

HAZARDOUS MATERIALS SPILLS REPORTING

Upper Mississippi River Basin Association  
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### A. Introduction

According to calculations made by the Office of Technology Assessment based on U.S. Bureau of Census data, over 1.5 billion tons of hazardous materials were transported by land, sea, and air in the United States in 1982. During transport and storage of these materials spills and leaks have occurred that have adversely affected the environment. On the Upper Mississippi River alone from 1980-1987 there was a total of 559 spills from vessels and facilities along the river. Ninety-three percent of the spills involved 1 to 1,000 gallons (See Appendix A). To combat degradation of the nation's resources from hazardous spills the federal and state governments enacted legislation requiring notification and containment/clean-up of the spills.

Spills along the Upper Mississippi River or its tributaries are an interstate concern due to degradation of water quality and wildlife habitat. Since each of the five states and the Coast Guard and the Environmental Protection Agency have different spills reporting and clean-up procedures, it is important that efforts be coordinated to minimize damage from spills. To this end, data on spills is used in assessing impacts and analyzing state and federal responses.

This report defines hazardous spills notification and reporting requirements and assesses the availability and usefulness of spills data both at the state and federal levels.

### B. Hazardous Materials Spill Reporting Requirements

#### 1. Federal

The reporting of hazardous material spills is required by federal law (40 CFR Part 117) which stipulates reportable quantities for hazardous substances. Any person in charge of a facility which discharges a reportable quantity of a hazardous substance must notify the appropriate federal agency, which in most cases is the Department of Transportation's National Response Center. Table 117.3 in 40 CFR Part 117 lists hundreds of hazardous materials and the quantity at which a spill of this material must be reported. In addition the National Response Center must be contacted immediately if because of a nonreportable quantity spill one or more of the following occurs:

- a fatality
- a serious injury requiring hospitalization
- estimated carrier or other property damage exceeding \$50,000
- fire, breakage, or suspected contamination involving the shipment of radioactive materials or etiologic agents; and
- a situation of such a nature that the carrier judges should be reported (49 CFR 171.15).

#### 2. State

In addition to the federal law each state has its own reporting requirements at least as stringent as the federal regulations.

Illinois law Public Act 91-384 requires telephone notification if any of the following events occur:

- a member of the general public is killed or receives injuries requiring hospitalization
- fire, breakage, spill, or suspected contamination from radioactive or etiologic agent
- authorized official recommends evacuation
- release of a reportable quantity
- damage to a container that will result in a release that will cause one of the above criteria to be met
- damage to a placarded rail car, and
- a placarded motor vehicle overturning on a public highway.

A call must first be made to the nearest local emergency response unit. Then a call must be made to the Illinois Emergency Services and Disaster Agency (ESDA) who notifies other appropriate state agencies if necessary.

Iowa Statutes 455B Chapter 131 of the Administrative Code require telephone notification of a hazardous condition within 6 hours of the onset of the condition. A hazardous condition is defined as the actual, imminent or probable spillage, leakage, or release of a hazardous substance to the environment which creates an immediate or potential danger to the public health or safety of the environment. The call may be made to the Department of Natural Resources (DNR) control office 24 hour emergency response number, the local police department, or the sheriff of the affected county. A sheriff or police chief who has been notified of a hazardous condition shall immediately notify the DNR. The DNR then notifies the regional office who then is in charge of the spill. If the spill is severe the main office staff will act as the coordinator.

Minnesota Statutes Chapter 115.061 requires notification of a spill of any quantity of any material if the environment is or could be affected. The call is made to the 24 hour emergency spill number at the central office of the Minnesota Pollution Control Agency (MPCA). The MPCA staff determine the severity of the spill and contact the response unit closest to the spill or most able to initiate clean-up or containment.

Missouri 10 CSR 24-3.010 requires notification of a spill that meets federal reportable quantities or criteria from 49 CFR 171 or that is listed as a reportable hazardous waste under state rules, or the release of in excess of 50 gallons of petroleum liquids or 300 cubic feet of petroleum gases. The call is made to the 24 hour emergency spill number at the central office of the Missouri Department of Natural Resources or to the National Response Center at the earliest practical moment. The DNR will notify other appropriate agencies of the hazardous substance emergency.

Wisconsin Statute 144.76 requires notification of a spill of a hazardous substance except for discharges which are within limits authorized by a permit. A hazardous substance is any substance which may cause or significantly contribute to an increase in mortality or serious irreversible or incapacitating reversible illness, or which may pose a substantial present or potential hazard to human health or the environment. The call is made to a 24 hour hotline staffed by the Division of Emergency Government which then contacts appropriate agencies. A call to the National Response Center does not satisfy Wisconsin notification requirements.

## C. Action Taken By Federal/State Agencies

### 1. Federal

The National Response Center contacts the Coast Guard, the Environmental Protection Agency (EPA), and Department of Interior offices when they receive a call. In some instances, for a serious spill, they will contact the affected state to make sure they have been notified. The federal agencies sometimes receive a direct call from the spiller or a state requiring assistance.

