Upper Mississippi River
Spill Response Plan & Resource Manual

Signatory Agencies:

Illinois Environmental Protection Agency
Iowa Department of Natural Resources
Minnesota Pollution Control Agency
Missouri Department of Natural Resources
Wisconsin Department of Natural Resources
U.S. Coast Guard
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

Coordinated by: **Upper Mississippi River Basin Association**

December 2014
Public Access Version

PUBLIC ACCESS VERSION
SPECIAL NOTICE

This is a special Public Access Version of the *Upper Mississippi River Spill Response Plan and Resource Manual*, and is thus suitable for broad dissemination. This version of the document includes the Spill Response Plan in its entirety, but omits certain portions of the Resource Manual due to security concerns. The omitted sections are listed in the Table of Contents. The Public Access Version is also maintained at www.umrba.org/hazspills/umrplan.pdf. Questions may be directed to the Upper Mississippi River Basin Association at 651-224-2880 or dhokanson@umrba.org.

HOW TO REPORT A SPILL ON THE UPPER MISSISSIPPI RIVER:

An Emergency Action Field Guide for Oil, Fuel, and Hazardous Materials

Spill Notification Basics for All River Users

If you see a spill, it's important to report it immediately! Those responsible for a spill must know and comply with all local, state, and federal reporting requirements, which can vary by jurisdiction and product spilled. However, other people may encounter evidence of a spill on the river, such as oil sheen, and not know whether the spill has been reported. When in doubt, **anyone who encounters a spill should notify the appropriate government authorities**. This is easy to do and will help ensure a successful response.

ESSENTIAL 24-HOUR NOTIFICATION NUMBERS

Federal, state, and local authorities should all be notified of a spill. This can be done with just a few short calls. To alert federal authorities, call the National Response Center (NRC). It is also very important to directly notify the state where the spill appears to have originated, or that appears to be most affected, by calling that state's "duty officer." When in doubt, please call all potentially affected states. Local authorities should also be contacted via 911, particularly if there appears to be an immediate public health or safety risk.

Federal	**National Response Center**	**800-424-8802**
State	**Illinois**	**217-782-7860**
	Iowa	**515-281-8694**
	Minnesota	**800-422-0798**
	Missouri	**573-634-2436**
	Wisconsin	**800-943-0003**
Local	All Jurisdictions	**911**

INFORMATION TO REPORT

Be prepared to provide the following information, if known, when reporting a spill:

- ✓ Location (river mile and/or general area)
- ✓ Apparent spill source and party responsible for spill
- ✓ Product spilled and estimated volume of product
- ✓ Any other notifications made
- ✓ Any response efforts currently underway

You may not have all of this information available. Don't worry, **just report what you know**. **Do not endanger yourself or others trying to obtain more information.**

SAFETY FIRST: PROCEED ACCORDING TO YOUR LEVEL OF TRAINING!

Spills present a variety of potential hazards. Do not endanger yourself or others by engaging in activities beyond your training. As a member of the general public, your primary duty is simply to report the spill as described above.

WHEN IN DOUBT, NOTIFY!

If you see a spill, it's important to report it immediately!

This document was prepared by the Upper Mississippi River Hazardous Spills Coordination Group. For additional copies, contact the Upper Mississippi River Basin Association at 651-224-2880 or visit www.umrba.org/hazspills.htm

April 2014

NOTE: Responders, Industrial Facility Staff, Government Personnel, and Other Response Professionals: **See the reverse side of this document** for more detailed reporting instructions and requirements on the River.

Detailed Procedures for the Upper Mississippi River (UMR)

SPECIAL UMR NOTIFICATION PROTOCOL FOR STATE AND FEDERAL AGENCY STAFF

State and federal response and resource agencies have established a special notification protocol for use on the UMR. If you do not work for one of these agencies, simply calling the 24-hour notification numbers listed earlier in this document will be sufficient to trigger the protocol. However, if you do work for a state or federal agency, you should conduct your notifications in accordance with the following protocol:

1. First-aware state notifies, by phone, other potentially affected states and appropriate federal response and natural resource agencies.
2. Once notified, each state is responsible for its own intrastate notifications.
3. If a federal agency is first-aware, it notifies the state where the spill occurred or the state being impacted. That state then proceeds as the first-aware state.

Additional numbers to implement the UMR notification protocol are:

Federal	U.S. Coast Guard Sector UMR U.S. EPA, Region 5 (IL, MN, WI) U.S. EPA, Region 7 (IA, MO) U.S. Dept. of the Interior (IL, MN, WI) U.S. Dept. of the Interior (IA, MO)	314-269-2332 312-353-2318 913-281-0991 215-266-5155 303-478-3373
State	Use the appropriate 24-hour Duty Officer phone number listed on the reverse of this page.	

ABOUT THE UMR SPILL RESPONSE PLAN

The UMR Hazardous Spill Response Plan and Resource Manual is designed to coordinate state and federal agency response to spills on the interstate UMR. It establishes several UMR-specific protocols and policies, including the UMR notification protocol outlined in this guide. It also includes appendices listing response resources, sensitive human and natural resources, and potential spill sources. Information about the UMR Plan is available from the Upper Mississippi River Basin Association at 651-224-2880 or www.umrba.org/hazspills.htm.

SPECIAL CONSIDERATIONS WHEN RESPONDING TO SPILLS ON THE UMR

Responders need to be aware of the following when responding to a spill on the UMR:

- ✓ It is a **complex physical system** including locks and dams, the main channel, side channels, and backwaters. As a result, flows and spill trajectories are variable and difficult to predict.
- ✓ **High-value natural resources** are present on the UMR, including tremendous seasonal concentrations of migratory species, threatened and endangered species, and diverse habitats ranging from river bottom to floodplain forests.
- ✓ The UMR is an **important source for drinking water**, industrial water use, and power plant cooling.
- ✓ **Commercial and recreational vessels** may need to be alerted for safety reasons; also, their operations may hinder response efforts.
- ✓ **Diverse potential pollution sources exist**, including vessels, pipelines, railroads, highway crossings, fixed facilities, and storm sewers and other outfalls.
- ✓ The **UMR is a multi-jurisdictional river**, and it serves as a border for counties, states, and federal agencies.

Resulting implications for responders include:

- ✓ The need to be aware of potentially dangerous river conditions.
- ✓ Follow the UMR notification protocol to ensure all potentially affected jurisdictions are notified.
- ✓ Consult state and federal natural resource managers throughout the response.
- ✓ Physical factors, public safety considerations, and natural resource concerns may limit response options – this applies to in situ burning and chemical countermeasures as well as mechanical removal.

HOW YOU CAN PREPARE IN ADVANCE

An actual emergency is no time to learn about spill response. Here are some things you can do in advance to maximize your effectiveness in responding to spills:

- ✓ Familiarize yourself with this emergency action guide, your own agency/company plan, and the UMR Spill Response Plan. Refresh your memory periodically. Encourage your co-workers to do the same.
- ✓ Make a list of additional local phone numbers for notification purposes — e.g., the non-911 numbers for local authorities, numbers for any nearby drinking water operators, etc. Keep those numbers with this guide.
- ✓ Customize/supplement this guide in other ways that will enhance its utility to you.
- ✓ Know the limits of your training and experience. Keep current with refresher training.

PREAMBLE

Preparation and maintenance of the Upper Mississippi River Spill Response Plan and Resource Manual, originally published in 1991, is a collaborative effort among five states and four federal agencies under the auspices of the Upper Mississippi River Basin Association (UMRBA) and through the Upper Mississippi River Hazardous Spills Coordination Group (UMR Spills Group). **The Upper Mississippi Spill Response Plan and Resource Manual is not intended to supplant any other local, state, regional, or national response or contingency plans. Rather, it is designed to address some of the unique circumstances that may arise in coordinating spill response on the Upper Mississippi River.** The Response Plan and Resource Manual is a unique, River-focused tool and information source for first responders and contingency planners. It addresses the commercially navigable mainstem of the Upper Mississippi River from Minneapolis, Minnesota to the Ohio River confluence at Cairo, Illinois.

It is the intent of the UMR Spills Group to update the Upper Mississippi River Spill Response Plan and Resource Manual on a periodic basis to ensure its currency. As such, a comprehensive review and update will be completed every three years. Routine updates will be done every six months to address any inaccuracies and minor changes as needed.

The Public Access Version of the plan is available at www.umrba.org/hazspills/umrplan.pdf. Should users of this document discover any errors or outdated information, they are asked to notify UMRBA using the corrections and updates form provided on page G-5. For further information about the plan, please contact UMRBA at:

Upper Mississippi River Basin Association
415 Hamm Building
408 St. Peter Street
Saint Paul, Minnesota 55102
Phone: 651-224-2880
Fax: 651-223-5815
Email: dhokanson@umrba.org

MEMORANDUM OF AGREEMENT
for Spill Response on the Upper Mississippi River

WHEREAS, the Upper Mississippi River is a valuable resource supporting a multitude of uses, and

WHEREAS, the river is a shared resource forming the borders of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, and

WHEREAS, the river is a federally navigable waterway and a federal fish and wildlife refuge, and

WHEREAS, a spill of oil or hazardous materials into the river could adversely affect the multiple uses of the river, and

WHEREAS, spills must be prevented and environmental damage and public health risks from spills must be minimized, and

WHEREAS, this Upper Mississippi River Spill Response Plan is compatible with the Regional and Area Contingency Plans in Regions V and VII and is consistent with the requirements of the National Contingency Plan, the National Response Plan, and the National Incident Management System,

NOW, THEREFORE, BE IT RESOLVED, that the undersigned hereby agree to coordinate their spill response activities utilizing the protocols outlined in this Upper Mississippi River Spill Response Plan and Resource Manual.

BE IT FURTHER RESOLVED, that the undersigned will update the Upper Mississippi River Spill Response Plan and Resource Manual as needed to reflect revisions to the above-referenced regional and national plans and changes in spill response methodology.

Director, Illinois Environmental Protection Agency

Commander, U.S. Coast Guard, Eighth District

Director, Iowa Department of Natural Resources

Regional Administrator, U.S. Environmental Protection Agency, Region V

Commissioner, Minnesota Pollution Control Agency

Regional Administrator, U.S. Environmental Protection Agency, Region VII

Director, Missouri Department of Natural Resources

Regional Director, U.S. Fish and Wildlife Service, Region 3

Secretary, Wisconsin Department of Natural Resources

U.S. Army Division Engineer, U.S. Army Corps of Engineers, Mississippi Valley

UPPER MISSISSIPPI RIVER SPILL RESPONSE PLAN AND RESOURCE MANUAL

TABLE OF CONTENTS

INTRODUCTION

SPILL RESPONSE PLAN

RESOURCE MANUAL

Note: The Resource Manual is not included in its entirety in the Public Access version of the Upper Mississippi River Spill Response Plan. Those portions not included are indicated below.

Section B: Spill Response, Clean-Up, and Related Resources

Section C: Sensitive Human and Wildlife Resources

Section D: Potential Sources of Spills and Related Resources

Section E: Regional and Local Resources

Section F: In Situ Burning and Chemical Oil Spill Treating Agents

Section G: Other Resources

INTRODUCTION

Background

The Mississippi River flows along ten states on the journey from its headwaters in northern Minnesota to the Gulf of Mexico. Activities on the river upstream can affect the quantity and quality of the river downstream. Likewise, activities on one side can affect the river uses on the other side.

The same holds true for spills of oil or other hazardous substances. Since the river is constantly flowing, any river segment adjacent to or downstream from a spill could be affected by that spill. The river is thus a shared resource, requiring dependable stewardship and coordination by the bordering states. The coordination of quick notification and response by all parties is essential to minimize the damage from hazardous substance spills.

To help prevent and respond to spills on the Upper Mississippi River, the five states bordering the Upper Mississippi River (Illinois, Iowa, Minnesota, Missouri, and Wisconsin) and four federal agencies (U.S. Environmental Protection Agency, U.S. Coast Guard, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers) meet periodically as the Upper Mississippi River Hazardous Spills Coordination Group (UMR Spills Group) to discuss common problems, propose solutions, reach agreements, and coordinate activities. While prevention of spills is the primary goal of these agencies, effective response to spills is an equally important and necessary goal.

Purpose of the Plan

Realizing the importance of rapid notification and a coordinated response to spills on the Upper Mississippi River, the UMR Spills Group member agencies have jointly produced this Upper Mississippi River Spill Response Plan and Resource Manual (UMR Spill Plan).

The UMR Spill Plan is designed to provide the first responder and the on-scene coordinator with the information necessary to make informed decisions. The Response Plan component sets out the procedures for notification and response by state and federal agencies in conjunction with existing plans. The Resource Manual provides reference information about the river, spill containment equipment, sensitive human and wildlife resources, and potential sources of spills.

Geographic Scope

The geographic scope of the UMR Spill Plan is the commercially navigable mainstem Upper Mississippi River (UMR), from Minneapolis, Minnesota to the Ohio River confluence at Cairo, Illinois.

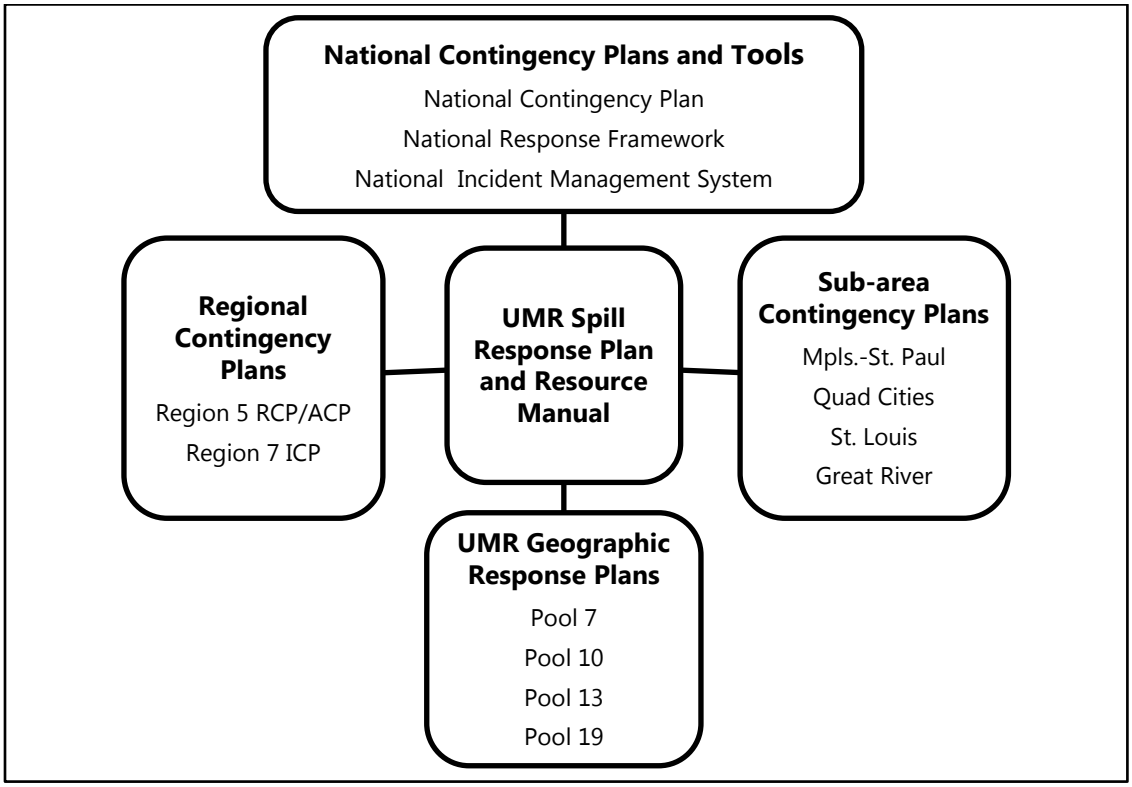
Authority

The UMR Spill Plan is a product of the interagency UMR Spills Group. The state and federal members of the UMR Spills Group have adopted the plan under a Memorandum of Agreement (MOA). Under this MOA, the signatories agree to coordinate their responses on the UMR in accordance with the protocols found in the UMR Spill Plan. Signatories also agree to participate in periodically updating the UMR Spill Plan. Additionally, the UMR Spill Plan is referenced by the Region 5 Regional/Area Contingency Plan (RCP/ACP) and the Region 7 Integrated Contingency Plan (ICP). As such, the UMR Spill Plan represents the policy of both Regions regarding the River.

Relationship to Other Plans and Protocols

The UMR Spill Plan is a working contingency plan that supplements state emergency response plans, regional/area contingency plans, and the National Contingency Plan (NCP). As such, the UMR Spill Plan is consistent with the Region 5 RCP/ACP and the Region 7 ICP and is in compliance with all requirements of the NCP, the National Response Framework (NRF), and the National Incident Management System (NIMS). Further, the UMR Spill Plan is designed to function alongside the sub-area plans in place along the River – i.e., Minneapolis-St. Paul, Quad Cities, Greater St. Louis, and Great River sub-areas. Additionally, the UMR Spill Plan and Resource Manual links to pool-specific geographic response plans, as described in Section IV. See Figure 1 for a diagram of these relationships among contingency plans.

Figure 1: Relationship of UMR Spill Plan to Other Contingency Plans



Additionally, the Upper Mississippi River notification protocol described in Section III does not replace or override other existing notification protocols or requirements (e.g., notification of the National Response Center per the NCP). Rather, this River-specific protocol is in place to speed and enhance communication among the agencies involved in response on the Upper Mississippi River.

SPILL RESPONSE PLAN

I. ROLE OF PRIVATE AND PUBLIC ORGANIZATIONS IN UPPER MISSISSIPPI RIVER SPILL RESPONSE

The UMR Spill Plan is designed to be consistent with standard approaches to response including those outlined in the NCP, NRF, and NIMS. There are also numerous legal and programmatic requirements that govern private entities' roles in spill planning and response. The following text describes the roles of public and private organizations in spill response in a generalized fashion that is consistent with the aforementioned plans and requirements. It is within the context of these roles that the River-specific protocols and procedures described in the UMR Spill Plan are established.

Prevention and Response Preplanning

The responsibility for preventing spills and preplanning response to a spill generally lies with the party storing, transporting, or using the material. Local, state, and federal entities are responsible for writing and implementing effective regulations covering storage, transport, use, and spill prevention and response plans. Some of their programs require permits or specify in detail the preventive measures and preplanning which is required of users, transporters, and storers. Some of these government programs also include inspections to verify adequacy of preventive measures. In the most extreme circumstances, government agencies are authorized to intervene to prevent a spill from occurring.

Most of the preventive actions and response preplanning required by governmental programs focus on protection of the public's safety and on response at the site of a potential spill. Actions related to preplanning environmental protection and preventing off-site impacts are also required of major facilities.

Response to Public Safety and Property Threats Caused by Spills

When a spill poses public safety and property threats via potential fires, explosions, toxic clouds, or other means, local officials are usually in command of the incident. The party responsible for the incident is required to cooperate with and aid local police and fire agencies, but typically does not direct or implement the firefighting, evacuation, or other first responses to the spill. The actions typically are taken minutes to hours from the onset of the spill. If highly specialized activities such as off-loading tank cars or repackaging hazardous chemicals are required, the responsible party may implement the actions under the general direction of the local public safety incident commander.

In most states, the role of state agencies in public safety response during the early stages of an incident is to advise local incident commanders to the extent possible. During major incidents state and federal authorities may be able to provide additional assistance to the incident commander at the scene by conducting sampling and analysis, providing specialized contractors or equipment, offering detailed advice, or serving other support functions. Seldom will state or federal authorities assume command from a local incident commander for short term on-site public safety related issues.

Response to Environmental and Health Threats Caused by Spills

A number of state and federal statutes and regulations require responsible parties to investigate and remedy environmental and health threats caused by their spills. Often these actions take place at locations distant from the spill's source itself. They usually begin somewhat later than does the public safety protection response, but they can go on for a much longer period of time. The actions can include things like placing containment and recovery booms and pads; sampling runoff and rivers; excavating soil;

doing hydrogeological investigations; air sampling; retrieving, cleaning, and rehabilitating affected wildlife; closing drinking water intakes; and providing an alternate water supply.

Generally in a major incident the environmental and health protection actions that are conducted by the responsible party are overseen by state or federal authorities, not the local commander. Local police and fire personnel are, however, often asked to assist.

Sometimes a responsible party is unable or unwilling to adequately or quickly undertake the environmental and health protection actions required by state or federal authorities. In those cases state or federal authorities can assume a more direct role. Typically, this is done by using agency personnel or hiring cleanup contractors to stop the release and/or clean up the oil/hazardous substances. These tasks are accomplished using government funds, such as state or federal Superfunds or the federal Oil Spill Liability Trust Fund. The costs of these direct government actions and damage to natural resources will usually be recovered later from the responsible party. The decision to assume governmental control of environmental and health follow-up to an incident usually hinges on the severity of the incident, the cost and duration of required actions, and the resources available to the involved state.

General Roles of Agencies and Other Entities Involved in UMR Spill Response

Table 1 briefly summarizes the roles of government agencies and other entities most likely to be engaged in hazardous spill response on the Upper Mississippi River. However, the table does not include all potential entities nor all potential roles in response. For more information, please consult the Region 5 Regional Contingency Plan/Area Contingency Plan (RCP/ACP), the Region 7 Integrated Contingency Plan, and individual entity's websites per the links embedded in Table 1. Those agencies labeled with an asterisk (*) are signers of the Memorandum of Agreement for Spill Response on the Upper Mississippi River.

Table 1: Description of Agency/Entity Response Roles (* = signatory to UMR Spill Response MOA)

FEDERAL GOVERNMENT	
US Army Corps of Engineers – Mississippi Valley Division* 	US Army Corps of Engineers (USACE) staff are not trained to directly take part in spill response *per se*, aside from addressing minor spills from a Corps facility. However, USACE may be able to provide some supporting functions during a response, depending on resources and capabilities available and avoiding conflict with the Corps' responsibilities under applicable laws or regulations. The precise nature and extent of the Corps' assistance will be determined by the specifics of a particular incident. In general, the Corps' capabilities include reporting and monitoring spills, providing information about river conditions, logistics support, and technical support. In addition, under certain circumstances, Corps personnel may be able to facilitate limited control and containment of spills through its river operations, such as emergency dredging or manipulation of river flows. Locks and dams may be accessed for use by responders, pending lockmaster approval. See "Policy on Coordination with USACE" for further information.
US Coast Guard – Eighth District* 	The US Coast Guard (USCG) supplies expertise in the fields of: 1) port safety and security, 2) marine law enforcement, navigation, and construction, and 3) manning, operation, and safety of vessels and marine facilities. USCG maintains continuously manned facilities that are capable of command, control, and surveillance for oil or hazardous substances releases occurring on the waters of the United States, and may provide these services to the on-scene coordinator (OSC). OSC Role: The USCG provides Federal On-Scene Coordinators (FOSC) for oil discharges when the source is either a vessel or marine transport related facility. See section on "FOSC Role and Jurisdiction" for more information. *Functions outside of the Eighth District:* National Strike Force: If a spill is beyond the resources of the responsible party's contractor and the local contractors, a federal on-scene coordinator may call in the Coast Guard's National Strike Force. The Strike Force consists of teams that can provide communications support, advice, and assistance for oil and hazardous materials removal. National Pollution Funds Center: USCG staffs the National Pollution Funds Center, which administers the Oil Spill Liability Trust Fund. National Response Center: USCG also staffs the National Response Center, the centralized "one call" receiver of spill reports nationwide.
US Department of Agriculture - Animal and Plant Health Inspection Service (APHIS) 	The U.S. Department of Agriculture (USDA) APHIS has no authorities of its own that directly apply to wildlife issues in a chemical or oil spill event. It does however, because of its other wildlife expertise, have extensive operational and technical capabilities to assist with humane capture, handling, hazing, transport, and other issues that typically arise in oil spill situations. In addition, USDA APHIS Wildlife Services is an emergency response agency that operates under the National Response Framework (NRF) and participates in emergency response working closely with other federal, state, tribal and local governments, along with the private sector to provide assistance and coordination during all-hazards emergencies, including oil spills.

FEDERAL GOVERNMENT (Continued)	
US Department of Commerce-National Oceanic and Atmospheric Administration	While National Oceanic and Atmospheric Administration (NOAA) response-related activities are primarily coastal and Great Lakes-focused, it can provide support to Mississippi River spills through the Scientific Support Coordinators (SSCs). An SSC can provide scientific advice to support operational decisions that will protect the environment effectively, mitigate collateral harm, and facilitate environmental recovery. The SSC advises on other technical issues (as requested by the OSC) after consulting with the appropriate NOAA hazardous materials resources or other federal, state, or academic networks. This includes considering advice from the trustee agencies, and any divergent opinions. Additionally, NOAA Weather Service offices provide water forecasting and hydrologic information which may be valuable in a response.
US Environmental Protection Agency – Region 5* and Region 7*	The US Environmental Protection Agency (US EPA) is responsible for providing expertise regarding environmental effects of pollution and environmental pollution control techniques. US EPA will also: 1) assist USCG in hazardous materials incidents, 2) advise the OSC of the degree of hazard a particular release poses to public health and safety, and 3) coordinate scientific support, including environmental assessment. OSC Role: US EPA provides Federal On-Scene Coordinators (FOSC) when an incident is from a source other than a vessel or marine transportation facility. Geographically, US EPA Region 5 has jurisdiction on the Mississippi River in Minnesota, Wisconsin, and Illinois; US EPA Region 7 has jurisdiction on the Mississippi River in Iowa and Missouri. See section on "FOSC Role and Jurisdiction" for more information.
US Fish and Wildlife Service– Midwest Region*	The US Fish and Wildlife Service (USFWS) is responsible for the conservation and management of lands and waters within the National Wildlife Refuges along the UMR, migratory birds, federally-listed threatened and endangered species, and inter jurisdictional fishes, and the supporting habitats for these species. USFWS shares with state natural resource agencies joint responsibilities for overseeing any activity that involves the handling of wildlife. USFWS is also a trustee bureau of the U.S. Department of the Interior with Natural Resource Damage Assessment and Restoration (NRDAR) authorities to restore or replace natural resources injured or lost due to spills of oil or releases of hazardous substances. USFWS fulfills these NRDAR responsibilities by working with co-trustees (e.g., states) and responsible parties as a distinct process coordinated with the emergency response itself. During a response, USFWS (via the Refuge Manager, District Manager, or designee) will establish a response protocol delineating specific roles and responsibilities of Refuge personnel. In general, Refuge personnel can provide responders with specific information on fish, wildlife, and habitat resources within the Refuge, will provide recommendations for preventing or minimizing spill impacts to Refuge resources, and will consult on the best locations for response staging areas and access points within Refuge boundaries. USFWS environmental contaminants biologists have spill response and NRDAR authority for the protection and restoration of trust resources. Environmental Contaminants biologists will implement the USFWS Contingency Plan and the Region 3 Cross Programmatic Spill Response Plan to support and provide assets to Refuge personnel as needed and requested by the Refuge. Environmental Contaminants biologists can open a Pollution Removal Funding Authorization (PRFA) with the USEPA or USCG to provide funding to support the USFWS response if needed. Environmental Contaminants biologists can also help fill Incident Command System (ICS) roles in spill response as requested by the FOSC and the Refuge including Wildlife Branch operations and Environmental Unit activities.

FEDERAL GOVERNMENT (Continued)	
Federal Emergency Management Agency	The Federal Emergency Management Agency (FEMA) requires the development, evaluation, and exercise of all-hazard contingency plans for all FEMA-funded jurisdictions at state and local levels. SARA Title III plans are often annexes of the all-hazard plan. FEMA monitors and provides technical assistance regarding public sector emergency response training and planning for incidents involving hazardous materials. In a response, FEMA provides advice and assistance to the lead agency on coordinating relocation assistance and mitigation efforts with other federal agencies, state and local governments, and the private sector. If the President declares a disaster or emergency, FEMA coordinates all federal assistance, including temporary housing. The OSC coordinates with the Federal Coordinating Officer in situations where both authorities are active. FEMA's National Emergency Support Team and Regional Emergency Response Teams provide coordination of federal response in situations of unique national significance, such as commercial nuclear power plant or nuclear weapons accidents and catastrophic natural disasters.
STATE GOVERNMENT	
Illinois Department of Natural Resources	The Illinois Department of Natural Resources (IL DNR) Office of Law Enforcement supports the Department's programs designed to protect Illinois' natural and recreational resources. Conservation Police Officers (CPO) or Game Wardens are vested with full state-wide police authority and are trained as law enforcement professionals. Although CPOs have full police authority in the enforcement of all Illinois Compiled Statutes, their enforcement mission is to focus upon those laws and activities associated with natural resource protection and recreational safety. As a natural resource trustee, the IL DNR works with USFWS and other co-trustees to assess damages to restore natural resources (as circumstances allow) lost or injured due to spill. Data acquired are used to determine the extent of damage to natural resources, to develop restoration or replacement strategies, and to develop and submit a claim for damages to the Responsible Party to implement the most appropriate restoration actions.
Illinois Emergency Management Agency	The Illinois Emergency Management Agency (IEMA) coordinates the state's disaster mitigation, preparedness, response and recovery programs and activities, functions as the State Emergency Response Commission, and maintains a 24-hour Communication Center and State Emergency Operations Center (SEOC). The SEOC acts as lead in crisis/consequence management response and operations to notify, activate, deploy and employ state resources in response to any threat or act of terrorism. IEMA assists local governments with multi-hazard emergency operations plans and maintains the Illinois Emergency Operations Plan.
Illinois Environmental Protection Agency*	The Illinois Environmental Protection Agency (IL EPA) Office of Emergency Response (OER) protects the health and safety of the citizens of Illinois during emergency incidents involving the release of oil, hazardous materials or other contaminants, while stabilizing, minimizing or eliminating the environmental consequences to the land, air or waters of the state. The Emergency Operations Unit (EOU), within OER, coordinates IL EPA's response to environmental emergencies and ensures that any environmental contamination is cleaned up. The EOU provides many services to other agencies and the public in the form of: 1) technical information about identification, chemical properties, toxicity and potential dangers of a given hazardous material, 2) monitoring or testing of air, water, soil or containers, 3) advice about containment of hazardous materials; restoration of the environment, including cleanup objectives; evacuation recommendations; and disposal or treatment of hazardous materials, 4) oversight to assure completeness of cleanup actions taken by responsible parties, documenting violations of the Illinois Environmental Protection Act for possible legal action, and 5) professional personnel, technical assistance and equipment to assist public safety officials.

STATE GOVERNMENT (Continued)	
Iowa Department of Natural Resources*	The Iowa Department of Natural Resources (IA DNR) Field Offices provides technical assistance to local, state, and federal response agencies, regulated industries, other responsible parties, and interested public during an incident. The Field Offices can also initiate appropriate enforcement action. As a natural resource trustee, the IA DNR works with USFWS and other co-trustees to assess damages to restore natural resources (as circumstances allow) lost or injured due to spill. Data acquired are used to determine the extent of damage to natural resources, to develop restoration or replacement strategies, and to develop and submit a claim for damages to the responsible party to implement the most appropriate restoration actions.
Minnesota Department of Agriculture	The Minnesota Department of Agriculture (MDA) is the lead state agency authorized to respond to most agricultural or chemical releases in Minnesota. The MDA's agricultural chemical emergency incident response staff consists of a four-person team based in St. Paul. Additional emergency response support is provided by eleven regional MDA agricultural chemical investigation staff members located in outstate Minnesota. In response to a spill event, MDA will work in support of local responders. When the incident transitions from public safety concerns to environmental protection, MDA will then oversee the responsible party's cleanup efforts.
Minnesota Department of Natural Resources	The Minnesota Department of Natural Resources (MN DNR) is co-trustee with the MPCA for the state's natural resources, and a co-trustee with the USFWS concerning the management of migratory birds and other resources. MN DNR is charged with control of all state-owned lands, parks, timber, waters, minerals, and wildlife in Minnesota. This includes the protection, preservation, and propagation of the fish and wildlife of the state. In response to a spill event, MN DNR personnel (conservation officers, biologists, and managers) may have responsibilities including: 1) notify all necessary MN DNR personnel and establish a response protocol describing the role of responders, 2) coordinate effort with other responding trustees, such as MPCA and the USFWS, 3) provide responders with specific fish and wildlife habitat information for an incident; the MN DNR will also consult with the responders as to the best locations for staging and recovery areas as well as access points, 4) provide responders with critical habitat information for state-listed threatened and endangered species as well as information on sensitive natural communities and special concern species found in the area of an incident, 5) provide responders with technical assistance and expertise on potential effects of oil and hazardous substances on fish and wildlife and their habitat, and 6) coordinate wildlife rescue and rehabilitation efforts with USFWS. As a natural resource trustee, MN DNR works with USFWS and other co-trustees to assess damages to restore natural resources (as circumstances allow) lost or injured due to spill. Data acquired are used to determine the extent of damage to natural resources, to develop restoration or replacement strategies, and to develop and submit a claim for damages to the responsible party to implement the most appropriate restoration actions.

STATE GOVERNMENT (Continued)	
Minnesota Department of Public Safety, Division of Homeland Security and Emergency Management	Minnesota Department of Public Safety, Division of Homeland Security and Emergency Management (HSEM) helps to coordinate activities before, during, and after emergencies through partnerships with local, state, federal, and private agencies. The Director of HSEM serves as the state Coordinating Officer and the Governor's Authorized Representative for all presidential declared disasters and emergencies. HSEM also organizes long-term disaster recovery efforts, coordinates local government emergency planning, authorizes use of chemical assessment teams (CATs), and reviews emergency operations plans for compliance. County Emergency managers work directly with HSEM and can provide Emergency Operation Centers (EOCs) and other resources.
Minnesota Pollution Control Agency*	The Minnesota Pollution Control Agency (MPCA) is the lead agency for state response to most oil and hazardous substance incidents in Minnesota. For agricultural chemical incidents in the state, the Minnesota Department of Agriculture is the lead agency. MPCA will be in support of local command unless asked to join unified command. MPCA will monitor cleanup progress by the responsible party (RP), and evaluate cleanup results for adequacy of environmental protection. If there is no RP known or available, or if the RP is unable or unwilling to complete the cleanup, then the state through the MPCA may take over cleanup using contractors.
Missouri Department of Natural Resources*	The Missouri Department of Natural Resources (MDNR) Environmental Emergency Response Section (EER) unit may respond to the scene of an environmental emergency if requested by a local authority, the party responsible for the spill, other governmental agencies, or at the discretion of the department. A response to the scene may be warranted if the party responsible for the release has not been identified or is not addressing the situation properly. While on scene the EER unit may provide technical advice or, if necessary, hire a contractor and direct cleanup efforts. MDNR EER staff may conduct some cleanups. Cleanup costs and penalties may be recovered from those responsible for the incident. MDNR is capable of collecting and analyzing environmental water, air, and soil samples. The state also maintains instrumentation for conducting real-time air monitoring. MDNR EER operates specially designed emergency response vehicles throughout the state, including one located in the St. Louis area. These vehicles carry protective clothing, monitoring equipment, communications equipment, and containment and cleanup supplies for small spills. Watercraft are also available, including an environmental emergency response boat that can be mobilized to the St. Louis area. All of this equipment and these personnel are accessible 24 hours a day by calling 573-634-2436. The MDNR Director is the Natural Resources Trustee for releases governed by OPA in the state of Missouri.

STATE GOVERNMENT (Continued)	
Wisconsin Department of Natural Resources*	The Wisconsin Department of Natural Resources (WDNR) has Regional Spill coordinators and county/area Conservation Wardens that that are also first responders. Wisconsin DNR Wardens have law enforcement authority and are the DNR agency liaison with the County Sheriff, local Fire Departments, and the County emergency managers. During a spill response, appropriate WDNR staff will be contacted (local biologists, technicians, law enforcement officers, Wildlife Health, Regional Spill Coordinators, and Public Affairs) and a response protocol established delineating specific roles and responsibilities of each program. WNDR determines what level of response, if any, is necessary to protect and respond to potentially threatened or injured fish, wildlife, and sensitive environments. If appropriate, WDNR personnel will contact the On-Scene Coordinator (OSC) to request participation in the spill response. Local WDNR staff, along with USFWS personnel, will ensure that resources at risk are clearly identified and communicated to the OSC and will participate in the ICS command structure, as necessary. The USFWS and WDNR have joint responsibilities for overseeing any activity that involves the handling of wildlife and the WDNR's Wildlife Rehabilitation Liaison will coordinate with area wildlife rehabilitators as necessary. The WDNR's Wildlife Veterinarian will provide veterinary support and expertise as necessary. The Department is the lead coordinating agency for Emergency Support Function 10 (Oil and Hazardous Materials) as part of the Wisconsin Response Plan. The primary responsibility of ESF 10 is to ensure that the state has a coordinated response to releases of oil and other hazardous materials that pose a threat to public health and safety and the environment. Each DNR region has a spill coordinator specifically trained to help responsible parties, response agencies and other DNR staff when a spill occurs. If a responsible party is unable or unwilling to provide adequate response, WDNR has the authority to identify, locate, monitor, contain, remove or dispose of the hazardous substance or take any other emergency action which it deems appropriate under the circumstances. In addition, the department may enter any property, premises or place at any time for the purpose of taking removal or other emergency action if the entry is necessary to prevent increased damage to the air, land or waters of the state. Notice is not required if the delay would result in imminent risk to public health, safety or the environment. WDNR can then seek cost recovery for costs incurred to providing those services. As a natural resource trustee, WDNR works with USFWS and other co-trustees to assess damages to restore natural resources (as circumstances allow) lost or injured due to spill. Data acquired are used to determine the extent of damage to natural resources, to develop restoration or replacement strategies, and to develop and submit a claim for damages to the responsible party to implement the most appropriate restoration actions.
Wisconsin Division of Emergency Management	In Wisconsin, county emergency managers organize under a regional manager within the Wisconsin Division of Emergency Management (WEM), which is under the Wisconsin Department of Military Affairs.

STATE GOVERNMENT (Continued)	
National Guard Civil Support Teams 	The function of the civil support teams (CSTs) is to assess a suspected weapons of mass destruction (WMD) attack, advise civilian responders on appropriate actions through on-site testing and expert consultation, and facilitate the arrival of additional state and federal military forces. There are currently 55 CSTs – one per state/territory and two in California. Each CST is composed of 22 people, 7 officer and 15 enlisted, from both the Army and Air National Guard, with a variety of specialties. Assigned vehicles include a command vehicle, operations van, a communications vehicle called the Unified Command Suite, an Analytical Laboratory System van, and other general purpose vehicles. The CST normally deploys using its assigned vehicles, but can be airlifted if required. As the CST is on standby 24/7, the advanced echelon will deploy within 90 minutes of notification and the rest of the team within three hours. This quick response gives the CST the ability to support the incident commander with critical information rapidly. The CST Commander can advise the incident commander as to the type and level of hazard present, possible courses of action, and additional National Guard assets that are available.
LOCAL GOVERNMENT	
County Emergency Management Agencies	During the response and recovery stages of an event, the county emergency management agency acts as a liaison between federal, state, and local units of government to promote speedy access to emergency resources and recovery funding. See Resource Manual Section E for a list of county emergency management agencies bordering the Upper Mississippi River.
Police, Fire, Sheriff, and Hazmat Teams	Local units of government typically have the primary role in protecting the public's safety and property from a spill through police and fire department response. During the initial stages of an incident, when life and safety issues are paramount, local officials (Fire/Police/Sheriff) will typically be in charge of the response to an incident until such time that they decide to enter into a unified command. Public hazmat teams, typically based in larger municipalities (see Resource Manual Section E) may assist with response. These teams will not perform cleanup work, but will rather stabilize public safety threats during incidents and turn incidents over to responsible parties or to the state/federal agencies for cleanup.

PRIVATE SECTOR	
Responsible Party	The spiller, or responsible party (RP), has the primary responsibility to conduct spill cleanup, following the procedures listed in the facility response plan. The first response action of the RP is making notification of an incident to appropriate other responders of the incident, according to law and the RP's own response plan. The RP conducts whatever response actions are necessary and for which their personnel are trained and equipped. The RP is required to have authorized and qualified individuals available 24 hours a day to respond to a spill. The RP should also have sufficient funds available to cover the cost of pollution response to the limit of liability for the vessel or facility. As the priorities of an incident evolve, they often include off-site and environmental concerns. The RP has the lead role in responding to these concerns, under the oversight of state or federal agencies. The RP is also liable for restoring or replacing natural resources which may be injured or lost due to the spill, and should coordinate with the natural resource trustees (via the NRDAR Liaison) as part of the NRDAR process. The RP will be placed at the command level of the response organization to represent their interests and to help coordinate assets and response actions. The RP should conduct inquiries into the cause of an incident. This is often done with the participation or oversight of state or federal agencies such as the Occupational Safety and Health Administration or the Department of Transportation. The RP should conduct a critique of their response to an incident and revise prevention, preparedness, and response measures accordingly. If the responsible party does not respond properly, the state or federal On-Scene Coordinator shall take appropriate response actions and should notify the responsible party of their potential liability for response costs incurred by the On-Scene Coordinator pursuant to state and federal law.
Cooperatives and CAER Groups	Spill response cooperatives and Community Awareness and Emergency Response (CAER) groups support spill response capacity through activities including arranging training and exercises for their members, developing shared equipment caches and mutual aid pacts, and area planning. A primary benefit of these groups is that they allow emergency planners and emergency responders to meet and network for mutual benefit in advance of an incident. On the UMR, there is one fully functioning CAER-type organization, Wakota CAER, which operates on the river in southern Twin Cities metro area and maintains response equipment caches along the river. Spill response cooperatives have also been established in the Red Wing, Lake City, Winona, and Bettendorf areas on the UMR. These cooperatives also possess some spill response equipment.

II. GENERAL RESPONSE PROTOCOL FOR SPILLS TO THE UPPER MISSISSIPPI RIVER

All spill incidents are unique in that the type of spill, location, time, and other environmental and human factors will vary for each incident. Since response procedures cannot be developed for every spill scenario, this protocol outlines the basic procedures that are to be used by state and federal personnel in responding to environmental and health threats presented by spills to the Upper Mississippi River (UMR). Due to the remoteness of most areas of the river, this protocol outlines the coordination which is deemed desirable by all in order to mitigate the effects of a spill.

As previously stated, this protocol is designed to be consistent with the National Contingency Plan (NCP), National Response Framework (NRF), and National Incident Management System (NIMS) – while providing additional information and direction to enhance the effectiveness of response on the UMR. In particular, while recognizing the federally-focused procedures and jurisdictions described in the NCP, this UMR protocol also acknowledges that response on the River is most likely to be led initially at the local level, evolving to state or federal oversight dependent on the particular circumstances of the incident.

Notification

Spill notification and updates will be given to neighboring and downstream states and to federal agencies in accordance with the procedures outlined in the UMR Spill Notification Protocol. See Section III-Interstate Notification Protocol for details. This protocol does not override the need for spills to be reported to the National Response Center, per the NCP. Rather, the UMR protocol is intended to both accelerate initial communication among agencies and provide a method of ongoing communication during a response.

Initial Investigation

An initial spill report may be received by the local police or fire department, state or federal agencies, and/or the National Response Center. Regardless of which agency receives the first call, the state where the spill occurs is responsible for determining if an investigation is warranted and, as needed, assuring it is initiated. The investigation may be led by the state where the spill occurred, a neighboring state, U.S. EPA, or U.S. Coast Guard, depending upon which agency is readily available or has the necessary resources. When a spill from an unknown source is discovered on the river, neighboring states will confer and agree on which state will determine the need for an investigation.

Determination of Necessary Spill Response Activities

In general, oversight and emergency response to a spill is encouraged at the most local level of government which has the necessary resources available. Moreover, a spiller or other responsible party is expected to provide all resources to complete an effective response and cleanup**.** However, certain incidents may justify the involvement of state and/or federal response agencies.

Factors to be considered in determining the appropriate level of effort of a response include:

- size of the spill
- type of material that is spilled

- location of the spill
- exposure/damage potential of vulnerable populations (human and environmental) and property
- willingness and ability of the spiller to respond
- cost of spill clean-up and containment compared to the effectiveness expected and the damage reduction anticipated
- availability of responding agencies capabilities
- media/political interest

An investigating state/federal agency will determine the extent of the spill and whether further response is necessary. This determination may be done by sending staff to the incident site or by receiving information via telephone reports from local police, fire, health, or environmental officials. The investigating agency will determine to the best of its ability the source of the spill, size of the spill, type of material spilled, the area affected, and the movement of the spill. The investigating agency will determine the necessary initial response and will expeditiously inform the designated coordinating state agency of its findings and actions to that point.

When a response justifies a continuing on-scene presence by a state or federal agency, an incident command system shall be established and the incident commander shall confer with the appropriate state and federal on-scene coordinators. The incident command systems established pursuant to this plan shall recognize that the pre-designated federal on-scene coordinators have ultimate authority and responsibility. See the Incident Command System Implementation Protocol in Section V for further details.

If a spill warrants it, the state or federal on-scene coordinator may request activation of the Regional Response Team(s). The degree of involvement and specific activities of the Regional Response Team(s) will be decided by their respective co-chairs.

If responsible parties are not apparent, or if the scope of the needed response is beyond their ability, or if the responsible party's response is insufficient, then the use of government funds to respond should be implemented by the incident commander and on-scene coordinators, depending upon their funding authority in a specific instance. Requests for federal assistance should be made through the states, or Native American tribes, unless the incident commander is the federal on-scene coordinator or his/her representative.

Federal On-Scene Coordinator (FOSC) Role and Jurisdiction

The federal on-scene coordinator (FOSC) directs federal response efforts and coordinates all other federal efforts at the scene of a discharge or release. The FOSC may monitor local, tribal state, or private actions to remove a discharge and may provide technical assistance to local, tribal, state or responsible party personnel.

If a response action is being conducted through local, tribal, state, or responsible party efforts, the FOSC will ensure adequate oversight. If local, tribal, or state agencies, or the responsible party cannot or will not initiate action to eliminate the threat, or if the removal is not being conducted properly, the FOSC should advise the government agency or responsible party and take appropriate actions to mitigate or remove the threat or discharge.

The FOSC can also access the Oil Spill Liability Trust Fund in cases where the responsible party has not been identified or cannot/is not immediately paying response costs. These funds can be used to reimburse other government agencies (state, local, tribal) through an FOSC-authorized Pollution Removal Funding Authorization.

U.S. EPA and U.S. Coast Guard share the responsibility as pre-designated federal on-scene coordinators for the Upper Mississippi River, as follows:

- Per U.S. EPA/U.S. Coast Guard memoranda of understanding, **the Coast Guard serves as the FOSC for all commercial vessel incidents and marine transportation related facilities (MTRs), regardless of location.**

- Per the National Contingency Plan, **U.S. EPA shall serve as the FOSC in all other federal responses on the UMR.** This responsibility is divided between Regions 5 and 7 as follows:

    - Region 5 will provide an FOSC for spills on the mainstem of the Upper Mississippi River totally within the State of Minnesota and where Minnesota, Wisconsin, or Illinois are the first principal responding state.

    - Region 7 will provide FOSCs for spills on the mainstem of the Upper Mississippi River when either Missouri or Iowa are the principal first responding state.

Resources permitting, the Coast Guard will investigate/respond as first federal official on-scene to all reported spills along the Upper Mississippi River. However, another federal or state agency may be the incident-specific on-scene coordinator (OSC) or first federal official on-scene.

Spill Mitigation, Containment, and Clean-up

The incident commander or on-scene coordinator will oversee spill mitigation efforts underway when he/she arrives at the scene or will initiate mitigation efforts using readily available resources. Many terminals on the river have small amounts of equipment that can be used for immediate spill containment. In addition, there are cooperation agreements among industries on several portions of the river that can provide individual facilities with access to larger quantities of spill containment and clean-up equipment. Most state and federal agencies working on the Upper Mississippi River have little or no spill containment or clean-up equipment other than the equipment of contractors under their control. See the list of available spill containment equipment on pages B-1 to B-13 of the Resource Manual for more information.

If the responsible party has assumed liability for the spill, the on-scene coordinator will work with the responsible party to mitigate the spill. If the responsible party is not known or is not willing or able to clean up the spill, the on-scene coordinator will pursue the options available to use government funds to hire a clean-up contractor. The on-scene coordinator will then direct the contractor in mitigation and clean-up efforts.

If the spill is beyond the resources of the responsible party's contractor and the local contractors, the federal on-scene coordinator may call in the Coast Guard's National Strike Force. The Strike Force consists of teams that can provide communications support, advice, and assistance for oil and hazardous materials removal. The teams have expertise in ship salvage, damage control, diving, and removal techniques and methodology. They are equipped with specialized containment and removal equipment

and have rapid transportation available. The Gulf Strike Team, based in Mobile, Alabama, and the Atlantic Strike Team, based in Fort Dix, New Jersey, are the most likely Strike Force resources to be mobilized in response to a spill on the Upper Mississippi River. See the Strike Team phone numbers listed under "Additional Resources" in the notification protocol.

