Division in the Office of Emergency and Remedial Response, and included representatives from the EPA Offices of Research and Development; Prevention, Pesticides, and Toxic Substances; Solid Waste; Solid Waste and Emergency Response; General Counsel; and Chemical Emergency Preparedness and Prevention. In addition, representatives from the following Federal agencies provided significant contributions to the working group's efforts: Departments of Agriculture, Interior, and Transportation; National Library of Medicine; National Institute of Environmental Health Sciences; and the Agency for Toxic Substances and Disease Registry.

#### 4.2 CLARIFICATION OF REPORTING REQUIREMENTS

The recent metam sodium spill drew attention to the potential for delays in notification to the National Response Center about releases of substances that are not specifically listed CERCLA hazardous substances, but that nonetheless rapidly form hazardous substances when released into the environment. That spill revealed that persons in charge of facilities or vessels may not be fully aware of the CERCLA section 103 notification requirement to immediately report to the National Response Center the release of a substance that rapidly forms an RQ or more of a RCRA hazardous waste. Because metam sodium, while not specifically designated as a CERCLA hazardous substance, rapidly hydrolyzed and decomposed into at least three specifically listed CERCLA hazardous substances, including hydrogen sulfide, monomethylamine, and carbon disulfide, and exhibited the reactivity characteristic of a RCRA hazardous waste, it became a CERCLA hazardous substance pursuant to CERCLA section 101(14)(C) when released. The metam sodium spill thus should have been reported immediately to the National Response Center.

To improve the likelihood that future releases of substances similar to metam sodium will be immediately reported to the National Response Center, Working Group 3 prepared a draft Federal Register Notice that addresses this issue.

The Notice reiterates the criteria used to define a RCRA characteristic waste and explains that a generally good source of information about a chemical's hazardous characteristics and its potential breakdown products is the material safety data sheet (MSDS). OSHA requires manufacturers to develop MSDSs and to make the MSDS available to downstream processors and users of the chemical pursuant to the requirements of the Hazard Communication Standard (29 CFR 1910.1200). Although information on the MSDS is not always complete and readily comprehensible, the MSDS is at times the primary source of information on a chemical's potential hazards. An MSDS often contains information on the flammability and reactivity of the chemical, based on ratings established by the National Fire Protection Association; these ratings are based on criteria similar to those that define a RCRA characteristic waste. In addition, OSHA published

#### RECOMMENDATIONS

- **Publish the Clarification Notice:** EPA should publish the clarification Notice to enhance the likelihood that potentially dangerous substances that are not specifically listed as hazardous substances under CERCLA would be reported immediately to the National Response Center when they are released at potentially hazardous levels.
- **Encourage Chemical Manufacturers to Include Information in MSDSs about Potential Breakdown Products of Chemicals:** Because transporters, processors, and users of chemicals often must rely on MSDSs as their sole source of information about the potential hazards of chemicals, EPA should work closely with OSHA and with chemical manufacturers to ensure that accurate and complete information about potential hazards, including those associated with breakdown products, of chemicals is included in the MSDSs.

an Advisory in Appendix C to 29 CFR 1910.1200, which lists available sources of information about the hazards of chemicals. The clarification notice references both the Advisory and the Hazard Communication Standard, and reiterates that if a reasonable person should have known that a substance when released would become a RCRA characteristic waste, failure of the person in charge of the vessel or facility to comply with the notification provisions in CERCLA can result in serious penalties. The Notice emphasizes that it is advisable, and parties are encouraged, to report all significant releases of potentially dangerous substances. The message in the Notice is: When in doubt, report.

### 4.3 ADDITIONAL REPORTING

Although the clarification notice described above will enhance the likelihood that the National Response Center will receive an increased number of reports of releases of potentially dangerous substances, the working group concluded that there was still a large universe of substances at fixed facilities and in transportation that, if released into the environment, would currently not be reported to the Federal government because current regulations do not affect these substances.

The working group believes that Federal notification could be enhanced further by developing a regulation that would establish specific reporting triggers that are tied to the potential adverse effects of the release rather than to a specific list of substances. Statutory justification for such regulatory action could be found in CERCLA section 115, which authorizes EPA to promulgate any regulations necessary to implement CERCLA, and 104(e), which authorizes EPA to collect information about releases of potentially dangerous substances so that EPA may carry out its responsibility to respond to releases of pollutants and contaminants under CERCLA section 104(a), and to designate additional substances as hazardous substances under CERCLA section 102.

EPA implements two other statutes that also may provide authorization for a regulation that requires releases of potentially dangerous substances to be reported to the National Response Center: The Clean Air Act (CAA) and the Toxic Substances Control Act (TSCA). Section 112(r)(7) of the CAA provides EPA with general authority to establish regulations requiring

reports of releases of certain substances into the air. This authority, however, would enable EPA only to require reports to the National Response Center of releases to air; CERCLA provides EPA with authority to address releases to all environmental media.

Section 8(e) of TSCA already requires manufacturers, processors, and distributors of chemicals to notify EPA when a release of a chemical causes significant damage to human health or the environment. TSCA, however, does not cover pesticides and certain other categories of substances (e.g., pharmaceuticals). An EPA policy statement issued on March 16, 1978 (43 FR 11110), and currently undergoing revision, nonetheless does require notification to the National Response Center when there is a release of a potentially dangerous substance that causes serious harm to human health or the environment. The TSCA section 8(e) reporting triggers could be clarified to ensure that releases of potentially dangerous substances are reported to the National Response Center in a timely manner. Exhibit 4-1 summarizes some of the issues considered by the working group in considering the various statutory authorities.

The working group also believes that notification to the National Response Center could be enhanced if EPA were to develop a regulation or guidance that identifies which chemicals would be likely to exhibit a characteristic of a RCRA hazardous waste when the chemical is released into the environment. If a chemical, when released, becomes a hazardous waste, it also automatically becomes a CERCLA hazardous substance and persons responsible for the release of such a waste would be subject to CERCLA notification and liability provisions.

### Reporting Triggers

Working Group 3 identified several possible reporting triggers that could be used to require immediate notification to the National Response Center of releases of potentially dangerous substances. For example, death or serious injury where medical attention is needed could be used to ensure that the Federal government is notified about releases of potentially dangerous substances that cause serious acute human health effects. Establishing appropriate reporting triggers, however, that reflect the likelihood that serious environmental or chronic human health effects

## SUMMARY OF REGULATORY OPTIONS

OPTION	ADVANTAGES	DISADVANTAGES
<p>1. Promulgate a regulation under CERCLA sections 104 and 115 that requires notification to the National Response Center when an accidental release of a potentially dangerous substance into the environment causes certain human health and environmental effects or exceeds a specified quantity</p>	<ul style="list-style-type: none"> <li>• Not restricted by substance or media</li> <li>• Requirement could be justified not only on need for designation, but also for response obligation</li> </ul>	<ul style="list-style-type: none"> <li>• Could be controversial because requiring notification of a release of a potentially dangerous substance could lead to eventual designation of that substance as a hazardous substance under CERCLA, with its attached liability</li> </ul>
<p>2. Promulgate a regulation under CERCLA sections 104 and 115 that requires immediate notification to the National Response Center of a release of 100 pounds or more of specifically listed chemicals that are likely to exhibit a RCRA characteristic when released</p> <p>Alternatively, provide list of substances in guidance rather than in CFR table</p>	<ul style="list-style-type: none"> <li>• TSCA and FIFRA labeling requirements could be used to support its implementation</li> <li>• Would promote compliance with existing obligation to immediately report releases of substances that, when released, become RCRA hazardous wastes</li> <li>• Assists EPA in fulfilling its obligation to respond to releases of hazardous wastes</li> </ul>	<ul style="list-style-type: none"> <li>• List of chemicals and criteria may be extremely controversial and difficult to generate</li> <li>• Producers of chemicals will not want their products labeled as hazardous</li> <li>• May overwhelm the National Response Center and Federal response system</li> </ul>
<p>3. Promulgate a regulation under CAA section 112(r)(7) that requires notification to the National Response Center when a release of a potentially dangerous substance into air causes certain specified human health and environmental effects or exceeds a specified quantity</p>	<ul style="list-style-type: none"> <li>• Less direct link to eventual designation of a chemical as a hazardous substance under CERCLA and to CERCLA liability if section 112(r) authority is used</li> <li>• Statutory listing criteria under section 112(r) are analogous to proposed reporting triggers</li> </ul>	<ul style="list-style-type: none"> <li>• CAA section 112(r)(7) only addresses releases of specific substances to the ambient air</li> <li>• CAA section 112 addresses only releases from fixed facilities</li> <li>• Linking the notification regulation to the designation of substances under section 112(b)(2) is closely aligned with CERCLA designation and liability</li> </ul>
<p>4. Revise the Policy Statement under TSCA section 8(e) to clarify the requirement to notify the National Response Center when a release of a chemical causes certain specified human health and environmental effects or exceeds a specified quantity</p>	<ul style="list-style-type: none"> <li>• Implements existing statutory interpretation; could be fairly noncontroversial</li> </ul>	<ul style="list-style-type: none"> <li>• TSCA section 8(e) does not apply to releases that are otherwise required to be reported to EPA</li> <li>• TSCA excludes coverage of chemicals used solely as pesticides</li> </ul>

may occur as a result of an accidental chemical release is more problematic. Possible approaches may include establishing a reporting trigger of "any fish or other wildlife kill directly related to the presence of a released chemical" and/or establishing a specified released quantity as a reporting trigger. The specified quantity could be based on historical release quantities that have been responsible for the majority of serious chemical releases (e.g., 10,000 pounds based on data from ERNS), the highest RQ level of 5,000 pounds, or some other basis.

The success of this regulatory approach is directly related to whether reasonable reporting triggers can be established that are clear and recognizable but not overly inclusive. It is extremely important that a balance be struck between the need to ensure that the National Response Center is notified in a timely manner about any serious release of a potentially dangerous substance and the need to ensure that the Federal response system, as well as that of industry, is not overwhelmed with reports about releases to which the Federal government would never, or rarely, respond, and which are currently being adequately addressed at the local level.

An alternative to this regulatory option would be to adopt the selected reporting triggers as guidance, and to publicize those triggers through such things as advisories to industry trade associations, and to encourage responsible parties to notify the National Response Center on a voluntary basis if a release exceeds one of the designated triggers. This voluntary approach to notification may accomplish the same goals as a notification regulation, but would be less controversial.

#### Products That Exhibit RCRA Characteristics

The Working Group considered development of a second regulation under CERCLA sections 104(e) and 115, or guidance materials, that would enhance the likelihood that releases of chemicals that become RCRA characteristic wastes upon release into the environment are immediately reported to the National Response Center. The regulation or guidance would identify a list of chemicals that, based on their chemical properties, are likely to exhibit RCRA characteristics when released into the environment and become a waste. RCRA characteristic wastes are CERCLA hazardous substances and have an assigned RQ of

100 pounds. Thus, this option would adopt the 100 pound reporting trigger for a specified list of chemicals that exhibit the characteristics of toxicity, ignitability, corrosivity, and reactivity as defined under section 3001 of RCRA.

Promulgation of such a regulation, or adoption of such guidance materials, would not alter existing CERCLA liability or notice requirements; responsible parties may only be held liable for releases or threatened releases of CERCLA hazardous substances. The guidance would only state that such substances have a likelihood of becoming RCRA characteristic wastes upon release. The listed chemicals would not be designated as hazardous substances, and thus would not automatically be subject to CERCLA liability; the status of the released substance under RCRA and CERCLA would depend on whether after a release occurs, the waste indeed meets the definition of a hazardous waste under section 3001 of RCRA. This suggested regulation or guidance would only address notification to the National Response Center, ensuring that the Federal government has the opportunity to evaluate the

#### **RECOMMENDATIONS**

- **Consider Clarifying Reporting Triggers Linked to the Effects of a Release:** EPA should review the reporting triggers under TSCA section 8(e) to determine whether they are adequate to ensure timely notification of releases of potentially dangerous substances that may warrant a Federal response. If necessary, revise the TSCA section 8(e) reporting triggers to provide increased clarity.
- **Develop a List of Chemicals Likely to Become RCRA Characteristic Wastes When Released into the Environment:** To enhance notification to the National Response Center, EPA should provide more information about chemicals that are likely to exhibit the RCRA hazardous waste characteristics if they are released into the environment and not cleaned up. Guidance should be adopted that lists those chemicals that, when released, have a high probability of satisfying the criteria of toxicity, ignitability, corrosivity, and reactivity specified in RCRA regulations defining characteristic wastes (40 CFR part 261.21-24).

release in a timely manner and, if necessary, to respond to the release. Because publication of a regulation or guidance would rely on a specific list of chemicals (and not just specified characteristics), the requirement to report releases of these wastes would be clearer and thus more likely to occur.