The federal agencies determine if their involvement is necessary based on the severity and location of the spill, the state's actions, and the availability of spill containment and clean-up equipment.

The Coast Guard only handles spills on federal navigable waters which empty to the ocean. Theoretically this could extend to the headwaters of navigable streams but in practice the Coast Guard usually only handles cases on major rivers like the Mississippi River.

The EPA handles spills of reportable quantities on land or water which the states cannot handle. If the EPA gets involved in a spill they are the on-scene coordinator for all spills except those which require Coast Guard assistance or those spills within a metropolitan area listed in a memo of understanding. Recently the EPA and the Coast Guard signed memos of understanding designating the Coast Guard as the on-scene coordinator for spills on a water body in designated metropolitan areas. These metropolitan areas usually contain a Coast Guard office that has the necessary spills equipment.

The Fish and Wildlife Service which is contacted by the Department of Interior, determines if their involvement is necessary based on the effects on fish and wildlife. If they respond to a spill they advise the on-scene coordinator on actions which will minimize damage to fish and wildlife and they take remedial action to help fish and wildlife that have been adversely affected. While the Fish and Wildlife Service primarily responds to large spills they will become involved in small spills of toxic substances.

### 2. State

Since most spills are of smaller quantities and can be handled by local authorities or state agencies, the containment and clean-up work is conducted primarily by the states. The federal agencies play a supporting role by providing expertise when necessary.

When a call is received at a state spill reporting number the information is forwarded to all appropriate agencies. The agency responsible for documenting the spill will send district staff out to the spill site to assist in the clean-up and/or document the spill event. Many times the actual containment and clean-up work is performed by the responsible party or the local authorities under the supervision of state staff.

If a spill occurs on a water body bordering more than one state, the state receiving the call notifies the other state/states that could be affected. Since there is no legal requirement for this notification, the call is made out of common courtesy.

This type of interstate notification is consistent with informal agreements made at a November 1983 meeting in Dubuque, Iowa. The meeting was coordinated by the Iowa Department of Water, Air, and Waste Management and consisted of a day long discussion of hazardous materials spills notification, containment, and clean-up and the responsibilities of different state and federal agencies. The meeting was attended by agency representatives from the five Upper Mississippi River Basin states, the EPA, Coast Guard, and the Army Corps of Engineers.

The meeting attendees reached some general conclusions, one of which pertained to notification. Since no one state or federal agency has enough personnel or equipment to implement the desired level of response to a Mississippi River spill, it was decided that the states, EPA, and the Coast Guard work closely with each other to coordinate efforts and pool resources. This includes contacting other potentially affected states and utilizing Coast Guard and EPA services when necessary.

#### D. Data Collection and Storage

##### 1. Incident Reporting Form

When a spill is reported both state and federal regulations require that an incident report form be filled out documenting the actions taken with regard to the spill. Federal Department of Transportation (DOT) regulations (CFR Parts 171, 174.45, 175.45, and 176.48) require that all releases of a hazardous material except from bulk water transporters and motor carriers doing solely intrastate business, must be reported by the spiller in writing to the Research and Special Programs Administration in Washington, D.C. within 15 days of the spill. This report is necessary regardless of whether the National Response Center has been notified of the spill. Other agencies and branches like the Coast Guard, Environmental Protection Agency, Bureau of Motor Carrier Safety, Federal Railroad Administration, Federal Aviation Administration, and the National Highway Traffic Safety Administration maintain their own accident/incident data bases.

The states each require an incident spill report which is usually filled out by the spiller or state/federal agency staff. A copy of the report is kept in the central office of the appropriate state agency in all five states.

##### a. Federal data

The reporting form (5800.1) required by the Department of Transportation covers only transportation related spills and does not include spills from bulk water transporters. The form requires information on the incident type, date, time, and location; reporting carrier's name and address, shipment information; deaths, injuries, loss, and damage; hazardous materials involved; nature of packaging failure and packaging information (See Appendix B). The information on this incident report is entered on the Hazardous Materials Information System (HMIS) which previously provided the most complete hazardous waste spills data in the country.

The EPA utilizes an incident report form for spills they handle. The form has been standardized so that the first 84 fields are the same throughout the district. Districts can add additional customized fields

if necessary. The forms basically include information on the reporter, discharger, incident location, date, material, source, cause, medium affected, damage, actions, and entities notified. This information is entered in the Emergency Response Notification System (ERNS) which is presently one of the more complete hazardous spills data bases. Appendix B contains a copy of the reporting form.

The Coast Guard does not have a standardized incident report form but they do have a standardized computer system (MSIS - Marine Safety Information System) into which the information is entered. Districts or detachments can have their own incident reporting form as long as the form contains the information necessary for computer entry.