Spill mitigation will be conducted so as to minimize the risk to public safety and the environment. Evacuation of communities, closure of water intakes, and other public safety measures will be implemented by the appropriate local, state, or federal agency in accordance with appropriate emergency response plans. In consultation with the designated on-scene U.S. Fish and Wildlife Service or state biologist, the on-scene coordinator will attempt to protect critical fish and wildlife habitat of the river. See pages C-13 to C14 of the Resource Manual for a list of Fish and Wildlife Service contacts for each pool of the river.

Press Releases and Public Information

During an incident, it is essential that the emergency public information organization and activity be recognized as a coherent system and emergency information be released from a single point to ensure consistency and authenticity. Spill updates will be given to the media at intervals determined by the incident commander. Press releases will be coordinated with the affected local communities, states, and federal on-scene coordinator.

To facilitate dialogue with the media in an oil or hazardous material incident, the incident commander may appoint an information officer or establish a joint information center (JIC). The JIC is the single point to co-locate representatives from agencies and organizations to handle public information needs, help control rumors, and limit multiple release points for information about the incident. The JIC structure is designed to work equally well for large or small responses and can expand or contract to meet the needs of the incident. Under the Incident Command/Unified Command systems (ICS/UCS), the JIC is led by the Information Officer (IO), named by the Incident Commander. See the National Response Team (NRT) website for more information on the JIC model.

Incident Closure

Once the incident is over the on-scene coordinator (OSC) for the lead agency will send an incident closure notice to state and federal agencies with whom the OSC has engaged during the response. The on-scene coordinator may request incident reports from other agencies to provide a complete picture of the incident. When appropriate, enforcement action will be taken against the responsible party if known. If local, state, or federal agencies incurred costs due to the spill, cost recovery action will be considered. Any agency intending to initiate a cost recovery action should notify all other agencies on the notification roster as to their intent. Interested agencies can then coordinate their activities.

Critique

OSHA regulation 1910.120 provides for including a critique of a response and follow-up in an organization's emergency response plan. A critique can be a valuable tool in assessing how well a plan met the needs of responding agencies during an actual incident and can provide the basis for making important modifications and improvements to the plan.

Following an incident that results in the implementation of the UMR Spill Plan, any responding agency can request that the lead state or federal agency for the incident arrange for a critique. The lead agency will then consult with the other organizations that responded to the incident, and if the majority agrees to

participate, will proceed to make arrangements for a critique. If local agencies were involved in the response, they will also be asked to participate in the critique.

The incident commander for the particular response, whether from a local, state, or federal agency, should chair the critique. If a unified command was used for the incident, the lead officials from each level of government will decide among themselves who should chair the critique. The lead agency for the response should provide a summary of the critique to the Upper Mississippi River Hazardous Spills Coordination Group for the evaluation of changes and improvements in the UMR Spill Plan.

III. INTERSTATE NOTIFICATION PROTOCOL FOR SPILLS TO THE UPPER MISSISSIPPI RIVER

As described in the Introduction, this River-specific protocol is in place to speed and enhance communication among the agencies involved in response on the Upper Mississippi River. It does not replace or override other existing protocols or notification requirements (e.g., notification of the National Response Center per the NCP), but rather augments these in light of the need for rapid, targeted, inter-jurisdictional coordination on the Upper Mississippi River. It also establishes a procedure for continued communication over the duration of an incident. All UMR spill response MOA signatories have agreed to utilize this notification protocol as part of their response to spills on the Upper Mississippi River.

Applicability

This spill notification protocol applies to all state and federal agencies which have signed the implementing MOA.

1) **Each state will be represented by only one contact or coordinating agency** who will represent and assume the "state" role for purposes of this protocol. It is assumed that this agency will be one which is responsible for environmental emergency response to a spill on the Upper Mississippi River. The coordinating agencies are listed in the spill notification roster.

2) **Each federal agency will be represented by only one contact point per federal region** for purposes of receiving notifications and updates. The contact points are listed in the spill notification roster.

Initial Notification

The state which first becomes aware of a spill should confirm that notification to the National Response Center, via call or online form, has been completed and initiate the UMR notification protocol. Under the UMR protocol, when a spill to the Upper Mississippi River occurs, **it is the responsibility of the first-aware state to notify other potentially affected states and appropriate federal response and natural resource agencies.** A state is to consider itself as first-aware if it has not previously been notified of the spill according to this protocol. Should a federal agency become first-aware of a spill, it will notify the state where the spill occurred (if known) or the state being impacted. That state will then be responsible for notifications according to this protocol. The initial notification protocol is as follows:

1) **All spills are to be reported.**

   a. **Notification of spills <u>likely to impact adjoining states</u> is to be made by voice immediately.** The notification is made to the coordinating agency via the 24-hour number listed in the notification roster in this manual.

   b. **Notification of <u>incidental spills or spills that are far upstream</u> of the notification recipient should be made during first available working hours by voice or email** utilizing the contact information provided in the notification roster in this manual.

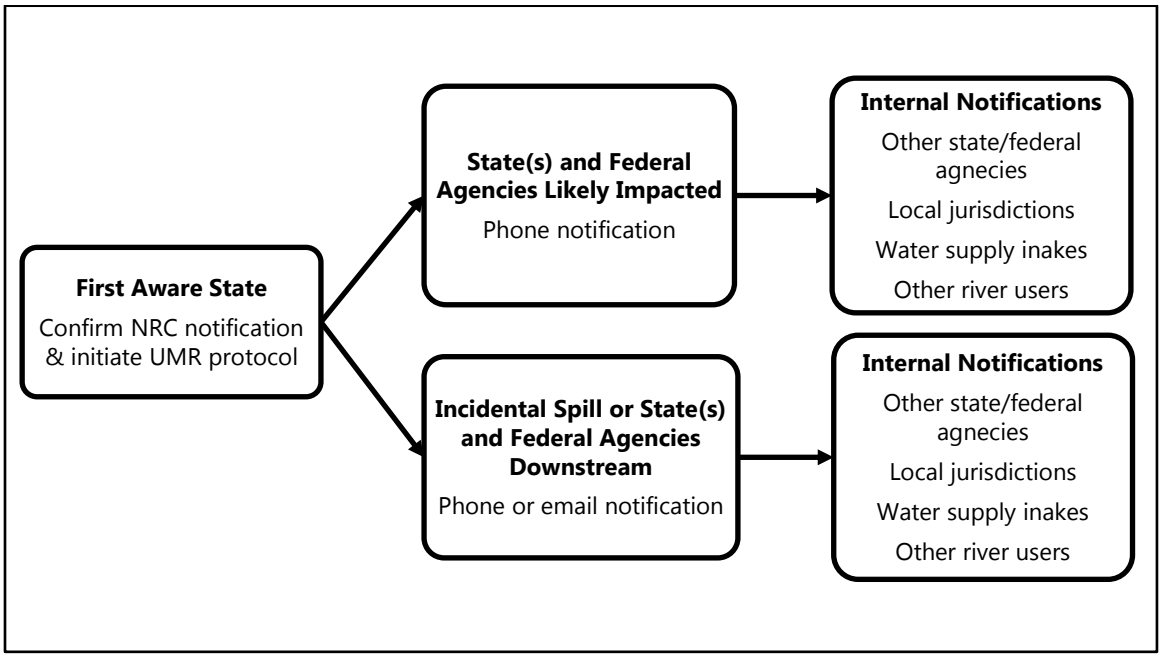
      The first-aware state should use its best judgment as to what is an incidental spill. Some factors that may affect this decision are i) the location of the spill relative to water intakes,

sensitive/critical fish and wildlife habitat, and major cities, and/or ii) the type and amount of material involved. In addition, news interest/coverage may make an otherwise environmentally insignificant spill into one of which other states and federal agencies should be made aware. If there is any doubt as to the significance of the spill, notification should be made.

2) **Each state is responsible for its own intrastate notifications**, such as those to other agencies within state government, local jurisdictions, and water supply intakes.

3) **When a spill originates within a state, that state will be the designated coordinating state** unless another state agrees to take over that responsibility (perhaps because of the greater involvement by the second state in the spill response). When the spill occurs in or affects the UMR at a boundary between two states, these states will decide during initial notification as to which state will be the designated coordinating state.

Figure 2: UMR Spill Notification Protocol



Updates

Informal daily updates will be made to adjacent and downstream states by the designated coordinating state if the response is state-lead or by the federal on-scene coordinator (FOSC) if the response is federally-led. A federal OSC may negotiate with a state to provide daily updates if the federal OSC maintains close communications and provides the necessary information to that designated coordinating state.

1) It is suggested that updates be emailed daily at a regular time which will meet agency management and public information needs, although urgent information should be sent immediately.

2) A state or federal agency which responds in any way to a spill is to update the designated coordinating state or federal OSC on its activity and findings daily. The reports should contain a

summary of all activity by that state/agency since its last report, including lab analyses and maps if appropriate. The reports should also list what future actions that state or agency plans to undertake.

3) When the designated coordinating state or federal OSC determines that daily updates are no longer necessary, this should be communicated via a final update. It should be labeled prominently as "FINAL" and state why the updates are being discontinued.

Spill Notification Roster

This roster is to be used for notification and status report purposes. The list contains primary contacts, which include the five Upper Mississippi River basin states, the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Coast Guard, and U.S. Fish and Wildlife Service. The primary contacts are those agencies that should receive first notice of a spill to the river. Additional key contacts, including downstream states and numerous federal agencies and offices are also included. Note that other river contact information can be found in the Resource Manual.

The call roster includes a business hour number for the primary response/coordinating agency, a 24-hour number for the agency that accepts the initial spill reports, and an email contact where available. The telephone number for the primary coordinating agency is used for interstate or interagency coordination during business hours. The 24-hour number is used for initial spill reporting for spills which may affect interstate waters. The email contact is used for other notifications or updates to state or federal agencies. Note that the emails are for individual UMR Spills Group members.

PRIMARY CONTACTS

Illinois

Coordinating Agency	Illinois Environmental Protection Agency Emergency Operations Unit	217-782-3637
24-hour	Illinois Emergency Management Agency	217-782-7860
Email	Roger Lauder	roger.lauder@illinois.gov

Iowa

Coordinating Agency	Iowa Department of Natural Resources	515-281-8694
24-hour	Iowa Department of Natural Resources	515-281-8694
Email	Joe Sanfilippo	joe.sanfilippo@dnr.iowa.gov

Minnesota

Coordinating Agency	Minnesota Pollution Control Agency Emergency Response Team	651-757-2161
24-hour	Minnesota Department of Public Safety	1-800-422-0798 or 651-649-5451
Email	Dorene Fier-Tucker	dorene.fier-tucker@state.mn.us

Missouri

Coordinating Agency	Missouri Department of Natural Resources	573-526-3315
24-hour	Missouri Department of Natural Resources	573-634-2436
Email	Rick Gann	rick.gann@dnr.mo.gov

Wisconsin

Coordinating Agency	Wisconsin Department of Natural Resources	800-943-0003
24-hour	Wisconsin Emergency Management	800-943-0003
Email	Tom Kendzierski	thomas.kendzierski@wisconsin.gov

PRIMARY CONTACTS
(Continued)

National Response Center - Washington, D.C.

Business Hours	National Response Center	1-800-424-8802
24-hour	National Response Center	1-800-424-8802
Online Form		www.nrc.uscg.mil

U.S. Department of the Army, Army Corps of Engineers - Vicksburg, MS

Business Hours	Mississippi Valley Division	601-634-5821
24-hour	Jim Hannon (cell)	601-831-2383
(See pp. A-6, A-7, and A-9 for Army Corps of Engineers' district and lock and dam contacts.)		

U.S. Environmental Protection Agency - Region 5, Chicago

Coordinating Office	Emergency and Enforcement Response Branch	312-353-2318
24-hour	Emergency and Enforcement Response Branch	312-353-2318

U.S. Environmental Protection Agency - Region 7, Kansas City

Coordinating Office	Emergency Response Program	913-551-7756
24-hour	Emergency Response Program	913-281-0991

U.S. Coast Guard – Sector UMR - St. Louis, MO

Business Hours	Sector UMR	314-269-2500
24-hour	Sector UMR	1-866-360-3386 or 314-269-2332

U.S. Fish and Wildlife Service - Twin Cities Regional Office

[Note: The Fish and Wildlife Service contact numbers listed below should be used only to report, or consult on, a spill that has already been reported to the National Response Center hotline (800-424-8802). Discussions with Fish and Wildlife Service personnel will under no circumstances constitute Natural Resource Trustee notification under OPA, CERCLA, or the NCP.]

Coordinating Office	None — use 24-hour number below in all instances	
24-hour	DOI Regional Environmental Officer for Region V (includes IL, MN, and WI) DOI Regional Environmental Officer for Region VII (includes IA and MO)	215-266-5155 303-478-3373

ADDITIONAL CONTACTS

National Pollution Funds Center – Washington, D.C.

Business Hours	National Pollution Funds Center	703-872-6000
24-hour	Command Duty Officer (CDO) Team 1 (includes Iowa and Missouri) Team 4 (includes Illinois, Minnesota, and Wisconsin)	202-494-9118 708-872-6067 703-872-6088

ADDITIONAL CONTACTS
(Continued)

Arkansas

Business Hours	Department of Emergency Management	1-800-322-4012
24-hour	Department of Emergency Management	1-800-322-4012

Kentucky

Business Hours	Department for Environmental Protection	502-564-2380
24-hour	Department for Environmental Protection	1-800-928-2380

Tennessee

Business Hours	Emergency Management Agency	1-800-258-3300
24-hour	Emergency Management Agency	1-800-258-3300

U.S. Coast Guard - Eighth District, New Orleans

Coordinating Office	Eighth District Command Center	504-589-6225
24-hour	Eighth District Command Center	504-589-6225

U.S. Coast Guard - St. Paul, MN

Business Hours	Marine Safety Detachment	612-725-1871
24-hour	Sector UMR	1-866-360-3386 or 314-269-2332

U.S. Coast Guard - Quad Cities

Business Hours	Marine Safety Detachment	309-782-0627
24-hour	Sector UMR	1-866-360-3386 or 314-269-2332

U.S. Coast Guard - Memphis, TN

Business Hours	Sector Lower Mississippi River	1-866-777-2784
24-hour	Sector Lower Mississippi River	1-866-777-2784

U.S. Coast Guard - Paducah, KY

Business Hours	Marine Safety Unit	270-442-1621
24-hour	Sector Ohio Valley	1-800-253-7465

U.S. Coast Guard - Louisville, KY

Business Hours	Sector Ohio Valley	502-779-5422
24-hour	Sector Ohio Valley	1-800-253-7465

U.S. Coast Guard, Atlantic Strike Team - Fort Dix, NJ

Business Hours	Atlantic Strike Team	609-724-0008
24-hour	Atlantic Strike Team	609-724-0008

U.S. Coast Guard, National Strike Force - Elizabeth City, NC

Business Hours	National Strike Force	252-331-6000
24-hour	National Strike Force	252-331-6000

ADDITIONAL CONTACTS

(Continued)

U.S. Department of Agriculture – Animal and Plant Health Inspection Service - Fort Collins, CO

Business Hours	Wildlife Services	970-266-6363 or 877-303-6363
24-hour	Wildlife Services	970-266-6363 or 877-303-6363

U.S. Department of the Interior - Philadelphia, PA (Regional Environmental Officer for Region 5)

Business Hours	Office of Environmental Policy & Compliance	215-597-5378
24-hour	Office of Environmental Policy & Compliance	215-266-5155

U.S. Department of the Interior - Denver, CO (Regional Environmental Officer for Region 7)

Business Hours	Office of Environmental Policy & Compliance	303-445-2500
24-hour	Office of Environmental Policy & Compliance	303-478-3373
(See pp. C-13 and C-14 for Fish and Wildlife Service field-level contacts.)		

U.S. Department of Commerce, National Oceanic and Atmospheric Administration - Cleveland, OH

Business Hours	Scientific Support Coordinator	216-522-7760
24-hour	NOAA Hazmat Duty Officer (Seattle)	206-526-6317

U.S. Department of Commerce, National Weather Service

Business Hours	Regional Warning & Prep Meteorologist, Kansas City	816-426-3239
24-hour	National Weather Service Forecast Offices (unlisted numbers)	
	Minneapolis, Minnesota	612-361-6671
	Milwaukee, Wisconsin	414-965-5063
	Davenport, Iowa	563-386-4110
	Des Moines, Iowa	515-270-4501
	Chicago, Illinois	815-834-0651
	St. Louis, Missouri	314-447-1887
24-hour	River Forecast Center (Minneapolis)	612-361-6660 612-361-6664

IV. KEY UPPER MISSISSIPPI RIVER RESPONSE CONSIDERATIONS, TECHNIQUES, AND TOOLS

Upper Mississippi River Physical Characteristics, Boundaries, and Jurisdictions

The Mississippi River flows 2,348 miles from the headwaters at Lake Itasca in northern Minnesota to the mouth at the Gulf of Mexico in Louisiana. The Mississippi River and its tributaries drain approximately 40 percent of the conterminous United States. The average discharge of the Mississippi River to the Gulf of Mexico is 420 billion gallons per day.

The Mississippi River is divided into two general hydrologic regions — the Upper Mississippi Region and the Lower Mississippi Region. The Upper Mississippi Region includes the northern 1300 miles of the river in the states of Minnesota, Wisconsin, Iowa, Illinois, and Missouri. The Lower Mississippi Region includes the 1000 miles of river that flow between Missouri, Kentucky, Arkansas, Tennessee, Mississippi, and Louisiana. The boundary between the two regions is the Ohio River confluence at Cairo, Illinois. The UMR Spill Plan addresses the commercially navigable mainstem of the Upper Mississippi River from Minneapolis, Minnesota to the Ohio River confluence at Cairo, Illinois.

The average discharge of the Upper Mississippi River at Cairo is about 121 billion gallons per day. This is approximately 30 percent of the total discharge of the Mississippi River into the Gulf of Mexico. The tributary contributing the greatest flow to the Upper Mississippi River is the Missouri River, with an average discharge of 48 billion gallons per day. Other major tributaries to the Upper Mississippi River include the Minnesota, St. Croix, Wisconsin, Illinois, and Kaskaskia Rivers.

Above the Quad Cities the UMR has a complex floodplain structure including the main channel, side channels, backwaters, and impounded areas. Further downstream there is less channel diversity, and levees separate much of the river from its floodplain. River flows are impacted by the degree of channel diversity.

Flow velocities also vary dependent on flow volume, which increases downstream as tributaries enter and can be dramatically impacted by precipitation events or lack of precipitation. Seasonal cycles also affect flow velocity and volume (e.g., typically higher in spring and lower in fall). Additionally, winter ice formation is also a consideration for response.

Further, the Upper Mississippi River falls within and sits at the border of variety of agency jurisdictions. This includes five states, two US EPA regions, USCG, USFWS, USACE, National Park Service, and various local jurisdictions. Multiple agencies within a single state may also be involved. As a result, any given location on the River may fall under the jurisdiction of multiple agencies at multiple levels of government.

Natural Resources and Human Uses

The commercially navigable portion of the Upper Mississippi River extends from Minneapolis, Minnesota to the Ohio River confluence — a total of approximately 856 river miles. This portion of the Upper Mississippi River is a major transportation artery linking the Midwest to U.S. and foreign markets. Industrial and agricultural commodities are shipped by barge on the waterway through a series of 29 locks and dams that maintain a 9-foot deep channel in the river. Over 100 million tons of commodities are shipped annually on the Upper Mississippi River.

Besides being a commercial transportation corridor, the Upper Mississippi River is a major wildlife and recreational resource. In fact, the Upper Mississippi River is the only inland river in the United States serving under federal law as both a federal commercial navigation project and a major national wildlife refuge complex. Specifically, the UMR was recognized by Congress as "a nationally significant ecosystem and a nationally significant commercial navigation system" in the Water Resources Development Act of 1986. In addition, the Upper Mississippi River Floodplain Wetlands were recognized in January 2010 by the Ramsar Convention as a Wetland of International Importance.

The UMR hosts many wildlife species, including over 300 migratory bird, 150 fish, 50 mammal, and 30 mussel species. In addition, the UMR provides critical habitat for 36 federally-listed or candidate species of rare, threatened or endangered plants and animals. Approximately 300,000 floodplain acres are within the National Wildlife Refuge System, and states manage roughly 140,000 additional acres.

Its abundant natural resources help draw over 12 million people annually to fish, swim, boat and recreate on the UMR. Recreational activity on the Upper Mississippi River System, which includes the Illinois River and other navigable tributaries, has been estimated to involve direct and indirect expenditures of more than $1.2 billion annually. Water-based recreational opportunities abound on the river and its backwaters. On the Upper Mississippi River alone there are over 380 boat harbors, access points, and marinas.

The Upper Mississippi River is also an important water supply. A total of 72 facilities including 23 municipalities, as well as numerous industries, hydropower plants, and fish and wildlife refuges take water from the river. Additionally, over 300 facilities discharge wastewater to the Upper Mississippi River, including industrial facilities and municipal sewage treatment plants. Considerable ground transportation and industrial infrastructure is also present in along the river, including highways, rail lines, pipelines and fuel storage/transfer facilities.

General Response Considerations and Implications

As a result of the UMR's physical characteristics, natural resources, human uses, and multiple jurisdictions, responders need to be aware of the following when responding to a spill on the River:

- It is a complex physical system including locks and dams, the main channel, side channels, and backwaters. As a result, flows and spill trajectories are variable and difficult to predict.
- High-value natural resources are present on the UMR, including tremendous seasonal concentrations of migratory species, threatened and endangered species, and diverse habitats ranging from river bottom to floodplain forests.
- The UMR is an important source for drinking water, industrial water use, and power plant cooling.
- Commercial and recreational vessels may need to be alerted for safety reasons; also, their operations may hinder response efforts.
- Diverse potential pollution sources exist, including vessels, pipelines, railroads, highway crossings, fixed facilities, and storm sewers and other outfalls.
- The UMR is a multi-jurisdictional river, and it serves as a border for counties, states, and federal agencies.

Further, resulting implications for responders include:

- The need to be aware of potentially dangerous river conditions.
- Follow the UMR notification protocol to ensure all potentially affected jurisdictions are notified.
- Consult state and federal natural resource managers throughout the response.
- Physical factors, public safety considerations, and natural resource concerns may limit response options – this applies to in situ burning and chemical countermeasures as well as mechanical removal.

Response Tactics: Limitations and Opportunities

Equipment Availability/Response Time
A limited amount of response equipment is pre-positioned and readily available for use on the UMR. This results in part from an uneven distribution of population along the approximately 850 miles of navigable UMR where there are handful of large population centers, several mid-size cities and smaller towns, and many miles of relatively remote areas. As a result, most of the pre-positioned equipment is to be found at facilities and largely in the Twin Cities and St. Louis areas. Terminals and spill response cooperatives also maintain small amounts of response equipment in some areas on the river. However, for the majority of river miles, no equipment is present nearby and response time to these areas is likely to be substantial. This situation, coupled with significant flow velocities in the river's main channel, can make timely and effective spill response on the UMR particularly challenging.

Booming
In the river's main channel, swift currents and debris makes boom deployment and maintenance extremely challenging, particularly for containment and collection booming. If boom is deployed for these purposes, smaller diameter boom (e.g., six inch) should be employed and deployment angles reduced. Devices such as "boom vane" and "boom deflectors" may assist with fast water deployment, and secure anchoring is critical. Responders should seek to identify opportune areas for collection (e.g., slack water areas, bends in the river), while being aware of sensitive resources which may reside in such areas. In some cases, protective deflection or exclusion booming may be the only viable option on the main channel. Slower-flowing side channels and backwaters may be more amenable to containment and collection booming, though care must be taken in response as these are often areas where high value natural resources are located. See the Inland Response Tactics Manual and the US Coast Guard's Field Guide for Oil Spill Response in Fast Water for more information on boom deployment. Also, site-specific response strategies have been developed for the Twin Cities and St. Louis areas, as well as for UMR Pools 7, 10, 13, and 19, which include very specific recommendations for boom deployment. See the section on Geographic Response Plans and Response Strategies below.

Skimmers
In the UMR's main channel, the effectiveness of skimmers is limited due to challenges with access, rapid current, and debris. However, they may be more effective in slower water areas, including side channels and backwaters. USCG's vessel of opportunity skimming system (VOSS) may provide for main channel skimming and has been successfully tested on Illinois River. Therefore, it could potentially be used on the UMR. However, the VOSS does require fairly significant time for deployment, both to be brought to the region and then to be affixed to an appropriate vessel. See the Inland Response Tactics Manual and the US Coast Guard's Field Guide for Oil Spill Response in Fast Water for more information on the use of skimmers.

Use of Barges in Response
A unique consideration for commercially navigable waterways such as the UMR is the potential for barges to be deployed in the containment, collection, and/or deflection of spilled product, essentially using barges as boom. This approach may provide for a rapidly-deployable and effective approach on some areas of the UMR. Generally, bow and stern anchors are required to maintain the desired position. Vessels can be cascaded similar to boom in order to move oil in the desired direction. Similar to boom deployment, the vessel should be anchored at an angle to the current to be effective. Barges can also be used as work platforms for spill response equipment. Of course, communication and coordination with individual operators offering to supply barges is necessary to confirm conditions and duration of use. See Section D for a list of shippers operating on the UMR.

Lock and Dam Operations
There are 29 navigation lock and dam structures on the UMR. With the exception of Upper St. Anthony Falls and Lock & Dam 19, these are low-head structures with minimal storage and are not designed for flood control. Rather, the intent of these dams is to maintain the 9-foot navigation channel within a relatively narrow band of pool elevation. Therefore, the ability of UMR locks & dams to hold back water and spilled product during an incident is quite limited. Most UMR dams utilize a combination of roller and Tainter gates, allowing for limited manipulation of flow across the dam, particularly in light of potential scouring issues. While recognizing these limitations, USACE has offered to assist where possible in response (see "Policy on Coordination with the U.S. Army Corps of Engineers" and contact persons on pages A-6, A-7, and A-9) and may be able to aid response in some cases by providing limited modifications of lock and dam settings/operations. Examples of these limited actions may include small drawdowns to pull product out of off-channel areas and changing gate settings to reduce velocity in a particular area to facilitate recovery.

In Situ Burning and Chemical Oil Spill Treating Agents
The use of in situ burning (ISB) and chemical oil spill treating agents (COSTAs) is expected to be very limited on the Upper Mississippi River. All five states, local authorities, and federal agencies with jurisdiction on the Upper Mississippi River advocate the used of mechanical cleanup (e.g., containment boom, skimmers, sorbent pads) as primary spill response methods. Use of ISB and COSTAs should only be considered when mechanical methods are not feasible or have not been successful. Even then, certain restrictions and approval process apply. See "Policy on In Situ Burning and Chemical Oil Spill Treating Agents" and Resource Manual Section F for more information.

Key Regional Planning and Response Tools

Upper Mississippi River Response DVD
As a companion to the UMR Spill Plan, a UMR Response DVD has been created, incorporating many of the resources listed below, including Inland Sensitivity Atlas maps, geographic response plans, sub area plans, and regional contingency plans. This DVD provides the most complete collection of UMR planning and response tools available, and allows for navigation among these tools. Copies of the DVD can be obtained by contacting UMRBA at 651-224-2880.

Region 5 Regional Response Team (RRT Website)
The Region 5 RRT website brings together many of the resources described here in an interactive, linked format. See www.rrt5.org.

UMR Pool Geographic Response Plans and Site-Specific Response Strategies
Geographic response plans (GRPs), including site-specific response strategies and initial incident action plan (IAP) templates, have been created for UMR Pools 7, 8, 10, 13, and 19. These GRPs are provided on

compact discs and also include contact lists, pool descriptions and Inland Sensitivity Atlas Maps. Additionally, site-specific response strategies have been developed for the Mississippi River in the Twin Cities and the greater St. Louis area. The sites specific response strategies are available in compact disc format (St. Louis only), within the Inland Sensitivity Atlas, as part of the UMR response DVD. Copies can be obtained by contacting UMRBA at 651-224-2880.

Habitat-Specific Response Fact Sheets and NEBA Fact Sheets
Fact sheets specific to riverine and riparian vegetated habitats have been developed to aid responders in selection of response techniques. Also available are fact sheets originally developed to accompany net environmental benefit analysis (NEBA) workshops. These NEBA fact sheets provide a summary of response considerations for general types of inland waterway habitats (e.g., vegetated shoreline) and species (e.g., freshwater mussels). All fact sheets are available at www.umrba.org/spillplans.htm as well as on the Region 5 RRT website.

Inland Response Tactics Manual
This manual of response tactics for inland waterways includes text and visual illustrations of numerous response tactics. It was originally adapted from the Alaska Clean Seas manual in order to be applicable in more moderate climates and has now been augmented with additional inland response tactics. The manual is available on the UMRBA website at http://www.umrba.org/spillplans.htm.

US EPA Region 5 Inland Sensitivity Atlas
This GIS-based mapping product covers the entire inland area of the Region 5 states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) and was designed specifically for use by regional spill planners and responders. Maps contain both potential spills sources (e.g., oil storage facilities, pipelines) and sensitive features/areas (e.g., water intakes, sensitive species, parks and other managed lands). Maps extend one county into bordering states and include the bordering counties of the UMR. Atlases are available in DVD format with one or more DVD per state, depending on the density of features and size of the state. Relevant contingency plans for the area are also included on each DVD. Contact Ann Whelan of US EPA Region 5 at 312-886-7258 or whelan.ann@epa.gov for more information. Also see information on the UMRBA website at http://www.umrba.org/isa.htm.

UMR Early Warning Monitoring Network
UMR-based public water suppliers, industries, and other partners have supported efforts to establish an "early warning monitoring network" on the UMR which would serve to provide advanced warning of a spill event via continuous monitoring installations. Currently, data from the installation just upstream of the Quad Cities is available at http://wqdatalive.com/public/269.

V. UPPER MISSISSIPPI RIVER RESPONSE POLICIES

Incident Command System Implementation Protocol
Addressing State and Federal Responders

Federal law requires implementation of a site-specific incident command system at all emergencies involving hazardous substances by the senior emergency response official responding (29 CFR 1910.120 and 40 CFR 311). The specific regulatory language suggests a seniority hierarchy increasing from local, to state, to federal. Yet, often it makes more sense for senior local or state officials to command because they have committed, effectively command, and are most familiar with the resources immediately available. Flexibility was the basis of past practice and has worked well. To maintain that flexibility and comply with current law, contingency plans must reflect this in writing. At the same time it must be recognized that federal and state responders are charged by law with specific authorities and responsibilities in certain emergency situations that cannot be subsumed. The following is suggested language for Regional and Area Contingency Plans; interregional contingency plans such as the Upper Mississippi River Spill Response Plan; state contingency plans; and, potentially, for local plans that, if incorporated, allows for more flexibility in compliance with 29 CFR 1910.120 (q)(3) than if this issue is not specifically addressed in such documents. This protocol does not commit any parties adopting it to do anything not already required by federal law.

AN INCIDENT COMMAND SYSTEM (ICS) SHALL BE ESTABLISHED AT ALL INCIDENTS INVOLVING HAZARDOUS SUBSTANCES BY THE SENIOR ON-SCENE OFFICIAL OF THE FIRST RESPONSE ORGANIZATION TO ARRIVE AT AN INCIDENT. The ICS should be based on the organization, terminology, and procedures recommended by the National Fire Academy[1] and applied in a broad sense to include all hazard control and mitigation response organizations including responsible parties; private responders; and local, state, and federal agencies. All such entities participating in a response are required by federal law to implement an intra-organizational ICS and integrate it with the overall ICS (29 CFR 1910.120 or 40 CFR 311).

The ICS established will have as the Incident Commander (IC) the most senior on-scene official with the expertise, capability, and determination to be the commander. The IC can be from a local unit of government or from a county, state, or federal agency, as long as he/she has the expertise, capability, determination, and authority. This protocol recognizes that typically, but not necessarily, the IC will change as the incident progresses from being primarily a public safety problem, with the local fire chief as IC, to an environmental incident, with a state or federal person as the IC. The following procedures specify a determinate yet flexible means of establishing the role of federal and state responders in an ICS.

Single Jurisdictional Area Affected

When the incident involves and affects only a single local geographical jurisdiction, the organizational structure of the ICS will be determined by the established local contingency plan. This may involve single or multiple agency involvement. In all situations, one person shall act as either an Incident Commander in sole charge or, when functioning as an Operations Chief, will implement the action plan of a Unified Command.

In such instances, responding state and federal officials, who might otherwise be considered the senior competent emergency response official at the site, shall either:

1. Identify themselves to the Incident Commander and integrate themselves into the established ICS per the Incident Commander's direction, usually as a technical specialist to an operations group supervisor or as an operations group supervisor; or

2. Join an existing Unified Command or request that the Incident Commander establish a Unified Command; or

3. Assume the Incident Command role when required by federal or state law, or when an existing Incident Commander agrees to such a transition, or when no ICS has been established.

The ICS transfer of command or initial assumption of command protocols shall be used.

Multiple Jurisdictional Areas Affected

When the incident involves and affects multiple local geographical jurisdictions or areas not covered by local emergency response organizations, the state or federal competent senior official at the site shall:

1. Preferably join an existing Incident Command or Unified Command as described above; or

2. Establish a Unified Command for an encompassing ICS if none exists; or

3. Assume Incident Command and establish an ICS incorporating existing local efforts as operations section branches or otherwise as appropriate.

Local, State, Federal Interaction

When not specifically prescribed, a Unified Command consisting of local, state, and federal senior competent emergency response officials at the site shall be the preferred approach to integrating several levels of government into an ICS. Where state law specifies incident command assignment, it shall take precedence over this protocol with respect to those state and local organizations to which it applies. Federal jurisdiction specified in CERCLA, OPA, or the RCP[2] shall take precedence over this protocol.

Seniority

Seniority, as discussed in 29 CFR 1910.120 (q)(3)(i)[3], is ranked according to competency and breadth of responsibility for purposes of this plan.

Competency will be determined by meeting the requirements of 29 CFR 1910.120 (q)(6)(v).[4] All officials meeting the competency criteria are senior to those who do not, unless specifically charged with overriding authority applicable to the specific incident situation by state or federal law.

Breadth of responsibility will be considered to increase from most local to state to federal. However, this protocol encourages the establishment of the ICS at the most local level practicable to assure the earliest implementation of a unified response strategy.

Post-Emergency Operations

This protocol is intended only to apply during the emergency phase of a response to which 29 CFR 1910.120 (q) applies. However, use of an incident command system throughout a response and cleanup is encouraged.

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1 One set of common terminology and procedures is vital to the efficient functioning of an ICS in an emergency. While no widely accepted ICS is specifically designed for hazardous materials response, the National Fire Academy (NFA) system is workable, widely accepted, and recommended by the Federal Emergency Management Agency. The NFA ICS is designated as the preferred ICS for purposes of this protocol until a more widely accepted system is available.

2 CERCLA is the Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as Superfund; OPA is the Oil Pollution Act of 1990; and the RCP is the Regional Contingency Plan adopted pursuant to 40 CFR 300.210.

3 29 CFR 1910.120 (q)(3)(i) "The senior emergency response official responding to an emergency shall become the individual in charge of a site-specific Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer."

4 29 CFR 1910.120 (q)(6)(v) "On scene incident commander. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder awareness level and in addition have competency in the following areas and the employer shall so certify:

(A) Know and be able to implement the employer's incident command system.
(B) Know how to implement the employer's emergency response plan.
(C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.
(D) Know how to implement the local emergency response plan.
(E) Know of the state emergency response plan and of the Federal Regional Response Team.
(F) Know and understand the importance of decontamination procedures."

Policy on In Situ Burning and Chemical Oil Spill Treating Agents

This policy is applicable to the commercially navigable waters of the Upper Mississippi River, including backwaters, except for those areas that are covered by a Sub-Area Contingency Plan (SACP). Sub-Area Planning Committees may develop specific policies for in situ burning and other countermeasures, as long as they are consistent with local, state, and federal regulations.

Oil spill responders have a limited number of techniques available to them that will minimize environmental impacts and facilitate effective cleanup. These include mechanical methods, the use of certain chemical oil spill treating agents, and in situ burning. *All five states, local authorities, and federal agencies with jurisdiction over the Upper Mississippi River advocate the use of mechanical containment and cleanup as primary spill response methods*. These methods include the use of absorbent pads, containment boom, skimmers, and similar equipment. In general, the use of dispersants is not promoted within the boundaries of the Region 5 or Region 7 Regional Response Teams (RRTs).

General Policy

The Federal On-scene Coordinator (FOSC) has the authority to utilize, or approve, any actions necessary to prevent, or substantially reduce, the threat to human life. This includes, but is not limited to, the use of chemical and oil spill treating agents (COSTAs) and in situ burning (ISB) (see 40 CFR 300.910(d)). The FOSC will inform the affected RRTs as well as the RRT representatives of any affected states of these actions. Other interested parties such as natural resource trustees should be informed as appropriate.

When there is no longer an immediate threat to human health and welfare, the use of COSTAs and/or ISB will be evaluated on a case by case basis, and is to be conducted in accordance with the remainder of this policy.

COSTA Procedure
For COSTAs the approving authority is the Federal On-Scene Coordinator (FOSC) when the FOSC has obtained the concurrence of both the Regional Response Team EPA co-chair and the affected state representative, and, to the maximum extent practicable, consulted with the federal natural resource trustees' representatives on the RRT (40 CFR 300.305(e) and 40 CFR 300.910(b)).

ISB Procedure
In situ burning, for the purposes of this guidance, is defined as the ignition of spilled oil that will burn due to its intrinsic properties, and does not include the adding of a separate burning agent to initiate or sustain the burn. The addition of burning agents requires the COSTA procedure approval because such agents are considered to be in the same category as COSTAs. In situ burning can be performed on the open water and near or on shore.

The use of in situ burning in these guidelines is not for disposal purposes; rather, it is a response technique to be employed when an oil slick has the potential to spread and contaminate additional areas. It is also considered as a cleanup technique for oiled shoreline habitats such as wetlands, where it is used in conjunction with other cleanup methods.

For in situ burns (ISB) on the Upper Mississippi River, the approving authority designated by this policy is the local Incident Commander (or Unified Command as applicable) and the State On-Scene Coordinator (SOSC), who may need to obtain internal permission.

A. If the proposed burn is on a local, state, tribal, or federally owned or managed natural resource area, the concurrence of the land owner/manager must be obtained.

B. Because state or federally listed threatened or endangered species, migratory birds, managed natural resource areas, or other natural resources could be affected, all responders and trustees share interest in timely and effective removal of spilled oil in ways that protect natural resources and the public's safety. Local incident commanders and state and federal on-scene coordinators shall consider the size, nature, and location of a spill, and the type and proximity of resources, and shall, to the maximum extent practicable, consult with state and federal, and, as appropriate, tribal, trustees before deciding to conduct in situ burning. It is the expectation of the members of the Region 5 and Region 7 RRTs that, except in extraordinary cases, a local incident commander or state or federal on-scene coordinator shall contact appropriate trustees before proceeding with any proposed in situ burn.

In addition, whenever the time available permits, the views of the FOSC should be sought and considered.

Because the time frame for making decisions regarding ISB is often very short, guidelines are included in Section F of the Resource Manual to assure that the most significant issues are considered. This decision-making methodology for burning is approved by the Upper Mississippi River Hazardous Spills Coordination Group, Region 5 Regional Response Team, and Region 7 Regional Response Team.

Special Policy for FOSC-Directed Burns

In situ burns overseen by a Region 5 FOSC follow the COSTA procedure (above) as a matter of RRT policy. The Region 5 RRT has established ISB Guidelines to facilitate the approval process. Region 5 federal burns are governed by the Region 5 ISB Guidelines, the NCP, and state and local regulations. Burns overseen by an SOSC or other parties in Region 5 must be in compliance with state and local regulations. Note that the Region 5 ISB Guidelines do not grant pre-approval to conduct an in situ burn. Rather, they are intended to provide consistent guidance throughout the region to facilitate decision-making on whether or not to conduct a burn during a spill incident.

Region 7 has also developed policy and guidelines for in situ burning, as well as COSTAs. Region 7 burns are governed by the Region 7 ISB Guidelines, the NCP and state and local regulations. It is Region 7 policy that all burns in Region 7 must comply with local, state, and federal regulations.

Consistent with both the Region 5 and Region 7 ISB policies, it is the Upper Mississippi River policy that all burns on the Upper Mississippi River must comply with local, state, and federal regulations.

The FOSC is authorized to use any countermeasure without requesting permission if he or she believes its use is necessary to prevent or substantially reduce a hazard to human life (40 CFR 300.910 (d)). SOSCs may have similar authority under applicable state laws and regulations.

Policy on Bioremediation

Because the Upper Mississippi River Spill Response Plan and Resource Manual is designed to provide the first responder and on-scene coordinator with information necessary to make informed decisions in the initial phases of response, bioremediation guidelines are not included in this plan. Bioremediation takes extended periods of time to reduce contaminant mass. It is usually applied to terrestrial environments, including, potentially, riverine shoreline. It is unlikely that oversight of such a project would involve a first responder or on-scene coordinator during the first phase of a response. In the unlikely event that a first responder, on-scene coordinator, or responsible party proposes to use bioremediation measures on or in the navigable waters of the Mississippi River, the National Contingency Plan, subpart J, and state officials should be consulted for authorities, restrictions, and approvals.

Policy on Vessel Detainment

In the course of investigating and responding to spills of oil or hazardous substances, it may be necessary to detain vessels. Federal authority to detain vessels for pollution response investigations in ports subject to the jurisdiction of the United States and on the navigable waters of the United States rests with the U.S. Coast Guard Captain of the Port (COTP).

The COTP is authorized to:

a. order a vessel to operate or anchor in a particular manner if the COTP has reasonable cause to believe that the vessel does not comply with any regulation or applicable law (33 USC 1223, Ports and Waterways Safety Act);

b. investigate any incident which affects or may affect the safety or environmental quality of the ports, harbors, or navigable waters of the United States (33 USC 1227, Ports and Waterways Safety Act); and

c. board and inspect any vessel, except public vessels, to enforce the oil and hazardous substance liability provisions of the Federal Water Pollution Control Act (33 USC 1321, Oil Pollution Act).

Known or suspected violations of federal pollution prevention requirements by vessels should be reported to the appropriate COTP. For incidents on the Upper Mississippi River from mile 0.0 up to mile 109.9, notify the Sector Ohio Valley in Louisville, Kentucky. For incidents on the Upper Mississippi River at mile 109.9 and above, notify the Sector Upper Mississippi River in St. Louis, Missouri. See Spill Notification Call Roster pages 20-21 for contact information.

Policy on Coordination with the U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers has a wide range of responsibilities on the Upper Mississippi River, including operation and maintenance of the commercial navigation system, management of Corps-owned lands, and flood damage reduction and flood response. Given its diverse river-related missions, the Corps has a variety of resources, capabilities, and expertise that could facilitate spill response on the Upper Mississippi River. This policy outlines the types of assistance that may be available from the Corps and the appropriate procedures for requesting that assistance.

The Corps administers its Upper Mississippi River projects and programs through the St. Paul, Rock Island, and St. Louis Districts, all of which are under the command of the Mississippi Valley Division in Vicksburg, Mississippi. (See p. A-8 for a map showing boundaries among the three districts.) In letters dated between November 2001 and February 2002, the Commanders of the three UMR districts each indicated that the Corps "stands ready to respond and assist the federally designated on-scene incident commander" in the event of a major spill on the Upper Mississippi River. However, that assistance is limited by the Corps' resources and capabilities and must not conflict with the Corps' responsibilities under applicable laws or regulations.

The precise nature and extent of the Corps' assistance will, of course, be determined by the specifics of a particular incident. In general, the Corps' capabilities include reporting and monitoring spills, providing information about river conditions, logistics support (including communications and other site resources), and contracting and technical support. In addition, under certain circumstances, Corps personnel may be able to facilitate control and containment of spills through its river operations, such as emergency dredging or manipulation of river flows. However, spill responders should be aware of the following limitations:

- The Corps' ability to modify river flows to facilitate spill response is generally quite limited. For example, there is very little storage capacity in the UMR pools; thus, the Corps cannot typically hold water behind the navigation dams.
- All assistance rendered by the Corps must not conflict with the Corps' responsibilities under applicable laws or regulations. Top priorities include the protection of public health and safety and public infrastructure.
- Corps personnel are trained only to the level necessary to respond to a spill from a Corps facility and thus do not have the training needed to respond directly to a major spill event.
- If the Corps provides assistance in response to the request of a federally designated on-scene incident commander, the Corps will compile all costs of providing that assistance and will seek reimbursement from the responsible party.

Corps Coordination Contacts

- **Contact the appropriate lockmaster (pp. A-6 and A-7) for site-specific assistance and information.**
- **Contact the appropriate District Hydraulics Branch (p. A-9) for requests for changes to dam gate settings, and river level and flow projections.**

Oiled Wildlife Response

The purpose of this section is to guide the organization and coordination of government agencies, responsible party, and oil spill response organizations response to reports of oiled wildlife on the Upper Mississippi River. Upon discovery of oiled wildlife or significant threat of oiling, emergency response personnel should notify the Regional Environmental Officer for the U.S. Department of the Interior, state wildlife resource agencies, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture Wildlife Services. See Spill Notification roster, pages 19 to 22. The Incident Commander should request the services of these agencies to assist the response in addressing oiled wildlife needs identified below which may be applicable for the incident. The responsible party for the spill is obligated to provide for the wildlife response. Wildlife resource agencies are obligated to track and document their expenses during a spill incident and may apply for funding from the U.S. Coast Guard's Oil Spill Trust Liability Fund. Information resulting from Wildlife Branch operations should be coordinated with natural resource damage assessment (NRDA) efforts, if NRDA has been initiated by the natural resource trustees. The NRDA process is separate from response actions, including wildlife recovery; however, coordination of response planning and field observations with NRDA allows for an overall more effective and efficient resolution of natural resource issues at spill sites.

ICS - Wildlife Branch with the Operations Section

A scalable Wildlife Branch within the Operations Section should be established as part of an incident-specific ICS structure. As soon as feasible and necessary, state and federal wildlife resource agencies should designate a Branch Director and Group Supervisors to direct the operational activities for the Wildlife Branch. These operational activities are outlined below. The Wildlife Branch will follow standard ICS rules and forms and the Incident Command is responsible for addressing all resource needs identified by the Branch Director necessary to implement approved wildlife response operations. All wildlife branch operations must be covered by a spill specific health and safety plan to protect the responders. Animal welfare and animal ethics apply to emergency spill response. It is important to establish direct communication and coordination protocols between the Wildlife Branch and the Environmental and Situation Units of the Planning Section to ensure proper documentation and reporting of field observations (e.g., numbers, species, and locations of impacted wildlife) to continually inform planning decisions for subsequent operational periods. Similar protocols should be established to get the same information on a timely basis to the natural resource trustees if NRDA has been initiated. Request for interviews from the media should be coordinated through an incident-specific public information officer.

Reconnaissance

Tasks for reconnaissance operations are to identify and determine the locations of oiled wildlife, along with the movement patterns of other wildlife that may become oiled. This may include the use of aircraft, watercraft, and vehicles. Predetermined search areas and routes plus the use of GIS will aid in the efficiency of the reconnaissance crews. Information and data gathered by this activity and associated forms may be used by the Environmental and Situation Units in the Planning Section and/or integrated into the Wildlife Branch to help plan wildlife avoidance and/or recovery operations. A Reconnaissance and Recovery Group may be established by the Wildlife Branch Director to fulfill these responsibilities.

Hazing and Deterrents

Hazing or deterrent operations are designed to mitigate the threat posed by wildlife use patterns that may cause oiling. Commercial vendors retained by the responsible party or the U.S. Department of

Agriculture Wildlife Services may carry out hazing or deterrent operations, as determined by the Wildlife Branch Director. The U.S. Department of Agriculture Wildlife Services maintains readiness to use advanced methods to haze and deter wildlife. It may be advisable to establish a separate Wildlife Hazing Group to carry out these specialized operations in close coordination with oil collection and recovery operations.

Recovery

The tasks for the recovery operations are to capture oiled wildlife for transport back to the rehabilitation facility. Recovery operations may include capture with hand nets or other techniques such as pharmaceuticals, rocket nets, traps, and other advanced methods. Recovery operational tasks may be assigned and accomplished by contractors working for the responsible party or by state and/or federal wildlife resource agencies. In particular, the U.S. Department of Agriculture Wildlife Services maintains readiness to use advanced methods to capture wildlife. All captures should be documented on approved forms using an agreed upon coordinate system along with tagging the cages or carriers. Decontamination procedures should be used on the capture tools, cages, and carriers for re-use. All recovery operations must be closely coordinated with Law Enforcement agents from state and federal wildlife resource agencies to ensure compliance with applicable laws and regulations. A Reconnaissance and Recovery Group may be established by the Wildlife Branch Director to fulfill these responsibilities.