The feasibility of this approach depends upon how straightforward it would be to develop a list of chemicals that exhibit the RCRA hazardous waste characteristics when released into the environment. Manufacturers of identified chemicals may vigorously resist any characterization of their chemicals as "hazardous" without specific designation under CERCLA or a showing that the chemical, when released, will become a RCRA hazardous waste.

#### 4.4 DESIGNATION OF HAZARDOUS SUBSTANCES

Several different approaches for expanding the list of hazardous substances designated under CERCLA were explored by Working Group 3, including: (1) automatically designating any chemical that, upon release to the environment, has been shown to cause significant damage to human health or the environment (e.g., metam sodium); (2) initiating a rulemaking to designate under CERCLA the marine pollutants in MARPOL Annex III (which include metam sodium); and (3) developing criteria for identifying potentially dangerous substances that should be designated as hazardous substances under CERCLA.

##### Immediate Designation

In response to a request from Congresswoman Boxer, the working group evaluated invoking the "good cause" exception contained in the Administrative Procedure Act (APA) to immediately designate metam sodium as a hazardous substance under CERCLA. Section 553 of the APA requires that administrative rules and regulations be promulgated pursuant to "notice and comment." Subsection (b)(3)(B) provides an exception to the notice and comment requirement "when the agency for good cause finds ... that notice and public procedure thereon are impracticable, unnecessary, or contrary to the public interest." Pursuant to that exception, EPA may promulgate an interim final rule that would take effect immediately upon promulgation when

the Agency can show "good cause" for not following normal notice and comment procedures.

After considerable scrutiny of this provision, it was determined that it would be inappropriate to list metam sodium as a hazardous substance without notice and comment.

In a letter to Congresswoman Boxer on October 29, 1991, Don Clay, the Assistant Administrator for OSWER explained the Agency's position. He stated that although it was of foremost importance to EPA that the metam sodium spill had caused significant environmental abuse to a 45-mile stretch of the Sacramento River, including abundant fish and animals killed, restrictions on recreation, and potential human health consequences, the Agency believed it was inappropriate to pursue an immediate hazardous substance designation by invoking the "good cause" exception to the APA. That decision in no way should suggest, however, that EPA did not consider this an issue of serious importance. As a result of the release, EPA has initiated a broad review of the regulatory framework through which the Agency responds to releases of substances like metam sodium.

The APA requires that regulations be promulgated pursuant to notice and comment unless the Agency for "good cause" finds that such procedures are impracticable, unnecessary, or contrary to the public interest. Because metam sodium, when released, rapidly formed CERCLA hazardous substances when it came in contact with water, and became a hazardous waste under RCRA, the CERCLA reporting and response authorities were triggered at the time the release occurred or shortly thereafter. Thus, the immediate listing of metam sodium as a CERCLA hazardous substance would not accord the Agency significant additional reporting or response authority.

Further, EPA believes that the underpinnings of notice and comment rulemaking should not be disregarded lightly. In fact, the importance of notice and comment is underscored by EPA's recent efforts to promulgate a rule to designate 226 extremely hazardous substances (EHSs) as CERCLA hazardous substances. Among these 226 EHSs are 29 pesticides, many of which are more acutely toxic to humans than metam sodium. Nonetheless, EPA is following notice and comment rulemaking procedures in seeking to list these

extremely toxic chemicals. The Agency believes it would be inappropriate to invoke the "good cause" exception to the APA for metam sodium when that exception was not evoked for the 226 EHSs.

In sum, EPA has determined that invocation of the "good cause" exception would not be appropriate for metam sodium. In the future, however, the Agency is not precluded from invoking that exception to designate other substances in appropriate circumstances.

#### Designation of MARPOL Annex III Marine Pollutants

The MARPOL Annex III list of pollutants, which includes metam sodium, is made up of marine pollutants and severe marine pollutants that are regulated while in maritime transit under an international treaty known as the 1978 Protocol to the International Convention for the Prevention of Pollution from Ships, or the MARPOL Protocol. Annex III "responds to concerns about the possible adverse environmental impact of packaged harmful substances entering the marine environment due to ship collisions, grounding, and other accidental and operational causes." On June 10, 1991, the President signed Annex III of the MARPOL Convention with no resolutions or reservations; MARPOL Annex III becomes effective on July 1, 1992.

Annex III of MARPOL is titled "Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form" and applies to all ships. Annex III's major provisions include: (1) a requirement that packaging of harmful substances be adequate to minimize the hazard to the marine environment posed by the package's specific contents; (2) a requirement that packages be marked with a durable and distinctive label which identifies the contents and that the contents are potentially harmful; (3) a requirement that packages be stowed onboard ship in a way that minimizes the risk to the marine environment; (4) a requirement that the vessels carry a special list or manifest setting forth the harmful substances on board, and where they are stowed; and (5) permission for parties to prohibit or impose quantity limitations on the carriage of certain substances.

Annex III regulates over 400 harmful substances. Many of these pollutants have an extremely high potential to cause significant

adverse human health and environmental effects upon release into the environment. One hundred and fifty-three (153) of the MARPOL Annex III pollutants are already on the list of CERCLA hazardous substances. Twenty-nine (29) of the MARPOL Annex III pollutants are EHSs already proposed to be designated as CERCLA hazardous substances (54 FR 3388, January 23, 1989). There are 241 MARPOL Annex III pollutants, however, that are not currently CERCLA hazardous substances and have not yet been proposed for designation as CERCLA hazardous substances.

For the purposes of Annex III, substances identified by any one of the following criteria are marine pollutants: (1) substances that bioaccumulate to a significant extent and are known to produce a hazard to aquatic life or to human health; (2) substances that bioaccumulate with attendant risk to aquatic organisms or to human health with a short retention of the order of one week or less; (3) substances that are highly toxic to aquatic life; or (4) substances that are liable to produce tainting of seafood.

The working group considered whether all Annex III marine pollutants should be designated as hazardous substances under CERCLA because the MARPOL pollutants could be released into navigable waters of the United States and could cause severe damage; except for those pollutants already designated as CERCLA hazardous substances, parties responsible for such releases would generally not be subject to CERCLA notification requirements.

The working group was concerned, however, that not all marine pollutants on the MARPOL Annex III list are considered to be toxic. For example, nine of the pollutants are on the list because they can taint seafood (i.e., affect the smell or taste, not the safety). Such a characteristic may not be sufficient to warrant designating the pollutant as a hazardous substance under CERCLA.

Further, because DOT has proposed to regulate the MARPOL Annex III pollutants as hazardous materials, the benefits from EPA regulatory action under CERCLA would be less significant.

The working group believed that a better alternative to designating all MARPOL Annex III marine pollutants as hazardous substances under

CERCLA would be to develop criteria that could be used to screen databases and lists of chemicals for the most potentially dangerous substances that are currently not on the CERCLA list of hazardous substances. Any pollutants on the MARPOL Annex III list that met those criteria would be considered for designation, along with other potentially dangerous substances. The criteria could be used to identify and designate the subset of MARPOL Annex III pollutants that most warrant listing.

### Designation Criteria

Specific designation of potentially dangerous substances as hazardous substances under CERCLA would subject them to regulatory control and should minimize the occurrence of accidental releases and the consequent damage. Currently, there are 783 designated CERCLA hazardous substances derived from the lists under the CWA, CAA, and RCRA, including 51 hazardous air pollutants (46 individual substances and 5 categories) added by Congress under the CAA Amendments of 1990.<sup>5</sup> In addition, EPA has proposed to designate 226 EHSs listed pursuant to section 302 of Title III of SARA.

To designate a substance as hazardous under CERCLA section 102(a), EPA must be able to show that the substance, "when released in the environment may present substantial danger to the public health or welfare or the environment." To date, EPA has not developed quantitative criteria to serve as a designation standard under CERCLA. The working group, therefore, devoted considerable energies to reviewing criteria and evaluating the implications of selecting those criteria for the universe of potentially dangerous substances that would be considered for designation under CERCLA.

The working group used screening criteria that included measures of the following types of effects, reflecting CERCLA's mandate to protect human health, welfare, and the environment: acute, chronic, and potential carcinogenic effects to human health; physical effects such as ignitability and reactivity; and ecological effects. The screening criteria enabled the working group to search large databases electronically, which was the most feasible way initially to examine large numbers of substances. It was anticipated that this would be a process that would undergo a series of

refinements and the substances identified would be further evaluated.

To measure the potential adverse effects on human health, substances that exhibit acute mammalian toxicity (as measured by an LD<sub>50</sub> or LC<sub>50</sub> below specified levels) were screened considering oral, dermal, and inhalation routes of exposure. The screening levels selected for each exposure route are shown in Exhibit 4-2 and are based on the methodology used to adjust RQs under CERCLA section 102.

Reproductive effects were the primary non-carcinogenic chronic effect considered by the working group, although other criteria were considered indirectly by augmenting the candidate chemical list with the nine additional substances not currently on the CERCLA list of hazardous substances that were identified as chronic toxicants by OSHA and the National Institute of Occupational Safety and Health (NIOSH).<sup>6</sup>

Substances also were included as candidates for designation if they are considered to be potential human carcinogens based on analyses performed by the International Agency for Research on Cancer (IARC) or by the National Toxicology Program (NTP). Potential human carcinogens were identified by these organizations through the review of bioassay data that indicated potential human carcinogenicity based on human or animal evidence studies, while noting varying degrees of certainty associated with the research. IARC potential human carcinogens were included if IARC assigned the substance to Groups 1, 2A or 2B; NTP potential human carcinogens were included if they were contained in the Fifth Annual NTP Report on Carcinogens.

For ecological considerations, aquatic toxicity criteria were selected as a preliminary screening criterion. Physical criteria (i.e., ignitability/flammability and reactivity) also were considered, although at this time the screening criteria included primarily non-quantitative key word searches (e.g., an electronic search for "flammable").

The working group used five screening levels for acute and chronic mammalian toxicity, aquatic toxicity, and ignitability; the five levels are equivalent to the thresholds used to adjust final RQs under CERCLA. The RQ levels were used



## EXHIBIT 4-2

### SCREENING CRITERIA BY LEVEL

Criteria	Acute Mammalian Toxicity			Aquatic LC <sub>50</sub> (mg/l)	Ignitability
	Oral LD <sub>50</sub> (mg/kg)	Dermal LD <sub>50</sub> (mg/kg)	Inhalation LC <sub>50</sub>		
Level 1	0 to < 0.1	0 to < 0.04	0 to < 0.4 ppm	0 to < 0.1	Not used
Level 2	0 to < 1	0 to < 0.4	0 to < 4 ppm	0 to < 1	Pyrophoric or self ignitable
Level 3	0 to < 10	0 to < 4	0 to < 40 ppm	0 to < 10	FP < 100°F BP < 100°F
Level 4	0 to < 100	0 to < 40	0 to < 400 ppm	0 to < 100	FP < 100°F BP ≥ 100°F
Level 5	0 to < 500	0 to < 200	0 to < 2000 ppm	0 to < 500	FP < 140°F

<sup>1</sup> Searches were also conducted for data expressed in mg/m<sup>3</sup>.

### ADDITIONAL SCREENING CRITERIA

Additional screening criteria were applied to databases.