#### b. State data

The amount of information required on the incident reporting form varies between the states. The only information that is the same on all the reporting forms is the reporter (date, time), responsible party (name, address, phone), spill incident (date, time, location, material spilled, amount, cause), and clean-up action taken. Copies of the states' incident report forms are located in Appendix C.

## 2. Computerized Data Systems

Ideally, the information on the incident reporting forms would be entered into a computer system for easy access and use. Following is a summary of the availability of computerized spills data in each of the five states and regional and national federal offices.

Illinois - The State of Illinois has a computerized spills data base which contains the majority of the information on the incident reporting form. The data base is maintained at the main office of the Office of Emergency Management and has been functional since January, 1987. An annual report is compiled plus the information is available in the monthly emergency incident summary. The data available in the emergency incident summary is shown in Table 1.

Iowa - The State of Iowa has no state run computer system. They send their reporting forms to the EPA Region VII office where the data is entered into the EPA computer system and a computerized report is returned to the state. Thus data on all spills in the State of Iowa are available from the EPA regional office.

Minnesota - The State of Minnesota does not have a computerized data base and therefore uses the hard copies of the reporting forms to generate an annual report. The reporting forms are filed chronologically and by the name of the responsible individual or company. A monthly list of spills is mailed to the EPA Region V office but has not previously been entered on the EPA computerized spills data base. By utilizing a new contact person at the EPA the data should in the future be entered on the EPA system.

Missouri - The State of Missouri has a computerized spills data base which contains all the information on the incident reporting form. The information is maintained on a personal computer at the Department of Natural Resources Laboratory Services Program. Each week the information is

transmitted electronically to the EPA Region VII office and a weekly report is developed. The data available on the state computerized system is shown in Table 1.

Wisconsin - The State of Wisconsin has a computerized spills data base which contains a small percent of the data on the incident reporting form. This information is maintained at the main office of the Department of Natural Resources. An annual report is compiled plus the information could be generated on a monthly, weekly, or other basis depending on the need. Wisconsin has an agreement with the Region V EPA whereby they send a copy of all incident reporting forms to the regional office. The information is sent to the EPA approximately one to two months after occurrence. The data available in the Wisconsin computerized system is shown in Table 1.

Table 1

Summary of State and Federal Agencies'  
Computerized Hazardous Material Spill Data\*

	<u>Illinois</u>	<u>Iowa</u> <sup>†</sup>	<u>Minnesota</u> <sup>†</sup>	<u>Missouri</u>	<u>Wisconsin</u>	<u>Coast Guard</u>	<u>EPA Regions V &amp; VII</u>	<u>DOT Cambridge, MA</u>
Report Date	X			X	X	X	X	X
Reported By				X		X	X	X
Location	X			X	X	X	X	X
Responsible Party	X			X	X	X	X	X
Spill Date				X	X	X	X	X
Spill Time				X	X	X	X	X
Spill Source	X			X	X	X	X	X
Material Spilled	X			X	X	X	X	X
Amount Released	X			X	X	X	X	X
Medium Affected				X	X	X	X	X
Waterway Affected				X	X	X	X	X
Spill Cause				X	X	X	X	X
Response Action	X			X	X	X	X	X
Entities Notified	X			X	X	X	X	X
Number of deaths/ injuries/evacuations	X						X	X

\* X indicates computer fields available on the data system. Not all fields will be used for all spills.

<sup>†</sup> No state-run computer system. Data from the incident reporting forms is entered on the EPA ERNS and is available at the EPA Regional or National Office.

## Regional Federal Offices

In addition to the states' data the EPA and the Coast Guard keep a record of hazardous materials spills. Both of these groups have a computerized data base that is linked to a regional office. On the Upper Mississippi River Coast Guard data from the three detachments is collected at the St. Louis District office which is connected to the Washington, D.C. office. Data on spills in Iowa and Missouri that the EPA handles is collected at the Region VII office and data on spills in Illinois, Minnesota, and Wisconsin is collected at the Region V office.

The Coast Guard data system contains information on spills that the Coast Guard responds to. Spills reported by the National Response Center or other sources are not required to be computerized unless there is Coast Guard involvement. The St. Louis District office transmits their data to the Coast Guard computers at a contracting firm in Columbus, Ohio. The data is downloaded every three months and sent to the Coast Guard office in Washington, D.C. Table 1 lists the computerized information available in the Coast Guard data base (MSIS - Marine Safety Information System).

The EPA data system (ERNS - Emergency Response Notification System) contains information on spills reported by the National Response Center, by the states, and other sources that report directly to the EPA. As noted earlier the states of Iowa, Minnesota, Missouri, and Wisconsin send complete information on spills to their regional EPA offices. Spills data from the state of Minnesota will be entered on the EPA system in the near future due to staff changes. (Historic spills data for the state of Minnesota is not available.) Thus the EPA will have complete information on these four states and only information derived from a National Response Center call or a call to the EPA for the state of Illinois. Since many calls are made to the National Response Center and the EPA for small nonreportable quantities, anonymous tips, etc., it is possible that the EPA office has information on both reportable and nonreportable quantity spills for the state. The only data from Illinois they will be missing is from calls to only the State spill number. Table 1 lists the computerized information available in the EPA data base.