Transport

The tasks for the transport operations are to safely and humanely move the captured wildlife from the recovery crews in approved carriers and vehicles to the rehabilitation facility. The may require stabilization of captured wildlife and triage to move the highest priority animals into care. This may also include euthanasia procedures as supervised by a qualifying professional. The transport operations may include tasks suitable for the use of volunteers. Wildlife transport operations may be implemented by the Reconnaissance and Recovery Group established by the Wildlife Branch Director.

Rehabilitation

Oiled wildlife rehabilitation expertise may be available from local, regional, or national vendors. If oiled wildlife rehabilitation is required, the Wildlife Branch Director may establish a Rehabilitation Group to assist the responsible party in obtaining wildlife rehabilitation services. The Group Supervisor will be responsible for ensuring all rehabilitation operations follow applicable State and Federal regulations. Permits and special rules are required from state and federal officials for wildlife care, and may vary by state. It may be necessary for the rehabilitation facility to construct or provide extended holding cages for after the initial emergency treatment until the animal is healthy for release back into the wild.
The rehabilitation facility operations may include tasks suitable for the use of volunteers. USFWS' *Best Practices for Migratory Bird Care During Oil Spill Response* should be consulted for additional information regarding rehabilitation operations, including techniques for the prevention of oiling of birds, as well as good practices for cleaning, caring for, and releasing recovered birds.

Release Back into the Wild

The release operation requires planning to avoid wildlife from returning to the oiled environment and to meet all applicable state and federal permits and rules. The release operations should be designed as not to promote disease transmission into wild populations. Released animals may be tagged for tracking. Release operations are typically implemented through the Rehabilitation Group.

Salvage and Morgue

It is unlawful to pick up and transport dead migratory birds according to state and federal laws. Other state rules may apply to picking up dead wildlife. Accordingly, all salvaging operations must be closely coordinated with Law Enforcement agents from state and federal wildlife resource agencies, as well as any natural resource damage assessment representatives coordinating with the response. All dead wildlife should be documented on forms with chain of custody forms, photographs and coordinates for the location. Dead wildlife specimens need to be properly wrapped and tagged to preserve the evidence and for potential chemical testing. Dead wildlife specimens are to be transported to a facility that can properly store them in a freezer or refrigerator for later custody by wildlife resource agency Law Enforcement personnel. Wildlife salvage operations may be completed by the Reconnaissance and Recovery Group, or through a specifically-assigned Wildlife Salvage Group, as established by the Wildlife Branch Director.

Policy on Volunteers

The use of volunteers is not anticipated to be a frequent component of spill response on the UMR. However, situations may arise that are large enough in scope, unique enough in impact, and/or draw in public involvement such that the use of volunteers will need to be considered. As such, this policy addresses major considerations related to the potential use of volunteers in UMR spill response. Please also see the *National Response Team's Use of Volunteers: Guidelines for Oil Spills* and the National Contingency Plan for more information regarding the use of volunteers.

Limitations; Benefit-Risk Tradeoff

The willingness of volunteers, both technically trained and from the public at large, to assist in response is both recognized and appreciated. However, in most oil or hazardous substance incidents on the UMR, the possible roles for volunteers are likely quite limited due to factors including the following: 1) most UMR spills have been small enough in scale such that they have not required resources and staff beyond that of professional private sector and government agency responders, 2) the river's physical characteristics (large water volume, fast flow, challenging access, etc.) present significant safety hazards, and 3) much of the river is distant from population centers which might supply volunteers. Additionally, federal agencies are generally prohibited from accepting volunteer services per 31 USC §1342, except in emergencies involving the safety of human life or the protection of property.

Therefore, the decision to employ volunteers must take into account the benefits that might be gained against safety and liability considerations, as well as legal restrictions on the use of volunteers. The Incident Commander must make the decision regarding the use of volunteers on a case-by-case basis, weighing the interests of the local volunteer community and the benefits of volunteer efforts against health and safety concerns, resources needed for volunteer supervision and training, liability concerns, and other relevant issues. As stated above, it is expected that in the large majority of UMR incidents, this will likely result in a decision not to use volunteers. *However, should the Incident Commander choose to employ volunteers, the considerations described in the following sections must be addressed.*

Integration of Volunteers within ICS

The use of volunteers must be integrated into the incident command structure. When the Incident Commander approves the use of volunteers, he/she should establish either: 1) a volunteer coordinator within the Resource Unit of the Planning Section (smaller scale volunteer efforts), or 2) a full Volunteer Unit in the Planning Section (larger scale volunteer efforts). Volunteers should only be deployed through direct written tasking from the Incident Commander via the incident action plan (IAP) process. The Incident Commander must also consider coordination with local government units and how local emergency operation plans affect the participation of volunteers (see list of county emergency management agencies in Resource Manual Section E).

Affiliated vs. Unaffiliated Volunteers

When use of volunteers is determined to be appropriate, the use of affiliated volunteers (i.e., those having a pre-existing relationship with a non-governmental organization or community-based organization engaged in response/relief) is preferred to the use of unaffiliated volunteers. Additionally, per MOU, the Corporation for National and Community Service (CNCS) can assist USCG and US EPA in developing and supporting an unaffiliated volunteer management program.

Scope of Volunteer Activities

As noted in the NCP, volunteers generally should not be used for physical removal of oil contaminated materials. Typically, volunteers should be used for minimal risk activities (e.g., data entry, assisting with lodging, distributing information, etc.). However, there may be circumstances under which volunteers may be used for higher risk activities such as certain oiled wildlife cleaning activities but only if they have received proper training and personal protective equipment.

Training

Volunteers must be trained to perform the tasks they are asked to do. An inexperienced or untrained volunteer must not be assigned to perform a task requiring training and/or experience. Moreover, federal and state laws require employees (including volunteers) working on sites exposed to hazardous substances, health hazards, or safety hazards to receive training meeting state and federal requirements before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards.

While volunteers may have received training and certifications at previous spills, they must have current certifications requisite to the desired volunteer position and may need to undergo new, or refresher training. This may cause delays in assignment if the volunteer has to be trained at the spill site, but it will avoid needless injuries.

VI. EXERCISING, DRILLS, AND TRAINING

The Upper Mississippi River Hazardous Spills Coordination Group strongly supports exercises, drills, and trainings to maintain and enhance spill response effectiveness on the Upper Mississippi River. The Group has, and will continue to, organize and participate in such activities along the River. In particular, the Group emphasizes broad participation in the planning and execution of these events, in order to build partnerships and enhance communication among various levels of government and the private sector. The Group also seeks to address emerging issues and response resource constraints in designing training and exercises.

RESOURCE MANUAL

RESOURCE MANUAL

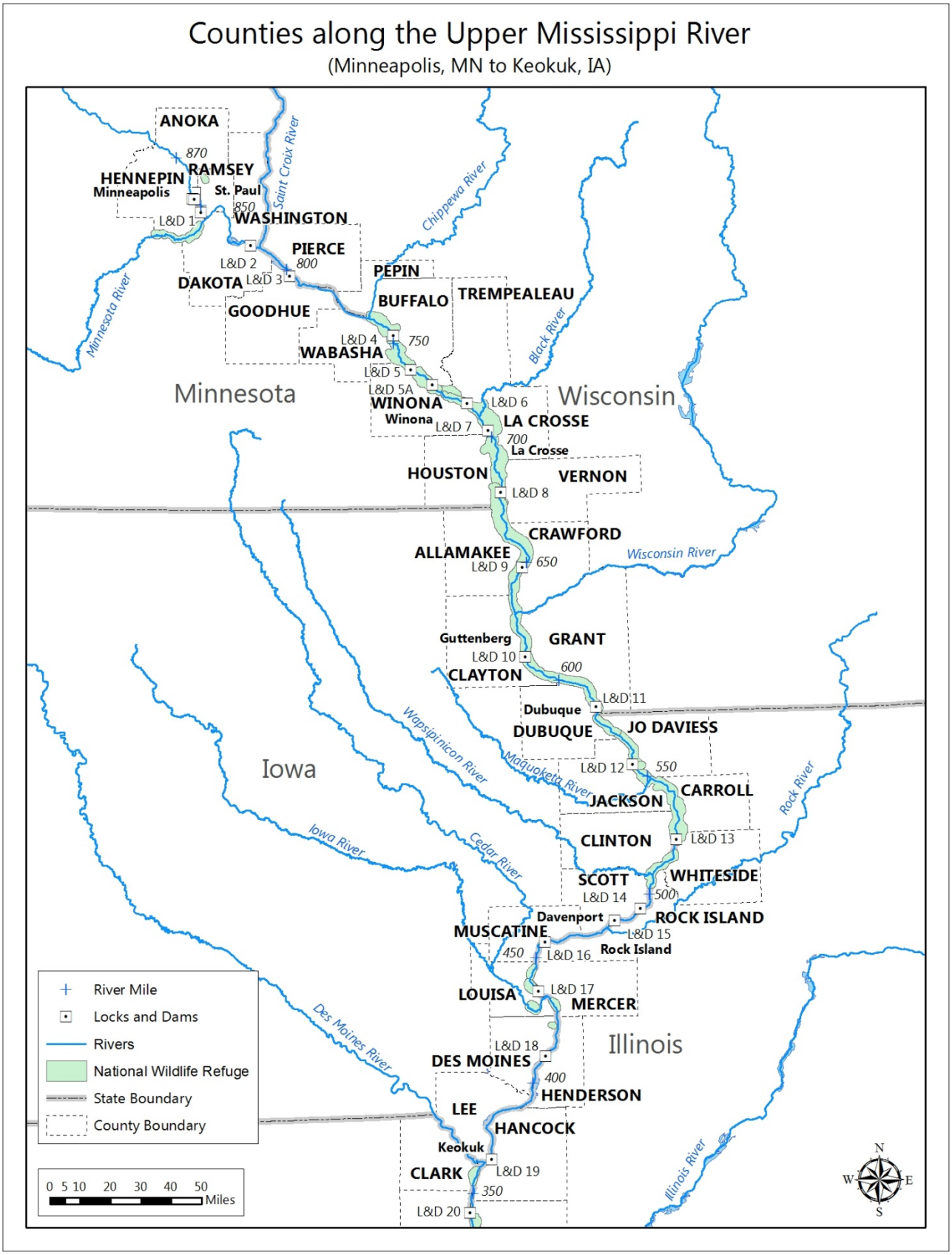
The Resource Manual contains reference information on the river and information on spill response and clean-up resources, sensitive human and wildlife resources, potential sources of spills, and public hazardous materials teams. Where possible, information in the manual is referenced by river mile. River mile 0 of the Upper Mississippi River is located at the confluence of the Ohio and Mississippi Rivers. River miles increase upstream to Minneapolis, Minnesota where the commercially navigable portion of the river ends at river mile 856. References to right and left bank are from the descending perspective. Some portions of the Resource Manual also refer to river pools. Pools are named for the lock and dam at their downstream end. Thus, for example, Pool 2 is the impounded area immediately above Lock and Dam 2. Information in the Resource Manual is generally presented in geographic order, beginning at the head of navigation in Minneapolis, Minnesota and ending at the confluence with the Ohio River in Cairo, Illinois.

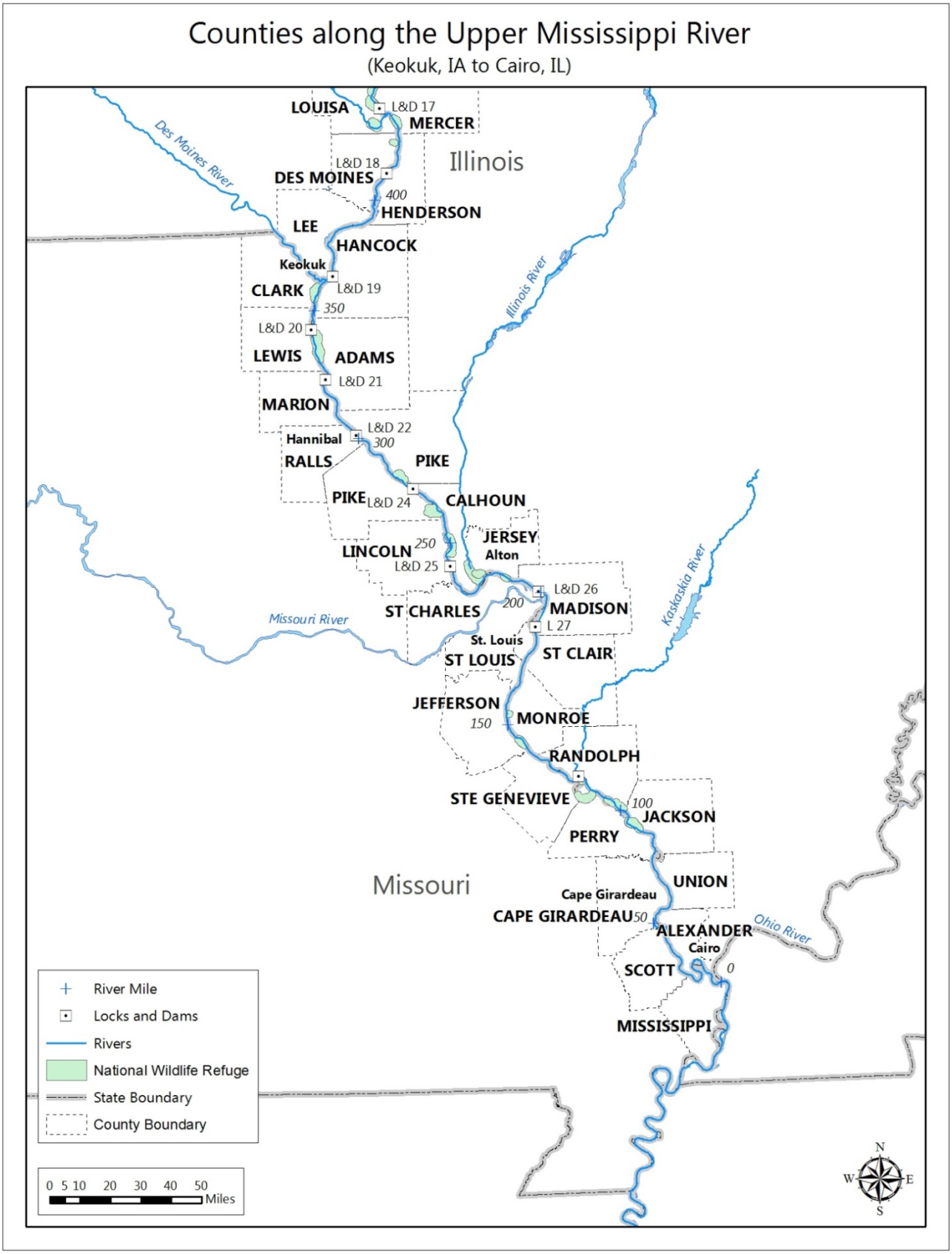
River mile locations for facilities in this manual were derived from a multitude of sources. Some of the river miles are accurate to within a tenth of a mile. Other river miles are accurate to within one or two miles depending on the source. The river mile locations are provided so that the spill responders can get an idea of the facilities and resources in their area. This manual is not meant to be the definitive source of facility location information on the river.

RESOURCE MANUAL

Section A: River Information and Locational References


Upper Mississippi River Miles by 50-Mile Segments
Minnesota
Wisconsin
Iowa
Illinois
Missouri
Minneapolis
St. Paul
Winona
La Crosse
Guttenberg
Dubuque
Davenport
Rock Island
Keokuk
Hannibal
Alton
St. Louis
Cape Girardeau
Cairo
870
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
L&D 1
L&D 2
L&D 3
L&D 4
L&D 5
L&D 5A
L&D 6
L&D 7
L&D 8
L&D 9
L&D 10
L&D 11
L&D 12
L&D 13
L&D 14
L&D 15
L&D 16
L&D 17
L&D 18
L&D 19
L&D 20
L&D 21
L&D 22
L&D 24
L&D 25
L&D 26
L 27
Minnesota River
Chippewa River
Black River
Wisconsin River
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
Des Moines River
Illinois River
Missouri River
Kaskaskia River
Ohio River
River Mile
Locks and Dams
Rivers
National Wildlife Refuge
Lakes
State Boundary
County Boundary
0 10 20 40 60 80 100
Miles
N
W
E
S


Counties along the Upper Mississippi River
(Minneapolis, MN to Keokuk, IA)
ANOKA
HENNEPIN
Minneapolis
RAMSEY
St. Paul
WASHINGTON
PIERCE
DAKOTA
GOODHUE
WABASHA
PEPIN
BUFFALO
TREMPEALEAU
WINONA
Winona
LA CROSSE
La Crosse
HOUSTON
VERNON
CRAWFORD
ALLAMAKEE
Guttenberg
GRANT
CLAYTON
Dubuque
DUBUQUE
JO DAVIESS
JACKSON
CARROLL
CLINTON
SCOTT
WHITESIDE
Davenport
ROCK ISLAND
MUSCATINE
Rock Island
LOUISA
MERCER
DES MOINES
HENDERSON
LEE
HANCOCK
Keokuk
CLARK
870
850
800
750
700
650
600
550
500
450
400
350
L&D 1
L&D 2
L&D 3
L&D 4
L&D 5
L&D 5A
L&D 6
L&D 7
L&D 8
L&D 9
L&D 10
L&D 11
L&D 12
L&D 13
L&D 14
L&D 15
L&D 16
L&D 17
L&D 18
L&D 19
L&D 20
Minnesota
Wisconsin
Iowa
Illinois
Saint Croix River
Chippewa River
Minnesota River
Black River
Wisconsin River
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
Des Moines River
Illinois River
River Mile
Locks and Dams
Rivers
National Wildlife Refuge
State Boundary
County Boundary
0 5 10 20 30 40 50
Miles
N
W
E
S


Counties along the Upper Mississippi River
(Keokuk, IA to Cairo, IL)
LOUISA
L&D 17
MERCER
Illinois
Des Moines River
L&D 18
DES MOINES
400
HENDERSON
LEE
HANCOCK
Keokuk
CLARK
L&D 19
350
L&D 20
LEWIS
ADAMS
L&D 21
MARION
Hannibal
L&D 22
300
RALLS
PIKE
PIKE
L&D 24
CALHOUN
JERSEY
Alton
LINCOLN
250
L&D 25
L&D 26
200
MADISON
ST CHARLES
L 27
Missouri River
St. Louis
ST LOUIS
ST CLAIR
Kaskaskia River
JEFFERSON
150
MONROE
RANDOLPH
STE GENEVIEVE
100
JACKSON
PERRY
Missouri
UNION
Cape Girardeau
CAPE GIRARDEAU
50
ALEXANDER
Cairo
Ohio River
SCOTT
0
MISSISSIPPI
River Mile
Locks and Dams
Rivers
National Wildlife Refuge
State Boundary
County Boundary
0 5 10 20 30 40 50
Miles
N
W
E
S

Upper Mississippi River Mile Points of County Lines

River Mile*	State	County/County
857.9 LDB	MN	Anoka/Hennepin
850.5 LDB	MN	Hennepin/Ramsey
845.3 RDB	MN	Hennepin/Dakota
841.9 RDB	MN	Dakota/Ramsey
835.7 RDB	MN	Ramsey/Dakota
833.1 LDB	MN	Ramsey/Washington
811.6 LDB	MN/WI	Washington/Pierce
807.1 RDB	MN	Dakota/Goodhue
779.3 LDB	WI	Pierce/Pepin
773.2 RDB	MN	Goodhue/Wabasha
763.4 LDB	WI	Pepin/Buffalo
741.9 RDB	MN	Wabasha/Winona
721.8 LDB	WI	Buffalo/Trempealeau
713.0 LDB	WI	Trempealeau/La Crosse
701.0 RDB	MN	Winona/Houston
691.3 LDB	WI	La Crosse/Vernon
673.8 RDB	MN / IA	Houston/Allamakee
667.6 LDB	WI	Vernon/Crawford
637.3 RDB	IA	Allamakee/Clayton
630.7 LDB	WI	Crawford/Grant
600.6 RDB	IA	Clayton/Dubuque
580.6 LDB	WI / IL	Grant/Jo Daviess
567.0 RDB	IA	Dubuque/Jackson
548.9 LDB	IL	Jo Daviess/Carroll
532.8 RDB	IA	Jackson/Clinton
524.7 LDB	IL	Carroll/Whiteside
511.5 LDB	IL	Whiteside/Rock Island
506.6 RDB	IA	Clinton/Scott
469.5 RDB	IA	Scott/Muscatine
448.8 RDB	IA	Muscatine/Louisa
448.8 LDB	IL	Rock Island/Mercer
425.6 RDB	IA	Louisa/Des Moines
425.5 LDB	IL	Mercer/Henderson
395.9 RDB	IA	Des Moines/Lee
390.6 LDB	IL	Henderson/Hancock

Upper Mississippi River Mile Points of County Lines

(Continued)

River Mile*	State	County/County
361.5 RDB	IA / MO	Lee/Clark
351.0 RDB	MO	Clark/Lewis
347.3 LDB	IL	Hancock/Adams
328.5 RDB	MO	Lewis/Marion
312.4 LDB	IL	Adams/Pike
306.1 RDB	MO	Marion/Ralls
297.4 RDB	MO	Ralls/Pike
275.4 LDB	IL	Pike/Calhoun
258.1 RDB	MO	Pike/Lincoln
236.4 RDB	MO	Lincoln/St. Charles
217.9 LDB	IL	Calhoun/Jersey
208.5 LDB	IL	Jersey/Madison
195.5 RDB	MO	St. Charles/St. Louis
182.3 LDB	IL	Madison/St. Clair
171.2 LDB	IL	St. Clair/Monroe
79.4 LDB	IL	Jackson/Union
75.2 RDB	MO	Perry/Cape Girardeau
55.4 LDB	IL	Union/Alexander
47.8 RDB	MO	Cape Girardeau/Scott
25.9 RDB	MO	Mississippi/Scott

* LDB = Left Descending Bank
RDB = Right Descending Bank

Upper Mississipipi River Locks and Dams

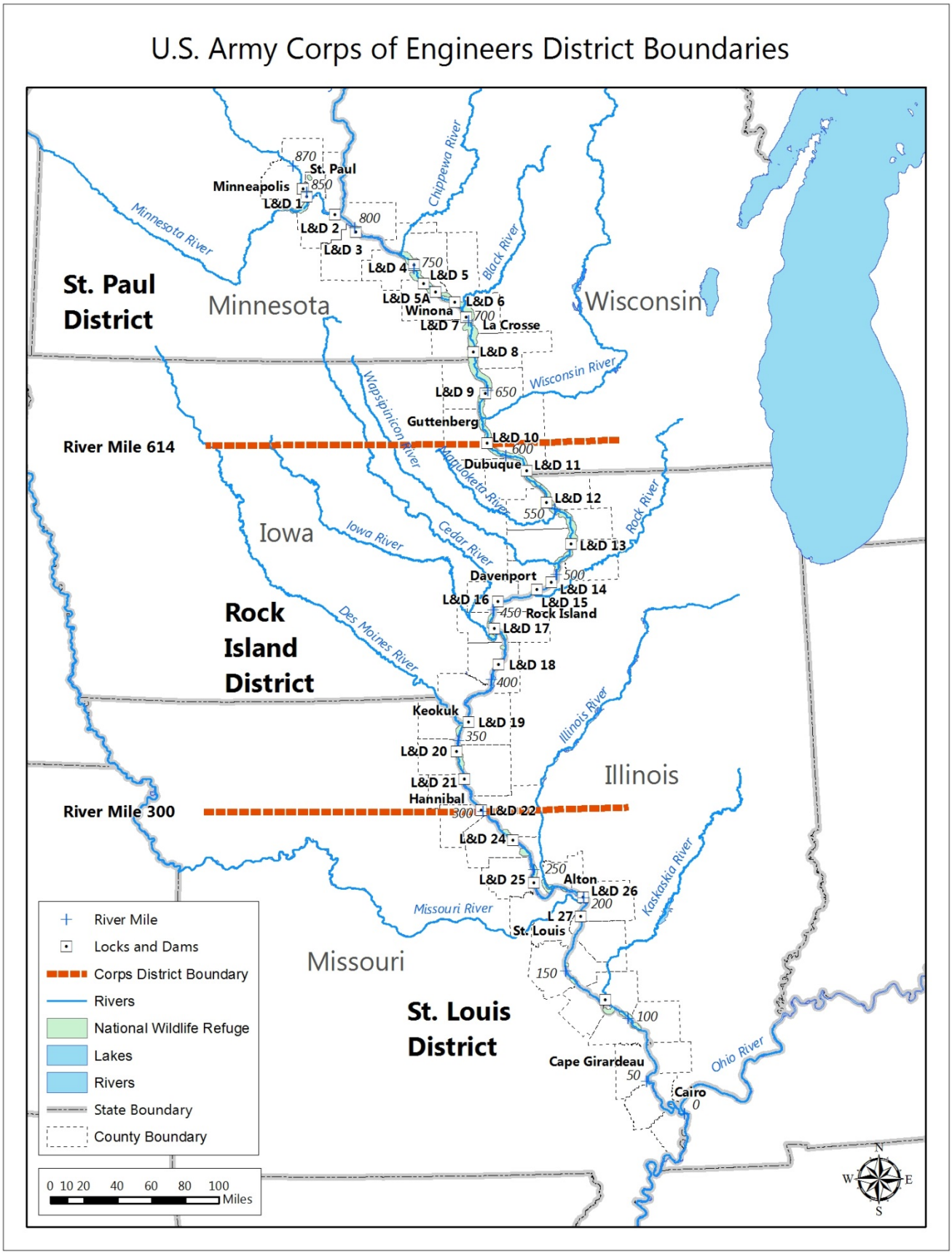
(Operated by the U.S. Army Corps of Engineers)

Lock Name	River Mile	Address	Waterbody	Emergency Phone	Contact Phone
Upper St. Anthony Falls	853.7 RDB	1 Portland Ave. Minneapolis, MN 55401-2528	Mississippi River	612-333-5336	612-333-5336
Lower St. Anthony Falls	853.4 RDB	1 Portland Ave. Minneapolis, MN 55401-2528	Mississippi River	612-332-6864	612-332-3660
Lock & Dam 1	847.6 RDB	5000 W River Pkwy. Minneapolis, MN 55417-1681	Mississippi River	612-724-2971	612-724-2971
Lock & Dam 2	815.2 RDB	1350 Dam Rd. Hastings, MN 55033-1145	Mississippi River	651-437-3150	651-437-3150
Lock & Dam 3	796.9 RDB	4330 Lock & Dam Rd. Welch, MN 55089-9644	Mississippi River	651-388-5794	651-388-5794
Lock & Dam 4	752.8 LDB	Main St. Alma, WI 54610-0325	Mississippi River	608-685-4421	608-685-4421
Lock & Dam 5	738.1 RDB	12554 Hwy 61 Minnesota City, MN 55959-9756	Mississippi River	507-689-2101	507-689-2101
Lock & Dam 5A	728.5 LDB	W679 State Hwy 35 Fountain City, WI 54629-7214	Mississippi River	507-452-2789	507-452-2789
Lock & Dam 6	714.1 LDB	W24055 Lock and Dam Rd. Trempealeau, WI 54661-0406	Mississippi River	651-290-5964	651-290-5964
Lock & Dam 7	702.5 RDB	33018 US Hwy 61 La Crescent, MN 55947-3404	Mississippi River	651-290-5186	651-290-5186
Lock & Dam 8	679.2 LDB	Near WI Hwys 35 & 56 Genoa, WI 54632-0265	Mississippi River	651-290-5035	651-290-5035
Lock & Dam 9	647.9 LDB	24545 State Hwy 35 Eastman, WI 54626-9723	Mississippi River	608-874-4311	608-874-4311
Lock & Dam 10	615 RDB	5 Lock and Dam Ln. Guttenberg, IA 52052-0849	Mississippi River	563-252-1261	563-252-1261
Lock & Dam 11	583 RDB	11 Lime St. Dubuque, IA 52001	Mississippi River	563-582-1204	563-582-1204
Lock & Dam 12	556.7 RDB	12401 N Riverview Bellevue, IA 52031	Mississippi River	319-872-3314	563-872-3314; 563-872-4919
Lock & Dam 13	522.5 LDB	4999 Lock Rd. Fulton, IL 61252	Mississippi River	815-589-3313; 815-589-2144	815-589-3313; 815-589-2144
Lock & Dam 14	493.3 RDB	25549 182nd St. Pleasant Valley, IA 52767	Mississippi River	563-332-0907; 309-794-4359	563-332-0907; 309-794-4359
Lock & Dam 15	482.9 LDB	Rodman Ave., Rock Island Arsenal Rock Island, IL 61201	Mississippi River	309-794-5266	309-794-5266; 309-794-5810
Lock & Dam 16	457.2 LDB	33109 102nd Ave. W Muscatine, IA 52761-9204	Mississippi River	309-537-3191	309-537-3191; 309-537-3412
Lock & Dam 17	437.1 LDB	173 Lock and Dam Rd. New Boston, IL 61272	Mississippi River	309-587-8125	309-587-8125; 309-587-8579
Lock & Dam 18	410.5 LDB	N 1675th St. Gladstone, IL 61437	Mississippi River	309-873-2246	309-873-2246
Lock & Dam 19	364.3 RDB	525 N Water St. Keokuk, IA 52632	Mississippi River	319-524-2631	319-524-2631; 319-524-0691

Upper Mississipipi River Locks and Dams

(Operated by the U.S. Army Corps of Engineers)
(Continued)

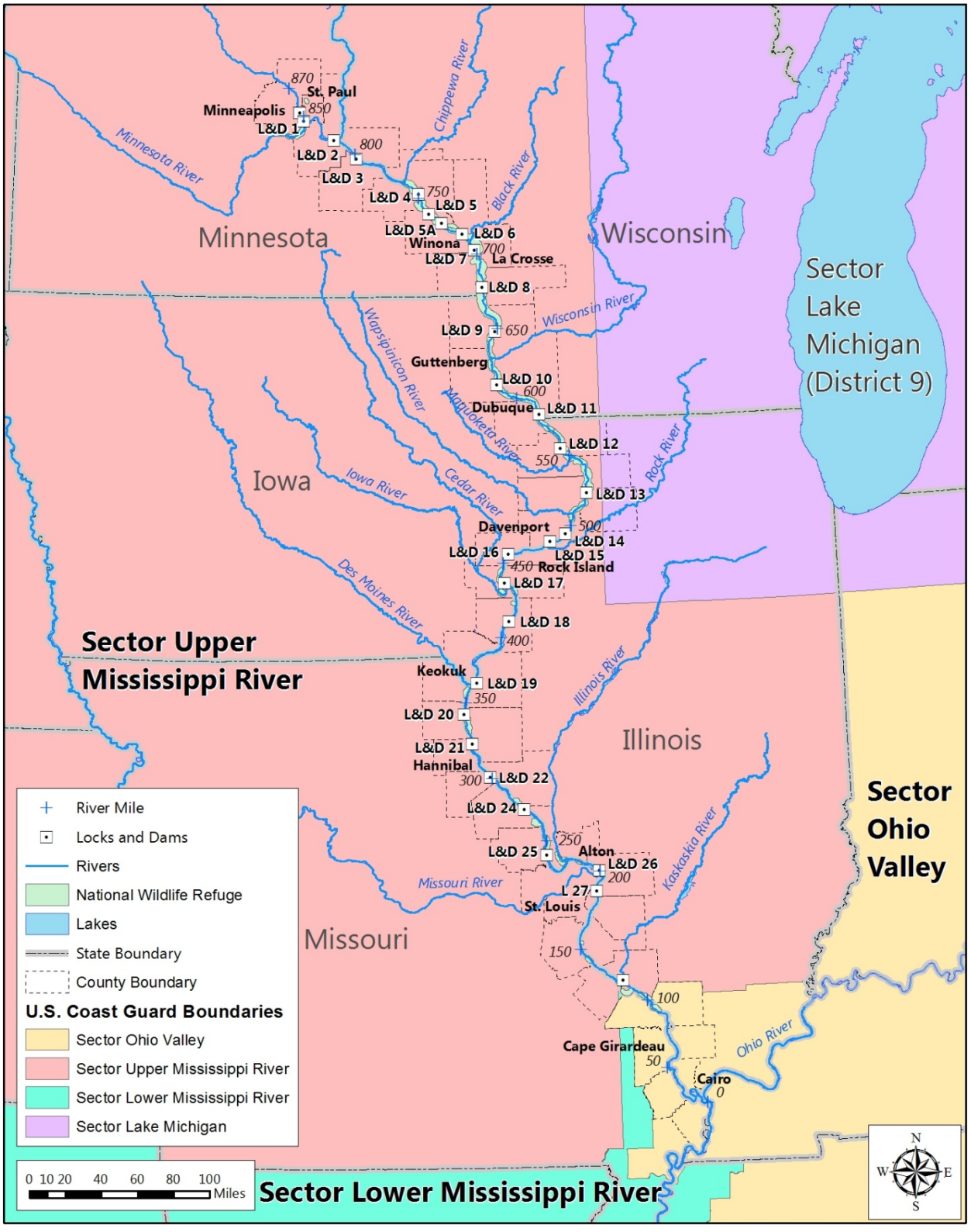
Lock Name	River Mile	Address	Waterbody	Emergency Phone	Contact Phone
Lock & Dam 20	343.2 RDB	N Front St. Canton, MO 63435	Mississippi River	573-288-3320	573-288-3320; 573-288-2100
Lock & Dam 21	324.9 LDB	W Lock and Dam Rd. Quincy, IL 62301	Mississippi River	217-222-0918	217-222-0918; 217-222-0352
Lock & Dam 22	301.2 RDB	Riverview Dr. New London, MO 63459	Mississippi River	573-221-0294	573-221-0294; 573-221-6463
Lock & Dam 24	273.4 RDB	350 N First St. Clarksville, MO 63336-0038	Mississippi River	573-242-3524	573-242-3524
Lock & Dam 25	241.4 RDB	10 Sandy Slough Rd. Winfield, MO 63389	Mississippi River	636-566-8120; 636-630-5803	636-566-8120
Melvin Price Locks & Dam 26	200.5 RDB	1 Lock and Dam Way East Alton, IL 62024-2400	Mississippi River	608-874-4311	636-899-1543; 618-462-1713
Locks 27 (Chain of Rocks)	185.5 LDB	3291 W 20th St. Granite City, IL 62040-1227	Mississippi River, Chain of Rocks Canal	563-252-1261	618-452-7107

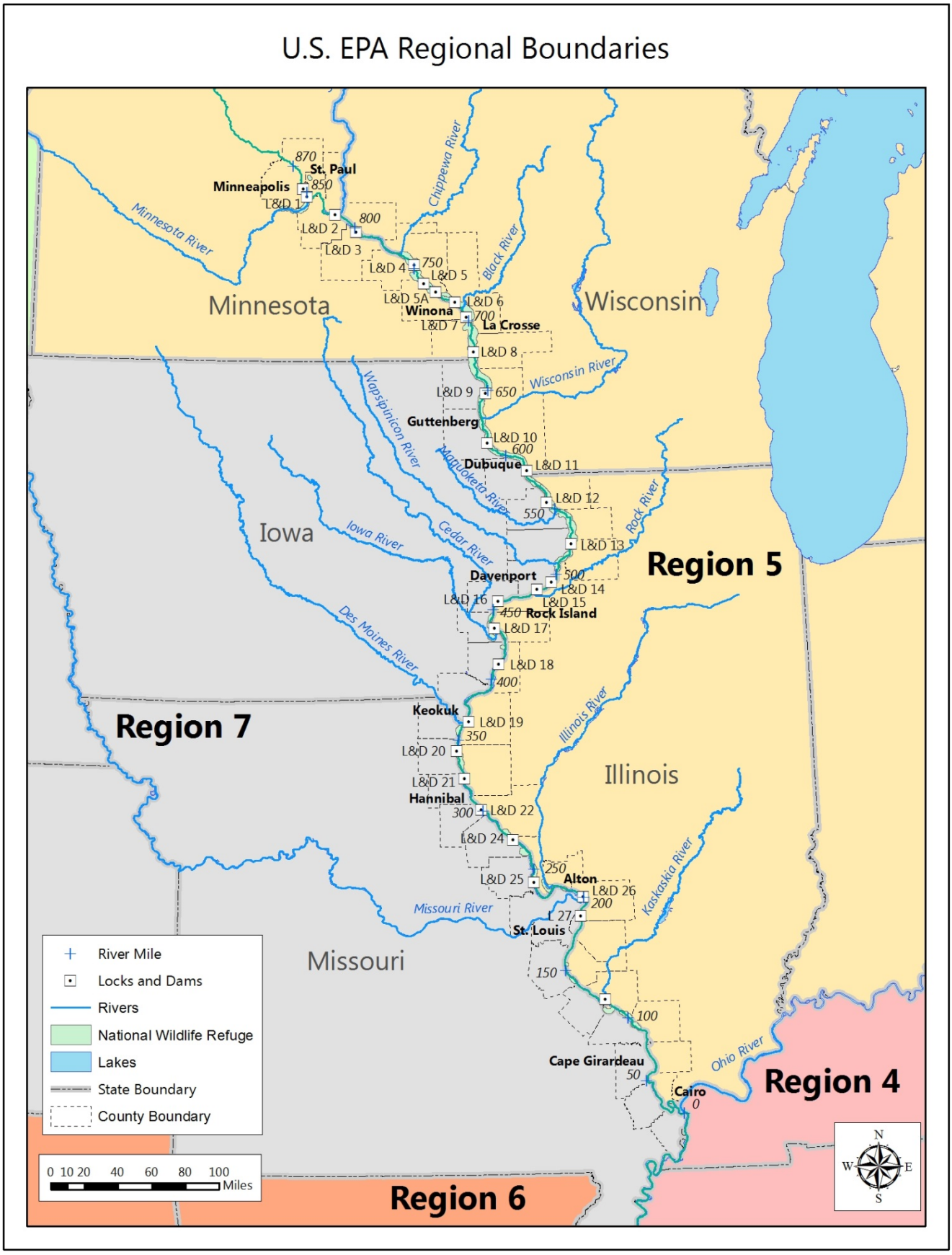

U.S. Army Corps of Engineers District Boundaries
St. Paul District
Rock Island District
St. Louis District
Minnesota
Wisconsin
Iowa
Illinois
Missouri
Minneapolis
St. Paul
L&D 1
L&D 2
L&D 3
L&D 4
L&D 5
L&D 5A
L&D 6
Winona
L&D 7
La Crosse
L&D 8
L&D 9
Guttenberg
L&D 10
Dubuque
L&D 11
L&D 12
L&D 13
Davenport
L&D 14
L&D 15
L&D 16
Rock Island
L&D 17
L&D 18
Keokuk
L&D 19
L&D 20
L&D 21
Hannibal
L&D 22
L&D 24
L&D 25
Alton
L&D 26
L 27
St. Louis
Cape Girardeau
Cairo
870
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
River Mile 614
River Mile 300
Minnesota River
Chippewa River
Black River
Wisconsin River
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
Des Moines River
Illinois River
Missouri River
Kaskaskia River
Ohio River
River Mile
Locks and Dams
Corps District Boundary
Rivers
National Wildlife Refuge
Lakes
Rivers
State Boundary
County Boundary
0 10 20 40 60 80 100
Miles
N
W
E
S

U.S. Army Corps of Engineers District Hydraulics Contacts

District	Telephone Number
St. Paul District (Headwaters to river mile 614)	
Hydraulics Branch – Water Control Section	(651) 290-5633 (business hours) Call individual Lockmaster (see page A-6) (24-hour)
Rock Island District (river mile 614 to 300)	
Hydraulics Branch	(309) 794-5849 (business hours) (309) 738-4101 (24-hour)
St. Louis District (river mile 300 to 0)	
Hydraulics Branch – Water Control Management Unit	(800) 432-1208 (business hours 7 days a week) (314) 630-6292 (24-hour)

U.S. Coast Guard District 8 Marine Inspection Zone Boundaries




U.S. EPA Regional Boundaries
Minnesota
Wisconsin
Iowa
Illinois
Missouri
Region 5
Region 7
Region 4
Region 6
Minneapolis
St. Paul
Winona
La Crosse
Guttenberg
Dubuque
Davenport
Rock Island
Keokuk
Hannibal
Alton
St. Louis
Cape Girardeau
Cairo
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L&D 2
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Minnesota River
Chippewa River
Black River
Wisconsin River
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
Des Moines River
Illinois River
Kaskaskia River
Missouri River
Ohio River
River Mile
Locks and Dams
Rivers
National Wildlife Refuge
Lakes
State Boundary
County Boundary
0 10 20 40 60 80 100
Miles
N
W
E
S

Upper Mississippi River Hazardous Spills Coordination Group
Cultural and Historic Resource Contacts

State Contacts

ILLINOIS

Illinois Historic Preservation Agency

Primary Contact Information	Other Key Contacts
Amy Martin, Director/SHPO Illinois Historic Preservation Agency 1 Old State Capitol Plaza Springfield, IL 62701-1512 Phone: 217-785-9045 Fax: 217-524-7525 Email: Amy.Martin@illinois.gov Website: www.state.il.us/hpa/ps/	**Deputy**: **Mike Jackson** Phone: 217-785-5031 Email: Mike.Jackson@Illinois.gov **Deputy**: **Anne Haaker** Phone: 217-785-5027 Email: anne.haaker@illinois.gov **Archaeologist: Joe Phillippe** Phone: 217-785-1279 Email: joe.phillippe@illinois.gov
Resources: Historic and Architectural Resources Geographic Information System (HAARGIS) www.illinoishistory.gov/ps/haargis.htm	

IOWA

State Historical Society of Iowa

Primary Contact Information	Other Key Contacts
Mr. Steve King, SHPO State Historical Society of Iowa Iowa Department of Cultural Affairs 600 East Locust Street Des Moines, IA 50319 Phone: 515-281-4013 Fax: 515-242-6498 Email: steve.king@iowa.gov Website: www.iowahistory.org/historic-preservation/	(None identified)
Resources: (None identified)	

Upper Mississippi River Hazardous Spills Coordination Group
Cultural and Historic Resource Contacts
(Continued)

IOWA (Continued)

Office of the State Archaeologist

Primary Contact Information	Other Key Contacts
Dr. John F. Doershuk, State Archaeologist Office of the State Archaeologist 700 South Clinton Street Building The University of Iowa Iowa City, IA 52242-103 Phone: 319-384-0751 Fax: (319) 384-0768 Email: john-doershuk@uiowa.edu **Website:** www.uiowa.edu/~osa/	**Geographic Information: Colleen Eck** Phone: 319-384-0735 Email: colleen-eck@uiowa.edu **Burials Program: Shirley Schermer** Phone: 319-384-040 Email: shirley-schermer@uiowa.edu
Resources: Iowa Site File (Isites) ags.gis.iastate.edu/IsitesPublicAccess/	

MINNESOTA

Minnesota Historical Society

Primary Contact Information	Other Key Contacts
Barbara Howard, DSHPO Minnesota Historical Society 345 Kellogg Boulevard West St. Paul, MN 55102-1906 Phone: 651-259-3466 Fax: 651-282-2374 E-mail: barbara.howard@mnhs.org Website: www.mnhs.org/shpo/	(None identified)
Resources: (None identified)	

Office of the State Archaeologist

Primary Contact Information	Other Key Contacts
Scott Anfinson, State Archaeologist Office of the State Archaeologist Fort Snelling History Center, 200 Tower Avenue St. Paul, MN 55111 Phone: 612-725-2411 E-mail: scott.anfinson@state.mn.us Website: www.osa.admin.state.mn.us/ Responsibilities: authenticating unrecorded burial sites	(None identified)
Resources: (None identified)	

Upper Mississippi River Hazardous Spills Coordination Group
Cultural and Historic Resource Contacts
(Continued)

MISSOURI

Missouri DNR-State Historic Preservation Office

Primary Contact Information	Other Key Contacts
Sara Parker Pauley, SHPO State Department of Natural Resources State Historic Preservation Office P.O. Box 176 Jefferson City, MO 65102 Phone: 573-751-4732 Fax: 573-751-7627 **Website:** http://www.dnr.mo.gov/shpo/	**Deputy**: **Mark A. Miles** Phone: 573-751-7858 Email: mark.miles@dnr.mo.gov **Cultural Resource Inventory Coordinator: Kerry Nichols** Phone: 573-751-7861 Email: kerry.nichols@dnr.mo.gov
Resources: (None identified)	

WISCONSIN

Wisconsin Historical Society

Primary Contact Information	Other Key Contacts
Dr. Michael E. Stevens, SHPO Wisconsin Historical Society 816 State Street Madison WI 53706 Phone: 608-264-6464 Fax: 608-264-6504 Email: michael.stevens@wisconsinhistory.org Website: http://www.wisconsinhistory.org/hp/	**Deputy**: **Jim Draeger** Phone: 608-264-6511 Email: jim.draeger@wisconsinhistory.org Archaeologist: John Broihahn Phone: 608-264-6496 Email: John.broihahn@wisconsinhistory.org
Resources: (None identified**)**	

Sources: Region 5 RCP/ACP; National Conference of State Historic Preservation Officers Website; Individual State SHPO Websites; Presentations to UMR Spills Group, April 2012