Carcinogenicity	Reactivity	Chronic Toxicity
1. Listed in IARC 1A, 2A, 2B or 2. Listed in the Fifth Annual NTP Report on Carcinogens	Textual search for keywords such as detonation, polymerize, and stabilizer.	Search on RTECS for reproductive effects, plus additional NIOSH chronic toxicants.

\* The TSCA and FIFRA inventories were screened to eliminate chemicals that are not currently in production.

## EXHIBIT 4-3

### NUMBER OF POTENTIALLY DANGEROUS SUBSTANCES MEETING EACH CRITERIA LEVEL<sup>1</sup>

	Standard Species	Unspecified Species
Level 1	147	268
Level 2	250	466
Level 3	594	923
Level 4	1,057	1,540
Level 5	1,506	2,131

<sup>1</sup> The fathead minnow and the bluegill are standard species for aquatic toxicity, and the rat is the standard species for acute mammalian toxicity and chronic toxicity.

as preliminary screening criteria because they are quantitative and allow for fairly straightforward electronic screening of large databases. Chemical databases were screened at each of the five levels for toxicity data based on studies using standard and "unspecified" species.

A final screening criterion was used to preserve on the candidate list only those substances that are not currently in commercial production. Presence on either the list of pesticide active ingredients pursuant to FIFRA or on the publicly available portion of the TSCA Inventory served to efficiently identify substances that are more likely to pose a threat to human health, welfare, and the environment. The working group assumed that substances not produced or used in commerce are less likely to be released into the environment and exposure to such chemicals would likely be minimal.

The working group developed and analyzed the effects of these human health and environmental screening criteria assuming that there would be ample opportunity later to carefully augment and modify the criteria. For example, members of the working group raised particular concerns about the criteria used to identify potential chronic toxicants and other toxicants that induce chronic effects following acute exposure, as well as ecological toxicants. The lack of precise quantitative criteria for the former and reliance solely on aquatic toxicity for the latter caused some concern for working group members. Before any rulemaking proceeds, therefore, the working group strongly recommends that the screening criteria be carefully reviewed and revised as necessary; none of the criteria should be considered final.

#### Databases

Three primary databases were considered for the first tier screening: the Registry of Toxic Effects of Chemical Substances (RTECS), Aquatic Information and Retrieval (AQUIRE), and the MERCK database. RTECS was selected as a starting point because it contains toxicity data on approximately 110,000 chemicals. A chemical is listed in RTECS if there is at least one documented positive study indicating that it is toxic. IARC data were accessed through data fields in RTECS. Similarly, there are fields in RTECS that identify those chemicals on the publicly available TSCA Inventory and/or on the FIFRA list of pesticide active ingredients.

As the primary source of aquatic toxicity data, the AQUIRE database was consulted. AQUIRE has information on approximately 4,000 chemicals. The information on ignitability and reactivity was obtained from the MERCK database, an index developed by the MERCK Company that includes information on ignitability, reactivity, and corrosivity for approximately 10,000 chemicals.

Two chemical lists were consulted subsequently to the screening analysis to begin to test the comprehensiveness of the screening criteria: the MARPOL Annex III list of marine pollutants that contains 270 substances not currently listed as CERCLA hazardous substances (all but nine marine pollutants were identified based on the screening criteria; metam sodium was identified as Level 2), and the list of 226 EHSs not on the CERCLA hazardous substances list.

Exhibit 4-2 presents the five screening levels and their associated criteria used to identify potentially dangerous substances that are currently not designated as hazardous substances under CERCLA. Exhibit 4-3 shows the number of substances that would be affected if EPA selected each screening level.

#### Additional Screening Criteria

Besides considering modified screening criteria to identify chronic and ecological toxicants, the working group believes it is appropriate to consider additional criteria to further narrow and fine-tune the candidate list. One possible criterion could be a minimum production level for candidate chemicals because chemicals produced in small quantities are less likely to be transported and used at different facilities and thus may pose a lower hazard. A production level threshold of 10,000 pounds could be considered, based on the fact that such a threshold was used to develop the list of regulated substances under CAA section 112(r) and to require reporting of toxic chemicals under SARA Title III section 313. Alternatively, a threshold could be established by analyzing production levels for chemicals that have caused serious adverse effects in the past.

The working group acknowledges that there is a potential problem in using production levels as a screening criterion for designating substances as hazardous substances under CERCLA; namely, production can change relatively quickly and, indeed, has been known to change in response to

regulatory actions. Nonetheless, the working group believes that such a criterion should be given serious consideration by future workgroups finalizing designation screening criteria.

A second screening criterion that should be considered would be release history. Consideration should be given to those substances that have been released in the past and have caused significant damage to human health or the environment. For example, Working Group 1 identified a list of potentially dangerous substances that caused death, injury, or environmental/property damage when released in the past. These substances should be considered carefully for designation as hazardous substances under CERCLA.

Finally, because the RQ adjustment criteria are not risk based, it may be appropriate to analyze the potential risks attributable to releases of the candidate chemicals. This final risk analysis could be used to further identify the substances of greatest concern. It would be important, however, that the risk models rely on the equations and default values contained in the *Risk Assessment Guidance for Superfund* and that they consider both episodic acute exposures and continuous chronic exposures caused by releases of these potentially dangerous substances. The risk analysis also could be used to quantify the benefits associated with designating these chemicals as hazardous substances under CERCLA.

## RECOMMENDATIONS

- **Resolve Issues Related to Designation of EHSs Prior to Developing Criteria:**  
Several issues surrounding the Agency's efforts to designate EHSs as CERCLA hazardous substances could significantly affect any designation criteria. These issues should be resolved, therefore, prior to moving forward with criteria development under CERCLA.
- **Consider Refining Screening Criteria, Validating Data, and Establishing Priorities for Designating Chemicals As Hazardous Substances under CERCLA:**  
The results of the analysis, although preliminary, indicate that there are potentially dangerous substances in commerce such as metam sodium that should be considered for designation under CERCLA. No definitive candidate chemical list can be generated based on this preliminary analysis, however, until there is opportunity for a comprehensive review of the studies and data supporting the toxicity findings. Serious consideration should be given to convening an interagency workgroup to develop additional criteria or take other actions to refine or expand upon the approach and analysis conducted by the working group thus far.

## ENDNOTES FOR DOCUMENT

1. Reports of releases of potentially dangerous substances may be made to the National Response Center for a variety of reasons. Many Federal statutes and regulations direct release reports to the National Response Center, including the Toxic Substances Control Act, HMTA, CERCLA, CWA, and others.
2. Copies of the ERNS data analyses are available from EPA through the ERNS Program Manager, (202) 260-2342.
3. These criteria will be phased-in over the next three years, but voluntary compliance is encouraged until the regulations are in effect. It should be noted that the new criteria would have covered the transport of metam sodium if the concentration of the mixture being transported was at least 35 percent metam sodium; however, in the July 1991 incident, the mixture was only 32 percent.
4. Although a number of environmental organizations were contacted and invited to speak at the Open Forum, all of the groups declined because of prior obligations.
5. CERCLA section 101(14) defines hazardous substance to include (A) any substance designated pursuant to section 311 of the Clean Water Act (CWA), (B) any element, compound, mixture, solution, or substance designated pursuant to section 102 of CERCLA, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of RCRA, (D) any toxic pollutant listed under section 307 of the CWA, (E) any hazardous air pollutant listed under section 112 of the Clean Air Act, and (F) any imminently hazardous chemical substance or mixture with respect to which EPA has taken action pursuant to section 7 of the Toxic Substances Control Act.
6. The nine additional chronic toxicants were identified in the NIOSH Recommendations for Occupational Safety and Health Standards (1988). The nine toxicants are: carbon black, carbon monoxide, carbon dioxide, cobalt, furfural alcohol, isopropyl alcohol, 2-nitronaphthalene, phenol-beta-naphthylamine, and zinc oxide.

## LIST OF ACRONYMS

AHE	-	Acute Hazardous Events
APA	-	Administrative Procedure Act
AQUIRE	-	Aquatic Information and Retrieval
ARIP	-	Accidental Release Information Program
ATSDR	-	Agency for Toxic Substances and Disease Registry
CAA	-	Clean Air Act
CASRN	-	Chemical Abstracts Service Registry Number
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	-	Clean Water Act
DOT	-	Department of Transportation
EHS	-	Extremely Hazardous Substance
EPA	-	Environmental Protection Agency
ERNS	-	Emergency Response Notification System
FEMA	-	Federal Emergency Management Agency
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
HMIS	-	Hazardous Materials Information System
HMR	-	Hazardous Materials Regulations
HMTA	-	Hazardous Materials Transportation Act
HSEES	-	Hazardous Substance Emergency Event Surveillance
IARC	-	International Agency for Research on Cancer
LEPC	-	Local Emergency Planning Committee
NIEHS	-	National Institute of Environmental Health Sciences
NIOSH	-	National Institute of Occupational Safety and Health
NRC	-	National Response Center
NRT	-	National Response Team

**LIST OF ACRONYMS**  
(continued)

NTP	-	National Toxicology Program
OSC	-	On-Scene Coordinator
OSHA	-	Occupational Safety and Health Administration
RCRA	-	Resource Conservation and Recovery Act
RSPA	-	Research and Special Programs Administration
RTECS	-	Registry of Toxic Effects of Chemical Substances
SARA	-	Superfund Amendments and Reauthorization Act of 1986
SERC	-	State Emergency Response Commission
TSCA	-	Toxic Substances Control Act

**REPORT OF THE  
HAZARDOUS SUBSTANCES TASK FORCE**

**APPENDIX A**

**Case Study of the  
July 14, 1991  
Cantara Loop Train Derailment**

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## INTRODUCTION

This case study is an overview of the events that occurred during and after the derailment of a Southern Pacific train car containing the pesticide metam sodium on July 14, 1991, near Dunsmuir, California. The train car was carrying approximately 19,500 gallons of metam sodium which spilled into the Sacramento River, resulting in extensive environmental damage, adverse health effects that ranged from minor irritations to nausea, and reduced tourism in a town known for its location on and near world class fishing streams. The spill has called into question the adequacy of existing methods for transporting hazardous materials and other potentially dangerous substances, and controlling them when released, and has prompted policymakers to examine the process of reporting and responding to environmental disasters.

This case study summarizes information gathered from a number of different Federal and State regulatory authorities, as well as from Southern Pacific Transportation Company (the owner of the train from which the release occurred), to provide a context in which to understand and apply the task force's findings and recommendations. The case study is organized into sections on the uses and regulation of metam sodium, a summary of the accident, notification and response activities, information on health and environmental effects, and a description of post-release activities.

## USES AND REGULATION OF METAM SODIUM

Metam sodium is a soil-applied pesticide for soil fungi, weed seeds, nematodes, and soil insects, and is used in the United States primarily on potato crops. As shipped on July 14, 1991, metam sodium was not regulated as a hazardous material by the DOT under HMTA.

Under CERCLA, as amended, a potentially dangerous substance is a hazardous substance if it is listed or designated pursuant to the authority of specific environmental statutes listed in CERCLA section 101(14), including the Clean Water Act, Clean Air Act, RCRA, and CERCLA section 102, or if action has been taken with respect thereto under section 7 of TSCA. Metam sodium is not a specifically listed CERCLA hazardous substance.

The release of metam sodium on July 14, 1991, however, was subject to the reporting and liability provisions of CERCLA because, when released, the metam sodium rapidly hydrolyzed and decomposed to form several different specifically listed hazardous substances, and because metam sodium became a hazardous waste as defined under section 3001 of RCRA.

Under the Federal Insecticide, Fungicide, and Rodenticide Act, metam sodium is regulated as an active ingredient in registered pesticide products. It also is a marine pollutant under MARPOL Annex II and III<sup>1</sup>; and is a hazardous and dangerous material under U.S. Coast Guard regulations governing shipment of materials by vessels.