## National Federal Offices

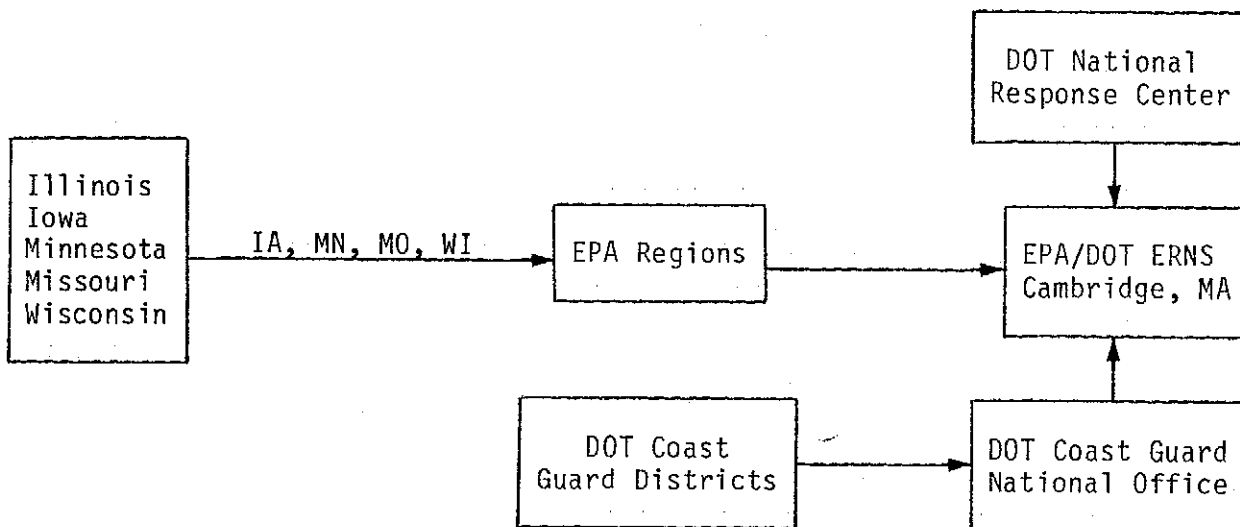
The final source of information on hazardous material spills is at the national level. Until just recently the information on the Department of Transportation's Form 5800-1 entered in the HMIS data base provided the most complete spills data in the country. Since it does not include spills from bulk water transporters or intrastate transport and has a low reporting rate the data does not provide an accurate and complete picture. To remedy this situation the EPA has developed a new data base (ERNS) that is managed by the Department of Transportation in Cambridge, Massachusetts.

As part of a national requirement to create a comprehensive spills data base the Department of Transportation, Research and Special Programs Administration, Transportation System Center in Cambridge, Massachusetts is in the process of creating a national spills data base with the IBM personal computer-based system ERNS (Emergency Response Notification System) utilized by EPA. These efforts are sponsored by the EPA and are undertaken through an interagency agreement between the EPA and DOT.



The ERNS data base consists of the information submitted by the National Response Center, the Coast Guard, and the EPA. Calls to the National Response Center are logged into the computer daily and are automatically loaded to the ENRS system. The Coast Guard data is derived from the MSIS system and contains only cases that have been closed. The data is downloaded every three months and sent to the Washington, D.C. office who forwards a tape to the ERNS system. Since downloading is infrequent and only closed cases have complete data, the MSIS portion of the data base is on the average 3-6 months behind and usually incomplete. The EPA data is derived from the regional ERNS systems and is sent to Cambridge via personal computer. In order to minimize duplication of reports the Coast Guard and EPA data submitted to the Cambridge office consists of only those spills which were not handled through a National Response Center call. Table 1 lists the computerized information available in the ERNS in Cambridge, Massachusetts. Figure 1 shows the flow of computerized spills data from the state to the regional and national level.

Figure 1. Flow Diagram of Computerized Spills Data



## E. Data Retrieval and Use

### 1. Spills in Upper Mississippi River Basin States

Since the Department of Transportation office in Cambridge, Massachusetts will be the national collection center for hazardous material spills, information on spills affecting the Upper Mississippi River Basin states can be derived from this source. The data will contain all spills information from Iowa, Minnesota, Missouri, and Wisconsin (from state reports to EPA); all Coast Guard handled spills; all EPA-handled spills; and spills in Illinois that were reported to the National Response Center, the EPA, or the Coast Guard. The only major data gap will be spills handled exclusively by the state of Illinois.

The data at the DOT Cambridge office can be sorted by state and can possibly be sorted by the waterway affected (i.e. Mississippi River) although this has not been done yet. Since the system is fairly new, procedures for data requests have not been established and monthly reports are presently not being developed. A request for information will need to be handled by DOT staff on a case-by-case basis.