RESOURCE MANUAL

Section B: Spill Response, Clean-Up, and Related Resources

Boat Accesses on the Upper Mississippi River

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
871 RDB	Mississippi River - Point Park E River Park Champlin, MN	763-421-2820	Mississippi River	X			
866.3 LDB	Mississippi River - Coon Rapids 9750 Egret Blvd NW Coon Rapids, MN	763-757-4700	Mississippi River	X			
863.1 RDB	Brooklyn Park 83rd Ave N, at River Park Brooklyn Park, MN	651-296-6157	Mississippi River	X			
860.3 RDB	Brooklyn Center Access I-94 / 694 & Hwy 252 Brooklyn Center, MN	763-569-3300	Mississippi River	X			
860.3 LDB	Mississippi River - I-694 E River Rd, S of I-694 Fridley, MN	763-757-3920	Mississippi River	X			
857.7 RDB	Camden Park Boat Ramp Soo Ave N, S of 37th Ave NE Minneapolis, MN	612-230-6400	Mississippi River	X			
Upper St. Anthony Falls Pool (river mile 857.6 to 853.4)							
855 LDB	Boom Island Park Public Access S of Plymouth Ave Bridge W of Sibley St. Minneapolis, MN	651-296-6157	Mississippi River	X			
Pool 1 (river mile 853.4 to 847.6) (No Boat Accesses)							
Pool 2 (river mile 847.6 to 815.2)							
846.6 LDB	Hidden Falls Regional Park MN		Mississippi River	X			
845 RDB	Fort Snelling State Park MN		Mississippi River	X			
844.8 LDB	Watergate Marina 2500 Crosby Farm Rd. St. Paul, MN	651-695-3780	Mississippi River	X	X	X	X
843.1 RDB	Pool & Yacht Club (Marina) 1600 Lilydale Rd. Lilydale, MN	651-455-3900	Mississippi River		X		
842.1 RDB	Lilydale 950 Lilydale Rd. Lilydale, MN	651-437-3191	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 2 (river mile 847.6 to 815.2) - continued							
840.3 RDB	Saint Paul Yacht Club, Upper Harbor (Marina) 375 W Water St. St. Paul, MN	651-292-8964	Mississippi River		X		X
839.6 RDB	Saint Paul Yacht Club, Lower Harbor (Marina) 100 Yacht Club Rd. St. Paul, MN	651-292-8964	Mississippi River		X		
832.5 RDB	South St. Paul Access Off Verderosa Ave. South Saint Paul, MN	651-306-3690	Mississippi River	X			
832.2 LDB	Mississippi River – Newport 21st St. Newport, MN	651-459-5677	Mississippi River	X			
830.6 RDB	Twin City Marina 4455 E 66th St. Inver Grove Heights, MN	651-455-9110	Mississippi River		X		X
830.3 RDB	River Heights Marina, Inc. 4455 E 66th St. Inver Grove Heights, MN	651-455-4974	Mississippi River	X	X	X	X
829.5 LDB	St. Paul Park Public Ramp 7th Ave, at Lion's Levee Park St. Paul Park, MN	651-459-9785	Mississippi River	X			
829.3 LDB	Willie's Hidden Harbor (Marina) 388 9th Ave. St. Paul Park, MN	651-459-9571	Mississippi River	X	X	X	X
826 RDB	River Grove Harbor (Marina) 3985 E 102nd St. Inver Grove Heights, MN	651-455-6273	Mississippi River	X	X		
822 LDB	Grey Cloud Park and Access On Lower Grey Cloud Island on S Grey Cloud Trail, 1.5 mi S of 103rd St. Cottage Grove, MN	651-458-3400	Spring Lake, Mississippi River	X			
820.2 RDB	Mississippi River Public Access - Spring Lake Hilary Path, N of Hwy 42 Township of Nininger, MN	651-296-6157	Spring Lake, Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 3 (river mile 815.2 to 796.9)							
814.3 RDB	Jaycee Park Access Lock and Dam Rd. Hastings, MN	651-480-6175	Mississippi River	X			
814.2 LDB	Hub's Landing and Marina 6 Spiral View Loop Rd. Hastings, MN	651-755-6540	Mississippi River	X	X		
814 LDB	King's Cove Marina 1 King's Cove Dr. Hastings, MN	651-480-8900	Mississippi River, Conley Lake	X	X	X	X
813.3 RDB	Hastings Marina 1111 E 1st St. Hastings, MN	651-437-9621	Mississippi River; Vermillion River	X	X	X	X
811.5 LDB	Leo's Landing (Marina) 137 Front St. Prescott, WI	715-262-5998	Mississippi River		X	X	
811.4 LDB	Point St. Croix Marina 101 S Front St. Prescott, WI	715-262-3161	Mississippi River		X	X	
811.2 LDB	Prescott Public Boat Launch 2nd St. Prescott, WI	715-262-5544	Mississippi River	X			
811 LDB	Miss-Croix Yacht Harbor (Marina) 451 S 2nd St. Prescott, WI	715-480-0406	Mississippi River		X	X	X
804 RDB	North Lake Public Access On North Lake, 190th St Way Township of Welch, MN	651-296-1151	North Lake; Twin Lakes	X			
800 RDB	Treasure Island Marina On Sturgeon Lake, 5734 Sturgeon Blvd, Township of Welch, MN	800-222-7077	Sturgeon Lake		X	X	
800 LDB	Diamond Bluff Landing 4th St. Diamond Bluff, WI		Mississippi River	X			
798.5 RDB	Sturgeon Lake Public Access Sturgeon Lake Rd, 2.1 mi upstream of Lock & Dam 3 4330 E Co Rd 18 Welch, MN	507-695-6341	Sturgeon Lake	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 4 (river mile 796.9 to 752.8)							
792.8 LDB	Mr. Sippi N1415 830th St. Hager City, WI	715-792-2992	Wisconsin Channel	X			
792.7 LDB	Trenton Township Boat Landing 825th St. Trenton, WI	262-675-6009	Wisconsin Channel	X			
791.4 RDB	Ole Miss Marina at Bay Point Park (Marina) 1429 Levee Rd. Red Wing, MN	651-764-2047	Mississippi River		X	X	X
791.2 RDB	Red Wing Marina At Bay Point Park and Levee Rd. Red Wing, MN	651-388-8995	Mississippi River		X	X	
790.9 LDB	Harbor Bar Docks, Inc. (Marina) N673 825th St. Hager City, WI	715-792-2417	Mississippi River		X		
790.8 LDB	Trenton Island Yacht Club (Marina) N671 825th St. Hager City, WI	715-792-2035	Mississippi River		X		
790.6 LDB	Island Campground and Marina N650 825th St. Hager City, WI	715-222-1808	Mississippi River	X	X		
790.3 RDB	Bay Point Municipal Park At Bay Point Dr and Levee Rd. Red Wing, MN	651-385-3674	Mississippi River	X			
789 RDB	Bill's Bay Marina 430 Nymphara Ln. Red Wing, MN	651-388-0481	Mississippi River		X	X	
788.7 RDB	Colville Park Public Access 515 Nymphara Red Wing, MN	651-388-4781	Mississippi River	X			
788.5 RDB	Ole Miss Marina at Colville Park (Marina) 490 Nymphara Red Wing, MN	651-764-2047	Mississippi River		X		
786.8 LDB	Bay City Village Park Lake Pepin Blvd. Bay City, WI	715-594-3862	Lake Pepin, Mississippi River	X			
780 LDB	Maiden Rock Campground Park St., Maiden Rock, WI	715-448-2205	Lake Pepin, Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 4 (river mile 796.9 to 752.8) - continued							
779.2 RDB	Mississippi River Beach Access Lake St. NE of Frontenac, MN	651 345-3401	Lake Pepin, Mississippi River	X			
776.7 RDB	Hansen's Harbor (Marina) 35853 Hwy 61 Blvd. Lake City, MN	651-345-3022	Lake Pepin, Mississippi River	X	X	X	X
775 RDB	Hok-Si-La Park Hwys 61 / 63 Lake City, MN	651-345-5383	Lake Pepin, Mississippi River	X			
774.5 LDB	Stockholm Municipal Park Spring St & Mill St. Stockholm, WI	715-672-5944	Lake Pepin, Mississippi River	X			
774 RDB	Skyline on Pepin (Marina) 1702 N Lakeshore Dr. Lake City, MN	651-345-5353	Lake Pepin, Mississippi River	X	X		
773 RDB	Ohuta Municipal Park Chestnut and Park Sts. Lake City, MN	651-565-3404	Lake Pepin, Mississippi River	X			
772.8 RDB	Lake City Marina 201 S Franklin St. Lake City, MN	651-345-4211	Lake Pepin, Mississippi River	X	X	X	X
772 RDB	Roschen Park Access Lakeshore Dr. Lake City, MN	651-345-5383	Lake Pepin, Mississippi River				
770.5 LDB	Deer Island Boat Landing Deer Island Rd. Pepin, WI	715-442-3171	Lake Pepin, Mississippi River	X			
767.2 RDB	Maple Springs Access Hwy 61, Maple Springs, Township of Pepin, MN	651-565-3675	Lake Pepin, Mississippi River	X			
767 LDB	Pepin Marina, LLC 303 1st St. Pepin, WI	715-442-4900	Lake Pepin, Mississippi River	X	X		
766.9 LDB	Sportsmans Landing 1st St. Pepin, WI	715-442-2133	Lake Pepin, Mississippi River	X			
765 RDB	Camp Lacupolis Resort (Marina) Route 4, CL 1 Pepin Township, MN	651-565-4318	Lake Pepin, Mississippi River	X	X	X	

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 4 (river mile 796.9 to 752.8) - continued							
763.5 LDB	Chippewa River Landing RM 2.0 of Chippewa River Great River Rd. Nelson, WI	608-685-6222	Chippewa River	X			
760.3 LDB	US FWS Indian Slough Landing State Rd 25 Nelson, WI	507-454-7351 UMR Refuge Winona Dist.	Indian Slough, Mississippi River	X			
760.3 LDB	US FWS Beef Slough Landing State Rd 25 Nelson, WI	507-454-7351 UMR Refuge Winona Dist.	Beef Slough	X			
760.3 LDB	US FWS Mississippi River Access State Rd 25 Nelson, WI	507-454-7351 UMR Refuge Winona Dist.	Big Lake	X			
760.3 LDB	US FWS Pontoon Slough Landing State Rd 25 Nelson, WI	507-454-7351 UMR Refuge Winona Dist.	Pontoon Slough	X			
760.3 LDB	Nelson-Trevino Bottoms State Natural Area Access State Rd 25 Nelson, WI	507-454-7351 UMR Refuge Winona Dist.	Indian Slough	X			
760. 5 RDB	Mississippi Parkside Marina 829 W 3rd St. Wabasha, MN	651-565-3809	Mississippi River	X	X	X	X
759.4 RDB	Wabasha Marina & Boatyard 1009 E Main St. Wabasha, MN	651-565-4747	Mississippi River		X	X	X
757 RDB	Wilcox Landing Public Access On Robinson Lake, T-341 County of Wabasha, MN	507-285-7176	Robinson Lake	X			
755.3 LDB	Buffalo River Landing Rieck Lake Park Alma, WI	507-454-7351 UMR Refuge Winona Dist.	Buffalo River, Buffalo Slough	X			
755.1 LDB	Rieck's Lakeside Park Rieck Lake Park Alma, WI	608-685-3330	Buffalo Slough, Buffalo River	X			
754.5 RDB	Peterson Lake Landing On Peterson Lake, N Co Rd 24 1.5 mi N of Lock & Dam 4 County of Wabasha, MN	507-454-7351 UMR Refuge Winona Dist.	Peterson Lake	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 4 (river mile 796.9 to 752.8) - continued							
754 LDB	Alma Marina 125 Beach Harbor Rd. Alma, WI	608-685-3333	Mississippi River	X	X	X	
753.7 LDB	Tank Pond Landing Beach Harbor Rd. Alma, WI	608-685-3330	Beef Slough	X			
Pool 5 (river mile 752.8 to 738.1)							
752.8 RDB	Pioneer Campsite Resort (Marina) 130 Pioneer Dr. Wabasha, MN	651-565-2242	Peterson Lake		X		
751.8 LDB	Dairyland Power Landing 500 Old St Hwy 35 Alma, WI	608-785-9994	Mississippi River	X			
751.7 LDB	Alma WI DNR Landing S Main St. Alma, WI	608-685-6222	Mississippi River	X			
748 LDB	Great River Harbor (Marina) S 2221 Hwy 35 Alma, WI	608-248-2454	Belvedere Slough	X	X	X	
747.7 RDB	US FWS Half Moon Public Access Half Moon Landing & W Newton Township of Minneiska, MN	507-454-7351 UMR Refuge Winona Dist.	Half Moon Lake	X			
747 RDB	Goose Lake Public Access 125th St. 1.0 mi upstream of Weaver, MN	651-296-1151	Goose Lake	X			
747 LDB	Belvidere Slough Landing Co. Rd. OO Belvidere, WI	608-785-9994	Pomme de Terre Slough	X			
744.8 RDB	Weaver Landing Hwy 61 Weaver, MN	507-454-7351 UMR Refuge Winona Dist.	Weaver Bottoms	X			
744.3 LDB	Buffalo City 10th Street Landing W 10th St. Buffalo City, WI	608-248-2262	Pomme de Terre Slough	X			
743 LDB	Upper Spring Lake Landing S River Rd. Buffalo City, WI	608-685-6222	Spring Lake	X			
742 RDB	Minneiska Public Landing Schell Hill Rd. Minneiska, MN	507-457-6335	Spring Lake, Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 5 (river mile 752.8 to 738.1) - continued							
741 LDB	Lower Spring Lake Landing River Rd & Spring Lake Landing Belvidere, WI	608-685-6222	Spring Lake	X			
Pool 5A (river mile 738.1 to 728.5)							
738.6 LDB	Whitman Dam Wildlife Area Kamrowski Rd. Downstream of Lock & Dam 5 Milton, WI	608-685-6222	Truedale Lake	X			
737.8 RDB	Bass Camp Resort (Marina) 12895 Rolbiecki St. Township of Rollingstone, MN	507-689-2856	Mississippi River		X	X	
735.7 LDB	Merrick State Park Access Park St / S 2954 State Rd 35 Milton, WI	608-687-4936	Fountain City Bay	X			
735.4 LDB	Merrick State Park South Access Park St / S 2965 State Rd 35 Milton, WI	608-687-4936	Fountain City Bay - Mississippi River	X			
733 LDB	Fountain City Boat Dock Liberty St. Fountain City, WI	608-687-7481	Mississippi River	X			
732 LDB	Fountain City Lower Landing Mill St. Fountain City, WI	608-687-7481	Mississippi River	X			
730.5 RDB	Minnesota City Boat Club (Marina) 5 Dike Rd. Township of Rollingstone Minnesota City, MN	507-689-2412	Crooked Slough	X	X	X	
730.2 RDB	US FWS Bob Verchota Landing Harbor Dr. Township of Rollingstone Prairie Island Rd. Winona, MN	507-454-7351 UMR Refuge Winona Dist.	Polander Lake	X			
728.8 RDB	Upper McNally Landing Lock & Dam 5A Dike Winona, MN	507-454-7351 UMR Refuge Winona Dist.	Polander Lake	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 6 (river mile 728.5 to 714.3)							
728.5 RDB	Latsch Prairie Island Park Access Prairie Island Rd. Winona, MN	507-457-8258	Straight Slough	X			
728.2 LDB	Breezy Pt. Marina W 656 Breezy Pt. Ln. Fountain City, WI	608-687-4774	Mississippi River	X	X		
728 RDB	Prairie Island Campground Access 1120 Prairie Island Rd. Winona, MN	507-452-4501	Straight Slough	X			
726 LDB	Latsch Island East Hwy 54 Buffalo, WI	608-685-6285	Mississippi River	X			
726 LDB	Dick's Marina / Winona Municipal Harbor Dicks Marina Rd. Latsch Island, WI	507-452-3809	Mississippi River	X	X	X	
725.7 LDB	Latsch Island Park and Landing Old Duke Rd, Latsch Island Winona, MN	507-457-8234	Mississippi River	X			
724.9 RDB	Winona Yacht Club (Marina) 24 Laird St. Winona, MN	507-454-5590	Mississippi River		X	X	X
724.7 RDB	St. Charles St. Public Access St. Charles St. Winona, MN	507-452-8550	Mississippi River	X			
723.7 RDB	E 5th St. Boat Landing E 5th St. Winona, MN	507-452-8550	Mississippi River	X			
720.9 RDB	Homer Boat Ramp Hwy 14 / 61 Homer, MN	507-457-6335	Mississippi River	X			
719.4 LDB	Trempealeau National Wildlife Refuge Access Refuge Rd. Trempealeau, WI	608-539-2311	Trempealeau River	X			
718 RDB	KOA Campground Ramp Hwy 61 across from Trempealeau Bay County of Winona, MN	507-454-2851	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 6 (river mile 728.5 to 714.3) - continued							
717.6 LDB	Perrot State Park S Park Rd. 2 mi upstream of Lock & Dam 6 Trempealeau, WI	608-534-6409	Trempealeau River	X			
717.6 LDB	Trempealeau River Canoe Launch (Carry-In) S Park Rd. Trempealeau, WI	608-534-6409	Trempealeau River	X			
Pool 7 (river mile 714.3 to 702.5)							
714.3 LDB	Sunset Bay Marina 24056 Lock and Dam Rd. Trempealeau, WI	608-534-6033	Mississippi River	X	X	X	
714 LDB	WI DNR Trempealeau Public Landing Peninsula Dr. Trempealeau, WI	608-685-6222	Mississippi River	X			
713.8 LDB	Larry's Landing Lake Rd. Trempealeau, WI	608-534-7771	Mississippi River	X			
713.4 LDB	Second Lake Access Lake Rd. Trempealeau, WI	608-685-6222	Second Lake	X			
713.4 LDB	Third Lake Access North Lake Rd. Trempealeau, WI	608-685-6222	Third Lake, Round Lake, Big Marsh Lake	X			
713.4 LDB	Third Lake Access South Lake Rd. Trempealeau, WI	608-685-6222	Third Lake, Round Lake, Big Marsh Lake	X			
713 LDB	US FWS Long Lake Landing Lake Rd 1.9 mi downstream of Trempealeau, WI	608-779-2399 UMR Refuge La Crosse Dist.	Long Lake, Big Marsh Lake	X			
713 LDB	US FWS Round Lake Landing Birch Ln. 1.9 mi downstream of Trempealeau, WI	608-779-2399 UMR Refuge La Crosse Dist.	Round Lake, Big Marsh Lake	X			
712 LDB	US FWS Lone Tree Landing Downstream of Trempealeau, WI	608-779-2399 UMR Refuge La Crosse Dist.	Big Marsh Lake, Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 7 (river mile 714.3 to 702.5) - continued							
709 LDB	Lytles Landing Canoe Launch (Carry-In) Lytle Rd. Onalaska, WI	608-534-6409	Black River	X			
708 LDB	Brice Prairie Walk-In Access (Carry-In) Co Rd ZB Onalaska, WI	608-783-4958	Lake Onalaska	X			
707.1 RDB	Dakota Public Access Riverview Dr. Dakota, MN	507-457-6335	Mississippi River	X			
707 LDB	US FWS Brice Prairie Landing Off Co Rd ZB Onalaska, WI	507-452-4232	Lake Onalaska	X			
705.2 RDB	Dresbach Park Park Rd. Dresbach, MN	507-643-6327	Mississippi River	X			
704.5 LDB	Schafer's Boat Livery W 7221 N Shore Ln. Onalaska, WI	608-781-3100	Black River, Lake Onalaska, Mississippi River	X			
704 LDB	Great River State Park Access Off Sunset Vista Rd. Onalaska, WI	608-534-6409	Lake Onalaska	X			
703.8 LDB	La Crosse Sailing Club (Marina) 3600 Lakeshore Dr. La Crosse, WI	608-781-2226	Lake Onalaska	X	X		
703.4 LDB	Fishermans Road Fishermans Rd. La Crosse, WI	608-789-7557	Black River				
703.2 LDB	Fisherman's Walkdown Fishermans Rd., French Island La Crosse, WI	608-781-9533	Black River	X			
702.8 LDB	Ist Ave Access - Onalaska Ist Ave. Onalaska, WI	608-781-9560	Black River	X			
702.6 LDB	Sias Isles Boat Landing Irvin St. Onalaska, WI		Black River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 8 (river mile 702.5 to 679.2)							
702.1 RDB	Pool 8 / Upper I-90 Access Off I-90, E of Hwys 14 and 61 S of Winona, MN	651-296-1151	Mississippi River	X			
702 LDB	Lower Dike Landing Bayshore Dr & Spillway Dr. Campbell, WI	608-785-9770 La Crosse County Facility	French Slough	X			
702 LDB	Upper Dike Landing Bayshore Dr & Spillway Dr. Campbell, WI	608-785-9770 La Crosse County Facility	Lake Onalaska	X			
702 LDB	US FWS Fisherman's Road Landing Fisherrmans Rd. La Crosse, WI	608-781-9533	Black River	X			
701.8 RDB	Lower I-90 Landing Off I-90, E of Hwys 14 and 61 S of Winona, MN	608-779-2399 UMR Refuge La Crosse Dist.	Mississippi River	X			
700.5 LDB	Black's Cove Marina 2003 Rose St (Hwy 53) La Crosse, WI	608-781-1212	Black River		X		
700.5 LDB	Best Western Midway Hotel (Marina) 1835 Rose St. La Crosse, WI	608-781-7000	Black River		X		
700 LDB	Richmond Bay Landing Goddard Pl. La Crosse, WI		Richmond Bay				
699.7 LDB	Logan St. Landing La Crosse, WI	608-789-7533	Black River				
699.6 LDB	Clinton St. Landing La Crosse, WI	608-789-7533	Black River				
699.6 LDB	Veterans Freedom Park Boat Ramp Clinton St & Boathouse Dr. La Crosse, WI	608-789-7557	Black River	X			
699.6 LDB	Catgut Marina 136 Clinton St. La Crosse, WI	608-317-1517	Black River		X		
699.5 LDB	French Island Yacht Club (Marina) 132 Marina Dr. La Crosse, WI	608-782-4092	Black River		X		
699.5 LDB	North Bay Marina 127 Marina Dr. La Crosse, WI	608-791-3838	Black River	X	X	X	X

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 8 (river mile 702.5 to 679.2) - continued							
699.4 LDB	American Boat Club (Marina) 605 1/2 Copeland Park Dr. La Crosse, WI	608-304-1365	Black River		X		
698.7 RDB	Sportsmen's Landing Hwys 61 & 14 La Crescent, MN	651-649-5451	W Channel, Mississippi River	X			
698.2 RDB	South Bay Marina 621 Park Plaza Dr. La Crosse, WI	608-304-1365	Mississippi River		X	X	X
697.2 RDB	La Crosse Pettibone Boat Club (Marina) 600 S Petttibone Dr. La Crosse, WI	608-784-7743	Mississippi River		X	X	
696.7 LDB	La Crosse Municipal Boat Harbor, Inc. (Marina) 1500 Houska Dr. La Crosse, WI	608-782-7077	Mississippi River	X	X	X	
695.8 LDB	Green Island Ramp 2312 S 7th St. La Crosse, WI	608-789-7533	Swift Creek, Mississippi River	X			
695 LDB	La Crosse Access Hanifl Rd. La Crosse, WI	608-789-7533	Mississippi River	X			
695 LDB	Chut's Landing (Marina) 2700 S 15th St. La Crosse, WI	608-788-1588	Bluff Slough		X		
694 RDB	Root River - Hwy 64 Access Brownsville, MN	507-206-2841	Root River	X			
692.8 LDB	Goose Island Boat Ramp 2 Goose Island Park Rd. Shelby, WI	608-785-9770 La Crosse County Facility	Wigwam Slough	X			
692.5 LDB	Goose Island Boat Ramp 3 Goose Island Park Rd. Shelby, WI	608-785-9770 La Crosse County Facility	Running Slough	X			
692 LDB	Goose Island Boat Ramp 1 Goose Island Park Rd. Shelby, WI	608-785-9770 La Crosse County Facility	Wigwam Slough	X			
691 LDB	Hunters Point Boat Landing Co Hwy Gi Bergen, WI	608-785-9770 La Crosse County Facility	Wigwam Slough	X			
691 LDB	Bergen Access Great River Rd. Bergen, WI		Running Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 8 (river mile 702.5 to 679.2) - continued							
688.3 RDB	Wildcat Park Access Off MN Hwy 26 0.4 mi downstream of Brownsville, MN	507-895-6341	Mississippi River	X			
686 LDB	Water's Edge Dock & Motel (Marina) 201 N Pearl St. Stoddard, WI	608-457-2126	Mississippi River	X	X	X	
685.5 LDB	Stoddard Park Landing Forest Ln. Village of Stoddard, WI	608-457-2136	Mississippi River	X			
681 RDB	Pool 8 / Renno Public Access Of MN Route 26 Township of Brownsville, MN		Mississippi River	X			
679.4 LDB	Engh's Boat Livery (Marina) N 165 WI Hwy 35 Genoa, WI	608-689-2394	Mississippi River	X	X		
Pool 9 (river mile 679.2 to 647.9)							
679 LDB	Mississippi River - Lock & Dam #8 Great River Rd. Genoa, WI		Mississippi River	X			
677.8 LDB	Dairyland Power Plant Access Off Great River Rd. Genoa, WI	608-788-4000	Thief Slough	X			
677 RDB	Millstone Landing Hwy 26 3 mi upstream of New Albin, IA	563-873-3423 UMR Refuge McGregor Dist.	Reno Bottoms, Minnesota Slough, Hayshore Lake	X			
676 RDB	Visgers Landing Hwy 26 2 mi upstream of New Albin, IA	563-873-3423 UMR Refuge McGregor Dist.	Visgers Lake, Ice Haul Slough, Minnesota Slough	X			
675 LDB	US COE Bad Axe Landing Great River Rd. Genoa, WI		Bad Axe River, Mississippi River	X			
673.5 RDB	Pool Slough Wildlife Area New Albin, Iowa Township, IA		Pool Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 9 (river mile 679.2 to 647.9) - continued							
673.4 RDB	IA DNR New Albin Access Army Rd. New Albin, IA	515-281-3449	Minnesota Slough, Lost Slough	X			
672.5 LDB	Victory Boat Landing Great River Rd. Wheatland, WI	608-648-3583 Town of Wheatland clerk	Mississippi River	X			
671.4 LDB	Violet R R Access Violet Rd. Wheatland, WI	608-648-3583 Town of Wheatland clerk	Mississippi River	X			
671.2 LDB	Blackhawk County Park Boat Ramp Blacktop Rd. Wheatland, WI	608-637-5485	Mississippi River	X			
671 LDB	Blackhawk Upper Access Blacktop Rd. Wheatland, WI	608-637-5485	Mississippi River, Battle Slough	X			
670.5 LDB	Blackhawk Park Wheatland, WI	608-637-5485	Battle Slough	X			
670.4 LDB	Blackhawk Park South - Green Lake Wheatland, WI	608-637-5485	Green Lake, Mississippi River	X			
670.3 LDB	Blackhawk Park Wheatland, WI	608-637-5485	Peck Lake	X			
669.7 LDB	Earl's Boat Landing 1 mi N of De Soto, WI	608-648-3630	Peck Lake, Green Lake	X			
669.3 LDB	Mississippi & Sports Recreation (Marina) E870 Ghelf De Soto, WI	608-648-3630	De Soto Bay		X		
667.3 LDB	De Soto Access Great River Rd. De Soto, WI	608-648-2700	Mississippi River	X			
665.4 LDB	US FWS Winneshiek Slough Landing WI Route 82 Freeman, WI	563-873-3423 UMR Refuge McGregor Dist.	Winneshiek Slough	X			
663.5 RDB	Lansing Marina 590 N Front St. Lansing, IA	563-538-4474	Mississippi River		X	X	

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 9 (river mile 679.2 to 647.9) - continued							
663.4 LDB	US FWS Big Slough Landing WI Route 82 Freeman, WI	563-873-3423 UMR Refuge McGregor Dist.	Mississippi River, Lafayette Slough	X			
662.4 RDB	S&S Houseboat Rentals (Marina) 990 S Front St. Lansing, IA	563-538-4454	Mississippi River		X	X	X
662 RDB	Village Creek Area Access Off Lansing Harpers Rd. Lansing, IA	515-281-3449	Mississippi River; Village Creek	X			
661 LDB	Rush Creek State Natural Area Access Great River Rd. Freeman, WI	608-266-2621	Winneshiek Slough	X			
660.5 RDB	Power Plant Access Great River Rd. Lansing, IA		Mississippi River	X			
658 LDB	Ferryville Landing Market Freeman, WI		Lake Winneshiek	X			
656 RDB	Lansing Township Access River View Rd. Township of Lansing, IA		Mississippi River	X			
654.2 RDB	IA DNR Heytman's Station Landing Heytman Dr. (at power plant) 6 mi downstream of Lansing, IA	515-281-3449	Mississippi River	X			
653 LDB	US FWS Cold Springs Landing Great River Rd. Seneca, WI	563-873-3423 UMR Refuge McGregor Dist.	Winneshiek Lake	X			
651.2 LDB	Lynxville Public Landing River Rd. Lynxville, WI		Mississippi River	X			
651 LDB	Withey's Campground Access (Marina) 309 Spring St. Lynxville, WI	608-874-4422	Mississippi River	X			
649.5 LDB	Mississippi River State Hwy 35 Seneca, WI		Mississippi River	X			
648 RDB	Below Dam No. 9 Off Great River Rd. Township of Taylor, IA		Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 10	**(river mile 647.9 to 615.1)**						
647.1 LDB	Vard Landing State Hwy 35 Eastman, WI		Mississippi River	X			
646.9 LDB	Gordon's Bay Landing Gordon's Bay Rd of Hwy 35 Eastman, WI	608-785-9994	Mississippi River	X			
646.3 RDB	Harpers Ferry Public Launch Unnamed St off of 1st St. Harpers Ferry, IA	515-281-5145	Harpers Slough	X			
646.2 RDB	Babe's Boat Landing (Marina) 243 N 1st St. Harpers Ferry, IA	563-586-4521	Harpers Slough	X	X	X	
646.1 RDB	End of the Line Boat Marina 219 N 1st St. Harpers Ferry, IA	563-586-2475	Harpers Slough		X		
646 RDB	Brown's Riverside Court & Marina 137 N 1st St. Harpers Ferry, IA	563-586-2607	Harpers Slough		X		
645.9 RDB	Delphey Brothers Marina, Inc. 113 S First St. Harpers Ferry, IA	319-586-2382	Harpers Slough		X	X	
644.3 LDB	Sioux Coulee Wayside Great River Rd. Eastman, WI		Mississippi River	X			
644 RDB	Lund's Landing (Marina) 751 Hwy 364 Approx. 3 mi S of Harpers Ferry, IA	563-586-2187	Harpers Slough		X	X	
643.1 LDB	Frenchman's Landing 28741 Frenchmans Landing Dr. Eastman, IA	608-874-4563	Mississippi River	X			
643 RDB	Nobels Island Hwy 364 3.2 mi downstream of Harpers Ferry, IA	515-281-6158	Harpers Slough	X			
643 RDB	Allamakee Co. Roadside Access Hwy 364 Harpers Ferry, IA		Harpers Slough	X			
639 LDB	Ambrough Slough Landing Hwy K Prairie Du Chien, WI	563-873-3423 UMR Refuge McGregor Dist.	Ambrough Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 10 (river mile 647.9 to 615.1) - continued							
638.6 LDB	Greymore Lake / Ambrough Landing Ambro Rd. Prairie Du Chien, WI	608-326-0233	Ambrough Slough	X			
638.2 LDB	Winneshiek Marina 32785 Co Rd K Prairie du Chien, WI	608-326-2888	Gremore Lake	X	X	X	X
637.6 RDB	Yellow/Mississippi River Access Hwy 76, Pikes Peak State Park, McGregor, IA	515-281-6158	Mississippi River	X			
637.4 RDB	Yellow River Access Hwy 76, Pikes Peak State Park McGregor, IA	515-281-6158	Mississippi River	X			
636.3 RDB	Clayton Co. Roadside Area Hwy 76 Marquette, IA		Mississippi River	X			
635.7 LDB	Marina Ramp N St. Feriole Dr. Prairie Du Chien, WI	608-326-6406	Marais de Sainte Feriole	X			
635.6 LDB	Prairie du Chien Marina 301 N St. Feriole Dr. Prairie du Chien, WI	608-326-8032	Marais de Sainte Feriole		X	X	
635.5 LDB	North Water St. Landing N Water St. Prairie Du Chien, WI	608-326-6406	E Channel Mississippi River	X			
635.3 LDB	Fisher St. Access Fisher St. Prairie Du Chien, WI	608-326-6406	E Channel Mississippi River	X			
634.7 RDB	Lady Luck Casino (Marina) 98 Waters St. Marquette, IA	563-873-3531	Mississippi River	X	X	X	
633.5 RDB	McGregor Marina Riverfront and Main St. McGregor, IA	563-873-9613	Mississippi River		X	X	
633.5 LDB	Lockwood Street Access W Lockwood St. Prairie Du Chien, WI	608-326-6406	E Channel Mississippi River	X			
633.2 LDB	Big River Campground On Pickerel Slough, N Arrowhead Ln. Prairie du Chien, WI	608-326-2712	Mississippi River	X			
629.5 LDB	Glen Lake Ramp Wyalusing State Park Wyalusing, WI	608-996-2261	Wyalusing Lake	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 10 (river mile 647.9 to 615.1) - continued							
627.8 LDB	Wyalusing Public Access Co. Rd. X Wyalusing, WI	608-723-2711	Mississippi River	X			
627 RDB	IA DNR Sny-Mcgill Access Great River Rd. Pikes Peak State Park 6.5 mi downstream of McGregor, IA	563-873-2341	Wyalusing Slough	X			
624.7 RDB	Clayton Mississippi River Access Front St. Clayton, IA		Mississippi River	X			
624 LDB	Bagley Bottoms Boat Landing Off S Willow Ln. Bagley (Wyalusing), WI	563-873-3423 McGregor District office Refuge	Glass Lake	X			
622.4 LDB	River of Lakes Resort 132 Packer Dr. Bagley, WI	608-996-2275	Jay's Lake	X	X	X	
622 LDB	Jay's Lake Landing Pine Ln. 1.5 mi S of Bagley, WI	507-895-6341	Jay's Lake	X			
621.2 RDB	Willies Landing Mallard Ln. Township of Garnavillo, IA		Mississippi River	X			
619.9 RDB	Frenchtown Boat Access On Frenchtown Lake 26254 Mississippi Rd. Elkader, IA	563-245-1516	Frenchtown Lake	X			
618.2 LDB	Glen Haven Public Landing Rock School Rd. Glen Haven, WI	608-794-2640	E Channel Mississippi River	X			
616.5 RDB	IA DNR Bussey Lake Landing Mississippi Rd. Guttenberg, IA		Mississippi River	X			
616.3 RDB	Winegar Works Marina Marina Rd. Guttenberg, IA	563-252-2050	Mississippi River		X	X	X
Pool 11 (river mile 615.1 to 583.0)							
614.7 RDB	Landing 615 (Marina) 703 S River Park Dr. Guttenberg, IA	563-252-1717	Mississippi River	X	X	X	

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 11 (river mile 615.1 to 583.0) - continued							
614.5 RDB	Guttenberg Marina 502 S 1st St. Guttenberg, IA	563-252-1161	Mississippi River	X	X		
613 LDB	Schleicher's Landing 7110 Closing Dam Rd. Cassville, WI	608-725-5216	Cassville Slough	X			
612.2 RDB	Camp Hide-A-Way Ramp Off of Great River Rd (Hwy 52) Guttenberg, IA	563-252-1305	Mississippi River	X			
607.8 RDB	IA DNR Turkey River Boat Landing Oak Rd 7 mi downstream of Guttenberg, IA	563-873-2341	Mississippi River / Turkey River	X			
607.7 LDB	Power and Light Landing At Nelson Dewey Generating Station 11999 Co Rd W Cassville, WI	608-725-5112	Mississippi River	X			
607 LDB	Cassville City Park Car Ferry Wyota St and W Front St. Cassville, WI	608-725-5180	Mississippi River	X			
606.4 LDB	Riverside Park Boat Ramp Off Hwy 133 on to Crawford St. Cassville, WI	608-725-5855	Mississippi River	X			
605.8 LDB	Eagle's Roost Resort (Marina) On Jack Oak Slough 1034 Jack Oak Rd. Cassville, WI	608-725-5553	Jack Oak Slough, Mississippi River		X		
603.6 RDB	Lowell's Landing (Marina) 112 Clark St. North Buena Vista, IA	563-245-2422	Mississippi River		X	X	
601.7 LDB	Bertom Lake Public Access Far-Nuff Rd. Cassville, WI	563-873-3423 McGregor District office Refuge	Coalpit Slough	X			
598.9 LDB	McCartney Landing Co. Rd. N Waterloo, WI	608-723-2711	McCartney Lake	X			
596.8 LDB	Lynn Hollow Access 4801 Lynn Hollow Ln. Potosi, WI	563-873-3423 McGregor District office Refuge	Spring Lake	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 11 (river mile 615.1 to 583.0) - continued							
596 RDB	Finley's Landing 24500 Finley's Landing Rd. Sherrill, IA	319-552-1571	Mississippi River	X			
592.3 LDB	Potosi Public Access S Main St. Potosi, WI		Mississippi River	X			
591 LDB	Grant River Recreation Area (in slough) 2 mi downstream of Potosi, WI	608-822-3501	Mississippi River	X			
589.5 RDB	Mud Lake Park Access Off Mud Lake Rd. 6 mi upstream of Dubuque, IA	563-552-2746	Mississippi River	X			
589.5 RDB	Hawkeye Boat Marina 22500 Golf Lake Rd. upstream of Dubuque, IA	563-552-2303	Mississippi River	X	X	X	
583.1 LDB	Pool 11 Access Eagle Point Rd. Jamestown, WI	608-822-3501	Mississippi River	X			
Pool 12 (river mile 583.0 to 556.7)							
582 RDB	Hawthorne Street Municipal Boat Ramp Lake St. Dubuque, IA	563-589-4250	Mississippi River	X			
582 RDB	Dubuque Marina and Yardarm 121 Shiras Ave Exd. Dubuque, IA	563-582-3653	Mississippi River	X	X	X	X
580.9 RDB	Schmitt Harbor (Marina) 1801 Admiral Sheehy Dr. Dubuque, IA	563-589-4391	Mississippi River	X			
580.7 RDB	Dubuque Yacht Basin (Marina) 1630 E 6th St (on Schmitt Island) Dubuque, IA	563-588-9564	Mississippi River		X	X	X
579.8 RDB	Port of Dubuque Marina 450 E 3rd St. Dubuque, IA	563-589-4263	Mississippi River	X	X	X	
579.5 LDB	East Dubuque Municipal Ramp N of Hwy 20 bridge East Dubuque, IL	815-747-3416	Mississippi River	X			
579 LDB	Mid-Town Marina 285 5th St PO Box 145 East Dubuque, IL	815-747-3310	Mississippi River		X	X	X

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 12 (river mile 583.0 to 556.7) - continued							
578 LDB	Snyder Bent Prop Marina and Lounge 780 Harbor Dr. East Dubuque, IL	815-747-8860	Mississippi River				
576.5 LDB	Frentress Lake Marine Center (Marina) 830 W Gill Rd. East Dubuque, IL	815-747-3155	Frentress Lake			X	X
573.8 RDB	Massey Marina 9526 Massey Marina Ln. Dubuque, IA	563-556-7055	Molo Slough		X	X	
566.5 LDB	Ferry Landing (Marina) Ferry Landing Rd. Galena, IL	815-777-1050	Harris Slough	X			
561 LDB	Chestnut Mountain Resort (Marina) 8700 W Chestnut Rd. Galena, IL	815-777-1320	Yonkers Lake		X		
559.5 RDB	Spruce Creek Harbor and Marina 30711 396th Ave. Bellevue, IA	563-652-3783	Mississippi River	X	X		
558.6 LDB	Blanding Landing Public Use Area 5720 S River Road Hanover, IL	563-582-0881	Mississippi River	X			
Pool 13 (river mile 556.7 to 522.5)							
556.5 RDB	Bellevue Public Ramp Riverview Dr. Bellevue, IA	563-872-5830	Mississippi River	X			
556.2 RDB	Point Pleasant Boat Landing (Marina) 907 Riverview St. Bellevue, IA	563-872-4205	Mississippi River	X	X	X	
556.1 RDB	Shady Haven Camper Park and Marina 911 S Riverview St. Bellevue, IA	563-872-4204	Mississippi River	X	X	X	
555.7 RDB	Bellevue Research Station Access 24143 Hwy 52 Bellevue, IA	563-872-4976	Mississippi River	X			
553 RDB	Pleasant Creek Public Use Area 11995 Hwy 52 Bellevue, IA	563-582-0881	Mississippi River	X			
551.3 LDB	Savanna Army Depot Access 18935 B Street Savanna, IL	815-273-8312	Crooked Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 13 (river mile 556.7 to 522.5) - continued							
540 LDB	Miller's Hollow 16327 N Route 84 (At Palisades State Park) Savanna, IL	815-273-2731	Miller's Lake	X			
540 LDB	Lazy River Marina 6850 Marina Rd. Savanna, IL	815-273-2851	Miller's Lake		X		
537.5 LDB	Marquette Park Municipal Landing Wayne King Dr, (Turn W off US Hwy 52, cross RR) Savanna, IL	815-273-4487	Mississippi River	X			
536.8 LDB	Savanna Marina 1 Main St. (Turn W off US Hwy 52, bear left) Savanna, IL	815-273-2955	Mississippi River	X	X	X	
536.8 LDB	Savanna Marina 1 Main St. Savanna, IL	815-273-2955	Mississippi River; Plum River		X	X	
535.7 RDB	North Boat Access On Town Lake, N end of Elk St. (Just W of US Hwy 52 on 207th Ave.) Sabula, IA	563-687-2772	Mississippi River, Town Lake	X			
535.5 RDB	Homeport Marina 515 River St. Sabula, IA	563-687-2793	Mississippi River	X	X	X	
534.8 RDB	Island City Harbor (Marina) 305 South Ave. Sabula, IA	563-687-2825	Mississippi River		X	X	X
534.4 RDB	South Sabula County Park Access 1516 South Ave. (US Hwy 52 to Sabula, turn or continue S on South Ave. to end) Sabula, IA	563-652-3783	Lower Sabula Lake; Mississippi River	X			
531.1 LDB	Big Slough Access Off Route 84 and Four Mile Rd. (Turn W from IL Hwy 84 onto Four Mile Rd, travel 1 mi.) Thomson, IL	309-794-4524	Mississippi River	X			
530.4 LDB	Paradise Harbor 4202 N Hwy 84 Savanna, IL	815-273-2851	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 13 (river mile 556.7 to 522.5) - continued							
527 LDB	Thomson Causeway Recreational Area Lewis Ave. (Turn W off US Hwy 52 on Main Ave., turn S into USACE campground, cross bridge to island, turn N to ramp) Thomson, IL	815-259-3628	Potters Slough	X			
525.8 RDB	Bulger's Hollow Public Use Area Off Hwy 67 and 170th St. (Turn E off US Hwy 67 on 170th St., drive to end) Clinton, IA	815-259-3628	Mississippi River	X			
524 LDB	Mickelson's Landing County of Carroll, IL	815-273-2732 Refuge Savanna District office	Potters Slough	X			
522.7 LDB	Lock & Dam 13 Public Use Area 4999 Lock Rd. (Turn W from IL Hwy 84 or E from US Hwy 67 on Lock Rd. Access on LDB behind Potter's Marsh) Fulton, IL	815-259-3628	Mississippi River	X			
Pool 14 (river mile 522.5 to 493.3)							
521 RDB	Clinton Municipal Ramps 30th Ave N Clinton, IA	563-242-2144	Mississippi River	X			
520.6 RDB	Clinton Municipal Ramps 25th Ave N Clinton, IA	563-242-2144	Mississippi River	X			
519 RDB	Lateke Sportscenter (Marina) 1209 Roosevelt St. Clinton, IA	563-242-2973	Lyons Chute	X	X		
518.8 RDB	Clinton Marina 511 Riverview Dr. Clinton, IA	563-242-3600	Mississippi River		X	X	X
517.6 LDB	Cattail Slough Public Use Area Off Diamond Rd. Fulton, IL	815-259-3628	Sunfish Slough	X			
517 RDB	Clinton Municipal Ramp 30th Ave N Clinton, IA	563-242-2144	Beaver Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 14 (river mile 522.5 to 493.3) - continued							
513.6 LDB	Albany Boat Access 2nd Ave N and Water St. Albany, IL	309-887-4308	Mississippi River	X			
512.2 RDB	Comanche Marina, Inc. 115th Ave. Camanche, IA	563-259-1514	Mississippi River	X	X		
512 RDB	Camanche Municipal Ramps 5th Ave. Camanche, IA	563-259-8446	Mississippi River	X			
511.9 RDB	Camanche Municipal Ramps 6th Ave. Camanche, iA	563-259-8446	Mississippi River	X			
511.8 RDB	Camanche Municipal Ramps 8th Ave. Camanche, IA	563-259-8446	Mississippi River	X			
510.8 RDB	Camanche Municipal Ramp Swan Slough Camanche. IA	563-259-8446	Swan Island Channel	X			
507.8 RDB	Rock Creek Marina and Campground 3942 291st St. Camanche, IA	563-847-7202	Rock Creek	X	X	X	
507.5 LDB	Jim Hass Boat Landing (Marina) 21808 River Rd. N, Cordova, IL	309-654-2410	Mississippi River		X		
503.5 LDB	Cordova Public Ramp #2 Cordova, IL	309-654-2620	Mississippi River	X			
503.3 RDB	Princeton Public Use Area 1 mi upstream of Princeton, IA	563-652-3132	Steamboat Slough	X			
503.3 LDB	Leisure Harbor Inn 701 Main St. Cordova, IL	309-654-2233	Mississippi River		X		
503.1 LDB	The Boathouse (Marina) 501 Main Ave. Cordova, IL	309-654-2515	Mississippi River	X	X		
502.8 LDB	White's Bait Cordova, IL	309-794-9111	Mississippi River	X			
502.5 RDB	Princeton Beach Marina 203 River Dr., PO Box 408 Princeton, IA	563-289-5024	Mississippi River	X	X		
502.4 RDB	Kernan's Riverview Restaurant (Marina) 333 River Dr. Princeton, IA	319-289-3879	Mississippi River		X		

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 14 (river mile 522.5 to 493.3) - continued							
502.3 RDB	Princeton Municipal Boat Ramp Washington St & River Dr. Princeton, IA	563-289-5315	Mississippi River	X			
500.2 LDB	Rock Island County Port Byron, IL	n/a	Mississippi River	X			
497.7 LDB	Port Byron Municipal Courtesy Dock 120 N Main St. Port Byron, IL	309-523-3705	Mississippi River	X			
497.2 RDB	LeClaire Municipal Courtesy Dock LeClaire, IA	563-289-4242	Mississippi River	X			
496.3 LDB	Shuler's Shady Grove Rapids City, IL	309-496-2321	Mississippi River	X			
495.7 RDB	Captain's Quarters Drystack Marina 1211 Canal Shore Dr. SW, LeClaire, IA	563-289-5050	Mississippi River		X	X	X
494.7 RDB	Green Gables Marina, Inc. 2315 Canal Shore Dr. SW LeClaire, IA	563-289-5652	Mississippi River	X	X	X	X
Pool 15 (river mile 493.3 to 482.9)							
493 RDB	LeClaire Boat Ramp LeClaire, IA	563-589-3229	Mississippi River	X			
493 LDB	Illinewek Public Ramp 1st St. East Moline, IL	309-496-2620	Mississippi River	X			
491.8 LDB	Hampton 6th St. Ramp 6th St. Hampton, IL	309-496-9123	Mississippi River	X			
489.8 LDB	Island Marina On Campbell's Slough 15806 Hwy 84 N East Moline, IL	309-752-1536	Mississippi River		X		X
488.3 LDB	Moline Municipal Ramp (East) 5500 River Dr. Moline, IL	309-797-0787	Mississippi River	X			
488.1 LDB	Marquis Harbor (Marina) 4801 River Dr. Moline, IL	563-588-9564	Mississippi River		X	X	
486.5 LDB	Moline Municipal Ramp (West) 2600 River Dr. Moline, IL	309-797-0787	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 15 (river mile 493.3 to 482.9) - continued							
485.6 RDB	Bettendorf Municipal Ramp 12th St. Bettendorf, IA	563-359-1651	Mississippi River	X			
484.1 RDB	Lindsay Park Yacht Club (Marina) Foot of Mound St., PO Box 3484 Davenport, IA	563-324-0370	Mississippi River	X	X	X	X
483.4 RDB	Quad City Marine (Marina) 935 E River Dr. Davenport, IA	563-762-9372	Mississippi River		X		X
483 LDB	Lock & Dam 15 Access Moline, IL	n/a	Mississippi River	X			
Pool 16 (river mile 482.9 to 457.2)							
482.4 RDB	LeClaire Park Public Ramp Main St. Davenport, IA	563-326-7766	Mississippi River	X			
481.6 RDB	Marquette St. Public Access Marquette St. Davenport, IA	563-326-7766	Mississippi River	X			
480.5 RDB	Credit Island Municipal Landing River Dr. Davenport, IA	563-326-7766	Mississippi River	X			
480 LDB	Rock Island Boat Club (Marina) 1706 Mill St. Rock Island, IL	309-788-9412	Mississippi River	X			
480 LDB	Rock Island Boat Club (Marina) 1706 Mill St. Rock Island, IL	309-788-9412	Mississippi River	X			
479.9 LDB	Sunset Park Ramps 18th Ave, and Sunset Park Dr. Rock Island, IL	309-788-7275	Mississippi River	X			
479.5 LDB	Rock island Sunset Marina 1309 Mill St. Rock Island, IL	309-793-3498	Lake Potter to Mississippi River	X			
479.2 RDB	Walter Buese Public Ramp S Concord St. Davenport, IA	563-326-7726	Mississippi River	X			
477.8 RDB	Davenport Inland Harbor (Marina) 4440 S Concord St. Davenport, IA	563-326-0365	Mississippi River		X		