## ACCIDENT SUMMARY

On Sunday, July 14, 1991, a Southern Pacific train derailed just north of Dunsmuir, California, on a section of track known as the Cantara Loop. Several cars fell down a 25-foot rocky embankment into the Sacramento River. The tank car positioned five cars behind the locomotive was thrust into an inverted position and sustained punctures above and below the waterline. This tank car contained approximately 19,500 gallons of metam sodium, and within a very short time, virtually all of the pesticide was released into the Sacramento River.

The exact cause of the Dunsmuir spill is still under investigation, but Southern Pacific has suggested several factors as possible contributors to the incident: the positioning of the tank car close to the head of the train immediately behind a long empty flat car; extreme draw-bar forces; a sharp throttle increase; the steep grade that includes several sharp curves; and the positioning of cars loaded with scrap metal at the rear of the train, which consisted predominantly of empty cars.

## NOTIFICATION AND RESPONSE ACTIONS

The derailment occurred at approximately 9:40 p.m. and was first reported by Southern Pacific to the California Office of Emergency Services (OES) just before 11:00 p.m. Southern Pacific did not report at that time that the tank car containing the metam sodium had ruptured or that there was a release of pesticide into the Sacramento River. At

11:40, California Department of Fish and Game (DFG) officials arrived at the scene. Southern Pacific notified the National Response Center about the derailment at 1:20 a.m. on July 15, 1991, more than three hours after the incident. At 3:30 a.m., the On-Scene Coordinator (OSC) from USEPA Region 9 contacted the California DFG to offer assistance, but was told at that time that no assistance was needed because no release had occurred. At 5:45 a.m. on July 15, California DFG officials notified USEPA Region 9 that a three-inch hole in the tank car had been located and metam sodium was indeed being released from the car into the Sacramento River. The USEPA Region 9 OSC again offered to assist the State in the response; however, State officials again declined the offer, believing at the time that the situation was under control. The addendum to this case study presents a chronology that summarizes the notification and response activities that occurred during the first three days of the spill.

Later on the morning of July 15, 1991, the California OES and California DFG notified USEPA Region 9 that the spill was more serious than originally reported and that the Sacramento River appeared to be seriously affected. In response to this report, but still without request by the State of California, two USEPA OSCs began the 5-hour drive from San Francisco to Dunsmuir and arrived at the spill scene at approximately 5:00 p.m., July 15, 1991. Simultaneously, USEPA requested that the U.S. Coast Guard Pacific Strike Team (PST) also respond to the release. The State of California formally requested Federal USEPA assistance at approximately 1:00 p.m., when it was confirmed that virtually all of the contents of the tank car had spilled into the Sacramento River.

The response was organized under the structure of the Incident Command System<sup>2</sup> with the California DFG and California Division of Forestry and Fire Protection sharing the command. More than 60 Federal, State, local, and private agencies and organizations participated in the response. The USEPA, in conjunction with several California State agencies, ensured that appropriate response actions were (and continue to be) taken. For example, upon arrival, the USEPA OSCs established an exclusion and contaminant reduction zone, and met with the California Department of Occupational Safety and Health to discuss safety

planning. The OSCs oversaw the removal of residual metam sodium from the tank car, and removal of the tank car from the river. The USEPA issued an enforcement order under section 106 of CERCLA to ensure that Southern Pacific undertook appropriate response activities. The CERCLA trust fund, Superfund, was accessed to finance an emergency response for a plume interdiction operation at Lake Shasta.

Once the severity of the spill was fully realized, the two counties bordering the spill area declared local emergencies and activated their emergency response systems. A Shasta County emergency response center was opened in Redding, and a Siskiyou County center was established in the city of Mt. Shasta. The California DFG acted as the State Agency Coordinator at the Incident Command Center, and was responsible for assigning key staff to both of the county centers. Officials at these centers focused on evaluating the spill impact on the environment and public health.

On July 15, 1991, a planning meeting was held to organize local agencies and coordinate response activities. Representatives from the USEPA and the Coast Guard PST met with representatives of Southern Pacific on July 16, 1991, to discuss details of the response action. On July 16, the residual material remaining in the tank car was removed and the tank car itself was removed from the river. Analysis of air and water samples showed levels above the human health warning limits of methylisothiocyanate, a harmful breakdown product of metam sodium.

Southern Pacific hired a clean-up contractor to contain the spill. Various proposals for containment or cleanup were discussed among Southern Pacific and the governmental agencies. The proposals included reducing the river flow in affected areas to facilitate use of activated carbon treatment; pumping contaminated water from pooled areas into rail cars and/or trucks; and dissipating the plume by aerating and agitating the water. On July 19, the Incident Commander approved initiation of plume aeration in Lake Shasta. These aeration activities commenced on July 20.

In addition to providing on-site technical assistance, the USEPA set up an "air curtain" downstream from the Southern Pacific operations

as a plume interdiction measure. The air curtain was designed to remove residual substances that escaped the aeration system. The USEPA also assessed treatment methods for substances entering Lake Shasta; made available EPA's remote submarine to conduct subsurface monitoring and sampling; and provided assistance to California DFG with the Department's natural resource damage assessment plan. In addition, the USEPA participated in a public meeting to discuss the spill and response, status of the river restoration, enforcement, and economic and financial reimbursements.

## HEALTH EFFECTS

Exposure to metam sodium has the potential for causing adverse health effects from both acute and chronic exposures.<sup>3</sup> In addition, existing medical conditions may be exacerbated upon exposure to metam sodium. Examples of acute health effects include excessive salivation, sweating, fatigue, weakness, nausea, headache, dizziness, and eye and respiratory tract irritation. Chronic conditions can include conjunctivitis, photophobia, and blurred vision. Studies also have suggested that the chemical may exhibit reproductive toxicity. Medical conditions that are prone to further aggravation upon exposure to metam sodium include impaired pulmonary functions and pre-existing eye problems.

A California Department of Health Services physician, Dr. Lynn Goldman, testified that exposure to metam sodium particularly affected citizens with pre-existing conditions, many of whom had lower immunity at the time of the spill, putting them at greater risk for exposure-related ailments. Emergency room records at the local hospital indicate increased activity levels in the aftermath of the spill. Between July 15 and July 31, for example, there were 252 visits to the emergency room, compared with eight visits for the first three weeks in August.<sup>4</sup> The most common symptoms were nausea (reported in 51% of patients), headaches (44%), eye irritation (40%), throat irritation (26%), dizziness (23%), and shortness of breath (21%).

Pregnant women are of special concern to health officials and continue to be monitored as a group because they have an elevated risk for chemical exposure-related medical problems<sup>5</sup>.

The fetuses of pregnant women exposed during the first few weeks of pregnancy may be at increased risk for neural tube defects. The California Department of Health Services advised pregnant women to undergo a test to screen for this type of birth defect if they were in the first trimester of pregnancy.

## ENVIRONMENTAL EFFECTS

The California DFG has primary responsibility for assessing the total resource damage attributable to the metam sodium spill. According to early accounts, all aquatic life and substantial amounts of vegetation along a 45-mile stretch of river leading to Lake Shasta was destroyed. Several sources place the number of fish killed at more than 200,000. The area affected by the spill supports more than 240 species of wildlife, including 75 mammalian species; 17 reptile species; 14 amphibian species; and 140 bird species. Among the mammals are the black bear, black-tailed deer, mountain lion, coyote, raccoon, river otter, and mink. The birds include several species of songbirds, hawks, and owls, as well as the flycatcher, bald eagle, and osprey. The amphibians include several species of salamanders and frogs; reptiles include the western pond turtle, three lizard species, and 12 snake species. In addition, a large number of insect species are found in this habitat. Several of the species potentially affected by the spill are considered endangered or threatened, including the bald eagle, Swainson's hawk, peregrine falcon, and wolverine.

It is clear from early assessments that the spill dramatically altered the ecological system. In their recently published draft Natural Resource Damage Assessment Plan, the California DFG outlines plans for assessing longer term damage to species known to be injured, and those suspected to be injured, by the spill.

Assessments indicate that the spill has not affected the drinking water supply to the residents of Dunsmuir, and California DFG biologists have noted that insects, algae, and small trout are returning to the river faster than originally anticipated. Naturalists fear, however, that large trees lining the banks may die within a few years, and would not be fully replaced for up to 50 years.

## **POST ACCIDENT ACTIVITIES**

Due to the severity of the spill, several Federal, State, and local agencies are conducting investigations in an attempt to determine the long-term effects of the spill and to assess how similar releases might be prevented in the future. In addition, support services are being offered by Southern Pacific, that will provide the town of Dunsmuir needed health and financial resources.

### **Southern Pacific Support Services**

Southern Pacific has taken several measures to reduce the burden placed on the citizens of Dunsmuir as a result of the spill. Southern Pacific reports that the company has spent approximately \$3 million for spill-related clean-up, medical check-ups, economic recovery, and for other purposes. Southern Pacific also established a community relations office in Dunsmuir to encourage dialogue between top Southern Pacific officials and the citizens of the region and opened a claims office to reimburse certain expenses incurred as a result of the spill. As of October, 1991, Southern Pacific reports it had received over 1,400 claims and made payment on 500 of these claims.

### **California DFG Resource Damage Assessment**

Immediately following the spill, the California DFG announced plans to conduct a comprehensive natural resource damage assessment. This damage assessment will determine the amount of damage to the ecosystem and will estimate the costs of restoration. A draft assessment plan was released in mid-October. The damage assessment will

include a description of the contamination and pathways of exposure, a determination of the quantity of injury, a resource recoverability analysis, and a restoration and compensation determination plan.

### **Legislative Initiatives**

Congresswoman Boxer has introduced three bills as a result of the metam sodium spill. H.R. 3423 and H.R. 3424 would amend HMTA. H.R. 3423 would require DOT to list as hazardous materials any material designated by the U.S. Coast Guard as a hazardous material when shipped by water. H.R. 3424 proposes to change the focus of HMTA by amending the definition of "hazardous material" in section 102(4) of HMTA to include substances that pose an unreasonable risk to the environment when transported in commerce, including risks posed by accidental discharges to water, air, or soil. In addition, Congresswoman Boxer introduced a bill, H.R. 3758, to add metam sodium to the DOT hazardous materials list and the CERCLA hazardous substances list.

### **Joint Government Enforcement**

Immediately following the spill, representatives from Federal, State, and local governments met to develop a cooperative approach to enforcement actions arising out of this incident. EPA Region 9 is participating in this enforcement effort, along with the U.S. Departments of Justice and Interior, the U.S. Forest Service, California Attorneys General's Office (on behalf of various State agencies), and the District Attorneys from Siskiyou and Shasta Counties.

**Addendum:**  
**Chronology of Cantara Loop Release: July 14 - August 6, 1991**

**JULY 14, 1991**

- 9:40 pm A Southern Pacific (SP) Transportation Company locomotive and six freight cars derail at the Cantara Loop, between the towns of Mt. Shasta and Dunsmuir, Siskiyou County, California. The cars fall directly into or adjacent to the Sacramento River. One tank car containing approximately 19,500 gallons of the pesticide metam sodium begins discharging into the river, apparently unknown to the railroad personnel.
- 11:00 pm SP reports rail accident to the California Office of Emergency Services (OES); initial reports indicate a minor train derailment involving a tank car of weed killer. As a precaution, the Sheriff's Department issued an advisory for the general population to stay away from the river and to keep all windows closed.