The data from the DOT office will have limitations in that it will not cover all spills in the Upper Mississippi River Basin states. As noted earlier, spills handled exclusively by the state of Illinois will not be in the data base. This can be remedied by using the computerized spills data maintained by Illinois.

The use of the Illinois state data may cause difficulties in that there will be a duplication of reports from the DOT Cambridge office when the spill was not handled exclusively by Illinois. To keep an accurate count of spills in Illinois it would be necessary to manually compare the state and the DOT data.

Another limiting factor with the DOT Cambridge data is the lag time on spills reports especially with the Coast Guard system. First, the Coast Guard data is only downloaded every three months so it is always at least three months old by the time it is entered on the DOT system. Second, complete data is not provided on a spill until the case is closed. Therefore basic information on the spill will exist on the system but may not include information like material spilled, quantity, clean-up actions, etc. The information may be provided months or even years later, rendering the data essentially useless in the interim.

Considering the limitations of the data it still appears that the DOT Cambridge office has the most complete and usable data source. The use of state information exclusively is time-consuming since all five states must be contacted and incomplete since federal agency involvement in spills is not documented. The use of regional federal agency data only, leads to data gaps since Coast Guard information is only available at the national level and state-handled spills in Illinois will be missing. The use of the DOT Cambridge office data only, will contain gaps for Illinois handled spills but will contain all other reported spills in a usable format.

## 2. Spills on Upper Mississippi River and Its Tributaries

Information on spills exclusively on the Mississippi River and its tributaries can be derived from both the DOT ERNS data and the Coast Guard MSIS data. The decision on which data base to use depends on the purpose for the data. If data is needed on all spills in the rivers handled by the Coast Guard, EPA, and the states, the DOT ERNS data will provide the most complete spills information. If the data is needed for only spills on the Mississippi River and its navigable tributaries (St. Croix, Black, and Minnesota Rivers) handled by the Coast Guard, then the Coast Guard MSIS data is more appropriate. Since the Coast Guard handles a large number of spills on the rivers as compared to the EPA and the states, the MSIS data base may provide sufficient information. For example, the Corps of Engineers study on the relationship of river traffic to spills utilizes the MSIS data base (See Appendix A). The data in the DOT HMIS system taken from the Form 5800-1 can not be utilized for Mississippi River spills since it does not include spills from bulk water transporters.

## F. Summary and Conclusions

Federal and state regulations require the reporting of hazardous material spills to the appropriate agency. Under federal regulations the appropriate agency is the Department of Transportation's National Response Center. Each of the five states has a 24 hour spills or emergency response number. The agency receiving the notification determines the severity of the spill and contacts the appropriate regional or local people who will conduct or supervise containment and/or clean-up operations. Information on the spill event is recorded in an incident report. In Illinois, Missouri, and Wisconsin the information on the report is entered on a computer system for easy access and use. The EPA and Coast Guard offices computerize their data which is later incorporated into a nationwide data base managed by the Department of Transportation in Cambridge, Massachusetts. Data on spills around the country is available from this office.

While the procedures for spills handling seem clear-cut the actual way spills are handled varies. Although federal regulations on notification are quite explicit it appears that many times the notification requirement is not adhered to. Since the states do not and are not required to contact the National Response Center if they receive a call on reportable quantities, if the individual reporting the spill does not contact the Center the reporting requirement is not met.

In addition coordination between national, regional, and local federal agency offices appears to be informal and confusing especially with regard to jurisdiction. For example, the local Coast Guard detachment explained that the EPA is the on-scene coordinator for land spills and the Coast Guard is the on-scene coordinator for water spills. The regional Coast Guard office explained that the EPA is always the on-scene coordinator unless they request Coast Guard assistance or the spill is in a metropolitan area where the EPA and the Coast Guard have signed a memo of understanding making the Coast Guard the on-scene coordinator. The national Coast Guard office explained that the jurisdiction policy varies throughout the country and was dependent on the local EPA and Coast Guard's working relationship. The policy appears confusing but seems to work.

The same kind of inconsistency is prevalent in some of the states when they are deciding whether to contact the EPA or the Coast Guard. Some of the states indicated they had no set criteria or limits of when to contact a federal agency and that the determination was based on personal experience gathered over the years. Basically if a state feels they can handle a spill they do not contact the federal agencies.

While this kind of inconsistency and informality are found throughout the entire spectrum of spills activities none of the individuals contacted expressed serious concern. It appears that even though procedures are not well defined the spills are handled appropriately.

The computerized data on spills is available from many state and federal agencies but the Department of Transportation ERNS system in Cambridge, Massachusetts is the most complete and usable source. To supplement data from Illinois that is not on the system it is possible to utilize Illinois' computerized spills data base.

If data is needed for spills exclusively on the Mississippi River and its tributaries the DOT ERNS system or the Coast Guard MSIS system can be utilized. The purpose of the data determines which system may be utilized.