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 16 (river mile 482.9 to 457.2) - continued							
474.9 RDB	Dodge Access County of Scott, IA	563-263-4337	Mississippi River	X			
473 RDB	Buffalo Municipal Ramp Buffalo, IA	563-381-2226	Mississippi River	X			
473 LDB	Kelly's Landing (Andalusia Harbor) (Marina) 1 Andalusia Harbor, PO Box 377 Andalusia, IL	309-236-3006	Andalusia Slough	X	X	X	
471.9 RDB	Buffalo Shores Park Access 1433 W Front St. Buffalo, IL	563-381-2900	Mississippi River	X			
471.5 LDB	Ducky's Lagoon (Marina) 13515 W 78th Ave. Taylor Ridge, IL	309-798-2423	Andalusia Slough	X	X	X	
470.1 LDB	Andalusia Slough Public Use Area On Andalusia Slough, Hwy 92 Andalusia, IL	563-263-7913	Mississippi River	X			
469 LDB	Public Use Area Hwy 92 E of Loud Thunder Forest Preserve County of Rock Island, IL	309-795-1040	Mississippi River	X			
468.2 RDB	Clark's Ferry Federal Recreation Area Montpelier, IA	563-263-7913	Mississippi River	X			
468 RDB	Clark's Ferry Access Montpelier, IA	563-263-7913	Mississippi River	X			
467 LDB	Loud Thunder Forest Preserve Public Ramp On Andalusia Slough Illinois City, IL	309-795-1040	Andalusia Slough	X			
464.6 RDB	Shady Creek Federal Recreation Area Hwy 22 1.5 m upstream of Fairport, IA	563-263-7913	Mississippi River	X			
463.2 RDB	Fairport Landing Marina 2142 Water St. Fairport, IA	563-264-8660	Mississippi River	X	X	X	
462.7 RDB	Izaak Walton League Ramp Fairport, IA	563-649-2288	Mississippi River	X			
461.9 RDB	Fairport Public Use Area Hwy 22 Fairport, IA	563-263-0241	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 16 (river mile 482.9 to 457.2) - continued							
461.8 RDB	Fairport Public Use Area Hwy 22 Fairport, IA	563-263-0241	Mississippi River	X			
Pool 17 (river mile 457.2 to 437.1)							
455.5 RDB	Muscatine Municipal Boat Harbor 110 Harbor Dr. Muscatine, IA	563-263-0241	Mississippi River		X		
455.2 RDB	Muscatine Public Access Muscatine, IA	563-263-0241	Mississippi River	X			
455.2 LDB	Mississippi River Gas Dock County of Rock Island, IL	309-537-3119	Mississippi River	X			
449.8 LDB	Blanchard Island Public Use Area County of Rock Island, IL	309-794-4523	Blanchard Chute	X			
446.8 LDB	Crosses Corner Public Use Area County of Mercer, IL	815-625-2968	Mississippi River	X			
446.6 RDB	Kilpeck Landing Public Use Area Downstream of Louisa Generating Station and Muscatine, IA	563-263-7913	Mississippi River	X			
442.8 RDB	Flaming Prairie Recreation County of Louisa, IA	319-523-8381	Mississippi River	X			
441 RDB	Port Louisa E of 120th St and G Ave. Township of Port Louisa, IA	319-523-6982	Mississippi River	X			
Pool 18 (river mile 437.1 to 410.5)							
435 RDB	Toolesboro Access County of Louisa, IA	319-523-8319	Mississippi River	X			
433.7 RDB	Ferry Landing Public Use Area At mouth of Iowa River County of Louisa, IA	319-263-7913	Mississippi River	X			
433 LDB	Sturgeon Bay Park Municipal Landing 1st St. New Boston, IL	309-587-8181	Mississippi River	X			
432.9 LDB	New Boston Ramp End of Hwy 17 New Boston, IL	309-587-8181	Mississippi River	X			
43.8 LDB	Thebes Municipal Ramp Front St. Thebes, IL	n/a	Mississippi River	X			
427.3 LDB	Keithsburg Municipal Ramp Keithsburg, IL	309-374-2311	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 18 (river mile 437.1 to 410.5) - continued							
427.2 LDB	Keithsburg Municipal Ramp Keithsburg, IL	309-374-2311	Mississippi River	X			
424.1 LDB	Riverview Access Area Keithsburg, IL	n/a	Mississippi River	X			
422.8 LDB	Big River State Forest Putney Landing On Campbell Slough Oquawa Township, IL	309-374-2496	Campbell Slough	X			
422 RDB	Hawkeye Dolbee Access Lake Rd, 3 mi upstream of Kingston, IA	319-753-8260	Huron Chute	X			
417.4 LDB	Delabar State Park Access 1.4 mi N of Oquawka, IL	309-374-2496	Mississippi River	X			
416 RDB	Casey Barrow Landing End of 180th St. County of Des Moines, IA	319-753-8260	Mississippi River	X			
415.8 LDB	Oquawka Municipal Ramp and Harbor (Marina) Foot of Schuyler St. Oquawka, IL	309-867-3481	Mississippi River	X	X		
415.2 LDB	Pier 415 Marina 216 Marina Dr,. Oquawka, IL	309-867-2315	Mississippi River	X	X	X	
Pool 19 (river mile 410.5 to 364.2)							
410.1 LDB	IL DNR Henderson Creek Access County of Henderson, IL	309-374-2496	Mississippi River	X			
409 RDB	Tama Beach Public Access Tama Rd at 65th St. Burlington, IA	319-753-8260	Otter Slough	X			
404.5 RDB	Bluff Harbor Marina 800 N Front St. Burlington, IA	319-753-2590	Mississippi River		X	X	X
404.1 RDB	Burlington Municipal Landing Between Columbia and Court Sts. Burlington, IA	n/a	Mississippi River	X			
403.9 RDB	Burlington Municipal Landing Market St. Burlington, IA	n/a	Mississippi River	X			
401 LDB	Ellison Creek County of Henderson, IL	n/a	Shokokon Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 19 (river mile 410.5 to 364.2) - continued							
400.2 LDB	Shokokon Access On Shokonon Slough Shokonon, IL	309-374-2496	Shokokon Slough	X			
397.8 RDB	Sullivan Slough River Access Sullivan Slough Rd. S of Burlington, IA	319-753-8260	Mississippi River	X			
390.3 LDB	Dallas City Municipal Ramp Spruce St. Dallas City, IL	217-852-3713	Mississippi River	X			
390.2 LDB	Dallas City Municipal Ramp Spruce St. Dallas City, IL	217-852-3713	Mississippi River	X			
389.3 RDB	Green Bay Access Area 2112 Green Bay Rd. Green Bay, IA	319-463-7673	Mississippi River	X			
384 RDB	Willow Patch Municipal Ramp 10 E Limits Fort Madison, IA	319-372-7700	Mississippi River	X			
383.6 RDB	Captain Kirk's Marina 902 4th St., PO Box 524 Fort Madison, IA	319-372-6477	Mississippi River		X	X	
383.5 RDB	Riverview Marina 318 Riverview Dr. Fort Madison, IA	319-372-7700	Mississippi River	X	X	X	
379.8 RDB	Ortho Public Ramp Ortho Rd. Fort Madison, IA	319-463-7673	Mississippi River	X			
376.8 LDB	Nauvoo Boat Ramp N Sycamore Haven Dr. Nauvoo, IL	217-453-2587	Mississippi River	X			
376.4 RDB	Heron Bend Conservation Area 2652 Hwy 61 County of Lee, IA	319-463-7673	Mississippi River	X			
375 RDB	Riverview Municipal Park Water St at Main St. Montrose, IA	319-463-5533	Mississippi River	X	X		
369.3 LDB	Larry Creek Access County of Hancock, IL	217-654-2229	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 20 (river mile 364.2 to 343.2)							
364 LDB	Montebello State Park Access Hamilton, IL	217-847-2936	Mississippi River	X			
363 RDB	Southside Boat Club Railroad & Cedar St. Keokuk, IA	319-524-7122	Mississippi River	X			
359.3 RDB	Alexandria Ramp Alexandria, MO	660-727-3283	Mississippi River	X			
359.2 LDB	Warsaw Boat Landing Water St. Warsaw, IL	217-256-3214	Mississippi River	X	X		
347.7 RDB	Fenway Landing Public Use Area Hwy 61 4.5 mi N of Canton, MO	217-228-0890	Mississippi River	X			
Pool 21 (river mile 343.2 to 324.9)							
342.5 RDB	Canton Municipal Ramp Bland St at Front St. Canton, MO	573-288-5581	Mississippi River	X			
340.9 LDB	Bear Creek Public Use Area On Canton Chute, County Rd 2450N County of Adams, IL	217-228-0890	Canton Chute	X			
331.4 LDB	Canton Chute Public Use Area Opposite Deadman Island Upstream of Quincy, IL	217-228-0890	Canton Chute, Mississippi River	X			
327.7 LDB	Kesler Park Ramps Chestnut and Bonansinga Sts. Quincy, IL	217-223-7703	Quincy Bay	X			
327.7 LDB	Art Keller Marina Quinsippi Island Quincy, IL	217-228-9227	Quincy Bay		X	X	
327 LDB	Quincy Ramp Hampshire St. Quincy, IL	217-223-7703	Mississippi River	X			
326.9 LDB	Clad Adams Bicentennial Park Front St. Quincy, IL	217-223-7703	Mississippi River	X			
326.5 LDB	South Side Boat Club 640 S Front St. Quincy, IL	217-222-1187	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 22 (river mile 324.9 to 301.2)							
324 .6 LDB	Lock & Dam 21 Public Access Quincy, IL	217-228-0890	Mississippi River	X			
320 RDB	Northeast Missouri Power Access County of Marion, MO	573-769-2107	Mississippi River	X			
309.2 LDB	John Hay Public Use Area East Hannibal, IL	217-228-0890	Mississippi River	X			
308.9 RDB	Nipper Marina 101 Broadway Hannibal, MO	573-221-0154	Mississippi River	X	X	X	
Pool 24 (river mile 301.2 to 273.4)							
301 RDB	Lock and Dam 22 Public Access County of Ralls, MO	573-221-0294	Mississippi River	X			
296.4 LDB	Cincinnati Landing Access County of Pike, IL	636-899-2600	Mississippi River	X			
294 RDB	DuPont Reservation Conservation Area Ashburn, MO	573-248-2530 Missouri DoC	Mississippi River	X			
288 LDB	Willow North Public Access County of Pike, IL	217-285-4364	Mississippi River	X			
284.3 LDB	Two Rivers North Access (Marina) County of Pike, IL	573-242-3524	Mississippi River	X	X		
283.7 RDB	Louisiana River Front Park South Carolina St. Louisiana, MO	573-248-2530 Missouri DoC	Mississippi River	X			
283.2 LDB	Two Rivers Marina Near Hwy 54 bridge County of Pike, IL	217-437-2321	Mississippi River	X	X	X	X
280.6 LDB	Gosline Public Access County of Pike, IL	217-285-4364	Mississippi River	X			
277.1 RDB	Calumet Creek Access Hwy 79 4 mi N of Clarksville, MO	573-882-9880	Mississippi River	X			
276 RDB	Silo Access Area 3 mi N of Clarksville, MO	573-882-9880	Mississippi River	X			
273.6 LDB	Pleasant Hill Access County of Calhoun, IL	618-465-6676	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 25 (river mile 273.4 to 241.4)							
273.4 RDB	Lock and Dam 24 Service Access Clarksville, MO	573-242-3524	Mississippi River	X			
273.2 RDB	Clarksville Boat Club 310 N 1st St. Clarksville, MO	573-242-9693	Mississippi River	X			
273 LDB	Pleasant Hill Pump Station Access County of Calhoun, IL	618-465-6676	Clarksville Slough	X			
271.8 RDB	Port Marmac County of Pike, MO	573-242-3336	Mississippi River	X			
265.3 LDB	Rip Rap Landing #1 Off Route 96 N of Mozier, IL	618-376-3303	Mississippi River	X			
260.4 LDB	Mozier Landing Access County Rd 2 County of Calhoun, IL	618-232-1218	Mississippi River	X			
258.5 LDB	Hamburg Access Water St. Hamburg, IL	618-232-1258	Mississippi River	X			
258.4 RDB	Hamburg Ferry Public Access Hwy P County of Pike, MO	573-898-5905	Mississippi River	X			
257.7 RDB	Timberlake Marina 40 N River Rd. Elsberry, MO	573-898-2077	Mississippi River / Westport Chute	X	X	X	
254.1 LDB	Red Landing 3 mi S of Hamburg, IL	618-376-3303	Mississippi River	X			
251 RDB	Hurricane Public Access County of Lincoln, MO	636-899-2600	Mississippi River	X			
249.2 RDB	Lincoln County N of Foley, MO	n/a	Mississippi River	X			
246.2 LDB	Turner Landing Off Hwy 2 County of Calhoun, IL	618-883-2524	Mississippi River	X			
245 RDB	Foley Public Access Parkers Landing, MO	636-528-6300	Mississippi River	X			
243 LDB	Cockrell Hollow Access Area County of Calhoun, IL		Batchtown Lake	X			
241.5 RDB	Port of Winfield 502 Pillsbury Rd. Winfield, MO	314-566-6573	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 26 (river mile 241.4 to 202.9)							
236.4 RDB	Cuirve Island Conservation Area Dalbow Rd. Old Monroe, MO	573-248-2530 Missouri DoC	Cuivre River	X			
231.7 RDB	Riverbend Marina 2407 Hwy C County of St. Charles, MO	636-946-2073	Mississippi River	X	X	X	X
231.4 RDB	Two Branch Marina 2021 Hwy C County of St. Charles, MO	636-946-2628	Mississippi River	X	X	X	
230.3 RDB	McCann Landing/Karmill Woods Harbor Peruque, MO	636-949-3373	Mississippi River	X			
227.2 RDB	Riverside Harbor 600 Kampville Dr. Kampville, MO	636-946-5535	Dardenne Slough	X			
226 RDB	South Shore Marina 1014 Urna Dr. St. Charles, MO	636-250-4344	Dardenne Slough		X		
225.5 RDB	Yacht Club of St. Louis (Private) 105 Lake Village Dr. St. Charles, MO	636-250-4435	Dardenne Slough	X			
224.8 RDB	Lake Center Marina 498 Lake Center St. Charles, MO	636-250-7500	Dardenne Slough		X	X	X
223.5 RDB	Eagles Landing Marina 800 Wilson Rd. St. Charles, MO	636-250-4480	Dardenne Slough	X	X		
223 LDB	Calhoun County Grafton, IL	n/a	Mississippi River	X			
222.7 RDB	Woodland Marina 125 Harbor Dr. St. Charles, MO	636-250-3446	Dardenne Slough	X	X	X	X
222.4 RDB	North Shore Yacht Club (Marina) 601 N Shore Dr. St. Charles, MO	636-250-4520	Mississippi River / Dardenne Slough		X		
222.1 RDB	Polestar Harbor (Marina) 6171 Hwy V St. Charles, MO	66-250-3008	Mississippi River / Dardenne Slough		X	X	X

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 26 (river mile 241.4 to 202.9) - continued							
222 RDB	Port Charles Marine (Marina) 6247 Hwy V St. Charles, MO	636-250-2628	Mississippi River / Dardenne Slough	X	X	X	X
221.7 RDB	The Duck Club (Private) 6257 Hwy V St. Charles, MO	636-250-4321	Mississippi River		X		
219 RDB	Club Sherwood Marina 29 Sherwood Harbor Dr. Portage Des Sioux, MO	636-250-4400	Mississippi River		X	X	
218.3 LDB	Pohlman Slough N of Grafton, IL	618-376-3303	Mississippi River	X			
212.9 RDB	Venetian Harbor (Marina) 1 Venetian Dr. Portage Des Sioux, MO	636-899-0940	Mississippi River		X	X	X
212.7 RDB	Sioux Yacht Club (Private) (Marina) Portage Des Sioux, MO	636-899-1830	Mississippi River		X		
212.5 RDB	Palisades Yacht Club, LLC (Marina) 1670 River View Dr. Portage Des Sioux, MO	636-899-1093	Mississippi River		X	X	X
212.5 RDB	My River Home Boat Harbor, Inc. (Marina) 1545 Riverview Dr. Portage Des Sioux, MO	636-899-0903	Mississippi River	X	X	X	X
211.4 RDB	Valley Sailing Association (Private) (Marina) N Hwy 94 Portage Des Sioux, MO	314-303-2510	Mississippi River		X		
209.2 LDB	Piasa Harbor Marina 10815 Lockhaven Road Godfrey, IL	618-466-7501	Piasa Chute	X	X	X	X
207.9 RDB	Spatterdock Lake Public Access Alta Villa Place, MO	636-899-2600	Brick House Slough	X			
206.6 RDB	Dresser Island Public Access Hwy 94 Brick House Slough, MO	573-248-2530 Missouri DoC	Brick House Slough	X			
205.5 RDB	Alta Villa Public Access Brick House Slough West Alton, MO	636-899-2600	Mississippi River, Brick House Slough	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name and Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Pool 26 (river mile 241.4 to 202.9) - continued							
204.5 RDB	Harbor Point Yacht Club (Private) 280 Jamie Circle West Alton, MO	636-899-1513	Mississippi River	X			
203.1 RDB	Lincoln Shields Public Access West Alton, MO	636-899-2600	Mississippi River	X			
Lock and Dam 26 to Lock 27 (river mile 202.9 to 185.0)							
202.3 LDB	Alton Marina 1 Henry St. Alton, IL	618-462-9860	Mississippi River	X	X	X	
200.7 RDB	Harris Park Access Area West Alton, MO	618-462-3580	Mississippi River	X			
194.9 LDB	Lewis and Clark State Park Access Wood River, IL	n/a	Mississippi River	X			
189.4 LDB	Chain of Rocks Access County of Madison, IL	n/a	Mosenthein Chute	X			
Lock 27 to Cairo, IL (river mile 185.0 to 0.0)							
182.8 LDB	Venice City Access Bremmen Ave. Venice, IL	618-877-2114	Mississippi River	X			
165.9 LDB	Monroe County Levee Rd. Columbia, IL	618-939-8681	Mississippi River	X			
158.6 RDB	Hoppie's Marina Kimmswick, MO		Mississippi River			X	
149.7 RDB	Jefferson County Hugs Landing Rd. Crystal City, MO	636-797-5334	Mississippi River	X			
140.5 RDB	Truman Access County of Jefferson, MO	636-458-2236	Mississippi River				
125.4 RDB	Ste. Genevieve Township Little Rock Road Township of Ste. Genevieve, MO	n/a	Mississippi River	X			
122.1 RDB	Marina De Gabouri 1 Marina Drive, PO Box 168 Ste. Genevieve, MO	573-883-5599	Mississippi River	X	X	X	
109.4 LDB	Chester Public Ramp Chester, IL	618-826-5114	Mississippi River	X			

Boat Accesses on the Upper Mississippi River

(Continued)

River Mile*	Facility Name Address	Phone	Waterbody	Ramp	Dock	Fuel	Lift
Lock 27 to Cairo, IL (river mile 185.0 to 0.0) - continued							
79.8 LDB	Grand Tower Boat Ramp Grand Tower, IL	618-565-2415	Mississippi River	X			
66.6 RDB	Trail of Tears Park Boat Ramp 429 Moccasin Springs Rd. Jackson, MO	573-290-5268	Mississippi River	X			
39.6 RDB	Scott County N Water St. Commerce, MO	563-326-8643	Mississippi River	X			

* LDB = Left Descending Bank
RDB = Right Descending Bank

Source: Upper Mississippi River Basin Association, unpublished data prepared for the U.S. Environmental Protection Agency's Region 5 Inland Sensitivity Mapping Project, January 2009, August 2011, and July 2013.

State Hazardous Materials Disposal Requirements

	Non-RCRA Regulated Debris and Soil (See also following pages for additional disposal regulations/options)	**RCRA Hazardous Debris and Soil**	**List of Emergency Response Contractors**
Illinois	- Debris and soil above cleanup objectives are special waste and must go to special waste landfill (permit, manifesting, and licensed waste hauler required) - Clean debris and soil can go to sanitary landfill - Permits expedited through IEPA Emergency Response	- Illinois has one RCRA landfill, several incinerators and other RCRA treatment facilities - Permits expedited through IEPA Emergency Response	- Available verbally from IEPA
Iowa	- Must go to permitted sanitary landfill - IDNR prior approval required	- Iowa does not have a RCRA program - No RCRA disposal facilities in Iowa	- Available from IDNR
Minnesota	- Expedite through MPCA spills and emergency response team	- Expedite through MPCA spills and emergency response team	- Available from MPCA
Missouri	- Go to sanitary landfill - Special waste permits required	- Must go to RCRA facility - Spiller must determine if RCRA hazardous	- Duty officer will assist on request
Wisconsin	- May go to engineered solid waste landfill - On site containment may be considered	- In state treatment or disposal preferred - No RCRA disposal site - RCRA treatment, storage available	- Available from WDNR

State Hazardous Materials Disposal Requirements

(Continued)

	Petroleum Contaminated Water	Land Farming	Pesticides and Fertilizers
Illinois	- NPDES permit required for all direct discharges including storm sewers - Local approval required for discharge to sanitary sewer	- Possible, demonstration permit necessary, significant containment and monitoring required	- Recovered liquids and solids may be applied to agricultural land according to label application rates. Permission needed of IEPA or IL Dept. of Agriculture
Iowa	- Can discharge to storm or sanitary sewer with approval from IDNR and POTW	- Allowed if IDNR criteria followed	- Recovered liquids and solids may be applied to agricultural land at normal rates, with approval by IDNR
Minnesota	- MPCA spills staff may authorize emergency discharges, may require treatment before discharge	- Guidance available for petroleum contaminated soil - Permit needed for more than 10 cubic yards	- Regulated by MN Dept. of Agriculture
Missouri	- Emergency discharge authorization may be granted for decanting, may go to POTW with their approval	- Various remedial technologies considered on a site-specific basis - NPDES permit required - Contact the Water Pollution Control Program at 573-751-1300	- Recovered materials may be used as product in accord with MO Department of Agriculture - Waste disposed as a RCRA or special waste - Contact the Hazardous Waste Program at 573-751-3176
Wisconsin	- WPDES permit probably required - Emergency discharge may be authorized to prevent an emergency condition threatening public health, safety, or welfare	- Guidance available for petroleum contaminated soil	- Recovered materials may be applied to agricultural lands per label instructions. Guidance available from WI Dept. of Agriculture

State Hazardous Materials Disposal Requirements

(Continued)

	Petroleum Contaminated Soils	Open Burning
Illinois	- Generic permits available at some landfills - See debris and soil and land farming discussions	- Allowed with permission for oil production spill residues when weather threatens environmental damage - Considerations are proximity to residences, visibility on roads, and atmospheric dispersion conditions
Iowa	- Excavated soil may be incinerated at an approved incinerator, land-applied at a permitted sanitary landfill, or land-farmed on property with the approval of the owner as long as IDNR criteria are followed	- Generally prohibited - Variance possible through IDNR
Minnesota	- May be incinerated at approved incinerator - May be land-farmed following guidelines and permit rules	MPCA spills and emergency response team authorized to approve oil spill burning after consultation with local officials and DNR approval.
Missouri	- Virgin material spill debris can go to sanitary landfill if not RCRA waste - May be treated by alternate technologies on a site-specific basis - NPDES permits and generic permits available - Debris must not contain any free liquids - Contact the Solid Waste Management Program at 573-751-5401	- Permission of Air Pollution Control Program (573-751-4817) and local fire officials required - Considerations are proximity to populated areas and ozone exclusion zones - Overseen by SOSC
Wisconsin	Guidance available for spills, see RCRA hazardous waste. Land farming, bio piles, and asphalt incorporation are options.	- Generally prohibited - Variance/exemption includes: burning of explosive or dangerous material with no other safe means of disposal, burning at rural or isolated solid waste disposal sites outside the SE Wisconsin Intrastate AQCR which may have a written exemption under s. NR 506, burning of special waste where permits are obtained from WDNR, burning of gaseous or liquid waste in a manner approved by WDNR. Must comply with all local and state fire protection regulations.

IDNR Iowa Department of Natural Resources
IEPA Illinois Environmental Protection Agency
MPCA Minnesota Pollution Control Agency
NPDES National Pollution Discharge Elimination System
POTW Publicly Owned Treatment Works
RCRA Resource Conservation and Recovery Act
WDNR Wisconsin Department of Natural Resources

Oil Spill Liability Trust Fund

The following text is adapted from information found on the United States Coast Guard's National Pollution Funds Center (NPFC) website at www.uscg.mil/npfc/. For more information regarding the Oil Spill Liability Trust Fund (OSLTF), including forms and claims instructions, please go to www.uscg.mil/npfc/ or contact the NPFC at 703-872-6000.

Funding of Oil Spills Under the Oil Spill Liability Trust Fund

The Oil Spill Liability Trust Fund (OSLTF) is a billion-dollar fund established to help pay removal costs and damages resulting from oil spills or substantial threats of oil spills to navigable waters of the United States. *The OSLTF is used only for costs not directly paid by the polluter*, also referred to as the responsible party (RP). Additionally, the fund can be used to pay costs to respond to "mystery spills," for which the source has not been identified.

The OSLTF has two major components:

- The *Emergency Fund* is available for Federal On-Scene Coordinators (FOSCs) to respond to oil discharges and for Federal natural resource trustees to initiate natural resource damage assessments. The Emergency Fund is capitalized by an annual $50 million apportionment from the OSLTF.
- The remaining *Principal Fund* balance is used to pay claims and to fund appropriations by Congress to Federal agencies to administer the provisions of OPA and support research and development.

The United States Coast Guard's National Pollution Funds Center (NPFC), in Arlington, Virginia, manages use of the OSLTF.

Who Can Access the Fund?

Federal On-Scene Coordinators (FOSCs) can obtain immediate access to a funding account and ceiling for incident response through a web application managed by the NPFC.

Other Federal, State, Local, and Indian tribal government agencies assisting the FOSC can get reimbursable funding authority via an FOSC-approved Pollution Removal Funding Authorization (PRFA). NPFC works with the FOSCs and the agencies to put PRFAs in place.

Natural resource trustees (as designated by the President of the United States, state, territorial governor, or Indian tribal governing authority) have several tools for accessing the OSLTF to pay for natural resource assessments and restoration.

Other claimants (individuals, corporations, and government entities) can submit claims for uncompensated removal costs and OPA damages (listed below) caused by the oil spill to the NPFC if the RP does not satisfy their claims. NPFC adjudicates the claims and pays those with merit.

What Can the Fund be Used for?

Federal Removal Costs, which include payment to cleanup contractors (Oil Spill Response Organizations [OSROs]), overtime for government personnel, equipment used in removal operations (generally at established standard rates or lease costs), testing to identify the type and source of oil, disposal of recovered oil and oily debris, and preparation of associated cost documentation.

Other Claims for costs and damages as specified in OPA:

- Uncompensated removal costs,
- Natural resource damages (NRD),
- Real/personal property,
- Loss of profits,
- Loss of subsistence use of natural resources,
- Loss of government revenues,
- Increased costs of government services, and
- Claims from RPs asserting a defense to liability.

Limitations to Accessing the OSLTF

The following conditions must be met in order for OSLTF funds to be used:

- The discharge (or substantial threat of discharge) must be into or on the navigable waters of the United States or adjoining shorelines or the Exclusive Economic Zone (EEZ).
- The discharge (or substantial threat of discharge) must be *oil*, which can include petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil; however, it cannot include any substance which is specifically listed or designated as a hazardous substance under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- In general, the maximum amount available from the OSLTF per incident is $1 billion or the balance in the OSLTF, whichever is less, and:
    - Funding for Federal removal (including response to a substantial threat) and natural resource damage pre-assessment activities is limited to the funds available in the OSLTF Emergency Fund, which receives an apportionment of $50 million on October 1st of each fiscal year (another $100 million can also be advanced from the OSLTF Principal Fund if necessary).
    - Natural resource damage claims are limited to a maximum of $500 million per incident.

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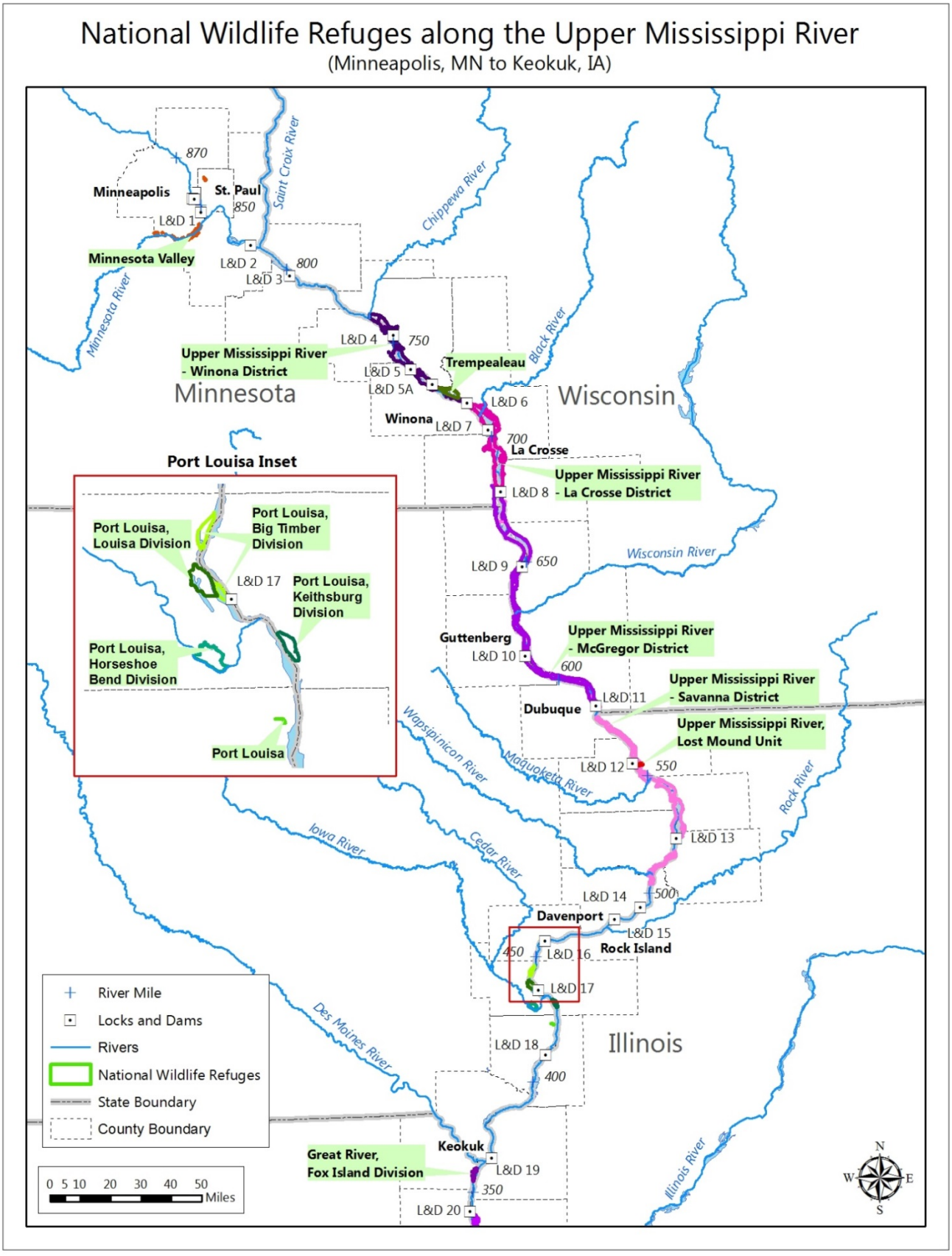
Section C: Sensitive Human and Wildlife Resources

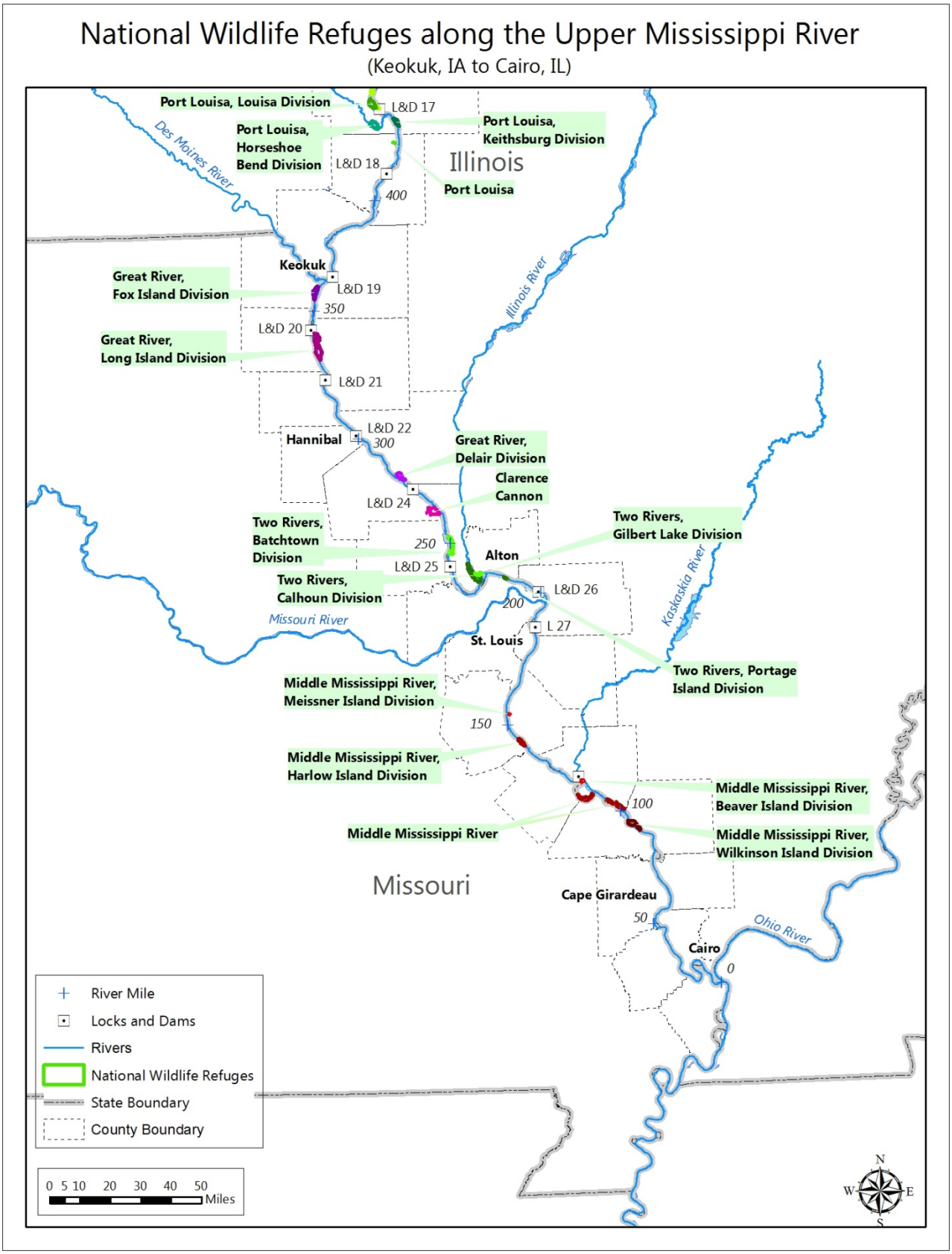
Sensitive/Critical Fish and Wildlife Habitat of the Upper Mississippi River

The Upper Mississippi River and its floodplain constitute a complex, ever-changing ecosystem. An extensive network of river lakes, backwater wetlands, ponds, sloughs and floodplain forest combines with main and side channels to provide valuable habitat for fish and wildlife, including numerous state and federally listed endangered and threatened species. State and federal agencies have long recognized the unique and irreplaceable habitat the Upper Mississippi River and its floodplain provide. Many state-owned Scientific Natural Areas, Preserves, and Wildlife Management Areas are located along the river. Also bordering and encompassing portions of the river are several National Wildlife Refuges (see maps on pages C-11 and C-12). One of these - the Upper Mississippi River National Wildlife and Fish Refuge (UMR NWFR) - consists of some 200,000 acres of aquatic, floodplain, and island habitat. The UMR NWFR's non-contiguous holdings extend from Wabasha, Minnesota to Rock Island, Illinois, a distance of more than 280 miles. The Upper Mississippi Refuge receives approximately 3.5 million visits annually, making it the most frequently visited National Wildlife Refuge in the United States.

Shallow backwater areas, which provide essential habitat for fish, furbearers, waterfowl, shorebirds, and raptors, are generally regarded as the most valuable habitat. However, the relative importance of **all** Upper Mississippi River habitat types varies seasonally or even daily due to the changing life history needs - and resulting distribution patterns - of fish and wildlife species, as well as to the variable nature of the river itself. Waterfowl and shorebirds concentrate by the tens of thousands at numerous locations along the river in spring and fall migrations, during which time they may be particularly vulnerable from a population standpoint to oil or hazardous substances spills. Eagles and other raptors forage extensively along the river year round and may themselves be adversely affected by feeding on prey which have been affected by a spilled substance. The use of deep, shallow, flowing, and calm water habitats by fish species varies with their wintering, spawning, and nursery needs. The concentrating effects of locks and dams and wing dams may put large numbers of fish at risk as spilled materials move downriver. Mussel beds, many consisting of threatened or endangered species, and other aquatic invertebrate populations are particularly vulnerable to spills due to their relative immobility and sensitivity to toxic agents. The most dramatic, readily observable spill effect - i.e., oiling and/or toxicity-related mortality to fish and wildlife - is often short-lived. However, similar, more subtle effects on aquatic invertebrate communities and emergent and submerged aquatic vegetation beds may result in the reduction of an area's habitat value and foodchain productivity for months or years following a spill event.

Both state and federal biologists and conservation officers have responsibilities for fish and wildlife management and conservation throughout the Upper Mississippi River region. Pages C-13 and C-14 list U.S. Fish and Wildlife Service personnel who can assist spill response coordinators in identifying and protecting critical fish and wildlife resources in the event of a spill on the river. Due to the continually changing nature of the Upper Mississippi and its resources, it is imperative that natural resource personnel be notified early in the spill response process in order to provide the best possible assistance.


National Wildlife Refuges along the Upper Mississippi River
(Minneapolis, MN to Keokuk, IA)
Minneapolis
St. Paul
L&D 1
870
850
Saint Croix River
Chippewa River
Minnesota Valley
L&D 2
L&D 3
800
Minnesota River
L&D 4
750
Upper Mississippi River
- Winona District
L&D 5
L&D 5A
Trempealeau
Black River
Minnesota
Wisconsin
L&D 6
Winona
L&D 7
700
La Crosse
Upper Mississippi River
- La Crosse District
L&D 8
Port Louisa Inset
Port Louisa,
Louisa Division
Port Louisa,
Big Timber
Division
L&D 17
Port Louisa,
Keithsburg
Division
Port Louisa,
Horseshoe
Bend Division
Port Louisa
L&D 9
650
Wisconsin River
Guttenberg
L&D 10
Upper Mississippi River
- McGregor District
600
Dubuque
L&D 11
Upper Mississippi River
- Savanna District
Upper Mississippi River,
Lost Mound Unit
L&D 12
550
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
L&D 13
L&D 14
500
Davenport
L&D 15
Rock Island
450
L&D 16
L&D 17
Des Moines River
Illinois
L&D 18
400
Keokuk
Great River,
Fox Island Division
L&D 19
350
L&D 20
Illinois River
River Mile
Locks and Dams
Rivers
National Wildlife Refuges
State Boundary
County Boundary
0 5 10 20 30 40 50
Miles
N
W
E
S


National Wildlife Refuges along the Upper Mississippi River
(Keokuk, IA to Cairo, IL)
Port Louisa, Louisa Division
L&D 17
Port Louisa, Keithsburg Division
Port Louisa, Horseshoe Bend Division
L&D 18
Illinois
Port Louisa
Des Moines River
400
Keokuk
Great River, Fox Island Division
L&D 19
350
L&D 20
Great River, Long Island Division
Illinois River
L&D 21
L&D 22
Hannibal
300
Great River, Delair Division
Clarence Cannon
L&D 24
Two Rivers, Batchtown Division
250
Alton
L&D 25
Two Rivers, Gilbert Lake Division
Two Rivers, Calhoun Division
L&D 26
200
Missouri River
L 27
St. Louis
Kaskaskia River
Two Rivers, Portage Island Division
Middle Mississippi River, Meissner Island Division
150
Middle Mississippi River, Harlow Island Division
Middle Mississippi River, Beaver Island Division
100
Middle Mississippi River
Middle Mississippi River, Wilkinson Island Division
Missouri
Cape Girardeau
50
Ohio River
Cairo
0
River Mile
Locks and Dams
Rivers
National Wildlife Refuges
State Boundary
County Boundary
0 5 10 20 30 40 50
Miles
N
W
E
S

Divisions of the U.S. Fish and Wildlife Service (Service) with natural resource responsibilities along the Upper Mississippi River include Ecological Services, Refuges and Wildlife, Fisheries Assistance, and Law Enforcement. Personnel from each of these divisions are located in a variety of field stations along the river, and are available to assist an On-Scene Coordinator in identifying and protecting fish and wildlife resources during spill response. In the event of a spill in the river, personnel from the following Service field stations have responsibility for the designated river pool(s). (See maps on pp. C-11 and C-12 for pool locations. Pool numbers correspond to the number of the lock and dam at the downstream end of the pool. Locks and dams are identified by numbers on the pp. C-11 and C-12 maps.)

NOTE: During business hours, U.S. Fish and Wildlife field-level contacts may be reached at the office phone numbers listed below. After hours, they may be contacted using home or cell numbers, or through the following 24-hour numbers for the Department of the Interior Regional Environmental Officers: 215-266-5155 for spills in Illinois, Minnesota, and Wisconsin and 303-478-3373 for spills in Iowa and Missouri.

Pools	Primary Contact	Alternate Contact
Pools 1–3	Elissa Buttermore 612-725-3548 x2205 office 919-602-9869 cell Twin Cities Ecological Services Field Office 4101 American Blvd. East Bloomington, MN 55420 612-725-3548	Dave Warburton Twin Cities Ecological Services Field Office 612-725-3548 x2203 office 612-600-6772 cell
Pools 4–6	Mary Stefanski, Winona District Manager 507- 494-6229 office 507-450-4649 cell 507-864-3758 home Upper Mississippi River National Wildlife and Fish Refuge Winona District 51 East 4th Street, Room 203 Winona, MN 55987 507-454-7351	Curt McMurl, Winona District Assistant Manager Upper Mississippi River National Wildlife and Fish Refuge 507-494-6213 office 507-450-1253 cell 618-946-0395 home
Pools 7–8 AND Trempealeau National Wildlife Refuge	Jim Nissen, La Crosse District Manager 608-779-2385 office 608-780-7301 cell 507-895-8510 home Upper Mississippi River National Wildlife and Fish Refuge La Crosse District N5727 County Road Z Onalaska, WI 54650 608-779-2399	Kendra Niemec, La Crosse District Assistant Manager Upper Mississippi River National Wildlife and Fish Refuge 608-779-2386 office 239-560-4866 cell 239-560-4866 home
Pools 9–11	Rich King, McGregor District Manager 563-873-3423 ext 12 office 608-387-2083 cell Upper Mississippi River National Wildlife and Fish Refuge McGregor District 401 Business Hwy 18N McGregor, IA 52157 563-873-3423	Vacant, McGregor District Assistant Manager Upper Mississippi River National Wildlife and Fish Refuge 563-873-3423 office

Pools	Primary Contact	Alternate Contact
Pools 12–14	Ed Britton, Savanna District Manager 815-273-2732 office 815-541-4598 cell Upper Mississippi River National Wildlife and Fish Refuge Savanna District 7071 Riverview Road Thomson, IL 61285 815-273-2732	Russ Engelke, Savanna District Assistant Manager Upper Mississippi River National Wildlife and Fish Refuge 815-273-2732 office 815-541-1385 cell
Pools 15–16	Vacant Rock Island Ecological Services Field Office 1511 47th Avenue Moline, IL 61265 Phone: 309-757-5800	Vacant Rock Island Ecological Services Field Office 309-757-5800
Pools 17–19	Cathy Henry, Refuge Manager 319-523-6982 office 309-791-1619 cell 319-729-2059 home Port Louisa National Wildlife Refuge 10728 County Road X61 Wapello, IA 52653 319-523-6982	Ron Knopik, Assistant Refuge Manager Port Louisa National Wildlife Refuge 319-523-6982 office 309-791-2863 cell 563-519-2132 home
Pools 20–25	Jason Wilson, Refuge Manager 573-847-2333 office 573-754-2576 cell 573-560-2109 home Great River and Clarence Cannon National Wildlife Refuges 37599 County Road 206 Annada, MO 63330 573-847-2333	Candace Chambers, Assistant Refuge Manager Great River and Clarence Cannon National Wildlife Refuges 573-847-2333 office 573-754-2431 cell 573-754-6636 home
Pools 25–27	John Mabery, Refuge Manager 618-883-2524 office 217-602-1748 cell 618-498-7009 home Two Rivers National Wildlife Refuge HC 82, Box 107 Brussels, IL 62013 618-883-2524	Jason Wilson, Refuge Manager Great River and Clarence Cannon National Wildlife Refuges 573-847-2333 office 573-754-2576 cell 573-560-2109 home
Open River to Cairo, IL	Jason Wilson, Refuge Manager 573-847-2333 office 573-754-2576 cell 573-560-2109 home Great River and Clarence Cannon National Wildlife Refuges 37599 County Road 206 Annada, MO 63330 573-847-2333	Candace Chambers, Assistant Refuge Manager Great River and Clarence Cannon National Wildlife Refuges 573-847-2333 office 573-754-2431 cell 573-754-6636 home

RESOURCE MANUAL

Section D: Potential Sources of Spills and Related Resources

Commodities Transported by Barge on the Upper Mississippi River (Calendar Year 2013)

Lock	Coal	Petroleum	Chemicals	Crude Materials	Primary Manufactured Goods	Farm Products	Manufacturing Equipment	Waste Material	Other
Upper St. Anthony	●		●	●	●		●		
Lower St. Anthony	●		●	●	●		●		
L&D 1	●		●	●	●		●		
L&D 2	●	●	●	●	●	●	●	●	
L&D 3	●	●	●	●	●	●	●	●	
L&D 4	●	●	●	●	●	●	●	●	●
L&D 5	●	●	●	●	●	●	●	●	●
L&D 5A	●	●	●	●	●	●	●	●	●
L&D 6	●	●	●	●	●	●	●	●	●
L&D 7	●	●	●	●	●	●	●	●	●
L&D 8	●	●	●	●	●	●	●	●	●
L&D9	●	●	●	●	●	●	●	●	●
L&D 10	●	●	●	●	●	●	●	●	●
L&D 11	●	●	●	●	●	●	●	●	●
L&D 12	●	●	●	●	●	●	●	●	●
L&D 13	●	●	●	●	●	●	●	●	●
L&D 14	●	●	●	●	●	●	●	●	●
L&D 15	●	●	●	●	●	●	●	●	●
L&D 16	●	●	●	●	●	●	●	●	●
L&D 17	●	●	●	●	●	●	●	●	●
L&D 18	●	●	●	●	●	●	●	●	●

Commodities Transported by Barge on the Upper Mississippi River (Calendar Year 2013)
(Continued)

Lock	Coal	Petroleum	Chemicals	Crude Materials	Primary Manufactured Goods	Farm Products	Manufacturing Equipment	Waste Material	Other
L&D 19									
L&D 20									
L&D 21									
L&D 22									
L&D 24									
L&D 25									
L&D 26/ Melvin Price									
L&D 27									

Tonnage Key							
<100,000	<500,000	<1,000,000	<5,000,000	<10,000,000	<15,000,000	<20,000,000	<25,000,000
							

Source:

U.S. Army Corps of Engineers. 2012 LPMS Summary of Lock Statistics by River Basin. Navigation Data Center. Online. Available. <http://www.navigationdatacenter.us/lpms/lpms.htm>

Upper Mississippi River Shipping Companies

Name	Phone #	Address	Web	River Mile
American Boat Company	618-337-8877	189 American Grain St. Cahokia, IL 662206	www.americanmillingco.com	176-177 LDB
Brennan Marine, Inc.	608-782-3670	P.O. Box 2557 820 Bainbridge St. LaCrosse, WI 54603	www.brennanmarineinc.com	698-699 (French Island)
Canton Marine Towing Co., Inc.	573-288-4486	1506 Wyaconda Ave. Canton, MO 63435	N/A	340-341 RDB (not on river)
Cargo Carriers, A Business of Cargill, Inc.	952-742-6763 952-221-6265 (after hours)	P.O. Box 5608 Minneapolis, MN 55440-5608	www.ccibarge.com	853-854 RDB (not on river)
Ceres Consulting, LLC.	618-271-7903	3808 Cookson Road East St. Louis, IL 62201	www.ceresbarge.com	181-182 LDB (not on river)
Columbia Marine Service	618-281-2992	2 Davis St Ferry Rd. East Carondelet, IL 62240	N/A	171 LD
Eagle Marine Industries, Inc.; Eagle Marine Transport, LLC	618-875-1153	1 Riverview Ave. Sauget, IL 62201	N/A	176-177 LDB
Gateway Dredging & Contracting, LLC	636-665-5180	1777 Hwy 79 S. Old Monroe, MO 63369	www.gdcstl.com	237-238 RDB (not on river)
Hall Towing, Inc.	319-372-3078	1618 20th St. Fort Madison, IA 52627	www.halltowing.com	382 RDB
Heartland Barge Management, LLC.	618-281-4515	252 Southwoods Center Columbia, IL 62236	www.heartlandbarge.com	165-166 LDB (not on river)
Humboldt Boat Service	314-381-9969	300 Humboldt Ave. St. Louis, MO 63147	www.humboldtboat.com	185-186 RDB
Luhr Bros., Inc.	618-281-4106	P.O. Box 50 250 Sand Bank Road Columbia, IL 62236	www.luhr.com	166-167 LDB (not on river)
Material Sales Co., Inc.	314-436-1541	920 S 2nd St. St. Louis, MO 63102	N/A	177-178 RDB
Norman Bros., Inc.	618-465-6455	322 State St. Alton, IL 62002	N/A	203-204 LDB
Osage Marine Services, Inc.	314-421-3575	750 E. Davis St. St. Louis, MO 63111	N/A	172-173 RDB
SCF Lewis & Clark Fleeting, LLC.	618-876-1116	2801 Rock Rd. Granite City, IL 62040	www.lewisandclarkmarine.com	185-186 (on canal)
SCF Marine Inc., A Seacor Holdings Inc., Co.	314-436-7556	717 N 1st St., Suite 600 St. Louis, MO 63102	www.seacorholdings.com	179 RDB
SCF Liquids	314-827-3369	727 N 1st St., Suite 600 St. Louis, MO 63102	www.seacorholdings.com	180 RDB
Southern Illinois Transfer, Inc.	618-826-2015	1038 State St. Chester, IL 62233	www.sitransfer.com	109-110 LDB (not on river)

Source:

The Waterways Journal "Inland River Guide," St. Louis, MO, 2013

Facilities Discharging to the Upper Mississippi River

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
857	RDB	Xcel Energy Riverside Generating Plant	Minneapolis, MN	Nuclear Energy Plant	Direct Discharge to Miss.	MN0000892	Major	800-895-4999
856.5	RDB	GAF Materials	Minneapolis, MN	Roofing Manufacturer	Direct Discharge to Miss.	MN0002119	Non-Major	612-529-9121
856.2	RDB	Northern Metals, LLC	Minneapolis, MN	Recycling Center	Direct Discharge to Miss.	MN0063380	Non-Major	612-529-9221
855	RDB	Centerpoint Energy	Minneapolis, MN	Natural Gas Distribution	Direct Discharge to Miss.	MN0063126	Non-Major	612-372-4727
854.1	RDB	Northern Natural Gas Company	Minneapolis, MN	Pipeline Company	Direct Discharge to Miss.	MN0050041	Non-Major	952-887-1709
847.7	LDB	St. Paul CSO Public Works	St. Paul, MN	Water, Sewer	Direct Discharge to Miss.	MN0025470	Non-Major	651-266-9700
841.3	LDB	Nexeo Solutions, LLC	St. Paul, MN	Chemical Products Supplier	Lagoon to Miss.	MN0053988	Non-Major	651-227-3440
840.2	LDB	Xcel Energy High Bridge Generating Plant	St. Paul, MN	Nuclear Energy Plant	Direct Discharge to Miss.	MN0000884	Major	800-895-4999
839.6	LDB	St. Paul Municipal Storm Water	St. Paul, MN	Stormwater Mgmt.	Direct Discharge to Miss.	MN0061263	Major	651-266-6234
838.4	RDB	St. Paul Pioneer Press and Dispatch	St. Paul, MN	Newspaper Printing	Direct Discharge to Miss.	MN0054577	Non-Major	651-222-1111
836.4	LDB	Flint Hills Resources - Pine Bend	St. Paul, MN	Pipeline Company	Direct Discharge to Miss.	MN0064696	Non-Major	651-438-1331
836	LDB	Metropolitan Wastewater Treatment Plant	St. Paul, MN	WWTP	Direct Discharge to Miss.	MN0029815	Major	651-602-1269
832.2	LDB	Newport Terminal Corp.	Newport, MN	Petroleum Bulk Terminal	Direct Discharge to Miss.	MN0058637	Non-Major	651-459-5588
829.9	LDB	St. Paul Park Refining Co., LLC	St. Paul Park, MN	Petroleum Bulk Terminal	Lagoon to Miss.	MN0000256	Non-Major	651-459-9771
823.7	RDB	CF Industries, Pine Bend Terminal	Rosemount, MN	Bulk Terminal	Discharge to Spring Lake	MN0069418	Non-Major	651-437-6191
818.7	LDB	Cottage Grove WWTP	Cottage Grove, MN	WWTP	Direct Discharge to Miss.	MN0029904	Major	651-602-1269
818.1	LDB	3M Cottage Grove Center	Cottage Grove, MN	Chemical Products Supplier	Direct Discharge to Miss.	MN0001449	Major	651-458-2153
813.7	RDB	Metropolitan Council - Hastings WWTP	Hastings, MN	WWTP	Direct Discharge to Miss.	MN0029955	Major	651-602-1000
810.8	LDB	Prescott WWTP	Prescott, WI	WWTP	Direct Discharge to Miss.	WI0022403	Non-Major	715-262-5544

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
800	RDB	Prairie Island	Welch, MN	WWTP	Discharge to Sturgeon Lake	MN0061336	Non-Major	651-385-2554
798	RDB	Xcel Energy - Prairie Island	Welch, MN	Nuclear Energy Plant	Lagoon to Miss.	MN0004006	Major	800-895-4999
790.2	RDB	Red Wing WWTP	Red Wing, MN	WWTP	Direct Discharge to Miss.	MN0024571	Major	651-385-3600
789.5	RDB	Xcel Energy - Red Wing Generating Plant	Red Wing, MN	Nuclear Energy Plant	Direct Discharge to Miss.	MN0000850	Non-Major	800-895-4999
780.1	RDB	Maiden Rock WWTP	Maiden Rock, WI	WWTP	Direct Discharge to Miss.	WI0032361	Non-Major	715-448-2608
773	RDB	Federal Mogul Powertrain Systems	Lake City, MN	Motor Vehicle Parts and Accessories	Direct Discharge to Miss.	MN0001147	Non-Major	248-354-7700
772	RDB	Lake City WWTP	Lake City, MN	WWTP	Piped to Miss.	MN0024571	Major	651-345-3711
766.7	LDB	Pepin WWTP	Pepin, WI	WWTP	Direct Discharge to Miss.	WI0022811	Non-Major	715-442-2461
751.8	LDB	Alma WWTP	Alma, WI	WWTP	Direct Discharge to Miss.	WI0022101	Non-Major	989-463-6506
751.5	LDB	Dairyland Power Coop Power Plant	Alma, WI	Nuclear Energy Plant	Direct Discharge to Miss.	WI0040223	Major	608-788-4000
732.5	RDB	Minnesota City WWTP	Minnesota City, MN	WWTP	Direct Discharge to Miss.	MN0069817	Non-Major	
732.1	LDB	Fountain City WWTP	Fountain City, WI	WWTP	Direct Discharge to Miss.	WI0024040	Non-Major	608-687-7481
726.2	RDB	Cytec Engineered Materials Inc.	Winona, MN	Chemical Technologies	Direct Discharge to Miss.	MN0003441	Non-Major	973-357-3100
724.7	RDB	RTP Co.	Winona, MN	Engineered Thermoplastic Compounds	Direct Discharge to Miss.	MN0053350	Non-Major	507-454-6900
723.6	RDB	Peerless Chain Co.	Winona, MN	Chain Manufacturing Plant	Direct Discharge to Miss.	MN0001325	Non-Major	800-873-1916
723	RDB	City of Winona Main WWTP	Winona, MN	Municipal WWTP	Wetlands to Miss.	MN0030147	Major	507-457-8207
714	LDB	Trempealeau WWTP	Trempealeau, WI	Municipal WWTP	Lagoon to Miss.	WI0020966	Non-Major	608-534-6434
704	LDB	Metallics, Inc.	Onalaska, MN	Metal Coating Plant	Direct Discharge to Miss.	WI0054500	Non-Major	608-781-5200
700.5	RDB	La Crescent WWTP	La Crescent, MN	Municipal WWTP	Direct Discharge to Miss.	MN0020621	Non-Major	507-895-2595
699.5	LDB	French Island Plant	La Crosse, WI	Electric Power Generation	Lagoon to Miss.	WI0070785	Non-Major	800-895-4999
696.9	LDB	La Crosse WWTP	La Crosse, WI	Municipal WWTP	Direct Discharge to Miss.	WI0029581	Major	608-789-7330

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
688.5	RDB	Brownsville WWTP	Brownsville, MN	Municipal WWTP	Direct Discharge to Miss.	MN0053562	Non-Major	507- 482- 6732
685.5	LDB	Stoddard WWTP	Stoddard, WI	Municipal WWTP	Direct Discharge to Miss.	WI0028304	Non-Major	608-457-2136
679.6	LDB	Genoa WWTP	Genoa, WI	Municipal WWTP	Direct Discharge to Miss.	WI0022284	Non-Major	262-279-6472
667.5	LDB	Desoto WWTP	De Soto, WI	Municipal WWTP	Direct Discharge to Miss.	WI0029793	Non-Major	608-648-2111
662.2	RDB	City of Lansing WWTP	Lansing, IA	Municipal WWTP	Direct Discharge to Miss.	IA0024597	Non-Major	563-538-4757
660	RDB	Lansing Power Station	Lansing, IA	Electric Power Generation	Lagoon to Miss.	IA0003735	Major	800-255-4268
657.7	RDB	Ferryville WWTP	Ferryville, WI	Municipal WWTP	Direct Discharge to Miss.	IA0020974	Non-Major	608-734-3624
650.6	LDB	Valley Ridge Clean Water Commission WWTP	Lynxville, WI	Municipal WWTP	Direct Discharge to Miss.	WI0036854	Non-Major	608-874-4698
646	RDB	Harpers Ferry STP	Harpers Ferry, IA	Municipal WWTP	Direct Discharge to Miss.	IA0070564	Non-Major	
641	RDB	Luster Heights Camp	Harpers Ferry, IA	Correctional Facility	Direct Discharge to Miss.	IA0065986	Non-Major	563-586-2115
634.9	RDB	Marquette WWTP	Marquette, IA	Municipal WWTP	Tributary To Miss.	IA0059463	Non-Major	563-873-3735
633.4	LDB	Prairie du Chien WWTP	Prairie du Chien, WI	Municipal WWTP	Direct Discharge to Miss.	WI0020257	Major	608-326-8534
632.9	RDB	City of McGregor WWTP	McGregor, IA	Municipal WWTP	Direct Discharge to Miss.	IA0028614	Non-Major	563-873-3795
631.6	RDB	DNR Pikes Peak State Park WWTP	McGregor, IA	Municipal WWTP	Tributary To Miss.	IA0075400	Non-Major	563-873-2341
622.6	LDB	Bagley WWTP	Bagley, WI	Municipal WWTP	Direct Discharge to Miss.	WI0060771	Non-Major	608-996-2769
619.9	RDB	Pattison Sand Co., LLC.	Clayton, IA	Industrial Sand Production		IA0080624	Non-Major	563-964-2861
614.5	RDB	City of Guttenberg WWTP	Guttenberg, IA	Municipal WWTP	Direct Discharge to Miss.	IA0022284	Non-Major	563-252-1161
607.8	LDB	WPL Nelson Dewey Generating Station	Cassville, WI	Coal Powered Electricity Generation	Direct Discharge to Miss.	WI0002381	Non-Major	800-255-4268
606.1	LDB	DTE Stoneman Generating Station	Cassville, WI	Coal Powered Electricity Generation	Direct Discharge to Miss.	WI0002020	Non-Major	608-725-5141
605.9	LDB	Cassville WWTP	Cassville, WI	Municipal WWTP	Tributary To Miss.	WI0021423	Non-Major	608-725-5180
599.2	LDB	City of Balltown - North WWTP	Balltown, IA	Municipal WWTP	Tributary To Miss.	IA0076911	Non-Major	

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
599.2	LDB	City of Balltown - South WWTP	Balltown, IA	Municipal WWTP	Tributary To Miss.	IA0076929	Non-Major	
592.1	LDB	Potosi-Tennyson Sewage Commission WWTP	Potosi, WI	Municipal WWTP	Wetlands to Miss.	WI0021547	Non-Major	608-763-2830
588	LDB	Dickeyville WWTP	Dickeyville, WI	Municipal WWTP	Tributary To Miss.	WI0023817	Non-Major	608-568-3151
585.2	RDB	John Deere Public Works	Dubuque, IA	Farm Equipment Manufacturing Plant	Lagoon to Miss.	IA0000051	Major	563-589-5151
581.8	RDB	Systems Bio Industries Inc.	Dubuque, IA	Food Preparation	Direct Discharge to Miss.	IA0002984	Non-Major	563-588-6244
581.4	RDB	Dubuque Greyhound Park and Casino	Dubuque, IA	Casino	Direct Discharge to Miss.	IA0080223	Non-Major	563-582-3647
580.2	RDB	Dubuque Power Plant	Dubuque, IA	Coal Powered Electricity Generation	Direct Discharge to Miss.	IA0001761	Non-Major	800-255-4268
580	RDB	Grand River Center	Dubuque, IA	Convention Center	Direct Discharge to Miss.	IA0077399	Non-Major	563-690-4500
579.4	LDB	East Dubuque WWTP	East Dubuque, IL	Municipal WWTP	Direct Discharge to Miss.	IL0025186	Non-Major	563-213-1058
578	RDB	Dubuque WWTP	Dubuque, IA	Municipal WWTP	Direct Discharge to Miss.	IA0044458	Major	563-589-4176
576	LDB	RH Stewart Properties	East Dubuque, IL	Real Estate Leasing	Lagoon to Miss.	IL0078204	Non-Major	815-747-3258
560.8	LDB	Chestnut Mountain Resort	Galena, IL	Recreational Resort	Direct Discharge to Miss.	IL0048879	Non-Major	815-777-1320
556	RDB	City of Bellvue WWTP	Bellevue, IA	Municipal WWTP	Direct Discharge to Miss.	IL0029009	Non-Major	563-872-4329
554	RDB	DNR Bellevue State Park	Bellevue, IA	Park WWTP	Direct Discharge to Miss.	IA0066010	Non-Major	563-872-4019
549.5	LDB	Savanna Army Depot Activity	Savanna, IL	Ammunition Supplies	Discharge to Buffalo Lake	IL0027049	Non-Major	815-273-8312
539.9	LDB	Mississippi Palisades State Park	Savanna, IL	Park WWTP	Discharge to Buffalo Lake	IL0053937	Non-Major	815-273-2731
536.8	LDB	City of Savanna WWTP	Savanna, IL	Municipal WWTP	Discharge to Savanna Slough	IL0020541	Non-Major	815-273-2251
534.6	RDB	City of Sabula WWTP	Sabula, IA	Municipal WWTP	Direct Discharge to Miss.	IA0032867	Non-Major	563-687-2420
527.6	LDB	Thomson Municipal WWTP	Thomson, IL	Municipal WWTP	Direct Discharge to Miss.	IL0073890	Non-Major	815-259-3700
520	RDB	Clinton WWTP	Clinton, IA	Municipal WWTP	Direct Discharge to Miss.	IA0035947	Major	563-242-2144
519.5	LDB	City of Fulton WWTP	Fulton, IL	Municipal WWTP	Direct Discharge to Miss.	IL0028860	Non-Major	815-589-2616

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
517.3	RDB	ADM Polymer	Clinton, IA	Plastic Materials and Resins	Discharge to Beaver Slough	IA0082279	Non-Major	563-242-1121
517.3	RDB	ADM Clinton Cogeneration Plant	Clinton, IA	Coal Powered Electricity Generation	Discharge to Beaver Slough	IA0080543	Non-Major	563-242-1121
514.5	RDB	ADM Corn Processing	Clinton, IA	Wet Corn Milling	Discharge to Beaver Slough	IA0003620	Non-Major	563-242-1121
514.2	LDB	Village of Albany SD WWTP	Albany, IL	Municipal WWTP	Direct Discharge to Miss.	IL0023302	Non-Major	309-887-4064
514.2	RDB	Sethness Products Co.	Clinton, IA	Cane Sugar Refining	Discharge to Beaver Slough	IA0000183	Non-Major	888-772-1880
514	RDB	Darling International Inc.	Clinton, IA	Animal and Marine Fats Oils	Discharge to Beaver Slough	IA0000914	Non-Major	563-242-9200
513.3	RDB	M L Kapp Generating Station	Clinton, IA	Electric Power Generation	Discharge to Beaver Slough	IA0001759	Non-Major	800-255-4268
512.8	RDB	Vertex Chemical Corp.	Clinton, IA	Industrial Inorganic Chemicals	Discharge to Beaver Slough	IA0068101	Non-Major	563-243-2000
510.5	RDB	City of Camanche WWTP	Camanche, IA	Municipal WWTP	Direct Discharge to Miss.	IA0021261	Non-Major	563-259-9410
510.1	RDB	ACC Chemical Co. and Getty Chemical Co.	Camanche, IA	Chemical Products Supplier	Direct Discharge to Miss.	IA0073407	Non-Major	
509.4	LDB	3M Cordova	Cordova, IL	Plastic Materials and Resins	Direct Discharge to Miss.	IL0003140	Major	309-654-2291
506.5	LDB	Quad Cities Nuclear Power Plant	Cordova, IL	Nuclear Energy Plant	Direct Discharge to Miss.	IL0005037	Major	800-483-3220
502.8	RDB	City of Princeton WWTP	Princeton, IA	Municipal WWTP	Direct Discharge to Miss.	IA0033227	Non-Major	563-289-5315
502	LDB	Cordova WWTP	Cordova, IL	Municipal WWTP	Lagoon to Miss.	IL0025356	Non-Major	309-654-2620
499	LDB	Village of Port Byron WWTP	Port Byron, IL	Municipal WWTP	Lagoon to Miss.	IL0023507	Non-Major	309-314-2140
497.2	RDB	City of LeClaire MS4	LeClaire, IA	Stormwater System	Direct Discharge to Miss.	IA0078824	Non-Major	563-289-4242
495.4	RDB	City of LeClaire WWTP	LeClaire, IA	Municipal WWTP	Direct Discharge to Miss.	IA0022012	Non-Major	563-289-4242
491.2	RDB	Americold - Bettendorf Plant #80562	Bettendorf, IA	Refrigerated Warehouse and Storage	Direct Discharge to Miss.	IA0073695	Non-Major	563-332-4300
490.3	RDB	City of Panorama Park MS4	Pleasant Valley, IA	Stormwater System	Direct Discharge to Miss.	IA0078948	Non-Major	563-343-5207
490.2	LDB	East Moline WWTP	East Moline, IL	Municipal WWTP	Discharge to Sugar Creek	IL0028550	Major	309-752-1580
489.7	RDB	MidAmerican Energy - Riverside Generating Station	Bettendorf, IA	Coal Powered Electricity Generation	Direct Discharge to Miss.	IA0003611	Major	888-427-5632

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
489.6	LDB	East Moline WTP	East Moline, IL	Municipal WTP	Direct Discharge to Miss.	IL0037745	Non-Major	309-752-1580
488.7	RDB	Alcoa, Inc.	Bettendorf, IA	Metals Engineering and Manufacturing	Direct Discharge to Miss.	IA0003395	Major	563-459-2000
487.1	RDB	Amoco Oil - Bettendorf Terminal	Bettendorf, IA	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	IA0001198	Non-Major	563-355-8876
484.8	LDB	John Deere Seeding and Cylinder	Moline, IL	Farm Equipment Manufacturing Plant	Direct Discharge to Miss.	IL0003000	Non-Major	309-765-7310
484.4	LDB	North Slope WWTP	Moline, IL	Municipal WWTP	Discharge to Sylvan Slough	IL0029947	Major	309-524-2000
480	RDB	City of Davenport WWTP	Davenport, IA	Municipal WWTP	Direct Discharge to Miss.	IA0076261	Non-Major	563-326-7877
476	RDB	Blackhawk Fleet, LLC	Davenport, IA	Water Transportation Systems	Direct Discharge to Miss.	IA0075604	Non-Major	563-381-8753
475.5	RDB	TexPar Energy, LLC	Davenport, IA	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	IA0001180	Non-Major	608-779-6580
475.4	RDB	Flint Hills Resources - Pine Bend	Davenport, IA	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	IA0082490	Non-Major	563-324-3766
474.6	RDB	Lafarge North America	Davenport, IA	Cement Quarry	Direct Discharge to Miss.	IA0063525	Non-Major	563-323-2751
473.8	RDB	City of Buffalo WWTP	Buffalo, IA	Municipal WWTP	Direct Discharge to Miss.	IA0020080	Non-Major	563-381-2226
473.7	LDB	City of Andalusia WWTP	Andalusia, IL	Municipal WWTP	Lagoon to Miss.	IL0021202	Non-Major	309-798-2215
473.1	RDB	City of Buffalo MS4	Buffalo, IA	Stormwater System	Direct Discharge to Miss.	IA0078760	Non-Major	563-381-2226
471.9	RDB	Camp Abe Lincoln	Blue Grass, IA	RV Parks and Campsites	Direct Discharge to Miss.	IA0067059	Non-Major	563-381-3053
468.6	RDB	Village of Montpelier SD	Montpelier, IA	Municipal WWTP	Direct Discharge to Miss.	IA0073890	Non-Major	
467.5	RDB	CIPCO - Fair Station	Muscatine, IA	Coal Powered Electricity Generation	Lagoon to Miss.	IA0001562	Non-Major	319-366-8011
465.5	RDB	Riverview Subdivision Package Plant	Muscatine, IA	Municipal WWTP	Direct Discharge to Miss.	IA0077453	Non-Major	
453.7	RDB	Grain Processing Corp.	Muscatine, IA	Grain Milling	Lagoon to Miss.	IA0003441	Non-Major	563-264-4265
453	RDB	Muscatine Water and Power Generation	Muscatine, IA	Coal Powered Electricity Generation	Lagoon to Miss.	IA0001082	Major	563-263-2631

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
452.4	RDB	Natural Gas Pipeline Company of America	Rock Island, IL	Natural Gas Transmission	Direct Discharge to Miss.	IL0079120	Non-Major	713-369-9000
449.9	RDB	Monsanto Co.	Muscatine, IA	Pesticides and Agricultural Chemicals	Direct Discharge to Miss.	IA0000205	Major	563-263-0093
447.7	RDB	MidAmerican Energy - Louisa Generating Station	Muscatine, IA	Coal Powered Electricity Generation	Lagoon to Miss.	IA0063282	Major	888-427-5632
432.2	LDB	New Boston WWTP	New Boston, IL	Municipal WWTP	Direct Discharge to Miss.	IL0074926	Non-Major	309-587-8181
414.7	LDB	City of Galesburg WTP	Oquawka, IL	Municipal WTP	Discharge to Prairie Slough	IL0078638	Non-Major	309-345-3649
403.5	RDB	Matteson Marine Service, Inc.	Burlington, IA	Freight Shipping	Direct Discharge to Miss.	IA0075035	Non-Major	319-754-5318
403.4	RDB	City of Burlington WWTP	Burlington, IA	Municipal WWTP	Direct Discharge to Miss.	IA0043079	Major	319-753-8157
399	RDB	Burlington Generating Station	Burlington, IA	Electric Power Generation	Direct Discharge to Miss.	IA0001783	Major	800-255-4268
390	LDB	Dallas City WWTP	Dallas City, IL	Municipal WWTP	Direct Discharge to Miss.	IL0028312	Non-Major	217-852-3575
383.7	RDB	City of Fort Madison WWTP	Fort Madison, IA	Municipal WWTP	Direct Discharge to Miss.	IA0027219	Major	319-372-5421
382	RDB	The Kensington	Fort Madison, IA	Residential Care	Direct Discharge to Miss.	IA0077143	Non-Major	319-372-4233
379	RDB	Chevron Chemical Plant	Fort Madison, IA	Nitrogenous Fertilizer Manufacturing	Direct Discharge to Miss.	IA0003387	Non-Major	319-372-6012
375.8	LDB	Nauvoo WWTP	Nauvoo, IL	Municipal WWTP	Direct Discharge to Miss.	IL0062391	Non-Major	217-453-2587
375.7	RDB	City of Fort Madison WWTP	Fort Madison, IA	Municipal WWTP	Direct Discharge to Miss.	IA0081001	Non-Major	319-372-5421
375	RDB	City of Montrose WWTP	Montrose, IA	Municipal WWTP	Direct Discharge to Miss.	IA0030848	Non-Major	319-463-5533
375	LDB	Nauvoo WWTP	Nauvoo, IL	Municipal WWTP	Direct Discharge to Miss.	IL0023531	Non-Major	217-453-2587
373.1	LDB	Nauvoo Colusa High School	Nauvoo, IL	Elementary and Secondary Schools	Direct Discharge to Miss.	IL0060453	Non-Major	217-453-2231
370.7	RDB	Hendricks River Logistics, LLC	Keokuk, IA	Marine Cargo Handling	Lagoon to Miss.	IA0063045	Non-Major	319-524-6841
369	RDB	Sandusky Mobile Home Village	Keokuk, IA	Package Plant	Direct Discharge to Miss.	IA0065391	Non-Major	319-524-5355

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
368.9	LDB	Camp Eastman	Hamilton, IL	Recreation and Sports Camp	Direct Discharge to Miss.	IL0043117	Non-Major	217-847-2770
364.2	LDB	City of Hamilton WWTP	Hamilton, IL	Sewage System	Direct Discharge to Miss.	IL0024911	Non-Major	217-847-2936
364.2	LDB	City of Hamilton WWTP	Hamilton, IL	Municipal WWTP	Direct Discharge to Miss.	IL0047651	Non-Major	217-847-2936
364.2	RDB	Ameren UE Keokuk Plant	Keokuk, IA	Electric Power Generation	Lagoon to Miss.	IA0033600	Non-Major	800-552-7583
363.7	RDB	City of Keokuk WWTP	Keokuk, IA	Municipal WWTP	Direct Discharge to Miss.	IA0042609	Major	319-524-2113
363	RDB	Roquette America Inc.	Keokuk, IA	Wet Corn Milling	Direct Discharge to Miss.	IA0000256	Major	319-524-5757
341.4	RDB	City of Canton WWTF	Canton, MO	Municipal WWTP	Lagoon to Miss.	MO0056278	Non-Major	573-288-4413
338.8	RDB	River Valley Country Club	Canton, MO	Membership Sports and Recreation Club	Direct Discharge to Miss.	MO0087513	Non-Major	573-288-3083
335.8	RDB	Lagrange WWTP	La Grange, MO	Municipal WWTP	Direct Discharge to Miss.	MO0041203	Non-Major	
330	LDB	Harris Corp. Broadcast Products	Quincy, IL	Printing Equipment Manufacturing	Direct Discharge to Miss.	IL0061387	Non-Major	618-624-5835
326.1	RDB	BNSF West Quincy Yard	West Quincy, MO	Railroad Yard	Direct Discharge to Miss.	MO0124770	Non-Major	800-795-2673
325.6	LDB	ADM Quincy	Quincy, IL	Soybean Processing	Lagoon to Miss.	IL0003590	Non-Major	217-221-0319
325	LDB	City of Quincy WWTP	Quincy, IL	Municipal WWTP	Lagoon to Miss.	IL0030503	Major	217-228-4580
320.2	RDB	CF Industries, Inc. - Palmyra Terminal	Palmyra, MO	Fertilizers - Mixing Only	Direct Discharge to Miss.	MO0001821	Non-Major	573-769-2181
319.6	RDB	BASF Hannibal Plant	Hannibal, MO	Pesticides and Agricultural Chemicals	Direct Discharge to Miss.	MO0001716	Major	573-769-2011
308.8	RDB	Hannibal WWTP	Hannibal, MO	Municipal WWTP	Bear Creek to Miss.	MO0085391	Non-Major	573-221-0111
305.6	RDB	Continental Cement Co., LLC	Hannibal, MO	Cement Manufacturing	Direct Discharge to Miss.	MO0111686	Non-Major	573-221-1740
283.5	RDB	Calumet Missouri, LLC	Louisiana, MO	Synthetic Lubricants		MO0137243	Non-Major	573-754-6211
282.7	RDB	Louisiana Board of Public Works	Louisiana, MO	City WTP	Tributary To Miss.	MO0001597	Non-Major	573-754-6912
282.4	RDB	Louisiana WWTP	Louisiana, MO	Municipal WWTP	Tributary To Miss.	MO0023124	Non-Major	573-754-6912
281.8	RDB	Wayne B. Smith, Inc.	Louisiana, MO	Construction Sand and Limestone Mining	Direct Discharge to Miss.	MO0127132	Non-Major	573-754-5361

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
281	RDB	Dyno Nobel, Inc. - Nitrogen Division	Louisiana, MO	Nitrogenous Fertilizer Manufacturing	Direct Discharge to Miss.	MO0105783	Major	573-754-4501
280.9	RDB	Missouri Chemical Works	Louisiana, MO	Industrial Organic Chemicals	Direct Discharge to Miss.	MO0000311	Major	573-754-6211
274.9	RDB	Holcim (US) Inc.	Clarksville, MO	Cement Manufacturing	Lagoon to Miss.	MO0000159	Non-Major	573-242-3571
272	RDB	Clarksville WWTP	Clarksville, MO	Municipal WWTP	Tributary To Miss.	MO0039632	Non-Major	573-242-3336
241.5	RDB	US Army Corps of Engineers	Winfield, MO	Federal Government WWTP	Direct Discharge to Miss.	MO0029955	Non-Major	636-566-8120
233.5	RDB	O'Fallon WTP	O'Fallon, MO	City WTP	Direct Discharge to Miss.	MO0129623	Non-Major	636-379-7605
226.2	RDB	Mississippi River WWTP	Saint Charles, MO	Regional WWTP	Direct Discharge to Miss.	MO0058343	Major	636-250-4600
225.1	RDB	Yacht Club of St. Louis	Saint Charles, MO	Amusement and Recreation Services	Direct Discharge to Miss.	MO0101303	Non-Major	636-250-4435
221.8	RDB	Duck Club Marina	Saint Charles, MO	Amusement and Recreation Services	Direct Discharge to Miss.	MO0111627	Non-Major	636-250-4333
18	LDB	Grafton WWTP	Grafton, IL	Municipal WWTP	Direct Discharge to Miss.	IL0029025	Non-Major	
217	LDB	Raging Rivers Waterpark	Grafton, IL	Amusement Park	Rice Hollow Creek to Miss.	IL0067971	Non-Major	618-786-2345
215.5	LDB	New Plaza Chautauqua WWTP	Elsah, IL	Hotels and Lodging Houses	Direct Discharge to Miss.	IL0076350	Non-Major	
213.9	LDB	Principia College WWTP	Elsah, IL	School WWTP	Direct Discharge to Miss.	IL0045462	Non-Major	618-374-2131
212.6	RDB	Portage Des Sioux	Portage Des Sioux, MO	Municipal WWTP	Direct Discharge to Miss.	MO0107328	Non-Major	
209.9	LDB	Lockhaven Country Club	Dow, IL	Membership Sports and Amusement Club	Direct Discharge to Miss.	IL0044971	Non-Major	618-466-2441
209.5	RDB	Ameren Missouri Sioux Energy Center	West Alton, MO	Coal Powered Electricity Generation	Direct Discharge to Miss.	MO0000353	Major	800-552-7583
207.8	LDB	City of Godfrey WWTP	Godfrey, IL	Municipal WWTP	Tributary To Miss.	IL0036421	Major	618-466-3334
204.2	LDB	Illinois American Water Co. - Alton Plant	Alton, IL	Water Supply	Direct Discharge to Miss.	IL0000299	Non-Major	855-705-8435
201.4	LDB	Alton Steel, Inc.	Alton, IL	Steel and Iron Mill	Lagoon to Miss.	IL0000612	Major	618-463-4490
199.5	LDB	East Alton, WTP	East Alton, IL	Water Supply	Old Wood River to Miss.	IL0051357	Non-Major	618-259-4646

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
198.8	LDB	Koch Nitrogen - Wood River Terminal	East Alton, IL	Special Warehousing and Storage	Old Wood River to Miss.	IL0070173	Non-Major	316-828-8705
198	LDB	BP Products North America Inc. - Wood River Terminal	Wood River, IL	Petroleum Bulk Stations and Storage	Lagoon to Miss.	IL0000035	Non-Major	618-254-7630
197.7	LDB	City of Wood River WWTP	Wood River, IL	Municipal WWTP	Direct Discharge to Miss.	IL0031852	Major	618-251-3100
197	LDB	PremCor Hartford Distribution Center	Hartford, IL	Petroleum Bulk Stations and Storage	Tributary To Miss.	IL0001244	Non-Major	210-345-4665
196.8	LDB	Equilon Enterprises LLC - Hartford Terminal	Hartford, IL	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	IL0076465	Non-Major	618-255-1111
196.6	LDB	City of Hartford CSO	Hartford, IL	Municipal WWTP	Direct Discharge to Miss.	IL0021423	Non-Major	618-251-2680
196.3	LDB	Marathon Pipeline LLC	Hartford, IL	Marine Cargo Handling	Direct Discharge to Miss.	IL0079669	Non-Major	618-254-1112
196.3	LDB	National Maintenance and Repair	Hartford, IL	Marine and Rail Repair Services	Direct Discharge to Miss.	IL0068055	Non-Major	618-254-7451
195.4	LDB	Phillips 66 Co.	Hartford, IL	Petroleum Bulk Stations and Storage	Cahokia Channel to Miss.	IL0071803	Non-Major	618-251-2800
193.5	RDB	Bissel Point WWTP St. Louis MSD	St. Louis, MO	Municipal WWTP	Lagoon to Miss.	MO0025178	Major	314-633-9000
190.1	LDB	Chain of Rocks Recycling and Disposal	Granite City, IL	Refuse Systems	Chouteau Slough to Miss.	IL0075523	Non-Major	618-797-6805
190	RDB	Chain of Rocks WTP	St. Louis, MO	Water Supply	Direct Discharge to Miss.	MO0000604	Non-Major	314-633-9000
185	RDB	St. Louis Disposal Solutions	St. Louis, MO	Refuse Systems	Dardenne Creek to Miss.	MO0136786	Non-Major	314-381-2600
185	RDB	Norfolk Southern Railway Co. - Luther Yard	St. Louis, MO	Railroad Yard	Lagoon to Miss.	MO0115568	Non-Major	314-679-1870
183.4	LDB	Metro East SD CSOS	East St. Louis, IL	Municipal WWTP	Direct Discharge to Miss.	IL0028592	Non-Major	618-452-9400
183.3	LDB	Centerpoint Energy - Mississippi River Transmission	Venice, IL	Coal Powered Electricity Generation	Ditch to Miss.	IL0078794	Non-Major	713-207-1111
182.8	LDB	IDOT District 8 Venice Pump Station	Venice, IL	Water Supply	Direct Discharge to Miss.	IL0071765	Non-Major	618-346-3110
182.4	LDB	Ameren Missouri - Venice Plant	Venice, IL	Coal Powered Electricity Generation	Direct Discharge to Miss.	IL0000175	Non-Major	800-552-7583
182.1	RDB	Kiesel Co. - Kiesel Marine	St. Louis, MO	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	MO0111805	Non-Major	314-351-5500
181.6	RDB	St. Louis Terminals Corp.	St. Louis, MO	Municipal WWTP	Direct Discharge to Miss.	MO0113328	Non-Major	314-241-9600

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
181	LDB	Illinois American Water Co. - East St. Louis Facility	East St. Louis, IL	Water Supply	Direct Discharge to Miss.	IL0000281	Non-Major	855-705-8435
180.5	RDB	Trigen Ashley Power Plant	St. Louis, MO	Combination Utilities	Direct Discharge to Miss.	MO0000345	Non-Major	314-621-3550
179.2	RDB	American River Transportation Co.	St. Louis, MO	Marine Cargo Handling	Direct Discharge to Miss.	MO0134741	Non-Major	866-574-9690
178.8	LDB	East St. Louis CSOS	East St. Louis, IL	Sewage System	Direct Discharge to Miss.	IL0033472	Non-Major	618-482-6843
177.6	RDB	Kinder Morgan - St. Louis	St. Louis, MO	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	MO0136891	Non-Major	314-776-6629
177.5	LDB	Veolia ES Technical Solutions LLC	Sauget, IL	Refuse Systems	Tributary To Miss.	IL0071552	Non-Major	618-271-2804
177.4	LDB	Joint American Bottoms and Sauget TRT Facility	Sauget, IL	Municipal WWTP	Direct Discharge to Miss.	IL0065145	Non-Major	618-337-1710
177	LDB	ConocoPhillips Co. East St. Louis Terminal	East St. Louis, IL	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	IL0069477	Non-Major	580-767-7473
176	RDB	JD Streett and Co. Inc.	St. Louis, MO	Petroleum Bulk Stations and Storage	Direct Discharge to Miss.	MO0121169	Non-Major	314-432-6600
173.6	LDB	Dupo WWTP	Dupo, IL	Municipal WWTP	Direct Discharge to Miss.	IL0026441	Non-Major	618-286-3280
172.7	LDB	Ingram Barge Co.	East Carondelet, IL	Marine Cargo Handling	Direct Discharge to Miss.	IL0072303	Non-Major	615-298-8200
172.5	RDB	Louisiana Dock Co.	St. Louis, MO	Marine Cargo Handling	Direct Discharge to Miss.	MO0001601	Non-Major	314-544-7645
171.8	RDB	MSD, Lemay WWTP	Lemay, MO	Municipal WWTP	Direct Discharge to Miss.	MO0025151	Major	314-638-7470
171.4	RDB	Mapico, Inc.	St. Louis, MO	Inorganic Pigments	Tributary To Miss.	MO0117307	Non-Major	314-544-1400
168.7	RDB	Jefferson Barracks Marine SVCS	St. Louis, MO	Marine Gasoline Service	Direct Discharge to Miss.	MO0119733	Non-Major	314-894-3805
162	RDB	MSD, Lower Meramec WWTP	St. Louis, MO	Municipal WWTP	Lower Meremec River to Miss.	MO0100978	Non-Major	314-768-6260
161.7	RDB	Ameren Missouri - Meramec Energy Center	St. Louis, MO	Coal Powered Electricity Generation	Lagoon to Miss.	MO0000361	Major	800-552-7583
159	RDB	Kimmswick WWTP	Kimmswick, MO	Municipal WWTP	Direct Discharge to Miss.	MO0106461	Non-Major	636-464-7407
156.5	RDB	Glaize Creek SD	Barnhart, MO	Municipal WWTP	Direct Discharge to Miss.	MO0056162	Major	636-464-3230
153.5	RDB	Teamsters Local 688	Pevely, MO	RV Parks and Campsites	Direct Discharge to Miss.	MO0046736	Non-Major	636-475-5375

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
151.1	RDB	Herculaneum WWTP	Herculaneum, MO	Municipal WWTP	Joachim Creek to Miss.	MO0027111	Non-Major	
145.8	RDB	River Cement Co. (DBA Buzzi Unicem USA)	Festus, MO	Cement Manufacturing	Cliffdale Hollow to Miss.	MO0000035	Non-Major	636-937-7601
145	RDB	LaRoche Industries Crystal City Nitrogen	Festus, MO	Nitrogenous Fertilizer Manufacturing	Direct Discharge to Miss.	MO0000817	Major	636-931-8100
140.4	RDB	Ameren Missouri - Rush Island Center	Festus, MO	Coal Powered Electricity Generation	Lagoon to Miss.	MO0000043	Major	800-552-7583
139.2	RDB	Holcim (US) Inc. - Ste. Genevieve Plant	Bloomsdale, MO	Cement Manufacturing	Tributary To Miss.	MO0133787	Major	636-524-8170
127.4	RDB	Tower Rock Stone Company	Ste. Genevieve, MO	Crushed and Broken Limestone	Direct Discharge to Miss.	MO0135399	Non-Major	573-883-7415
126.9	RDB	Chemical Lime Co.	Ste. Genevieve, MO	Lime Manufacturing	Direct Discharge to Miss.	MO0124044	Major	573-883-3001
125.5	LDB	Kellogg Terminal	Modoc, IL	Marine Cargo Handling	Tributary To Miss.	IL0079545	Non-Major	618-284-7287
123	RDB	Ste. Genevieve WWTP	Ste. Genevieve, MO	Municipal WWTP	N Gobouri Creek to Miss.	MO0052159	Non-Major	573-883-5400
120.4	RDB	Bigfield Terminal	Ste. Genevieve, MO	Inland Water Freight Transportation	Lagoon to Miss.	MO0129186	Non-Major	
109.3	LDB	City of Chester WTP	Chester, IL	Municipal WTP	Direct Discharge to Miss.	IL0001066	Non-Major	618-826-3315
107	LDB	Chester WWTP	Chester, IL	Municipal WWTP	Direct Discharge to Miss.	IL0072931	Major	618-826-2414
98.2	LDB	Kinder Morgan Bulk Terminals	Rockwood, IL	Port and Harbor Operations	Direct Discharge to Miss.	IL0060674	Non-Major	713-369-8758
81.9	LDB	Ameren Corp. Grant Tower Power Station	Grand Tower, IL	Coal Powered Electricity Generation	Direct Discharge to Miss.	IL0000124	Major	800-552-7583
69.5	RDB	Proctor and Gamble Paper Products	Jackson, MO	Paper Mill	Tributary To Miss.	MO0044121	Major	573-651-9200
54	RDB	Cape Rock WTP	Cape Girardeau, MO	Municipal WTP	Direct Discharge to Miss.	MO0000116	Non-Major	573-339-6357
50.3	RDB	Cape Girardeau WWTP	Cape Girardeau, MO	Municipal WWTP	Direct Discharge to Miss.	MO0050580	Major	573-339-6357
50	RDB	Biokyowa	Cape Girardeau, MO	Medicinal, Botanical Manufacturing	Direct Discharge to Miss.	MO0102474	Non-Major	573-335-4849
49.8	RDB	Buzzi Unicem USA - Cape Girardeau	Cape Girardeau, MO	Cement Manufacturing	Direct Discharge to Miss.	MO0000809	Major	573-335-5591
48.7	RDB	SE Missouri Regional Airport	Scott City, MO	Marine Cargo Handling	Direct Discharge to Miss.	MO0120421	Non-Major	573-334-6230
48	RDB	Missouri Fibre Corp.	Scott City, MO	Wood Products	Direct Discharge to Miss.	MO0120642	Non-Major	573-264-4699

Facilities Discharging to the Upper Mississippi River

(Continued)

River Mile	Bank	Facility	Location	Type	Description	NPDES Permit	NPDES Type	Contact Phone
44.2	RDB	Enterprise Products	Scott City, MO	Pipeline Transfer of Petroleum Products	Direct Discharge to Miss.	MO0119300	Non-Major	573-264-3544

Acronyms:

CSO: Combined Sewer Overflow
MS4: Municipal Separate Storm Sewer System
MSD: Metropolitan Sewer District
NPDES: *National Pollutant Discharge Elimination System*
SD: Sanitary (Sewer) District
WTP: (Drinking) Water Treatment Plant
WWTP: Wastewater Treatment Plant

Source:

The data listed in the above table was compiled from the EPA Envirofacts Facility Registry Service (FRS) in June 2014. See: http://www.epa.gov/enviro/html/fii/fii_query_java.html

Railroad Tracks Along the Upper Mississippi River

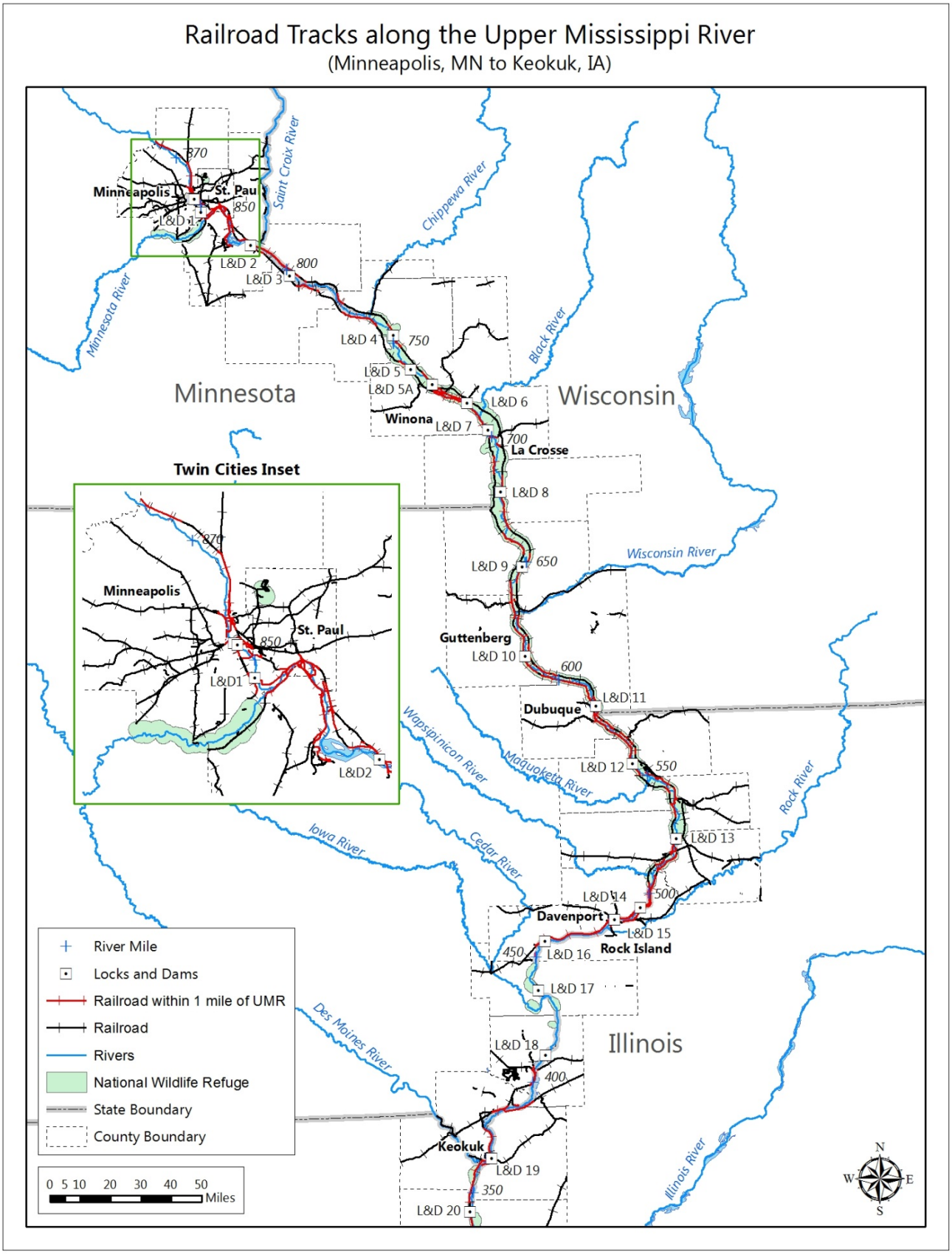
Railroads cross the Upper Mississippi River or run within one mile of the river for approximately 475 miles on the left descending bank and 625 miles on the right descending bank. Thus for the 856 mile river reach from Minneapolis, Minnesota to the Ohio River confluence, 55 percent of the left bank and 73 percent of the right bank contain railroad tracks. The river stretches that do not have nearby railroad tracks are primarily located downstream of Davenport, Iowa as shown on the accompanying maps.

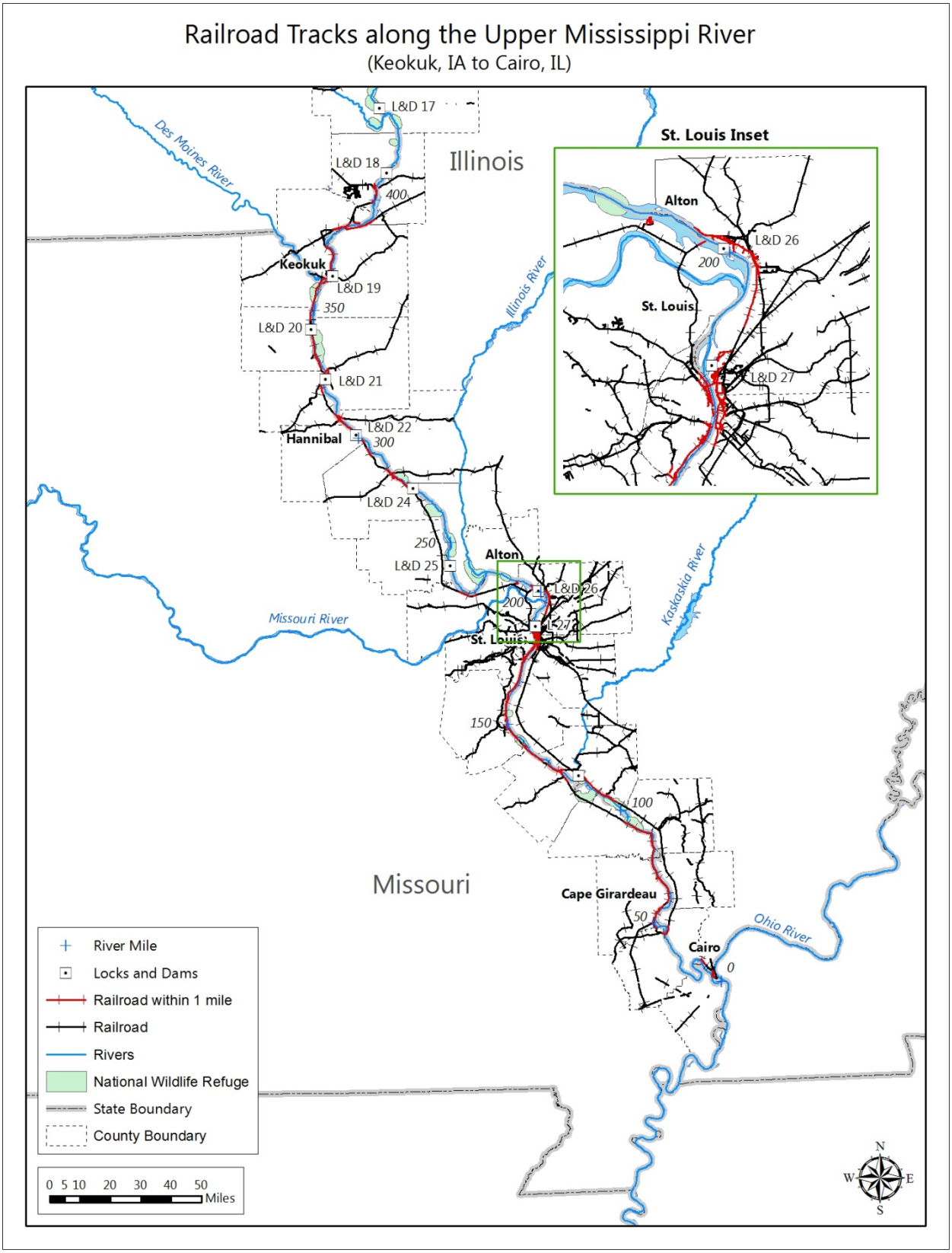
Two major railroad companies — BNSF Railway and Canadian Pacific Railway — own over 82 percent of the tracks near the river. BNSF owns approximately 550 miles of track and Canadian Pacific owns approximately 360 miles of track. Several other railroad companies own the remaining 18 percent of the tracks. Various products, including hazardous materials, are transported on these railroad tracks.