**JULY 15, 1991**

- 1:18 am SP reports the train derailment to the National Response Center, indicating that diesel oil spilled onto the banks of the Sacramento River and that one tank car, carrying a weed killer, rested in the river but was not leaking.
- 1:30 am OES reports the SP train derailment to the U.S. Environmental Protection Agency (EPA) Region 9. An EPA On-Scene Coordinator (OSC) receives the initial report of a train derailment from the National Response Center. This report does not specify that the river is being affected and does not request EPA assistance.
- 3:30 am The OSC contacts the California Department of Fish and Game (DFG) and offers EPA assistance, which is declined. The metam sodium leak from the tank car has not yet been reported.
- 5:00 am Estimated time that the pesticide reaches the town of Dunsmuir. Estimates indicate that metam sodium will flow through 45 miles of river to the Sacramento Arm of Lake Shasta over the course of the next three days.
- 5:45 am California DFG Incident Commander (IC) contacts the EPA OSC to report a 3" hole in the tank car that has leaked approximately 1000 gallons of weed killer: 200 gallons into the river and 800 gallons onto the river bank. EPA's offer to assist is again declined.
- 5:50 am Fisherman and SP personnel observe massive fish kill underway.
- 7:00 am EPA OSC reports the incident to the EPA Region 9 Emergency Response Section chief.
- 10:00 am Two OSCs dispatched to the scene, although EPA assistance still has not been requested and confirmed reports of the metam sodium spill have not been received.
- 11:00 am SP's hazardous materials team, wearing protective clothing, determines additional damage exists to tank car below the water line.
- 11:30 am EPA OSC requests that the U.S. Coast Guard (USCG) Pacific Strike Team (PST) respond to the incident.

- 12:00 pm The California Highway Patrol closes nearby interstate highway.
- 1:00 pm State of California EPA formally requests Federal EPA assistance and confirms the report that most of the 19,500 gallon tank car load has spilled into the river.
- 5:00 pm EPA and PST arrive at the site and find inadequate safety practices in effect. EPA assumes temporary command at the scene. SP is ordered to provide security in order that unauthorized persons do not enter the site.
- 6:00 pm The interstate highway is reopened.
- 6:15 pm EPA is informed by SP personnel that the track, after extensive hours of repair, is open and clear; trains will be coming through on schedule. A Siskiyou County Health Administrator arrives and expresses concerns about the lack of air monitoring. Seventy residents have been treated for complaints ranging from minor skin irritations to nausea.
- 7:30 pm Site operations suspended due to darkness. EPA's offer to assist in directing the recovery and removal efforts at the spill scene are accepted, provided EPA activities are within the scope of the Incident Command System (ICS). California DFG assumes the lead in monitoring the river cleanup and impact of the spill.
- 9:25 pm EPA issues a verbal Notice of Federal Interest to SP, under the Comprehensive Environmental Response, Compensation, and Liability Act, considering the company a potentially responsible party for the cleanup of the spill.
- 9:30 pm A meeting is held at the Command Post (CP) to inform responding agencies of the status of activities surrounding the incident and identify tasks to be performed. It is discovered that voluntary evacuation of the Dunsmuir townspeople has begun. Information regarding metam sodium and its properties is available for planning response activities.
- 11:00 pm EPA meets with California Department of Occupational Safety and Health to discuss safety planning for removal operations scheduled to begin on July 16, 1991.

#### JULY 16, 1991

- 12:00 am Responding agencies meet at the CP to discuss operations and safety plans for pumping and removal of the tank car, as approved by the IC.
- 7:00 am EPA and PST meet with SP to discuss details of the removal. A site safety meeting is held to review the details of the operation.
- 11:15 am EPA allows SP to operate trains during tank car removal. Several trains coming through cause delays in response operations.
- 12:15 pm Pumping equipment is ready for operation. A test train operated by Southern Pacific with the Federal Railroad Administration personnel on board to observe is included in the rail traffic line-up.
- 3:15 pm The 2,800 gallon capacity vacuum truck is positioned near the river and approximate 2,100 gallons of the tank car contents are removed. The railcar is dragged across river onto the bank, releasing liquid through previously unseen punctures in the tank car.

- 4:40 pm Worker and equipment decontamination commence. Operations at the spill site begin partial demobilization.
- 5:00 pm EPA takes aerial photos of the spill site, Sacramento River, and Lake Shasta for visual assessment of the damage. The river appears cloudy with a pale green color in the area of Dunsmuir and many dead fish are seen. Several members of the media are seen wading through the river in areas not authorized for public access.
- PM A meeting is held to inform responding agencies of decision to establish a separate CP in Redding. EPA asks IC to concentrate on the remediation of the spill downstream of the train wreck.

#### **JULY 17, 1991**

- AM EPA continues to emphasize immediacy in beginning operations on spill cleanup. Several methods are discussed as options. PST views the river and reports conditions similar to those reported by EPA. Responding agencies learn that incorrect medical treatment information has been released to area physicians.
- 12:00 pm Physicians from CAL EPA arrive. They begin to implement proper treatment practices and consult with SP to improve air sampling.
- 2:00 pm EPA is informed that DFG IC, in agreement with Shasta County IC, is not requiring SP to begin remedial actions in the river. Because the pesticide had already reached Shasta Lake, it was considered inconsequential to concentrate on the river. EPA and Siskiyou County officials believe differently and request IC to reconsider.
- 6:20 pm SP is issued a verbal order by DFG IC to begin removal of contaminants from eddies and deep pools.

#### **JULY 18, 1991**

- 10:00 am PST personnel are released from the scene.
- 4:00 pm SP reports delay in the river pumping due to technical difficulties within the contaminated water storage system and problems with Department of Transportation driver time.
- 6:00 pm A meeting is held at the Redding CP, where most of the decision makers are located. Shasta County Health official recommends reopening campgrounds. Pumps arrive at the Cantara Loop; samples are collected to determine contaminant concentration. SP reports negative air monitoring results and commits to restocking the river.
- 8:00 pm A Redding meeting informs responding agencies of the 40 medical cases reported in Dunsmuir, fifty percent of the previous day's cases. It is estimated that the plume may reach the dam in 30 to 40 days.

#### **JULY 19, 1991**

- 7:00 am Responding agencies meet and focus response objectives on health-related issues. EPA's request to direct attention to environmental concerns is acknowledged. Reports indicate the plume in

Lake Shasta is sinking while contaminant concentrations in affected areas are decreasing. Lake and river sampling continue, but sediment sampling is deferred until a later date.

- 10:15 am SP's plan to aerate and agitate the main body of the plume is approved by responding agencies but California DFG recommends a secondary barrier in the case that SP's plan is not effective. Fish cages would be lowered into pools to search for hotspots.
- 6:00 pm Meeting allows responding officials to express concerns and frustrations with response activities. Suggestions include construction of a safety zone, however, this will require closing the major highway. Discussions focus on concern for the public and the anxiety being exhibited by displaced residents.

Other reports indicate wildlife casualties. Vegetation has been agitated, and strong odors are prevalent in the region of the spill site. California DFG requests EPA take the lead in constructing and monitoring the second air barrier below the SP operation.

#### **JULY 20, 1991**

- 4:45 pm SP begins pumping operations. The secondary air barrier is prepared for operation. Air monitoring in and around SP aeration operation resulted in non-detectable levels of targeted contaminants. The plume, according to SP, is not expected to reach the air barrier for 2 to 3 days because it is moving at about 3/4 miles per day in the Sacramento River arm of Lake Shasta. No mandatory evacuation is implemented.

#### **JULY 21, 1991**

Diving and Environmental Response Team efforts are delayed. Air monitoring continues to result in negative detection of contaminant levels around SP operations.

- 7:30 pm A meeting informs responding agencies of the river access restrictions that are being lifted. SP commits to the provision of site security.
- 11:30 pm Secondary air barrier is operational, but not yet ready for continuous operations.

#### **JULY 22, 1991**

- 12:30 am Air barrier construction crew stops for the night.
- 7:00 am EPA is informed that plume has reached or surpassed the location of the air barrier. This is two days earlier than SP's estimates.
- 8:30 am Continuous operations of the air barrier commence. TAT air monitoring is transferred from SP operation to the air barrier; results continue to be below the detection limit.
- 6:30 pm Meeting provides SP with written notification designating EPA officials for response activities. The ICS is dismantled. SP agrees to provide site security and communications. SP requests that the aeration/agitation operation be shut down but their request is denied.



### **JULY 23, 1991**

- 12:00 pm Second segment of air barrier is operational. A distinct chemical odor is detected in the area of the air barrier, while air monitoring results continue to register below levels of detection.
- 6:00 pm Responding agencies review the contaminant hotspots present in the river. SP recommends shut down of aeration operations, as worker safety is being compromised. This is denied. It is agreed that SP operations may break down on the condition that immediate construction of their proposed second air barrier commences.
- 10:30 pm EPA observes that SP equipment is shut down but no construction activities are occurring. EPA issues SP a verbal notification of noncompliance.

### **JULY 24, 1991**

- 12:00 am SP equipment is operational. SP agrees to maintain the aeration operation until the second air barrier has been constructed.
- 6:40 am IC upholds the actions of EPA in serving SP verbal notification of noncompliance.
- 8:00 am EPA retracts notice of noncompliance as SP immediately reacted to the notification by starting operations and reporting that the air barrier would be running within the day. The second air barrier is constructed upgradient from the air barrier constructed by EPA/USCG.
- 6:00 pm A meeting report is held to confirm that a well-defined layer in the lake had no dissolved oxygen and elevated levels of MITC are found in sediments along the river. Test sample taken downstream from the air barrier showed dramatically reduced MITC readings.
- 6:30 pm EPA provides SP with written notification of responsibility to oversee operation and monitoring of the EPA/USCG air barrier within 24 hours. IC orders SP to begin construction of second air barrier. SP is requested to pump the area of the river emitting strong chemical odors.

### **JULY 25, 1991**

- 5:10 am The first SP air barrier begins operations. EPA/USCG air barrier experiences difficulties that result in temporary shutdown. Air monitoring continues below detection. EPA inspection of the air barriers results in the SP admission that they did not plan to construct a second air barrier.
- 11:00 am EPA informs California DFG of SP's intent of operating two air barriers: the first SP air barrier and the EPA/USCG air barrier.
- 6:00 pm California DFG agrees to discontinue air monitoring on the recommendation of EPA and SP. EPA and USCG/PST report that they will be demobilizing the following day.

### **JULY 26, 1991**

- 7:00 am EPA disagrees with the requirement that SP build a third air barrier. EPA provides written notice that if the judgment for a third air barrier is not lifted, SP does not have to repair the EPA/USCG air barrier.

10:30 am    The first EPA OSC is demobilized.

PM            SP is informed of the decision to maintain operations of the first air barrier and repair the EPA/USCG air barrier.

**AUGUST 6, 1991**

Shasta County health officials notify the California DHS of an outbreak of dermatitis among Shasta County jail inmates and crew leaders who had assisted in removing dead fish from the river.

## ENDNOTES FOR APPENDIX A

1. The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), is an international treaty designed to "prevent the pollution of the marine environment by the discharge of harmful substances or effluent containing such substances" from ships. Annex III "responds to concerns about the possible adverse environmental impact of packaged harmful substances entering the marine environment due to ship collisions, grounding, and other accidental and operational causes." On June 10, 1991, the President signed Annex III of the MARPOL Convention; MARPOL Annex III enters into force for all parties on July 1, 1992.
2. The Incident Command System is a management tool for achieving coordinated decision making and concerted action during responses to large scale emergencies, when more than one organization is involved in the response.
3. ATSDR has provided initial financial assistance to the California Department of Health Services to begin conducting long-term health effects studies. Potential areas of analysis may include chronic respiratory disease, reproductive hazards, immune system function, and laboratory tests of liver and other metabolic functioning. Further funding will be necessary to carry out these studies.
4. State of California Department of Health Services and California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, "A Draft Medical Surveillance for Metam Sodium Spill-Related Illnesses," October 7, 1991.
5. EPA's Office of Prevention, Pesticides, and Toxic Substances (OPPTS) is currently reviewing data on the reproductive effects of exposure to metam sodium. According to OPPTS, however, the available developmental toxicological studies are problematic because they do not indicate a level at which an effect is observed. Also, the available animal studies showing birth defects used daily oral exposure over most of the gestation period, which is different from the more acute exposure experienced by the people near the Dunsmuir spill. Assessing the risks to residents of the area is also difficult because of uncertainty about extrapolating results of animal studies to humans.