Appendix A

Spills Information  
on the Upper Mississippi River  
and Its Major Tributaries

VESSEL AND FACILITY SPILLS BY SIZE OF SPILL  
IN THE UPPER MISSISSIPPI RIVER  
1980 - 1987 RECORD I/

Class Size (Gallons)	Vessel Spills		Facility Spills		Class Size (Gallons)	Vessel Spills		Facility Spills	
	Number	Probability of Occurrence	Number	Probability of Occurrence		Number	Probability of Occurrence	Number	Probability of Occurrence
1 - 1,000	267	.93356	253	.92674	50,001 - 51,000	0	0	0	0
1,001 - 2,000	6	.02098	5	.01832	51,001 - 52,000	0	0	0	0
2,001 - 3,000	2	.00699	2	.00733	52,001 - 53,000	0	0	0	0
3,001 - 4,000	1	.00349	1	.00366	53,001 - 54,000	0	0	0	0
4,001 - 5,000	1	.00349	1	.00366	54,001 - 55,000	0	0	0	0
5,001 - 6,000	0	0	2	.00733	55,001 - 56,000	0	0	0	0
6,001 - 7,000	0	0	1	.00366	56,001 - 57,000	0	0	0	0
7,001 - 8,000	0	0	1	.00366	57,001 - 58,000	1	.00349	0	0
8,001 - 9,000	3	.01049	0	0	58,001 - 59,000	0	0	0	0
9,001 - 10,000	0	0	3	.01099	59,001 - 60,000	0	0	0	0
10,001 - 11,000	1	.00349	0	0	60,001 - 61,000	0	0	0	0
11,001 - 12,000	0	0	0	0	61,001 - 62,000	0	0	0	0
12,001 - 13,000	0	0	0	0	62,001 - 63,000	0	0	0	0
13,001 - 14,000	0	0	0	0	63,001 - 64,000	0	0	0	0
14,001 - 15,000	0	0	1	.00366	64,001 - 65,000	0	0	0	0
15,001 - 16,000	0	0	0	0	65,001 - 66,000	0	0	0	0
16,001 - 17,000	0	0	0	0	66,001 - 67,000	0	0	0	0
17,001 - 18,000	0	0	0	0	67,001 - 68,000	1	.00349	0	0
18,001 - 19,000	0	0	0	0	68,001 - 69,000	0	0	0	0
19,001 - 20,000	0	0	0	0	69,001 - 70,000	0	0	0	0
20,001 - 21,000	0	0	0	0	70,001 - 71,000	0	0	0	0
21,001 - 22,000	0	0	0	0	71,001 - 72,000	0	0	0	0
22,001 - 23,000	0	0	0	0	72,001 - 73,000	0	0	0	0
23,001 - 24,000	0	0	0	0	73,001 - 74,000	0	0	0	0
24,001 - 25,000	0	0	0	0	74,001 - 75,000	0	0	0	0
25,001 - 26,000	0	0	0	0	75,001 - 76,000	0	0	0	0
26,001 - 27,000	0	0	0	0	76,001 - 77,000	0	0	0	0
27,001 - 28,000	0	0	0	0	77,001 - 78,000	0	0	0	0
28,001 - 29,000	0	0	0	0	78,001 - 79,000	0	0	0	0
29,001 - 30,000	0	0	0	0	79,001 - 80,000	0	0	0	0
30,001 - 31,000	0	0	0	0	80,001 - 81,000	0	0	0	0
31,001 - 32,000	0	0	0	0	81,001 - 82,000	0	0	0	0
32,001 - 33,000	0	0	0	0	82,001 - 83,000	0	0	0	0
33,001 - 34,000	0	0	0	0	83,001 - 84,000	0	0	1	.00366
34,001 - 35,000	0	0	0	0	108,001 - 109,000	0	0	0	0
35,001 - 36,000	0	0	0	0	110,001 - 111,000	1	.00349	0	0
36,001 - 37,000	0	0	0	0	180,001 - 181,000	0	0	0	0
37,001 - 38,000	0	0	0	0	205,001 - 206,000	0	0	1	.00366
38,001 - 39,000	0	0	0	0	377,001 - 378,000	0	0	0	0
39,001 - 40,000	0	0	0	0	684,001 - 685,000	0	0	0	0
40,001 - 41,000	0	0	1	.00366					
41,001 - 42,000	0	0	0	0					
42,001 - 43,000	0	0	0	0					
43,001 - 44,000	1	.00349	0	0					
44,001 - 45,000	0	0	0	0					
45,001 - 46,000	0	0	0	0					
46,001 - 47,000	0	0	0	0					
47,001 - 48,000	0	0	0	0					
48,001 - 49,000	0	0	0	0					
49,001 - 50,000	0	0	0	0					
<b>Total</b>	<b>286</b>	<b>0.99994</b>	<b>273</b>	<b>0.99999</b>					

I/ Source: U. S. Coast Guard Marine Safety Information System.