Both BNSF Railway and Canadian Pacific have spill contingency plans and store spill containment equipment at many of their facilities along the river. In the event of a spill emergency, the following telephone numbers should be used to reach railroad officials:

BNSF Railway, Command Center for Emergency Response.....1-800-832-5452

Canadian Pacific Spill Response.....1-800-766-4357


Railroad Tracks along the Upper Mississippi River
(Minneapolis, MN to Keokuk, IA)
Minnesota
Wisconsin
Illinois
Twin Cities Inset
Minneapolis
St. Paul
L&D 1
L&D 2
L&D 3
L&D 4
L&D 5
L&D 5A
Winona
L&D 6
L&D 7
La Crosse
L&D 8
L&D 9
Guttenberg
L&D 10
Dubuque
L&D 11
L&D 12
L&D 13
L&D 14
Davenport
L&D 15
Rock Island
L&D 16
L&D 17
L&D 18
Keokuk
L&D 19
L&D 20
L&D2
870
850
800
750
700
650
600
550
500
450
400
350
Saint Croix River
Chippewa River
Minnesota River
Black River
Wisconsin River
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
Des Moines River
Illinois River
River Mile
Locks and Dams
Railroad within 1 mile of UMR
Railroad
Rivers
National Wildlife Refuge
State Boundary
County Boundary
0 5 10 20 30 40 50
Miles
N
W
E
S


Railroad Tracks along the Upper Mississippi River
(Keokuk, IA to Cairo, IL)
Illinois
Missouri
Des Moines River
Illinois River
Missouri River
Kaskaskia River
Ohio River
L&D 17
L&D 18
400
Keokuk
L&D 19
350
L&D 20
L&D 21
Hannibal
L&D 22
300
L&D 24
250
L&D 25
Alton
L&D 26
200
L&D 27
St. Louis
150
100
Cape Girardeau
50
Cairo
0
St. Louis Inset
River Mile
Locks and Dams
Railroad within 1 mile
Railroad
Rivers
National Wildlife Refuge
State Boundary
County Boundary
0 5 10 20 30 40 50
Miles
N
W
E
S

Selected Tributaries to the Upper Mississippi River

Tributary Name	Enters UMR at River Mile*	Stream Length** (Miles)	Drainage Area*** (Square Miles)
Rice Creek, MN	861.8 LDB	28.7	111
Shingle Creek, MN	857.8 RDB	11.2	29
Minnesota River, MN	844.0 RDB	359.4	1,183
St. Croix River, WI	811.5 LDB	173.1	680
Big River, WI	804.9 LDB	12.8	21
Vermillion River, MN	795.6 RDB	59.2	147
Cannon River, MN	794.6 RDB	118.6	393
Rush River, WI	780.6 LDB	50.9	167
Wells Creek, MN	777.7 RDB	28.4	41
Chippewa River, WI	763.4 LDB	196.1	723
Buffalo (Beef) River, WI	754.5 LDB	70.0	228
Zumbro River, MN	750.2 RDB	64.7	154
East Indian Creek, MN	745.0 RDB	16.3	20
Whitewater River, MN	743.0 RDB	18.2	36
Pleasant Valley Creek, MN	722.0 RDB	10.5	45
Trempealeau River, WI	717.0 LDB	82.6	360
Tank Creek, WI	711.8 LDB	4.9	34
Shingle Creek, WI	710.2 LDB	5.5	34
Black River, WI	708.4 LDB	192.1	528
La Crosse River, WI	698.2 LDB	61.5	169
Root River, MN	693.7 RDB	81.8	253
Bad Axe River, WI	675.2 LDB	4.0	11
Upper Iowa River, IA	671.1 RDB	156.2	368
Village Creek, IA	662.0 RDB	23.7	73
Rush Creek, WI	659.5 LDB	15.7	53
Copper Creek, WI	655.6 LDB	4.1	27
Du Charme Creek, WI	644.4 LDB	7.2	58
Paint Creek, IA	640.7 RDB	33.2	85
Yellow River, IA	637.6 RDB	53.5	195
Wisconsin River, WI	631.7 LDB	435.6	1,671
Sny Magill Creek, IA	627.1 RDB	10.3	36
Turkey River, IA	608.2 RDB	153.2	426
Grant River, WI	593.0 LDB	44.9	98
Platte River, WI	588.3 LDB	48.2	159
Little Maquoketa River, IA	586.4 RDB	30.3	86
Catfish Creek, IA	577.7 RDB	3.4	54
Menominee River, IL	574.5 LDB	11.6	31
Little Menominee River, IL	570.7 LDB	13.6	44
Sinsinawa River, IL	569.1 LDB	21.2	49
Tetes Des Morts Creek, IA	567.4 RDB	17.6	48

Selected Tributaries to the Upper Mississippi River

(Continued)

Tributary Name	Enters UMR at River Mile*	Stream Length** (Miles)	Drainage Area*** (Square Miles)
Galena River, IL	565.1 LDB	50.1	123
Smallpox Creek, IL	563.1 LDB	16.1	32
Maquoketa River, IA	548.7 RDB	150.0	412
Apple River, IL	545.3 LDB	55.0	123
Plum River, IL	536.6 LDB	46.6	118
Elk River, IA	528.3 RDB	21.7	77
Silver Creek, IA	526.4 RDB	5.2	44
Johnson Creek Diversion Ditch, IL	522.1 LDB	26.5	66
Otter Creek, IL	522.1 LDB	11.9	23
Rock Creek, IA	507.0 RDB	14.2	26
Sodus Creek, IA	507.0 RDB	4.0	26
Wapsipinicon River, IA	506.7 RDB	299.7	903
Duck Creek, IA	487.7 RDB	21.3	64
Rock River, IL	479.1 LDB	215.1	769
Copperas Creek, IL	450.8 LDB	32.2	73
Iowa River, IA	434.0 RDB	323.7	904
Edwards River, IL	431.4 LDB	73.9	253
Pope Creek, IL	427.7 LDB	58.3	162
Hawkeye-Dolbee Diversion Channel, IA	422.1 RDB	4.2	26
Yellow Spring Creek, IA	410.4 RDB	1.8	27
Henderson Creek, IL	409.9 LDB	64.8	190
Flint Creek, IA	405.3 RDB	35.4	117
Skunk River, IA	396.0 RDB	93.2	217
Devils Creek, IA	377.6 RDB	14.1	23
Sheridan Creek, IL	372.4 LDB	10.6	19
Larry Creek, IL	369.3 LDB	4.0	24
Chaney Creek, IL	364.9 LDB	11.7	22
Des Moines River, IA / MO	361.5 RDB	429.7	1,461
Fox River, MO	353.5 RDB	105.9	295
Bear Creek, IL	341.0 LDB	44.1	162
Wyaconda River, MO	337.3 RDB	50.7	113
Rock and Ursa Creek Diversion Ditch, IL	336.3 LDB	24.4	37
Durgens Creek, MO	331.5 RDB	22.6	43
Fabius River Diversion, MO	321.0 RDB	6.4	21
North River, MO	320.9 RDB	81.4	235
South River, MO	320.7 RDB	18.4	49
Mill Creek, IL	318.2 LDB	23.8	51
Hadley-McCraney Diversion Channel, IL	296.7 LDB	4.7	54
Salt River, MO	284.3 RDB	75.0	325

Selected Tributaries to the Upper Mississippi River

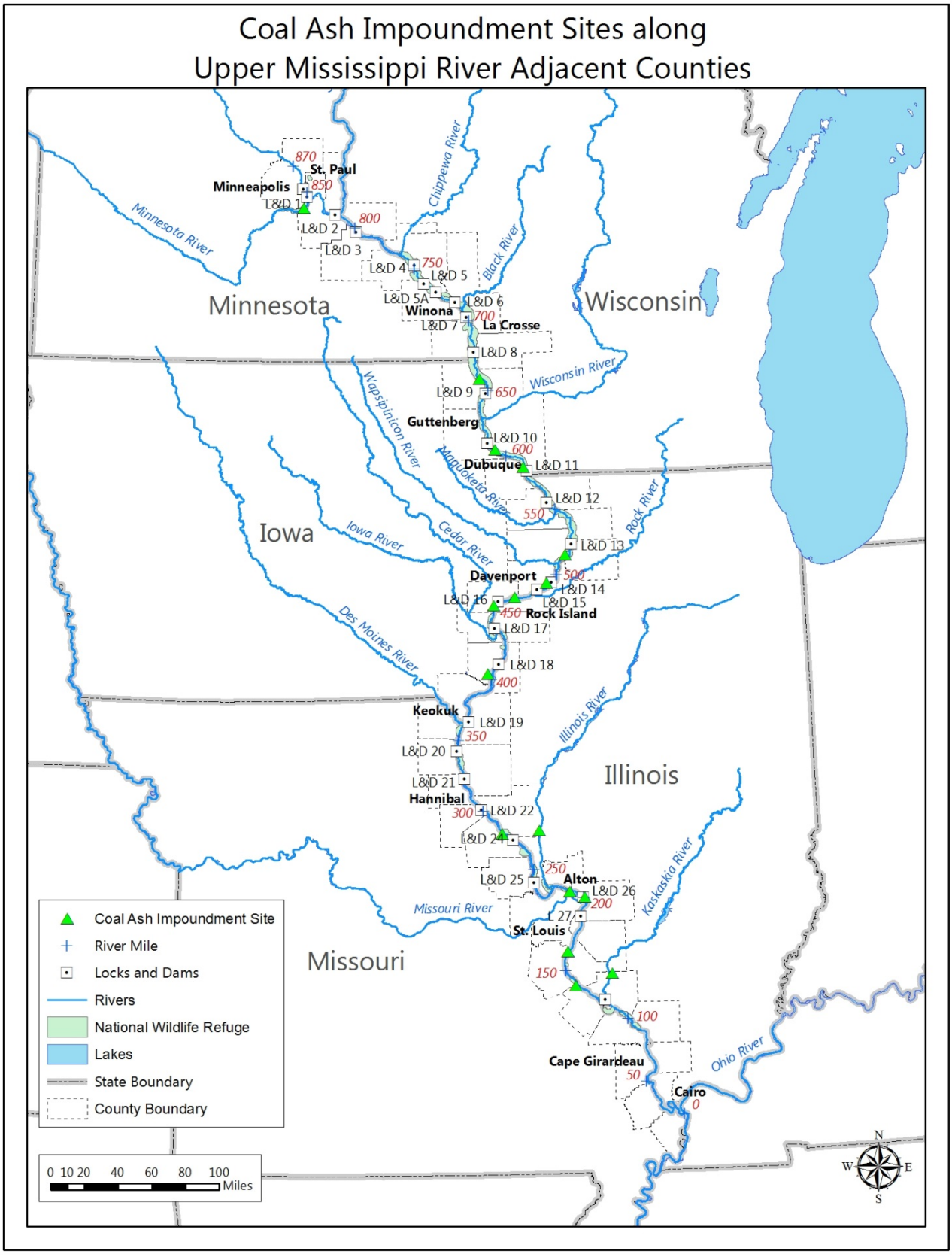
(Continued)

Tributary Name	Enters UMR at River Mile*	Stream Length** (Miles)	Drainage Area*** (Square Miles)
Noix Creek, MO	282.3 RDB	13.4	45
Buffalo Creek, MO	280.9 RDB	14.1	48
Ramsey Creek, MO	265.1 RDB	17.7	74
Bryants Creek Diversion Channel, MO	260.7 RDB	18.1	84
Bobs Creek, MO	238.1 RDB	24.3	42
Peruque Creek, MO	233.5 RDB	44.0	81
Dardenne Creek, MO	227.4 RDB	40.2	164
Illinois River, IL	220.0 LDB	273.6	1,416
Piasa Creek, IL	209.4 LDB	29.7	99
Wood River, IL	199.3 LDB	2.6	27
Missouri River, MO	195.5 RDB	594.4	2,835
Cahokia Creek Diversion Channel, IL	195.0 LDB	4.9	21
Chain of Rocks Canal, IL	184.1 LDB	8.7	94
Prairie duPont Creek, IL	174.3 LDB	20.4	67
River Des Peres Drainage Channel, MO	172.1 RDB	6.2	27
Meramec River, MO	160.8 RDB	229.1	892
Fountain Creek, IL	156.4 LDB	30.1	91
Joachim Creek, MO	151.5 RDB	36.9	133
Kaskaskia River, IL	117.7 LDB	304.9	818
Marys River, IL	106.6 LDB	42.3	121
Apple Creek, MO	75.2 RDB	47.3	180
Indian Creek, MO	69.0 RDB	12.0	42
Castor River Diversion Channel, MO	48.8 RDB	35.0	118
Cache River, IL	12.9 LDB	92.1	181

* LDB = Left Descending Bank
RDB = Right Descending Bank

** Estimated stream length using National Hydrography Dataset (NHD) and including only the named main branch of the stream within the UMR states.

*** Estimated drainage area using NHD 12-digit hydrologic unit code (HUC) watersheds intersecting the streams along the above defined lengths.


Coal Ash Impoundment Sites along
Upper Mississippi River Adjacent Counties
Minnesota
Wisconsin
Iowa
Illinois
Missouri
Minneapolis
St. Paul
La Crosse
Winona
Guttenberg
Dubuque
Davenport
Rock Island
Keokuk
Hannibal
Alton
St. Louis
Cape Girardeau
Cairo
870
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
L&D 1
L&D 2
L&D 3
L&D 4
L&D 5
L&D 5A
L&D 6
L&D 7
L&D 8
L&D 9
L&D 10
L&D 11
L&D 12
L&D 13
L&D 14
L&D 15
L&D 16
L&D 17
L&D 18
L&D 19
L&D 20
L&D 21
L&D 22
L&D 24
L&D 25
L&D 26
L&D 27
Minnesota River
Chippewa River
Black River
Wisconsin River
Wapsipinicon River
Maquoketa River
Rock River
Iowa River
Cedar River
Des Moines River
Illinois River
Missouri River
Kaskaskia River
Ohio River
Coal Ash Impoundment Site
River Mile
Locks and Dams
Rivers
National Wildlife Refuge
Lakes
State Boundary
County Boundary
0 10 20 40 60 80 100
Miles
N
W
E
S

Coal Ash Impoundment Sites
Along the Upper Mississippi River

River Mile*	Facility Name, Address, and Phone Number	Parent Company Address
8.0 RDB Minnesota River	Black Dog Power Station 1400 E Black Dog Rd. Burnsville, MN 55337 800-895-4999	Xcel Energy 414 Nicollet Mall Minneapolis, MN 55401
607.7 LDB	Nelson Dewey Generating Station 11999 Co. Rd. VV Casssville, WI 53806 800-255-4268	Alliant Energy 4902 N Biltmore Ln., Ste 1000 Madison, WI 53718-2148
660.0 RDB	Lansing Power Station 2320 Power Plant Dr. Lansing, IA 52151 800-255-4268	Alliant Energy 4902 N Biltmore Ln., Ste 1000 Madison, WI 53718-2148
586.0 RDB	John Deere Dubuque 18600 S John Deere Rd. Dubuque, IA 52001 563-589-5151	Deere & Company World Headquarters 1 John Deere Pl. Moline, IL 61265
513.4 RDB	ADM Clinton Power Plant 1251 Beaver Channel Pkwy. Clinton, IA 52732 563-242-6073	Archer Daniels Midland Co. 4666 Faries Pkwy. Decatur, IL 62526
492.3 RDB	Riverside Generating Station 6001 State St. Bettendorf, IA 52722 888-427-5632	MidAmerican Energy Co. PO Box 657 Des Moines, IA 50306-0657
467.6 RDB	Fair Station 3800 Hwy. 22 W Montpelier, IA 52759 319-366-8011	Central Iowa Power Cooperative PO Box 2517 Cedar Rapids, IA 52406-2517
453.0 RDB	Muscatine Generating Station 1700 Industrial Connector Rd. Muscatine, IA 52761 563-263-2752	City of Muscatine 215 Sycamore St. Muscatine, IA 52761
403.6 RDB	Burlington Generating Station 4282 Sullivan Slough Rd. Burlington, IA 52601 800-255-4268	Alliant Energy 4902 N Biltmore Ln., Ste 1000 Madison, WI 53718-2148
281.0 RDB	Hercules Missouri Power Plant 11083 Hwy. D Louisiana, MO 63353 859-815-3333	Ashland Inc. 50 E. RiverCenter Blvd. - PO Box 391 Covington, KY 41012-0391
42.7 RDB Illinois River	Pearl Station Rt. 100 S Pearl, IL 62361 217-829-4291	Illinois Rural Electric Cooperative 2 S. Main St. - PO Box 80 Winchester, IL 62694

Coal Ash Impoundment Sites
Along the Upper Mississippi River
(Continued)

River Mile*	Facility Name, Address, and Phone Number	Parent Company Address
209.5 RDB	Sioux Power Station 8501 N State Rt. 94 West Alton, MO 63386 800-552-7583	Ameren Missouri PO Box 790352 St. Louis, MO 63179-0352
199.9 LDB	Wood River Power Station 3200 East Broadway Alton, IL 62002 618-433-0115	Homefield Energy Office 1500 Eastport Plaza Dr. Collinsville, IL 62234
161.9 RDB	Meramec Power Station 8200 Fine Rd. St. Louis, MO 63129 800-552-7583	Ameren Missouri PO Box 790352 St. Louis, MO 63179-0352
138.8 RDB	Rush Island Power Station 100 Big Hollow Rd. Festus, MO 63028 800-552-7583	Ameren Missouri PO Box 790352 St. Louis, MO 63179-0352
19.5 LDB Kaskaskia River	Baldwin Energy Complex 10901 Baldwin Rd. Baldwin, IL 62217 618-785-2294	Homefield Energy Office 1500 Eastport Plaza Dr. Collinsville, IL 62234

* All river miles are for the Upper Mississippi River, unless otherwise indicated.

RESOURCE MANUAL

Section E: Regional and Local Resources

Public Hazardous Materials Teams

(Note: Listed below are Level A public sector hazardous materials teams that include some portion of the Upper Mississippi River within their response area. No Illinois-based teams are included in this list. Requests for hazmat team assistance in Illinois should be directed to the Illinois Emergency Management Agency at 217-782-7860).

Name	Location	Upper Mississippi River Response Area*	24-hour Telephone
St. Paul Fire Department	St.Paul, MN	Ramsey, Washington, and Dakota Counties, MN	651-649-5451 (Minnesota State Duty Office)
Chippewa Falls/ Eau Claire Fire Departments	Chippewa Falls and Eau Claire, WI	Pierce, Pepin, northern Buffalo, and northern Trempealeau Counties, WI	800-943-0003 (Wisconsin Emergency Management)
Winona Fire Department	Winona, MN	Winona County, MN	507-454-6100 (Winona County Sheriff's Department)
La Crosse Fire Department	La Crosse, WI	southern Buffalo, southern Trempealeau, La Crosse, Vernon, and Crawford Counties, WI; Allamakee County, IA	800-943-0003 (Wisconsin Emergency Management)
Rochester Fire Department	Rochester, MN	Goodhue, Wabasha, Winona, and Houston Counties, MN	651-649-5451 (Minnesota State Duty Office)
Madison Fire Department	Madison, WI	Grant County, WI	800-943-0003 (Wisconsin Emergency Management)
Linn County Hazmat Team	Cedar Rapids, IA	Clayton County, IA	319-398-3911
Dubuque Fire Department	Dubuque, IA	Dubuque County, IA	563-589-4415
Bettendorf Fire and Rescue	Bettendorf, IA	City of Bettendorf; portion of Scott County, IA (east of Hwy 67)	563-344-4015

Public Hazardous Materials Teams

(Continued)

Name	Location	Upper Mississippi River Response Area*	24-hour Telephone
Davenport Fire Department	Davenport, IA	Jackson, Clinton, and Scott Counties, IA	563-326-7979
Muscatine Fire Department	Muscatine, IA	Muscatine and Louisiana Counties, IA	563-263-9922
Burlington Fire Department	Burlington, IA	City of Burlington, IA and Des Moines County	563-753-8373
Fort Madison Fire Department	Fort Madison, IA	Lee County, IA	319-372-7700
Keokuk Fire Department	Keokuk, IA	Lee County, IA	319-524-1642
St. Charles and Warren Counties HazMat Response Teams	St. Charles, MO	St. Charles County, MO	636-928-7569
St. Louis County Hazardous Materials Team	St. Louis, MO	St. Louis County, MO	314-428-1133 North County 636-394-5442 Central County
St. Louis City Fire Department	St. Louis, MO	City of St. Louis, MO Mouth of Missouri River to Mouth of Meramec River on the UMR	314-533-3810
Jefferson County Emergency Management Agency	Hillsboro, MO	Jefferson County, MO	636-797-5381

* Includes entire city or county unless listed otherwise noted.

County Emergency Management Agencies along the Upper Mississippi River

(Listed by State Upstream to Downstream)

State	County Name	Phone	Address
MN	Anoka County	Dispatch: (763) 421-4760 Main: (763) 323-6150	2100 3rd Avenue Anoka, MN 55303
MN	Hennepin County	Dispatch: (612) 596-0254 Main: (612) 596-0252	1600 Prairie Drive Medina, MN 55340-5421
MN	Ramsey County	Hotline: (651) 297-1304 (9:00 AM-4:30 PM) Main: (651) 643-8378	2099 University Av. W., Suite 201 St Paul, MN 55104-3431
MN	Washington County	Main: (651) 430-7938	15015 62nd St. N Stillwater, MN 55082
MN	Dakota County Emergency Preparedness	Main: (651) 438-4703	1580 Highway 55 Hastings, MN 55055
MN	Goodhue County	Main: (651) 388-1181 Alt: (651) 267-2640	430 West 6th Street Red Wing, MN 55066
MN	Wabasha County	Main: (651) 565-3069	848-17th Street East Wabasha, MN 55981-5033
MN	Winona County	Main: (507) 457-6498	201 W 3rd St Winona, MN 55987
MN	Houston County	Main: (507) 725-5249 Manager: (507) 725-5834	Courthouse, 306 S Marshall St., Suite 2008 Caledonia, MN 55921
WI	Pierce County	Main: (715) 273-6751 Emergency: (715) 273-5051	Courthouse Annex Room 503 414 W. Main St. PO Box 805 Ellsworth, WI 54011
WI	Pepin County	Main: (715) 672-8897 24-hour (715) 672-5944	740 7th Ave West Durand, WI 54736
WI	Buffalo County	Main: (608) 685-6298	407 South Second Street PO Box 494 Alma, WI 54610-0494
WI	Trempealeau County	Main: (715) 538-2311	36245 Main St. PO Box 67 Whitehall, WI 54773
WI	La Crosse County	Main: (608) 789-4811 Alt: (608) 785-9634	333 Vine St. La Crosse, WI 54601
WI	Vernon County	Main: (608) 637-5266	318 Fairlane Dr. Suite 5 Viroqua, WI 54665
WI	Crawford County	Main: (608) 326-0266	224 N. Beaumont Rd. Prairie du Chien, WI 53821
WI	Grant County	Main: (608) 723-7171 Dispatch: (608) 723-2157	1000 N. Adams St. PO Box 506 Lancaster, WI

County Emergency Management Agencies along the Upper Mississippi River

(Continued)

State	County Name	Phone	Address
IA	Allamakee County	Main: (563) 568-4233	110 Allamakee St. Waukon, IA 52172
IA	Clayton County	Main: (563) 245-3004	600 Gunder Rd. NE, Suite 13 PO Box 464 Elkader, IA 52043-0464
IA	Dubuque County	Main: (563) 589-4170	14928 Public Safety Way Dubuque, IA 52002-8216
IA	Jackson County	Main: (563) 652-7036 Cell: (563) 542-3911	201 W. Platt Maquoketa, Iowa 52060
IA	Clinton County	Main: (563) 242-5712	Courthouse, 612 North 2nd Street P.O. Box 2957 Clinton IA 52733-2957
IA	Scott County	Main: (563) 484-3050	1100 E. 46th St. Davenport, IA 52807
IA	Muscatine County	Main: (563) 264-6003	312 East Fifth Street Muscatine, Iowa 52761
IA	Louisa County	Director: (319) 750-1128	12635 County Rd G56 Wapello, Iowa 52653
IA	Des Moines County	Main: (319) 753-8206	512 N. Main St. Suite 1 Burlington, IA 52601
IA	Lee County	Main: (319) 372-4124	811 Avenue E P.O. Box 240 Fort Madison, IA 52627
IL	Jo Daviess County Emergency and Disaster Preparedness	Main: (815) 777-0263 Toll free: (877) 777-0263	9483 US Hwy 20 West PO Box 318 Galena, IL 61036
IL	Carroll County ESDA	Director: (815) 631-8844	301 North Main Street Mt. Carroll, IL 61053
IL	Whiteside County ESDA	Main: (815) 772-4044	400 N. Cherry St. Morrison , IL 61270
IL	Rock Island	Main: (309) 799-5166	6120 78th Ave Milan, IL 61264
IL	Mercer County /Community Emergency Response Team	Main: (309) 582-3759	S1007 NW 3rd St. Aledo, IL 61231
IL	Henderson County	Main: (309) 867-2780	PO Box 308 Oquawka, IL 61469
IL	Hancock County ESDA	Main: (217) 357-2115	1006 Wabash Carthage, IL 62321
IL	Adams County	Main: (217) 277-2005	222 N 52nd St. Quincy, IL 62035
IL	Pike County /Sheriff	Director: (217) 285-5550	204 E Adams St. Pittsfield, IL 62363

County Emergency Management Agencies along the Upper Mississippi River

(Continued)

State	County Name	Phone	Address
IL	Calhoun County ESDA	Main: (618) 576-2733	HCR 61, Box 48 Hardin, IL 62047
IL	Jersey County/Jerseyville ESDA	Main: (618) 498-6881	114 N. Washington Jerseyville, IL 62052
IL	Madison County	Main: (618) 692-0537	101 E. Edwardsville Rd., Suite 260 Wood River, IL 62095
IL	St. Clair County	Main: (618) 825-2750	110 W. Washington Belleville, IL 62220
IL	Monroe County	Main: (618) 939-8681 ext. 231	100 S. Main St. Waterloo, IL 62298
IL	Randolph County	Main: (618) 826-5000 ext. 227	2515 State St. Chester, IL 62233
IL	Jackson County	24-Hour: (618) 684-3137	1001 Walnut St. Murphysboro, IL 62966
IL	Union County	Main: (618) 697-0760	301 W. Mississippi St. Jonesboro, IL 62952
IL	Alexander County/Cairo	Main: 618-306-3282	2000 Washington Ave Cairo, IL 62914
MO	Clark County	Coordinator: (660) 727-2512	250 N Morgan Kahoka, MO 63445
MO	Lewis County	Coordinator: (573) 248-4789	202 N Highland St. Ewing, MO 63440
MO	Marion County Emergency Services	Main: (573) 221-1121 Dispatch: (573) 221-1806	3246 Hwy. 61 Hannibal, MO 63401
MO	Ralls County	Coordinator: (573) 822-9736 Dispatch: (573) 985-1911	PO Box 246 Perry, MO 63462
MO	Pike County	Coordinator: (573) 754-0151	13055 Pike 133 Louisiana, MO 63353
MO	Lincoln County	Coordinator: (636) 528-6300	250 W. College St. Troy, MO 63379
MO	St. Charles County	Main (24-hour pager): (636) 949-3023	301 N 2nd St. Rm 280 St. Charles, MO 63301
MO	St. Louis County Police Office of Emergency Management	Main: (314) 628-5400	14847 Ladue Bluffs Crossing Dr. Chesterfield, MO 63017
MO	Jefferson County	Main: (636) 797-5381	Jefferson County Courthouse 300 Main St. Hillsboro, MO 63050
MO	Ste. Genevieve	Coordinator: (573) 883-0263	295 Brooks Dr. Ste. Genevieve, MO 63670
MO	Perry County	Main: (573) 547-4000	406 N. Spring St. Perryville, MO 63775

County Emergency Management Agencies along the Upper Mississippi River
(Continued)

MO	Cape Girardeau	Main: (573) 204-0911	#1 Barton Square Jackson, MO 63755
MO	Scott County	Main: (573) 545-3549	131 S. Winchester St., PO Box 431 Benton, MO 63736
MO	Mississippi County	Daytime: (573) 683-2111 Evening: (573) 683-1782	PO Box 369 Charleston, MO 63834

RESOURCE MANUAL

Section F: In Situ Burning and Chemical Oil Spill Treating Agents

In Situ Burn Checklist

The following checklist will assist OSCs at any level to ensure that reasonable decisions are made on the use of ISB on the Upper Mississippi River.

ISB Decision Tree

Step 1: Site Conditions and Desirability

- Access routes to the scene?
- Locational information to include: River mile or latitude/longitude or other precise geographical description?
- Material, amount, size, age, phase, condition of spill?
- Environmental conditions: air temperature, wind speed, lake/river current speed, wave heights, water temperature, ice conditions?
- Will the use of ISB prevent or reduce further damage by the spill?
- Is mechanical containment and recovery adequate? If so, explain why burning is being considered.
- Ecological factors such as environmentally sensitive areas? See page F-29 for Ecological Considerations.

Step 2: Feasibility

- Can worker safety be reasonably assured?
- Can the fire be contained? If not, should not burn.
- Are environmental conditions favorable? Wind speeds less than 20 knots (23 mph, 34 feet/sec), currents less than 3/4 of a knot (0.9 mph, 1.3 feet/sec), and waves less than 3 feet? If not, then probably should not conduct the burn.
- Will the smoke plume lower the visibility enough to adversely impact transportation via air, water, or land?
- Are atmospheric conditions very stable (i.e., winds are light and fog or low stratus clouds are present)? Then, the smoke plume will likely be more difficult to disperse and you might not want to burn unless there will be no human impact.
- Is the oil burnable? Recommended thicknesses are 2 to 3 mm for fresh crude oil, 3 to 5 mm for diesel and weathered crude, and 5 to 10 mm for emulsions and bunker C. Water-in-oil emulsions containing more than 30 to 50% water are difficult to ignite and support combustion. Most oils readily burn if the water content is less than 25%. Most crude oils require an evaporative loss of less than 30% to burn.
- Residues: The removal of burn residues should be considered since the potential exists for undefined levels of environmental impacts even with a successful burn. See pages F-34 and F-35 for additional information.
- Is the product ignitable without adding a burning agent? COSTA procedure approval is required for use of burning agents.

The term "burning agents" means those additives that, through physical or chemical means, improve the combustibility of the materials to which they are applied. It is recommended that, when addition of a burning agent is being evaluated, first consideration be given to the more environmentally friendly products such as kerosene or jet fuel "A" before considering the more environmentally hostile products such as gasoline or diesel.

- Is the product gasoline or other light petroleum product? If so, both mechanical techniques and ISB are still viable options. However, due to the greater risk of flammable hazard, uncontrolled sources

In Situ Burn Checklist

(Continued)

of ignition should be removed from the area, only intrinsically safe equipment should be used on the site, and combustible gas indicators should be used to monitor for flammable vapors.

- Is the area forested or are conditions very dry? If so, then it may not be safe to burn.
- If in a marsh or wetlands area see pages F-14 to F-15.
- Are adequate fire boom, towboats, and igniters available?
- Is adequate helicopter/monitoring equipment available?
- Can notices to mariners, aircraft, and populations be issued in time?
- Can personnel and equipment be mobilized in time?
- Can authorization be secured in time?

See pages F-33 to F-35 for information operational considerations : open water burning, inland environment burning, ice conditions, fire boom, ignition, oil thickness, weathering, emulsification, and burn residues.

Step 3: Acceptability

- Distance between burn and human population?
- Will ambient PM-10, averaged over 1 hour, near humans, be above 150 micrograms per cubic meter? If so, evacuate or shield them, or do not conduct the burn.

Generally, burning should not be conducted if human population centers exist within 6 miles downwind of the burn or 3 miles in other directions. These distances are only a rule of thumb - they may be longer or shorter depending on the circumstances of the case. In general, a safety margin of 45 degrees of arc on either side of the wind vector should be allowed to account for wind shifts. This means that burning is not recommended if there is a human population center within 6 miles from the burn measured along the wind direction and expanded 45 degrees on either side of the wind direction. A 3 mile safety margin is recommended in other directions.

Other considerations include:

- Does the landowner concur with the decision to burn?
- Are there cultural, historical, or archaeological resources that could be affected by the burn? If so, probably should not burn.
- Does the proposed burn area contain state or federal threatened or endangered species populations or their critical habitats? If so, and the proposed burn appears likely to result in greater overall injury to those species or habitats than other response actions, including "no action", the state and federal natural resource trustees will likely object to it.

Step 4: Authorization and Conditions

- Are forecasted weather conditions favorable?
- The Site Safety Plan should be reviewed to ensure that ISB is adequately addressed.
- Unified Command authority to start, proceed, limit, or halt the burn must be recognized.
- Conduct trial burn to evaluate smoke plume drift and dispersion.
- Burn extinguishing measures are available?
- Public notification. See page F-28 for guidelines on Public Notification.
- A written description of the incident and burn plan should be provided to the OSC and other pertinent players.

In Situ Burn Checklist

(Continued)

Step 5: Monitoring

The primary operational purpose in monitoring the burning of spilled oil is to determine if burning requirements and objectives are met. Although the current body of knowledge about burning is limited, each operational use provides an opportunity to gather further information. Operational monitoring should occur during a response involving the use of in situ burning and should be accompanied by a detailed monitoring plan.

Operational monitoring should include such parameters as:

- type and amount of oil spilled;
- weather and water conditions;
- trajectory of the slick and smoke plume;
- estimated volume of oil to be burned;
- estimated volume of oil actually burned and remaining;
- observation of the effectiveness of residual material collection;
- observations of adverse affects to natural resources both pre- and post-burn (e.g., number of dead organisms)
- effects on human health (see pages F-16 to F-27 for Air Monitoring Guidelines)

In an effort to gather more data about in situ burning, spill-of-opportunity research possibilities involving a broad range of physical, biological, and chemical issues, is encouraged. Research monitoring might involve:

- collection of oil sample prior to burning for analysis;
- observations of residual material behavior and fate;
- collection of residual material for analysis;
- upwind and downwind air sampling;
- number and location of sampling stations;
- determination of compounds (PAHs, particulates) to be monitored;
- species and numbers of biota (e.g., waterfowl, aquatic organisms, vegetation) in the area.

Step 6: Reports

- A lessons learned report should be submitted by the Unified Command to the FOSC (and thence to the RRT), SOSC, state and federal natural resource trustees, and local incident commander. The feedback from these reports will help in evaluating policies and procedures and improving them as needed, especially since burning is a relatively new countermeasure on the Upper Mississippi River and these guidelines are untested.
- Post burn monitoring of the site should be considered.

ISB Reference Sources

National Contingency Plan, 40 CFR Parts 300 to 399.
API/NOAA manual "Options for Minimizing Environmental Impacts of Freshwater Spill Response, September 1994", also known as the Freshwater Manual.
Region 5 In Situ Burn Guidelines adopted in June 1996.
Alternative Response Tool Evaluation System (ARTES) adopted by RRT-5 in June 1996.
NOAA HAZMAT In Situ Burning Planning Guidelines, 11 June 1996.
Alaska Regional Response Team In Situ Burn Guidelines for Alaska, May 1994.

In Situ Burn Checklist

(Continued)

S.L. Ross Environmental Research Ltd., Alaska Clean Seas, Alaska Department of Environmental Conservation, In Situ Burning: A Valuable Tool for Oil Spill Response, April 1995

Regional Response Team 2 - In Situ Burning Decision Flow Chart, DRAFT 11/12/96.

Regional Response Team 6, In Situ Burn Decision Tree.

Chemical Oil Spill Treating Agents (COSTAs)

What a Responder Needs to Know to Consider Use of a COSTA

Except for specific circumstances (i.e. to prevent or substantially reduce a hazard to human life in accordance with 40 CFR 300.910 (c)) the use of chemical oil spill treating agents (COSTAs) will be considered on a case-by-case basis. Chemical oil spill treating agents include dispersants, herding agents, emulsion treating agents, solidifiers, elasticity modifiers, shoreline cleaning agents, shoreline pre-treatment agents, oxidation agents, and bioremediation agents.

In general, the use of dispersants is not promoted within the boundaries of the Region 5 or Region 7 Regional Response Teams (RRTs).

Regarding other non-dispersant COSTA, Region 7 has no pre-approvals in place. Region 5 has a pre-approval in place for the test use of the elasticity modifier product, ELASTOL. Additionally, the use of the NOCHAR A610 solidifier product contained in booms, sock, and pillows is also approved for use in Region 5. No approval is in place for use of uncontained solidifier products. Note that both ELASTOL and NOCHAR were removed from the National Product Schedule in 1996, and, therefore, neither may be used except as provided for in the National Contingency Plan (40 CFR 300.910 9 paragraph (c)).

Consistent with the National Contingency Plan (NCP), in situations when a human hazard is not present, the federal on-scene coordinator (FOSC) must receive the concurrence of the U.S. Environmental Protection Agency (USEPA) Regional Response Team (RRT) representative(s), and the RRT representative of the affected state(s) to use any chemical product. The FOSC must also consult with the Department of Interior (DOI) and Department of Commerce (DOC) natural resource trustees, where practicable, before authorizing the use of a chemical product. Any on-scene coordinator (OSC) or responder must comply with applicable local, state, and federal regulations.

Note that the FOSC is authorized to use any chemical product without requesting permission if he or she believes its use is necessary to prevent or substantially reduce a hazard to human life (40 CFR 300.910 (c)). If a chemical product is used under these circumstances, the FOSC must notify the USEPA RRT representative and the state(s) RRT representative of its use as soon as possible. This policy should be applicable to any OSC whether local, state, or federal.

General COSTA show stoppers:

- Is the product on the National Product Schedule? If not, then it should not be used except as noted in 40 CFR 300.910 (c).
- Are all players in agreement on its use? If not, then it should not be used. These players shall include the Local Incident Commander, FOSC, SOSC, and the State and Federal natural resource trustees.
- COSTAs require RRT approval.

COSTA Decision Tree

The following information is excerpted from the API/NOAA manual "Options for Minimizing Environmental Impacts of Freshwater Spill response, 1994.

Chemical Oil Spill Treating Agents (COSTAs)

(Continued)

Dispersants

Objective:
To remove floating oil from the water surface and disperse it into the water column, to reduce impacts to sensitive shoreline habitats and animals that use the water surface.

Description:
Specially formulated products that contain surface-active agents are sprayed at concentrations of about 5 percent of the oil onto the slicks by aircraft or from boats. The products can be applied undiluted or mixed with water. The dispersants reduce the oil/water surficial tension and decrease the energy needed for the slick to break into small particles and mix into the water column. Some physical energy is needed to mix the dispersant into the oil and treated oil into the water.

Applicable Habitat Types:
Open water and large rivers with sufficient depth and volume for mixing.

When to Use:
When the impact of the floating oil has been determined to be greater than impacts resulting from mixing of oil into the water column.

Biological Constraints:
Not suitable in shallow water depths where the dispersed oil could affect benthic resources. The dispersed oil must not affect water intakes.

Environmental Effects:
May increase effects on water-column organisms, particularly plankton and larval fish. Dispersion will only be partially effective, so some water surface impacts will still occur.

Other Limitations:
Effective application needs enough wind, but not too much (generally less than 25 knots). Dispersants are not too effective after approximately 12 hours due to weathering of oil and increased viscosity. In general, lighter petroleum products are more dispersible than heavier products. Dispersants should not be used if water intakes are nearby. For aerial application of dispersants the visibility should be 3 miles or better, the ceiling should be 1000 feet or higher, and the wind speed should be 25 knots or lower.

Emulsion treating agents

Objective:
To break or destabilize emulsified oil into separate oil and water phases. Can also be used to prevent emulsion formation.

Description:
Emulsion treating agents are water-soluble surfactants that are applied to emulsified oil at low concentrations (0.1-2 percent). They can be injected into skimmer reservoirs to break the emulsion so that excess water can be separated from recovered oil. They also can be sprayed (similar to dispersants) directly onto slicks to break or prevent emulsions.

Applicable Habitat Types:
On all water environments where emulsified oil is present.

When to Use:
For recovered oil, where storage capacities are very limited, to separate the oil and water so that the water can be treated and discharged. On floating slicks, when formation of emulsified oil has or could reduce skimmer efficiency.

Biological Constraints:
Unknown at this time.

Environmental Effects:
Because this is a new application approach, there are very little data available on which to evaluate environmental effects. Effective dosages are 1-2 orders of magnitude lower than dispersants. There are concerns about application to slicks on how treatment might change the physical or chemical properties of the oil, whether the oil will be more readily dispersed, and how the treated oil will behave upon contact with birds, mammals, and shorelines.

Elasticity Modifiers (visco-elastic agents, elastimers, viscosity modifying agents)

Objective:
To impart visco-elastic properties to treated oil and increase skimming rates.

Description:
Chemical agent is applied as a liquid spray or a slurry onto the oil in the proper dosage. Treated oil is rendered visco-elastic, but still fluid, gelatinous, or semisolid; there is no chemical change in the oil. The primary purpose is to increase the efficiency in removal rates by skimmers. Increases the recovery by drum skimmers, but can clog weir-type skimmers.

Applicable Habitat Types:
On all water environments where oil can be contained for recovery with skimmers. Not for use adjacent to wetlands or debris because of an increase in adhesive behavior of the treated oil.

When to Use:
When recovery efficiency of skimmers needs to be increased. Must be used in conjunction with booming or other physical containment. Not for use on heavy oils which are already highly viscous.

Biological Constraints:
Not suitable for vegetated shores or where there is extensive debris mixed in the oil. Should be avoided when birds or other wildlife that may be more adversely impacted by the treated oil can not be kept away from the treated oil.

Environmental Effects:
May enhance the smothering effect of oil on organisms. Thus, the treatment should be considered only where recovery of the treated oil is likely.

Chemical Oil Spill Treating Agents (COSTAs)

(Continued)

Herding Agents

Objective:
To collect or herd oil into a smaller area and thicker slick, thus increasing recovery. Also can be used to herd oil away from sensitive areas.

Description:
Chemical agents which are insoluble surfactants and have a high spreading pressure are applied in small quantities (1-2 gallons per lineal mile) to the clean water surrounding the edge of a fresh oil slick. They contain the oil, prevent spreading, but do not hold the spill in place. Hand-held, vessel-mounted, or aircraft systems can be used. Must be applied early in spill, when oil is still fluid.

Applicable Habitat Types:
On all water environments.

When to Use:
Potential use for collection and protection. For collection, use to push slicks out from under docks and piers where it has become trapped, or in harbors, where the equipment is readily accessible for use early in the spill. For protection, in low-current areas, use to push slicks away from sensitive resources, such as wetlands. Not effective in fast currents, rough seas, or rainfall.

Biological Constraints:
Not suitable for use in very shallow water or fish spawning areas.

Environmental Effects:
Direct acute toxicity to surface layer organisms, though available products vary greatly in their aquatic toxicity.

Solidifiers

Objective:
To change the physical state of spilled oil from a liquid to a solid.

Description:
Chemical agents (polymers) are applied to oil at rates of 10-45 percent, solidifying the oil in minutes to hours. Various broadcast systems, such as leaf blowers, water cannons, or fire suppression systems, can be modified to apply the product over large areas. Can be applied to both floating and stranded oil.

Applicable Habitat Types:
All water environments, bedrock, sediments, and man-made structures.

When to Use:
When immobilization of the oil is desired, to prevent re-floating, penetration into the substrate, or further spreading. However, full solidification may not occur unless the product is mixed well with the oil, and may result in a mix of solid and untreated oil. Generally not used on spills of heavy oil because the product cannot be readily mixed into viscous oils.

Biological Constraints:
Must be able to recover all treated material.

Environmental Effects:
Available products are insoluble and have very low aquatic toxicity. Unrecovered solidified oil may have longer impacts because of slow weathering rates. Physical disturbance likely during application and recovery.

Chemical Shoreline Pre-Treatment

Objective:
To prevent oil from adhering to or penetrating the substrate.

Description:
Various types of chemicals, either solidifiers, surfactants, or film-forming agents, are applied to habitats in advance of the oil to prevent oil adhesion and penetration. Application must occur just prior to stranding of the oil, thus it is time-critical.

Applicable Habitat Types:
For solidifiers, bedrock, sand and gravel habitats, and man-made structures. For surfactant-type products and film-forming agents, sand to gravel habitats.

When to Use:
When oil is projected to impact an applicable shoreline, particularly those which have high recreational or aesthetic value. However, lack of information on the availability, effects, and effectiveness of most products greatly limits their use.

Biological Constraints:
The toxicity of currently available products vary over three orders of magnitude, thus each product should be evaluated prior to consideration for use. Solidifiers should not be applied where smothering of organisms is of concern.

Environmental Effects:
Product-specific. Solidified oil will have higher smothering effects. Products which disperse oil will affect nearshore resources. See discussion for dispersants and solidifiers.

Shoreline Cleaning Agents

Objective:
To increase the efficiency of oil removal from contaminated substrates.

Description:
Special formulations are applied to the substrate, as a presoak and/or flushing solution, to soften weathered or heavy oils to aid in the efficiency of flushing methods. The intent is to be able to lower the water temperature and pressure required to mobilize the oil from the substrate during flushing.

Applicable Habitat Types:
On any habitat where water flooding and flushing procedures are applicable.

When to Use:
When the oil has weathered to the point where it will not flow using warm to hot water. This approach may be most applicable where flushing decreases in effectiveness as the oil weathers.

Biological Constraints:
The released oil should be recoverable rather than dispersed into the water column. Use may be restricted where suspended sediment concentrations are high, adjacent to wetlands, and near sensitive nearshore resources.

Environmental Effects:
If more oil is dispersed into the water column, there could be more oil sorbed onto suspended sediments and transferred to nearshore habitats, particularly along sheltered shorelines.

Nutrient Enrichment

Objective:
To speed the rates of natural microbial degradation of oil by addition of nutrients (generally nitrogen and phosphorus).

Description:
Nutrients are applied to the habitat in one of several methods: soluble inorganic formulations which are dissolved in water and applied as a spray, requiring frequent applications; slow-release formulations which are applied as a solid and designed to slowly dissolve; and oleophilic formulations which adhere to the oil itself, thus they are sprayed directly on the oiled areas.

Applicable Habitat Types:
Could be used on any habitat type where safe access is allowed.

When to Use:
On moderately to heavily oiled substrates, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where nutrients are a limiting factor in natural degradation. Most effective on diesel-type and medium oils that do not have large amounts of high-molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills which will be completely removed by evaporation at faster time frames than microbial degradation.

Biological Constraints:
Not suitable in shallow water or restricted waterbodies where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern. Contact toxicity of oleophilic formulations may restrict areas of direct application. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms.

Environmental Effects:
Very little information available on effects in freshwater.

Natural Microbe Seeding

Objective:
To speed the rates of microbial degradation of oil by addition of nutrients and microbial products.

Description:
Formulations containing hydrocarbon-degrading microbes and fertilizers are added to the oiled area. The argument is made that indigenous organisms will be killed by the oil or not able to degrade the oil, so new microbial species need to be added to speed the process of biodegradation.

Applicable Habitat Types:
Could be used on any habitat type where safe access is allowed.

Biological Constraints:
Not suitable in shallow water or restricted waterbodies where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms.

Environmental Effects:
Very little information available on effects in freshwater.

When to Use:
On moderately to heavily oiled substrates, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where nutrients are a limiting factor in natural degradation. Most effective on diesel-type and medium oils that do not have large amounts of high-molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills which will be completely removed by evaporation at faster time frames than degradation.

Potential Effectiveness of ISB

Although in situ burning is a relatively simple technique, its effectiveness can be limited by spill circumstances. Whether and how oil burns is the result of the interplay among a number of physical factors related to the oil itself and the extent to which the oil has been exposed to the environment. Critical factors—such as oil thickness, degree of weathering, and extent of emulsification—generally change with the passage of time, and the changes that occur make it more difficult to burn the oil. As a consequence, in situ burning is most easily and effectively implemented during the early stages of a spill.

The efficiency of in situ burning is highly dependent on a number of physical factors. Test burns and actual spill situations suggest it can be very effective in removing large quantities of oil from the water. Burn efficiencies of 50 to 90 percent can be expected making this response method more efficient than others methods. In comparison, mechanical removal (such as skimming) typically has an efficiency of 10-20 percent.

In situ burning has most often been considered and tested with crude oil spills. However, its feasibility with other types of refined oil products (e.g., diesel and Bunker C fuel oil) has been demonstrated. Difficulties with establishing and maintaining necessary slick thicknesses (in the case of lighter oils) and ignition (for heavier oils) make in situ burning a slightly less viable alternative for those materials than for crude oils.