# **REPORT OF THE HAZARDOUS SUBSTANCES TASK FORCE**

## **APPENDIX B**

### **Summary of Open Form Presentations**

October 29, 1991 -- 8:30 a.m. to 3:15 p.m.

Sheraton Premier Hotel at  
Tysons Corner, Virginia

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## WELCOMING REMARKS

Dorothy A. Canter, Science Advisor, Office of Solid Waste and Emergency Response (OSWER), functioned as Chair of the Open Forum and provided an introduction to the day's presentations.

Bowdoin Train, Deputy Assistant Administrator of OSWER, began with a brief background of the July 1991 train derailment that caused the release of almost 20,000 gallons of the pesticide metam sodium into the Sacramento River in California.

- The River and Lake Shasta suffered massive fish kills and other environmental damage; hundreds of people sought medical assistance; and pregnant women were given health advisories.
- Following the spill, concerns were raised about whether metam sodium, and other potentially dangerous substances, are adequately regulated to prevent and control releases of these substances.

Mr. Train then commented on the implications of the release, i.e., that Federal regulatory agencies need to examine the issue of accidental releases of potentially dangerous substances, identify substances that fall through regulatory gaps, and explore approaches to minimize releases and improve response to releases.

- One outcome of the spill was the formation of the EPA Hazardous Substances Task Force. Its goals are to examine the process by which potentially dangerous substances are listed as hazardous substances under CERCLA, and to identify approaches for controlling releases of potentially dangerous substances.
- DOT, through the NRT, formed a parallel task force to evaluate the Federal role in controlling the transport of potentially dangerous substances.

Mr. Train indicated that the EPA Hazardous Substances Task Force is charged with the responsibility of going beyond the traditional regulatory framework in controlling releases.

- It is important for EPA to explore non-traditional approaches to augment traditional regulatory approaches.
- EPA has already developed two voluntary programs to achieve tangible environmental benefits through such non-command, non-control approaches:
  - The "33/50" program, a voluntary program in which corporations develop plans to reduce emissions of chemicals on the Toxics Release Inventory initially by 33 percent and ultimately by 50 percent; and
  - The "green lights" program, a program encouraging the use of more efficient and modern lighting in the business community.
- The non-traditional approaches presented at the Open Forum will assist the task force in developing additional strategies to control releases of potentially dangerous substances.

Mr. Train concluded with the announcement that the EPA Hazardous Substances Task Force is on a fast track: an interim report by the Task Force is scheduled to be completed by January 1992, and a final report, including recommendations, by April 1992. The Open Forum, which is one of the efforts of the task force, will have the following goals:

- To provide information on activities being undertaken by the Federal government to prevent and control releases of potentially dangerous substances.
- To provide interested parties the opportunity to describe their organization's activities and initiatives that address releases of potentially dangerous substances.
- To provide interested parties the opportunity to present additional approaches for preventing and controlling releases of potentially dangerous substances.

\* \* \*

Alan I. Roberts, Associate Administrator for Hazardous Materials Safety in the Research and

Special Programs Administration (RSPA) of DOT, described RSPA's role in DOT and explained DOT's activities following the metam sodium spill.

- RSPA is a very small part of DOT, but has a wide range of responsibilities and achievements with respect to the transport of hazardous materials, including an excellent safety record. Some current activities of DOT with respect to hazardous materials transport include:

- The 1990 Hazardous Materials Transportation Uniform Safety Act (HMTUSA), which amends the 1974 Hazardous Materials Transportation Act (HMTA), will require a large number of rulemakings and studies.

- DOT has been given new responsibility for sanitary food transportation issues under the 1990 Sanitary Food Transportation Act.

- DOT will be taking a major role in implementing section 4 of the Oil Pollution Act, including participating in the prevention of spills.

- In addition, RSPA is responsible for ongoing maintenance of its basic program. The regulation Docket HM-181, which was issued on December 21, 1990, is an entire revamp of the regulations for transportation of hazardous materials. International compatibility is emphasized, which will also serve to enhance the U.S. chemical trade surplus.

Mr. Roberts then referred to the October 29, 1991, *Washington Post* article which indicated that the Sacramento River was recovering quickly despite dire forecasts after the spill of metam sodium. He expressed the opinion that many substances could cause aquatic fatalities if released in large quantities, but the persistence of substances needs to be recognized. Mr. Roberts then summarized some agency and industry responses to the events of spill:

- The event prompted acknowledgement of issues concerning non-regulated substances. For example, the Chemical Manufacturers Association (CMA) issued a press release

supporting examination of products not currently regulated under CERCLA or HMTA. Some of this is addressed by HM-181, which expanded the toxicity definition by a factor of ten for full regulation under HMTA. In addition, other substances are being researched to determine their potential to cause serious environmental harm.

- DOT is also committed to adopting the requirements of Annex III of the MARPOL Convention on marine pollutants. After July 1, 1992, Annex III will become mandatory for the international transport of marine pollutants by vessel. DOT is currently drafting a proposed rulemaking for applying the Annex III requirements to all modes of transportation. (Since the Open Forum, the DOT proposed rule has been published in the Federal Register (57 FR 3854, January 31, 1992).)

Mr. Roberts concluded with the observation that any regulation must take into account its degree of complexity, level of understanding, applicability, and comprehensibility. DOT, through the Motor Carrier Safety Assistance Program, must work in cooperation with 16,000 State enforcement personnel to oversee an even larger regulated community.

## OVERVIEW OF FEDERAL ACTIVITIES

Timothy Fields, Jr., Deputy Director of EPA's Office of Emergency and Remedial Response (OERR), provided an overview of EPA's authority to respond to releases of hazardous substances and explained how the metam sodium spill relates to the issue of controlling substances that are potentially hazardous upon release.

Mr. Fields described the Superfund program and the regulations under CERCLA and Title III of SARA.

- Response under CERCLA has two general components: (1) response authority; and (2) notification and liability provisions.
  - Under CERCLA section 104, EPA has the authority to respond to a release, or a threatened release, of a hazardous substance, or a pollutant or contaminant

that may present an imminent and substantial danger to the public health or welfare.

- Only those substances that are specifically identified as CERCLA hazardous substances trigger the additional notification and liability requirements under CERCLA sections 103 and 107, respectively.
- The mechanisms for defining a CERCLA hazardous substance include: (1) under CERCLA section 101(14), specific listing or designation under four other Federal environmental statutes; (2) exhibition of a RCRA hazardous waste characteristic; and (3) under CERCLA section 102, designation through rulemaking (used to develop the draft final rule which designates the 226 extremely hazardous substances defined in SARA Title III).

Mr. Fields then discussed the ramifications of designating potentially dangerous substances as CERCLA hazardous substances to achieve CERCLA's goal of protecting human health and the environment:

- Notification to the National Response Center (NRC) for any release of a hazardous substance in amounts greater than its reportable quantity (RQ);
- Notification to State emergency response commissions (SERCs) and local emergency planning committees (LEPCs), to ensure adequate State and local response capabilities in the event of a release;
- Responsible party liability for cleanup costs and damages for injury to or loss of natural resources; and
- Automatic listing and regulation of hazardous substances under DOT's HMTA.

Mr. Fields then explained that if the government is properly informed of hazardous substance releases, it can coordinate and monitor the response activities of the appropriate agencies to ensure that everything possible is done to protect public health and welfare and the

environment. The metam sodium spill was a prime example of how important this notification is.

- Metam sodium is not specifically designated as a CERCLA hazardous substance nor is it listed as a hazardous material under DOT's regulations. However, when released, it rapidly hydrolyzed to form several different CERCLA hazardous substances, including hydrogen sulfide, monomethylamine, and carbon disulfide. The spilled metam sodium also exhibited RCRA characteristics, making it a RCRA hazardous waste, and thus, a CERCLA hazardous substance as well.
- Although the circumstances of this particular spill did trigger the response and liability provisions under CERCLA, the incident points out that the regulatory framework of the Federal government may overlook certain substances that are, or potentially could be, hazardous to human health and the environment when released.
- Therefore, EPA needs to reexamine its approach for designating substances as hazardous substances under CERCLA to ensure that all potentially dangerous substances are identified and addressed.

Mr. Fields then stated that the purpose of the Hazardous Substances Task Force is to examine the issues associated with expanding the CERCLA hazardous substance list, including identifying approaches for providing controls beyond EPA's traditional regulatory framework. He concluded that information collected during the Open Forum may assist the task force in understanding the nature and scope of the problem and in identifying potentially innovative, non-regulatory approaches for controlling releases of currently unregulated, dangerous substances.

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James O'Steen, Director of the Office of Hazardous Materials Safety of DOT, discussed the current and future hazardous materials transportation regulation.

- DOT regulations have been established for approximately 80 years, but, more recently, the regulations have increasingly addressed



environmentally hazardous materials. DOT's primary emphasis has been in regulating materials that pose medium and high acute hazards to the public and environment and that may be released during transportation. The hazardous materials regulations (HMR) are established under the authority of HMTA (1974) as amended by HMTUSA (1990).

- Fewer than 3,000 hazardous materials are specifically listed under DOT's hazardous materials regulations; the rest are regulated under generic descriptions in 20+ hazard classes, each of which has specific defining criteria. The regulatory system is based on classifications according to the criteria and a hierarchy between these criteria.
- Under CERCLA section 306(a), CERCLA hazardous "substances" are required to be listed and regulated by DOT as hazardous "materials;" hazardous substances are listed in a separate appendix in the HMR. Shippers are responsible for classifying a material as hazardous in accordance with the defining criteria of the HMR and for determining whether a material is listed as a CERCLA hazardous substance in the appendix.
- Major changes to the HMR were accomplished by the publication of Docket HM-181 on December 31, 1990 (effective for voluntary compliance on January 1, 1991). HM-181 amended the HMR to improve safety, put HMR in harmony with international regulations, and support American competitiveness in the international market.
- HM-181 provides the following safety provisions: improved packaging for bulk/non-bulk hazardous materials; improved hazard classification, communication, storage requirements; expanded the scope of criteria for the classification of poisons; and enhanced packaging regulations for less acutely hazardous chemicals, including hazardous substances and wastes.

Mr. O'Steen then described DOT's efforts in response to the metam sodium spill.

- On June 10, 1991, the US ratified MARPOL Annex III, which will be mandatory for

international transport of marine pollutants after July 1, 1992. Up to 500 chemicals have been identified by Annex III as marine pollutants; the majority of these are already defined as hazardous materials, but under Annex III, they would also bear additional marine pollutant markings. Under Annex III, there are two risk categories of pollutants: marine pollutants and severe marine pollutants. Metam sodium is categorized as a marine pollutant.

- A DOT priority is to apply the MARPOL Annex III requirements to all modes of domestic transportation. DOT plans to publish a Notice of Proposed Rulemaking (NPRM) for regulating these materials under the HMR. In the meantime, US shippers may use the provisions of Annex III on an optional basis.

Mr. O'Steen also briefly described the goals of the NRT Task Force, which are to:

- Develop a compendium that catalogs which agencies control what hazards and how;
- Identify existing gaps and overlaps in the system of regulations and controls (guidance, information, etc.);
- Develop recommendations for improvement in regulation and interagency coordination.

Mr. O'Steen concluded with the note that DOT looks to EPA to take the lead in evaluating chronic health and environmental hazards of materials. DOT believes that it is important to work with EPA and other Federal agencies, the general public, and the regulated community in taking expedient actions to improve transport of materials that present an environmental hazard.

#### QUESTIONS TO EPA AND DOT

- Vernon McDougall, International Brotherhood of Teamsters, requested a progress report on the hazardous materials worker training regulations required under HMTUSA. Alan Roberts responded that the final rule package is entering the clearance process.