Source: Supplement I Draft Environmental Impact Statement,  
Second Lock at Locks and Dam 26 (Replacement),  
Mississippi River, Alton, Illinois and Missouri,  
U.S. Army Corps of Engineers, St. Louis District,  
November 1987

VESSEL AND FACILITY SPILLS BY RIVER MILE SEGMENT  
OF THE UPPER MISSISSIPPI RIVER  
1980 - 1987 RECORD 1/

Pool	River Mile	Vessel Spills		Facilities Spills	
		Number	Probability of Occurrence	Number	Probability of Occurrence
1	847.8 - 860.0	0	0	1	.00366
2	815.3 - 847.8	59	.20179	55	.20146
3	796.9 - 815.3	4	.01399	4	.01465
4	752.8 - 796.9	1	.00349	2	.00733
5	738.2 - 752.8	3	.01049	0	0
5A	728.5 - 738.2	1	.00349	1	.00366
6	714.4 - 728.2	0	0	1	.00366
7	702.5 - 714.4	1	.00349	0	0
8	679.3 - 702.5	0	0	1	.00366
9	647.9 - 679.3	5	.01748	4	.01465
10	615.1 - 647.9	0	0	1	.00366
11	583.0 - 615.1	3	.01049	3	.01099
12	556.7 - 583.0	3	.01049	6	.02198
13	522.5 - 556.7	0	0	2	.00733
14	493.3 - 522.5	6	.02098	7	.02564
15	483.0 - 493.3	6	.02098	24	.08792
16	457.2 - 483.0	11	.03846	5	.01832
17	437.0 - 457.0	3	.01049	2	.00733
18	410.5 - 437.0	1	.00349	0	0
19	364.3 - 410.5	3	.01049	4	.01465
20	343.2 - 364.3	2	.00699	0	0
21	324.9 - 343.2	0	0	2	.00733
22	301.2 - 324.9	0	0	0	0
24	273.4 - 301.2	1	.00349	1	.00366
25	241.5 - 273.4	6	.02098	1	.00366
26	202.8 - 241.5	15	.05245	3	.01099
27	185.5 - 202.8	110	.38462	88	.32234
* <u>2/</u>	185.0 - 160.0	43	.15035	55	.20147
Total		286	0.99997	273	1.00005

1/ Source: U. S. Coast Guard Marine Safety Information System.

2/ This is not a pool area; these figures represent the St. Louis Harbor area.

Source: Supplement I Draft Environmental Impact Statement, Second Lock at Locks and Dam 26 (Replacement), Mississippi River, Alton, Illinois and Missouri, U.S. Army Corps of Engineers, St. Louis District, November 1987

VESSEL AND FACILITY SPILLS BY MAJOR TRIBUTARIES  
OF THE UPPER MISSISSIPPI RIVER 1/

River	River Mile	Vessel Spills		Facility Spills	
		Number	Probability of Occurrence	Number	Probability of Occurrence
<u>Illinois River 2/</u>					
LaGrange	80.2 - 157.8	0	0	0	0
Peoria	157.8 - 231.1	3	.7500	1	.2500
Starved Rock	231.1 - 246.9	1	.2500	0	0
Marseilles	246.9 - 271.5	0	0	2	.5000
Dresden	271.5 - 286.0	0	0	0	0
Brandon	286.0 - 291.0	0	0	0	0
Lockport/O'Brien	291.0 - 331.0	0	0	1	.2500
Illinois River Total		4	1.0000	4	1.0000
<u>Other Tributaries of the Upper Mississippi River</u>					
St. Croix	0 - 25.0	0 <u>3/</u>	-	0 <u>6/</u>	-
Black	0 - 5.0	0 <u>4/</u>	-	0 <u>7/</u>	-
Minnesota	0 - 15.0	0 <u>5/</u>	-	0 <u>8/</u>	-

- 1/ Source: U. S. Coast Guard Marine Safety Information System.  
2/ Actual U. S. Coast Guard record 1980 - 1987 of report incidences.  
3/ Used Pool 3 on the Upper Mississippi River: Spills/tow = .0025,  
.0025 x Average tows per year on St. Croix River : 98.9 x 0.0025  
4/ Used Pool 7 on the Upper Mississippi River: Spills/tow = .0006,  
.0006 x Average tows per year on Black River : 133 x 0.0006  
5/ Used Pool 1 on the Upper Mississippi River: Spills/tow = 0  
No calculations necessary.  
6/ Facility incidence per tow (Pool 3) = .002; .002 x 98.9 tows = 0.2  
7/ Facility incidence per tow (Pool 7) = 0; No calculations necessary.  
8/ Facility incidence per tow (Pool 1) = .0007; .0007 x 133.0 tows = .09

Source: Supplement I Draft Environmental Impact Statement,  
Second Lock at Locks and Dam 26 (Replacement),  
Mississippi River, Alton, Illinois and Missouri,  
U.S. Army Corps of Engineers, St. Louis District,  
November 1987