ISB Relationship to Other Countermeasures and Potential Environmental Tradeoffs

Relationship to Mechanical and Other Response Methods

Spill prevention is the first line of defense in spill response planning, however, acceptance of the probability that a spill can and will occur is essential to successful preparedness. Burning will be considered as a possible response option only when mechanical containment and recovery response methods are incapable of controlling the spill alone.

While physical containment and mechanical removal of spilled oil is the primary objective of any response, prudent planning dictates the consideration of alternative countermeasures.

Summary of Potential Tradeoffs Relevant to ISB

As is the case with all response methods, the environmental tradeoffs associated with in situ burning are situation dependent and cannot be considered independently from operational tradeoffs. In situ burning can offer important advantages over other response methods in specific cases, and may not be advisable in others depending on the overall mix of circumstances.

Advantages

- In certain areas where other techniques may not be possible or advisable due to the physical environment (e.g., ice conditions or wetlands) or the remoteness of the region, burning may represent one of the few viable response choices besides no action.
- In situ burning may prevent or significantly reduce the extent of shoreline impacts, including exposure of sensitive biological resources, wildlife habitats, and the oiling of high value recreational or commercial beaches.
- The magnitude of a spill may overwhelm the containment and storage equipment deployed or available for a region, necessitating the consideration of other methods in an overall response strategy.
- Burning can rapidly remove a large volume of oil from the surface of the water, reducing the magnitude of subsequent environmental impacts of stranded oil.

Disadvantages

- Large quantities of highly visible black smoke is generated that may adversely affect human and other exposed populations downwind.
- There may be the potential for mortalities and other adverse biological impacts from localized temperature elevations at the water surface. Although this would be expected to occur in a relatively small area, in specific bodies of water at specific times of the year, affected populations may be large enough or important enough to represent reasons for not considering burning as a cleanup technique. Adverse impacts from temperature elevation should be considered relative to the toxic effects of the spill if burning is not employed.
- The longer-term effects of burn residues on exposed biological populations has not been investigated. It is not known whether these materials represent a significant source of toxicity.
- In situ burning must be carefully controlled in order to maintain worker safety and to prevent unintended environmental impacts.
- There is a relatively short window of opportunity to use burning after a spill occurs prior to the oil weathering and losing its flammable characteristics.

Proposed Guidelines for ISB in Marshes

Based on the available data on effectiveness and effects of burning on oiled marshes, the following guidelines are proposed:

- Make sure that it is possible to contain and control the fire; it is not as easy to put out a fire in vegetation as it is with oil contained in a fireproof boom.
- Impacts to below ground vegetation are likely to be lower if there is a water layer between the oil and the substrate.
- A standing water layer of just a few inches may get hot enough to kill shallow roots anyway, however, little information is available regarding this effect.
- Burning of oiled woody wetland vegetation (compared to grasses and sedges) should not be considered.
- Not enough is known about seasonal effects on the ability of burned, oiled vegetation to recover, yet burning in late fall to early spring, when the vegetation is dormant and before production of new growth seems to be the best time.
- If it can be done with minimal impacts, heavy accumulations of oil should be removed using other methods, to reduce the amount of burn residues which may cause long-term impacts to both vegetation and animals returning to the habitat.
- Light fuels oils and crudes burn more efficiently and generate less residues, which should reduce the potential for long-term impacts.
- Burning of oil trapped in ice appears to have the least environmental impacts because the burn area is contained, the plants are dormant, and the above-ground vegetation is dead.
- There is some concern that burning of muddy substrates could alter their physical properties (i.e., make them hard) thus degrading their biological productivity.
- Every wetland is different in terms of the type of wetland, the species growing there, the condition (optimal or marginal for species use), and the known or estimated tolerances of that type of system to physical and chemical disturbances. Biologists or botanists should be consulted prior to the use of burning as a cleanup technique in a wetland.
- Mechanical or manual alternatives to in situ burning may compact oil into sediments, where it persists longer. Therefore, the relative damages from different response options should be weighed carefully.

ISB in Wetland Habitats

There are few studies on the relative effects of burning oiled wetlands compared to other techniques or natural recovery and most of the experience is derived from estuarine habitats. However, in situ burning in wetlands can be effective since it can remove a large quantity of oil with a minimum of physical disturbance. The type of wetland vegetation and the season of the year along with many other factors will dictate whether burning is feasible in a particular wetland.

Refuge managers have historically conducted prescribed burns of wetlands to rejuvenate wetlands that have accumulated high litter loads, generate green vegetation or open spaces to attract wildlife, release nutrients for re-cycling, and to restore habitats in areas that were historically subject to frequent wildfires to their natural conditions. The presence of oil in a wetland may have two important effects: the high BTU of the oil may increase the temperature and heat penetration of the burn, and there is often an oil residue which can cause toxicity. However, the experiences of fire ecologists and practitioners can greatly contribute to the development of guidelines for burning wetlands as a spill-response strategy.

Proposed Guidelines for ISB in Marshes

(Continued)

Guidance is being developed for specific types of wetlands such as:

- Wooded swamps
- Fresh-to-brackish impoundment marshes
- Great Lakes coastal marshes
- Upper Mississippi River marshes (lock and dam pools)
- Riparian wetlands
- Inland freshwater marshes
- Potholes

For now, based on discussions with refuge staff with fire management duties, the following general considerations for use were developed:

Pros

- Where access is limited or mechanical/manual removal has the potential to cause more damage by equipment and trampling, burning can rapidly remove oil from sensitive areas.
- It provides a response option when no others are acceptable, or where likely oil residues will be unacceptably high with other options, including natural recovery.
- It rapidly removes oil from the habitat when there is a time-critical element, such as a short-term change in the physical conditions which will likely cause loss of containment and further spreading, or a seasonal increase in wildlife use, such as arrival of large numbers of migratory waterfowl.

Cons

- Burning can cause substantial initial plant damage because the above-ground vegetation is removed.
- Burning can cause long-term impacts to vegetation, especially if the fire is so hot that the below-ground plant parts are killed.
- There is a potential for burning to increase oil penetration into the substrate, when there is no standing water.
- Any animals present and unable to escape (such as gastropods on clean vegetation above the oiled area) will be killed.

Air Monitoring Guidelines for Human Health Impacts of ISB

In situ burning may affect two groups of people: the workers conducting the burn (the responders), a fairly homogeneous group of young, healthy adults, and the general public, which is much more heterogeneous and includes individuals who are more susceptible to toxic agents. The basic premises and possible monitoring options for each group are discussed below.

Monitoring for Responders

The responders, i.e., the workers assigned to conduct the in situ burn, are likely to be healthy and physically fit adults. Responders' locations will vary with the nature of the burn and the stage at which it is conducted. Most of the time they are expected to be upwind of the slick and the smoke plume. However, at times they may be downwind of the evaporating slick and therefore be exposed to volatile organic compound (VOCs). Responding crews may also be downwind and near the burning oil where they can be exposed to combustion products.

Responders may be exposed to VOCs from the evaporating slick, similar to what is expected during skimming operations, and to combustion by-products from the burning oil: carbon dioxide, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulates, and other combustion products. Air concentration of those substances depends on many variables, and we can expect substantial variability. Responders may be exposed to levels of gases and particulates above the permissible occupational exposure limits, and should therefore be provided with personal protective equipment and be trained in its proper use. In reality, responders' exposure is likely to be intermittent, and will vary greatly depending on location, weather conditions, and assigned tasks. Overall exposure duration is expected to vary from minutes to several hours.

Sampling Purpose

Sampling the responders' exposure level should serve several purposes, among them:

- Characterize exposures and hazards associated with the operation to provide better protection;
- Compliance with OSHA requirements, per 29 CFR 1910.134 b.(8)[1] and 29 CFR 1910.120.q.3.(ii)[2];
- Data collection for scientific purposes.

Air sampling should not substitute for workers' protection and safe work practices. Responders should be protected from overexposure regardless of monitoring and air sampling.

Exposure Limit

Exposure limits for responding personnel should be based on occupational exposure guidelines (see Table 1) such as OSHA's Permissible Exposure Limits (PEL) or applicable State standards. Exposure to the general public should not exceed the National Ambient Air Quality Standards (NAAQS).

[1] Regulations concerning respiratory protection

[2] Regulations concerning Hazardous Waste Operations and Emergency Response (HAZWOPER)

Table 1. Occupational Exposure Limits and the National Ambient Air Quality Standard for the Most Significant Products of ISB

COMPOUND	OSHA PEL[1]	ACGIH TLV[2]	NAAQS[3]
benzene (in VOC)	1 ppm (5 ppm)*	10 ppm (32 ppm)	N/A
nitrogen dioxide	(1 ppm)	3 ppm (5 ppm)	0.053 ppm annual average
sulfur dioxide	2 ppm (5 ppm)	2 ppm (5 ppm)	0.03 ppm annual average (0.14 ppm 24 hour average)
carbon monoxide	35 ppm (200 ppm)	25 ppm	9 ppm
PAHs	0.2 mg/m^3	0.2 mg/m^3	N/A
particulates PM-10	5 mg/m^3	5 mg/m^3	0.05 mg/m^3 annual average (0.15 mg/m^3 24 hour average)

1. U.S. GPO, 1993. 29 CFR 1910.1000, Table 2.
2. American Conference of Government Industrial Hygienists, 1993. Threshold Limit Values for Chemical Substances and Physical Agents, 1993-1994. Cincinnati, OH.
3. U.S. GPO, 1993. 40 CFR 50.4 to 50.11.

* Numbers in parentheses indicate short-term exposure limits (STEL)

When To Sample

Sampling should be done as long as there is a potential for exposure .

Sampling Method

Industrial hygiene equipment and methods may be used. This may include personal sampling pumps, passive dosimeters, and real-time instruments. In general, the sampling should:

- follow sound industrial hygiene practices and procedures, including taking blank samples, proper sample packaging, etc.;
- be a combination of area samples (e.g., instruments placed on the boom towing boats), and personal sampling on the workers themselves;
- include both short-term peak exposure and time-weighted average, taken over the total length of exposure;
- be done for all substances of concern, making VOCs and particulates the top priority;
- determine background levels before and after the burn; and
- avoid erroneous readings caused by sources of smoke or fuel on the vessels, e.g., exhaust fumes, fuel vapors.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Protection

Responders should use safe operating procedures such as staying upwind of the burn and the slick as much as possible and keeping safe distances from the fire. Responders should use respiratory protection and protective clothing as needed. It should be emphasized that safety risks such as heat and cold stress, falling overboard, or vessel collisions are just as real as chemical exposure, and more acutely dangerous. Responders should receive safety training that should include description of the hazards involved, precautions to be taken, and proper use of the safety equipment.

Monitoring for General Public

The general public usually includes people of all ages. It also includes individuals with allergies and with respiratory, cardiovascular, and other diseases. The vulnerability of these individuals to combustion by-products may be much greater than that of the responders. The distance between the general public and the burning site may vary greatly, depending on the specifics of the burn. The operational guidelines suggest six miles when the wind blows toward shore. However, burns may be conducted closer than six miles if conditions permit. Similarly, a burn may be inappropriate at six miles or a greater distance, if conditions are unfavorable.

Several miles downwind of the burn, levels of vapors evaporating from the slick and gaseous by-products form the fire are expected to be near background levels. Particulate level is the main concern. Based on data from experimental burns and from computer models, the level of particulates in the center of the plume three miles downwind of the burn is expected to be around 150 $\mu g/m^3$ (McGrattan et al. 1993). If the burning is conducted according to the operational guidelines suggested above, PM-10 levels six miles away from the burn should be significantly lower than 150 $\mu g/m^3$ in the center of the plume, and much lower than that at ground level. Concentrations at any one location will depend on specific atmospheric conditions at the time of the burn.

Visual Observations

Visual observations should be conducted to track plume direction and height, and to verify that the smoke behaves as predicted by the weather reports. Observations from ships and aircraft should continue as long as the burning takes place.

Monitoring Considerations

In situ burn is a relatively new response technique. There are legitimate concerns about exposure to the smoke plume by the general public and environment. In order to make decisions concerning the continuation of an in situ burn, it is advisable to collect information concerning concentrations of smoke particulates of 10 µm (PM-10) or less. Monitoring should be established when there is reason to believe that the weather conditions and/or location of the burn could produce a situation in which the general public or sensitive environments could be affected by fallout from the smoke plume. Depending on circumstances, the burn may be monitored by qualitative assessment (i.e., visual observation) and/or by quantitative methods that employ air sampling.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Exposure Limits

Exposure limits for the general public should be based on the National Ambient Air Quality Standards, which is used by EPA for air quality control. The standard for respirable particulates 10 µm in diameter and smaller (PM-10) is shown in Table 1. To err on the side of safety, this Upper Mississippi River policy adopts an action level of a 150 $\mu g/m^3$ average over one hour. Concentrations above this level should result in operational measures to control the rate of burn/smoke formation.

Sampling Limitations

In general, air sampling should not be regarded as a requirement for conducting in situ burning but as an option if the situation warrants. Sampling should not be used as the means to determine whether the public is adequately protected: the public should be protected regardless of air sampling. We believe that such protection may be achieved by adhering to operational guidelines. Sampling, however, may be valuable by providing feedback information to the OSC, by increasing the comfort level of both those conducting the burn and those potentially exposed to it, and by collecting data that may be of value for future in situ burning. Trends are more important than a single number. The readings of a real time particulate monitor may fluctuate widely, depending on nearby activity such as passing cars or smoke from fireplaces in nearby houses. A single reading may be misleading. Averaging the concentration readings over a period of time (e.g., 15 minutes) should provide an indication of the trend, that is, whether particulates concentration goes up or remains steady. Visual observations coupled with sampling that could provide the general trend of particulate concentration should be useful in ascertaining the effect of the burn on exposure of the general population to particulates.

It is also important to state clearly the limitations and shortcomings of sampling data. These data should be interpreted correctly, and the numbers should be presented with the associated uncertainty and possible interferences and inaccuracies. Otherwise, the numbers may not mean much or, worse yet, be misleading.

Sampling

Sampling may be conducted for several reasons:

1. To assess exposure levels at different points, in order to provide immediate feed back to the OSC, and to verify visual observations of plume behavior.
2. Validation of air dispersion models
3. To satisfy other scientific or historical data collection needs

Based on previous experience, the concentration of gases in the plume would drop to below the exposure limit within several hundred yards of the burn. Particulate concentration in the center of the plume may remain above the level of concern for several miles downwind. Sampling of particulates should therefore be the main effort.

When To Sample

Sampling is an option that may be exercised anytime during the burn. It may be desirable when there is a potential for exposure (even if it is expected to be below the limit). Therefore, sampling may be done

when the plume drifts over a populated area, over natural resources, or for scientific data collection, at various locations downwind of the burning site. Since the purpose of this sampling is to monitor in situ burning effects on sensitive populations, there is no need to require it when there is no reason to believe that a sensitive population will be affected. If the smoke plume is expected to be carried away from population centers or sensitive areas, sampling should not be required.

Sampling Equipment

Sampling equipment should be:

- Portable, easily deployable, and available when needed;
- Sensitive, accurate, and precise enough to provide meaningful data;
- If possible, provide real-time readings for immediate feedback and, in addition, have the capability to log readings over several hours, to get the average concentration over an extended period of time.

Real-time particulate samplers are commercially available from several manufacturers.

In addition, sampling pumps using filter media may be deployed at various locations. Their data, which is not real time, may be used for exposure assessment, model validation, and to provide information for future in situ burning.

Recommended Air Monitoring Equipment for ISB

The primary health concern for in situ burning is the evolution of particulates from the burning of crude oil, fuel products or other hydrocarbons. Secondly, within the first several hours of the burn, the generation of volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbon's (PAHs) vapors could be additional health and safety concerns in the immediate area. Air monitoring is an important tool in communicating risks involved to the public at an emergency response. If it is determined that a burn will be conducted and there is risk of exposure to a human population center, then air monitoring should be completed (see pages 16 to 19). The Responsible Party (RP) may conduct air monitoring in conjunction with a burn, either independently or with government oversight. The air monitoring results should be immediately reviewed and assessed to determine the effectiveness of the burn and to address any public health concerns.

The U.S. EPA Region 5 and Region 7 Emergency Response Branches and their contractors, along with the U.S. EPA Environmental Response Team (ERT) and United States Coast Guard Strike Teams, are often called in emergencies to conduct perimeter and on site air monitoring. The U.S. EPA regional offices maintain a 24 hour readiness along with contractor support to provide air monitoring equipment at an emergency response. Equipment arrival time would depend on the mobilization time to the scene from the Regional Office. For a spill on the upper Mississippi this would translate to 3 to 10 hours. The Federal On-Scene Coordinator (FOSC) can mobilize additional air monitoring resources from the ERT or from the USCG Strike Teams. The State Emergency Response Coordinator, or local HAZMAT team, can also mobilize air monitoring resources during an emergency.

The ERT in Edison, New Jersey, is on call 24 hours and is equipped and specialized in supporting OSC's in conducting air monitoring. The ERT can mobilize to the site within 12 to 24 hours after being notified

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

by a FOSC to support air monitoring activities. The United States Coast Guard maintains the Strike Teams to provide assistance to the OSC during an emergency. The Strike Teams are equipped and trained to provide air monitoring, safety monitoring, and other assistance to the OSC as needed. The Strike Teams can mobilize to the site in 12- 24 hours to provide air monitoring assistance.

During an incident when in situ burning is being evaluated, and humans could be exposed to the smoke plume, it is recommended that the Incident Commanders plan to have air monitoring set up prior to and during the burn event. The U.S. EPA and its contractors would immediately mobilize staff and equipment to monitor for particulates using Real Time Aerosol Monitors (RAMs). In addition, carbon monoxide, carbon dioxide, and VOCs can be monitored directly at the burn location. The U.S. EPA Region 5 and 7 offices and their contractors maintain air monitoring equipment to support these operations.

It is recommended that direct reading instrumentation be used to monitor the effectiveness and potential health concerns during a burn. The data should be evaluated, assessed and communicated to the workers and to the public as soon as the results become available. The Real-Time Aerosol Monitors (RAMS), Mini Real-Time Aerosol Monitors (Mini-RAMS), or equivalents, serve as valuable tools to access the particulates in a plume which could impact humans during an in situ burn. The current guidelines for safe levels of particulates are a PM-10 (particulate matter less than 10 microns) concentration of less than 150 micrograms per cubic meter. The proposed Clean Air Act Amendments may change the PM-10 standard. The RAM and Mini-RAM instruments will directly read a measure of the total particulate in milligrams per cubic meter and give real time data for monitoring the particulates in air. The instruments can be used to screen residential areas during an in situ burn so that particulate concentrations can be monitored and the risk to the public and on-site workers may be assessed. The RAMS and Mini-RAMS have been used successfully at tire fires, train derailments involving flaring of hydrocarbons, and other chemical fires where an observable plume is seen.

In addition to the above instruments, the U.S. EPA would mobilize a photo ionization detector, explosimeter, and a portable gas chromatograph to monitor volatile emissions directly at the source of the burn. The U.S. EPA maintains portable gas chromatographs, colorimetric tubes, and fixed sampling pumps, to monitor volatile emissions, PAHs, particulates, carbon monoxide and carbon dioxide during an in situ burn.

The air monitoring equipment described in the following table can be mobilized to an emergency by calling the U.S. EPA Regional Office or the National Response Center.

U.S. EPA Region 5 (24 hour Spill line) (Minnesota, Wisconsin, Illinois)	312-353-2318
U.S. EPA Region 7 (24 hour Spill Line) (Iowa and Missouri)	913-281-0991
National Response Center (Manned by USCG can tie into USEPA regional Office or USCG Office)	800-424-8802

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

The State Emergency Response Section or Local HAZMAT team can also mobilize air monitoring equipment to the scene. Both can be contacted through the State Emergency Response telephone numbers found in the Notification Section of the UMR Spill Plan (see pages 6-7).

Another resource for air monitoring equipment can be vendors, such as industrial hygiene subcontractors, who rent air monitoring equipment. These vendors can make equipment available within 24 hours of an incident.

The NOAA Scientific Support Team can also provide air monitoring resources from its field office at Louisiana State University. This resource can be activated through the NOAA Scientific Support Coordinator for the Great Lakes and Inland Rivers in Cleveland, Ohio.

The purchase price of the mini-RAM is $1,400 and the RAM is $6,700.

Table 2 shows the current inventory of air monitoring capabilities for in situ burning in U.S. EPA Regions 5 and 7.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Table 2. USEPA Regions 5 and 7 Air-Monitoring Capabilities For ISB

EPA Regions 5 (resources located in Chicago, IL, unless otherwise noted)

INSTRUMENT OR TECHNIQUE	TARGET COMPOUND(S)	SAMPLING PERIOD OR TURNAROUND TIME	COMMENTS\ LIMITATIONS
Real-Time Aerosol Monitors	Will yield measure of total particulates, with continuous digital display, concentration ranges from mg/m3 to mg/m3, with option for respirable size selection	Portable particulate monitor. Can provide immediate results once calibrated and in operation; battery operated.	3 units located in Chicago, Illinois; mobilization time determined by distance to site.
Mini Real-time Aerosol Monitors (Mini-RAMs)	Will yield measure of total particulates in milligrams per cubic meter.	Once calibrated, they will give reading 36 seconds after turned on and then a reading every 10 seconds for 500 minutes; can provide time-weighted ave.	2 Units located in Chicago, Illinois, mobilization time determined by distance to site.

EPA Region 7 (resources located in Kansas City, KS, unless otherwise noted)

Combustible Gas and Oxygen Alarm Model 261	Measures levels of oxygen and flammables	Real-time monitoring	Indicates whether it is safe to enter an area; won't measure mists of some oils.
Minirams (Total particulate Miniature Real-time Aerosol) Model PDM-3	Will yield measure of total particulates in milligrams per cubic meter.	Once calibrated, they will give reading 36 seconds after turned on and then a reading every 10 seconds for 500 minutes.	Three available at START KC office. Could be zeroed out before ignition of spill. No analysis of components of particles measured.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Table 2 continued

INSTRUMENT OR TECHNIQUE	TARGET COMPOUND(S)	SAMPLING PERIOD OR TURNAROUND TIME	COMMENTS\ LIMITATIONS
Gilian Personal Sampling Pumps HFS Air Sampling Systems	Capable of sampling for wide range of compounds, including PAHs.	Sample duration of at least 4 hours necessary, longer for some compounds.	START has access to 15 and there are 15 at EPA Region 7. A realistic startup is 48 hours after notice, because of need for charging and calibrat- ion, and purchase of unique sampling trains, which include absor- bent tubes, cassettes, filters and microimpinger traps.
Draeger Tubes	Region has tubes for H2S, CO, CO2, TPHs, SO2, benzene, toluene and xylenes. No PAH tube on market.	Real-time results that are quasi-quantitative.	Almost instantaneous results. EPA also has Sensidyne kits, which will give similar results.
OVAs	Provides concentrations of unidentified total volatiles.	Gives real-time results of total volatiles.	3 OVAs in KC START office, 2 in St. Louis; it does not provide chemical-specific results
HNu	Provides analysis of total volatiles present; some limitations in reading, compounds depending on span in photo-ionization detection (PID) lamp.	Gives real-time results of total volatiles.	3 Hnu's in KC START office, 2 in St. Louis; use limited in wet conditions; soot during burn would likely coat lamp, making it unusable. No chemical-specific results.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Table 2 continued

INSTRUMENT OR TECHNIQUE	TARGET COMPOUND(S)	SAMPLING PERIOD OR TURNAROUND TIME	COMMENTS\ LIMITATIONS
TVA-1000	Analysis of total volatiles, with both flame ionization detector and photo-ionization detector.	Gives real-time results of total volatiles. Can be set for 8-hour exposure mode.	2 Available in KC START office; lamp of PID less exposed to moisture and soot, so of a little more use than Hnu.
Monitox	Designed for confined space, rather than ambient sampling. Only H2S and HCN available.	Designed to show whether threshold levels of gases exist.	2 of each in KC START office.
Polyurethane foam (PUF) samplers	Could be used to collect volatile and semivolatile samples; use on PAHs in region been very limited.	Sampling durations of several hours -- up to 3 days -- are standard.	Eight are regularly available in Kansas City, but more are available from other regions. Require power source.
PM-10 Air Samplers	Will measure particles of <10 microns.	Sampling durations of several hours are required.	Require power source; is a radioactive element involved.
Single Point Monitor from MDA Scientific	Inorganics, including ammonia, hydrogen cyanide and sulphuric acid	The SPM is designed to work with specific key, and cassette, which must be kept frozen. They are not kept on hand by START. Acquisition time would be 48 hours.	The setup time and limitation of sampling to such analytes as cyanides, acids and amines makes its use during any in situ burn response unlikely.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Table 2 continued

INSTRUMENT OR TECHNIQUE	TARGET COMPOUND(S)	SAMPLING PERIOD OR TURNAROUND TIME	COMMENTS\ LIMITATIONS
Summa Canisters	Summas can be used to collect a wide range of volatile compounds, but they do not lend themselves to collection of semi-volatiles, particularly PAHS, which stick to the inside of the canister.	Sampling periods vary from minutes to several hours. 24-hour analytical turnarounds are possible.	Real-time applications must be tied to presence of Mobile Laboratory or use of portable GC, such as Photovac. Not applicable to nonvolatiles.
Portable Gas Chromatograph, Photovac	Volatile Compounds	Estimated 2-3 hours after arrival at spill.	The Photovac has been used primarily to analyze head space samples from soil in the region. It has the potential to analyze air samples collected in Summa canisters, but it is necessary to extract samples collected from Summas. It does not lend itself to analysis of semi-VOCs.
EPA Mobile Lab	Can measure volatiles from samples collected from air, water or soil.	Will ultimately be capable of prompt turn-around of field samples collected in Summas or soil-gas bottles. The Lab is currently being retrofitted and updated.	Mobile Lab must be driven to spill site; it will require four ad-ditional hours to calibrate equipment. Some extractions will require 24-48 hours. Could be used for samples containing VOCs, semi-VOCs, PCBs and PAHs.

Air Monitoring Guidelines for Human Health Impacts of ISB

(Continued)

Sampling Location

Sampling location should be based on priority concerns, with the first priority given to population centers downwind of the burn. For scientific data collection, (e.g., model validation) we recommend that samplers be placed at different distances from the burn to collect particulate concentration data at ground level. Data collected would be extremely valuable for future burns.

If it is determined that sampling is needed, real-time particulate samplers (PM-10) should be positioned on: 1) the shoreline, at the expected centerline of the plume; 2) at the population center of concern; and 3) in several locations in the vicinity of the population downwind of the burn. PM-10 samplers which can operate for more than eight hours, can collect PM-10 reading before the burn commences, (to gather background data during the burn), during the actual burn, to assess the burn effect; and, if possible, after the burn is over, to collect post-burn readings. Sampling results should be relayed to the FOSC. If it is established that the readings exceed the level of concern, the FOSC will be so advised.

Other Sampling Considerations

1. Area background readings should be taken before and after the burn to determine baseline levels.
2. EPA and regional air monitoring stations may be able to assist by providing historical data, and by conducting air sampling during the burn itself.

Public Notification for ISB

Notification of the public of an impending burn is critical to the overall success of an in situ burn effort. The notification, coordinated through the joint information center, should focus on conveying the following messages:

- Burning is a simple, well understood, and controlled practice.
- Strict health and environmental criteria are being used in deciding whether or not to burn.
- Burning is being conducted because it presents the opportunity for greater health and environmental protection than could be achieved by other spill response methods or no response.
- Health and environmental precautions will accompany burning.
- The burns will be carried out by specially trained personnel and will be closely monitored.
- The public will be notified of each burn before or as it begins.

Public notification can be initiated through radio/TV broadcasts, and broadcasts to mariners. If necessary, local government and state emergency service personnel with access to established public warning systems and authority to use them can facilitate this notification.

Materials to educate the public and media about burning, its risks, tradeoffs with other countermeasures should be developed ahead of time and available for dissemination during the burn. This material would cover the trade-offs involved in choosing response countermeasures, and relate the risks of in situ burning to better known risks (i.e. forest fires). Distribution of this information can be through the agencies' public affairs offices prior to a spill and through a joint information center established during a spill.

Suggested Public Notice for ISB

At (time) on (date), a release of oil occurred at (location). Following an evaluation of the situation, local, state, and federal officials have determined that burning the oil in place is the safest and most effective way to protect the public health and environment. The burn will be conducted under controlled conditions to ensure that the fire will not threaten the public, property, or environment.

The decision to burn was made after considering strict health and environmental criteria. Officials have determined that the burning will present an opportunity for greater health and environmental protection than can be achieved by using other spill response methods, including not responding. Health and environmental precautions will accompany the burning.

The burns will be carried out by specially trained personnel and will be closely monitored. The burn will begin at approximately (time), and the public will be advised when the burn is complete. Questions should be directed to (person or organization) at (telephone number).

Ecological Considerations for ISB

Open Water ISB

Potential ecological impacts of open water in situ burning have not been extensively discussed or studied. Conclusions are based on documented physical effects observed in the laboratory and at limited test burns.

The surface area affected by in situ burning is likely to be small relative to the total surface area and depth of a given body of water. This does not necessarily preclude adverse ecological impacts, particularly if rare or sensitive species use the waters in question. Organisms that may be affected by in situ burning include those that use the uppermost layers of the water column, those that might come into contact with residual material, and possibly some benthic (bottom-dwelling) plants and animals.

Direct Temperature Effects

Burning oil on the surface of the water could adversely affect those organisms at or near the interface between oil and water, although the area affected would presumably be relatively small. Observations during large-scale burns using towed containment boom did not indicate a temperature impact on surface waters. Thermocouple probes known to be in the water during the Newfoundland burn showed no increase in water temperatures during the burn (NOBE Facts, January 1994). It appears that the length of time the burning layer resides over a given water surface may be too brief to change the temperature due to the fact the ambient temperature water is continually being supplied below the oil layer as the boom is towed.

Surface Microlayer

Role and importance of the surface microlayer - The surface of the water represents a unique ecological niche called the "surface microlayer," which has been the subject of many recent biological and chemical studies. Although most studies of the microlayer have been conducted in the marine environment, the results can also be applied to the freshwater environment. The microlayer, variously defined but often considered to be the upper millimeter or less of the water surface, is a habitat for many sensitive life stages of aquatic organisms, including eggs and larval stages of fish and crustaceans, and reproductive stages of other plants and animals. The microlayer also is a substrate for microorganisms and, as such, is often an area of elevated microbial population levels and metabolic activity.

Potential effects of burning on the surface microlayer - The ecological importance of the surface microlayer and the potential impacts to it from burning activities have been discussed in the different, but related, context of ocean incineration. The Office of Technology Assessment (1986) noted in an evaluation of the technique,

> …given the intermittent nature of ocean incineration, the relatively small size of the affected area, and the high renewal rate of the surface microlayer resulting from new growth and replenishment from adjacent areas, the long-term net loss of biomass would probably be small or non-existent.

Despite the obvious differences between shipboard incineration of hazardous wastes and surface burning of spilled oil, the above rationale is applicable to in situ burning. Accordingly, potential impacts to the ecologically important surface microlayer are, to some extent, offset by the presumably short-lived nature of the burn and its associated residual material.

Ecological Considerations for ISB

(Continued)

Environmental Toxicological Considerations

Although many studies to define the physical and chemical characteristics that result from in situ burning have been performed, there has been little research on potential ecological effects. To address some of these information shortfalls, Environment Canada coordinated a series of studies to determine if in situ burning resulted in water column toxicity beyond that attributable to allowing the slick to remain on the surface of the water. While these studies centered on the Newfoundland in situ burn field trials conducted in August, 1993, they also included laboratory tests to investigate potential effects in a more controlled environment.

Toxic effects were evaluated using three standard marine test organisms: sand dollar, oyster, and fish. In both the laboratory and the field experiments, sensitive toxic endpoints in these organisms were studied in the three situations of no oil, no burning; oil on water, no burning; and oil on water, burned. Results from the laboratory and field studies indicated that although toxicity increased in water samples collected below burning oil on water, this increase was generally no greater than that caused by the presence of an unburned oil slick on water. Chemical analyses performed in conjunction with the biological tests reflected low hydrocarbon levels in the water samples. In addition to water column samples, the residues remaining after the laboratory and Newfoundland field burns will be subjected to aquatic toxicity testing.

Beyond the direct impacts caused by high temperatures, the by-products of in situ burning may be toxicologically significant. Although analysis of water samples collected from the upper 20 cm of the water column immediately following a burn of crude oil yielded relatively low concentrations of total petroleum hydrocarbons (1.5 ppm), compounds that have low water solubility or that associate with floatable particulate material tend to concentrate at the air-water interface (U.S. EPA 1986). Strand and Andren (1980) noted that aromatic hydrocarbons in aerosols originate from combustion associated with human activities, and that these compounds accumulate in the surface microlayer until absorption and sedimentation remove them.

Burn residues could be ingested by fish, birds, mammals, and other organisms, and may also be a source for fouling of gills, feathers, and fur. However, these impacts would be expected to be much less severe than those manifested through exposure to a large, uncontained oil spill.

Contamination is likely to be local in scale affecting certain unique populations and organisms that use surface layers of the water column at certain times to spawn or feed. In crafting an effective and protective response strategy, these effects should be weighed against effects resulting from alternative actions.

Safety and Health Considerations and By-Products of ISB

Safety of Response Personnel

The safety of personnel during both ignition and burn phases of large amounts of combustible liquids on the surface of the water presents some unique safety concerns for workers and response personnel. Many of these concerns are addressed in greater detail in operationally oriented references and include, but are not limited to the following:

Fire Hazard - Care must be taken that the burn be controlled at all times to ensure the safety of personnel and property. This precludes burning at sources such as tankers, ships, or tank farms unless means are taken to ensure that the flame cannot propagate from the burn location to the source.

Ignition Hazard - Personnel and equipment involved in ignition of the oil slick must be well coordinated. Weather and sea conditions need to be kept in mind and adequate safety distances be kept at all times. Specialized ignition equipment, unknown fire behavior and uncertain flash-points introduce safety risks.

Vessel Safety - Burning at sea may involve the use of several vessels operating in close proximity, perhaps at night or in conditions of poor visibility. These conditions are hazardous by nature and generally require training and close coordination. Maneuverability while towing boom or positioning other containment equipment will require skilled personnel.

Training - Training of personnel to operate equipment for in situ burning should be developed to minimize the risk of injury and accident. Training should meet all applicable OSHA regulations and guidelines.

Response personnel working in close proximity to the burn may be exposed to levels of gases and particulates that may require the use of personal protective equipment. Training for burn personnel should include proper use of use of personal protective equipment which may be used to minimize inhalation of, and skin contact with, combustion by-products. Exposure limits such as OSHA's PELs (Permissible Exposure Limits) are applicable to this group of typically healthy adults.

Other hazards can include the exposure of personnel to extreme heat conditions, smoke and fumes; working under time constraints or extended periods of time. Personnel involved with burning operations must be well briefed on the plan of operations, with safety stressed, and must be notified of all changes from the approved burn plan. The need for burning must be constantly evaluated and should be reconsidered if conditions (e.g., weather, operations, equipment) pose a threat or danger to human health and safety, or facilities. As more knowledge is gained from burning, it is most likely that additional safety concerns will be identified.

General Public Health Considerations

Burning oil produces a visible smoke plume containing smoke particulates, combustion gases, unburned hydrocarbons, residue left at the burn site and other products of combustion. It also results in the evaporation and release of volatile compounds from the oil. Public health concerns relate to the chemical content of the smoke plume and the downwind deposition of particulates. It should be noted that not burning an oil spill also introduces its own air quality concerns. Analysis of the physical behavior of

spilled oil has shown that 50 percent of a light crude oil spill can evaporate fairly readily, and it is the acutely toxic lighter fractions of a crude oil mix that quickly move into the atmosphere.

Results of recent burn tests indicate that in situ burning does not yield significant emissions above that expected for similar types of combustion such as forest fires. Many human health experts feel that the most significant human health risk resulting from in situ burning is inhalation of the fine particulate material that is a major constituent of the smoke produced. An early assessment of health concerns attributable to the Kuwaiti oil fires identified the less than 10-micron particulate matter as representing the greatest health hazard in that situation. The extent to which these particles present a health risk during an in situ burn depends on the concentration and duration of exposure. It is important to remember that particulates in these concentrations are so small that they do not settle readily. They will be carried by the prevailing wind over large distances, over which their concentrations will rapidly decline.

Polynuclear aromatic hydrocarbons (PAHs) are a group of hydrocarbons produced during in situ burning. They are found in oil and oil smoke, where their relative concentration in the latter tend to be higher than in the oil itself. Possible carcinogenicity of some members make this group a serious health concern, although it is generally long-term exposure to the higher molecular-weight PAHs that is the basis for concern. Sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) are eye- and respiratory tract irritants that are produced by oil combustion. Concentrations of PAHs decline downwind as smoke from the fire is diluted by clean air. The concentrations of other by-products of burning oil (i.e., combustible gases) also decline downwind.

Burning should not be allowed if downwind human populations are at risk. The downwind extent of human risk has not been empirically determined although it is an area of very active research. There are no exposure standards for respirable particles generated by a burn that could be applied directly to determine safe downwind distances. Atmospheric dispersion models, if available for the specific area, could be utilized to help refine potential downwind exposures. If models are not available, whenever possible, a small pilot burn could be conducted before a larger burn in order to gauge the effectiveness of the ambient conditions to disperse the smoke and gasses resultant from the burned material. Because wind direction meanders under most circumstances, no population should be within a 45° arc to either side of the wind direction. Local wind and weather events (e.g., air stability class, lake breezes, and frontal passages) must be considered when determining downwind directions.

By-products

By-products of in situ burning exist because no combustion process is completely efficient in oxidizing a given source material. Besides the normal results of burning, CO_2, H_2O, and an assortment of other sulfur and nitrogen residues, a wide range of intermediate combustion products are generated. Although the exact mix of burn residues varies, by products can be categorized into three groups: unburned oil, airborne components, and combustion residues.

Operational Considerations for Conducting ISB

Open Water Burning

An open-water in situ burning technique most likely to be used would involve the use of boats towing fire resistant booms that could be used to contain the spilled oil and keep it from spreading. The boom, attached to the boats by towing lines, would be towed such that it forms a U shape. The open end of the U is maneuvered through the oil slick, and a "boomfull" of oil is collected. The boom is towed away from the main slick and the oil is ignited. During the burning the boom is pulled in such a way as to slowly advance ahead to ensure that the oil is concentrated at the back end of the boom and to maintain maximum thickness. A burn can be terminated by letting the oil layer thin out by releasing one end of the boom. After the oil is consumed the process is repeated. Other techniques may include containing the oil continuously spilling from a burning oil rig, or placing fire boom around a tanker that caught fire.

Burning in Other Inland Environments

Although it is widely held that in situ burning does take place in the inland zone, little technical information exists on techniques and impacts of burning in environments other than open water. In most cases these involve burning in ice conditions and in wetlands and the results are varied and anecdotal.

Burning in Ice/Winter Conditions - Containment is almost always required to maintain the minimum 2-3 mm thickness necessary to burn oil. Ice edges can act as natural barriers, and as long as the oil is of sufficient thickness, combustion is possible. However, wind and/or low currents may be necessary to herd the oil into sufficient thickness along the edge. Oil trapped under the ice may also accumulate in sufficient thicknesses along leads in broken ice resulting in favorable conditions for burning. Test burns in a 1986 Esso wave basin showed burning efficiencies of up to 90% where moderate winds herded the oil into long narrow leads. Burning in other lead geometries and along brash ice resulted in less efficient burns. Arctic studies have also shown it is possible to ignite and burn fresh, weathered, and emulsified oil at temperatures as low as -35°C. It is important to note that an in situ burn in broken ice is not easily extinguished once ignited

Burning oil in snow conditions is similar to burning oil on water since as the snow melts during the burn it can form a meltwater pool upon which the oil continues to burn. Certain conditions such as wind, snow properties, and concentration of the oil in the snow all can impact the success of the burn. Burn efficiencies of 90-99% have been shown during field studies and actual spills. Oil/snow mixtures of up to 75% can be ignited with a diesel or gasoline soaked rag. [This section was from *Detection of Oil in Ice and Burning Oil Spills in Winter Conditions*, PROSCARAC, Inc., March 1992]

Fire Resistant Boom

The application of in situ burning requires the physical collection and containment of oil to maximize the efficiency of the burning process and to provide a means to control the burn. Generally, this is accomplished by the use of a fire boom or some type of fire resistant containment. If fire boom or other fire containment devise is not available and/or the equipment to deploy the boom is unavailable or inadequate, approval for use of in situ burning may be denied.

Operational Considerations for Conducting ISB

(Continued)

Ignition

Heavy oils require longer heating times and a hotter flame to ignite compared to lighter oils. Many ignition sources can supply sufficient heat. These include pyrotechnic igniters, laser ignition systems, and aerial ignition systems. Pyrotechnic devices have been successfully used to ignite floating oil slicks under a range of environmental conditions. Disadvantages to their use are associated with safety, shelf life, availability, speed of deployment, and cost (Spiltec, 1987). Laser ignition, while a promising technique, remains experimental in nature with drawbacks associated with difficulties in beam focusing from the air, wind effects during oil preheating, energy requirements, and cost. Aerial ignition systems using gelled gasoline dropped from helicopters appear to be a more viable technique applicable in a range of environmental conditions. Whichever method is used considerations of safety and efficiency must enter into the decision process.

Oil Thickness

In general, oil slicks can be effectively burned if they are consistently 2 to 3 mm thick. This number can vary with oil viscosity and degree of weathering, with more viscous and more weathered oils requiring a considerably thicker layer of oil (estimated to be nearly 10 mm). Also, burn efficiencies increase as thickness of the slick increases. This consideration, therefore, implies that spilled oil must be contained by some means (fire resistant boom, ice, etc.) in order to prevent oil spreading and the resultant thinning of surface layers.

Effects of Weathering

Weathered oil requires a longer ignition time and higher ignition temperatures. However, igniting weathered oil is generally not a problem with most ignition sources because they have sufficient temperature and burn time to ignite most oils. Weathering, as it affects the ability to burn oil, is currently under study in laboratory and field experiments.

Effects of Emulsification

The effect of water content on oil ignition is thought to be similar to that of weathering, in that it decreases ignitability and combustibility. However, oil containing some water can be ignited and burned. The controlling factor in the combustion of emulsions is the removal of water, which is accomplished either through the boiling of the water out of the emulsion, or by breaking the emulsion thermally or chemically. The effect of emulsions on the ability to burn oil is currently under study in laboratory and field experiments.

Unburned Oil and Solid Burn Residues

Although in situ burning has the potential for removing a large proportion of the mass of an oil spill from the water surface, some of the source material will not be consumed and will remain as a concern. Similarly, combustion residues, described as stiff, taffy-like material will remain after the burn. Provisions for the removal of these materials must be made as the potential exists for undefined levels of shoreline impacts even with a successful burn.

Operational Considerations for Conducting ISB

(Continued)

Although sinking of burn residues has seldom been observed in test burns, a slight increased in density relative to the original oil has been observed. In the 1991 explosion and burning of the tanker *Haven* off Genoa, Italy, burn residues were thought to have sunk. Reliable estimates of the amount of oil actually burned were not possible, but the tanker was laden with 141,000 tons of Iranian heavy crude, and very little remained in the wreck following the accident and fire. It was reported that several surveys during 1991 confirmed that there was sunken oil offshore and along the coast. The sunken oil is now thought to have resulted from the extraordinary heating of the contained product inside the cargo holds of the vessel. This oil basically under went a crude distillation, in which lighter components were driven off and a denser—and in this case, heavier than sea water—material remained.

It should be emphasized that the circumstances specific to this situation should not be used as the basis for generalization in all burning scenarios.

RESOURCE MANUAL

Section G: Other Resources

Acronyms

ACP	Area Contingency Plan
AST	Atlantic Strike Team
ATSDR	Agency for Toxic Substances and Disease Registry
CAA	Clean Air Act
CAER	Community Awareness and Emergency Response
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPT	Captain of the Port
CWA	Clean Water Act
DHS	Department of Homeland Security
DNR	Department of Natural Resources
DO	Dissolved Oxygen
DOA	Department of Agriculture
DOC	Department of Conservation
DOT	Department of Transportation
DPS	Department of Public Safety
DRAT	(USCG) District Response Advisory Team
EHS	Extremely Hazardous Substance
EIS	Environmental Impact Statement
EMAC	Emergency Management Assistance Compact
EMC	Emergency Management Committee
EO	Executive Order
EOC	Emergency Operations Center
EOP	Emergency Operation Plan
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986 (SARA Title III)
ESA	Endangered Species Act
ESF	Emergency Support Function (annex to the Federal Response Plan)
EWMN	(Upper Mississippi River) Early Warning Monitoring Network
FD	Fire Department
FEMA	Federal Emergency Management Agency
FOSC	Federal On-Scene Coordinator
FRP	Facility Response Plan
FRP	Federal Response Plan
FY	Fiscal Year
GAO	Government Accountability Office
GIS	Geographic Information System
GLC	Great Lakes Commission
GPS	Global Positioning System
GRP	Geographic Response Plan
GSA	U.S. General Services Administration

Acronyms
(Continued)

HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
HHS	U.S. Department of Health and Human Services
H.R.	House of Representatives
HSEM	Homeland Security and Emergency Management
HUC	Hydrologic Unit Code
IC	Incident Commander
ICS	Incident Command System
IO	Information Officer
ISA	Inland Sensitivity Atlas
JIC	Joint Information Center
L&D	Lock(s) and Dam
LDB	Left Descending Bank
MARAD	U.S. Maritime Administration
MMS	Minerals Management Service
MNRG	Midwest Natural Resources Group
MRC	Mississippi River Commission
MVD	(USACE) Mississippi Valley Division
MVP	(USACE) St. Paul District
MVR	(USACE) Rock Island District
MVS	(USACE) St. Louis District
NAS	National Academies of Science
NCP	National Contingency Plan
NEBA	Net Environmental Benefit Analysis
NEPA	National Environmental Policy Act
NGRREC	National Great Rivers Research and Education Center
NGO	Non-Governmental Organization
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPFC	National Pollution Fund Center
NPS	National Park Service
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NRDA	Natural Resources Damage Assessment
NRT	National Response Team
NSF	National Strike Force
NWR	National Wildlife Refuge
OMB	Office of Management and Budget
OPA	Oil Pollution Act of 1990

Acronyms
(Continued)

ORSANCO	Ohio River Valley Water Sanitation Commission
OSC	On-Scene Coordinator
OSHA	Occupational Health and Safety Administration
OSLTF	Oil Spill Liability Trust Fund
OSRO	Oil Spill Removal Organization
PCA	Pollution Control Agency
PHMSA	Pipeline and Hazardous Materials Safety Administration
PL	Public Law
PPE	Personal Protective Equipment
PREP	National Preparedness for Response Exercises Program
PRFA	Pollution Removal Funding Authorization
QA/QC	Quality Assurance/Quality Control
RCP	Regional Contingency Plan
RCRA	Resource Conservation and Recovery Act
RDB	Right Descending Bank
RIFO	(USFWS) Rock Island Field Office
RM	River Mile
RMP	Risk Management Plan
RP	Responsible Party
RRT	Regional Response Team
SARA	Superfund Amendments and Reauthorization Act
SAV	Submersed Aquatic Vegetation
SCAT	Shoreline Cleanup Assessment Technique
SDWA	Safe Drinking Water Act
SEMA	State Emergency Management Agency
SERC	State Emergency Response Commission
SHPO	State Historic Preservation Officer
SONS	Spill of National Significance
SOSC	State On-Scene Coordinator
SPCC	Spill Prevention Control and Countermeasure
SSC	Scientific Support Coordinator
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
TRANSCAER	Transportation Community Awareness and Emergency Response
TSS	Total Suspended Solids
UCS	Unified Command System
UMR	Upper Mississippi River
UMRBA	Upper Mississippi River Basin Association
UMRCC	Upper Mississippi River Conservation Committee
UMRNWFR	Upper Mississippi River National Wildlife and Fish Refuge

Acronyms
(Continued)

USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WQ	Water Quality
WQEC	(UMRBA) Water Quality Executive Committee
WQTF	(UMRBA) Water Quality Task Force
WQS	Water Quality Standard

Upper Mississippi River Spill Response Plan and Resource Manual

Corrections and Updates

Information contained in The Upper Mississippi River Response Plan and Resource Manual reflects currently available information that has been verified when possible. Because information contained within the Plan and Manual will change over time, the document will be updated periodically to reflect these changes. If you are aware of changes or errors, or if you can provide additional information, please take the opportunity to inform us. Your information will be incorporated into the next version of the Response Plan and Resource Manual. Thank you for your assistance.

Correction ☐ Additional Information ☐ *(Please check one)*

Section of Plan or Manual _____

Page # (s) _____

Correction / Information _____

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Please use additional pages, if necessary.

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