- Mike Rush, Association of American Railroads, asked if DOT, in promulgating the rule to implement the treaty requiring DOT to regulate the MARPOL substances, had given thought to incorporating environmental criteria into the HMR so that the regulations would address not only listed substances, but also substances that pose environmental hazards which have not been specifically identified by United Nations groups. Alan Roberts responded that consideration has been given to this issue but commented that the DOT rulemaking incorporating the MARPOL list into the HMR will not address this issue in order to expedite the process. Mr. Roberts pointed out, however, that 90 percent of those pollutants on the MARPOL list (at 100 percent concentration) are already subject to the HMR. Dorothy Canter also added that the EPA Hazardous Substances Task Force is looking into developing such environmental criteria.
- Tim Fields provided some additional comments on the Hazardous Substances Task Force's activities. More than 20 chemical lists are being reviewed to identify additional substances to be considered for designation as hazardous substances under CERCLA. By the end of January 1992, the task force hopes to determine what actions (e.g., regulatory or non-regulatory) should be taken for substances not currently on the CERCLA hazardous substance list. The final task force report will be distributed to interested parties.

#### **PRESENTATIONS BY INTERESTED ORGANIZATIONS ON ONGOING INITIATIVES**

Ron Weber, Chairman of Distribution Committee at the Chemical Manufacturers Association (CMA), discussed initiatives being undertaken by both CMA and by Air Products and Chemicals, Incorporated, in preventing and controlling transportation-related spills.

- CMA is the focal point for the chemical industry's advocacy on legislative, regulatory, and legal matters at the international, Federal, State, and local levels, and maintains voluntary programs and services to address public concerns. The purpose of the distribution

committee is to oversee CMA programs to ensure safe and efficient distribution of chemicals and to promote effective emergency response.

- Some chemical industry initiatives, implemented through CMA programs, include:
  - CMA adopted Responsible Care<sup>®</sup> from the Canadian chemical industry and implements the following performance objectives: community awareness and emergency response; pollution prevention; process safety; employee health and safety; distribution; and product stewardship.
  - The chemical industry's collective emergency response programs are activated through the National Chemical Response and Information Center, and include the Chemical Transportation Emergency Center (CHEMTREC), the Chemical Mutual Aid Network (CHEMNET), the Chemical Referral Center, and emergency response training programs.
  - In September 1985, CMA established a Lending Library of audiovisual training programs that provide guidance for personnel responding to hazardous materials emergencies. Library services are available at no cost to anyone in the U.S.
  - Two new CMA initiatives to be operational in the near future are the Medical Treatment Emergency Communications (MEDTREC) initiative and the Epidemiology Resource and Information Center (ERIC).
- CMA has also been involved in several interindustry initiatives that involve chemical manufacturers and chemical carriers working together:
  - The Interindustry Rail Safety Task Force was re-established in 1989 to improve railroad and chemical company operating practices, risk assessment, risk management, emergency response, and product identification.

- The interindustry Transportation Community Awareness and Emergency Response (TRANSCAER) initiative was established to increase the public's awareness and understanding of the transportation of hazardous materials and to improve the readiness of communities to respond to transportation incidents. (A TRANSCAER video was shown following the Open Forum.)
- The company Air Products and Chemicals, Inc., an international supplier of industrial gases and related equipment, chemical products, and environmental and energy systems, has also undertaken its own initiatives to improve distribution safety:
  - The company has several programs designed to reduce product releases, including bulk truck, railroad tank car, and drum shipment leak prevention measures.
  - The company offers returnable or disposable intermediate bulk containers (IBCs) which have exhibited significant advantages over drum shipment.
- Mr. Weber stressed the importance of transportation safety and the chemical industry's awareness of the potential risks to public safety, health, and the environment posed by the release of hazardous materials.

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Vernon McDougall, Acting Director, Safety and Health Department, International Brotherhood of Teamsters, discussed labor initiatives in spill prevention and mitigation.

- Because there is a direct link between the way a vehicle is operated and the likelihood of a spill, prevention practices essential for the trucking industry include means of ensuring alert, qualified, and skilled drivers and safe vehicle operating condition.
- The modal administrations of DOT that regulate carriers play a large role in preventing spills. The Teamsters are working with DOT and others to improve worker safety through

initiatives such as the commercial drivers license program, and implementation of the Motor Carrier Safety Assistance Program.

- Other initiatives include collective bargaining with unionized companies to obtain improved safety performance as a means of preventing spills. For example:
  - Contracts have been negotiated to require double-trailer trucks to be configured with better handling capabilities.
  - Contracts have been negotiated to include initiatives for reducing driver fatigue, by including air-ride seats, air conditioning, and requirements for cab dimensions (ergonomics). Heated rear-view mirrors are another example of negotiated safety measures that go beyond government regulations.
  - Contracts have also been negotiated for hazardous materials training, and for provision of respirators and protective clothing.
  - One final, but very important contract provision, is the driver's right to refuse to drive an unsafe truck or to drive under unsafe conditions.
- In an effort to mitigate spills, the Teamsters are also developing training programs:
  - Currently, they have a grant from the National Institute of Environmental Health Sciences to train hazardous materials transportation workers.
  - More focused programs will also be developed that will incorporate HMTUSA requirements, when these are issued.
- Mr. McDougall concluded with the observation that the HMTUSA requirements will help integrate hazardous materials transportation training requirements into the workplace.

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Dr. Barbara Sattler, National Center for Hazard Communication, University of Maryland, discussed the role of the university in environmental work force training and education.

- The University of Maryland's National Center for Hazard Communication, like programs at other universities, provides education and training through non-credit programs. For example, employees are taken from the field and given updated information based on regulations, guidance documents, and expertise from within the universities.
- The focus of all training and education should be on prevention. Prevention can be separated into three categories: primary (how to avoid future accidents); secondary (how to immediately contain damage and avoid expansion of contaminants); and tertiary (how to control long-term damage, such as long-term health effects, and avoid further damage).
- The university's role in primary prevention is accomplished by providing basic scientific information on hazardous materials. The Center also conducts basic research used in developing material safety data sheets (MSDSs). This scientific information is eventually communicated to all of those handling hazardous materials.
- A recent national study of 2,000 facilities indicated massive non-compliance with the hazard communications standards, which require that workers be given information on hazardous chemicals. Survey results indicated that although 80 percent of workers had managed hazardous substances, many did not know proper handling practices, had not had training, or had never heard of the hazard communications standards. Thus, small and middle-sized companies, in particular, need to be taught how to comply with regulations. Scientific education can be provided to the public through university programs, in both credit and non-credit formats.
- A study of worker knowledge of MSDSs showed that 40 percent of the MSDSs tested were incomprehensible to workers because of the reading level at which the MSDSs were written, and also because of poor formatting

and difficult vocabulary; an even larger percentage of MSDSs are inaccurate to varying degrees. To correct this problem, universities have developed hazard communications courses to teach workers how to properly label chemicals (to ensure compliance and comprehensibility). The University of Maryland is holding a course on how to develop MSDSs.

- Other primary prevention initiatives include:
  - Under a grant, in part from EPA, the University of Maryland worked with towns and townships to develop a guide on how to respond to emergencies involving hazardous substances. The Center also works with unions and trade associations to develop educational materials.
  - Universities are also conducting basic research on ways to prevent pollution through source reduction and how to conduct on-site reclamation, thus decreasing the hazardous chemicals being transported.
  - The University of Maryland Technical Extension Service uses university knowledge to assist small and medium-sized businesses with technical problems and environmental audits.
  - Training is available through the National Continuing Education Association and a consortium of universities.
- Secondary prevention initiatives include non-credit programs to train the emergency response community to understand the problem and correct it.
- Tertiary prevention initiatives include providing policy staff and decision-makers with information, and working to make environmental health part of medical training.

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Michael J. Rush, General Counsel, Association of American Railroads (AAR), discussed railroad industry initiatives.

- The Interindustry Rail Safety Task Force (including the AAR, CMA, and Railroad Progress Institute) has four working groups. One of these is examining railroad operating practices.
  - As part of the task force, AAR conducted a data analysis of chemicals transported by rail and identified 15 chemicals that represent substantial environmental risk. Most of these are responsible for a small percentage of hazardous materials traffic, but a large percentage of cleanup costs.
  - Two sets of restrictions were implemented for trains transporting these chemicals and PIH chemicals, flammable gases, and Class A explosives.
    - Key trains (5 or more cars of these hazardous materials) are restricted to a maximum speed of 50 mph and, when passing other trains, are given the main track. Key trains must also be inspected following any emergency braking. Speed and inspection requirements apply upon warning from wayside detectors for overheated bearings.
    - Key routes are tracks with annual traffic of 10,000 car loads of hazardous materials, or 4,000 car loads of the hazardous chemicals subject to the key train restrictions. On these routes, wayside detectors must be placed no greater than 40 miles apart. Requirements governing track inspections and the class of track used for passing trains apply. Annual hazardous materials training for employees, including emergency response plans, also is required.
  - The three other work groups of the task force focus on: (1) chemical company operating practices (e.g., hazardous materials storage and loading); (2) chemical risk assessments, which may help in designing railroad operating practices, tank car design, and track conditions; and (3) emergency response information (e.g., standard format for shipping papers).
  - The railroad industry provides information to its employees through a hazardous material data base. Emergency response instructions are automatically printed on shipping papers for train transport.
  - Other railroad industry programs include emergency response training for fire fighters, other public officials, and industry employees; publications containing emergency response information on virtually all hazardous materials transported by rail; emergency action guides with detailed methods of response to releases; and initiatives and programs to prevent releases (including upgrades in track and equipment, requirements for car testing, and the installation of wayside detectors).
- \* \* \*
- Rick Horner from the Workplace Health Fund provided an update on the activities of the Center for Emergency Response Planning (CERP).
- The Workplace Health Fund is an institution for the promotion of research and education on industrial disease, and serves as a technical resource in making accessible (primarily to the AFL-CIO and other labor groups) information that has already been or is being developed.
  - CERP serves as a clearinghouse for information (e.g., on regulations, data bases, and training courses); holds training sessions concerning ways to prevent chemical incidents; and produces books and other publications providing information about incident prevention issues in industry.
  - CERP stresses that there are only "incidents," not accidents, because incidents can be prevented, while the word "accidents" means they cannot.
  - In an effort to prevent such chemical "incidents," CERP emphasizes the importance of its programs for training labor and management together.
  - CERP also produces publications that focus on incident prevention such as films and training modules. In addition, CERP issues Hazard Alerts when specific problems are

identified in the industry that kill people (e.g., venting of hazardous materials from tanks). It's "cheap" insurance to look at hazards before incidents occur.

- Other initiatives include research by the Workplace Health Fund on ergonomic issues that affect facilities where hazardous waste is produced, tested, or stored, such as how the design of facility control rooms can affect how easy it is to see and understand warning systems.

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Tom Gilding, Director of Environmental Affairs at the National Agricultural Chemicals Association (NACA), provided examples of company initiatives to better prevent and/or respond to spills at stationary facilities storing agricultural chemicals.

- NACA has developed programs promoting fire and spill prevention and emergency preparedness to warehouse operations through awareness and self-evaluation.
- Prevention initiatives must take into account the locations, storage facilities, and handling practices for the chemicals involved. Regulatory and educational initiatives coupled with voluntary actions need to be properly balanced to achieve effective spill prevention and mitigation efforts.
- One area of focus has resulted from the concern about fires at warehouse facilities, because such fires often have damaging environmental consequences.

-- To address this concern, NACA, in cooperation with the public warehousing industry, has developed survey documents that identify proper chemical storage and handling procedures. These documents also specify appropriate pre-emergency planning measures that should be taken.

-- These survey documents have been modified to also apply to smaller retail outlet warehouse operations.

- Another NACA initiative addresses bulk storage and handling of agricultural chemicals.

-- Although the majority of agricultural chemical containers currently being used are non-refillable, there is a significant trend within the industry towards using refillable containers. The main reason for this trend is to minimize wastes by reducing the number of containers needing disposal.

-- NACA is also looking for ways to standardize refillable containers to further increase safety during handling operations, and to add "user-friendly" features that encourage greater use of these containers.

-- The Midwest Agricultural Chemicals Association (MACA) has also been active and has developed industry performance standards for refillable containers.

-- Spill mitigation depends on containment and pre-emergency planning. Pre-emergency planning is critical in that it stresses coordination and communication programs for emergency responders prior to incidents.