TYPES AND QUANTITIES OF HAZARDOUS MATERIAL SHIPPED BY POOLS AND ASSOCIATED PROBABILITY OF EXPOSURE TO A SPILL INCIDENT (NUMBER OF BARGES)

Product Group or Hazardous Material	Pools 5-10		Pools 11-13		Pools 14-19		Pools 20-25		Pool 26		Pool 27		System Total			
	2/ Prob-ability	2/ Pools	2/ Prob-ability	2/ Pools	2/ Prob-ability	2/ Pools	2/ Prob-ability	2/ Pools	2/ Prob-ability	2/ Prob-ability	2/ Prob-ability	2/ Prob-ability	2/ System Total	2/ System Prob-ability		
1. Petroleum Products	1,557	.0228	3,382	.0230	1,424	.0192	2,730	.0130	2,775	.0134	2,940	.0378	3,748	.0389	18,556	.0211
2. Crude Petroleum	19	.0003	46	.0003	25	.0003	17	.0001	18	.0001	192	.0025	82	.0009	399	.0005
3. Gasoline	60	.0009	190	.0013	86	.0012	138	.0007	151	.0007	79	.0010	165	.0017	833	.0009
4. Jet Fuel and Kerosene	45	.0007	99	.0007	46	.0006	83	.0004	62	.0003	15	.0002	23	.0002	373	.0004
5. Distillate Fuel Oil	84	.0012	197	.0013	43	.0006	75	.0004	60	.0003	83	.0011	68	.0007	570	.0006
6. Residual Fuel Oil	44	.0006	99	.0007	51	.0007	93	.0004	92	.0004	87	.0011	78	.0008	544	.0006
7. Coke Petroleum Pitches	1,090	.0159	2,180	.0148	910	.0123	1,480	.0071	1,298	.0062	1,019	.0131	1,156	.0120	9,133	.0104
8. Chemicals and Chemical Products	3,985	.0583	7,531	.0512	3,975	.0536	5,615	.0459	9,129	.0439	4,695	.0603	5,403	.0561	44,293	.0503
9. Organic Industrial Chemicals	24	.0004	28	.0002	37	.0005	174	.0008	160	.0008	108	.0014	128	.0013	659	.0007
10. Synthetics	0	0	1	0	0	0	0	0	0	0	12	.0002	4	0	17	0
11. Drugs, Soaps, Paints, Detergents	1	0	4	0	0	0	0	0	2	0	22	.0003	19	.0002	48	.0001
12. Inorganic Industrial Chemicals	58	.0008	147	.0010	2	0	0	0	0	0	4	0	6	0	217	.0002
13. Nitrogenous Fertilizers	43	.0006	163	.0011	64	.0009	239	.0011	425	.0020	289	.0037	312	.0032	1,485	.0017
14. Potassic Fertilizers	1,417	.0207	772	.0052	1,144	.0154	2,170	.0104	1,755	.0084	533	.0068	692	.0072	8,483	.0096
15. Phosphatic Fertilizers	74	.0011	286	.0020	190	.0026	379	.0018	304	.0015	28	.0004	22	.0002	1,285	.0015



Product Group or Hazardous Material <sup>1/</sup>	System Totals <sup>2/</sup>															
	2/ Pools HN-4	2/ Prob- ability	2/ Pools 5-10	2/ Prob- ability	2/ Pools 11-13	2/ Prob- ability	2/ Pools 14-19	2/ Prob- ability	2/ Pools 20-25	2/ Prob- ability	2/ Pool 26	2/ Prob- ability	2/ Pool 27	2/ Prob- ability	2/ System Total	2/ System ability
16. Other Basic Chemicals	39	.0006	51	.0003	21	.0003	24	.0001	33	.0002	16	.0002	26	.0003	210	.0002
17. Other Fertilizers	2,157	.0316	5,856	.0398	1,917	.0259	4,657	.0222	4,189	.0202	1,593	.0205	1,938	.0201	22,305	.0253
18. Sulphur; Liquid and Dry	0	0	0	0	0	0	2	0	0	0	7	.0001	5	0	14	0
19. Lime	8	.0001	21	.0001	14	.0002	34	.0002	33	.0002	64	.0008	55	.0006	229	.0003
Total Toxic <sup>3/</sup>	10,665	0.9999	20,965	0.9998	9,949	0.9997	21,910	0.9999	20,448	0.9998	11,786	1.0001	13,930	1.0002	109,653	0.9999
Total All Shipments	68,361		147,089		74,110		209,382		207,816		77,855		96,142		880,855	

1/ Source: IMR Performance Monitoring System.  
2/ Quantities are measured in number of barges.  
3/ Includes toxic and non-toxic shipments.

Source: Supplement I Draft Environmental Impact Statement, Second Lock at Locks and Dam 26 (Replacement), Mississippi River, Alton, Illinois and Missouri, U.S. Army Corps of Engineers, St. Louis District, November 1987