- Mr. Gilding concluded with the observation that the actions that industry trade associations can take in developing recommendations or industry standards for spill prevention and control is seriously limited because of anti-trust liabilities.

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Edward Wytkind, Executive Director of the Transportation Trades Department (TTD) of the AFL-CIO, provided the labor perspective on the transportation of hazardous materials and its initiatives to prevent incidents and provide response.

- TTD was organized to represent workers in all modes of transportation, including fire fighters.

- Despite any good intentions by the industry, the marketplace will not take care of itself nor

will it protect working people; thus, TTD feels that increased Federal enforcement is necessary because in the current regulatory environment, this is not being carried out. For example, after the metam sodium spill, government inspections were cancelled.

- To address this concern, TTD sees the need for more regulations to improve worker safety, such as higher penalties imposed for safety infractions, including penalties for first-time infractions.

- In addition, the basic elements of response in the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations (29 CFR Part 1910.120) should be incorporated into hazardous materials training for railroad workers.

- For example, a survey of railroad workers showed that railroad training programs did not address the minimum items required by HAZWOPER. Even at Dunsmuir, railroad workers responding to the emergency were not wearing the personal protective equipment now required for farm workers and others using metam sodium.

- Currently, the unions provide the only source for emergency response training for railroad workers who deal with hazardous wastes, despite the requirement by OSHA that employers provide this training.

- Another area of concern is inadequate emergency response plans.

- Emergency response plans are not required for hazardous material transport, and there is little coordination, therefore, between rail and truck carriers and LEPCs.

- The National Transportation Safety Board recommended in 1985 that railroads develop and implement emergency response procedures for their railyards; as of 1991, only 6 of the 54 with railyards had developed such plans.

- Development and implementation of a data base for emergency response planning has been proposed in legislation referred to as the Fire Fighters' Bill; this legislation is likely to be considered during the 103rd Congress. The data base would track and monitor daily shipments of hazardous materials and provide information on content, appropriate response procedures, and personal protective equipment.

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Cindy Kelly, Director of Environmental Programs for the International City/County Management Association (ICMA), described the problems facing local governments and made recommendations for initiatives that could address these problems.

- ICMA is an association of professional managers serving cities, counties, regional councils, townships, and other forms of local government.

- ICMA publishes a series of books for use by local government, the most recent of which addresses emergency management.

- ICMA also gives seminars and works with LEPCs to help them develop emergency planning programs, and assists local governments in taking steps toward preventing pollution.

- Recommendations for government initiatives include giving local government more authority to require spill prevention initiatives, and encouraging insurance companies to offer lower premiums to companies that take precautionary or preventative steps.

- In addition, any potentially hazardous substance and possible by-products of listed chemicals, such as metam sodium, should be put in CHEMTREC so that information is available when needed for a response effort; environmental effects data should also be incorporated.

- Better preparation for responding to incidents is needed especially in rural areas, including better response coordination. One way to

improve response coordination in the event of an emergency is to respond according to the Incident Command System, which is adopted by fire departments nationwide.

- Training programs should be developed to prepare local government officials for response efforts in emergency situations.

#### **PRESENTATIONS BY INTERESTED ORGANIZATIONS ON OPTIONS**

Vernon McDougall, Acting Director of the Safety and Health Department for the International Brotherhood of Teamsters, suggested several near-term options for spill prevention and mitigation.

- More government agencies, especially OSHA, should become involved in the dialogue over spill prevention and mitigation.
- DOT needs to improve its enforcement of regulations controlling the transportation of hazardous materials; in the past, DOT's Federal Highway Administration has been more education-oriented and less involved in enforcement activities.
- OSHA and the Federal Highway Administration, the Federal Railroad Administration, and other modal administrations at DOT should work together to better exchange information and to improve regulatory enforcement in the field.
- Non-regulatory approaches for spill mitigation and prevention should include efforts to encourage companies and associations in the industry to better share training initiatives and improve communication among themselves.
- Through the Motor Carrier Safety Assistance Program, DOT should begin to consistently collect data on the conditions under which hazardous materials are transported by truck, such as the condition of equipment used and the qualifications of drivers.
- In particular, DOT should use OSHA as a resource in addressing worker safety issues and ensuring that drivers and other

workers dealing with hazardous materials are working under satisfactory conditions; OSHA should be delegated more jurisdiction from DOT to resolve problems in this area.

- HMTUSA grant dollars earmarked for hazardous materials transportation worker training programs in fiscal year 1992 should be allocated by the National Institute of Environmental Health Sciences in time to plan, prepare for, and implement the new training programs mandated by forthcoming regulations under HMTUSA.

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Dr. Barbara Sattler from the Center for Hazard Communication at the University of Maryland discussed the role of universities in preparing the environmental work force to help prevent incidents from happening and to appropriately address the incidents that do occur.

- In the past, the curricula used to train the environmental work force have emphasized reacting effectively to incidents, rather than focusing on preventing them from occurring; now the entire educational process has to be re-examined at all levels to facilitate a shift in focus from response to prevention.
- Universities can encourage and educate the environmental work force to focus more on prevention by incorporating a greater diversity of courses into the environmental health curricula, and by encouraging students to look more broadly at the environmental safety issues they will be facing.
- Management classes should be incorporated into technical curricula for environmental professionals, and technical information and courses should be offered to professional managers so that both have the knowledge and training needed to work effectively in an environmental health capacity.
- In addition, public health concepts, economics, risk communication training, training courses to teach environmental health scientists how to provide training



programs, and global-level issues in environmental health science should be incorporated by universities into their curricula and offered as non-credit courses or in training seminars.

- EPA should adopt or encourage LEPCs to use orientation programs to ensure more consistent and high-quality local emergency response planning. Currently, there is no training required by LEPC members, nor any orientation.
- EPA should also assist universities in finding ways to finance the high cost of offering a quality education to environmental health science students.
- Innovative approaches EPA should consider for enhancing spill prevention and mitigation include: (1) finding more effective ways to transmit the relevant information to the regulated community when new regulations are promulgated; (2) and becoming more self-aware of what functions EPA's various programs carry out and what resources they offer and have access to.
- Finally, EPA could hold a national conference of environmental practitioners, representatives from the regulatory community, and members of the academic community to develop a plan for ensuring that the environmental health work force is well-qualified to do its job.

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Sheldon Samuels from the Workplace Health Fund spoke about risk reduction through proper plant siting and function and offered additional suggestions for environmental planning to reduce the risk of chemical spills.

- Realizing that the chemical industry, due to its competitive environment, cannot regulate itself, the government must accept the responsibility for regulating the industry.
- Because too much time is required to regulate chemicals individually, a risk reduction and spill prevention plan should be developed in which the entire chemical industry would be re-designed so that all levels of production

would be integrated at the same site. This would minimize the amount of handling of hazardous materials and, thus, reduce the risk of incidents occurring. EPA needs to begin prevention activities that are more than just lip service.

- One major barrier to the government's efforts to create a plan for regulating the industry is the lack of available information and data. There is also a lack of coordination evident among the various Federal agencies that should be working together on environmental health and safety issues.
- The Federal government should also encourage improvements in: (1) the design of trucks and facility control rooms; (2) the incorporation of ergonomics into training programs; (3) and the establishment of adult education programs for scientific literacy so that the workforce has the ability to respond effectively to incidents that occur.
- In addition, the Federal government should encourage management and labor to work together to reduce the risk of spills during transportation and at facilities.
- In conclusion, EPA ought to conduct environmental planning; it has the capacity but has not taken the initiative to promote effective planning measures. Furthermore, industry, various organizations and response groups, and government agencies need to work together in carrying out environmental planning initiatives.

## AUDIENCE COMMENTS

Andrea Corbett of the International Association of Fire Fighters suggested that the Hazardous Substances Task Force should broaden its scope.

- The task force should consider the issue of making more information available to emergency responders before and during an incident.
- EPA should emphasize the importance of training and encourage communities and fire

departments to commit resources to training all emergency responders to handle chemical incidents.

- In the long-term, EPA should have some enforcement authority for ensuring compliance with 49 CFR Part 311 (emergency responder training, medical surveillance, etc.) for personnel not covered by relevant OSHA regulations.

### QUESTIONS FROM THE AUDIENCE

The following questions were taken from the audience, and answers were provided by the appropriate speakers.

*Question (for Barbara Sattler):* Will the Technical Extension Service work with farmers and if not, what is the best way to reach the agricultural community?

*Answer:* Although the Technical Extension Service works in Maryland only, there are chapters of the Agricultural Extension Service in every state which are available to work with the agricultural community. The Cooperative Extension Service at the University of Maryland provides certification training for farm workers involved in the application of pesticides as required by the EPA. To get to the broader question of how to reach the agricultural community, this may be (and is) done through the Cooperative Extension Service and/or the state Department of Agriculture. Each state has a Cooperative Extension Service, located in a university setting that is funded by a "Land Grant." The Cooperative Extension Service in Maryland employs an agent to serve each of the counties in Maryland. This system is (reportedly) the same in every state, and provides a major information network to the agricultural community. The state Departments of Agriculture also serve as communication networks, but act more strongly in a regulatory, rather than training, capacity.

*Question (for Sheldon Samuels, Vernon McDougall, and Michael Rush):* Are there common initiatives that labor and management can work to accomplish together?

*Answer (Sheldon Samuels):* Yes, however, it is usually the case that management refuses to

participate in workshops and other activities held to promote such initiatives. In general, cooperation from management is lacking.

*Answer (Vernon McDougall):* A key opportunity for cooperating is to improve safety initiatives is through worker training programs.

*Answer (Michael Rush):* Labor and management can work together on communicating emergency response information to public officials. Train crews are the first to be affected by an incident and should therefore be trained to communicate pertinent information to public officials effectively.

*Question (for Vernon McDougall):* What programs exist to address worker/operator responsibility for safety, particularly for controlling problems of substance abuse and overall worker physical and mental health quality?

*Answer:* Drivers of heavy trucks, and those carrying hazardous materials requiring placards, are subject to DOT-mandated drug testing. Truck drivers are also subject to a DOT-mandated medical examination every 2 years. However, caution should be given against the tendency to place too much of the blame for hazardous materials incidents only on the drivers.

*Question (for Michael Rush):* What kind of information is available in the Standard Information Commodity Code (STCC) data base?

*Answer:* STCC assigns identification numbers to commodities. The railroads retrieve chemical information from their data bases by STCC numbers. For example, railroads place emergency response information on shipping papers by retrieving information on the STCC numbers assigned to the commodities. The information is then placed on the shipping papers.

*Question (for Michael Rush):* What information is available in CHEMTREC about metam sodium spill and how was the railroad involved?

*Answer:* CHEMTREC had an MSDS on metam sodium. The railroad involved notified CHEMTREC following the accident.

## OPEN FORUM - CLOSING REMARKS

Timothy Fields, Jr., Deputy Director of OERR, provided the closing remarks.

- In reference to the absence of environmental groups at the open forum, more than five environmental groups were invited to participate, but declined. Written comments from those groups will be welcomed and considered by EPA in the activities of the Hazardous Substances Task Force.
- Since the inception of the task force, EPA has taken several steps to address task force concerns, including:
  - Developing a Federal Register notice clarifying the notification and liability requirements under CERCLA for releases of potentially dangerous substances that may rapidly hydrolyze or form CERCLA hazardous substances or that become RCRA characteristic wastes when released into the environment.
  - Publishing an environmental alert requiring immediate notification to the NRC of releases of metam sodium and other potentially dangerous substances.
  - EPA is considering publishing an Advance Notice of Proposed Rulemaking (ANPRM) regarding the possible designation of metam sodium as a CERCLA hazardous substances.
  - A draft interim report will be completed early in 1992 summarizing the Hazardous Substances Task Force's findings and recommendations for regulatory, enforcement, voluntary, and educational actions that should be taken.
  - EPA's Hazardous Substances Task Force will work closely with the NRT Task Force in this effort.